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Editorial

Managers for Digitized World: The process of digitalization is changing how we manage, work, and live. The main focus of management in the past was resource and process optimization. However, in the digital age, networks, data, and algorithms are becoming more and more important to manage. This change will have a significant impact on the future of management. On the one hand, digitization helps managers by providing them with new options to increase the productivity, efficiency, and decision-making. On the other hand, it also brings in new challenges, such as the requirement to control a more complex and unstable environment.

It is imperative for managers to possess a profound comprehension of digital technologies and their potential applications in enhancing organizational performance. In the digital age, emotional intelligence which includes self-awareness, empathy, and emotional regulations is important for the leadership as technical expertise. Although the direction of management is unclear, one thing is certain: digital technology will have a significant impact. Future success will be in the hands of the managers who are able to embrace these developments. Those who fail to adapt will fall behind.

The developments in the digital era impact the education, the public sector, and commerce. As traditional leadership and management role become less relevant, new competencies and mindsets are required to remain competitive and fit the emerging new roles. Leaders in academia and business must collaborate to discuss and take advantage of the current digital technology as well as to reshape the business education and the workplace of the future to develop digital and leadership competencies in anticipation of future problems.

In a digitally connected world, the future of management is an exciting and yet a challenging journey. It requires leaders who can adapt, pick up new skills, and use digital tools and technology to their advantage in order to propel success. In the digital age, ethical concerns are critical and include privacy, diversity, equity, and inclusion. A lifelong education is essential in the rapidly changing digital world. Long-term success requires staying current with the newest tools and trends in the digital space. As a result of the globalization of business, managers now have to deal with cross-cultural problems and obstacles in global marketplaces.

New Delhi **Editor**

31st July 2024

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Delineate the Sphere of Retail banking: A Bibliometric Analysis

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ABSTRACT

In Retail banking, bibliometric analysis and mapping have yet been able to assess output, show the industry's growth through time, and pinpoint the most recent trends as of 2023. A bibliometric examination of retail banking in the Scopus collection is therefore the main goal of this study. To get the results, the bibliometric analysis was carried out using the R-studio (biblioshiny) software. Between 1989 and 2023, 331 distinguished authors authored 163 of the most pertinent publications in 93 journals. Additionally, a thematic analysis and a three-field plot analysis of the authors, nations, and keywords were completed. The word cloud of the indexed keywords and co-citation analysis is also included in this study. Furthermore, the current study significantly adds to the body of literature by offering a framework for future research in retail banking based on new trends in 2023, which was published by the Digital Banking Report Research in December 2022.

KEYWORDS: *Retail banking, Bibliometric analysis, R-studio, Service quality, Digital banking.*

INTRODUCTION

Due to significant technological advancements, the financial industry is facing stiff competition in providing integrated financial services around the world. Retail banking has played an important role in converting services into lucrative business models. Retail banking, additionally known as consumer banking or individual banking, is specifically for providing services to the general public rather than to companies, corporations, or other banks, which is commonly referred to as wholesale banking. Retail banking services include the provision of savings and transactional accounts, donation options, GST& and other taxes, social security schemes, MSME services, Kisan services, mortgages, personal loans, and debit and credit cards. Retail banking is also differentiated from investment banking and commercial banking on some terms, unlike retail banking investment banking deals mainly with fund procurement services for companies, governments, and other entities. It may also refer to a branch or department of a bank that deals with individual customers. Retail banking provides many services for increasing the satisfaction level of customers. Customers' pleasure has been found to have a meaningful effect on their intent to make a purchase (Carter, 2010), their loyalty to a brand, and the financial performance of their company (Chalmeta, 2006). The demands, expectations, and wants of customers are constantly changing. To satisfy customers with our cutting-edge goods and services in this changing environment, we must constantly assess their requirements and expectations. The level of service quality that a company provides is evaluated with different techniques concerning the expectations of its clients especially for the customers. In order to satisfy their specific needs, customers acquire services. They have standards and expectations regarding a company, and they have a good understanding of their requirements, what they can anticipate from it in terms of service, and how quickly they can expect it to be met. Businesses with high service standards can maintain their clientele over the long run. There are many models available for measuring service quality. According to the extremely well-known Gap model presented by (Parasuraman et al., 1985), the quality of service is a function of the discrepancy between expectations and performance along the quality dimension. Later in 1988, this model was improved and given the term SERVQUAL to gauge how well services were perceived by customers. 10 dimensions of service excellence had

previously been divided into 5 dimensions—reliability, tangibility, assurance, responsiveness, and empathy. suggested technical and functional quality paradigms (Gronrous, 1984).

This field study provides a thorough overview of the retail banking sector to help readers evaluate the papers on retail banking that are currently available on Scopus, one of the most important international databases, to better understand the nature of this issue. To understand and analyze earlier studies, researchers and practitioners alike use a variety of qualitative and quantitative literature review techniques. Among these, bibliometrics can provide a thorough, open, and dependable evaluation procedure employing the statistical evaluation of academia. Bibliometrics is the application of statistical techniques to the evaluation of books, papers, and other publications, especially those with scientific content. In the late 19th century, bibliometrics studies first became popular. The citation network analysis of Derek John de Solla Price and Eugene Garfield's Science Citation Index laid the groundwork for an organized bibliometrics research program in the early 1960s. One widely used bibliometric technique is citation analysis, which examines the frequency, patterns, and graphs of citations in documents. Many researchers use bibliometric analysis for a spectrum of objectives, including identifying new patterns in the performance of articles and journals, years of journals, collaboration patterns, citation analysis, and research constituents, as well as examining the conceptual framework of an existing body of knowledge (Donthu et al., 2021a; Verma and Gustafsson; 2020; Donthu et al., 2020c). The purpose of my study is to gather data and observations about how retail banking has changed through time between 1989 and 2023. The most commonly cited publications that cover trends in retail banking and advancements in several disciplines have been examined by many researchers. This study will help in identifying the trends, innovations, and standards of work in gestational diabetes mellitus.

METHODOLOGY

Data collection

Scopus and Web of Science are two important literature databases that provide the data used in the bibliometric analysis (Aria and Cuccurullo, 2017). We looked through the online Scopus database to compile publications on service quality in retail banking between the years 1989 and 2023. For this inquiry, the Scopus database was chosen because with tools we can manage, analyze, and visualize research. Scopus is an abstract and citation database of printed and online sources that have undergone peer review. Access to a wide range of international, peer-reviewed content is made possible via Scopus.

Scopus offers extensive metadata records for scientific papers as well as information on author and institution biographies. Precision in profiling is ensured by cutting-edge algorithms and hand curation where necessary. Scopus is a preferred source of data for research assessments, landscape studies, institution rankings, and policy evaluation because of its reputation for trustworthiness (Baas et al., 2020). We utilized the following query terms based on the study's objectives – Retail banking, Service quality, and customer satisfaction. Therefore, we mentioned this query in the article title field for figuring out papers: TITLE ("Service quality") and (Retail banking")" and "(customer satisfaction)". Finally, 163 papers were received and chosen for further evaluation using the Bibliometric approach. The bibliometric analysis is conducted using the Biblioshiny application to achieve the study's objectives.

Data Analysis

Through a quantitative and qualitative bibliometric study, the productivity of one branch of banking, retail banking, was investigated. These emerging patterns in the research landscape are highlighted by indicators including authorship, country studies, and top journal rankings. Co-occurrence analysis was used to look at the relationship between authors, keywords, and citations. After a more thorough search, the results were exported to a CSV or Excel file with the following fields: authors, year published, publication's name, abstracts, subject category, ISSN, keywords, and times cited. The collected information then needed to be cleaned. The Data was analyzed for possible similarities or discrepancies, and the author names were normalized. Additionally, descriptive approaches, bibliometric analysis, and bibliometric mapping were used to examine the outcomes. There were two stages

to the analysis. It began by calculating the fundamental bibliometric indices (number of articles produced annually by language, timespan, country, institution, sources, author collaboration, and annual growth). Then it moved on to analyzing very important points (co-keywords, co-authors, co-citations, and terms in titles and abstracts).

Table 1. Overview of results

Particulars	Information about particulars
Basic information	
Timespan	1989:2023
Sources (Journals, Books, etc.)	93
Documents	163
Annual Growth Rate %	2.06
Document Average Age	10.8
Average citations per doc	52.12
References	8897
Document Contents	
Keywords Plus (ID)	125
Author's Keywords (DE)	390
AUTHORS	
Authors	331
Authors of single-authored docs	24
Authors Collaboration	
Single-authored docs	35
Co-Authors per Doc	2.34
International co-authorships %	17.18
Document Types	
Article	132
book chapter	14
conference paper	6
conference review	1
Review	10

Basic Bibliometric Indicators

Primary information and chronological annual scientific production of documents

This section examines the study profile of retail banking and service quality and their impact on customer satisfaction, spanning published sources from 1989 to 2023. It includes details on the volume of publications currently being made, the most often referenced articles, research trends, well-known authors, co-authors, countries, average citations, universities, authors' keywords, and the sources of publications. The very first piece on retail banking to emerge in the Scopus database dates back to 1989.

The data in Table 1 relates to every paper published in the field of digital entrepreneurship between 1989 and 2023, and it includes average publishing years, average citations per document, average citations per year, document classifications and elements, author information, and author collaboration work.

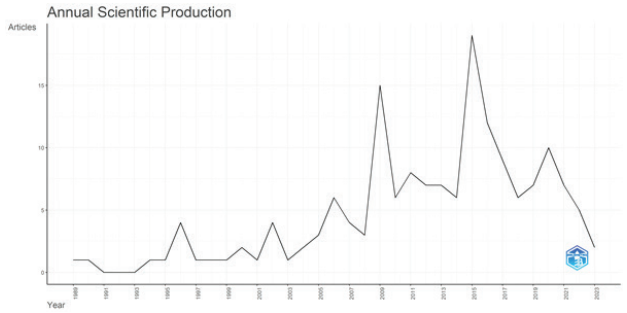

Figure.1, source: Biblioshiny

Figure. 1, shows the historical projection of retail banking from the year 1989-2023. In 2015 the maximum number of documents/ articles were published by eminent authors. This could be because of various government measures, such as the enhancement of the number of banks' public service units in rural areas, regional rural banks helping the rural peoples with many banking services, govt. plans like the Pradhan Mantri Jan Dhan Yojana program, and free credit and debit cards with minimal transaction constraints, are propelling the retail banking sector. Another reason was that technological advancements such as the increased usage of credit and debit cards, insurance, ATMs, direct debits, loans, and phone banking have all helped the expansion of retail banking in India. Many trends in urbanization changing drastically are another key factor influencing retail banking. After 2001, the number of articles has grown drastically. The number of articles declined after 2020 because it is only limited to searches of service quality in retail banking but still, there are new trends in retail banking such as Moving to the cloud, Intelligent Process Automation, cost transformation, Bank-as-a-

service approach, innovation initiatives, API usage, open banking, and many others which are depicted in fig.2 by which many practitioners and researchers can see the future in this field.

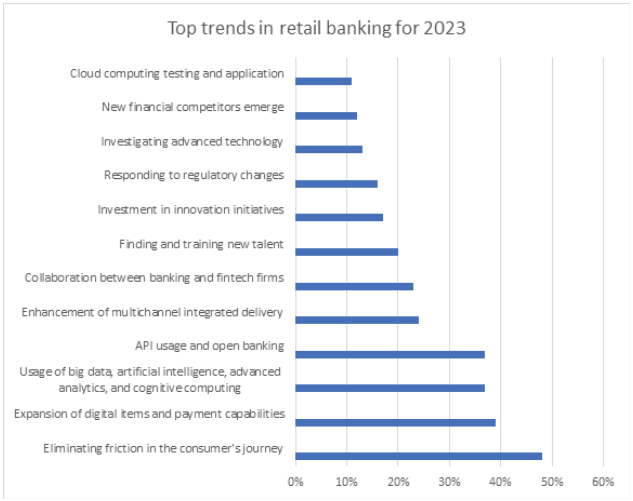

Figure.2, Source: Digital Banking Report Research December 2022

Figure. 2 illustrates the list of top retail banking trends and priorities for 2023. We have a list of developments identified by an expert panel of prominent industry influencers and asked banks, credit unions, and the supplier community internationally to put forward their final three selections. Some significant trends have diminished since last year. The use of big data and artificial intelligence (AI) has declined from 43% to 37%, the enhancement of multichannel integrated delivery has decreased from 32% to 24%, and investment in innovation projects has decreased from 28% to 17%, although some trends have increased from last year. Training new talent increased from 12% to 20%, while digital item expansion increased from 26% to 39%. When compared to the top five trends, financial leaders did not evaluate the importance of innovation (17%), upgrading talent (20%), Cloud computing (11%), or new banking competition (12%). While we agree that these four themes were not a top priority last year, we believe they will become more important in the future as financial institutions strive to evolve into better future-ready. Explosive digital banking revolutions in the banking industry will necessitate a constant dedication to generating partnerships or expanding interactions with third-party organizations. It will also necessitate the upgrading of outmoded technologies as well as the reconsideration of conventional procedures and organizational structures. The timing and speed of this transition will differ from one organization to the other, but the necessity for forward-thinking is inevitable. This list of top trends provides benefits for future researchers and practitioners. Because digitalization of banking is a new wave of competition today. Also, the growth and development of any country majorly depend on its advanced banking system.

Table 2. Top 10 most influential authors on Retail banking

Element	h_ index	g_ index	m_ index	TC	NP
CHOUDHURY K	5	6	0.294	173	6
KAURA V	4	4	0.364	285	4
NARTEH B	4	4	0.364	110	4
AL-HAWARI MA	3	4	0.231	91	4
SHARMA S	3	3	0.273	227	3
AL-HAWARI M	2	2	0.133	68	2
ANANDA S	2	3	0.333	21	3
CLEMES MD	2	2	0.143	100	2
DE BRUIN L	2	2	0.667	10	2
DE MEYER-HEYDENRYCH C	2	2	0.667	10	2

Source: Biblioshiny

The top 10 authors in retail banking are listed in Table 2, along with the publications they produced, the citations they received, and their h-index, g-index, and m-index. Here, the h-index counts both the number of extremely significant papers a scientist has written and the frequency with which they have been cited. A different iteration of the h-index that shows the h-index each year since the first publication is the m-index. Furthermore, the g-index prioritizes works that have received a lot of citations. Choudhury K has the highest h and g index which makes him the most prolific author in this field. The amount of articles and citations a writer receives determines their impact. Table 2 shows that Choudhury K published a maximum of six publications. The following three authors—Kaura V., Narteh B., and

AL-Hawari Ma.—each contribute four articles. Author Kaura V received the highest citations(285).

Table 3. Top 10 journals on Retail banking

Element	h_ index	g_ index	m_ index	TC	NP
International Journal Of Bank Marketing	25	33	0.833	2703	33
European Journal Of Marketing	4	4	0.182	1266	4
Journal Of Retailing And Consumer Services	4	4	0.25	382	4
Marketing Intelligence And Planning	4	4	0.222	291	4
International Journal Of Services And Operations Management	3	3	0.231	50	3
Journal Of Financial Services Marketing	3	4	0.2	78	4
Service Industries Journal	3	3	0.107	139	3
Total Quality Management And Business Excellence	3	3	0.25	47	3
Asia Pacific Journal Of Marketing And Logistics	2	2	0.154	49	2
International Journal Of Quality And Reliability Management	2	2	0.222	82	2

Source: Authors compilation

Table 3 includes the top 10 most relevant journals on retail banking listed in detail along with their h index, g index, and m index. International Journal of Bank Marketing has the highest number of publications with a total of 33. "European Journal of Marketing and Journal of Retailing and Consumer Services" are addressed after this. Table 3 provides a thorough overview and journal production over time. Sources production overtime is also mentioned below in Figure. 3 for better understanding and statistical analyses.

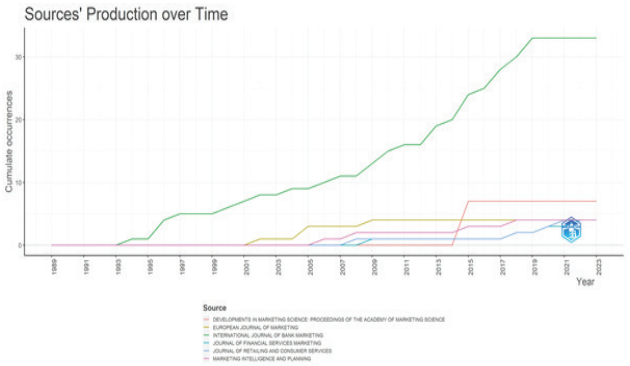

Figure.3, Source: Biblioshiny

Figure 3 shows the sources of production in retail banking from 1989 to 2023 through time. This graph clearly illustrates that the "International Journal of Bank Marketing" has the most publications overall, with a total of 33 since 2019. The "International Journal of Bank Marketing" is shown in green color, and this analysis of the data demonstrates that this is the case. The publications "Journal of Retailing and Consumer Services" (blue line), "Marketing Intelligence and Planning" (pink line), and "Development in Marketing Science: Proceedings of the Academy of Marketing Science" (red line) are additional excellent sources for materials created in this area.

Figure 4, the map was generated through "biblioshiny" Different shadows of blue color represent different productivity rates. Dark blue represents high-production countries and grey represents no article present in those countries related to service quality retail banking. In Fig 4 India has the highest number of documents produced with a total of 78 documents followed by the USA and UK with several 27 and 25 documents in retail banking.

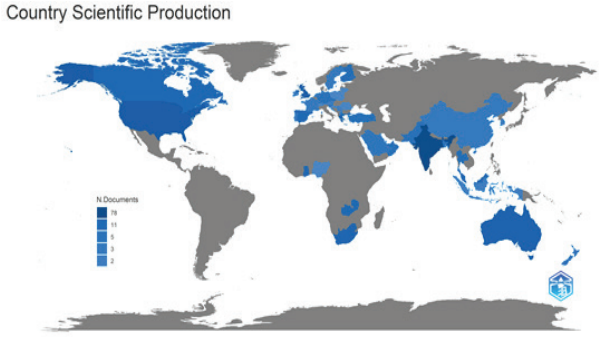

Figure 4. Source: Biblioshiny

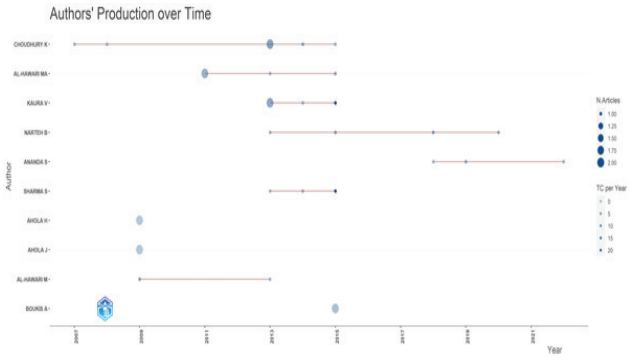

Figure 5. Source: Biblioshiny

Figure.5, depicts the most relevant ten authors' production over time. Figure 5 shows that "Choudhary K" has the longest timeline year(2007-2015). The number of citations every year is directly related to the color intensity. After analyzing the authors' production it is seen that Kaura (2015) and Sharma S (2015) have collected the highest 23 citations per year. Recently (Anand s, 2022) published an article with total citations of 1 per year. The bubble size varies in direct proportion to the volume of published documents i.e. Boukis A (2015) published at least 2 articles with citation 1.22.

Figure 6. Source: Biblioshiny

Word cloud of indexed keywords

An analysis was conducted for the most frequent words in the bibliometric study on retail banking. A word cloud helps assess the most common words, Fig. 6 shows that the majority of the effort is concentrated on banking, service quality, sales, and customer satisfaction. Additionally, words in smaller letters (internet banking, consumption behavior, industrial performance, internet marketing) suggest possible paths for further research (Mulay et al., 2020).

Top Indexed keywords(1)that occur 4 or more times and titles words(2) that occur 25 or more times.

Table 4. Indexed keywords (1)

	Frequency
Banking	9
Service quality	9
Sales	8
Retail banking	6
Customer satisfaction	5
Quality of service	5
Retailing	5
Electronic commerce	4
Internet	4

Source: Biblioshiny

Table 5. Titles (2)

	Frequency
Banking	97
Services	97
Quality	91
Retail	71
Customer	58
Satisfaction	39
Loyalty	25

Figure.7, Source: Biblioshiny, Word cloud based on Titles and title frequency is mentioned in Table 5

The three-field format for authors, nations, and keywords is shown in Figure 8. The nations involved are displayed in the left field, the authors are displayed in the middle, and the banking-related keywords are presented in the right field. This diagram is based on the more common Sankey designs (Riehmann, Handlerand Froehlich, 2005). According to Riehmann et al. (2005), the size of the boxes is associated with the number of

occurrences. Therefore it can be stated that India has the highest number of publications on service quality, retail banking, and customer satisfaction. The term customer satisfaction and service quality is also popular in the United Kingdom, Bangladesh, and Oman.

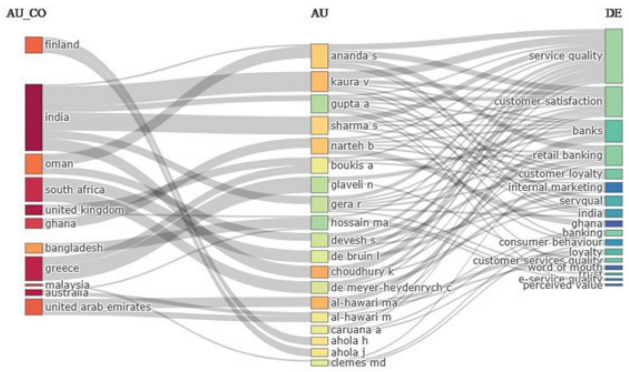

Figure.8, Three field plot Source: Biblioshiny

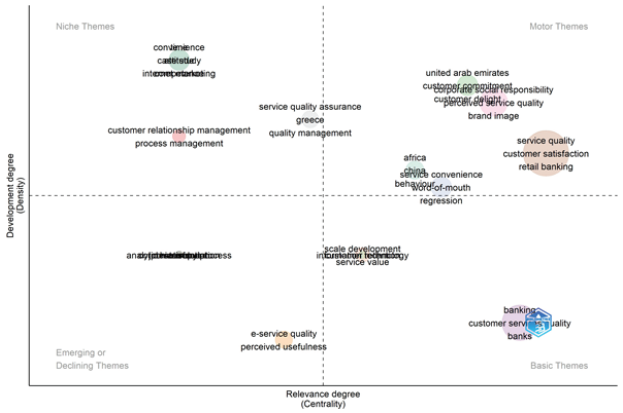

Figure 9. Thematic map, source: R studio

Figure.9, depicts the thematic analysis that derives themes from keyword clusters and their links among authors. Properties (such as density and centrality) define these topics. The horizontal axis is used to show centrality, while the vertical axis represents density. Density reflects the cohesion among the nodes, while centrality represents the degree of linkage between various themes(Esfahani et al., 2019). Fig. 9 depicts the 4 quadrants. Quadrant 1 contains the motor theme. Quadrant 2 contains highly developed and specialized themes. Quadrant 3 contains emerging and declining themes. Quadrant 4 consists of basic and transversal themes. Service quality, customer satisfaction, brand image, service convenience, word of mouth, corporate social responsibility, and customer commitment are the main driving themes in this quadrant. The upper-left quadrant has high-density topics but minor external linkages, making it of little importance in the field (low centrality). The results imply that themes in Q2 could include subjects like process management and customer relationship management that should be more closely related to service quality and retail banking. The lower left theme includes e-service quality, perceived usefulness, and corporate reputation. Finally, the lower right quadrant includes banking, customer service quality, information technology, scale development, and service values which are basics and essential for the development of the field.

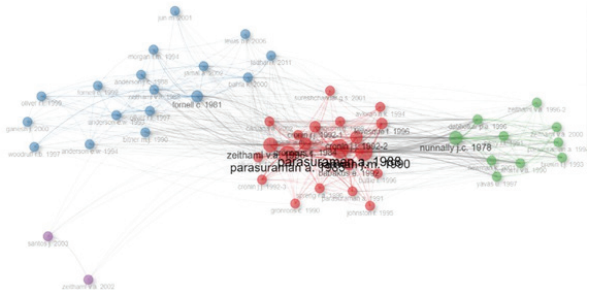

Figure 10. Source: Biblioshiny

Co-citation is the act of citing two works simultaneously in one article(Small. 1973). The likelihood that two references have a connection increases when they are often referenced together in other papers (Benckendorff and Zehrer, 2013). Bibliometric coupling was a method proposed by Kessler, and co-citation was a method proposed by Small. To search for related documents, the co-citation of documents is employed. To analyze the intellectual framework of a scientific discipline, author co-citation is typically used. Co-citation analysis is the study of works that cite the sources simultaneously for example when at least 2 authors cite the same paper. Fig. 10 makes it very clear why clusters of research start popping up when multiple researchers co-cite an identical pair of papers. In these clusters, several co-cited works have recurring topics. Clusters 1 and 3 contain many papers and are represented by the colors red and blue, respectively. Cluster 2 is displayed in green, whereas Cluster 4 is shown in purple. It has been observed that research communities arise when multiple writers mention the same sets of two publications. Clusters of papers with similar citation patterns often

share a common theme. The figure displays the co-citation networks within the dataset, dividing them into four distinct groups. A node with a similar color appears to share certain commonalities. This linkage diagram illustrates the organizational principles underlying the authors' citations in this study on retail banking.

DISCUSSION AND IMPLICATION

To reflect the state of the research at the time, a thorough analysis of the literature on retail banking from 1989 to 2023 was undertaken for this study. We evaluated the productivity of writers, journals that have been published, and countries using bibliometric analysis techniques. We performed citation, keyword, and co-citation analyses to comprehend the wider field of retail banking. Two stages are discernible from the year-by-year historical analysis of articles: the first up to 2015, and the second beginning after 2015. The annual scientific production reports a surge in the creation of materials related to retail banking. In 2015, several new developments emerged that ushered in a new era of retail banking, including mobile-first design, an increase in digital and social selling, an emphasis on encryption and authentication, industry consolidation, and numerous others. From 2015 onward, banks will more actively test relationship- and customer-level pricing systems and use price as a lever to preserve deeper engagement with clients, predicts Chris Skinner.

Retail banks have expanded their digital services since COVID-19. Before 2015, fewer publications were produced, according to annual scientific production. Before that time, banks concentrated mostly on remittances, credit, and payment services including savings. Due to the 2008 financial crisis, the banking industry experienced a decline. This served as a wake-up call for banking professionals, who were then able to bring about the policy much more effectively.

The top 10 prominent authors and their work in retail banking are listed in this study. Choudhury K is the most prominent author on this topic because he has the greatest h and g indices. The most publications and total citations were received by Choudhury K. With the most publications, the "International Journal of Bank Marketing" is the most prolific. The analysis also examined the nations that made the largest contributions in terms of papers produced and overall citations. Based on various blue shades, the scientific production of countries illustrates the various productivity rates country-wise. With a total of 78 documents created, it is evident that India has the highest production rate. The majority of the work is focused on retail banking, service quality, and customer pleasure, as evidenced by the word cloud of indexable keywords.

The three-plot analysis shows the layout for the nations, authors, and keywords examined, showing that India has the most publications on retail banking, service quality, and customer satisfaction. Focus is also placed on customer happiness and service quality in banking in the United Kingdom, Bangladesh, and Oman. The most often cited works, according to a co-citation analysis, are those by Fornell C., Cronin J.J., Nunnally J.C., and Parasuraman; these authors will be the basis for further research.

CONSTRUCTION AND FUTURE OUTLOOK FOR RESEARCH

For information retrieval, the research study is limited to using only one source (Scopus), and the conclusion is drawn from these publications that solely rely on the Scopus database. Although it is the most thorough source, it only includes a part of all articles and publications. With the aid of the Google Scholar or Web of Science collection, researchers and administrators can broaden this investigation and produce statistically more reliable results. In general, we can observe that retail banking is moving in the direction of digital transformation. The retail banking services and products available now are significantly improved over those offered in the past. Investors have been interested in the banking sector because it is more appealing. Additionally, a researcher can broaden this investigation by carrying out quantitative tests to produce more statistically quantifiable data, using the search term ("e-services" or "retail banking") in Scopus. In addition, number rather than quality is the main focus of the citation analysis.

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Unlocking Opportunities: The Dual Forces of Financial Inclusion and Cybersecurity in Shaping Digital Banking

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ABSTRACT

The emergence of digital banking has resulted in a notable transformation in the range of services provided by banks to their customers. Consumers have access to more options for the quicker delivery of services related to finance with the use of digital payment system, which expands the breadth of these services. Digital banking can fulfil the aim of the financial inclusion and can also increase the digital transactions due to cyber security. This paper analyses the impact of Financial inclusion and Cyber security on Digital Banking. Both descriptive and analytical research methods are used in the analysis. A structured questionnaire was developed to achieve the objectives of the research. Data collected from the respondents is analyzed by using various statistical tools like normality test, Cronbach alpha, Exploratory Factor Analysis, Multicollinearity test, One way anova, Correlation test and Regression test. For the analysis of data SPSS 25 was used. For initial work MS Excel was used. Later on data was exported to SPSS 25.

KEYWORDS: *Digital banking, Financial inclusion, Cyber security.*

INTRODUCTION

Digital Banking refers to providing of banking services that is computerized (the automation of traditional banking services), in which consumers can have approachability to the financial products and the services that are given by banks through the means of the internet. This provides more personalised services to the customers. Digital banking can fulfil the aim of the Financial inclusion. Financial inclusion is the comprehensive endeavor of ensuring equitable access to banking and financial products and services for all individuals within a given society, devoid of any form of discrimination or favoritism. The major aim of this initiative is to foster economic inclusion by offering essential financial services to all individuals within society, irrespective of their revenue or savings level. Cybersecurity is a critical aspect of digital banking due to the sensitive nature of financial transactions and the potential risks associated with online platforms. By implementing robust cybersecurity measures and staying vigilant against evolving threats, banks can mitigate risks and build trust with customers in their digital banking services.

REVIEW OF LITERATURE

Barua, Kathuria, and Malik (2016) - According to the findings India possessed a number of strategic assets that created favorable conditions for the deployment of technology to increase financial inclusion. Aadhar, the country's national identification system, robust financial networks, the Indian postal service, thriving mobile networks with billions of connections, and inclusion Indian posts all fall into this category. GPFI (2017) - The report presented by the GPFI highlights that a key factor contributing to is the widespread use of progressive digital services, facilitated by a legislative and policy framework that supports such advancements. Between 2011 and 2014, there was a global increase of 700 million people who were given access to formal financial services as a result of the proliferation of new digital financial services. Lee, K. C., & Chung, N. (2009) He has concentrated on how customers' trust and satisfaction are impacted by the three quality

elements connected to mobile banking: system quality, information quality, and interface design quality. His suggested study model evaluates the potential effects of these three external quality determinants on satisfaction and trust, drawing on the work of DeLone and McLean. Ozili (2018) - According to the findings, a model was developed to show the roles that the government, Fintech companies, and banks play in digital finance and financial inclusion. For the purpose of achieving financial inclusion through digital banking, there is a requirement for comprehensive financial data inclusion. Comprehensive financial data inclusion refers to the process of combining the biometric information of a whole population with their bank accounts. This can give a dual set of benefits: firstly, the verification and tracing of financial transactions done via digital mode, and secondly, the monitoring of the income and demographic profile of users of digital financial services. Both of these benefits can be obtained. The capacity of the public to participate in the digital environment, as well as their willingness to do so, is a crucial prerequisite for reaching high levels of financial inclusion.

Research Gap

Regarding geographical concerns, plenty of studies regarding Financial Inclusion and Digital Banking are from African countries and South Asian countries specific. In India studies related to concerned subject started after Financial inclusion Drive and India Digital Program. The majority of articles were based on survey method and very less articles were based on experiment method. Moreover the study on Financial Inclusion and cyber security in shaping the digital banking is not explored much.

Objectives

- To study and explore the impact of Financial Inclusion on Digital Banking.
- To find the association of other factors like gender, ease, accessibility and adaptability with the Digital Banking.
- To examine the relationship between Digital Banking Usage and the Cyber Security.
- To study the association of other factors like demographic factors, digital skills, strong passwords safety etc. with the Cyber Security.

RESEARCH METHODOLOGY

The current study utilizes a combination of primary and secondary data sources. Both descriptive and analytical research methods are used in the research. Descriptive research is used to describe the demographic profile of the respondent like age, qualification, marital status etc. A structured questionnaire was developed to achieve the objectives of the research. Data was collected from 410 respondents from Bareilly and nearby areas. The researcher chose Convenience and Snow Ball Sampling methods for data collection. The data is analyzed by using various statistical tools like normality test, Cronbach alpha, Exploratory Factor Analysis, Multicollinearity test, One way anova, Correlation test and Regression test. For the analysis of data SPSS 25 was used.

Hypotheses

H01: There is no impact of Financial Inclusion on Digital Banking

H02: There is no association of factors like gender, ease, accessibility and adaptability with the Digital Banking

H03: There is no relationship between Digital Banking Usage and Cyber Security

H04: There is no association of other factors like age, digital skills, strong passwords safety etc. with the Digital Banking.

Data Interpretation and Analysis

Table 1

Demographics		Number
Gender	Male	215
	Female	195
Age (in years)	Less than 25	85
	25 – 35	135
	36 – 50	130
	More than 50	60
Marital status	Married	155
	Unmarried	255

Level of Education	High school	66
	Intermediate	182
	Graduation/ Postgraduate	105
	Professional	57

Normality Testing

Table 2.

Variable	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Gender	-0.079	0.108	-2.002	0.216
Age	0.054	0.108	-0.839	0.216
Area	-0.064	0.108	-1.547	0.216
Education	0.185	0.108	-0.567	0.216
Marital	-0.786	0.108	-1.388	0.216
Occupation	0.308	0.108	-1.240	0.216
Income	1.925	0.108	3.370	0.216
DB1	0.847	0.108	-1.287	0.216
DB2	0.911	0.108	-1.115	0.216
DB3	1.370	0.108	-0.120	0.216
DB4	2.094	0.108	2.400	0.216
DB5	0.924	0.108	-1.016	0.216
FI1	0.719	0.108	-1.451	0.216
FI2	0.981	0.108	-0.860	0.216
FI3	0.734	0.108	-1.409	0.216
FI4	0.395	0.108	-1.636	0.216
FI5	0.341	0.108	-1.765	0.216
ODB1	-0.361	0.108	-1.739	0.216
ODB2	-0.014	0.108	-1.984	0.216
ODB3	0.073	0.108	-2.000	0.216
ODB4	0.191	0.108	-1.970	0.216
ODB5	-0.270	0.108	-1.935	0.216
CS1	0.303	0.108	-1.787	0.216
CS2	-0.397	0.108	-1.794	0.216
CS3	-0.635	0.108	-1.603	0.216
CS4	-0.220	0.108	-1.954	0.216
OCS1	-0.327	0.108	-1.901	0.216
OCS2	0.126	0.108	-1.992	0.216
OCS3	0.095	0.108	-1.999	0.216
OCS4	0.055	0.108	-2.005	0.216

Normality was assessed using the skewness and kurtosis distribution values. The cut-off was +/- 3. All the skewness and kurtosis values were withing cut-off values, hence, the data was normally distributed.

Exploratory Factor Analysis (EFA)

Table 3.

Items	Factors					Cronbach's Alpha
	DB	FI	ODB	CS	OCS	
DB1	0.717					0.898
DB2	0.957					
DB3	0.934					
DB4	0.837					
DB5	0.713					
FI1		0.739				0.845
FI2		0.745				
FI3		0.743				
FI4		0.873				
FI5		0.792				
ODB1			0.860			0.823
ODB2			0.616			
ODB3			0.815			
ODB4			0.812			
ODB5			0.649			
CS1				0.817		0.829
CS2				0.871		
CS3				0.670		
CS4				0.878		
OCS1					0.844	0.895
OCS2					0.763	
OCS3					0.936	
OCS4					0.939	

KMO & Bartlett's Test of Sphericity

Table 4.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.763
Bartlett's Test of Sphericity	Approx. Chi-Square	8378.406
	Df	253
	Sig.	<0.001

KMO values and Bartlett's Test of Sphericity shows good sampling adequacy.

Total Variance Explained by all the factors were 69% (68.96), which was greater than 50%, showing good sampling adequacy. Convergent and discriminant validity was established through the EFA. After removing the low loaded and cross loaded items, the remaining items were loaded onto the same factors and all the item loadings were greater than 0.50, therefore, there was evidence of convergent and discriminant validity. Cronbach's alpha value for each factor was greater than 0.70. Therefore, the reliability of the factors was established.

MULTICOLLINEARITY TESTING

Multicollinearity was assessed using two approaches: VIF (Variance Inflation Factor, Correlations between Independent Variables)

Tolerance and VIF

Table 5.

Factor	Collinearity Statistics	
	Tolerance	VIF
FI	0.901	1.110
ODB	0.995	1.005
CS	0.903	1.108
OCS	0.997	1.003

VIF (Variance Inflation Factor) values are less than 3.3 so there is no multicollinearity issue in the dataset.

Correlation

Table 6.

Factor	FI	ODB	CS	OCS
FI	1.000			
ODB	0.063	1.000		
CS	-0.310	-0.040	1.000	
OCS	0.031	-0.023	-0.042	1.000

Correlations between the independent variables are less than 0.70, hence, there is no evidence of mulicollinearity in the dataset.

Linear Regression Analysis

Table 7.

Hypothesis	Factor	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t Value	P Value
H1	FI	0.046	0.041	0.045	1.132	0.258
H2	ODB	0.483	0.036	0.511	13.389	0.001
H3	CS	0.082	0.037	0.089	2.230	0.026
H4	OCS	-0.007	0.031	-0.008	-0.216	0.829

Note. Dependent Variable : DB

FINDINGS OF HYPOTHESES

H01: There is no favorable impact of Financial Inclusion on Digital Banking

In Multiple Linear regression the R value is 0.518, R square value is 0.268 , the F value is 46.276, t value is 1.132. The P value is .258 which is more than .05 hence, null hypothesis is accepted . So, there is no positive of financial inclusion on Digital Banking.

H02 : There is no relationship of parameters like gender, ease, accessibility and adaptation with the digital banking.

In Multiple Linear regression the R value is 0.518, R square value is 0.268 , the F value is 46.276, t value is 1.132. The P value is .001 which is less than .05 therefore null hypothesis is rejected .There is positive influence between other variables of Digital Banking with the Digital Banking.

H03: There is no association between Digital Banking adoption and cyber security

In Multiple Linear regression the R value is 0.518, R square value is 0.268 , the F value is 46.276, t value is 1.132. The P value is .001 which is less than .05 hence null hypothesis is rejected. There is close association between Cyber Security and Digital Banking.

H04: There is no association of other parameters like age , digital skills, strong passwords etc. with the Digital Banking.

In Multiple Linear regression the R value is 0.518, R square value is 0.268 , the F value is 46.276, t value is 1.132. The obtained p-value of .829 above the predetermined significance level of .05, leading to the acceptance of the null hypothesis. There is no positive impact of other factors of Cyber Security with the Digital Banking.

CONCLUSION

Based on the findings of this study, the conclusion drawn is that Financial Inclusion does not have a substantial impact on Digital Banking. However, despite the fact that the Financial Inclusion scheme wasn't introduced until 2014, a significant number of people were already using digital banking even before that year. In the present day and age, the rise of digital banking can also be attributed to a number of other aspects, such as the fact 'that it is more convenient more widely accepted, and more easily adaptable. Based on the findings of this research, it is clear that online safety and digital banking have a direct relationship with one another. The protection of digital banking provided by cyber security is beneficial. There are some other factors of cyber security which may not impact digital banking usage like role of gender in context of perceiving cyber security while using digital banking, role of digital skills and digital literacy needed for cyber security, age of people etc. It was observed there is no positive impact of other factors of cyber security on digital banking. Individuals who lack digital skills or digital literacy may demonstrate a willingness to acquire knowledge and understanding in the areas of cyber security and online banking. The only need is to create awareness and to launch such programmes which can be beneficial for the public. To increase the digital banking and bring the people under the ambit of Financial Inclusion , It is very important to create awareness. Cyber Security is equally important for the Digital Banking, wakefulness of the same should be created at the same time.

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Advancing Higher Education Reform and Convergence with IFRS Implementation: Assessing the Impact of New Education Policy 2020

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ABSTRACT

India's National Education Policy (NEP) 2020 is a comprehensive framework designed to improve the country's education system and align it with the UN Sustainable Development Goals (SDGs) 2030. It is built on five pillars: access, equity, affordability, accountability, and quality. India's rapidly expanding economy and workforce provide a unique chance to contribute to global development through education. However, the country's education system is archaic and does not meet contemporary standards. To properly execute the NEP, India would need to make major investments in its educational system. This involves updating infrastructure, educating instructors, and creating creative curriculum. Despite its flaws, the NEP has the potential to transform India's educational system and position the country as a global leader in education. By investing in education and giving all children with access to great learning opportunities, India can create a brighter future for its inhabitants and the globe. This article investigates important gaps and obstacles in implementation that must be solved to really promote "universal quality education" with the goal of delivering value internationally. The article also underlines how creative curriculum and high educational standards help to overcome obstacles faced during IFRS adoption, which is required for improved reporting of finances and economic success.

KEYWORDS: *National education policy, 2020, India, IFRS, Convergence, IND-AS, Adoption.*

INTRODUCTION

India's higher education system is highly fragmented, with many small-sized institutions affiliated with universities. This fragmentation is a major challenge to educational reform, as it makes it difficult to implement new policies and programs [1].

Additionally, more than 20% of universities register less than 100 students annually, rendering them financially unviable for significant enhancements in educational quality. Considering there are prospects for higher education reform in India despite these barriers. For higher education reform in India. According to the government's National Education Policy 2020, an education system centered on India will directly support the country's long-term development into a just and vibrant information age by offering all citizens access to high-quality education. Consolidating smaller schools into larger, multifunctional universities is one strategy for addressing the problems of fragmentation and financial inevitableness [2].

These could make it possible to invest more in facilities and resources while also giving students entrée to a wider range of educational opportunities. Enhancing the standard of research and instruction at Indian universities is a crucial additional reform. [3].

Increased teacher and institutional autonomy, boosted research funding, and improved procedures for academic and organisational leadership development could all help achieve this. Finally, the government must take action to make sure that the higher education regulatory structure is effective and efficient. This would involve cracking down on fake colleges and

creating a more supportive environment for innovative institutions. By addressing these challenges and seizing the opportunities for reform, India can create a higher education system which is world-class and meets the requirements of its expanding economy [4].

"A single, comprehensive collection of international accounting standards that are clear, enforceable, and call for accurate, comparable, and transparent data in financial statements and other reporting to assist those who make decisions."

From April 1, 2011, the Indian government has likewise taken the IFRS convergence approach. India chose partial adoption, and with a few carves in and carves out of IFRS, IND --AS was established, which would apply to corporations depending on the Corporations Act 2013, mandatorily beginning on April 1, 2016. The "Ministry of Corporate Affairs (MCA)" has been tasked with the task of converting Indian GAAP to IFRS, resulting in IND AS.

The section of eminent accounting institutions and the Government is important in overcoming these challenges faced during the implementation of IFRS and various measures are required (Iyoha and Faboyede 2011; Firoz, 2011). (Muniraju and Ganesh, 2016; Bhargava and shikha, 2013, Marulkar, 2013, Patro and Gupta, 2012) suggested IFRS should form integral part of curriculum so that more awareness can be generated from the initial stages only and improve the standard of reporting.

OBJECTIVES OF STUDY

The National Education Policy 2020 study aims to accomplish the following goals:

1. Briefly summarise India's new higher education system's main policies.
2. Contrast NEP 2020 in relation to India's current educational framework.
3. Describe the novel aspects related to Newly introduced education policy.
4. Examine how NEP 2020 might affect the impact of India's sector of higher education.
5. Assess the viability of NEP 2020's higher education initiatives.
6. Make recommendations for enhancing NEP 2020's implementation to help it achieve its objectives.
7. The part NEP 2020 will play in enhancing IFRS implementation and financial reporting requirements.

RESEARCH METHODOLOGY

This study uses a mixed-methods approach to investigate the newly introduced National Education Policy (NEP) 2020. First, it provides a conceptual outline of the key elements related to the NEP framework. Second, it conducts a detailed analysis of different sections of the NEP 2020 and compares it to the current education policy. Third, it uses focus group discussions to identify innovations in the NEP and predictive analysis techniques to know the policy's implications. Finally, it concludes with recommendations based on the insights from the focus group analysis. [5-8]. Secondary data from literature reviews, websites, and other articles will also be used in the study.

Comparison of the Existing NEP 1986 with the New NEP 2020

An important document that describes India's educational destiny is (NEP) National Education Policy In 1986, the first NEP was released, and the most recent changes was made in 2020. The NEP 2020 is a significant departure from the previous NEP, and it aims to make India's educational system most renowned in world.

The following table compares the NEP's (2020) main attributes with the NEP 1986:

Feature	NEP 2020	NEP 1986
Curriculum	Flexible and holistic curriculum that focuses on critical thinking, problem-solving, and creativity	A rigid curriculum that focused on rote memorization
Pedagogy	Student-centered and experiential learning	Teacher-centered and lecture-based teaching
Assessment	Comprehensive and formative assessment that focuses on learning outcomes	Summative assessment that focused on memorization

Structure	5+3+3+4 structure with multiple entry and exits	10+2 structure with a rigid separation between elementary, secondary, and higher education
Medium of instruction	Grades K–5 are taught in either the student's mother tongue or a regional language.	English as the medium of instruction from primary school
Equity and inclusion	Focus on equity and inclusion for all students, regardless of their background	Focus on equity and inclusion, but with a greater emphasis on disadvantaged groups
Teacher Education	Focus on high-quality and rigorous teacher education	Focus on teacher education, but with a less rigorous focus on quality
Quality Research as well as innovation	Focus on promoting quality research along with innovation in education	Focus on research and innovation, and less rigorous focus on quality
Governance	Decentralized governance with a greater role for states and local governments	Centralized governance with a greater role for the central government

Curriculum: The new NEP 2020 places a strong emphasis on a flexible, all-encompassing curriculum that emphasizes creativity, problem-solving, and critical thinking. Regardless of their backgrounds or hobbies, the curriculum's framework will help pupils reach their full potential.

Pedagogy: The new NEP 2020 encourages immersive and student-centered learning. This infers students will actively participate in their education and have the chance to practice what they are learning.

Assessment: The new NEP 2020 places a strong emphasis on thorough and formative evaluation that is centered on learning outcomes. This entails rather than just memorization of facts, students are evaluated on their capacity to apply what they had learn.

Structure: A 5+3+3+4 structure with numerous entry and exit points is introduced by the new NEP 2020. This implies that students will have greater educational freedom and be able to select the route that is best for them.

Medium of instructions: The revised NEP 2020 suggests using the mother tongue or a regional language as the medium of instruction up to grade 5. This will improve learning and offer kids with a solid foundation in their language.

Equity and inclusion: No matter what student's background is, parity and inclusion are emphasised in the new NEP 2020. The program contains a number of initiatives, such as scholarships for underprivileged groups and assistance for students with disabilities, to make sure that all student has admittance to a top-notch education.

NEW EDUCATION POLICY 2020 AND IFRS

It was discovered that implementing IFRS has a significant influence on liquidity and profitability ratios, indicating an increase in reporting quality. Implementing IFRS improves not just corporate accounting, but also public accounting, and opens up additional worldwide prospects for accounting professionals. IFRS should be fully integrated into B.com and M.com courseware to make them more globally compatible and offer more research opportunities (Bhargava & Shikha, 2013). For the successful application of IFRS in India through convergence, academicians must be trained in the many complexities of the IFRS. Academicians won't be able to contribute to such implementation until and unless it happens. Academicians play a crucial role since they can prepare aspiring accountants to handle the challenges that the accounting profession provides. (Marulkar,2013)

The National Education Policy 2020 is a significant improvement over the previous NEP 1986. It is more flexible, holistic, and inclusive, and it focuses on the critical thinking, the problem-solving, and the creativity. The Indian educational system is anticipated to undergo a major transformation because of new NEP. To properly implement the new NEP, there are a few obstacles that

must be overcome. The absence of resources is one problem. In directive to effectively execute the new NEP, the government requires to make significant investments in education. The shift in perspective is another difficulty. A change from a teacher-centered to a student-centered approach to education is required under the new NEP. Both the teachers as well students will need to adopt a new mind-set in imperative to do this.

Despite its difficulties, the new NEP 2020 represents a development for Indian education. It might make India's educational system a model for the remaining globe.

NEP 2020 for the higher education's main highlights include the following:

"The Higher Education Commission of India (HECI)" was founded: The current regulatory structure for higher education will get streamlined when the UGC, MCI, AICTE, DCI, AICTE, and INC are merged into and replaced by the HECI.

The establishment of a National Accreditation Council (NAC) in order to improve the higher education sector's quality assurance procedures, the NAC will take the place of current certification organisations like NAB as well of NAAC.

Research in University and College will receive funding from the NRF, which will support creativity and knowledge creation.

Creating Multidisciplinary Universities (MU) and Multidisciplinary Autonomous Colleges (AC) from fragmented higher education institutions: With a target enrollment of greater than 3,000 students on each campus by 2040, NEP 2020 aspires to transform scattered higher education bodies into MU and AC. These will be split into two groups: those that prioritise teaching and those that prioritise research. NEP 2020 intends to advance the gross enrollment ratio (GER) in institutions of higher learning, encompassing vocational training, beyond its present level of 26.3% to 50% by the 2035 in order to increase access to additional education.

Other than the above, the NEP 2020 also focuses on the following for higher education:

Holistic and multidisciplinary education: NEP 2020 promotes research at the undergraduate and graduate levels while highlighting the value of comprehensive and diverse education.

Shift towards student-centered pedagogy: The emphasis in education will move from interdisciplinary thinking to putting more emphasis on interaction, demonstration, debate, and discussion.

Introduction of an Academic Bank of Credit (ABC): Academic credits will be digitally stored by the ABC, enabling flexible degree routes. This offers choices for five-year integrated Bachelor/Master's degrees, two-year Master's degrees, and four-year bachelor's programmes with numerous options for completion

Encouragement of the research and innovation: The NEP 2020 encourages research and the innovation by establishing centers such as Start-up incubation centers, Technology development centers, and Interdisciplinary Research Centres.

Shift from teacher-centered teaching to student-centered teaching: NEP recommends a transition from the traditional examination system to a more comprehensive and continuous evaluation system.

Establishment of academic and the career counseling centers: To safeguard students' academic and emotional well-being, NEP 2020 encourages the creation of centres for academic as well as career counselling.

Support for student-led clubs and activities: To promote a well-rounded learning environment, NEP 2020 promotes student-led organisations and activities in a variety of subjects.

Innovative Curriculum: A more high-quality education is guaranteed by innovative curricula, which is urgently required to bring about reform in higher education. IFRS should be fully implemented to upsurge research opportunities and make B.com and M.com courseware more globally compatible. (Bhargava & Shikha, 2013).

Encouragement of the Online Distance Learning (ODL) courses: With a combination of in-person instruction, online instruction, and ODL components,

the NEP 2020 promotes ODL courses as a component of the degree programmes. Recognition of credits earned at foreign institutions of higher learning: In order to entice more international students, the NEP 2020 focuses on raising the eminence of higher education. It also allows for the degree-granting recognition of credits obtained at foreign institutions of higher learning.

Increasing the number of scholarships offered by private higher education institutions and improving the National Scholarship Portal: The NEP 2020 enhances the Portal of National Scholarship and promotes merit-based student support by boosting private institutions of higher education to offer more scholarships. Generally speaking, the NEP 2020 is a thorough and ambitious plan that has the power to revolutionise the Indian educational sector.

Conclusion

The revolutionary National Education Policy 2020 seeks to equip India's young for the twenty-first century. The current subject-based educational system would be replaced by a multimodal one that adheres to worldwide standards. Although this transformation is required, it presents difficulties for how to carry it out successfully and promise that students are ready to compete on a global scale. NEP 2020 addresses the basic for innovative solutions to India's problems as well how it fits with other government programmes like Make in India, Start-up India, Skill India, and Self-reliant India. The policy takes into account significant societal and cultural elements including regional adaptation and universal access to the higher education. However, these elements must be carefully used to make sure that pupils get the information and abilities required for success in the globalised environment. The innovative curriculum and topic choice freedom offered by NEP contribute to enhanced IFRS and Financial Reporting Standards adoption. IT represents a positive step forward in the effort to enhance India's educational system as a whole. In keeping with the government's nation-building initiatives and the Sustainable Development Goals, it offers crucial structural and institutional improvements. The effectiveness with which the programme is carried out by the federal and state governments will determine its effectiveness, though.

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Aspects of HR Analytics in the Organisational Context

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ABSTRACT

The evolution of digitization, emerging technologies, and artificial intelligence necessitates organizations to adapt their operational approaches and skill sets to achieve strategic goals effectively. HR analytics emerges as the empirical cornerstone empowering organizations to make informed decisions regarding human capital and strategic initiatives, thereby enhancing their competitive edge. However, the scholarly exploration of theory-driven paradigms in HR analytics adoption remains limited.

Additionally, there exists a dearth of literature on HR analytics concerning contextual influences shaping organizational capabilities in this domain.

INTRODUCTION

Over time and in various contexts, human resource practices have evolved from handling legal and other mandatory tasks to becoming a trusted partner for entrepreneurs in the development and implementation of business strategies (Buller and McEvoy, 2012)1. Human resource management (HRM) has been essential in helping business entrepreneurs organise the data gathered from pertinent procedures since the very beginning of the 20th century (Kavanagh et al., 2015)2. Data usage has evolved; first, it was gathered to track employee information, but later, it focused on meeting the legal requirements of employment (Ferris et al., 2007)3.With growing knowledge of employee productivity and their beneficial function in providing vitality to HRM, ever more varied data were gathered (Ulrich and Dulebohn, 2015)4. It is a well-known fact that the information technology sector's explosive growth has been credited as being the main factor behind this new transition (Strohmeier, 2007)5.

Studies reveal that the needs-driven approach to the Human Resource (HR) function has given way to opportunities and capabilities-driven approaches (Mitsakis, 2014)6. In the need-driven tradition, HR's responsibility was to assess the organization's talent gaps and address them (Mabey and Salaman 1995)7. However, under the opportunity-driven tradition, HR's job was to concentrate on employees' learning potential, giving special attention to abilities like systematic thinking that would help them actively participate in the organization's strategic planning. The goal of HR in the capability-driven tradition is to provide executive and managerial capabilities that can have a major impact on the organization's success (Hillyard, 2000)8. Metrics and analytics have become more popular as a result of the HR function's evolution, despite the fact that HR practitioners have frequently disregarded this (Vargas, 2015)9.

Organisations place a high value on HR decision-making and the necessity of a strong connection between HR and other departments. Accordingly, a great deal of research has been done to assess the effectiveness and value of HR initiatives in an effort to empower HR practitioners by offering tools to improve organisational associations and decision-making. Numerical models are often used in this (Becker, 1964)10, (Becker et al., 2001)11, (Fiocco, 2017)12,(Fitz-Enz, 1984)13,(Toulson and Dewe, 2004)14.

It seems as though there is increasing pressure on HR professionals to demonstrate their value to the company. In terms of decision-making and strategy from an HR viewpoint, this need needs to be translated into a novel notion or subject that characterises one of the main movements of the current day (Falletta, 2014)15, Marler and Boudreau, 2017)16.Levenson

(2011)17 proposed that the application of analytics and metrics can improve the decision-making process in organisations concerning human resources and HR. HR practitioners can enhance their alignment with their organization's objectives by utilising Human Resource Analytics (HRA).

Furthermore, via the use of predictive analytics, they can develop into strategic partners for the company (Vargas, 2015)18. From a financial standpoint, Cascio and Boudreau (2011)19 proposed that the usage of HRA would help HR professionals form different perspectives on how they contribute to the financial goals of the businesses by developing appropriate metrics. One example of this would be the tracking, analysis, and use of workplace accident data for forecasting insurance costs, employee attendance, and other HR needs as needed.HRA is a phrase that has been described in a variety of ways, but to put it simply, it refers to the process of using data to support choices on HR systems, practices, and policies.

Thus, HRA supports organisational management's ongoing learning process by encouraging them to examine data before making decisions (Rasmussen and Ulrich, 2015)20. This is corroborated by the fact that HRA offers an invaluable framework and toolkit for measuring and evaluating the efficacy of HR-related procedures, interventions, and initiatives (Lydgate, 2018)21, (Mortensen et al. 2015)22 have described a generic analytics discipline. It involves the fusion of quantitative methodologies, decision-making, and advanced technologies. To put it another way, analytics includes tools for effectively processing data, quantitative techniques for analysing corporate data, and the theories, instruments, and procedures that go into them.

Three major developments that have an impact on how businesses operate today have contributed to the growth of HRA. First, there is more rivalry now because businesses operate in a global setting. Technology has advanced in tandem with this. As a result, the HR department had to change in order to adapt to the new competitive environment(Beer, 1997)24(Caldwell, 2003)25,(Haines and Lafleur, 2008)26.Second, as businesses became more globalised, people realised how important human capital was from a competitive standpoint and how it indicated outstanding human capital management (Bassi 2011)26 , Dias and Sousa, 2015)27. Third, business analytics emerged as a way to handle massive volumes of data with the introduction of big data, and this trend has also reached HR.

The HRM administrators have been able to gather data more effectively for processing and later storing for future use by utilising this new technology. Thus, in the end, the entire procedure saves time when it comes to assigning administrators to new positions.

In its early stages, personnel management served as the central focus of HRM, which was seen as an administratively oriented profession. The HRM administrators placed a strong emphasis on carrying out these tasks as efficiently as possible because employees were essentially being treated like business expenses. These days, strategic HRM has created essential HR practices that help business owners reach their objectives and, eventually, increase their profitability (Walsh et al., 2010)28. Nevertheless, it is noted that in spite of its vital efforts, strategic HRM has not yet succeeded in reaching the goal of being a strategic partner. The primary cause of this failure is the lack of proper information regarding workforce-related issues (Lawler et al., 2004)29.The data-driven HRM approach is thought to be the most appropriate one to address this problem (Pape, 2016)30.

The experts discussed adopting an outside-in approach to improve the efficacy of HRM practices in addition to data-driven measurement and related decision-based activities (Brockbank, 2015)31. It is clear from all of these assessments that HR should place a strong emphasis on its function from the standpoint of strategic partnerships. By doing this, individuals participate in external decision-making activities in addition to data-driven decision-making procedures. Despite the lofty claims made about the potential of HR analytics, the comparatively published research in this field raises questions about its true use and worth. A recent Deloitte study states that it has been found that while just 8% of the organisations in the research area voted in favour of HR analytics' strong analytical capabilities, one-third of them are still actively developing the technology (Deloitte, 2015)32. With the exception of these, not much has changed from prior years in this area. It is

therefore possible to conclude that the hopes for the possibilities of HR analytics in the future have not yet materialised.

HR and Organisational Performance

A company's return on investment (ROI), financial gains, losses, market performance, and productivity are all considered growth indicators by investors (Becker and Gernart, 1996)33. Therefore, it may be calculated from an HRM standpoint by comparing the expense to improvement or value creation. Research indicates that managers in any organisation might not recognise the true correlation between the HR division and business expansion (Charan et al., 2015)34. According to Becher and Gerhart(1996), two decades When HR performance research first started, the tools used to develop and carry out HR choices were extremely difficult to comprehend. A little over two decades later, Guest (2011, p. 3)35 argued that although there is information, recognising the relationship between HRM and the expansion of the business is still not well executed.

The primary obstacle to creating HRM devices and tools that add value to any organisation is the inconsistent body of research that exists between studies on HR methods and those that look into the function of the HR department and the tendency to supervise understanding from corporate governance. To make the work practicable and cost-effective, a large body of literature on HRM performance is available; specific studies will be included to make the study specific. The current study offers a paradigm that combines various corporate governance and HRM streams. Prominent academics like Guest (2011) have underscored the significance of doing an integrated literature review, while Wright et al. (2005), proposed that the story of the "elephant and the blind men" It was clarified that not every experience fully exemplifies a phenomenon. It just implied that the combined specifics of all blind persons would roughly sound like the elephant when they had to tell each other about a specific portion.

Tactics and Business Consequence

Identifying the organisational functions and promoting the creation of commitment-based HR systems and high-performance work practices are crucial, so it makes sense from a logical standpoint that the HR analytics and strategic HRM function be integrated within the organisational area (Combs et al., 2006). Commitment-based HR systems, on the other hand, assess the significant amount of money invested in organisational resources, which in the end promotes human resource development in all aspects. For instance, commitment-based HR systems typically incorporate hiring, training, and development using competitive, stringent talent acquisition strategies.

HR Analytics and Decision-Making

According to Acito and Khatri (2014)36, the use of data analytics increases a company's efficacy and efficiency. It is accomplished by making an impact on managerial or organisational networks, such as supply chains, operational domains like accounting, and commercial divisions, such as wellness and health management initiatives (Ward et al., 2014)37. HRM is a new department on the data analytics bandwagon, but management understands its value and acknowledges their own institutional reluctance to adapt.

It is popularly known by numerous terms, e.g. workforce/ talent/ HR or people analytics. The above-mentioned analytics have many things common in them are focused on analysing data from human resources departments, combining data from various internal departments, and even combining data from inside sources. Both structured and unstructured data can be gathered, manipulated, interpreted, and broadcast with the assistance of infotech departments. All analytics are used to support decision-making that affects individuals in any organisation, and HR decisions are then linked to improved business outcomes and employee performance in any organisation (Momin and Mishra, 2015)38.In the 1940s, a number of large corporations were using analytics to improve talent management and selection (Lawler, 2015)39. Nevertheless, since the advent of information technology, gathering data and analysing and interpreting it have become considerably more convenient. It has made workforce analytics practically employable for every organisation and conveniently accessible.

Furthermore, the information gathered from numerous new sources—like calendars, email, and wearable technology—provides more favourable conditions for comprehending worker or employee behaviour

and improving performance, which is difficult in the opposite situation. The organization's productivity and effectiveness could be greatly increased by following this path of analytical and evidence-based decision-making. Not withstanding the organization's extensive use of hype and marketing, workforce analytics implementation and accomplishment remain a difficulty.

The creation of workforce analytics teams and enforcements has caused many institutions to strive for strategic intuitiveness and awareness from their personnel data, which frequently falls short of prediction (Ramussen and Ulrich, 2015)40. These efforts have delayed other responsibilities. For example, a survey conducted by Deloitte (2017)41, including over 10,000 business and HR heads, found that although more than 70% of those in the organisation think that workforce analytics is essential for improving employee performance and growing the business. However, only 8% of the companies said they had any kind of useful data, 9% said they knew what kind of talent in their workforce produced good performance, and 15% said that three are talent indices or talent rosters for their managers.

Need and Significance of the Study

Examining the analytical facets of human capital management in the organisational setting and its significance in obtaining successful business solutions is one of the study's major contributions. The report also points out the discrepancies that now exist in Indian businesses between the expected and actual HRA competencies. Furthermore, the study aims to offer suggestions to the academic and industrial sectors regarding how these gaps might be filled.

Furthermore, the study sheds insight on how HR professionals' abilities, motivations, and opportunities can be leveraged to boost organisational productivity and efficiency. It is also looked at how important it is for businesses to have an analytical reference point (HRA) in order to make wise decisions that improve their bottom line. As a result, it is anticipated that our research could support theoretical deductions based on current HR analytics parameters. Additionally, it is anticipated that the current study will identify new prospective employment criteria with sound HR analytics procedures.

HR analytics has been proposed as a means of improving business performance (Molefe, 2013)42. Only when senior management makes well-informed judgements based on the HR analysts' insights will this be feasible. According to Deloitte Consulting (2017), the use of HRA is becoming more and more common across organisations worldwide. Thus, two crucial areas must be addressed in order to achieve company goals. The first step in accomplishing this is having capable HR analysts who can pinpoint the issues preventing the organization's personnel from working as efficiently as possible.

It seems that most businesses are still not up to speed on how to handle the growing amounts of data. While many HR teams in the organisations are proficient in assessing HR operations, the majority of them are not proficient in critically identifying the variables that can produce results (Rekers, 2013)43.As a result, senior organisational leadership consistently puts pressure on HR departments to locate qualified candidates (Deloitte, 2016)44. Additionally, the use of HR is constrained to the basic accounting and reporting associated with HR (Davenport et al., 2010)45

Rather to hiring a lot of HR generalists to handle the majority of the everyday tasks, the HR team's analytics function is seen as a rare ability that requires regular use by specialists. Despite the fact that the financial, marketing, and supply chain sectors have enormous access to highly developed analytics in the form of endogenous metrics and predictive analytics, businesses still struggle to link analytical measures with human capital in order to produce information that is helpful for strategic outcomes (Hoffmann et al., 2012)46. Failure of business results is caused by the absence of critical inputs needed to improve business performance. As a result, the HR departments must change from their current positions to enable analytically sound and efficient decision-making.

A discrepancy exists between expectations and actual practices as a result of the integration and implementation of these new competencies (Hamid, 2014)47. Furthermore, the extent to which the businesses are using these analytical practices for proactive future strategies is still understudied, even though the contribution of HR analytics has been

documented through the use of technical dashboards to collect and interpret data sets.

CONCLUSION

HR Analytics emerges as a pivotal discipline empowering HR to realize its potential as a genuine strategically Leveraging analytics amplifies the potency of data, enabling HR practitioners to fuse their expertise with these insights to take informed actions and make future projections. By ensuring that HR data insights are credible and robust, analytics underscores its indispensable role as a complementary facet to comprehensive logic in crafting effective measurement systems.

The significance of HR analytics transcends mere improvement in employee performance and ROI; it facilitates a nuanced understanding of how employees contribute to organizational goals, forecasts workforce needs, and optimizes staffing strategies in alignment with strategic and financial objectives. Moreover, it furnishes statistically sound evidence crucial for shaping new HR initiatives within existing strategies. The symbiotic relationship between human resource analytics and its contribution to augmenting the strategic value of HR is profound and positively correlated.

Essential competencies for HR professionals engaging in analytics include business acumen, adeptness in data collection and analysis, strong analytical capabilities, as well as effective communication and presentation skills. This study asserts that HR analytics furnishes a data-centric framework for addressing workforce challenges by harnessing statistical models and software tools to glean novel insights, thereby facilitating astute decision-making that enables enterprise leaders to optimize human resource management and elevate the strategic significance of HRM.

With the ongoing technological advancements across industries, businesses are increasingly embracing HR analytics to enhance organizational effectiveness. HR analytics facilitates data-driven decision-making through the application of statistical models and techniques, thereby enabling a comprehensive interpretation of HR-related data for improved outcomes.

This paper delves into the challenges associated with the implementation and utilization of HR analytics in businesses, often stemming from a lack of requisite skills and knowledge among HR professionals or issues related to data quality and governance. Such challenges may hinder organizational support from top management. Nevertheless, despite these hurdles, HR analytics continues to offer competitive advantages, enabling businesses to address HR-related issues, enhance organizational performance, and refine HR functions.

Addressing knowledge and skill gaps can be achieved through learning and adopting relevant competencies. Moreover, ethical and legal utilization of data can be ensured by adhering to pertinent policies and norms. While the implementation of HR analytics presents both advantages and disadvantages, a broader perspective reveals that the opportunities it presents outweigh the challenges, ultimately fostering significant organizational growth.

Understanding the precise purpose of implementing HR analytics can yield substantial returns on investment, leading to broader acceptance and integration of HR analytics within HR departments. As organizations grasp the potential of HR analytics and its timely application, evidence-based results will become increasingly prevalent, transforming traditional HR decision-making processes into statistical approaches. Strategic deployment of HR analytics at opportune moments within businesses can catalyze remarkable organizational growth, propelling them towards accelerated development.

Frameworks for measuring and evaluating the efficacy of HR-related procedures, actions, and initiatives are made available by Human Resource Analytics (HRA). In order to assist the HR systems with decision-making, policy-making, and the adoption of pertinent practices, this method incorporates data-driven approaches. The current study examines the components of HR analytics and their competences with a focus on the effect of HRA on business outcomes.

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Teacher Resilience Amidst Role Ambiguity and Role Conflict: A Comparative Analysis of Government and Private School Environment

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ABSTRACT

This research explores the nuanced dynamics of role ambiguity and role conflict among teachers in government and private schools through a comprehensive comparative analysis. Drawing insights from 304 participants in the Bihar Southwest region, the study reveals that both sectors experience a moderate level of role ambiguity, with private school teachers facing slightly elevated challenges. Similarly, a moderate level of role conflict is noted in both government and private schools, with a marginally reduced conflict perception among private school teachers. The correlation analysis unveils intricate interconnections between specific dimensions of role ambiguity and role conflict, offering valuable insights into the complex relationships within the teaching profession. These findings underscore the need for targeted interventions to clarify role expectations, particularly in private schools, and provide a basis for further exploration into the factors contributing to these perceptions. Ultimately, the study contributes to a deeper understanding of organizational stressors in education, emphasizing the importance of addressing role-related challenges for teacher well-being and educational effectiveness.

KEYWORDS: *Role ambiguity, Role conflict, Organizational stress, Government and private school teachers.*

INTRODUCTION

The educational landscape represents a crucial foundation for societal advancement, with teachers bearing the weight of multifaceted responsibilities within both government and private school sectors (Smith, 2018). However, inherent within this dynamic and demanding profession lie persistent challenges related to role ambiguity and role conflict, significantly impacting the job satisfaction, well-being, and overall performance of educators (Jones & Brown, 2019). Role ambiguity, characterized by the perception of ill-defined job responsibilities, often arises from vague job descriptions, evolving expectations, and insufficient training (Green, 2017). Similarly, role conflict emerges from the inherent tensions between diverse responsibilities, such as educator, mentor, disciplinarian, and administrator, resulting in reduced job satisfaction, heightened stress levels, and potential burnout among teachers (Johnson et al., 2020). Distinct challenges are encountered by teachers in government and private schools. Government school educators face constraints posed by limited resources, bureaucratic intricacies, and diverse student populations, significantly contributing to role ambiguity and conflict (Adams, 2019). In contrast, the pressures faced by teachers in private schools stem from high parental expectations, the need to meet rigorous academic standards, and potential job insecurity within profit-oriented structures (Baker & Smith, 2021). These diverse challenges necessitate a comprehensive analysis to discern the unique factors contributing to role ambiguity and conflict within each

educational setting (Williams, 2018). This study adopts a mixed-method research approach incorporating surveys and interviews to explore the experiences and perceptions of teachers in government and private school sectors. By comparing and analyzing these distinct challenges, the research endeavors to illuminate the prevalence and intensity of role ambiguity and conflict among teachers in both sectors. The exploration further aims to determine whether the factors contributing to these issues significantly differ between government and private schools (Taylor et al., 2022). Understanding the origins and impact of role ambiguity and conflict within these diverse educational settings is pivotal for devising targeted strategies to alleviate these challenges (Anderson, 2019). By identifying similarities and disparities in teachers' experiences, this research aims to provide sector-specific recommendations to enhance the working conditions for educators. Ultimately, addressing these issues has the potential to significantly impact teacher satisfaction, performance, and the quality of education provided to students in government and private school settings (Brown, 2020).

METHODOLOGY

Objectives

The primary objective of this research is to conduct a comparative analysis of role ambiguity and role conflict experienced by teachers in government and private school teachers. The specific aims are as follows:

- To assess and compare role ambiguity and role conflict levels among teachers in government schools and private schools.
- To identify and analyze factors contributing to role ambiguity and conflict in government and private school settings.
- To formulate recommendations to alleviate role-related challenges based on research findings.
- Contribute to the field of organizational research by advancing our understanding of the comparative aspects of role-related challenges in diverse educational settings, thereby enriching the literature on teacher resilience and organizational dynamics in education.

These objectives aim to provide a comprehensive understanding of the differences in role-related challenges between government and private school teachers and offer insights to foster a supportive and conducive environment for educators in both sectors.

Hypotheses :

- There is no significant difference in the levels of role ambiguity experienced by teachers in government schools compared to those in private schools.
- There is no significant difference in the levels of role conflict experienced by teachers in government schools compared to those in private schools.

Tools Used

Singh and Srivastava Organizational Stress Inventory (OSI) Scale:

The OSI scale, designed to measure organizational stress, comprises 12 sub-scales assessing various stress-related factors within an organization. For the purpose of this research, only two specific sub-scales from the OSI were utilized based on the demands of the study: the sub-scales focusing on role ambiguity and role conflict. These selected sub-scales were specifically tailored to measure the perceived levels of role ambiguity and role conflict among government and private school teachers.

Research Design

Utilizing a descriptive research design to analyse role ambiguity and role conflict among teachers in government and private schools. This design allows for the examination of differences between the two educational sectors.

Participants and Sampling

- Sample Selection: Selection of 304 school teachers, with 152 participants from government schools and 152 from private schools in five districts of Bihar Southwest region (Kaimur, Rohtas, Buxar, Bhojpur and Patna) using a purposive sampling technique.
- Inclusion Criteria: Criteria for selection include diverse teaching experience, subject expertise, and administrative roles to ensure a representative sample.

Data Analysis

Quantitative Analysis: Statistical Package for the Social Sciences (SPSS) was used for quantitative data analysis, including descriptive statistics, correlation analysis, comparative tests ANOVA, and potentially regression analysis based on collected survey data.

This methodology provided a structured approach to collect both quantitative and qualitative data, allowing for a comprehensive analysis of role ambiguity and role conflict among teachers in government and private school sectors.

RESULTS

Table 1: Comparison of Mean value

Type of Job		RA1	RA2	RA3	RA4	RC1	RC2	RC3	RC4	RC5
Government	Mean	2.45	3.62	3.11	3.03	2.49	3.31	3.28	3.52	3.51
	N	152	152	152	152	152	152	152	152	152
	Std. Deviation	.890	.861	.998	.969	.861	.930	.936	.763	.806
	Kurtosis	.020	1.242	-1.107	-1.192	.004	-1.054	-.758	.751	.769
	Skewness	1.025	-1.258	-.498	-.141	.872	-.355	-.580	-1.019	-1.254
Private	Mean	2.45	3.52	3.29	3.40	2.47	3.13	3.31	3.39	3.53
	N	152	152	152	152	152	152	152	152	152
	Std. Deviation	.890	.853	.946	.915	.853	.947	.964	.877	.845
	Kurtosis	-.235	.122	-.965	-.328	.527	-1.510	-.886	-.636	.222
	Skewness	.932	-1.034	-.801	-.990	1.207	-.315	-.702	-.907	-.938
Total	Mean	2.45	3.57	3.20	3.21	2.48	3.22	3.29	3.45	3.52
	N	304	304	304	304	304	304	304	304	304
	Std. Deviation	.889	.857	.975	.960	.856	.941	.949	.823	.824
	Kurtosis	-.125	.627	-1.059	-1.029	.227	-1.270	-.836	-.046	.454
	Skewness	.974	-1.135	-.641	-.530	1.032	-.333	-.639	-.977	-1.078
Government teachers RA Mean		TOTAL					Average			
		12.21					3.05			
Private teachers RA Mean		12.66					3.16			
Government teachers RC Mean		16.11					3.22			
Private teachers RC Mean		15.83					3.16			

The table no 1.unveils the experiences of government and private school teachers regarding Role Ambiguity (RA) and Role Conflict (RC). Government school teachers report a moderate level of Role Ambiguity, with a mean score of 12.21 (average rating 3.05), indicating a discernible level of perceived ambiguity in role expectations. In contrast, private school teachers exhibit a slightly higher mean score of 12.66 (average rating 3.16), indicating a marginally elevated level of role ambiguity. Both groups perceive a moderate degree of ambiguity, yet private school teachers face slightly greater challenges. In terms of Role Conflict (RC), government school teachers report a mean score of 16.11 (average rating 3.22), suggesting a moderate level of perceived conflict in their roles. Private school teachers display a slightly lower mean score of 15.83 (average rating 3.16), indicating a marginally reduced level of role conflict. Both sectors experience a moderate degree

of role conflict, but private school teachers navigate their roles with a slightly lower perception of conflict. These findings emphasize the prevalence of organizational stressors in the form of role ambiguity and role conflict among teachers, warranting further exploration into contributing factors and their potential impact on teacher well-being and educational effectiveness.

Table 2: Paired Samples Correlations

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	RA1& RC1	304	.378	.000
Pair 2	RA2 & RC2	304	.315	.000
Pair 3	RA3& RC4	304	.007	.900
Pair 4	RA4 & RC5	304	.301	.000

The table no. 2 correlation analysis of Role Ambiguity (RA) and Role Conflict (RC) factors among the study participants reveals notable associations. The pairs RA1 & RC1 and RA2 & RC2 exhibit strong and statistically significant positive correlations (0.378 and 0.315, respectively). In contrast, the relationship between RA3 & RC4 is weak and non-significant (0.007). However, RA4 & RC5 demonstrate a moderate positive correlation (0.301) that is statistically significant. These results suggest intricate interconnections between specific dimensions of Role Ambiguity and Role Conflict, providing valuable insights into the nuanced relationships within the teaching profession. Further exploration could shed light on the implications and potential causes of these observed correlations.

Table 3: Paired Differences

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	RA1 - RC1	-.030	.973	.056	-.139	.080	-.531	303	.596
Pair 2	RA2 - RC2	.349	1.055	.060	.230	.468	5.764	303	.000
Pair 3	RA3 - RC4	-.257	1.272	.073	-.400	-.113	-3.518	303	.001
Pair 4	RA4 - RC5	-.306	1.060	.061	-.426	-.186	-5.031	303	.000

The table no. 3 paired differences analysis between Role Ambiguity (RA) and Role Conflict (RC) factors reveals nuanced variations in specific dimensions. While the differences in RA1 - RC1 scores are not statistically significant, indicating a lack of substantial disparity, significant distinctions emerge in other pairs. RA2 - RC2 scores show a highly significant difference ($p = 0.000$), suggesting a meaningful divergence between these dimensions. Similarly, RA3 - RC4 and RA4 - RC5 pairs exhibit statistically significant differences ($p = 0.001$ and $p = 0.000$, respectively), underscoring notable variations in these dimensions. These findings emphasize the intricacies of the relationships between Role Ambiguity and Role Conflict factors in the teaching profession, offering valuable insights for further exploration and potential interventions to address organizational stressors.

Table 4: Correlations

		Type of Job	City	RA1	RA2	RA3	RA4	RC1	RC2	RC3	RC4	RC5
Type of Job	Pearson Correlation	1	.000	-.004	-.058	.095	.196**	-.015	-.095	.017	-.080	.016
	Sig. (2-tailed)		1.000	.949	.316	.100	.001	.789	.100	.763	.164	.781

	N	304	304	304	304	304	304	304	304	304	304	304
City	Pearson Correlation	.000	1	-.071	-.072	.209**	.220**	-.038	-.059	.199**	.001	.113*
	Sig. (2-tailed)	1.000		.220	.213	.000	.000	.509	.302	.000	.993	.049
	N	304	304	304	304	304	304	304	304	304	304	304
RA1	Pearson Correlation	-.004	-.071	1	-.238**	.175**	.084	.378**	-.194**	.113*	-.091	.121*
	Sig. (2-tailed)	.949	.220		.000	.002	.144	.000	.001	.049	.113	.035
	N	304	304	304	304	304	304	304	304	304	304	304
RA2	Pearson Correlation	-.058	-.072	-.238**	1	-.076	-.164**	-.180**	.315**	-.084	.264**	.028
	Sig. (2-tailed)	.316	.213	.000		.189	.004	.002	.000	.145	.000	.621
	N	304	304	304	304	304	304	304	304	304	304	304
RA3	Pearson Correlation	.095	.209**	.175**	-.076	1	.477**	.191**	-.155**	.526**	.007	.241**
	Sig. (2-tailed)	.100	.000	.002	.189		.000	.001	.007	.000	.900	.000
	N	304	304	304	304	304	304	304	304	304	304	304
RA4	Pearson Correlation	.196**	.220**	.084	-.164**	.477**	1	.196**	-.210**	.467**	-.140*	.301**
	Sig. (2-tailed)	.001	.000	.144	.004	.000		.001	.000	.000	.015	.000
	N	304	304	304	304	304	304	304	304	304	304	304
RC1	Pearson Correlation	-.015	-.038	.378**	-.180**	.191**	.196**	1	-.263**	.285**	-.100	.146*
	Sig. (2-tailed)	.789	.509	.000	.002	.001	.001		.000	.000	.083	.011
	N	304	304	304	304	304	304	304	304	304	304	304
RC2	Pearson Correlation	-.095	-.059	-.194**	.315**	-.155**	-.210**	-.263**	1	-.150**	.216**	.018
	Sig. (2-tailed)	.100	.302	.001	.000	.007	.000	.000		.009	.000	.758
	N	304	304	304	304	304	304	304	304	304	304	304
RC3	Pearson Correlation	.017	.199**	.113*	-.084	.526**	.467**	.285**	-.150**	1	.045	.303**
	Sig. (2-tailed)	.763	.000	.049	.145	.000	.000	.000	.009		.437	.000
	N	304	304	304	304	304	304	304	304	304	304	304
RC4	Pearson Correlation	-.080	.001	-.091	.264**	.007	-.140*	-.100	.216**	.045	1	.099
	Sig. (2-tailed)	.164	.993	.113	.000	.900	.015	.083	.000	.437		.086
	N	304	304	304	304	304	304	304	304	304	304	304
RC5	Pearson Correlation	.016	.113*	.121*	.028	.241**	.301**	.146*	.018	.303**	.099	1
	Sig. (2-tailed)	.781	.049	.035	.621	.000	.000	.011	.758	.000	.086	
	N	304	304	304	304	304	304	304	304	304	304	304

** Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

In the table no. 4 within Role Ambiguity (RA) factors, strong positive correlations are observed between RA1 and RA3 (r = 0.378**), as well as between RA3 and RA4 (r = 0.477**). Moderate positive correlations exist between RA2 and RA3 (r = 0.315**) and RA4 (r = 0.220**). Notably, RA2 has a weak negative correlation with RA1 (r = -0.238**).In the realm of Role Conflict (RC) factors, moderate positive correlations are identified between RC1 and RC3 (r = 0.467**) and RC3 and RC4 (r = 0.301**). RC2 shows moderate positive

correlations with both RC3 (r = 0.285**) and RC4 (r = 0.210**). Meanwhile, RC1 has weak correlations with RC2 (r = 0.196**) and RC4 (r = 0.191**). These findings emphasize the interconnectedness of elements within RA and RC, underscoring the importance of a comprehensive approach in addressing role-related challenges.

These correlations suggest interrelations between different elements within both Role Ambiguity and Role Conflict factors. Strong positive correlations indicate a tendency for these variables to move in the same direction, while weak correlations suggest a less consistent relationship between those particular variables. Further analysis could help understand the implications and potential underlying causes of these observed correlations.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.234a	.055	.026	.494

a. Predictors: (Constant), RC5, RC2, RA1, RC4, RA3, RA2, RC1, RA4, RC3

In the table no. 5 model summary indicates the overall fit and performance of the regression model. The model's R value, a measure of the correlation between the observed and predicted values, is 0.234. The R Square value, representing the proportion of the variance in the dependent variable explained by the independent variables, is 0.055. The Adjusted R Square, which adjusts the R Square for the number of predictors in the model, is 0.026. The Standard Error of the Estimate, reflecting the accuracy of the model's predictions, is 0.494. The predictors in the model include RC5, RC2, RA1, RC4, RA3, RA2, RC1, RA4, and RC3. Overall, the model provides a modest fit to the data, with a limited proportion of the variance explained.

Table 6: ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.160	9	.462	1.892	.053a
	Residual	71.840	294	.244		
	Total	76.000	303			

a. Predictors: (Constant), RC5, RC2, RA1, RC4, RA3, RA2, RC1, RA4, RC3

b. Dependent Variable: Type of Job

In the table no. 6 ANOVA table assesses the significance of the logistic regression model as a whole. In this case, the F-ratio is 1.892 with a significance level of 0.053, suggesting a borderline significance. This implies that the model, including the specified predictors, may have some explanatory power in predicting the dependent variable (Type of Job).

DISCUSSION

The results of the comparative analysis on role ambiguity and role conflict among government and private school teachers in the Southwest region of Bihar underscore the importance of considering organizational and contextual factors in understanding the experiences of educators within distinct educational settings. Theoretical frameworks in organizational psychology and educational leadership can provide valuable insights into the observed patterns and variations.

The study delves into the prevalence and impact of role ambiguity (RA) and role conflict (RC) among government and private school teachers, offering a comparative analysis across five districts in Bihar Southwest region. The quantitative findings shed light on the experiences of 304 teachers and provide valuable insights into the organizational stressors within each sector.

Role Ambiguity (RA):The mean scores suggest that both government and private school teachers experience a moderate level of role ambiguity, with private school teachers facing slightly greater challenges in role expectations. The nuanced landscape of perceived ambiguity in government schools (Mean RA score of 12.21) and private schools (Mean RA score of 12.66) signifies the need for targeted interventions to clarify and streamline role expectations, especially in private educational settings where ambiguity appears slightly elevated.

Role Conflict (RC): Results indicate a moderate level of role conflict for both government and private school teachers. Government school teachers report a mean

RC score of 16.11, while private school teachers present a slightly lower mean RC score of 15.83. This suggests that teachers in both sectors navigate their roles amidst conflicting demands. The marginally reduced level of conflict in private schools warrants exploration into potential factors contributing to this difference, such as school size, management styles, or resource availability.

Correlation Analysis: The correlation analysis reveals meaningful associations between specific dimensions of RA and RC. Strong positive correlations between RA1 & RC1 and RA2 & RC2 underscore the interplay between role ambiguity and conflict, indicating that as ambiguity in roles increases, so does the perception of conflict. The non-significant correlation in RA3 & RC4 suggests that certain aspects of ambiguity might not necessarily correlate with conflict.

Organizational Role Theory offers valuable insights into the experiences of teachers in government and private schools, particularly regarding Role Ambiguity (RA) and Role Conflict (RC). In government schools, the higher mean values of RA can be attributed to the intricate bureaucratic structures, leading to unclear role expectations. In contrast, private schools with streamlined structures provide clearer role delineations, reducing ambiguity for teachers. The comparative analysis underscores how organizational structures significantly shape educators' experiences.

Educational Leadership further elucidates the disparities in RC between government and private school teachers. Leadership styles and decision-making processes in government schools may contribute to heightened role conflict, while agile leadership structures in private schools foster collaborative decision-making, positively impacting teacher well-being. This highlights that teacher well-being is a systemic outcome influenced by leadership practices, necessitating interventions beyond individual coping strategies.

A deeper exploration into Role Theory reveals the interrelations within RA and RC factors, emphasizing their strong positive correlations. This interconnectedness implies that interventions addressing role-related challenges must adopt a comprehensive approach recognizing the complexity of these interconnected elements. Educational policies and training programs should ground themselves in Role Theory, acknowledging the multifaceted nature of the teacher's role. Policies should go beyond superficial guidelines, recognizing the intricate balance teachers must maintain in fulfilling various roles, while training programs should equip educators with specific skills and a deeper understanding of the dynamic and interconnected nature of their roles. This comprehensive approach is crucial for creating supportive environments and promoting the well-being of teachers in diverse educational settings.

Teacher resilience has emerged as a pivotal concept in the field of education, reflecting an educator's ability to adapt, endure, and thrive amidst the myriad challenges inherent in the teaching profession. This resilience is especially crucial in contexts marked by role ambiguity and role conflict, where teachers grapple with complex demands and organizational stressors. Understanding and fostering teacher resilience not only contribute to the well-being of educators but also have profound implications for the quality of education provided to students.

Challenges Faced by Teachers

Role Ambiguity: Teachers often encounter ambiguity in their roles, where expectations may be unclear or evolving. This lack of clarity can lead to frustration, stress, and a sense of professional disorientation.

Role Conflict: The simultaneous demands of multiple roles within the teaching profession, such as educator, mentor, and administrator, can create conflicting expectations. Negotiating these conflicts can be emotionally and mentally taxing for teachers.

Self-Efficacy: Resilient teachers possess a strong sense of self-efficacy, believing in their ability to make a positive impact on their students despite obstacles. This confidence contributes to a proactive and empowered teaching approach.

Social Support: Building a robust support network, including colleagues, administrators, and mentors, is a crucial component of teacher resilience. Collaborative environments where educators can share experiences and strategies contribute to a resilient teaching community.

Reflective Practice: Resilient teachers engage in

reflective practices, continuously assessing and refining their teaching methods. This self-awareness allows them to learn from challenges, adapt their approaches, and continuously improve their teaching effectiveness.

Strategies for Building Teacher Resilience

Professional Development: Providing ongoing professional development opportunities equips teachers with new skills and perspectives, enhancing their adaptability and efficacy in the classroom.

Mentorship Programs: Establishing mentorship programs allows experienced teachers to guide and support newer educators. This mentorship fosters a sense of belonging and provides a valuable resource for navigating challenges.

Wellness Initiatives: Promoting teacher well-being through wellness programs, stress reduction activities, and mental health support can significantly contribute to building resilience.

Clear Communication: Ensuring clear communication of roles, expectations, and support mechanisms helps alleviate role ambiguity and conflict, providing a foundation for teacher resilience.

Recognition and Appreciation: Acknowledging and appreciating teachers' efforts and achievements fosters a positive work environment, enhancing their sense of efficacy and contributing to overall resilience.

CONCLUSION

Teacher resilience is an essential quality that not only enables educators to overcome challenges but also plays a crucial role in shaping the educational experiences of students. Fostering resilience requires a multifaceted approach, including organizational support, professional development, and a collaborative culture. As education continues to evolve, recognizing and nurturing teacher resilience remains a cornerstone for sustaining a vibrant and effective teaching profession.

Components of Teacher Resilience

Adaptability: Resilient teachers exhibit a remarkable capacity to adapt to changing circumstances, curriculum revisions, and evolving educational policies.

A more profound exploration of Organizational Role Theory, Educational Leadership, and Role Theory enriches our comprehension of the results. It highlights the need for interventions and policies that transcend surface-level adjustments, recognizing the deep-rooted organizational and leadership dynamics shaping the experiences of teachers in government and private schools. This depth of understanding is crucial for fostering sustainable teacher well-being and, in turn, enhancing the educational experience for students.

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Motivation Under Pressure: A Study on Role Overload Challenges Among Educators in Government and Private Educational Institutions

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ABSTRACT

This study investigates the role overload challenges confronting educators in government and private institutions across the East UP region, drawing insights from 200 participants. Findings indicate a slightly elevated perception of role overload among private educators compared to their government counterparts. Significant differences surface in role overload perceptions between the two sectors across various dimensions, including teaching responsibilities, administrative responsibilities, behavioural issues,, professional development, and extracurricular activities. Regression analysis identifies key predictors such as teaching responsibilities, administrative responsibilities, and extracurricular activities, which significantly influence variations in role overload perceptions among educators. Coefficients analysis sheds light on the relative impact of these predictors on role overload experiences. Additionally, this research emphasizes the impact of motivation under pressure on educators' experiences of role overload. Overall, the study underscores the nature of role overload challenges in the East UP educational environment and emphasizes the necessity for targeted interventions to address sector-specific role overload stressors and enhance teacher well-being, thereby improving educational outcomes.

KEYWORDS: *Role overload, Educators, Wellbeing, Government and private institutions.*

INTRODUCTION

The research on role overload challenges among educators, the quote "Teaching is the profession that teaches all the other professions" takes on added significance. It emphasizes the foundational role of educators in nurturing and preparing future generation for success in their chosen careers. When teachers face dissatisfaction and stress due to role overload challenges, it not only affects their own well-being but also has far-reaching implications for the quality of education and the future workforce.Role overload, a condition where individuals feel that the demands placed on them exceed their available time, energy, and abilities (Rizzo et al., 1970), Pareek(1983) defined Role overload (RO) emerges when there are excessive or unrealistic expectations placed on one's role.is becoming more prevalent in today's workplaces, resulting in significant negative impacts on both employees and organizations (Alfes et al., 2018).

The Role overload is associated with various adverse outcomes such as intentions to leave the job (Jensen et al., 2013), decreased engagement in organizational employees' behaviours (Eatough et al., 2011), diminished commitment to the organization (Fisher, 2014). Maslach and Leiter (2016),revealed that occupational stress, particularly role overload, is a pervasive concern in the teaching profession, affecting job satisfaction, burnout, and overall job performance. Teacher workload stands out as a prevalent source of stress among educators,Keenan A., Newton T (1985). As the workload of teachers escalates, their hours spent working increase, leading to heightened job demands and subsequently elevated stress levels, which may culminate in feelings of anxiety and depression. A

systematic review echoed these observations, indicating that key risk factors linked to anxiety and depression encompassed overwhelming job requirements and workload,Battams S., Roche A.M. (2014).

In Doss et al.'s (2018) research, it was discovered that government teachers experience higher levels of occupational stress when contrasted with their counterparts in private institutions. Similarly, Dubey and Mishra (2016) found that government teachers exhibited greater job satisfaction compared to semi-government and private teachers, whereas private teachers experienced elevated levels of occupational stress in comparison to both government and semi-government teachers. Kyriacou and Sutcliffe (1978) conducted seminal work on teacher stress, highlighting the multifaceted nature of role overload. They observed that the demands placed on teachers extend beyond the traditional scope of instructional responsibilities, encompassing administrative tasks, student behavioural issues, and extracurricular duties. Furthermore, Skaalvik and Skaalvik (2017) stress the importance of considering contextual factors when examining teacher stress, as the nature and intensity of role overload challenges may vary across different Institute types.

In the Indian educational context, research on teacher stress and role overload has gained momentum. Trivedi and Garg (2020) and Singh and Bhargava (2018) have explored the experiences of teachers in both government and private Institutes, shedding light on the unique stressors faced by educators in these sectors. However, there is a noticeable gap in the literature when it comes to a direct comparative analysis of role overload challenges, especially within the specific regional context of East UPregion. This study address's role overload challenges among government and private educators in East UP, drawing from global insights and India's socio-cultural context to inform interventions for teacher well-being.

Objectives

- To investigate and compare role overload challenges among government and private Educators in the East UP.
- To explore the interconnected dimensions of role overload in the educational context.
- To identify potential variations in the experiences of role overload among educators in different institutional settings.

Hypotheses: There will be no significant differences in the levels of role overload between government and private Educators.

Research Method: This study employed a Descriptive approach to investigate role overload challenges among 200 educators of colleges in government and private Institutes across the East Uttar Pradesh Region. Data collection included administering the six factors related to Role Overload of Singh and Srivastava Organizational Stress Inventory (OSI) via surveys, supplemented by semi-structured interviews to gather qualitative insights. The sample, selected through stratified random sampling, ensured proportional representation from both sectors. Quantitative analysis computed by SPSS encompassed descriptive statistics, ANOVA, and Regression analyses to discern differences between government and private Educators, while qualitative data underwent thematic analysis to elucidate contextual factors influencing role overload experiences. This combined approach facilitated a comprehensive exploration of the phenomenon, capturing both quantitative trends and qualitative aspects. This approach aimed to provide a holistic perspective on role overload challenges among government and private Educators, contributing to an in-depth and comprehensive exploration of the research objectives.

RESULTS ANALYSIS

Table 1 Descriptive Analysis

Type of Job		RO1	RO2	RO3	RO4	RO5	RO6
Government	Mean	2.88	3.59	3.34	3.18	3.61	3.42
	N	100	100	100	100	100	100

	Std. Deviation	1.045	.896	.930	1.053	.902	.898
Private	Mean	3.60	3.66	3.59	3.61	3.57	3.81
	N	100	100	100	100	100	100
	Std. Deviation	.892	.802	.838	.921	.872	.808
Total	Mean	3.24	3.63	3.46	3.39	3.59	3.62
	N	200	200	200	200	200	200
	Std. Deviation	1.036	.850	.893	1.011	.886	.875

The Table no.1 results indicate that, on average, private educators perceive slightly higher levels of role overload across all job types compared to their government counterparts. Specifically, private educators reported higher mean scores for each aspect of job overload (RO1, RO2, RO3, RO4, RO5, RO6) compared to government educators. However, the differences between the means are not substantial. The standard deviations show relatively similar levels of variability within each group. Overall, these findings reveal that both government and private educators experience role overload, with private educators tending to perceive slightly higher levels.

Table 2: ANOVA Results for Role Overload Dimensions

Table 2. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RO1	Between Groups	39.228	1	39.228	41.529	.000
	Within Groups	281.492	198	.945		
	Total	320.720	199			
RO2	Between Groups	.422	1	.422	.583	.446
	Within Groups	215.765	198	.724		
	Total	216.187	199			
RO3	Between Groups	4.795	1	4.795	6.112	.014
	Within Groups	233.802	198	.785		
	Total	238.597	199			
RO4	Between Groups	13.992	1	13.992	14.299	.000
	Within Groups	291.595	198	.979		
	Total	305.587	199			
RO5	Between Groups	.113	1	.113	.144	.705
	Within Groups	234.457	198	.787		
	Total	234.570	199			

RO6	Between Groups	11.304	1	11.304	15.480	.000
	Within Groups	217.612	198	.730		
	Total	228.917	199			

The Table no. 2 ANOVA analysis reveals significant differences in role overload perceptions across various factors among educators. Specifically, factors related to teaching responsibilities (RO1), (RO3), (RO4), and(RO6) showed significant variations between groups. This reveals that these aspects significantly influence educators' perceptions of role overload. However, for factors (RO2) and (RO5), no significant differences were found, indicating that these may not be major contributors to role overload perceptions among educators. These findings emphasize the complexity of role overload and underscore the importance of targeted interventions to address specific factors contributing to educators' perceived workload.

Table 3. Regression AnalysisModel Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.404a	.163	.146	.463

The regression analysis (Table 3) indicates that the model explains a significant proportion of the variability in role overload perceptions among educators (R^2 = .163). The adjusted R-square value of .146 suggests that approximately 14.6% of this variability is accounted for by the model's independent variables. The standard error of the estimate is 0.463, reflecting the average discrepancy between observed and predicted values.

Table 4 .ANOVA[b]

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	12.375	6	2.063	9.628	.000[a]
	Residual	63.625	194	.214		
	Total	76.000	199			

The ANOVA results (Table 4) indicate a significant regression model ($F(6, 194) = 9.628$, $p < .001$), suggesting that the independent variables collectively predict role overload perceptions among educators. The regression model accounts for a substantial portion of the variability in role overload perceptions, as evidenced by the significant sum of squares for regression (12.375).

Table 5. Coefficientsa

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.024	.161		6.354	.000
	RO1	.156	.029	.321	5.421	.000
	RO2	-.054	.034	-.091	-1.559	.120
	RO3	-.025	.038	-.045	-.658	.511
	RO4	.066	.031	.132	2.111	.036
	RO5	-.069	.032	-.122	-2.154	.032
	RO6	.077	.038	.135	2.041	.042

The coefficients analysis (Table 5) reveals significant predictors of role overload perceptions among educators. Specifically, teaching responsibilities (RO1) and (RO4) exhibit positive and statistically significant relationships with role overload, conversely (RO5) demonstrate a negative relationship with role overload, reveals that opportunities for professional growth may mitigate perceived workload. However, factors related to (RO2), student behavioural issues (RO3), and (RO6) do not significantly predict role overload perceptions.

DISCUSSION

The study underscores the pervasive nature of role overload among educators in both government and private institutions, revealing a plethora of responsibilities that surpass their available time and resources. Educators are burdened with diverse tasks, including implementing the New Education Policy 2020, work pressure of semester system, preparing and maintaining results, timetable within limited timeframe, inadequate faculty student ratio, poor infrastructure, administrative duties work pressure, adopting new teaching methodologies, career advancement, trainings,committee responsibilities, Counselling, Extracurricular activities, Cocurricular activities and navigating technological advancements. These Role overload obligations often detract from teaching duties, potentially compromising the quality of education delivery. Conversely, private educators contend with challenges such as larger class sizes, heightened pressure for academic excellence, job insecurity and limited professional development opportunities, contributing to a sense of role overload. The role overload Mean values revealed a slightly higher perception of role overload among private Educators. While the difference is not substantial, it indicates that private Institute educators may, on average, experience a marginally higher level of role overload. This underscores the importance of interventions to focus the unique stressors faced by educators in both government and private institutions.

RO1-Significant differences were observed in teachers' perceptions of teaching responsibilities between government and private Institute educators. Private Educators reported a higher mean, indicating potentially greater role overload in managing their teaching duties. This finding reveals that private Educators may face distinct challenges related to classroom responsibilities, warranting targeted support to alleviate their workload.

RO2 - No significant differences were found in the perceptions of administrative tasks between government and private Educators. This similarity implies that both groups experience comparable levels of role overload concerning administrative responsibilities. Addressing administrative burdens may require collaborative efforts across sectors to develop efficient systems and support mechanisms.

RO3 - A significant difference was identified in teachers' perceptions of managing student behavioural issues. Government teachers reported a lower mean, suggesting potentially lower stress related to student behaviour compared to their private Institute counterparts. Interventions in private Institutes may need to focus on strategies for handling behavioural challenges effectively.

RO4 –There were Significant differences found in perceptions of class size, indicating that private Educators may perceive a higher role overload in managing larger classes. This underscores the need for private institutions to consider class size as a factor influencing teacher stress and explore ways to optimize teaching conditions.

RO5 - No significant differences were observed in perceptions of professional development responsibilities. Both government and private Educators may share similar challenges related to professional development expectations. This finding reveals a common ground for collaborative initiatives to enhance professional growth opportunities for all educators.

RO6 - Significant differences were noted in perceptions of managing extracurricular activities. Private Educators reported a higher mean, indicating potential role overload in balancing these additional responsibilities. Addressing this disparity may involve strategies for private Educators to manage extracurricular commitments effectively.

In the context of educators facing role overload, several theories provide valuable insights into their motivation and well-being. Adams' Equity Theory suggests that educators compare their input, such as time and effort dedicated to their roles, with the outcomes they receive,

including recognition and rewards. When educators perceive an imbalance between their inputs and outcomes, such as when excessive workload isn't met with adequate recognition or support, feelings of inequity may arise, leading to demotivation and dissatisfaction. Maslow's Hierarchy of Needs theory highlights how role overload can impede educators' progression toward fulfilling higher-level needs, such as esteem and self-actualization. When educators are overwhelmed with responsibilities, their focus often shifts to meeting basic needs like job security and safety, leaving little room for growth and self-fulfilment. Herzberg's Two-Factor Theory further emphasizes the importance of recognition and opportunities for growth in motivating educators. Role overload can negatively impact both hygiene factors, such as workload and stress levels, and motivators, like recognition and advancement opportunities, leading to decreased job satisfaction and morale. Finally, Skinner's Reinforcement Theory underscores the significance of positive reinforcement in managing role overload. Providing educators with support, recognition, and opportunities for growth can reinforce their efforts and mitigate the negative effects of excessive workload. Conversely, failure to address role overload can lead to burnout and decreased motivation among educators.

In the context of "Motivation Under Pressure," several strategies can effectively address the challenges educators face. Firstly, providing adequate support and resources to teachers is crucial. This includes offering professional development opportunities, access to necessary tools and technology, and assistance with administrative tasks. Additionally, fostering a supportive work environment where teachers feel valued and recognized for their contributions can boost morale and motivation. Implementing flexible work arrangements and workload management strategies can also help alleviate stress and prevent burnout. Moreover, promoting a culture of collaboration and peer support enables educators to share best practices, problem-solve together, and feel a sense of camaraderie. Finally, recognizing the importance of work-life balance and implementing policies that support it can contribute to long-term motivation and job satisfaction among educators. By prioritizing these strategies, educational institutions can effectively support their teachers and maintain a motivated and engaged workforce even under pressure.

CONCLUSION

This research highlights the widespread issue of role overload among both government and private educators. Government teachers face added responsibilities like policy implementation and practical duties, while private educators deal with larger class sizes and academic pressure. Addressing these challenges requires systemic changes, including providing resources and fostering a supportive culture. Prioritizing educator well-being is essential for improving teaching practices and student outcomes.

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Digitalization as A Tool for Promoting Women Entrepreneurs

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ABSTRACT

Digital marketing is a very popular concept in recent days. The information era has united many different professions and specialties through the growth of the internet. And, lot of things have turned up to digital, from virtual reality simulations to e-commerce websites. The scope of marketing has also been impacted by this change, especially in the wake of the Covid-19 outbreak and the global move to digital media. Even though digital marketing has been adopted by various small, medium and large scaled businesses, most of the Self-Help Groups (SHGs) are still following the traditional form of marketing. With this view in mind, the present study aims to examine the performance of WSHGs utilising digital media platform to promote their entrepreneurial products. And also, to identify the constraints faced by the WSHGs in relation to the digital marketing of their products. This is a qualitative as well as quantitative based research study. Through a structured interview schedule the primary data from 200 WSHGs of Tripura selected randomly. For drawing necessary inferences Kruskal Wallis U Test and Wilcoxon Signed Rank Test have been utilised.

KEYWORDS: *Digital marketing, Self help groups, Women entrepreneurship, Constraints.*

INTRODUCTION

Nowadays, the concept of digital marketing is highly prevalent. Since the internet has grown, the information era has brought together a wide range of expertise and occupations. Virtual reality simulations and e-commerce websites are only two examples of the many things that are entirely digital. This transformation has an effect on marketing as well, particularly in light of the Covid-19 pandemic and the widespread adoption of digital media. While many small-, medium-, and large-scale enterprises have embraced digital marketing, the majority of SHGs continue to use traditional marketing methods (Sindhu,2023).The concept of Self-Help Groups (SHGs) was introduced in our country's rural areas with the goal of boosting the economy from the ground level. SHGs are small groups of 10-20 rural individuals especially women who have come together for a shared interest. They carry out entrepreneurial activities in their own rural communities by using their resources to produce and market goods derived from locally accessible raw materials. Members of the self-help group are all microentrepreneurs with similar social and economic backgrounds. The government creates, trains, and provides ongoing support for Self-Help Groups (SHGs) through several initiatives (Sridevi et. al., 2019).

The entire system of lifestyle and livelihoods has undergone a metamorphosis due to the advent of digital technology. This technology has the ability to improve financial inclusion both in terms of impact and process. Microfinance initiatives in India, spearheaded by self-help organisations, have made notable progress towards financial inclusion, livelihood enhancement, and women's empowerment. The self-help group movement has been undergoing significant changes due to the recent boom in digital technology usage, which also holds great potential to improve the welfare of women's self-help groups in a number of ways (Batra et. al., 2022).

Self-help groups are a rapidly expanding category of women-run, locally owned companies in the nation. Introducing the group's products to the market and

using marketing techniques to sell and promote them is a challenging phase. Today, as the e-business online market grows quickly, goods from MSME's and overseas are becoming more and more popular domestically due to their inexpensive prices. These groups find it challenging to sell their commodities in the market in such a business environment (Jain & Nalla, 2024).

The shift from traditional media to digital media has affected marketing as well especially for SHGs. With the development of technology, search engine marketing, social media marketing, and digital marketing has also gain popularity. Due to its heavy reliance on the internet, digital marketing has benefited most from the rapid growth of internet users. Customers' purchasing habits are evolving, and they are favouring digital marketing over traditional marketing (Sindhu,2023). Based on all these studies, the present research aims to examine how group approach (Self-Help Groups) in Tripura uses digital social media as an advertisement tool to promote their entrepreneurial products and how does it affect their performances.

LITERATURE REVIEW

Sindhu (2023) in the study aimed to identify the difficulties related to microfinance programmes for female entrepreneurs using digital marketing. This study is descriptive in nature, with a focus on a single Self Help Group (SHG) including one hundred women in Hulimavu, Bangalore. The data acquired by means of interviews with bank managers and focus groups. The researcher recruited ten people for one group and fifteen people for six groups, with a moderator for each group. Two-way focus groups were conducted at different locations. The duration of each chat ranged from 45 to an hour. The obtained data has been analysed using comparative analysis. The majority of participants were found to be members of the SHG's Lower Income Group (LIG) and Middle-Income Group (MIG). The conversation goes into great detail about the participants' income sources, educational backgrounds, ability to repay debt, and familiarity with technology. In parallel, the Bank evaluates the accessibility of each MFS marketing strategy to ascertain whether the target audience is receiving the content within 45 to an hour. The obtained data has been analysed using comparative analysis. The majority of participants were found to be members of the SHG's Lower Income Group (LIG) and Middle-Income Group (MIG). Khou & Suresh (2018) aimed to ascertain how much farmers know about social media and how to use it to produce and market their goods. Data were gathered from original sources in the Pondicherry villages of Pooranakuppam, Manaveli, Thavalakuppam, and Nallavadu. According to the survey, social media is used by the majority of farmers in the aforementioned villages for a variety of agricultural-related objectives, including marketing and production. Chege & Wang (2020) determined to evaluate how innovative entrepreneurial tactics affect environmental analysis and how that affects the performance of small and medium-sized enterprises (SMEs) in rural Kenya and other developing nations. The paper makes the case that strategies for sustainable environmental analysis can improve the performance of small businesses in rural locations. The framework was derived from a sample of 272 rural enterprises located in Kenya. For content analysis, partial least squares regression and correlation models are employed. The findings indicate that environmental instability has a little impact on small businesses' performance in rural locations. Nonetheless, the results show that adding entrepreneurial invention techniques to environmental scanning has a beneficial effect on rural SMEs' performance. Naik & Rodrigues (2018) their study focuses on the marketing issues that the female SHG in the research area is facing. SHG must enter e-commerce in order to market their products given the rise of digital marketing and online marketing. When asked about the challenges they faced running the SHG, the respondents generally mentioned that selling their produce was a problem. Therefore, the advantages of the SHG and the marketing challenges they encounter are the main subjects of the current study. The report also offers a cloud-based marketing approach that the SHG can utilise to advertise and sell their produce. The study also identified a number of implementation-related challenges and their solutions.

The above literatures sheds light on the concept of digital marketing as a vital tool for promoting SHG products.

Keeping this view in mind the present study is carried out to examine how group approach (Self-Help Groups) in Tripura uses digital social media as an advertisement tool to promote their entrepreneurial products and how does it affect their performances.

OBJECTIVES

- To examine the entrepreneurial performance of WSHGs utilising digital media platform to promote their products.
- To identify the digital promotional constraints faced by women entrepreneurs of SHGs.

HYPOTHESES

H01: there is no significant impact of digital platforms as a promotional tool for entrepreneurial products of WSHGs.

H02: there is no significant impact of digital platforms as a promotional tool on entrepreneurial performance of WSHGs.

RESEARCH METHODOLOGY

The study is qualitative and quantitative in nature which is based on primary data collected by survey method using a structured interview schedule. For the purpose of data collection 200 Women SHGs (WSHGs) were randomly selected. Out of these 200 WSHGs, 100 WSHGs were found to use digital media platform as a tool for product promotion. Kruskal Wallis U Test and Wilcoxon Signed Rank Test was applied to analyse the performance of the WSHGs. The study was carried on the West Tripura District of the state of Tripura, India.

PROMOTIONAL STRATEGIES OF THE WSHGS

For fulfilling the purpose of the study, the promotional techniques followed by each of the WSHGs are collected through primary survey. 200WSHGs were categorised as 100 WSHGs following the traditional method of product promotion whereas, 100 WSHGs were following digital platforms for promotion of their products. The categorization is done as per the following figure:

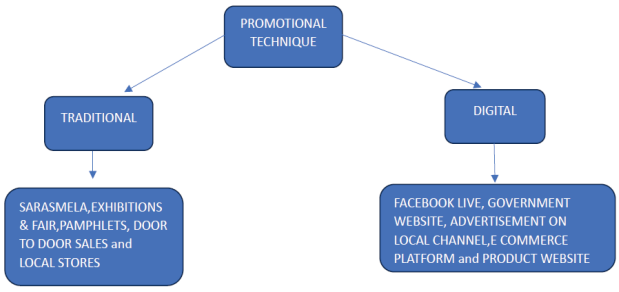

Fig 1: Categorization of the promotional technique
Source: Compiled by Researcher from field survey

The figure 1 portraits the traditional and digital promotional techniques that are followed by the WSHGs of Tripura. From further, discussions with the women entrepreneurs of the SHGs, it was identified that the 100 WSHGs are following traditional promotional technique, incorporates saramela, exhibitions & fairs, pamphlet distribution, door to door sales and setting up of local stores as a medium for promotion of their product. However, the 100 WSHGs involved in digital promotional techniques, inculcates Facebook live, government websites, advertisement through local television channels, e-commerce platform and creating own website for promoting their products.

TRADITIONAL PROMOTIONAL TOOLS V/S DIGITAL PROMOTIONAL TOOLS

Product promotion is a very crucial aspect for any business unit, whether a large-scale business or a small-scale business including the group approach. The business environment is dynamic with high competition. The WSHGs' competitors are not only limited to fellow WSHGs manufacturing similar products but it is with the large-scale businesses which have strong brand name, marketing team and product promotion strategies. Thus, the WSHGs have to upgrade themselves and develop their technology "Know How" to announce their existence in the market. And for this purpose, the current study is conducted to examine how the entrepreneurial performance of WSHGs in Tripura are effected by the use of digital media as an advertisement tool to promote their products. For conducting the study, a five-point Likert scale was developed where 1 stands of strongly disagree, 2 stands for disagree, 3 stands for undecided, 4 stands for agree and 5 stands for strongly

agree and Kruskal Walis U Test was performed. For, categorizing the WSHGs, dichotomous questions based on Yes and No were asked to the WSHGs about their product promotional tools.

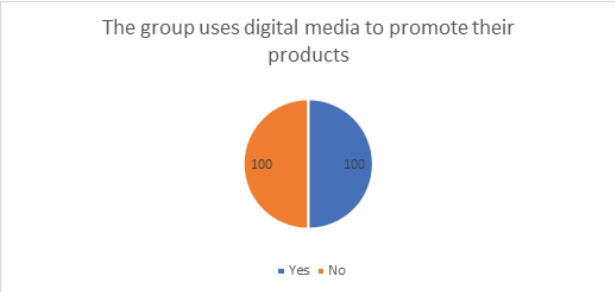

Fig 2: Groups' choice of product promotion platform
Source: Compiled by Researcher from field survey using SPSS

Figure 2 depicts the preference of the WSHGs. Out of 200 WSHGs questioned, 100 WSHGs prefer to promote their products on digital media platform.

To analyse the performance of the groups, two variables i.e., Sales turnover and Profit (Dhiman & Rani,2014) were identified.

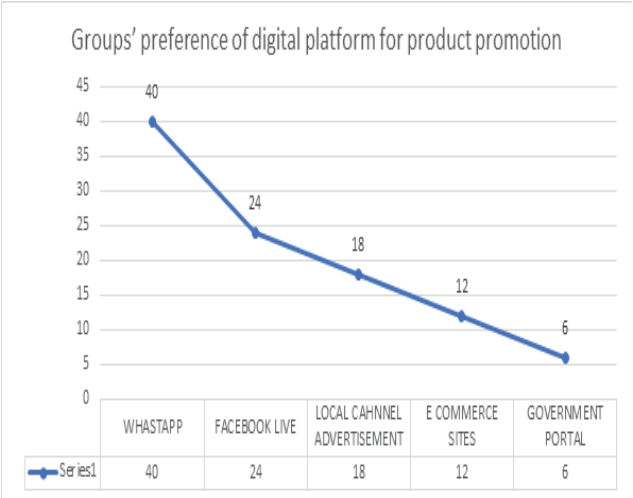

Fig 3: Groups' choice of digital platform for product promotion

Figure 3 depicts the preference of the WSHGs with reference to the choice of digital platform for product promotion. The figure clearly illustrates that the WSHGs prefers whatsapp promotion more followed by facebook live then advertising on local channels followed by enlisting their products on various e-commerce platforms and then using Government portals.

Table 1: Kruskal Wallis U Test

Ranks			
Variables	Digital promotional group	N	Mean Rank
Sales turnover	2.00	2	11.50
	3.00	48	56.99
	4.00	48	44.57
	5.00	2	76.00
	Total	100	
Profit	2.00	2	14.25
	3.00	48	56.34
	4.00	48	44.83
	5.00	2	82.50
	Total	100	

Test Statistics[a, b]		
	Sales turnover	**Profit**
Chi-Square	9.568	9.337
df	3	3
p-value	0.023	0.025

Source: Compiled by Researcher from field survey using SPSS

Table 1 illustrates the result of Kruskal Wallis U Test. Here, the p value for sale turnover is 0.023 and Profit is 0.025 which is less than 0.05 implying that there is a positive impact of digital media platform as a tool for promoting WSHGs' entrepreneurial products. Rejecting Null hypothesis.

Table 2: Wilcoxon Signed Rank Test

Test Statistics[a]		
Pair	Before Sales-After Sales	Before Profit-AfterProfit
Z	-8.682b	-8.682b
p-value	0.000	0.000

Source: Compiled by Researcher from field survey using SPSS

Table 2 illustrates the result of Wilcoxon Signed Rank Test. Here, two pairs have been taken into consideration i.e., the before and after status of the sales turnover of the groups (Before Sales- After Sales) and the before and

after status of the profit of the groups (BeforeProfit-After Profit) the p value for both the pairs is 0.000 which is less than 0.05 implying that there is a significant impact of digital platforms as a tool for product promotions of WSHGs on their performance. Therefore, rejecting the null hypothesis.

DIGITAL MARKETING CONSTRAINTS OF WOMEN ENTREPRENEURS OF SHGS

The study revealed five major reasons for WSHGs preferring traditional form of product promotion:

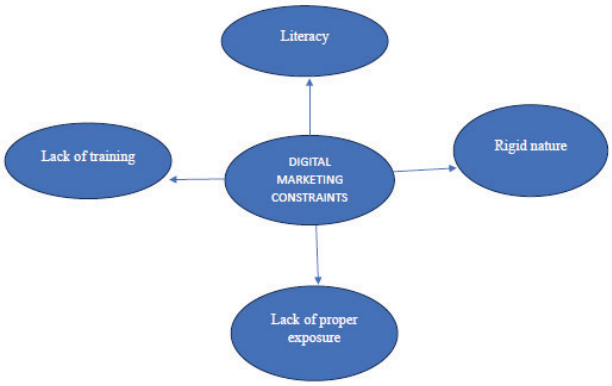

Fig 4: Identified Digital Marketing Constraints

Source: Compiled by Researcher from field survey

FINDINGS

i. The WSHGs tend to sale more and earn more profit after using digital media platform for promoting their entrepreneurial products.

ii. Online marketplaces have the ability to link WSHGs with fintech firms and financial institutions that provide customised goods. And so, WSHGs can obtain a variety of financial services, such as insurance, and savings accounts, by utilising digital marketing channels.

iii. Digital promotion of their products helped them to increase the customer base and has pushed them to step out of their area and place their product across different parts of the state and across the country as well.

iv. The study found that the WSHGs prefers whatsapp promotion more followed by facebook live then advertising on local channels followed by enlisting their products on various e-commerce platforms and then using Government portals.

v. Throughout the interview process, the researchers also came across various women entrepreneurs of SHGs who lacks basic education. Most of them are either illiterate or primary pass with no basic computer or technological knowledge. There are very few women in the group who have cleared secondary education.

vi. The rigid nature of many women entrepreneurs of the SHGs is due to regular usage of traditional promotional techniques. Sudden shift to digital platform creates difficulty for them to understand and analyse the algorithm that the online platforms follow, further, they sometimes tend to overlook the technical training and therefore, they are not able to promote their products digitally, leading to shift back to the traditional system.

CONCLUSION

For any business to survive among its competitions, it is very much important for the business to have strong promotional techniques. With the passage of time the promotional techniques changed its route from traditional to digital forms using various digital platforms. During the Covid-19 outbreak, the use of digital platforms increased at an increasing rate. With reference to this context, the study aimed to examine the marketing performance of the WSHGs using digital media as an advertisement tool to promote their products. The study illustrated that usage of digital platform to promote their products has a positive impact on the marketing performance of the WSHGs the study also found that the WSHGs prefers whatsapp promotion more followed by facebook live then advertising on local channels followed by enlisting their products on various e-commerce platforms and then using Government portals. They are constantly trying to technically upgrade themselves to be able to utilize the digital platforms to promote their product. Various constraint like literacy level of the women, rigidity in accepting new concepts, lack of training, and lack of proper exposure were identified as reasons that were affecting the performance of the WSHGs in relation to using digital platforms for promoting their products. Necessary steps should be taken to overcome

such constraints ensuring proper utilization of digital platforms.

RECOMMENDATIONS

To overcome the various constraints that are identified, the following recommendations can be useful:

i. Proper awareness should be created in the context of digital marketing and how it will help the WSHGs in promoting their products in the long run.

ii. Before providing any training related to digital marketing, it is very much necessary for the trainers to conduct educational programs about computers and various technical aspects to develop their technical skills prior to start promoting their products digitally.

iii. Joining hands with well-known local influencers, leaders of the community, and elders who can support the WSHG's efforts and educate the illiterate members of the community. Credibility and trust can be greatly increased by their endorsement.

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Crab Mentality Syndrome: A Conceptual Perspective

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ABSTRACT

In today's increasingly competitive world, individuals often harbor feelings of envy and seek to surpass others due to selfishness and greed. When someone experiences envy towards another person, a common response is to attempt to undermine them. We all directly or indirectly, consciously or subconsciously come across such envious people in our nearby vicinity and experience. Peer pressure to eat some of that birthday cake in the office, discouragement of going to the gym to get some exercise, when one is on a weight loss program, co-workers talking about favoritism or unfair advantage involved in one's well-deserved promotion, friends and relatives belittling one's happiness of personal achievement are a few situations to convince that one has encountered a phenomenon that people call "Crab Mentality Syndrome". With different nomenclature across cultures like kanya-kanya syndrome (Phillipines), Alamihi Syndrome (Hawai), Tall Poppy Syndrome, the mentality is common with societies and groups that have experienced suppression, bullying, and oppression for a period, across generations and decades, and is a terrible stressor for both the instigator and victim of this Syndrome.

Based on a Literature Review of the few studies conducted on this novel topic, numerous blogs, and interviews of people encountering the syndrome, the conceptual research highlights the concepts and antecedents that instigate the Crab Mentality Syndrome, the grounds, and effects of the sabotaging mentality not only both the person being targeted and the one doing the undermining. The conceptual research also identifies the symptoms and reasons of manifestation of the effect in people which appears to be their behavioural trait despite people knowing it to be disadvantageous to them. The secondary study also proposes to establish the quintessential role of the leaders in the transition from the fixed mindset to the abundance mindset to overcome the syndrome and manage stress in the workplace, signaling the further scope of research of the cause-and-effect relationship of the mentality across different domains in the industry.

KEYWORDS: *Crab mentality, Fixed mindset, Abundance mindset.*

INTRODUCTION

"If I can't have it, neither can you"

The saying effectively illustrates the concept of crabs in a bucket and human behaviour known as the Crab Effect or Crab Mentality. It showcases how some individuals within a group possess a selfish, harmful, and envious mindset. They aim to undermine and impede the progress of others who are performing better in the group. (Omar Itani, 2020)

The term "crab mentality", a popular phrase among Filipinos, first coined by Ninotchka Rosca, refers to a person's behaviour of undermining or sabotaging anyone who succeeds or shows potential for success greater than their own. (Kristine 2020). It fosters competition among neighbors, criticizing those who fail to cooperate and leading to envy and rivalries in the workplace. Behaviours associated with crab mentality emphasize feelings of resentment and inadequacy, and fuel individuals' efforts to undermine their peers' success (Smith et al., 2023), affecting team cohesion and productivity. (Johnson et al. 2024)

Recent research has further explored the multifaceted nature of crab mentality, shedding light on its psychological and sociological underpinnings, and emphasizing the detrimental impact it can have on group dynamics and individual well-being.

Understanding the Crab Behaviour

The metaphor of crab mentality vividly illustrates a phenomenon observed among groups of individuals. When placed in a bucket or pot together, crabs, individually capable of escaping, exhibit curious behaviour. As noted by Itani (2020), while some crabs attempt to crawl up the side to freedom, others engage in futile competition, clawing at each other in a misguided effort to reach the top. This behaviour, often summarized by the adage "If I can't have it, neither can you," encapsulates the selfish and counterproductive nature of the crab mentality (Tushar & Yatish, 2014). Various terms have been used to describe this phenomenon, including the crab-bucket effect, crabs in a barrel syndrome, crab syndrome, and pull-down syndrome (Pratchett, 2009). Recent research, such as that conducted by Smith et al. (2023) and Johnson et al. (2024), further elucidates the psychological and organizational dynamics underlying crab mentality, emphasizing its detrimental impact on individual progress and group cohesion.

OBJECTIVES OF THE STUDY

1. To investigate the antecedents underlying crab mentality syndrome and its impact on interpersonal dynamics.
2. To analyze the influence of the antecedents on the prevalence and expression of crab mentality across diverse cultural and organizational contexts.
3. To evaluate existing interventions and propose strategies for mitigating the negative effects of crab mentality on organizational culture and productivity.

Human Crab Psychology

Sadly, crabs don't have a monopoly on this behaviour. Many humans exhibit a crab mentality when someone in their orbit begins to achieve some type of self-improvement or success that they can't achieve themselves. (Hughes L, 2021). Crab mentality is what happens when one person fails and does not want others to succeed, while also deterring those who are trying to be successful (Perry, 2009). Individuals affected by this mindset may behave similarly to crabs in a bucket, ready to pull down any other crab that tries to climb out. (Rajan 2009).

The syndrome can be well understood in some situations which may be knowingly or unknowingly sabotaging people's thoughts and actions in a variety of situations in daily lives: (Hartvickson K 2019)

- A situation where family, friends, or work colleagues aren't as excited about your recent achievement.
- Your recent intention and hard-core commitment to improve fitness and lose weight have been intentionally conquered by friends and relatives forcing you to plunge on a slice of chocolate cake.
- A delight to finally sign that new client you've been working on for months, only to have your office colleagues act like it's no big deal.
- An engagement in a new hobby to socialize with new people, mocked by older friends discouraging you from engaging in it.

Well, in real life, the people spending most of the time with each other and influencing each other's thought process and behaviour, are not actually physically trying to break each other down as crabs do, but as humans, try to break each other's spirits down on witnessing someone else on their way to success (Tagle J, 2022). Such people are commonly addressed to be having a Fixed Mindset (first coined by Stanford psychologist Carol Dweck) or Scarcity Mindset, who tend to see everything in terms of win-lose, with the opinion that there is only so much, and if someone else has it, that means there will be less for me. It is not as brazen as someone physically preventing others from accomplishing things, but the people use social pressure to try and accomplish the same goals – to prevent anyone from making too much progress. (Strongman H 2018). Studies in human behaviour show that one's crab mentality comes from personal insecurity or low self-esteem, which is usually unknown to the individual. It may be that the feeling of disdain, jealousy, and antagonism is justified. (Tagle J , 2022). In the workplace, crab mentality manifests in people who don't like others excelling, and who will covertly or overtly do

things to prevent that from happening. They attack the self-confidence of a colleague who achieves or gets the opportunity to achieve more success than them. (Terry Pratchett, 2009). The objective is to hinder the progress of others, thwart their aspirations, and prevent them from seizing opportunities, ultimately causing them to lose their drive. This is usually because of negative emotions such as jealousy, envy, resentment, bad competitiveness, conspiracy, and spite. (Terry Pratchett, 2009). It isn't necessarily always malicious. Individuals may genuinely think they're safeguarding their friends' well-being by discouraging them from taking perceived risks, unaware that they're imposing their own fears and limiting beliefs onto others. However, deliberate malintent is often present, as individuals strive to prevent others from surpassing them. They engage in behaviours that undermine confidence, challenge perceptions of reality, and even sabotage opportunities. Those afflicted with this syndrome view their peers as rivals rather than potential collaborators, transforming the workplace into an environment marked by fear, insecurity, and diminished self-worth, rather than one characterized by confidence and mutual support. (Stephen Covey).

MANIFESTING CRAB MENTALITY IN PEOPLE

Crab Mentality Syndrome, a phenomenon deeply entrenched in human behaviour, manifests in various forms and settings, often hindering progress, collaboration, and innovation. At its core, this syndrome stems from a complex interplay of psychological, social, and organizational factors, each contributing to the creation and perpetuation of a toxic environment marked by envy, competition, and sabotage. Understanding the antecedents of crab mentality is crucial in unravelling its underlying mechanisms and devising effective strategies to mitigate its detrimental effects on individuals and organizations.

One prominent antecedent of crab mentality is the concept of Fixed Mindset, as proposed by psychologist Carol Dweck (2006). Individuals with a fixed mindset perceive success as finite and immutable, leading them to view the achievements of others as a direct threat to their self-worth. This mindset fosters a zero-sum mentality where one person's success is perceived as another's failure, fuelling resentment and hostility (Scott R, 2010). Moreover, research by Abrugar (2014) suggests that individuals with a fixed mindset are more likely to engage in self-sabotaging behaviours aimed at undermining the success of their peers, thereby perpetuating the cycle of crab mentality.

Emotional Motivation, encompassing ego-centric tendencies, jealousy, and a sense of inequity, serves as another significant antecedent of crab mentality (Art Markman, 2015). When individuals feel threatened by the success of others or perceive a lack of fairness in the distribution of rewards, they are more likely to exhibit behaviours characteristic of crab mentality. Aydın and Oğuzhan (2019) found that workplace environments characterized by high levels of competition and limited opportunities for advancement often breed feelings of jealousy and resentment among employees, further exacerbating the crab mentality. Similarly, research by Katherine Hartvickson (2019) and Sam Whoofle (2018) highlights the role of envy in driving destructive behaviours aimed at undermining the success of others.

The Zero-Sum Bias, a cognitive bias wherein individuals perceive resources or opportunities as finite and fixed, also contributes to the prevalence of crab mentality (Meegan D, 2010). Studies by Pilditch et al. (2018) and Johnson et al. (2022) suggest that individuals prone to zero-sum thinking are more likely to engage in competitive behaviours aimed at securing their share of resources, even at the expense of others. This mentality creates a cutthroat environment where collaboration and cooperation are viewed as threats to individual success, fostering an atmosphere of mistrust and hostility within organizations.

The Bandwagon Effect, characterized by the tendency to adopt certain behaviours or beliefs simply because others are doing so, can also fuel crab mentality (Herbert K). Jerry Tagle's (2022) research indicates that individuals may succumb to peer pressure and conform to negative group norms, such as sabotaging the success of high-performing colleagues, in an attempt to fit in or gain social approval. This herd mentality perpetuates the cycle of crab mentality by discouraging dissent and promoting conformity to destructive behaviours.

Peer Pressure, another significant antecedent, plays a pivotal role in shaping individual behaviours within

social groups or communities (Emily Ker, 2021). Janey Davies (2021) suggests that individuals may succumb to peer pressure and engage in crab mentality behaviours, such as gossiping or backstabbing, to gain acceptance or avoid social ostracism. This pressure to conform to negative group norms reinforces the cycle of crab mentality and perpetuates a culture of toxicity within organizations.

Loss Aversion, a cognitive bias wherein individuals place greater emphasis on avoiding losses than on achieving gains, can also contribute to the prevalence of crab mentality (Dr. Tara Swart). Research by Qiqi Cheng & Guibing (2021) and Cheng & He (2017) suggests that individuals may resort to sabotaging the success of others to minimize their own perceived losses or maintain their relative position within a competitive hierarchy. Similarly, Zeng et al. (2019) found that individuals with a strong loss aversion are more likely to engage in self-destructive behaviours aimed at undermining the success of their peers.

Imposter Syndrome, characterized by inadequacy and self-doubt despite evidence of competence or success, is another significant antecedent of crab mentality (Bravata et al., 2021). Caflisch (2020) suggests that individuals struggling with imposter syndrome may perceive the success of others as a threat to their credibility or competence, leading them to engage in behaviours aimed at undermining their peers' achievements. Ganapathi & Letchumanan's (2023) research indicates that imposter syndrome can foster a hypercompetitive environment where individuals are driven to outperform their peers at any cost, perpetuating the cycle of crab mentality.

Social Comparison, the tendency to evaluate one's abilities and attributes in relation to those of others, can also fuel crab mentality (Festinger, 1954). Van Lange et al. (2002) found that individuals engaged in frequent social comparisons are more likely to experience feelings of envy and resentment towards those perceived as more successful or accomplished. Lee & Oh's (2019) research suggests that social comparison can create a competitive environment where individuals vie for status and recognition, often at the expense of collaboration and cooperation. Conway et al. (2023) highlight the role of social comparison in perpetuating the cycle of crab mentality and undermining interpersonal dynamics within organizations.

Low Self-Esteem, characterized by feelings of inadequacy and unworthiness, is another significant antecedent of crab mentality (Twenge & Campbell, 2003). Orth et al. (2008) found that individuals with low self-esteem are more likely to perceive the success of others as a personal threat, leading them to engage in behaviours aimed at undermining their peers' achievements. Sowislo & Orth (2013) suggest that low self-esteem can foster a competitive environment where individuals are driven to outperform their peers to validate their self-worth. Muir et al. (2024) highlight the role of low self-esteem in perpetuating the cycle of crab mentality and undermining collaborative efforts within organizations.

Competition for Resources, particularly in environments characterized by limited opportunities or scarcity, can exacerbate crab mentality (Harrison, 2010). Folger & Cropanzano (1998) found that individuals may resort to sabotaging the success of others to gain a competitive edge or secure access to valuable resources. Grant & Berry (2011) suggest that competition for resources can foster a cutthroat environment where individuals are driven to prioritize their interests over those of their peers. Johansson et al. (2023) highlight the role of resource scarcity in perpetuating the cycle of crab mentality and undermining cooperation within organizations.

Organizational Culture, shaped by prevailing norms, values, and practices, plays a pivotal role in fostering or mitigating crab mentality within organizations (Schein, 2010). Cameron & Quinn (2011) found that organizations that promote individualism and competition over collaboration are more likely to experience high levels of crab mentality among employees. Barney & Hansen (1994) suggest that organizational cultures that reward cutthroat competition or favoritism may inadvertently foster an environment where individuals are driven to undermine their peers' success. Martin et al. (2024) highlighted the role of organizational culture in perpetuating the cycle of crab mentality and undermining teamwork and cooperation.

Leadership Behaviour, characterized by the actions and decisions of organizational leaders, can also influence the prevalence of crab mentality within organizations

(Bass & Avolio, 1994). Yukl (2006) found that leadership styles that emphasize competitiveness or favouritism may exacerbate crab mentality by creating an atmosphere of mistrust and resentment among employees. Goleman (2000) suggests that leaders who lack transparency or fail to provide clear direction may inadvertently fuel feelings of insecurity and uncertainty, further exacerbating the crab mentality. Kouzes & Posner (2018) highlight the role of leadership behaviour in shaping organizational culture and fostering a climate of collaboration or competition.

Social Norms and Peer Influence, shaped by prevailing cultural attitudes and group dynamics, play a significant role in perpetuating crab mentality within social groups or communities (Cialdini & Trost, 1998). Bicchieri (2006) found that social norms that prioritize individual success over collective achievement may encourage the adoption of crab mentality behaviours, reinforced by peer pressure and social influence within social groups. Asch (1951) suggests that individuals may conform to negative group norms, such as sabotaging the success of high-performing colleagues, in order to gain social approval or avoid social ostracism. Smith & Bond (2022) highlight the role of social norms and peer influence in perpetuating the cycle of crab mentality and undermining collaboration and cooperation within organizations.

Overall, the antecedents of crab mentality are multifaceted and interconnected, stemming from a complex interplay of individual characteristics, social dynamics, and organizational factors. By understanding these underlying mechanisms and their implications for interpersonal dynamics, organizations can develop strategies to mitigate the detrimental effects of crab mentality and foster a culture of collaboration, innovation, and mutual support.

Table 1: Antecedents of Crab Mentality (Factors)

Fixed Mindset	(Carol Dweck, 2006), (Scott R, 2010), (Abrugar, 2014)
Emotional Motivation	(Art Markman, 2015), (Aydın & Oğuzhan, 2019),
	(Katherine Hartvickson, 2019), (Sam Whoofle, 2018)
Zero-Sum Bias	(Meegan D, 2010), (Pilditch et al., 2018),
	(Johnson et al., 2022)
Bandwagon Effect	(Herbert K), (Jerry Tagle, 2022)
Peer Pressure	(Emily Ker, 2021), (Janey Davies, 2021)
Loss Aversion	(Dr. Tara Swart), (Qiqi Cheng & Guibing, 2021),
	(Cheng & He, 2017), (Zeng et al., 2019)
Imposter Syndrome	(Bravata et al., 2021), (Caflisch, 2020),
	(Ganapathi & Letchumanan, 2023)
Social Comparison	(Festinger, 1954), (Van Lange et al., 2002),
	(Lee & Oh, 2019), (Conway et al., 2023)
Low Self-Esteem	(Twenge & Campbell, 2003), (Orth et al., 2008),
	(Sowislo & Orth, 2013), (Muir et al., 2024)
Competition for Resources	(Harrison, 2010), (Folger & Cropanzano, 1998),
	(Grant & Berry, 2011), (Johansson et al., 2023)
Organizational Culture	(Schein, 2010), (Cameron & Quinn, 2011),
	(Barney & Hansen, 1994), (Martin et al., 2024)
Leadership Behaviour	(Bass & Avolio, 1994), (Yukl, 2006),
	(Goleman, 2000), (Kouzes & Posner, 2018)
Social Norms and Peer Influence	(Cialdini & Trost, 1998), (Bicchieri, 2006),
	(Asch, 1951), (Smith & Bond, 2022)

Source: Author's Own

THE CRAB MENTALITY IMPACT IN WORKPLACES

The impact of Crab Mentality extends far beyond individual behaviour, permeating organizational cultures and dynamics, and ultimately shaping the success and well-being of entire institutions. Research by Itani (2020) and Kristine (2020) has elucidated how Crab Mentality can breed toxicity within workplaces, manifesting as a pervasive culture of envy, resentment,

and sabotage. This toxic culture not only undermines individual morale and job satisfaction but also erodes trust and collaboration among team members, hampering organizational productivity and effectiveness. For instance, a study conducted by Johnson et al. (2022) found that teams plagued by Crab Mentality often experience higher rates of turnover and absenteeism, as employees become disillusioned with their work environment and seek opportunities elsewhere. Additionally, the prevalence of Crab Mentality can stifle innovation and creativity within organizations, as employees may hesitate to share ideas or take risks for fear of being criticized or undermined by their peers (Sam Whoofle, 2018).

Moreover, the impact of Crab Mentality extends beyond the immediate confines of the workplace, affecting broader societal dynamics and relationships. Research by Art Markman (2015) and Aydın & Oğuzhan (2019) has highlighted how Crab Mentality can perpetuate a cycle of competition and mistrust within communities, hindering collective progress and social cohesion. This phenomenon is particularly pronounced in competitive environments where individuals vie for limited resources or opportunities, such as in densely populated urban areas or industries with high demand and low supply (Herbert K, year). For example, a study by Katherine Hartvickson (2019) revealed how Crab Mentality among entrepreneurs in a competitive market led to cutthroat tactics and unethical behaviour, ultimately undermining the integrity of the industry.

Furthermore, the prevalence of Crab Mentality within organizations can have lasting repercussions on individual career trajectories and professional development. Research by Emily Ker (2021) and Janey Davies (2021) has demonstrated how employees who fall victim to Crab Mentality may experience stagnation in their careers, as their colleagues actively thwart their advancement opportunities out of jealousy or insecurity. This phenomenon is particularly detrimental for marginalized groups or individuals from underrepresented backgrounds, who may already face systemic barriers to career advancement (Terry Pratchett, 2009). For instance, a study conducted by Meegan D (2010) found that women and minority employees were disproportionately affected by Crab Mentality within male-dominated industries, as they struggled to gain recognition and support from their peers and superiors.

GETTING RID OF THE SYNDROME: INDIVIDUAL's ROLE

Remember the golden rule "Love your neighbour as thyself"

The best antidote for crab mentality is unity joining the forces and cooperating with the comrades to create a better position for survival.

No one is perfect and all are striving towards perfection. The choice of being like the colony of ants, fighting and surviving like a team, or behaving like crabs in a bucket, acting selfishly, competing, and pulling down, leading to their demise, is a tough one but must be made by the human himself (Pjcorts). To move in the direction of avoiding a crab mentality is to recognize the very existence of the same in one's personality and try to resolve the underlying issues (Itamar Shatz) like jealousy, insecurity, and selfishness. Embracing humility and admitting mistakes are noble acts that differentiate humans from crabs. (Abrugar V Q, 2014). Studies have examined self-reflection as the first step towards overcoming crab mentality (Ker E,2021) and journaling helps in keeping one more self-aware.

Climbing out of one's bucket, spending time with oneself, focusing on self rather than others, and promoting positive patterns of thinking (Itani O, 2020) help the instigators break free from the Crab Mentality. They can proceed towards building a mindset of growth and abundance by not being the crab pulling others down on account of greed and jealousy instead lifting the people up (Itani O, 2020) by being compassionate, recognizing the vulnerable effort that a person endured, redefining perspective towards others, expanding social circle (Ker E,2021) by connecting with people that give boost and support and putting less time and energy in toxic relationships. Comparison is the thief of joy (Theodore Roosevelt). Thanks to social media that instigates doubting self because others are happy, doing better, looking prettier, enjoying more. It is pertinent to understand that every picture of a meal has been carefully curated to present the type of lifestyle

that provokes envy. Hence, not getting carried away by false representation and living the life your way is the key (Davis, J 2021). Comparing affects self-worth and self-perception. No matter how big and successful a human is, an inferiority complex to someone is inherent (Grace Scot). Although, easier said than done, one way to curb inner crab is to stop comparison with others and let go of limiting beliefs. Limiting beliefs is something one accepts as true and can be hurtful or harmful. These beliefs keep the crab mentality internalized by making one fearful and preventing from going after what one wants in life (Songco C 2020). Researches (Huges L), (Grace Scot), (Songco C 2020) show that the act of kindness towards self and others, increases happiness, releases oxytocin, increases energy leading to a longer lifespan, and is a constant curb in instigating crab mentality. (Huges L) strongly supported the Law of 33% (spend a third (33%) of time with the people above, a third with the people below, and a third with those on the same level) as an antidote for the syndrome and suggested to get around people who do things differently and learn from their successes and mistakes, eventually passing the learnings to others. The development of a new mindset of growth and abundance transforms an instigator to becoming a motivator (Ker E,2021).

In his book Atomic Habits, James Clear emphasizes that individuals don't have to passively accept their environment; they can actively shape it. Clear suggests that to enhance their chances of success, people should operate in environments that facilitate progress rather than hinder it. (Omar Itani,2020) echoes this sentiment in his work, affirming that individuals affected by crab mentality should take proactive steps to improve their surroundings. They should strive to become the architects of their environment, transitioning from the shadows of negativity to the brightness of positivity, and forming new supportive communities. Sometimes, the key isn't to entirely rebuild the environment but rather to enhance its components so that future growth is more attainable. (Woofle S) examined that the best resort to overcome the syndrome is being an architect of one's own environment, following a new tribe that inspires and supports and dims the inner critic voice to raise confidence (Itani O, 2020) finding new groups or peers of a similar mindset, or even more positive, identify and minimize the negative influences around, find mentors and coaches that expand the realm of possibility, enabling to develop a positive and forward-thinking, growth mindset. One should immediately distance from negative and small-minded people who possess the traits of being life-sucking, dream-crushing, energy-draining (Scot G) (Itani O, 2020) and do not intend to take ownership or responsibility for their own lives but enjoy an illusionary sense of relief in complaining about others.

In addressing crab mentality in others, individuals have two primary approaches: they can directly address and mitigate this mentality using strategies like those employed to combat it within themselves, or they can focus on their own mindset and behaviours (Sunita Soh). For instance, one effective strategy involves recognizing that crab mentality in people is often rooted in their own personal issues rather than the actions of others (Shatz I 2020). It's crucial to remain vigilant against crab mentality and to acknowledge its presence when it surfaces, assessing whether it indicates low self-esteem. Efforts should then be made to cultivate healthy self-esteem, enabling more positive interactions with others. (Woofle S 2018)

Figure 1: Crab Mentality Syndrome

Source: Author's Own

THE LEADERS' QUIESSENTIAL ROLE-BUILDING THE ABUNDANCE MINDSET

Crab Mentality, with its insidious grip on individuals and organizations alike, presents a formidable challenge that must be addressed to foster healthier and more productive environments. Rooted in envy,

insecurity, and competition, Crab Mentality undermines collaboration, stifles innovation, and corrodes morale within workplaces and communities. However, with a concerted effort and targeted interventions, it is possible to overcome this detrimental syndrome and create environments where individuals can thrive and succeed.

In a workplace, people threatened by their peers' success, become rattled when a peer makes a breakthrough or become more productive and start undermining their efforts, discouraging innovation, and underplaying their successes. (Mattone J, 2019)

Generally tagged as rotten apples or problematic team members, the people would rather belittle others than try themselves and are sure to drag everyone down whenever they see an opportunity. (Hartvickson K, 2019) Such crab mentality manifested people are detrimental to a team or a business and a challenging task for the leaders is to be aware of those who seem to do more to bring people down than they do to lift them up and guide the victims of such mentality to keep head high and carry on. Leadership plays a crucial role in driving cultural change and dismantling Crab Mentality within organizations. Leaders must lead by example, demonstrating transparency, fairness, and inclusivity in their decision-making processes. The leaders see the big picture, not the "bucket", take the crabs out of the bucket and let them all have an opportunity to be successful making clear that success isn't a zero-sum game where one person "winning" means that someone else must "lose." (Mattone J, 2019) The leaders need to change the environment for the team members by splitting up the team, changing the internal structure, swapping team members, breaking the team up into smaller teams, or some other creative methods and use all the tactics and make it clear to your team that crab mentality won't be tolerated in the workplace (Opie P 2020). Numerous leadership development initiatives have been instrumental in aiding leaders to identify systemic issues such as crab mentality, offering techniques to effectively manage such challenges. Additionally, leadership coaching has emerged as a valuable resource, assisting leaders in navigating issues related to corporate culture awareness. (Mattone J, 2019) (Opie P 2020). By fostering open communication channels and providing opportunities for feedback and collaboration, leaders can build trust and cohesion among team members, mitigating the effects of Crab Mentality. The leaders should aim at changing the mindset and behaviour directly, using similar techniques as would be used to avoid crab mentality in self and do things such as call them out on their behaviour, or explain why their mindset is problematic for themself and for others. (Friedman R 2019) and peel back the layers to help them identify why they are sabotaging themselves, the team, and ultimately the business. Furthermore, fostering a culture of psychological safety, where employees feel comfortable expressing their ideas and concerns without fear of judgment or retribution, is essential for overcoming Crab Mentality. By providing support and resources for personal and professional development, organizations can empower employees to grow and succeed, reducing the need for comparison and rivalry. Moreover, organizations must implement structural changes to reinforce positive behaviours and discourage toxic ones. Performance evaluation systems that reward teamwork and cooperation, as opposed to individual achievement at the expense of others, can help shift organizational norms away from Crab Mentality. Additionally, creating pathways for career advancement and recognition that are based on merit and contribution rather than politics or favouritism can help mitigate feelings of competition and resentment among employees.

CONCLUSION

In conclusion, the research on Crab Mentality has provided valuable insights into the complex interplay of psychological, sociological, and organizational factors underlying this phenomenon.

Once You Climb Out of That Bucket, The Open Sea is Yours to Discover

The crabs attempting to escape the bucket are those unwilling to accept confinement. They perceive the light above and recognize an opportunity to break free. They are prepared to step beyond their imposed limitations in pursuit of freedom. Regrettably, the remaining crabs in the group fail to share the same perspective; they view the liberation of others as a threat to their well-being, thus preventing the departing crabs from leaving them behind. (Itani O, 2020)

We're all susceptible to the crab mentality (but are not crab), however, it's essential to understand that the very thought of another's failure is a result of one's personality issues that need to be resolved. Hence, we need to be mindful of the crab mentality and challenge it and be better off by viewing the success of others as a source of inspiration and motivation, rather than bitterness and low self-esteem. To second the words of motivational speaker, Jim Rohn: "You are the average of the five people that you spend your most time with", it is vital that to overcome the "crab mentality" one must surround with positivity and with people that want nothing but the success of everyone. Being confined to a box is a self-choice and this doesn't resonate with the people who are dreamers, visionaries and ready to discover the open sea.

In the vast expanse of the sea, we must cultivate collaboration and mutual support because, in reality, there's ample space for everyone to thrive. However, the presence of crab mentality within our families and societies wrongly convinces us that resources such as money, employment opportunities, happiness, and love are scarce commodities. Shedding the crab mentality also fosters humility and equips us to cope with setbacks and errors more effectively. It's essential to eradicate these detrimental traits by embracing a growth mindset, acknowledging our own capabilities, and acknowledging the strengths of others as well. (Nguyen S 2021). One must spend most of the time around people who are trying to achieve the same types of success that you are. Above all, keep setting those goals and keep learning. (Hughes L, 2021). Crab mentality is universal and is everywhere. We avoid having a crab mentality by always wishing the best for others and to be happy when they are successful. Each one of us must follow our own passions, inner calling, and support each other to make this island a better place, and not be the crab that pulls others down. (Woolfe S 2018). Simple practices like expressing gratitude, doing mindfulness meditation, letting go of your limiting beliefs, and saying a powerful affirmation to boost your confidence and self-esteem, treating people with respect, being self-goal focussed and true to oneself, can be adopted to overcome the crab mentality (Songco C)

Humans are not crabs and are gifted with a brain that allows to think critically. They cannot be confined in a box without their consent. A dreamer, a visionary, or someone seeking something better for oneself should start the crawl upward, put in constant effort, struggle, and sacrifice to soar, and fly (Itani,O 2020). Being jealous is normal, but to use that negatively or positively is upon us.

RECOMMENDATIONS

Based on our findings, we offer the following recommendations for today's companies:

- Foster a Culture of Collaboration: Encourage teamwork and mutual support through initiatives such as cross-functional projects, mentorship programs, and recognition of collective achievements.
- Cultivate Inclusive Leadership: Invest in leadership development programs that emphasize empathy, transparency, and fairness, empowering leaders to create environments where diverse perspectives are valued and respected.
- Align Incentives with Collaboration: Review reward systems and performance metrics to ensure they incentivize cooperation and teamwork rather than fostering cutthroat competition.
- Promote Open Communication: Create channels for honest feedback and dialogue, allowing employees to express concerns and address issues related to Crab Mentality in a constructive manner.
- Invest in Diversity and Inclusion: Embrace diversity as a source of strength and innovation, fostering an environment where all individuals feel welcome and empowered to contribute their unique talents and perspectives.

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Knowledge Extraction using Bert Towards Building Swot Applications

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ABSTRACT

Semantic web technologies are a key driver of semantic interoperability in IoT (Internet of Things)-generated data, since they leverage common vocabularies in an ontology-driven manner. Despite the growing interest in IoT ontology standardisation, there is still no widespread endorsement of a unified IoT ontology. Existing ontologies contain a wide range of relationships and concepts to address various IoT data properties and the same IoT concepts are always being redesigned by new ontologies, making it difficult to reuse and combine multiple IoT ontologies that contain repetitive ideas. The most popular terms in IoT ontologies, including the W3C Web of Things, the W3C SSN/SOSA, the ETSI M2M SAREF, and the Komninos ontologies, have been examined in this study, and Lov4IoT smart cities ranking data corpus has been used. The Lov4IoT catalogue is used to automatically identify the vocabulary to be extracted from ontologies of various IoT application domains using machine learning approaches and by making use of IoT publications containing domain-specific knowledge. Vocabulary extraction is done using BERT Optimization along with K-Means clustering in order to boost the accuracy. The k-mean approach produces semantically consistent clusters for the smart city domain, with an accuracy of 70.9%. Using this study, ontology engineers will be able to apply and mix existing ontologies to achieve semantic interoperability. To our knowledge, no study has looked into the significance of automatically finding the relevant topics for iot.schema.org using these machine learning techniques.

KEYWORDS: *IoT, Ontology, Lov4IoT, BERT, Vocabulary extraction, Semantics.*

INTRODUCTION

The Internet (IoT) endeavours to connect nearby devices to the Web, with the goal that data generated by them can be transmitted and managed [1]. By 2025, as per an estimate by International Data Corporation (IDC), around 42 billion devices, generating over 79 ZB data would be used [2]. Applications for smart cities are progressively made possible by IoT. Foundations for smart cities are costly to create, construct, use, and keep up with. Cost-saving interoperability is fundamental, and it is expected at a wide range of levels, prominently i) the framework, ii) the plan, iii) the work process for handling IoT information, iv) the services and applications, and v) the utilization of information for decision making. A semantic methodology, especially one made feasible by the utilization of relevant ontologies, can support interoperability and better adapt to the variety of IoT connected devices, supporting their related data types. The issue of picking the right catalogue and ontologies emerges from the way that there are various ontology catalogues that are appropriate to smart cities and IoT cities. The Santander smart city project in Spain is an example of an IoT based

smart city plan, which utilized more than 20,000 sensors to oversee power, air quality, parking places, improve waste management, and control lighting [3]. Smart city applications, which spread across various projects like water system management, energy management, medical services, asset, and transportation etc., depend on the successful utilization of information provided by these 'things'. In different cities, these applications are accordingly revived (like parking applications, bicycle sharing applications) regularly. For instance, the CityPulse project identified 101 application scenarios and examined a handful of them [4]. These projects are occasionally refreshed to exploit new, important datasets. On open-source information gateways like Comprehensive Knowledge Archive Network (CKAN), smart city datasets are accessible. These kinds of activities promote the reuse of datasets and endeavors to associate them as per the Linked Data principles [5]. One of the principal downsides of such entryways is the shortfall of relationship between the datasets and their relationship with organizing information models. Reusing ontologies created for smart city apps will help to ensure consistent coordination between the government and cities, and it may also speed up semantic interoperability and cut down on application development time. As seen in the European IoT Hub 2020 project [6] cities like Santander are using semantic web technologies (SWTs) in this vein. Open sensor-produced data is being distributed by cities more and more in France. Consolidating these datasets using SWTs is the goal of the Smart City project, which is funded by the French National Research Agency (ANR) [7].

The Semantic Sensor Networks (SSN) cosmology is one of the early endeavors to improve semantic interoperability of information provided by sensors or gadgets [8]. In October 2017, SSN, which extended and further developed the SSN ontology delivered in 2011 [9], got a W3C suggestion. There are, however, a few shortcomings like a classification scheme and including the real-time feature. For representation of sensor data, ontology is required for classifying the context, measurement types, unit of measurement, and services offered by the 'things'. Along these lines, developers keep designing new ontologies for developing applications for smart cities. We can draw inspiration from the online environments of code sharing made available by software developers. We might establish an ontology catalogue environment to promote the reuse of the ontologies' execution as well as their plan by making the code accessible on the web. Most overviews of ontology catalogues that focus on IoT smart city are lacking and don't report contemporary work [10].

IoT is a Schema.org vocabulary extension that aims to organise the heterogeneous Web of Things (WoT) data and hence provide semantic interoperability [11][12]. Ontology experts were supposed to benefit from the innovative KE4WoT ontology, which logically examines the essential points that constantly appear in present ontologies from a particular IoT application location. KE4WoT utilizes machine learning procedures and is supported by a corpus of 4,500 articles (of conferences and journals) having domain specific knowledge across three significant IoT applications of smart weather, city, and home. The makers of iot.schema.org mostly benefit from the KE4WoT (key subjects) results. The basic benefit of KE4WoT is a reduction in the human exertion and the time taken in fostering a diagram, as well as supporting the subject reuse for additional created interoperability. Domain experts can then consolidate the subjects into new vocabulary to depict IoT gadgets, services, and functions while creating refined applications across different IoT settings [12].

The reception of semantic web technologies is promoted in this review for applications including smart cites that require more noteworthy information pattern and interoperability. With the utilization of an open vocabulary, ontologies empower engineers to reuse and exchange application area information across different heterogeneous frameworks, stages, settings, and so on [13]. Best practices for building ontologies ought to be supported, with an emphasis on: utilizing existing ontologies as much as plausible; and changing the ontologies. This will increment interoperability by eliminating heterogeneity issues among models and abbreviate improvement time [14]. Machine learning is utilized to officially communicate the connections among logic and classes (ideas) in a specific space [15]. In 2001, Arumugam et al. distributed one of the significant investigations engaging on finding the most

relevant scheme of ontologies for a specific premium [16].

Long short-term memory (LSTM) and BERT are two deep learning strategies that have, in recent times, made huge progressions in learning repeated information. The most state of the art execution is shown by BERT; however, it is heavy and pre-trained [17]. This exploration proposes a straightforward deep learning-based grouping strategy. This technique utilizes a lightweight BERT-based installing model that utilizes a smart transformer's encoder to accomplish semantic clustering of rankings.

Research Objectives

The goal of web services discovery is to find the appropriate services to meet customer expectations. Supporting ranking or discovery before the matching process is useful by compiling significant services according to their domain or features. The objective of the smart city is to make a typical information space for a metropolitan region on the center of the smart city which will be the information system for observing the condition of the essential things in the city (can be obtained from the sensors conveyed in a city), and will be the plan of different services to customers/clients [18].

1. To apply BERT optimization for big data analysis from the rearranged data and its ranking order arrangement.
2. To extract vocabulary by calculating frequency of words in the twitter comments and the ranking of smart cities' ontologies.

In light of in-depth understanding, this evaluation suggests a clear implementation of service clustering technique. This method uses an original transformer's encoder and a lightweight BERT-based installation model to achieve semantic clustering of the service piece. To build an instructional cyclic structure for web service that makes use of neural language structures to learn creation of service rankings. The model may derive semantic information from these rankings and understand the relationships between the commands issued by different services. Second, the pre-prepared model is capable of generating the vectors for each ranking's representation [19].

Research Problem

In spite of its importance, the IoT has become progressively troublesome because of the tremendous amount of introduced heterogeneous things, detecting information, and suggesting services. Along these lines, the generated data has made information sharing which is a difficult activity. Also, this volume of information is continuously growing, including semantic heterogeneity (synonymy, antonymy, polysemy etc). The determined measurement may be expressed in various ways [20].

Long-term problems to address include:

- Semantic interoperability amongst IoT projects. For this, in this work, we are using the schema to enhance semantic interoperability.
- Classifying and merging already-existing ontologies to solve an assessment problem observed by scientific literature.
- Reuse of domain knowledge and skills. For this, in this work, we are promoting the reuse of ontologies.
- Words used most frequently when searching for smart cities based on its rankings, where IoT is relevant for Twitter posts.

Significance of Study

Knowledge extraction from semi-structured or unstructured sources, including analysing text documents and conversations on social networks like Twitter and Reddit, has received a lot of attention. However, knowledge extraction from organised information sources has not received much attention (such as ontologies). No prior work has proposed such a method for analysing a set of IoT-related ontologies using the machine learning technique of BERT coupled with k-means clustering.

This paper's major contribution focuses on the opportunities and difficulties associated with using big data in smart cities. In addition to connecting with their residents more actively and effectively, smart cities save resource usage and expenditures. Smart cities are one of the emerging technologies that augment big data. Data gathering and the amassing of vast amounts of data that can be used for good have become a part of daily life.

The semantics of web resources can be defined concisely and logically with the use of ontology. The ontology outlines the relevant concepts in a domain, their properties, value ranges and likely links among the concepts and properties. Ontology helps in managing resources by offering a significant understanding of the 'thing' due to the fact that it characterises essential ideas the types of objects and their features and the semantic connections that connect those concepts as opposed to the real structure of a resource or syntactic highlights like consecutive requesting or the settling of components [15].

Three user gatherings can benefit from ontology records used in the IoT and smart city space: i) application fashioners who need to find, select, and reuse ontologies that could meet their necessities; ii) ontology engineers who need to disseminate and share their ontologies to help reuse; and iii) makers and upkeep staff of the ontology records.

LITERATURE REVIEW

In order to handle the heterogeneity and ambiguity of the enormous amounts of data that connected objects have collected and to assure interoperability with IoT frameworks, IoT semantics have been described and introduced in this sector [4]. From this vantage point, they gave an outline of a couple of current ontologies, for example, O&M and SSN ontologies, which attempt to address sensors and their data. Szilagyi and Wira's survey gave an outline of SWT utilized at different IoT framework levels as well as the pivotal ontologies that were used to make IoT applications and services [21], SSN and the IoT-O in particular. Banerjee, S., Chakraborty, C., & Chatterjee S. [22] carefully examined, discussed, and interpreted potential ontologies that could be used for IoT by taking into account sensors, time, location, and context. Ontologies, that are both general and concentrated on a particular domain, were designed using the previously mentioned techniques. Similarly, to give semantic interoperability between heterogeneous IoT frameworks, the creators in [23] depicted the IoT ontologies that are right now being used. They, for the most part, focused on broad application ontologies used in IoT stages and domain-specific application ontologies (medical services and strategic areas). IoT ontology usage was divided into two layered ways by Hamraz et al. [24] in their assessment of best-in-class practices. While the space layer records specific characterized ontologies that are ordered into climate (smart home, horticultural etc.) and client situated (medical care, e-learning, and other) domains, the cross-area system mirrors the ideas of WoT components (devices, services, data etc.) [25]. the previously mentioned investigations are coordinated with their country's commitment, and year of distribution.

There isn't much research employing the Word2Vec method to perform term analytics on IoT ontologies. Word2Vec and K-means clustering were used by Muppavarapu et al. in 2021 to assess the vocabulary extraction in existing models [2]. It is inadequate with regards to a comparative investigation to understand semantic-based IoT explanations. In order to extract word frequency that can aid IoT in Google search to locate the smart city ranking, we processed the SWTs together with trending BERT optimization. Medical care, smart cities and other IoT application areas are undeniably hidden in this review. The creators in this work just momentarily present the selected approaches. Thus, various ongoing and critical examinations are not considered in this overview.

Smart City Projects based on Semantics

We look at papers with the expression "smart city" in this part with an eye towards consolidating semantic web innovation. Alkandari et al. present a survey which explores smart cities from a general framework and from specific applications' point of view, along with the role of ICT in smart cities [26]. However, the direction of semantics-based smart city projects was not explored in the paper.

The Italian city of Padova is planned and demonstrated as a proof-of-concept deployment of an IoT city by Zanella et al. [27]. This smart city project outlines a general framework for designing IoT based urban smart cities. It utilizes no semantic web innovations and rather focuses on the IoT nodes' data formats (XML and EXI), communication protocols and the web services offered. This carries us to notice the heterogeneity issues (communication protocols and devices) in OSI model advances at the application, transport, and association layers. Brilliant structures, junk the board,

air quality, noise observing, traffic congestion, city energy use, smart parking, and smart lighting are a portion of the paper's key application regions for savvy smart communities. The degree of smart city utilisation is highlighted in this study.

The FP7 EU SmartSantander project, which offers genuine sensor information, is the establishment for the SEN2SOC (Sensor measurements and Social interactions) experiment. To improve the utility of the information, SEN2SOC consolidates smart Santander sensor information with information from interpersonal organizations (Twitter, Flickr, and Foursquare) [28]. On the SmartSantander project side, the semantic data annotation is completed. The paper neither describes nor cites the ontologies utilized for the semantic annotation. Real-time functionality is also discussed, however no ontologies have been provided that meet this criteria. As a proof-of-concept, applications for smart cities like temperature heat maps have been developed.

To deal with the diverse and the large amount of information generated within smart cities, Zhang et al. developed a versatile system [29]. The system utilizes machine learning techniques alongside semantic web advancements. Two use cases of traffic pattern analysis and detection of pollution from vehicles have utilized this semantics-based system for experimentation.

Open Agile Smart Cities (OASC) is a network strategy that aims to create a worldwide smart city framework by emphasising a standard programming interface, an open information platform, and data models. This convergence explicitly resolves the inquiry, "Where could we find data models that are reusable for smart cities?" [30].

The Ontology Alignment Evaluation Initiative (OAEI) benchmark was utilized to assess OntoPhil, an ontology matching strategy made explicitly for smart cities [31]. Agent ontologies that must communicate with the SOFIA ontology for smart cities have also been matched using OntoPhil. The work's fundamental flaw is that the ontology matching system was tested with ontologies from the OAEI effort rather than ontologies for smart cities. It illustrates the requirement for a baseline for ontologies used in smart cities.

Catalogues of Ontologies

For domains other than smart cities and IoT, D'Aquin & Noy delivered a study of ontology libraries in 2012 [10]. In our work, we preferably use the expression "ontology catalogue" in its place. The absence of mention of IoT and smart city catalogues in [10] further makes our work on the subject, as covered in the methodology section ahead, more significant.

The additional classifications that apply to ontology catalogues are: i) coverage and purpose, which portrays how restricted and defined the ontologies can be for a specific domain and have varying sizes and types; ii) catalogue's content, which frames the way that new ontologies are added to the collection and what quality checks are precede this addition; iii) ontology catalogue's size; iv) ontology metadata, which incorporates data such as, the ontology name, domain, designers, creation and modification dates, license, etc. [7].

A database of schemas called Schema.org can be used to represent places, people, things, services, etc. in structured data that is embedded in web pages [11]. iot.schema.org, is an extension of this towards WoT, is currently being developed.

A collaborative ontology development tool called Protégé makes use of ontologies that have been created using it [32]. Ontologies can be discussed and annotated with the use of WebProtégé's features. A crucial requirement is to give users an easy way to publish their ontologies online so that others can view them without having to download any software.

A collection of ontologies can be found in Ontology Design Patterns (ODPs) [33]. The following categories can be utilized to classify ontologies ODPs for content, reengineering, logic, alignment, lexico syntactic, architecture, and exemplary. To retrieve ontologies referred to within the repository; it is difficult to execute a precise keyword search using phrases like "city" or "IoT."

Existing literature surveys on ontologies covering IoT and Smart City

By using web technologies, the WoT [34] is considered an expansion of the IoT, that simplifies it to convey sensor information and afterward makes that information

accessible to engineers by means of sites and web services. We explore few ongoing overviews relating to it in this section since sensor companies, IoT, and WoT technologies are believed to be the establishment for creating smart cities.

A few overviews in regards to sensor ontologies have utilized the SSN ontology particularly, which was distributed as a W3C Proposal in October 2017 [35]. There has been comparison between 23 ontologies, including DogOnt, iotlite, IoT-O, M3 Light, OpenIoT, Spitfire, SOSA etc., on the basis of properties, observations, procedures, actuations, deployment, results etc. On the W3C SSN documentation, more data with respect to the review of sensor ontologies is accessible. This is an ongoing work to the SSN ontology work published earlier [8]. Authors in explain the extensive analysis conducted on sensor ontologies for building the SSN ontology in 2012 [36].

In the 2016 overview by Szilagyi et al., a semantic web stack for IoT has been designed [21]. Furthermore, this stack appears to be a continuation of work by Barnaghi et al. [37] and Serrano et al. [38], but isn't expressed clearly. The paper also presents an IoT namespace without indicating its origination: whether from the existing ontology or from its own. The exploration also fails to present a deep assessment of the currently available ontologies [21].

In July 2017, Bajaj et al. published a survey on IoT ontologies [39]. Beginning around 2012, IoT ontologies have been the essential subject of examination (after the main arrival of W3C SSN) for classifying ontologies into categories such as sensor, context-aware, location-based and time-based ontologies. These can further be categorized as general or specific to a domain. The importance of reasoning and assessing ontologies has been underlined, but the evolution and comparison of such ontologies is missing.

Semantic Interoperability

Among the ontologies included in Ganzha et al. overview on semantic interoperability are those relating to IoT/sensors, e-health/m-health, and transportation and logistics [14]. The paper's main flaw is that the authors emphasise the need for greater work in this area in order to achieve semantic interoperability while failing to mention the ontology catalogues that already exist for IoT and smart cities. There are no tools available to make getting all ontologies easier.

An assortment of rules and best practices for semantic interoperability were delivered by the European Research Cluster on the Internet of Things (IERC) AC4 (Movement Chain 4) in Walk 2015 [38]. It lists the following difficulties that must be overcome: a framework for linking open data, mechanisms and guidelines for reasoning, an interoperable model for semantic annotation of IoT data, planning for lightweight variants in constrained environments, association between various vocabularies, and simple integration with existing applications are just a few of the concepts discussed.

Extracting Relationships

Wu and He proposed a model that utilizes both the pre-trained BERT language model and information from the objective elements to satisfy the relationship classification task [40]. They find the expected substances, perceive the data, and move it while consolidating the legitimate encoding for the two elements through the laid out engineering.

Wang et al. introduced convolutional neural network design for the connection extraction task, which utilizes two degrees of thoughtfulness regarding all the more effectively perceive designs in different situations. This plan empowers start to finish getting the hang of utilizing task-explicit labelled information without the use of outer data, for example, explicit reliance structures [41].

METHODOLOGY

The proposed methodology is shown in figure 1. The following modules are included in the suggested system for annotating the smart cities. The implementation has been done using Python software from the smart city data obtained from secondary sources.

LOV4IoT Catalogue

LOV4IoT ontology catalogue acts as a tool that references over 450 ontologies as well as projects based on ontologies. Most of these are related to the IoT or WoT domain, employing sensors and making use of SWTs. It aims at promoting the reuse of ontologies of the said domain and therefore creating semantically

interoperable applications. We involved the LOV4IoT library to explore the domain information skill and ease out the production of IoT applications. It incorporates references to 4 ontologies: W3C Web of Things ontology, W3C SSN/SOSA ontology, ETSI M2M SAREF ontology, Komninos ontology in the domain of smart cities. Smart city has been used as the dataset.

Retrieving Twitter Comments

The following stage involves retrieving Twitter comments using Hawksey's TAGS (Twitter Archiving Google Sheets) [42]. To gather information from Twitter, we have used the free TAGS Google Sheet template. By using user-defined search parameters, TAGS searches the Twitter Search API (Application Programming Interface) and archives the results in a Google Sheet. The user can set up TAGS to update the archive every hour or run the query manually. The search term "smart city" was used to gather over 1028 tweets from 1st Dec 2020 to 31st Jan 2021 for this work.

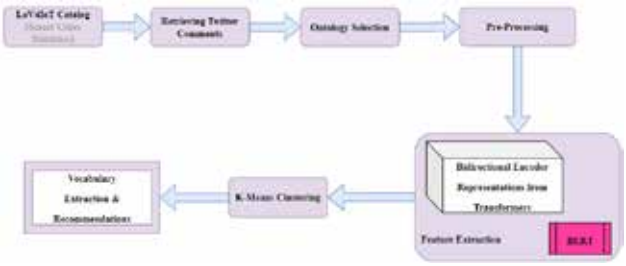


Fig.1 Proposed Methodology

Ontology Selection

Based on the previous step, the ontology can be chosen in this phase. This selection entails integrating ontology matching techniques to automatically align the smart cities knowledge in order to deduce additional knowledge and integrate smart city. One can add labels and comments and rewrite the smart cities information in a universal language to make the task of ontology matching tools easier.

Pre-Processing

In the pre-processing phase, the following steps are used:

a. Remove Twitter special characters: The goal is to identify and eliminate Twitter special features like usernames, URLs, punctuation, and numbers.

b. Case folding: This technique converts capital letters to lowercase letters.

c. Acronym conversion: This involves converting an abbreviation into a whole word.

d. Synonym conversion: The goal is to change nonstandard words, including those with repetition characteristics, into standard words.

e. Eliminate stop word: The intention is to eliminate meaningless words.

BERT

To enhance the effectiveness and quality of NLP (Natural Language Processing) solutions, Devlin et al. created the pre-trained language model known as BERT in 2018. The deep learning layers of transformer encoder serves as the foundation of BERT architecture. In the multi-head self-attention layer of the BERT, the value of h is equal to 12, and there are 12 levels of transformer encoder in total [43]. Uncased BERT model uses this architecture to determine a word's importance in a document based on its context. Using an attention mechanism, a self-attention layer converts the input embeddings, a query (Q), and a collection of key-value pairs (K, V), into an output vector. The attention score defines how much emphasis should be placed on other parts of the input sentence when the encoder is learning the embeddings for a word at a specific point [44]. It can be calculated as shown in equation 1, given the query, key vectors of dimension dk, and value vectors of dimension d_v:

$$Attention\,(Q,K,V) = Softmax\left(\frac{QK}{\sqrt{d_k}}\right)V \quad (1)$$

The layer in this case calculates the dot products of the query and all of the keys, divides each by $\sqrt{d_k}$, and then uses the Softmax function to get the weights on the value vectors.

K-Means Clustering

Using k-means cluster technique, the data is partitioned into unknown (k) number of clusters based on some basic information [45]. By minimising an objective function, this algorithm attempts to separate N information with D features into D clusters. The minimum objective function can be seen in the additional condition for a

cluster of D-layered information {x1, x2…x_n} shown in equation 2:

$$J = \sum_{n=1}^{N} \sum_{k=1}^{K} r_{nk} \|x_n - \mu_k\|^2 \quad (2)$$

Data x_n 's membership in cluster k is represented by the value of $r_{nk} \in \{0,1\}$. The sum of the squares of the distances between each x_n data point and each μ_k centroid makes up the objective function J. By using an iterative process that involves two stages: optimization of r_{nk} and optimization of μ_k, it is important to find the proper values for r_{nk} and μ_k in order to minimise J. By iteratively choosing values for r_{nk} and μ_k, using equations 3 and 4, one can minimise the objective function J [46].

$$r_{nk} = \begin{cases} 1, & k = \arg min_k \|x_n - \mu_k\|^2 \\ 0, & others \end{cases} \quad (3)$$

$$\mu_k = \frac{\sum_{n=1}^{N} r_{nk} x_n}{\sum_{n=1}^{N} r_{nk}} \quad (4)$$

Vocabulary Extraction and Recommendations

The cycle removes space explicit terms from a corpus of area explicit expressions and gives the terms the fitting domain specific sorts. This issue is unique in relation to conventional NER. Most off-the-rack NERs are told to perceive a little determination of undeniable level classes, like Individual, Association, Area, and so forth. For our situation, characterizing the sorts for a specific space is fundamental prior to utilizing these sorts to clarify phrases in the corpus. Utilizing terms like "Distributed Computing Technology," "Application Server," and "Programming Language," we need to arrange terms like "Distributed computing," "IBM Web Circle," and "Casual conversation" for the IT business. We depend on sources beyond the corpus, explicitly LOD, since relevant kinds probably won't be accessible in the corpus. Figure 2 exhibits our cycle for making a jargon.

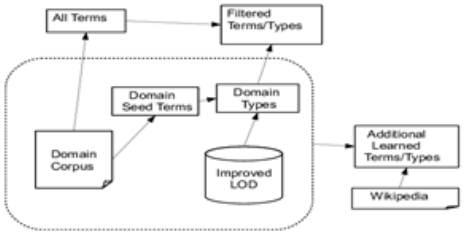


Fig. 2 Vocabulary Extraction Process

Our method carries out the following actions:

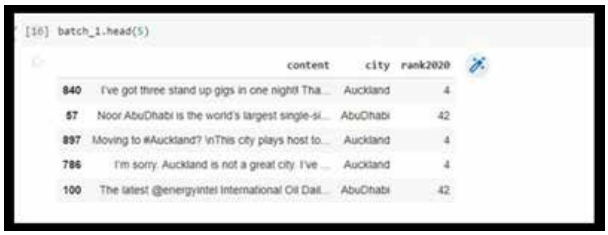
1. Draw out a term population from the domain corpus. The collection of all noun phrases is this.
2. Take a seed set of phrases that are domain-specific from the corpus.
3. Using the seed terms from step 2, employ statistical techniques to extract domain-specific types from LOD.
4. Based on the domain-specific types from step 3, filter the collection of all terms from step 1. As a result, a collection of terms that are specific to a given domain are produced.
5. Use NER to further enhance the corpus' coverage of the particular domain. Additional terms that fall under a subset of the kinds discovered in step 3 are discovered by the NER algorithm.

RESULTS AND DISCUSSIONS

BERT Model

The bidirectional approach for smart cities, a popular consideration model, was utilized to demonstrate language as the super-specialized BERT advancement. Past investigations either inspected text groupings from a left-to-right preparation point of view or from a joined left-to-right or right-to-left preparing viewpoint. The review's discoveries exhibit that bidirectional prepared language models can appreciate setting and stream of language more profoundly than single-heading language models [47]. Figure 3 shows that pre-training model of Bert Model downloading before testing such that it initializing the BERT model. As presented in figure 4, we are utilizing (.) go to show initial five records of content, city, and rank. These outcomes are emerged by utilizing BERT bidirectional capabilities.

Fig.3 Pre-Training Model downloading – Before BERT Output

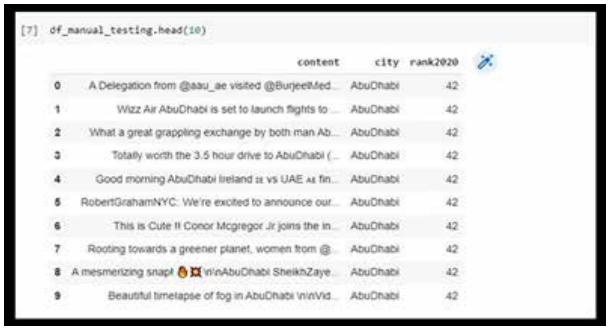


```
[10] batch_1.head(5)
```

	content	city	rank2020
840	I've got three stand up gigs in one night! Tha...	Auckland	4
67	Noor AbuDhabi is the world's largest single-si...	AbuDhabi	42
897	Moving to #Auckland? \nThis city plays host to...	Auckland	4
786	I'm sorry. Auckland is not a great city. I've ...	Auckland	4
100	The latest @energyintel International Oil Dail...	AbuDhabi	42

Fig. 4 BERT output

Similarly, in figure 5, we are using manual (.) head testing which shows the top 42 ranking of the CITY with the help of trained and tested BERT model.



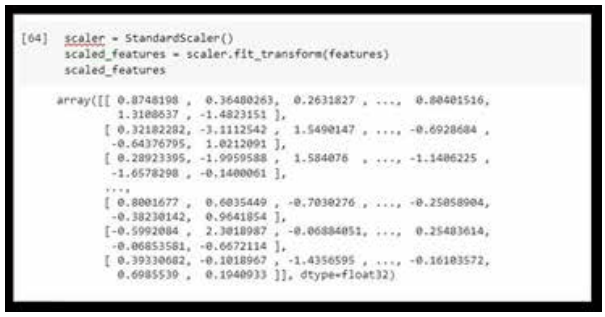
```
[7] df_manual_testing.head(10)
```

	content	city	rank2020
0	A Delegation from @aau_ae visited @BurjeelMed...	AbuDhabi	42
1	Wizz Air AbuDhabi is set to launch flights to ...	AbuDhabi	42
2	What a great grappling exchange by both man Ab...	AbuDhabi	42
3	Totally worth the 3.5 hour drive to AbuDhabi (...	AbuDhabi	42
4	Good morning AbuDhabi Ireland 🇮🇪 vs UAE 🇦🇪 fin...	AbuDhabi	42
5	RobertGrahamNYC. We're excited to announce our...	AbuDhabi	42
6	This is Cute !! Conor Mcgregor Jr joins the in...	AbuDhabi	42
7	Rooting towards a greener planet, women from @...	AbuDhabi	42
8	A mesmerizing snap! 🔥🖼 \n\nAbuDhabi SheikhZaye...	AbuDhabi	42
9	Beautiful timelapse of fog in AbuDhabi \n\nVid...	AbuDhabi	42

Fig. 5 Manual Testing Output of City Ranking

K-Means Clustering

The unsupervised k-means machine learning algorithm and semantically related terms are grouped together. The number of clusters, or ontology concepts that reflect semantically coherent terms, is what is meant by the K parameter. Figure 6 shows that the whole data has been scaled before deploying for k-means clustering in order to calculate the centroid of the data.

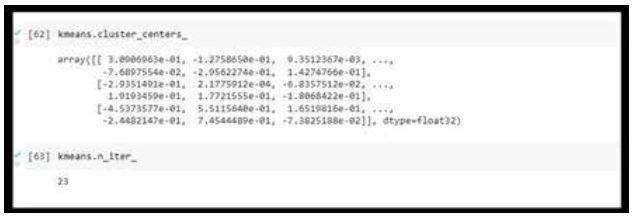


```
[64] scaler = StandardScaler()
     scaled_features = scaler.fit_transform(features)
     scaled_features

array([[ 0.8748198 ,  0.36480263,  0.2631827 , ...,  0.80401516,
         1.3108637 , -1.4823151 ],
       [ 0.32182282, -3.1112542 ,  1.5490147 , ..., -0.6928684 ,
        -0.64376795,  1.0212091 ],
       [ 0.28923395, -1.9959588 ,  1.584078  , ..., -1.1486225 ,
        -1.6578298 , -0.1400061 ],
       ...,
       [ 0.8001677 ,  0.6035449 , -0.7030276 , ..., -0.25858904,
        -0.38230142,  0.9641854 ],
       [-0.5992084 ,  2.3018987 , -0.06884051, ...,  0.25483614,
        -0.06853581, -0.6672114 ],
       [ 0.39330682, -0.1018967 , -1.4356595 , ..., -0.16103572,
         0.6985539 ,  0.1940933 ]], dtype=float32)
```

Fig. 6 Data Scaled before K-Means Clustering

Based on the clustering done by using the calculations of centroids, as shown in figure 7, the array of data is scaled in k-means clustering to improve the accuracy, as shown in figure 8 (accuracy of 70.9% is achieved).



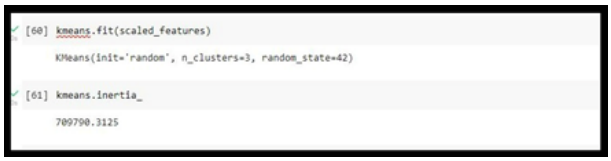
```
[62] kmeans.cluster_centers_

array([[ 3.0006963e-01, -1.2758650e-01,  9.3512367e-03, ...,
        -7.6897554e-02, -2.9562274e-01,  1.4274766e-01],
       [-2.9351491e-01,  2.1775912e-04, -6.8357512e-02, ...,
         1.9193459e-01,  1.7721555e-01, -1.8068422e-01],
       [-4.5373577e-01,  5.5115640e-01,  1.6519816e-01, ...,
        -2.4482147e-01,  7.4544489e-01, -7.3825188e-02]], dtype=float32)

[63] kmeans.n_iter_

23
```

Fig. 7 K-Means Clustering used centroid calculations



```
[60] kmeans.fit(scaled_features)

KMeans(init='random', n_clusters=3, random_state=42)

[61] kmeans.inertia_

709790.3125
```

Fig. 8 K-Means Clustering Accuracy output

Microsoft's Power BI (Business Intelligence) is used to show vocabulary extraction. Using Power BI, it is simple to visualise the overall material using, for instance, word clouds. Figure 9 illustrates a word cloud visualisation based on enriched twitter content. As seen in the image, the majority of locations are cities or nations, but other types of places, such as a lab, a building, a market, or a sidewalk, are also designated as locations. As a city official, you would be interested in all the tweets concerning your city's smart cities. The representation of all tagged sites provides a quick comparison of your city to other locations in at the next level of analysis which may include Twitter accounts and users.

Fig. 9 Vocabulary Extraction

As seen in figure 9, there are several word symbols that are frequently used in Twitter to refer to the recipient of a tweet. It's critical to distinguish between those who make retweets and those who submit tweets. There is a need to make an association of interpersonal organization perception programme so that the organization information should constantly have Source and Target sections. Thus, people who make tweets should be

explicitly included the section. As a matter of fact, texts that have been named as key expressions incorporate various catchphrases connected with numerous vital parts of smart cities, including governmental issues, smart cities' services, technologies etc. In figure 10, instances of specific frequencies are shown.

Fig.10 Sample Output of Words Frequency in the Twitter Comments

Extraction of vocabulary for smart city knowledge-Achieved through Results

The dataset contains significant ontologies like rankings for smart cities (developed by IBM). The k-mean approach produces semantically consistent clusters for the smart city domain, with an accuracy of 70.9%. The name of the topic cluster for "Smart cities" makes it abundantly obvious which topics fall under this umbrella. The findings show that the country's statistical profile, which is only used in one ontology, is the most crucial phrase in the domain of smart cities. Among the list of available smart city ontologies, the Komninos ontology is the largest. It's also interesting to note the importance of terminology like "building & infrastructure" and "transportation mode" in the area of smart cities.

CONCLUSION AND FUTURE SCOPE

For programmers, consultants, and specialists in smart cities, the application of our suggested approach for knowledge extraction using LOV4IoT catalogue and BERT and k-means clustering techniques for building semantically interoperable web of things applications results in a number of intriguing and beneficial conclusions. Based on the clustering done by using the calculations of centroids the array of data is scaled in k-means clustering to improve the accuracy of 70.9% is achieved. So it shows high precision of our proposed method in comparison to previous literature studies.

The soft aspects of smart city research must be respected in addition to the practical approach's interpretations. In results, we have discussed the output from employing a BERT model for NLP, output of city ranking, vocabulary extraction, and a sample output of words' frequency in the Twitter comments. One of the critical discoveries of our review is that the plausibility of carried out smart cities applications and administrations is constantly advanced by a decent incorporation of these procedures.

Future work could include simply improving the methodology to accommodate more IoT application areas, such as manufacturing, industry 4.0, robotics, healthcare, etc. In fact, there are IoT-based projects for smart cities that are already under development, such as disaster preparedness using semantic web technologies and smart city ranking based on tweets and word frequency for future IoT searches. Examining the methodology for assessing the quality of ontologies is a further task for the future, in order to promote ontology reuse and semantic interoperability. Further, ontology catalogues could be unified and synchronised to automatically update all catalogues with new ontologies. An algorithm for ranking ontologies that would suggest which ones to reuse could also be developed as a future scope of this work.

COMPLIANCE WITH ETHICAL STANDARDS

Funding: No funding was received for this study.

Conflict of interest: Ms. Nikita Malik (the first, corresponding author) declares that she has no conflict of interest. Dr. Sanjay Kumar Malik (the second author) declares that he has no conflict of interest.

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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Decoding Behavioural Biases: Investigating their Impact on Investment Decision Making in the Indian Stock Market

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ABSTRACT

This paper explores the domain of behavioural finance to examine how different biases affect investment decision making in Indian stock market. Drawing insights from behavioural economics, we analyze the influence of various cognitive biases on investors' decision-making processes. Drawing on insights from psychology and sociology, we analyze data collected from 585 respondents to investigate the influence of heuristics, framing, and prospect biases on investment decisions. Through Structural Equation Modelling, we examine the relationships between these biases and investment decision making (IDM), shedding light on the factors that shape investor behaviour.

Our findings disclose that although heuristics, such as availability bias, herding, and gambler's fallacy, show statistically insignificant relationships with IDM, their influence may not be as substantial as initially assumed. Conversely, Framing biases represented by conservatism, representativeness, and overconfidence demonstrate relationships that are statistically significant with IDM, amid framing variables demonstrating the highest explanatory power. Prospect biases which includ loss aversion, mental accounting, and regret aversion, demonstrate stronger relationships with IDM, suggesting a significant impact on investor decision making.

The findings underscore the intricate nature of behavioural biases in shaping investment decisions, underscoring the necessity of taking framing biases into account alongside heuristics and prospects. Our research enriches the body of knowledge in behavioural finance by offering valuable insights into the particular biases that impact investment decisions within the context of the Indian stock market. Investors, financial practitioners, and policymakers can all benefit from the implications drawn from these findings, informing strategies to mitigate the adverse consequence of the biases thereby fostering more informed decision making in financial markets.

KEYWORDS: *Behavioural finance, Heuristics, Prospects, Framing, SEM, Indian stock market, Investment decision making.*

INTRODUCTION

In the sphere of financial markets, investment decisions are not solely determined by economic fundamentals; rather, human psychology and sociology are also notably influenced by behavioural biases. Behavioural finance is a field that amalgamates insights from these disciplines with traditional financial theory, emphasizes the pivotal significance of these biases in shaping investment decision-making processes. This is especially pertinent within the dynamic landscape of the Indian stock market, renowned for its volatility and nuanced intricacies.

In this study, we delve into the realm of behavioural finance to uncover how different biases impact the process of investment decision-making among a sample population of 585 respondents within the Indian stock market. Our analysis encompasses a diverse array of cognitive tendencies, including availability bias, herding behaviour, gambler's fallacy, overconfidence, representativeness bias, conservatism and loss aversion,

mental accounting and regret aversion. These biases are grouped into three overarching themes: heuristics bias, framing bias and prospects bias, each representing distinct dimensions of decision-making processes.

By meticulously examining the effects of various biases on investment decisions, our study endeavors to enrich the existing literature in behavioural finance. By comprehending how all these biases manifest in the investment decisions, we intend to provide insight that can offer strategies to mitigate their adverse effects and promote more informed and rational decision making in the Indian stock market context. So, we endeavor to illuminate the intricate dynamics inherent in financial decision-making within the contemporary market landscape.

Grouping biases under overarching themes provides clarity and highlights their collective impact on decision making. Heuristics such as availability bias, herding, and gambler's fallacy signify deviations from rational decision making, especially in situations characterized by uncertainty or incomplete information. Framing effects, encompassing biases like overconfidence, representativeness, and conservatism, illustrates how investors may under react or overreact to past returns or fundamentals, influenced by their beliefs and perceptions. With reference to prospects framework, biases like regret aversion, mental accounting and loss aversion illustrate how investors have a tendency to assess gains and losses disparately. According to prospect theory, investors often assign greater significance to perceived gains compared to losses, a phenomenon that shapes their decision-making processes.

OBJECTIVE

The principal objective of this research is to investigate the extent to which stock market investment decision making is affected by behavioural biases. Specifically, we aim to determine whether biases like availability bias, herding behaviour, overconfidence, representativeness bias, conservatism, gambler's fallacy, loss aversion, mental accounting and regret aversion impact the decision-making process of investors in the Indian stock market.

Furthermore, our study seeks to identify out of all these biases which one exerts substantial influence on investors. By analyzing the relative strength of each bias in shaping investment decisions, we aim to find out the key drivers behind investor behaviour and investment decision making in the Indian stock market.

Scope

This study endeavours to understand how behavioural biases affect investment decision-making within the Indian stock market. By analyzing responses from 585 participants, the study intends to offer insights that can assist investors in developing more effective strategies. Understanding which biases influence decision making enables investors to approach their investments more cautiously and deliberately and achieve their financial goals. Additionally, the study fosters self-awareness among investors, empowering them to recognize and mitigate the effects of biases on their decision-making processes.

Limitations and Mitigation

While offering valuable insights, the study is limited by its reliance on a specific sample size and self-reported data, which may affect generalizing the findings. To tackle this, in future research, sample size could be expanded and alternative methodologies can be employed. By using Longitudinal analyses, deeper insights into the temporal dynamics of behavioural biases could be achieved. By addressing these limitations and adopting rigorous methodologies, future research can develop our understanding of behavioural biases in the Indian stock market, facilitating more effective decision-making strategies for investors and stakeholders.

LITERATURE REVIEW

Almansour et al, 2023, delved into how behavioural finance elements shape investment choices within the Saudi equity markets, concentrating on behavioural biases. They investigated the impact of biases like herding behaviour, disposition effect, blue chip bias, and overconfidence on how investors perceive risk and make investment decisions. Their findings underscored a notable relationship among these behavioural factors and heightened risk perception. Particularly, overconfidence emerged as a pivotal factor directly influencing investment decisions. Moreover, the study illuminated that all four behavioural finance factors exert a meaningful positive indirect influence on investment decision making.

Sharma, Mittal, 2021, undertook a qualitative study investigating the determinants of investment choices among individual equity investors in Uttarakhand, India, focusing on Dehradun. Through interviews with investors, the study uncovered a predominant reliance on comfort levels and personal convictions over quantitative analysis in decision-making processes. Psychological biases and past experiences emerged as noteworthy influencers shaping these decisions. Furthermore, the study identified market dynamics, economic conditions, and demographic factors as pivotal elements affecting investors' investment choices.

Jabeen et al, 2020, delved into the influence of socio-psychological factors on investment decisions, examining how behavioural biases act as mediators in this relationship. Stress, depression, anxiety, and social interactions were identified as primary sources of cognitive biases, subsequently impacting investment choices. Results underscored that these socio-psychological factors affect investment decisions through the mediating pathways of various behavioural biases, including loss aversion, representative bias, herding, and overconfidence.

Sharma A. 2019, investigated the effect of behavioural biases on the investment choices of individual investors in the Delhi NCR region, shedding light on the interplay between human behaviour, emotions, and investment decisions alongside the influence of globalization on financial markets. Study revealed that behavioural biases, encompassing herd bias, overconfidence, availability bias, mental accounting, and regret aversion, wielded a substantial influence on investment decisions. Moreover, the research highlighted that heightened awareness and knowledge of financial instruments establish a noteworthy correlation between investment choices and behavioural biases.

Barberis, et al 2016 conducted an empirical examination to test the hypothesis that the prospect theory value of a stock's past return distribution can forecast the stock's future return within the U.S. stock market. Their study yielded compelling evidence supporting this assertion, particularly evident among small-capitalization stocks, where individual investors wield greater influence. The results indicated that stocks characterized by higher prospect theory values tend to demonstrate lower returns in the subsequent period.

Ravindra et al, 2015 examined the experience of individual investors frequently making irrational investment choices driven by a range of behavioural biases. These biases, encompassing disposition effect, mental accounting, overconfidence, representativeness, narrow framing, aversion to ambiguity, anchoring, availability bias, and regret aversion, were identified as significant culprits behind suboptimal decision-making. The authors emphasized that these biases often result in detrimental long-term returns for individual investors.

Baker & Wurgler, 2007, delved into the concept of investor sentiment. Their work underscored the importance of gauging and comprehending the influence of investor sentiment on stock prices. The paper juxtaposed two distinct approaches to investigating investor sentiment: a "bottom-up" approach centered on individual investor psychology and a "top-down" macroeconomic perspective delving into the external origins and empirical repercussions of investor sentiment. They argued persuasively that sentiment consistently exerts considerable effects on stock prices, particularly for securities that are challenging to arbitrage or value accurately.

Tversky, Kahneman, 1974, extensively examined various cognitive biases and heuristics that significantly shape human judgment and decision-making, particularly in uncertain scenarios. They elucidated the heuristics of representativeness and availability, elucidating how these mental shortcuts often result in systematic errors in assessing probabilities. Collectively, their research underscored how these cognitive biases can profoundly impact perceptions and decision-making processes, leading to a plethora of errors and misjudgements.

DATA ANALYSIS

H1: Heuristic Biases influence the investors' decisions at Indian Stock Market.

H2: Framing Biases influence the investors' decisions at Indian Stock Market.

H3: Prospect Biases influence the investors' decisions at Indian Stock Market.

The study aims to investigate the effect of behavioural biases—specifically heuristic, framing, and prospect biases—on investment decisions among 585 participants

at the Indian stock exchange. Data collection is conducted through questionnaire, which is divided into three sections: personal information, investment decision and behavioural factors. The primary aim of the study is to explore how various behavioural biases impact investment performance, serving as the dependent variable in the study. The independent variables encompass heuristic bias, reflecting simplified decision-making strategies; framing bias, indicating the impact of information presentation; and prospect bias, capturing investors' responses to potential gains and losses.

RESEARCH FRAMEWORK

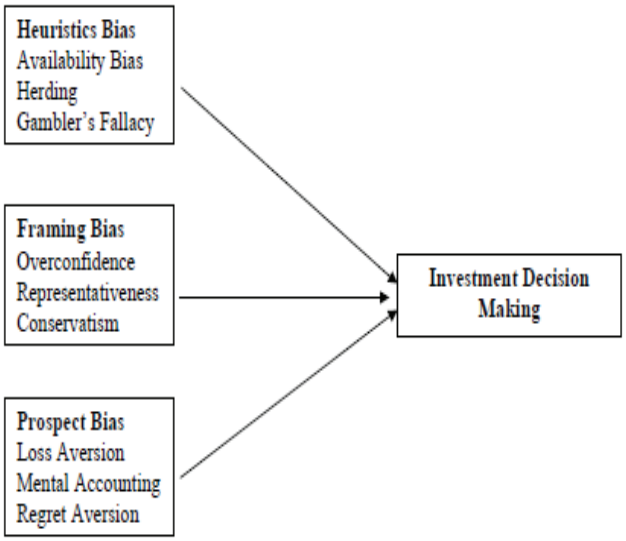

Fig 1: Research Framework of the influence of Behavioural Factors over investment decision making (Source::The Authors)

The investigation is done based on responses collected from 585 respondents who had invested at least once in the Indian stock market. Out of the total respondents the maximum respondents 76.1% age between 21-40 and 19.7% are in the age group 41-60 and 4.3% are above 60 years of age. Out of the overall population 73.5% are male and 26.5% are female. Of the overall respondents, 68.4% of the respondents are married whereas 30.8% are single and 9% belong to others category. 35% of the respondents have an annual income less than 5 lacs whereas 28.2% of the total population has an income ranging between 5 lacs-10 lacs. 15.4% of the respondents have an annual income above 15 lacs.

STRUCTURAL EQUATION MODEL

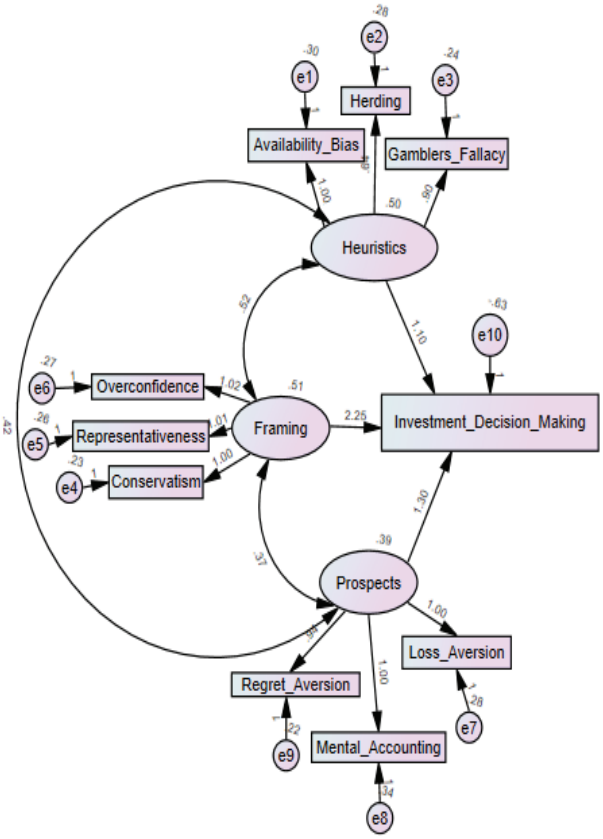

Fig. 2: Structural Equation Model, The influence of Behavioural Factors over investment decision making (Source: The Authors)

In the model, the relationship between heuristics and investment decision-making (IDM) is represented by the coefficient estimate linked with the predictor variable "Heuristics" in the equation for IDM. As far as the association between Heuristics and IDM is concerned, a positive estimate 0.015 but insignificant p=0.978 relationship exists between Heuristics and IDM. Therefore H1 is rejected and Heuristics have no influence over IDM. However, for the Framing there exists a positive estimate 3.394 and a significant relationship with IDM. Therefore H2 is accepted and Framing Biases have an influence on the investors' decisions at Indian Stock Market. Similarly for prospects there exists a positive estimate 1.266 and a significant relationship with IDM. Thus, H3 is accepted and Prospect Biases have an influence on the investors' decisions at Indian Stock Market.

Table 1: Regression Weights of the Structural Equation Model

			Estimate	S.E.	C.R.	P	Label
Availability_Bias	<---	Heuristics	1.000				
Herding	<---	Heuristics	.580	.033	17.443	***	
Gamblers_Fallacy	<---	Heuristics	.937	.042	22.282	***	
Conservatism	<---	Framing	1.000				
Representativeness	<---	Framing	1.013	.038	26.964	***	
Overconfidence	<---	Framing	.982	.047	21.083	***	
Loss_Aversion	<---	Prospects	1.000				
Mental_Accounting	<---	Prospects	.983	.038	25.638	***	
Regret_Aversion	<---	Prospects	.929	.044	21.127	***	
Investment_Decision_Making	<---	Heuristics	.015	.554	.028	.978	
Investment_Decision_Making	<---	Prospects	1.266	.305	4.151	***	
Investment_Decision_Making	<---	Framing	3.394	.355	9.568	***	

(Source: The Authors)

As displayed in Table 2, out of the various factors affecting IDM, Based on these coefficients, the factor with the largest coefficient is Conservatism with a coefficient of 0.701 followed by Regret Aversion with a coefficient of).700 and Loss Aversion 0.680. This suggests that, among the factors examined, conservatism bias has the greatest influence on Investment Decision Making. These findings underscore the substantial role of behavioural biases in shaping investment decisions, with investors exhibiting tendencies towards conservative decision-making strategies having the most pronounced effect on IDM. Conversely, variables such as Herding and Availability Bias demonstrate comparatively weaker associations with IDM, suggesting lesser influence in driving investment decisions.

Table 2: Squared Multiple Correlations

Variables	Estimate
Investment_Decision_Making	1.058
Regret_Aversion	.700
Mental_Accounting	.639
Loss_Aversion	.680
Overconfidence	.663
Representativeness	.675
Conservatism	.701
Gamblers_Fallacy	.623
Herding	.398
Availability_Bias	.617

(Source: The Authors)

CONCLUSION

Heuristics represented by Availability Bias, Herding and Gamblers Fallacy show statistically insignificant relationship with IDM. Also, the coefficients for Heuristics are relatively small compared to other variables, and the p-values for Availability Bias and Herding suggest that these variables may not have a considerable influence on IDM and we reject H1 hypothesis.

Framing, represented by Conservatism, Representativeness and Overconfidence demonstrate statistically significant relationships with IDM. The coefficients for Framing variable are the highest among all, suggesting a substantial influence on IDM. Out of all the factors considered in the analysis, Conservatism affects investors the most. The squared multiple correlations (R-squared) for each variable provide insight into the proportion of variance in IDM explained by the independent variables. The highest R-squared value is associated with Framing variables, indicating that Framing has the most explanatory power in predicting IDM compared to Heuristics and Prospects. So we accept H2 and conclude that Framing biases have an impact on investor's decisions.

Prospects indicated by Loss Aversion, Mental Accounting and Regret Aversion demonstrate statistically significant relationships with IDM and we accept H3. The coefficients for these variables are relatively higher, indicating a stronger influence on IDM. Therefore, when considering behavioural biases in investment decision-making, it may be essential to pay particular attention to framing biases as they have the strongest predictive power in this model preceded by the Prospect biases.

Thus we conclude that while heuristics, represented by Availability Bias, Herding, and Gamblers Fallacy, show statistically insignificant relationships with investment decision-making (IDM), framing biases, represented by Conservatism, Representativeness, and Overconfidence, demonstrate statistically significant relationships with IDM. Specifically, Conservatism has the most substantial influence on IDM among all factors considered. Additionally, prospects, indicated by Loss Aversion, Mental Accounting, and Regret Aversion, also exhibit statistically significant relationships with

IDM. The coefficients for these prospect variables suggest a strong influence on IDM. Overall, the study underscores the importance of framing biases, followed by prospect biases, in predicting IDM.

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Structural Equation Modelling on Post Covid effect of Remote Jobs on Employee Productivity

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ABSTRACT

The epidemic of COVID-19 has changed the worldwide employment landscape, prompting a quick adoption of virtual work as a necessary reaction to the issue. Many employees were forced to migrate from typical office-based work environments to remote arrangements as governments and organizations imposed lockdown measures and social distancing policies to combat the virus's spread. Although initially motivated by a need for security and continuity, this transformation has had far-reaching consequences for both individuals and organisations. Number of organizations are still continuing the concept of working virtually of their employees after the pandemic. The influence of remote jobs on employee productivity is an important area of concern in the aftermath of this significant shift. Virtual employment offers numerous advantages, including greater schedule flexibility, minimized commuting, and improved harmony between work and personal life. However, it also presents novel challenges that could potentially affect productivity. Employees' capacity to stay motivated and perform efficiently in remote work contexts can be influenced by factors such as limited social connection, blurred work-life boundaries, technology constraints, and limited access to managerial support. Structural Equation Modelling (SEM) have been used as an analytical framework to acquire a better understanding of the post-COVID effects of virtual jobs on employee productivity and to give a better insight to develop a model.The purpose of this research is to use SEM to evaluate the multivariate correlations between remote jobs and employee productivity in a post-pandemic setting in IT sector.

For this a survey of employees of IT sector located in Delhi NCR region is conducted. Measurements like reliability, factor analysis, CFA, SEM analysis is conducted. The study's findings have important implications for organisations, employees, and governments navigating the post-pandemic environment. Understanding the elements that influence employee productivity in virtual work arrangements can help to inform the creation of successful strategies and interventions to optimise virtual work arrangements while also promoting employee well-being and performance. Moreover, the results contribute to the ongoing discourse regarding the evolution of work by shedding light on the challenges and advantages presented by extended or hybrid remote employment. Ultimately, this study aims to contribute to the growing pool of insights into the impact of remote work on employee efficiency. The research will provide significant insights that can aid organisations in maximising the benefits of remote work while addressing its possible limitations by utilising SEM's extensive analytical skills. The organizations would be able to understand the areas they need to look into, if they actually are willing to get the benefits of employee virtual work even after post pandemic.

KEYWORDS: *Remote work, Employee productivity, SEM model, Pandemic.*

INTRODUCTION

The global employment landscape has undergone a significant transformation due to the COVID-19 pandemic, prompting both organizations and individuals to rapidly embrace remote work arrangements as a critical measure in response to the crisis.This monumental transition, driven by the imposition of lockdown measures and social distancing protocols, has triggered a paradigmatic change that continues to resonate even as the pandemic recedes. Consequently, many organizations are opting to maintain remote work practices beyond the immediate crisis, ushering in a new era of work dynamics.

Amidst this transformation, the ramifications of virtual work on employee productivity have emerged as a central concern. While virtual work offers advantages such as heightened flexibility, reduced commute times, and improved work-life equilibrium, it simultaneously introduces a host of challenges that can potentially impede productivity. This research aims to assess the adequacy of the measurement model and explore the impact of remote work on employee productivity using Structural Equation Modeling (SEM) analysis. To holistically apprehend the post-COVID effects of remote work on employee productivity, Structural Equation Modelling (SEM) emerges as an invaluable analytical framework. By employing SEM, this research seeks to unravel the intricate web of correlations between virtual work arrangements and employee productivity in the context of the Information Technology (IT) sector in the Delhi National Capital Region (NCR). By conducting a thorough employee survey that includes aspects such as reliability, factor analysis, Confirmatory Factor Analysis (CFA), and SEM analysis, this study aims to develop a comprehensive understanding of the correlation between remote work and employee productivity. The ensuing insights gleaned from this study hold critical implications for organizations, employees, and policy-makers as they navigate the evolving landscape following the pandemic's wake. Deeper comprehension of the determinants shaping employee productivity within virtual work settings can serve as a lodestar for crafting strategies and interventions that optimize these arrangements while preserving employee well-being and performance. Moreover, the research's findings contribute to the ongoing dialogue surrounding the future of work by illuminating the challenges and prospects inherent in the burgeoning realm of long-term or hybrid remote labor.

In summation, this study embarks on the pivotal mission of broadening our comprehension of the dynamic relationship between virtual work and employee productivity. By leveraging the analytical capabilities of SEM, this study seeks to offer practical insights that enable organizations to optimize the benefits of remote work while efficiently managing its inherent challenges. In doing so, organizations can strategically navigate the complexities of the post-pandemic era to harness the potential of remote work, thereby fostering enhanced productivity and resilience.

LITERATURE REVIEW

The COVID-19 pandemic triggered a significant shift in organizational design as remote work was suddenly and widely adopted (Varma et al., 2022). Prior to the pandemic, remote work was typically an optional arrangement with clearly defined terms and conditions for both employees and companies (Golden et al., 2008). However, the pandemic forced many industries to quickly transition to remote work without prior preparation. Even post-pandemic, numerous organizations have chosen to continue remote work due to its cost-saving benefits, such as reduced office space requirements. Nevertheless, not all businesses can feasibly transition to remote work (Aitha& Acharya, 2015).

Gajendran and Harrison (2017) highlighted that telecommuting can lead to improved job satisfaction and work-life balance, potentially enhancing productivity. Additionally, a meta-analysis by Golden and Veiga (2005) showed that remote work's impact on productivity is mediated by factors like task interdependence and Job discretion. However, concerns have been raised regarding the potential downsides of remote work. A longitudinal study by Kniffin et al. (2018) suggested that the initial boost in productivity seen during remote work transitions may wane over time, highlighting the need for ongoing assessments. The role of technology in remote work productivity has been explored extensively. Furthermore, Grant et al. (2018) argued that technology can facilitate knowledge sharing and collaboration, contributing positively to

remote employee productivity.Psychological factors also play a crucial role in the remote work-productivity relationship. A study by Raghuram et al. (2020) emphasized the significance of perceived autonomy and control in remote work settings, suggesting that these factors can enhance motivation and ultimately productivity

Numerous studies have investigated the effects of technology availability on productivity, revealing a multifaceted relationship. A study by Barley and Kunda (2018) emphasized that technology-enabled automation can augment individual output by streamlining processes.Moreover, the type and quality of technology matter significantly. A study by Orlikowski (2007) underscored that technology that aligns with employees' tasks and competencies tends to have a more pronounced positive impact on productivity. However, technology availability can also present challenges. A study by Duxbury and Higgins (2018) cautioned that excessive reliance on technology, especially communication tools, might lead to information overload and decreased productivity due to constant interruptions. Moreover, interruptions caused by technology can disrupt concentration and impair deep work, as highlighted by Newport (2016).

In conclusion, the relationship between technology availability and employee productivity is multi-dimensional. While technology can streamline processes, enhance collaboration, and bridge remote work challenges, careful consideration of technology integration, employee skills, and potential drawbacks is essential. As workplaces undergo transformations in the digital era, comprehending these dynamics becomes crucial for fully leveraging technology's potential to improve employee productivity.

RESEARCH METHODOLOGY

A questionnaire on remote work and employee productivity was prepared. A survey of 860 employees of IT sector was conducted. Statistical analysis was applied. Reliability of the questionnaire through Cronbach alpha test was checked. Factor analysis was conducted. Thereafter, CFA and SEM analysis were applied.

Table 1.: Reliability Statistics

	Cronbach's Alpha
Remote Work & Employee Productivity (RW & EP)	.877

In table1.1. the Cronbach alpha values for remote work& employee productivity is 0.877 which indicates internal consistency of the items.

Table 2. Factor Matrix

	Factor		
	1	2	3
RW1	.807		
RW2	.782		
RW3	.785		
RW4	.674		
RW5	.515		
RW6	.495	.415	
RW7	.463	.442	
RW9		.882	
RW10		.546	
EP1			.825
EP2			.766
EP3			.745
EP4			.743
EP5			.716

The Principal Axis Factoring extraction approach with Oblimin rotation and Kaiser Normalization was used in the investigation. After six iterations, convergence was reached. The examination of the data in table 1.2 indicated three elements: employee productivity, team member distance, and technological accessibility.

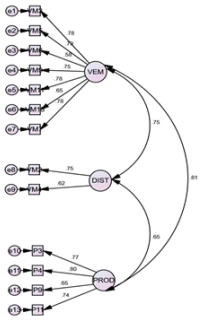

Fig. 1 CFA Model

Source: Author

Fig. 1. indicates following

VEM -Technological accessibility.

DIST -Team Member Distance

PROD- Employee Productivity

Table 3 Model Fit Summary

Model	C Min/ DF	CFI	RMSEA	PCLOSE
Default	1.386	0.961	0.061	0.272
Cut-off	1-3	>0.9	<0.5	>0.05

In table 3 ,the "Model Fit Summary" from CFA analysis presents several goodness-of-fit indices as well as the suggested cut-off values for each index to assess the model's fit. CF Min/DF (Comparative Fit Index - CFI): The CF Min/DF value for the model is 1.386, indicating a relatively good fit compared to the observed data. With a CFI value of 0.961, which surpasses the suggested cutoff of >0.9, the model's fit is deemed acceptable. RMSEA (Root Mean Square Error of Approximation): The RMSEA value for the model is 0.061, falling within the acceptable range of <0.5. This suggests that the model's predictions closely match the observed data, contributing to its overall acceptability. The PCLOSE value for the "Default" model is 0.272, indicating a reasonable fit. Since the suggested threshold is >0.05, the model's fit is considered acceptable based on this index.Overall, the CFA model appears to have an acceptable fit based on the provided indices and cut-off values.

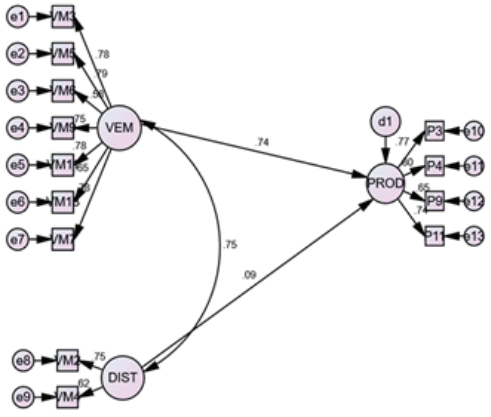

Fig. 2 SEM Model

Source: Author

Table 4 Regression Weights

			Estimate	S.E.	C.R.	P	Label
PROD	<---	VEM	.723	.178	4.065	***	par_8
PROD	<---	DIST	.130	.252	.517	.605	par_9
VM7	<---	VEM	1.000				
VM13	<---	VEM	.815	.122	6.671	***	par_1
VM11	<---	VEM	.998	.121	8.251	***	par_2
VM9	<---	VEM	1.020	.129	7.916	***	par_3
VM6	<---	VEM	.693	.118	5.895	***	par_4
VM5	<---	VEM	1.145	.135	8.508	***	par_5
VM3	<---	VEM	1.025	.123	8.334	***	par_6
P3	<---	PROD	1.000				
P4	<---	PROD	1.017	.128	7.958	***	par_7
VM4	<---	DIST	1.000				
VM2	<---	DIST	1.283	.271	4.739	***	par_10
P9	<---	PROD	.748	.117	6.401	***	par_11
P11	<---	PROD	.943	.129	7.338	***	par_12

Table 4 represents a statistically significant and positive relationship between the latent construct "PROD" and the observed variable "VEM." A higher value of "VEM" is associated with a higher value of "PROD." It suggests that high degree of 'Technological Accessibility' is associated with high degree of 'Employee Productivity'. The relationship between the latent construct "PROD" and the observed variable "DIST" is not statistically significant. The p-value (P) being relatively high (0.605) suggests that changes in "Team Member Distance" are not reliably associated with changes in "Productivity."

Table 5 Standardized Regression Weights

			Estimate
PROD	<---	VEM	.745
PROD	<---	DIST	.093
VM7	<---	VEM	.777
VM13	<---	VEM	.646
VM11	<---	VEM	.776
VM9	<---	VEM	.748
VM6	<---	VEM	.577
VM5	<---	VEM	.792
VM3	<---	VEM	.782
P3	<---	PROD	.772
P4	<---	PROD	.801
VM4	<---	DIST	.616
VM2	<---	DIST	.752
P9	<---	PROD	.652
P11	<---	PROD	.742

In table 1.5, standardised regression weights offer information about the relationships between variables in the model. A weight of 0.745 between "VEM" (Technological Accessibility) and "PROD" (Employee Productivity) indicates that a one-standard deviation increase in technological accessibility correlates to a 0.745 standard deviation increase in productivity. In contrast, the weight of 0.093 between "DIST" (Team Member Distance) and "PROD" demonstrates a weaker association, suggesting that a one-standard-deviation increase in team member distance results in just a 0.093 standard-deviation increase in productivity. In summary, improvements in technological accessibility have a significant impact on productivity, whereas changes in team member distance have just a little effect.

CONCLUSION

The investigation conducted using Structural Equation Modelling (SEM) yielded some noteworthy conclusions about the influence of remote work on worker productivity in the Information Technology (IT) sector of the Delhi National Capital Region (NCR). Three primary criteria were examined in the study: employee productivity (PROD), team member distance (DIST), and technological accessibility (VEM).

Employee productivity and technology accessibility have a statistically significant and beneficial link, according to the investigation. Increased staff productivity is correlated with greater technological accessibility. This emphasizes how crucial it is to use technology and communication tools to increase the efficiency and productivity of remote labour.

According to the investigation, there is no statistically significant correlation between employee productivity and team member distance. This implies that variations in the distance between team members are not consistently linked to variations in worker productivity. While team members' physical separation can provide difficulties, modern communication tools can lessen these impacts.

Although to varying degrees, team member distance and technology accessibility both affect employee productivity. When it comes to employee productivity, technological accessibility is more important than team member distance. This emphasizes how important technology is for enabling remote work and increasing efficiency. The study's conclusion emphasizes how remote labor has revolutionized the worldwide job scene, especially in the wake of the COVID-19 pandemic.

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Overconfidence Bias and Crisis: The Case of Global Financial Markets

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ABSTRACT

Purpose – The objective of this paper is to check the overconfidence bias in the global financial markets before crises and during crisis. The crises consider in this research are covid-19 Pandemic and Russia- Ukraine War.

Methodology – To check the presence of overconfidence bias in the stock markets at global level, vector auto regression (VAR) model has been used in this study. Further to analyses the response of endogenous variables of VAR, The Granger causality test has applied on VAR system. This model clearly specifies which variable leading to whom. It also specifies the dependent as well as independent variable. For this purpose, data of 33 global indices has collect and split into two phases (Pre crises and During Crises) for analysis.

Findings – The results of the study shows that overconfidence is more pronounced in Saudi Arabia, Switzerland, Ireland, Italy, Romania before crisis. The strong evidence of overconfidence found in Belgium, Brazil, Israel, India, New Zealand, Shree Lanka.

Originality – This study seems to be the initial endeavor to measure overconfidence bias in the wave of a recent wars along with the global pandemic.

KEYWORDS: *Overconfidence, Russia-Ukraine war, Financial markets, Crisis, Covid-19.*

INTRODUCTION

Behavioral finance becomes the attraction point for researchers and academicians from the last 3 decades (Sharma and Kumar, 2020). Behavioral theories help in explaining deviations from equilibrium in the financial markets all over the world (Javaira and Hassan, 2015). Standard finance theories were useful in symmetrical financial market for taking calculated and rational decisions. But these theories were unable to explain the chaos in the financial markets. The disequilibrium, stock market bubbles, excessive trading, sentiments-based transactions are causes of chaos and disruption in the stock market which were unexplained by standard finance models (Kapoor and Prosad, 2017). As a result, behavioral finance has evolved to explain the anomalies in the stock market. In the discipline of behavioral economics, stock market investors are frequently characterized as individuals seeking satisfaction rather than making rational choices. It is suggested that humans do not inherently make optimal decisions; instead, their choices are unpredictable and inconsistent (Tomer, 2016). Many research has shown that investors' inconsistent and irrational decision-making is influenced by various behavioral biases (Costa et al., 2019).

The behavioral biases can classify into 2 parts: 1) heuristic driven biases and 2) frame dependent biases. The former bias is based on hit and trail methods. In other words, investors use rule of thumb, their past experiences, past trends and beliefs for future decision making which is referred as heuristic (Tversky and Kahneman, 1974). Due to use of heuristics in decision making, investors lead towards biased and irrational decisions (Ceschi et al., 2019). In complicated situations which required specific skills to apprehend cumbersome financial information, people move towards mental shortcuts for financial decision making (Fenzl and Pelzmann,2012). Heuristic driven

biases consist overconfidence, anchoring-adjustment, familiarity, optimism, representative, illusion of control and self-attribution effect. The frame dependence bias describes that investors are more affected by losses as compared to similar amount of gain (Yechiam, 2019). The decisions of investors change according to the way of presentation of information in front of them. They interpret and respond towards the same information in a different way as same information frame differently. Biases tied to specific frames primarily stem from individual perceptions and encompass tendencies such as regret aversion, loss aversion, disposition effect and the mental accounting (Shrotryia and Kalra, 2021).

Overconfidence bias out of all the behavioral eccentricity is one of the major and prominent drivers of anomalies, chaos and excessive volatility in the global financial markets (Gupta et al., 2018). These impediments give rise to an economic illusion that can lead an otherwise stable stock exchange to crumble, presenting significant implications for regulators at both domestic and global levels. During crisis and extreme stress, behavioral illusions seem more apparent. Many studies observe presence of behavioral biases during crisis like covid-19 pandemic (Botzen et al. (2022), Kuruppu and Zoysa (2020), Parveen et al. (2023). It is assumed that behavior delusion affects stock market during the war between Russia-Ukraine and Israel-Hamas as well. The global hustle began when China confirmed its 1st instance of an unidentified virus on 31st December 2019, marking the infancy of the pandemic (Salisu et al., 2020). It was declared as global pandemic on march 11, 2020. Many countries have announced complete lockdown in their nations. Air lines were banned, production stopped and many businesses were shut. Covid had affected economies and GDP of almost all the countries at vast level. Additionally, many currencies experienced devaluation in the forex market, as (Mishra et al., 2020). This served as an alarming call for market regulators and policymakers. However, In June 2020, authorities opted to embrace the "New Normal" and started easing demarcations.

At the end of February, 2022, Russia takes an action of conquering of Ukraine, paramount cause of approx. 9% decline in Moscow's MOEX index during that week (Izzeldin et al., 2023). This event has emerged as the most significant hit to the global economy. Russia and Ukraine are significant exporter of wheat, seed oil, corn and natural, coal, crude oil and fertilizer in the Europe, Asia, middle East and African regions (Gill, 2022). The world had still not completely recovered from the covid pandemic and this event hit the global economy. World market has faced cascading financial effects due to this event. The financial literature demonstrate that significant political events and changes have the potential to agitate markets due to the risk a

nd uncertainty (Bialkowski et al., 2008). Geopolitical occurrences such as terrorism, border disputes, and war are external events that can directly influence market risk premia and impact investors' sentiment. Consequently, they can have an adverse effect on asset valuation, investment decisions, and portfolio allocation. Terrorism substantially and negatively influences stock market sentiment, providing an explanation for the adverse effects on financial markets (Nikkinen and Vahamaa, 2010). The intensity of impact of these events depends on the human causality (Arin et al., 2008). The Hamas terrorist attack against Israel initiated on 7 October 2023, which was another shock for the financial markets.

During Russia-Ukraine War and Covid Pandemic, Researchers has conducted many studies on the behavioral pattens and human sentiments float in the financial marks. But researcher could not find any study analyzing overconfidence bias in these three significant crises (Covid and Russia-Ukraine war) with multiple stock market indices. This study is an endeavor to fill this gap in existing literature by providing answer of following research questions- Does overconfidence bias impact the global stock markets similarly; how does covid and Ukraine-Russia war affect confidence of world-wide investors and their trading pattern; Is there any remarkable change in the market returns and volume because of these crises? With these research questions as a foundation, the present study seeks to explore the concurrent association between returns and market volumes, specifically examining overconfidence, in various stock markets globally during both pre-Crises and crises phases.

The rest of the paper is organized as follows: Section 2 furnish a review of the pertinent literature, while Section 3 offers a description of the data taken and the

methodology used. Section 4 disclose and discusses the findings, with Section 5 featuring a robustness analysis. The paper concludes with a final section.

LITERATURE REVIEW

Overconfidence or Excessive self-assurance emerge as a widely examined bias inside the realm of behavioral finance, accentuate attention to its presence, origins, and repercussions. This phenomenon pertains to investors' disposition to overestimate their understanding, skills, and the accuracy of their knowledge in respect of the values of securities (Kansal and Singh, 2018). Self-attributed traders eventually turn into overconfident investors because they blame extraneous factors for failures instead of learning from their fallacies (Hirshleifer, 2001). In 2007, Weber and Glaser revealed that a majority of traders, affected by the belief in their above-average abilities, indulge in exorbitant trading. It was propound that overconfidence is a trait ingrained in individuals rather than in the whole markets, exploring the impact of various personal characteristics on the financial market (Odean,1998). The interchange between overconfidence bias and market return has been a subject of investigation for several years. Daniel et al., (2004) investigated the phenomenon, suggesting that overconfidence stems from an extreme reaction to private, prior collected information and less reaction to publicly available information, leading to market disequilibrium. Many research demonstrate that overconfidence become the cause of high trading volume in stock market (Statman et al. (2006), Sahi and Arora (2012), Odean (1999) and Chandra and Kumar (2012). The substantial influx of unusual volumes eventually diminishes overall returns, leaving investors with a portfolio of risky investment (Zhang et al., 2019; Hsu and Shiu, 2010). Consequently, this contributes to an increase in accumulated market volatility and risk. Overconfident investors think they can predict the returns and expect higher return as compared to under confident traders. Overconfidence lure them to trade them with huge frequency and lead them towards irrationality (Lewellen, 1977). Many studies have observed largest trading volume with great volatility because of presence of overconfidence in the stock market (Kahneman et al. (1998), Odean (1999), Barber and Odean (2000). As a consequence, this contributes to augmented aggregate market risk and volatility (Duxbury, 2015).

Overconfidence bias demographics

Several research studies based on primary data observed that males are more confident as compared to females. These studies demonstrate that gender plays a significant role in the behavioural aspect of decision making (Prosad et al. (2015), Kumar and Goyal (2016), Trejos et al. (2019), Baker et al. (2019). But study conducted by Kansal and Singh (2018) showed that gender has no significant role in confidence level of stock market investors. Zaiane and Abaoub (2010) conducted a study investigated overconfidence bias and its influencing factors in the Tunisian stock market. The research involved the data collection through questionnaires, with a sample of 150 investors choosen from the Tunisian market. Correlation tool was employed as the statistical technique for data analysis. The results of the study revealed that Tunisian investors exhibited overconfidence, and no impactful correlation was identified between overconfidence and demographic factors such as age and income. Goodie (2005) investigated this most often used overconfidence bias through 2 distinct ways, examining divine strength's influence on confidence level and deceptive betting belief in both gamblers and non-gamblers. In the initial study, a sample of 200 college students, including eighty females and one hundred twenty males, who were regular gamblers, responded to questionnaire. The findings revealed that problem gamblers scored lower on problematic points compared to non-problem gamblers, indicating a tendency toward less positive bets. In the second study, involving 384 participants (105 females and 279 males), bets were designed to establish a value-independent position, mitigating the impact of overconfidence. The results indicated that problem gamblers exhibited higher levels of overconfidence and were more inclined to engage in betting. It can be concluded that overconfidence bias may attract to financial losses for investors (Dashtbayaz & Mohammadi (2016). Huang et al. (2016) discovered that CEOs experiencing overconfidence bias manifest greater boldness in opting for high-risk debt structures. This aligns with the findings of Ho et al. (2015), who also observed that individuals with overconfidence

bias ready to undertake higher levels of risk. A study documented that; types of investors have significant relation with the level of Investor's confidence. Small and retail investors found to be more confident than institutional investors (Hsu and Shiu, 2010). Kinari (2016) come up with a study showed a direct correlation between the degree of overconfidence bias and the time horizon of investment. After commencing survey of 3,000 investors of German, it was discovered by Glaser and Weber (2007) that overconfidence and the subsequent trade volumes are affected by the better than median effect as compared to miscalibration. Almost identical findings are observed in a survey conducted on UK investors by Merkle (2017). Moreover, the degree of market experience is not identified as a factor influencing overconfidence and biased behaviour (Deaves et al., 2010). Confidence affected from the personality type and other demographic variables observed by Tjandrasa and Tjandraningtyas (2018) in their study. The results were similar to the results of study conducted by Sitlani et al. (2011), which showed that demographic variables play a significant role in decision making.

Hypothesis

H1. Overconfidence bias is imperatively observed in the global stock markets during normal period (Before crisis: Russia-Ukraine War and Covid).

When investors get high return at constant rate continuously, their confidence level increase. They start trading aggressively because of this increased confidence. This leads to aggregate increase in trading volume of stock market (Statman et al., 2006). This demonstrate that there is lead-lag relationship in observed market returns and market trade volume at different point of time. This is the confirmation of overconfidence in the security market which support the above-mentioned hypothesis.

H2. Overconfidence bias is imperatively observed in the global stock markets during crisis period (Russia-Ukraine War and Covid).

Furthermore, with the inception of the COVID-19 virus and Russia-Ukraine war, the financial markets, particularly stock markets, exhibited a distinct and unprecedented trend characterized by a decline in securities prices and index market values across countries worldwide. Foreign professional investors opted for a cautious approach, withdrawing investments from numerous emerging markets and depleting them of Forex reserves. Rizwi and Haroon (2020) present proof highlighting an negative relationship between COVID-19 cases and stock market. As the number of cases increase, trade in stock market started decrease. On the contrary, another researcher Talwar et al. (2021) suggest that interpretation of economic news and information may perceive the covid crisis as a gainful buying opportunity. However, none of the above-mentioned experimental studies have thoroughly examined the implications of such market behaviour or its correlation with most prominent overconfidence bias. Consequently, the 2nd hypothesis of the study based on this.

The both hypotheses are developed to know the world-wide stock markets moments and technical patterns before and during crisis period. Before crisis period is shock and blunder free, which is appropriate to check overconfidence in stable environment. Second hypothesis will help to know the overconfidence during crisis.

Data

The data has been collected from investing.com website for 33 countries indices from period 1st Jan 2016 to 7th December 2023. The data is bifurcated into two parts: 1-1-2016 to 28-02 2020 (Before Crisis), 1-03-2020 to 7-12-2023 (During Crisis Period). The closing adjusted prices, Trade volume, high and low prices data has collected. The choice of Indices of countries is completely based on availability of data. The countries with the name of Indices, which are used for analysis are mentioned below:

Country	Stock market Indices
OMX Stockholm	Sweden
OMX Helsinki	Finland
Australia	ASX-200
New Zealand	NZX 50
Japan	Nikkei-225
Bahrain	Bahrain All share
Oman	MSM 30
Belgium	BEL 20

Romania	BET
South Korea	KOSPI
Indonesia	Jakarta stock exchange composite index
Ireland	ISEQ overall
Sri Lanka	CSE All share
Mexico	S&P/BMV IPC
Germany	DAX
Brazil	BOVESPA
Egypt	EGX 30
Spain	IBEX-35
UK	FTSE-100
Hong Kong	Hang Seng Index
Philippines	PSEi-Composite
Italy	FTSE MIB
Turkey	BIST 100
Portugal	PSI-20
Poland	WIG 30
Qatar	QE General
Vietnam	VN 30
Canada	TSX Composite Index
India	S&P BSE Sensex
Thailand	SET 100
Saudi Arabia	TASI
Switzerland	SMI
Israel	TA-35

The trading volume download from website was available in millions and billions. This has been standardised in excel by using the formula mention below:

=IF (ISTEXT (cell number), 10^ (LOOKUP (RIGHT (cell), {"B", "K", "M"}, {9,3,6})) *LEFT (cell number, LEN (cell number)-1), cell number)

The daily Index Return is calculated for all indices through R studio software by using the formula mention below:

>Filename $ Return = timeseries:: get returns (Filename$ variable name) *100)

METHODOLOGY

To check the overconfidence bias in the selected stock markets of 33 countries, vector auto regression (VAR) model has applied. This model helps to check the lead-lag relation of a variable with past lag value of itself and with past lag value of another variable. Return and Volume are two variables on which this model has applied to check the overconfidence in the stock market. If the lead-lag relationship of return with volume found significant and positive. It indicates that as the return increase in the market, investor become confident and trade in high volume to get more return due to optimistic behaviour. As data is collected for long period so the lag length has determined based on Schwarz information criteria (SIC). Further to check the lead-lag relationship, Granger causality test has employed on the data get after application of VAR model. To apply VAR model, it is necessary to fulfil its condition. Its first condition is that it can apply only on stationary series. The stationarity of data has been checked through R studio by applying Augmented Dickey Fuller (ADF) test. ADF shows Presence or absence of unit root. This test has a null hypothesis that, Series has a unit root. DF value is greater than Printed P value give indication of rejection of null hypothesis, which shows non-stationarity of series.

VAR Test Results

Parameters (P)	Australia		Belgium		Turkey		Brazil	
	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol
R1	-0.20001	1.83E+09	0.004861	54748.60	-0.01769	71536916	-0.18344	-75509
R2	0.06346	1.39E+09	0.046002	-42222	0.037179	30095283	0.111142	-87208
R3	0.074936	8.34E+08	-0.00736	18219.3	0.001024	11584221	0.079004	-85245
R4	-0.02208	4.30E+08	0.026867	-381160			-0.01935	-34822
R5	0.082882	1.43E+09	0.060473	192941				
R6			-0.11569	-732981				

R7								
V1	4.34E-12	0.293226	-1.33E-08	0.396505	1.16E-10	0.538424	2.33E-08	0.43644
V2	-3.09E-12	0.156527	1.14E-08	0.15749	-9.84E-11	0.103804	1.26E-08	0.05632
V3	3.25E-12	0.089038	-1.55E-08	0.154423	2.27E-11	0.238873	-3.21E-08	0.1129
V4	-1.40E-12	0.050941	1.41E-08	0.01307			1.90E-08	0.1478
V5	-2.74E-12	0.157969	-5.03E-09	0.156538				
V6			1.05E-08	0.06015				
V7								
C			-0.02106	746986.1			-0.23399	2830083

P	Polland		Vietnam		Canada		Saudi Arabia		Israel	
	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol
R1	-0.00884	205666.9	0.03667	2105.59	-0.10078	-3208999	0.10547	5138606	-0.059067	-94077535
R2	0.004299	-453847	0.021510	3521.33	0.053916	-2927557	-0.0384	3758553	0.027942	-14507981
R3			-0.01504	4631.96	0.077342	-2990896	0.080438	-1921246	-14507981	-1.08E+08
R4					0.02857	-3232662	-0.0145	4223988	0.005372	-97677155
R5					0.033301	489124.8			0.107693	79394630
R6					-0.19878	-4641085				
R7					0.189898	-902353				
V1	-7.66E-10	0.430470	3.27E-07	0.36091	-2.29E-10	0.206326	1.06E-10	0.324236	-8.47E-12	0.093609
V2	6.71E-09	0.24735	7.01E-07	0.23655	1.53E-10	0.112233	3.11E-10	0.184768	-2.21E-11	0.128444
V3			-6.70E-07	0.2621	-9.51E-10	0.059958	1.12E-11	0.129429	2.11E-11	0.100556
V4					-6.98E-11	0.091817	1.56E-12	0.180032	4.21E-12	0.018358
V5					-2.33E-10	0.092384			2.21E-11	0.390144
V6					1.22E-09	0.094635				
V7					6.60E-10	0.082362				
C	-0.15427	9955717	-0.0322	23848	-0.10106	64442703	-0.0677	44202734	-0.000293	9070653

P	Switzerland		Thailand		India		QATAR		PORTUGAL	
	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol
R1	-0.03274	-459863.3	-0.09851	26784096	-0.03859	195620	0.14237	4836759	0.039287	586436.1
R2	-0.02612	129171.3	0.024996	37771965	-0.03138	-559694	-0.0344	-2451611	0.069562	-818925.9
R3			0.123863	4847656	0.003838	487106			-0.00021	131028.4
R4			0.028883	14148186	0.035136	-853589				
R5			0.133767	63422446	0.149692	-762124				
R6					-0.12809	-656155				
R7					0.099237	-938220				
V1	1.44E-10	0.499647	1.77E-11	0.449135	1.03E-08	0.11427	1.88E-10	0.478241	-8.59E-10	0.498438
V2	-1.90E-10	0.300613	-1.19E-10	0.095373	-1.51E-09	0.18957	7.22E-10	0.185374	1.68E-09	0.112112
V3			8.69E-11	0.111468	-5.53E-09	0.07994			-6.17E-10	0.183123
V4			5.28E-11	0.085217	3.09E-09	0.11467				
V5			-1.92E-11	0.142216	3.93E-09	0.14849				

V6					-1.21E-08	0.08355				
V7					1.29E-08	0.02533				
C	0.010041	10096620	-0.04778	3.07E+08	-0.05303	2969100	-0.095	37353364	0.008389	19454841
P	**PHILIPPINES**		**SWEDEN**		**NEW ZEALAND**		**JAPAN**		**OMAN**	
	Rtn	**Vol**	**Rtn**	**Vol**	**Rtn**	**Vol**	**Rtn**	**Vol**	**Rtn**	**Vol**
R1	-0.06325	3050.39	-0.01738	956655.7	0.122762	-1325966	0.012092	-4213835	0.2181	-483046.8
R2			0.021837	-1911543	0.008767	1269215	0.083363	-2162788		
R3			0.007073	2180866	0.039013	-2486469				
R4			0.057798	-1643421	-0.09121	-393668				
R5					0.115054	-893035				
R6					-0.05023	218862.6				
R7										
V1	-2.75E-08	0.23863	-1.79E-10	0.41984	-2.23E-09	0.094113	-1.55E-10	0.50187	2.34E-10	0.028884
V2			1.90E-10	0.098565	-1.37E-09	0.026150	3.97E-10	0.247135		
V3			-5.45E-10	0.068361	5.41E-11	0.095261				
V4			5.38E-10	0.201151	2.55E-09	0.018321				
V5					7.46E-10	0.068056				
V6					2.65E-09	0.306385				
V7										
C	-0.00572	108203	0.029411	63775845	-0.06597	10739659	-0.14371	1.94E+08	0.00741	10574140
P	**SOUTH KOREA**		**INDONESIA**		**IRELAND**		**MEXICO**		**SPAIN**	
	Rtn	**Vol**	**Rtn**	**Vol**	**Rtn**	**Vol**	**Rtn**	**Vol**	**Rtn**	**Vol**
R1	-0.01433	14334533	0.005645	2.23E+08	0.018997	390064	-0.0069	1307584	-0.03764	2521104
R2	0.096509	13367084	-0.04282	71503301	0.05774	-378692.2			0.139864	-2296389
R3			0.162022	-43554315	-0.00261	-293885.2			-0.02326	1498731
R4					0.011619	-800693.5				
R5					0.016421	-42616.23				
R6					-0.13064	-962305.6				
R7					0.088253	216609.2				
V1	-6.40E-11	0.567071	-7.70E-12	0.417903	1.31E-10	0.116479	1.06E-10	0.116537	-2.65E-10	0.42431
V2	1.90E-10	0.304922	1.73E-11	0.24125	1.25E-09	0.072293			5.48E-11	0.18876
V3			-6.14E-12	0.215273	-2.98E-10	0.050609			2.87E-11	0.144653
V4					3.04E-10	0.043577				
V5					-8.42E-10	0.068091				
V6					-8.58E-10	0.038374				
V7					-4.94E-11	0.041951				
C	-0.07923	8257253	-0.03328	2.13E+09	-4.94E-11	13643851	0.00666	1.63E+08	0.049966	46692464

P	ITALY		HONG-KONG		UK		EGYPT		GERMANY	
	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol	Rtn	Vol
R1	-0.06441	-310403	-0.0156	-6618317	-0.05825	-3951204	0.186883	4670080	-0.04613	-669841.9
R2	0.109993	-781114	-0.0401	-7018176	0.01137	-13900968	-0.00351	1048172	0.069723	-50876.33
R3					-0.01956	776041.5	0.059399	-1276525		
R4										
R5										
R6										
R7										
V1	-4.14E-10	0.520213	7.11E-11	0.481462	-2.82E-10	0.307113	6.63E-11	0.45582	-2.59E-09	0.490412
V2	2.55E-11	0.212791	1.11E-10	0.215740	1.71E-10	0.245555	-1.35E-10	0.10143	1.70E-09	0.294838
V3					1.17E-10	0.132966	-3.38E-10	0.17526		
V4										
V5										
V6										
V7										
C	0.210869	1.23E+08	-0.4737	6.98E+08	0.007523	2.60E+08	0.121714	41148961	0.10124	16665170

P	SHREE LANKA		ROMANIA		BAHRAIN	
	Return	Volume	Return	Volume	Return	Volume
R1	0.290987	7921647	0.02543	-909428	0.144298	-96442
R2	-0.10711	10551871	0.122328	-3798001	0.076216	105861
R3	0.064747	-216272.3	0.036451	-3426060	0.104806	71981.7
R4			-0.03989	-4826337		
R5			0.098134	2681818		
R6			-0.13032	3475808		
R7						
V1	-5.86E-10	0.277369	-1.50E-10	0.03163	3.65E-09	0.13963
V2	1.00E-09	0.18741	7.22E-10	0.002027	-4.81E-09	0.12276
V3	5.05E-11	0.203577	2.50E-10	-0.00456	-3.08E-09	0.15596
V4			1.08E-10	0.010083		
V5			1.84E-10	0.003684		
V6			5.78E-11	0.014716		
V7						
C	-0.00971	45939195	0.020203	25169765	0.025994	1797218

Granger causality test results

Australia			Belgium		Turkey		Brazil		Polland	
(DV): RETURN										
	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis

Exclude- Volume										
Chi-square	2.241576	10.91994	0.409869	16.93478	6.702562	2.810665	7.897112	3.030853	0.607499	3.199143
Dof	2	5	2	6	4	3	3	4	1	2
P	0.3260	0.0530	0.8147	0.0095	0.1525	0.4217	0.0482	0.5527	0.4357	0.2020
DV: VOLUME										
Exclude- Return										
Chi-square	22.63573	23.99483	4.546682	26.80435	28.40720	32.52306	6.313262	10.40959	0.913350	4.397101
Dof	2	5	2	6	4	3	3	4	1	2
P	0.0000	0.0002	0.1030	0.0002	0.0000	0.0000	0.0973	0.0341	0.3392	0.1110
Vietnam			**Canada**		**Saudi Arabia**		**Israel**		**Switzerland**	
(DV): RETAUS										
	Pre-Crisis	**During Crisis**	**Pre-Crisis**	**During Crisis**	**Pre-Crisis**	**During Crisis**	**Pre-Crisis**	**During Crisis**	**Pre-Crisis**	**During Crisis**
Exclude- Volume										
Chi-square	10.75495	0.666981	0.343157	11.16862	1.771283	2.331848	6.454709	4.481535	1.565552	0.018992
Dof	3	3	2	7	3	4	5	5	2	2
P	0.0131	0.8809	0.8423	0.1314	0.6212	0.6750	0.2645	0.4824	0.4571	0.9905
DV: VOL__NORMAL										
Exclude- Return										
Chi-square	30.43646	52.98211	6.291520	17.93257	18.61485	7.272837	3.617152	12.41570	7.549111	0.415215
Dof	3	3	2	7	3	4	5	5	2	2
P	0.0000	0.0000	0.0430	0.0123	0.0003	0.1222	0.6057	0.0295	0.0229	0.8125
Thailand			**India**		**Qatar**		**Portugal**		**Philippines**	
(DV): RETAUS										
	Pre-Crisis	**During Crisis**	**Pre-Crisis**	**During Crisis**	**Pre-Crisis**	**During Crisis**	**Pre-Crisis**	**During Crisis**	**Pre-Crisis**	**During Crisis**
Exclude- Volume										
Chi-square	0.102618	9.968964	0.752027	28.55674	2.474677	2.463483	4.292942	1.679531	6.780975	0.004417
Dof	1	5	6	7	6	2	5	3	1	1
P	0.7487	0.0761	0.9933	0.0002	0.8713	0.2918	0.5081	0.6415	0.0092	0.9470
DV: VOL__NORMAL										
Exclude- Return										
Chi-square	3.948675	11.42719	5.999424	51.88196	3.342066	10.54187	29.94528	1.279014	0.300824	1.461167
Dof	1	5	6	7	6	2	5	3	1	1
P	0.0469	0.0435	0.4233	0.0000	0.7648	0.0051	0.0000	0.7341	0.5834	0.2267

Sweden			Finland		New zealand		Japan		Oman	
(DV): RETAUS										
	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis
Exclude- Volume										
Chi-square	0.002307	2.252152	NA	4.008245	4.63E-07	18.12145	11.63181	3.023622	0.091177	0.143990
Dof	1	4	NA	3	1	6	7	2	1	1
P	0.9617	0.6895	NA	0.2606	0.9995	0.0059	0.1133	0.2205	0.7627	0.7043
DV: VOL__NORMAL										
Exclude- Return										
Chi-square	1.128991	2.121426	NA	2.850252	0.003137	15.42409	9.034799	1.203147	1.251742	0.079491
Dof	1	4	NA	3	1	6	7	2	1	1
P	0.2880	0.7134	NA	0.4153	0.9553	0.0172	0.2502	0.5479	0.2632	0.7780

South Korea			Indonesia		Ireland		Mexico		Spain	
(DV): RETAUS										
	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis
Exclude- Volume										
Chi-square	6.386198	1.632460	2.437776	3.237226	16.71837	0.926684	0.471689	0.160015	3.278279	0.221664
Dof	3	2	6	3	5	7	1	1	5	3
P	0.0943	0.4421	0.8754	0.3565	0.0051	0.9959	0.4922	0.6891	0.6572	0.9740
DV: VOL__NORMAL										
Exclude- Return										
Chi-square	18.28127	13.87405	6.919087	4.261814	26.81219	6.685658	0.651807	0.109853	8.332104	5.578750
Dof	3	2	6	3	5	7	1	1	5	3
P	0.0004	0.0010	0.3284	0.2345	0.0001	0.4623	0.4195	0.7403	0.1389	0.1340

Italy			Hong-Kong		UK		Egypt		Germany	
(DV): RETAUS										
	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis	Pre-Crisis	During Crisis
Exclude- Volume										
Chi-square	7.435824	2.200850	0.992581	6.516161	5.068822	4.046179	6.752227	0.634527	1.904373	2.104672
Dof	5	2	3	2	2	3	3	3	1	2
P	0.1902	0.3327	0.8030	0.0385	0.0793	0.2565	0.0802	0.8885	0.1676	0.3491
DV: VOL__NORMAL										
Exclude- Return										
Chi-square	19.38061	0.080988	2.835797	0.549113	1.045611	4.096196	8.584564	8.896789	2.648211	1.335506

Dof	5	2	3	2	2	3	3	3	1	2
P	0.0016	0.9603	0.4176	0.7599	0.5929	0.2513	0.0354	0.0307	0.1037	0.5129

	Shree Lanka		Romania		Bahrain	
	(DV): RETAUS					
	Pre- Crisis	During Crisis	Pre- Crisis	During Crisis	Pre- Crisis	During Crisis
	Exclude- Volume					
Chi-square	3.021994	12.79244	1.344114	5.479496	3.234941	1.130060
Dof	1	3	1	6	2	3
P	0.0821	0.0051	0.2463	0.4839	0.1984	0.7698
	DV: VOL__NORMAL					
	Exclude- Return					
Chi-square	0.925014	16.12358	5.038399	7.916474	3.266772	0.809159
Dof	1	3	1	6	2	3
P	0.3362	0.0011	0.0248	0.2443	0.1953	0.8473

Granger causality results indicates whether volume leading the returns or returns trading the volume trade. This test also give clear demarcation between dependent and independent variable. Through this test, researcher able to find out presence or absence of overconfidence in global financial markets.

CONCLUSION

The aim of this study to check the presence of overconfidence in global stock markets. The VAR and Granger Causality test results shows that overconfidence continue persist in Australia, Canada, South Korea, Turkey, Thailand, Egypt, Vietnam before and during crisis. There is no strong evidence of overconfidence in Polland, Japan, Oman, Qatar, Portugal, Philippines, Sweden, Finland, Japan, Oman, Indonesia, Mexico, Spain, Hong-Kong, UK, Germany, Bahrain. Crisis has impacted the overconfidence level in the Belgium, Brazil, Israel, India, New Zealand, Shree Lanka. The overall result shows that Developed and emerging markets are more affected by overconfident investors as compared to frontier markets due to strong evidence of overconfidence in these markets. The coefficients are significant and positive for the developed and emerging markets as per the VAR results. Which is a clear indication of presence of overconfidence. Whereas Granger causality results showed that return leads the trade volume in these nations. The economy of the frontier markets not that much strong due to which the liquidity in these markets also low. The less liquidity became the reason of less trading. This could be the probable cause of absence of overconfidence in the stock market of these countries. The reason of high trading and overconfidence in developed nations can be low trading cost. This fact suggest that behaviour finance describe the unorganized trading pattern and fluctuations due to the market crashes.

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Analytical Investigation on Motivational Patterns of Students in Higher Education

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ABSTRACT

In order to investigate motivational patterns among Indian college students, this study uses analytics. The results show that a variety of factors affect academic goals, job satisfaction, and emotional experiences. Comparisons by gender show no discernible variations in the reasons for education. The results guide the creation of focused interventions meant to improve student performance and engagement in postsecondary education. Teachers and legislators may foster learning settings that promote human development by having a sophisticated grasp of the complex interactions between intrinsic and extrinsic motives. By promoting fairness and inclusion in higher education, our study helps to guarantee all students has an opportunity thrive and reach their maximum potential.

KEYWORDS: *Motivation, Analytics, Academic success, Gender comparisons, Targeted interventions.*

INTRODUCTION

Comprehending the motivating tendencies of college students is essential for instructors, legislators, and other academic community stakeholders. In order to shape students' actions, attitudes, and academic results, motivation is essential. In order to improve learning experiences and encourage academic achievement, educators may better create instructional tactics, support systems, and interventions by looking into the underlying elements influencing student motivation. Motivation is a fundamental concept in educational psychology since it is a potent factor that impacts students' academic success, perseverance, and engagement. The complex interplay between internal desires and external influences that drive people to chase specific goals or activities is what we call motivation. In the context of higher education, developing an atmosphere that supports learning and individual development requires an awareness of these motivating patterns. The inherent desire for knowledge, expertise, and personal pleasure is a crucial component of student motivation. Many students are motivated to learn because they have a sincere curiosity and enthusiasm for it; they look for chances to learn new things, develop new abilities, and widen their horizons intellectually. A strong sense of involvement and fulfillment in the learning process is fostered by this intrinsic drive, and it raises academic performance and success to new heights. But internal elements are not the only things that motivate students in higher education. Students' actions and decisions are also greatly influenced by outside factors including societal standards, professional goals, and financial concerns. The possibility of earning a prestigious degree, landing a well-paying career, or meeting social or familial expectations, for example, might inspire pupils. Students' long-term objectives, study habits, and academic decisions can all be influenced by these external incentives. Further, there can be significant variances in motivational patterns between student groups, which can be attributed to variations in personal histories, life experiences, and sociocultural settings. Several factors, including gender, social class, cultural background, and educational experience, can influence how individual students perceive and react to motivational cues. Students from underprivileged backgrounds, for example, might encounter certain difficulties

and obstacles that have an impact on their drive and academic achievement. It is crucial to comprehend the various motivational characteristics of students in order to promote diversity, equity, and inclusiveness in higher education. Teachers may establish a nurturing and empowering learning environment where each student has the chance to flourish by identifying and meeting their specific needs and motivations.

In addition, understanding student motivation patterns can guide the development of focused interventions and assistance services to improve student engagement, retention, and graduation rates. For instance, identifying students who may be at risk of disengagement or academic underperformance allows institutions to provide proactive support and resources to help these students overcome obstacles and achieve their full potential.

A revolutionary method for comprehending and promoting student achievement is to use analytics to the analysis of motivating trends among college students. Institutions may have a better understanding of the elements affecting student motivation, engagement, and academic results by utilizing data analytics. The methodical gathering, evaluation, and interpretation of information on the characteristics of students, their academic standing, and their behavioral tendencies is made possible by analytics. Through preemptive interventions and focused support techniques, researchers and educators may uncover patterns, correlations, and predicted indications of student achievement thanks to this data-driven approach. Institutions can, for instance, employ predictive modeling approaches to identify students who are likely to become disengaged or to attrition, allowing for the implementation of early intervention programs like academic counseling services or individualized mentoring programs. Additionally, educational experiences may be customized by institutions using analytics to cater to the unique requirements and preferences of each student. Institutions can create tailored support materials, adaptive curriculum designs, and individualized learning paths by evaluating data on student learning styles, preferences, and objectives. This customized approach increases student engagement and enjoyment while promoting academic achievement and retention. Analytics provide ongoing assessment and improvement of training programs and practices.

Key performance indicators may be monitored, interventions can be evaluated over time for their efficacy, and institutions can make data-driven modifications as needed. This iterative process guarantees that resources are distributed effectively and that treatments are in line with students' changing needs. In general, the integration of analytics into the analysis of student motivating patterns in higher education enables institutions to make well-informed decisions, maximize the provision of student support services, and cultivate an innovative and exceptional teaching and learning culture.

With a focus on demographic variables like gender, state of origin in India, and monthly financial allowance, the study aims to thoroughly investigate, through the use of data analytics, the motivational factors influencing college students' academic pursuits, satisfaction levels, and emotional experiences. This will be achieved through the use of a Likert scale analysis. This goal is in line with the study's objectives, which are to investigate the motivational landscape of Indian college students by looking at the things that influence their academic goals, satisfaction levels, and emotional experiences. The study aims to offer delicate insights into students' perceptions and attitudes by utilizing a Likert scale analysis and incorporating diverse demographic variables. This will help to deepen our knowledge of motivational patterns and inform the development of focused interventions and assistance services that will improve student engagement, retention, and graduation rates in higher education.

LITERATURE REVIEW

- Motivational Beliefs by Pintrich & De Groot (1990): Highlights the influence of beliefs on achievement and self-regulated learning.
- The Academic Motivation Scale by Vallerand, RJ et al. (1992): A Measure of Intrinsic, Extrinsic, and Amotivation in Education.
- Goal Theory by Anderman & Anderman (1999): Explores goal theory's impact on student motivation and achievement, but questions remain about goal orientation and academic behaviors/outcomes.

- Self-Regulated Learning by Zimmerman (2000): Emphasizes goal-setting and strategy use for academic motivation, but knowledge gaps exist on how students regulate learning in various academic situations.
- Self-Determination Theory (SDT) by Deci & Ryan (2000): Emphasizes internal and extrinsic motivation, with autonomy, competence, and relatedness fostering student involvement.
- Self-Efficacy Beliefs by Pajares & Valiante (2001): Influence student motivation and success, but knowledge gaps exist on how these beliefs form and change.
- Expectancy-Value Theory (EVT) by Eccles & Wigfield (2002): Examines how task value and perceived competence affect student engagement and performance.
- Intrinsic Motivation by Vallerand & Houlfort (2003): Importance of intrinsic motivation in academic settings.
- Accomplishment Goal Theory (AGT) by Urdan & Schoenfelder (2006): Discusses the value of mastery goals, but unanswered questions remain about goal interactions with motivation and academic success.
- Social and Academic Elements by Meece et al. (2006): Highlights peer pressure and teacher-student connections impacting motivation.
- Motivation, Well-being, and Academic Success by Ryan & Deci (2009): Examines the relationship between motivation, well-being, and academic success, highlighting the significance of psychological need satisfaction and intrinsic motivation.
- Emotional Experiences by Wang, Zhao, & Zhang (2019): Uses analytics to investigate how emotional experiences shape motivational patterns. Identifies emotional elements affecting student engagement and enjoyment, highlighting the importance of addressing mental health alongside academic support.
- Intervention Techniques by Park & Park (2020): Uses analytics to assess the effectiveness of interventions for raising student motivation and engagement. Identifies factors predicting motivation levels and creates customized interventions, supporting evidence-based decision-making.
- Analytics for Motivational Trends by Zhang, Li, & Zhang (2021): Utilizes data-driven approaches to examine the link between academic achievement and students' motivational characteristics, including demographic factors.

METHODOLOGY

The research utilized a mixed-methods approach, integrating the gathering of quantitative data using Likert scale questions with the acquisition of qualitative insights via open-ended questions. Thematic analysis was performed on the qualitative replies, and statistical analysis was applied to the quantitative data. There were 476 individuals in the sample size from Bengaluru's colleges and universities. Combining quantitative and qualitative data, this study used a mixed methods approach, to gain a comprehensive understanding of the research goals. The questions in the questionnaire were selected to capture various aspects related to participants' demographics, subjective well-being, educational motivations, and perceptions about their current life situation. Here's an explanation of how each type of question contributes to the research objectives:

Demographic Information (Questions 1-4)

These questions gather basic demographic data about the participants, such as their name, current field of study, state of residence, and gender. Understanding these demographics can help contextualize the responses and identify any potential patterns or differences based on demographic factors.

Financial Allowance (Question 5)

This question aims to understand the financial situation of the participants, which can influence their perceptions of life satisfaction and well-being.

Subjective Well-Being (Questions 6-10)

These questions assess participants' subjective well-being by asking them to rate their overall life satisfaction, the extent to which they find their activities worthwhile, and their feelings of happiness and anxiety. These measures provide insights into participants' overall emotional and psychological well-being.

Likert Scale Statements adapted from the Academic Motivation Scale (AMS) (Questions 11-38)

These statements are designed to assess participants' educational motivations and attitudes towards their studies. The statements cover a range of reasons why individuals may pursue higher education, such as career aspirations, personal fulfilment, and intellectual curiosity. Participants are informed to rate the degree to which they agree or disagree with each statement on a Likert scale.

The survey instrument was meticulously designed to enumerate every facet of participants' educational experiences and general state of health. It started with demographic information, including name, state of residence, and subject of study, which established the framework for comprehending the backgrounds of the participants. Later measures of subjective well-being, including life satisfaction, the perceived worth of daily activities, and recent feelings of worry and happiness, provided information on their mental states.

Likert scale responses allowed participants to express complex viewpoints by delving deeper into attitudes and reasons related to education. These aspects included job objectives, personal fulfillment, and intellectual curiosity. The questionnaire enabled a comprehensive investigation of the study issue by combining quantitative and qualitative data gathering techniques. This allowed for the discovery of connections, patterns, and insights among different variables. By using analytical tools such as Tableau and Python, the process of data analysis was made more efficient and accurate by improving the accuracy of the interpretation.

RESULTS AND DISCUSSION

Our research utilizes Tableau to compare five important metrics between genders, out of a total of 33. These criteria were chosen because they are important for comprehending important facets of student motivations and experiences in the context of education. We guarantee a more targeted and concentrated study by limiting the parameters, which enables deeper insights into certain elements impacting students' academic aspirations, satisfaction levels, and emotional experiences. These results are clearly shown in Figures 1 through 5, which give a clear and succinct picture of the connections between college students' financial assistance, study streams, anxiety levels, and views of studying as a waste of time. This approach of selecting a subset of parameters enables a more manageable and interpretable analysis while still capturing essential dimensions of student motivations and experiences.

Key findings from our study are shown in Figures 1 through 5, which highlight different facets of the experiences and motivations of the students. The distribution of demographic data from each state, except Punjab and Himachal Pradesh, is shown in Figure 1 for the various research streams. Looking at Figure 2, we see an interesting pattern where students, both male and female, who receive more financial help generally report being less happy than those who receive less financial support. Figure 3 explores the link between study streams and student happiness, emphasizing certain study streams where female students show greater levels of satisfaction, such physiotherapy and fashion. Based on their fields of study, Figure 4 offers insights into students' anxiety levels. It shows that students in physiotherapy, forensic science, life science, and other related streams have higher anxiety levels than other students. Finally, Figure 5 illuminates the beliefs of students that studying is a waste of time, showing that a greater proportion of students in the forensic science and physiotherapy departments than in other departments have this opinion. These studies offer insightful information on the complex dynamics between student experiences and motives in the context of education. Comparing similar data for other criteria also enables a thorough knowledge of the many elements impacting students' academic goals, degrees of satisfaction, and emotional experiences.

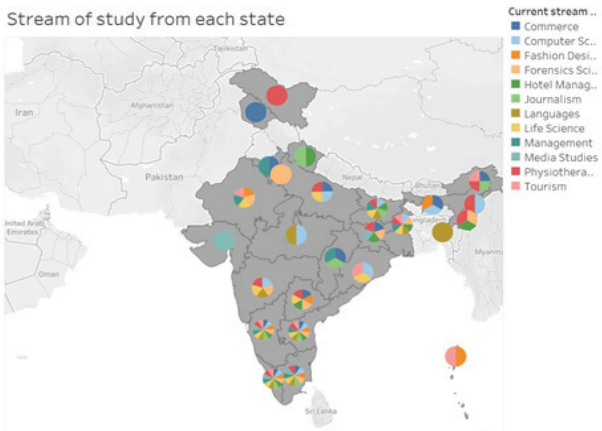

Figure 1. Stream of study from each state

Figure 2. Happiness with respect to financial support

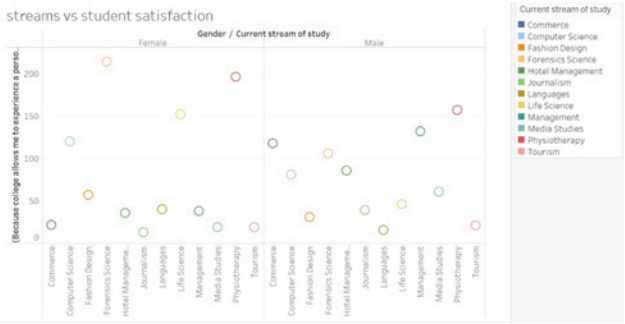

Figure 3. Stream vs student satisfaction

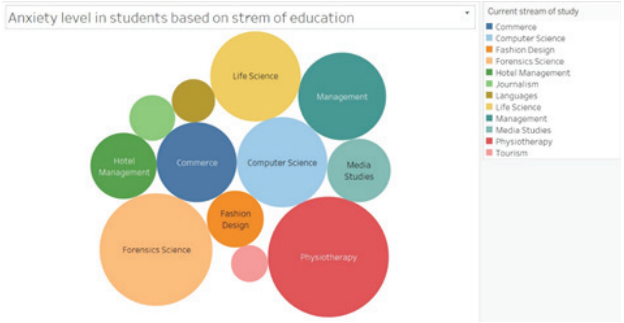

Figure 4. Anxiety level in students based on stream of education

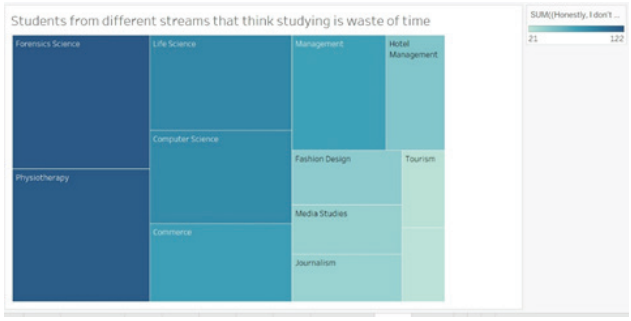

Figure 5. Students from different streams that think studying is a waste of time

By calculating the average of each student's Likert scale scores, we were able to utilize a Python program to compare the attitudes and motives for education by gender. The following is the hypothesis that the t-test examines:

Null Hypothesis (H0):

There is no significant difference in the mean educational motivations between males and females.

Alternative Hypothesis (H1):

There is a significant difference in the mean educational motivations between males and females.

t-test to compare the mean motivations between males and females

T-statistic: -0.49100915624643154

P-value: 0.6236472204167047

There is no significant difference in educational motivations between genders.

The t-test compares the mean educational motivations between females and males to determine if between the two groups there is a statistically significant difference. In this case, the t-statistic is approximately -0.491 and the p-value is 0.624.

The difference between the means of the two groups in relation to the variability within the groups is measured by the t-statistic. The means of the two groups are comparable if the t-statistic is near zero, but there is a significant difference between the means if the t-statistic is big.

The p-value is the probability of observing the data if the null hypothesis (i.e., there is no difference between the means) is true. A small p-value (typically less than the significance level, often 0.05) indicates that the observed difference between the groups' it means is unlikely to have occurred by chance alone. Leading to the rejection of the null hypothesis. Conversely, a large p-value suggests that the observed difference is likely due to random variation and does not provide strong evidence against the null hypothesis.

The mean educational motivations of females are somewhat lower than those of males, according to the negative t-statistic; nevertheless, this difference

is not statistically significant. The comparatively significant p-value (0.624), which is higher than the standard significance level of 0.05, lends credence to this view. Consequently, we are unable to reject the null hypothesis based on the t-test results, meaning that there is no discernible difference in the educational motives of females and males in the dataset. In Figure 6, a box plot that was created to visually represent the data is displayed.

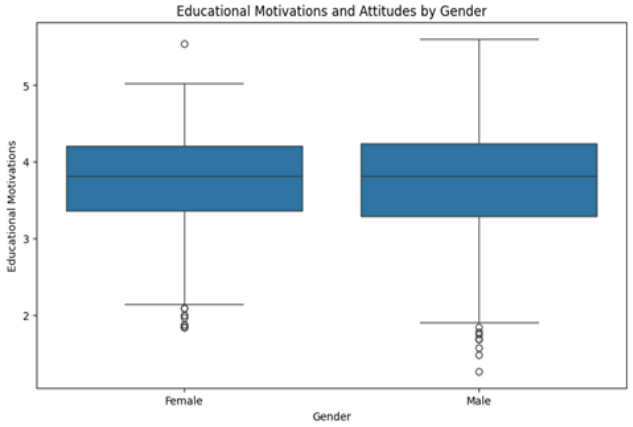

Figure 6. Educational Motivations and Attitudes by Gender

CONCLUSION

Using a mixed-methods approach and analytics approaches, the study examined the motivational environment of Indian college students, focusing on factors that impact their academic pursuits, satisfaction levels, and emotional experiences. Employing analytical techniques such as Tableau and Python enabled a thorough comprehension of the intricate interactions between motivating elements among university students. The analysis demonstrated the heterogeneous nature of the students by revealing varying distributions of demographic variables such as gender and place of origin among the various study streams. Both genders' reported levels of happiness were connected with higher financial assistance, suggesting that financial support had an effect on emotional health. The necessity for mental health care is highlighted by the heightened anxiety levels observed in several areas, such as forensic science and physical therapy. Different departments' opinions on studying being a waste of time highlighted the need for focused interventions. The fact that there was no discernible gender difference in the motives for education further highlights the need of encouraging diversity in higher education. All things considered, the study provides insightful information on the motivations of students, guiding initiatives to improve engagement and academic performance. Additionally, it demonstrates the value of analytics in data analysis.

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Influence of Sustainable Development Goals (SDGs) on Cause Related Marketing Strategy and Consumer Purchase Intention

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ABSTRACT

United Nations formulated Sustainable Development Goals (SDGs)- 2030 to encompass several social, economic, and environmental issues to form a shared framework for promotion of peace and prosperity globally. These 17 goals focus on preserving the planet- now and into the future. 178 nations including India committed to developing measures and strategies for achieving these sustainability goals. United Nations, Governments, Companies, and consumers are concerned for preservation of the 3Ps namely People, Planet and Profit which can also be termed as Triple Bottom Line (TBL). It is critical to explore the ways in which marketing can aid in achieving sustainability.

The research paper examines the influence of the Sustainable Development Goals (SDGs) on formulating the Cause Related Marketing strategy adopted by organizations and its effect on the consumer's intention to purchase the products. The research paper identifies Cause Related Marketing constructs which can be associated with sustainability and Triple Bottom Line. 'People' relates to the social aspect of CRM, 'Planet' relates to the Environmental responsibility of the organization and 'Profit' relates to the economic aspect of the organization. The paper also examines the effect of such an SDG-oriented Cause Related Marketing strategy on the consumer's purchase intention.

A conceptual model was formulated by integration of concepts of Sustainability Development Goals with Cause related marketing strategies adopted by private organizations. The study was based on responses of 319 respondents using online questionnaire. A conceptual model was developed to study five constructs namely Environmental Concern, Company's Motivation, Brand-Cause Fit, Brand Loyalty, and Consumer-Cause Identification on the consumer's Purchase Intention. SPSS and SmartPLS softwares were used for testing the conceptual model. The results support the conceptual model and hence there is a positive influence of the SDG-oriented Cause Related Marketing strategies on the consumer's purchase intention. This implies that private organizations should formulate their Cause Related Marketing strategies on the principles of Sustainability Development Goals to positively influence the consumers' purchase intention. This will in turn support United Nations and Governments to achieve the 2030 SDGs agenda.

KEYWORDS: *Cause related marketing, Corporate social responsibility, Purchase intention, Sustainable Development Goals (SDGs), Triple bottom line.*

INTRODUCTION

There is a heightened need for everyone to understand the meaning of Sustainability and realize its importance for sustenance of life on this planet. This is the time when all the stakeholders like United Nation, Governments, Policy Makers, Companies, consumers, academicians must come together and work in unison to accomplish the Sustainable Development Goals (SDGs).

A lot of deliberations have been carried out globally to address the seventeen interconnected Sustainable Development Goals (SDGs) pertaining to social, economic, and environmental issues. These goals are related to removing poverty, attaining Zero hunger, promotion of Good health and well-being, foster Quality of education, promote Gender equality, make available Clean water and sanitation, provide Affordable and clean energy, promote Decent work and economic growth, endorse the Industry, innovation and infrastructure, bring Reduction of inequalities, develop Sustainable cities and communities, encourage the Responsible production and responsible consumption, take appropriate Climate action, improve Life below the water, sustain the Life on the land, establish Peace, justice, and strong institutions, and the last being developing Partnerships for achieving these goals. (Sustainable Development Goals. UN)

'The SDGs Agenda 2030' has been implemented by the governments of 178 countries which have pledged to achieve these goals. In India for example 'NITI Aayog' holds the responsibility of implementing the SDG framework at National, sub-national and local levels in an integrated manner. Governments at state level formulate region specific indicators, targets, and goals to for assessing their progress on the extensive set of the Global Goals on health, gender, education, economic growth, climate change, environment, and others. The Sustainable Development Goals (SDGs) India Index utilizes Interactive Dashboards to visualize and to explore the report's data.

Achieving such a big target is a difficult task for the governments without help. It is imperative for private organizations to join hands with the Governments, non-profit organizations and most importantly the masses or consumers or people in the society. The role of the government is to take forward these global goals to the root or local level of the country. There should be focus on positively influencing beliefs and attitudes of every individual in favor of these SDGs, only then it will be a true success.

Private organizations have high reach and recognition in the masses. Companies are reaching out to potential consumers using marketing, advertising, product promotions, tie ups, sponsorships, contests etc. The expenditure on such activities is a huge amount. Moreover, under Companies Act 2013, organizations with high profit and turn over mandatorily invests a part of their profit to social developmental activities prescribed by the government. The primary objective of a private organization is to increase their sales and profit maximization. Cause related marketing is a win-win-win situation for all three participants i.e. the organization itself, Not- for profit organizations (NPOs) which support the social causes and the consumers who buys products from these organizations. In CRM for every product the customer buys, a fixed or part value is donated by the private organization to its supported Not- for profit organization.

The research paper explores the possibility of integrating the concepts of Sustainability Development Goals with Cause related marketing strategies adopted by private organizations. There is a lack of such studies. The paper explores the idea of private organizations formulating their Cause Related Marketing strategy on the principles of Sustainability Development. There is a need to study the influence of such SDG-oriented Cause Related Marketing strategy on the consumer purchase intention.

LITERATURE REVIEW

Sustainable Development Goals (SDGs)

The term sustainability has been defined by World Commission on Environment and Development (1987) as growth which would meet needs of the present generations without compromising the capabilities of the future generations to meet their own requirements.

In the Sustainable Development Summit (2015) SDGs were adopted by international community as comprehensive global development agenda (Poornima, 2017). They pertain to environmental, social, and economic issues distributed as 17 goals by means of 169 integrated targets designed to attain sustainable development. They are projected to be accomplished by various countries by the year 2030 (Ramanujam et al., 2019). For the success of SDGs, a common platform is required to integrate the efforts of several stakeholders like private organizations or companies, governments, nongovernmental organizations (NGOs), and knowledge institutes (Singh, 2016).

The role of private organizations is crucial in supporting the goals of Government for achieving SDG targets. UN designed SDGs by involving the private sectors to ensure their involvement and interest to create solutions for these sustainability challenges. SDG's denote long-term strategic market outlook of a business and viewed as a great gift for them (Pedersena, 2018). SDGs can be regarded as the index of sustainable development for enabling the private organizations in developing their business practices involving people, planet and profit for reduction in adversity and maximization of productive impacts (Institute for Human Rights and Business [IHRB], 2015). Moreover, expectations of the stakeholders have increased from the private organizations. Consumers are all the time more aware of the environmental problems and highly interested in addressing them. These factors have motivated companies to adopt sustainability goals and targets in the business.

Triple Bottom Line (TBL)

The study of the Sustainability Development Goals has revealed its foundation as the three major components or dimensions of sustainable development as 3Ps i.e. People (social equity), Planet (environmental quality) and Profit (economic benefits) also termed as the Triple Bottom Line (Elkington, 1997). This model aids companies to develop long-term strategies for transitioning to sustainability. A company can be considered sustainable only if it cares for all three aspects of Triple Bottom Line.

Economic Dimension: 'Profit'

Focus is on the value creation or financial performance of the organization. Several factors are monitored like growth in sales, cash-flows, creation of shareholder value, and the business' economic impact along with the operational impact on the society in general (Chabowski et al., 2011). Organization's performance also comprises of the management of strategic capabilities efficiently, developing the core competencies (Prahalad & Hamel, 1999) and shareholder's value creation (Doyle, 2000).

Social Dimension: 'People'

Focus of an organization is on creating an impact by the welfare of people, employees and public by working for matters like assistance in education, interaction with community, contribution towards charitable causes, and conducting fair price practices (Engardio, 2007). There is a positive relationship between CSR behavior of the organization and consumers' attitudes towards such organizations (Lichtenstein, Drumwright, & Braig, 2004; Baghi, Rubaltelli, & Tedeschi, 2009).

Environmental Dimension: 'Planet'

Focus is on the organization's efforts to minimize their negative environmental impact and improve ecological footprint by effective energy management and waste production. There is increased greening of the marketplace by easy availability and affordability of the green products, usage of eco-labelling, and going for the ISO 14001 certification.

The environment dimension of the TBL has been considered as most significant by researchers as everything depends on the availability of Earth's resources, their restrictions, and systems in place, and thus has received utmost focus (Porritt, 2007; Bansal, 2005; Seuring & Müller, 2008; James et al.,2015) compared to the social and economic dimensions which are considered as secondary.

Corporate Social Responsibility (CSR)

CSR is a business strategy to fulfill the environmental, economic, and social standards simultaneously (Carron et al., 2006). It is a wide-ranging concept requiring a planned strategy. Several societal factors have contributed in the formulation of CSR practices like population growth, presence of many socioeconomic challenges, rising concern for conservation of the global environment, increase in human rights activism, growing awareness among both consumers and employees, development, and implementation of national and global frameworks (Sawhney, 2004).

Private sectors need to play a prominent role in nation building and global sustainable development. Business act as corporate citizens. Their existence and sustenance depend upon the environment and society they are operating in and their employees (Fyke et al., 2016). Their role should not be restricted to profit maximization and protecting the interests of their shareholders. The new motto of business must include protection of the environment, empowerment of their employees and communities, and thriving for the society (Arevalo

& Aravind, 2011). Hence, firms must undertake their business practices to merge their economic interests with contributing to all the stakeholders. This can be achieved by developing business practices on the lines of the SDGs.

Cause Related Marketing (CRM)

Cause related marketing combines both marketing and CSR concepts and a means to communicate the efforts of an organization devoted to doing good for a social cause. It can be considered as a part of organizations CSR activities, where the organization commits to donate either a fixed amount or as a percentage of price of the product to the selected cause (Kotler and Lee 2006). The aims of CRM are intensification of the corporate image or brand image, leverage brand's equity and making profits. Consumers tend to purchase from companies allied with a good cause (Coric, 2015) and have better perception of such organizations (Farache and Perks, 2008).

There are broadly three types of CRM (Andreasen 1996): most used is transaction-based CRM where a fixed percentage of sales are donated to the selected cause. Second type is joint issue promotion in which company and not for profit organization (NPO) work in partnership for promotion of the cause by using marketing strategies. Third type is licensing the NPOs names and logos by the sponsoring organization in return of a fixed fee or percentage of revenues.

In a CRM Campaign, all the partakers gain benefits and referred as a win-win-win situation (Varadarajan and Menon, 1988; Silva and Martins, 2017). The organization benefits by building a positive brand image, increased reputation, heightened brand value (Mohr et al. 2001) and rise in profits (Berglind and Nakata, 2005). CRM campaigns tend to develop positive marketing relationships of organizations with their customers (Ross et al. 1992), and boost consumer's purchase intention (Pirsch and Gupta, 2006). Research has shown that people who support a certain cause becomes consumers of the organization supporting that cause, this results in increased brand reputation and loyalty of such consumers (Berglind and Nakata, 2005; Pirsch and Gupta, 2006).

From the perspective of the NPOs or the charity, CRM brings in a significant surge in funding for them in form of donations from the organization (Pirsch and Gupta, 2006). Other benefits include increased visibility to the society and public, creation of multiple sources of donations, improvement in cause's repute (Berglind and Nakata, 2005), higher cause awareness, enhanced NPOs reputation (Varadarajan and Menon, 1988), and improved likelihoods for enlisting volunteers (Silva and Martins, 2017).

When the consumers purchase CRM products, it acts as a value add for the purchase (Webb and Mohr, 1998), it gives them higher satisfaction by serving a particular cause (Polonsky and Wood, 2001) and lessens the post-purchase guilt of buying hedonic products (Silva and Martins, 2017).

CONCEPTUAL MODEL AND HYPOTHESES DEVELOPMENT

For the formulation of SDG-oriented Cause Related Marketing strategy, all the components of Cause Related Marketing were studied to identify five major components which represent integration of the concepts of Sustainability Development Goals with Cause related marketing strategies adopted by private organizations. These components are:

Environmental Concern

This construct relates to the Planet or Environmental Dimension of the SDGs. Consumers are said to show 'Environmental Concern' when they adjust their consumption behavior to be greener (Wu et. Al, 2019). Research has revealed that consumers are becoming more conscious about the green economy and companies which support the environmental practices are favored (Kusuma et. Al 2008). Previous consumer behavior literature related to of organic food has proven that environmental concern of the consumers and pro-environmental attitude has a positive and significant effect on their purchase intention (Pomsanam et. Al 2014; Asif et. Al 2018).

Hypothesis 1: 'Environmental Concern' will have a positive and significant effect on consumer's purchase intention.

Four items were used to measure Environmental Concern (Yadav et. Al,2006). EC1: Equilibrium of nature is very delicate and can be upset easily. EC2: Human beings can be held responsible for harming the

environment. EC3: It is essential for humans to create a balance with nature for their survival. EC4: Interference of humans in nature can be devastating.

Company's Motivation

This construct relates to the Profit or Economic Dimension of the SDGs. When a consumer decides to purchase a product related to a CRM campaign, they evaluate the probable motives of the organization for supporting a specific cause. If they have confidence in organization's intentions or motivations as altruistic, they will be ready to purchase this product. If there is distrust in an organization's motives, consumers will be hesitant to purchase such products (Webb and Mohr, 1998). On the other hand, when consumers perceive that organization is supporting a social cause for the right reasons, they will select such products and brand repeatedly (Barone et al., 2000).

Hypothesis 2: 'Company's Motivation' will have a positive and significant effect on consumer's purchase intention.

Four items were used to measure Company's Motivation (Tsai, 2009): CM1: Brands launch CRM campaigns as they are motivated by philanthropic drives more rather than desire of profit-generation. CM2: Brands are motivated to launch the CRM campaigns for fulfilling their philanthropic desires instead of profit-generation desires. CM3: Brands motive is to help the beneficiaries instead of helping themselves. CM4: CRM campaigns choose a charity based on its importance for the brand.

Brand Loyalty

This construct relates to the Profit or Economic Dimension of the SDGs. Building repetitive business is crucial for the long-term profitability of companies. This can be achieved by building customer loyalty or brand loyalty. Loyal consumers are dedicated to the brand as the brand provides a higher level of satisfaction compared to other players (Holland & Baker, 2001). Brand loyalty is not limited to re-purchase tendency, it inspires regular purchase by keeping the customers hooked to the products (Oliver, 1997).

Hypothesis 3: 'Brand Loyalty' will have a positive and significant effect on consumer's purchase intention.

Four items were used to measure Brand Loyalty (Jacob & Chestnut, 1978; Chaudhuri & Holbrook, 2001). BL1: I will buy the same brand again when I buy the next time. BL2: I plan to keep purchasing products from the same brand. BL3: I feel that I am devoted to the brand. BL4: I can pay higher price for this brand compared to other similar brands.

Brand Cause Fit

This construct relates to the People or Social Dimension of the SDGs. Brand- cause fit formulate attitudinal and behavioral outcomes of the consumers (Nan et. Al, 2007). When there is a high degree of fit between the brand value and causes it supports, it would lead to a positive effect on purchase behavior of the consumers (Pracejus and Olsen, 2004). Several other benefits are enjoyed by the organization like brand recall value increases, it establishes better credibility in the eyes of consumers, and greater fitting together between the consumers of the organization and the cause it supports (Chéron et al., 2012). When the consumers perceive that fit between brand and cause is low, negative perceptions will increase. Consumers would feel that the brand is misusing the cause for their own benefits.

Hypothesis 4: 'Brand Cause Fit' will have a positive and significant effect on consumer's purchase intention.

Three items were to measure Brand Cause Fit (Hou et al., 2008). BCF1: I feel it is important for the companies to support a cause. BCF2: I feel if the companies support a cause related to their operations, more advances can be made. BCF3: If products contribute in the causes closely related to themselves, I prefer to select those products.

Consumer Cause Identification

This construct relates to the People or Social Dimension of the SDGs. Consumer-cause identification concept comes into play when a consumer associates or identifies their self-concept with how they feel about the cause supported by the company (Lichtenstein et al., 2004). When there is a strong association or identification of the consumer with the cause, it leads to forming a positive attitude towards the brand (Bhattacharya and Sen, 2003) and reportedly an improvement in consumers purchase intentions.

Hypothesis 5: 'Consumer Cause Identification' will have a positive and significant effect on consumer's purchase intention.

Three items were used to measure Consumer Cause Identification (Hou et al., 2008): CCI1: I will choose those products which donates to the causes I feel concerned for. CCI2: In a situation, of a cancer patient, their relatives will choose the products which donates to cancer cure. CCI3: If donations are made more transparent of its usage, I will prefer to choose such products.

Purchase Intention

Purchase intention is a positive intent towards a transaction and indicates the real purchase behavior of the consumers (Chang and Wildt, 1994). According to research (Parengkuan, 2017) purchase intention of consumers can be influenced if price of the product changes or perceived value of the product changes, internal and external motivations of the consumers can also change at any time. Hence, companies must continuously adapt their products and brand values as per the changing needs of the consumers.

Four items were used to measure Purchase Intention (Yadav et. Al, 2006). PI1: I have willingness to purchase the products if they are offered. PI2: I have intention to purchase the products if they are made available. PI3: I have plans to consume the products if they are made available for purchase. PI4: I will attempt to consume the products if they are made available for purchase.

A conceptual model (Figure 1) was developed to study the influence of such SDG-oriented Cause Related Marketing strategy on the consumer's purchase intention.

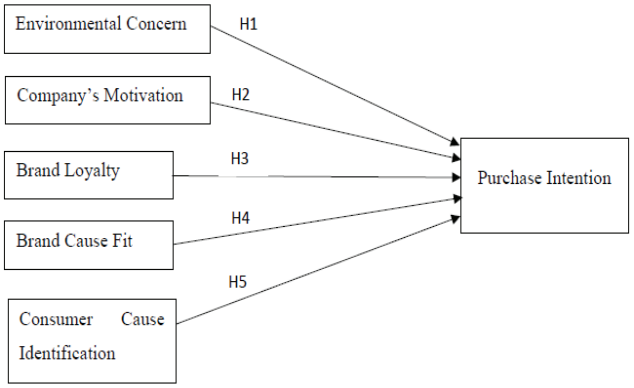

Figure 1: Conceptual model to study the influence of SDG-oriented Cause Related Marketing strategy on the consumer's purchase intention

The results of testing the conceptual model will indicate the applicability of the conceptual model. If it is found that the proposed SDG-oriented Cause Related Marketing strategy have a positive influence on the consumer's purchase intention, marketers and private organizations would have direct implications. There will be more evidence to formulate the Cause Related Marketing strategy by incorporating the underlying principles of SDG.

RESEARCH METHODOLOGY

The study uses a descriptive research design. A structured questionnaire was formulated for collecting data or responses using convenience sampling technique by means of online survey method. The questionnaire comprised of two sections. The first section was based on the demographic characteristics or profile of the respondents. The second section was based on 22 statements or items for the six research constructs. The items were measured on a five-point Likert Scale (1-5) where 1 pertains to 'strongly disagree' while 5 refers to 'strongly agree'.

Sample size should consist of at least 15 respondents for each construct (Stevens, 1996). For this study, conceptual model comprised of six constructs implying that the acceptable number of respondents should be more than 90. The convenience sampling technique was used to conduct the survey. Valid responses were collected from 319 respondents. The respondents were the consumers of FMCG products across India.

Demographic profile of the respondents

Profile of respondent characteristics depicts that based on Gender, 52% respondents were male and 48% were female. With respect to Age classification, 18% respondents were in age group 18-29 years, 54% respondents were in 30-49 years age group and remaining 28% respondents were in above 49 years age group. With respect to Marital Status, 58% respondents were Married and remaining 42% respondents were unmarried. In terms of educational qualifications, 15% respondents were undergraduates, majority 75% respondents were graduates and remaining 10% were post graduates.

MEASUREMENT MODEL

In this study structure equation model (SEM) approach was used. Confirmatory factor analysis (CFA) was performed for testing the validity of the constructs. Cronbach's alpha value of greater than of 0.6 indicates the presence of internal consistency or reliability (Gefen et al., 2000). In this study Cronbach's alpha value was calculated for all latent variables or observed variables individually (Table 1: Reliability Analysis) and it was found that value of all the coefficients were higher than 0.6, thus internal consistency of the questionnaire is high and the data collected using it can be used for further analysis.

Table 1: Reliability Analysis

Construct	Cronbach's Alpha Value
Environmental Concern	0.786
Company's Motivation	0.758
Brand Loyalty	0.893
Brand Cause Fit	0.840
Consumer Cause Identification	0.823
Purchase Intention (of Consumers)	0.737

CONFIRMATORY FACTOR ANALYSIS (CFA)

In the study, AMOS 25.0 was used to assess the constructs of using Confirmatory Factor Analysis. The results indicates that P-value is 0.01 for all the constructs, which implies that loadings on the intended constructs are statistically significant and there is convergent validity. The CMIN/DF value is found to be 3.598 which can be adequate and acceptable value for the default model. The CFI value is found to be 0.801 which indicates good level of the fitness. RMSEA value is 0.060 and any value less than or equal to 0.6 confirms a good fit.

A structural model analysis (SEM) was conducted to study the structural relationships. Based on Index of the fitness values of the conceptual model, it was found that the structural model is within the acceptable parameters of the goodness of fit. It was observed that model indicators are also within the threshold limits of the structural model. CMIN/DF value is 3.633 is acceptable for default measurement model. The Comparative Fit Index (CFI) value is 0.881, any value close to 1 indicates a good fit. Parsimony adjusted measures index (PCFI) value is 0.825, any value higher than 0.6 indicates a good fit of model. Root mean square error of approximation (RMSEA) value is 0.067, any value less than or equal to 0.06 indicates a good fit (Deng et. Al, 2010; Haier et. Al, 2019)

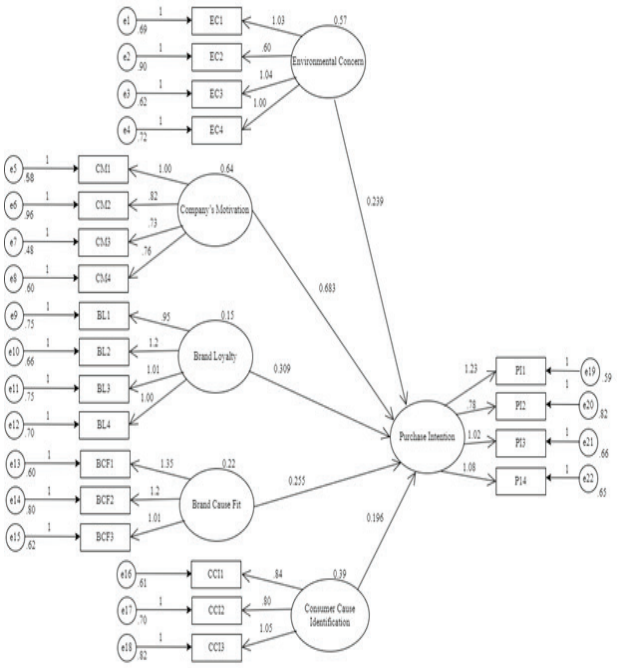

Figure 2: Confirmatory Factor Analysis (CFA) for the Conceptual Model

The results of structural equation model analysis show the results of hypothesis testing (Table 2) below.

Table 2: Hypothesis testing results

Hypotheses	p-value	Total effect	Result
H1: Environmental Concern -> Purchase Intention	0.002	0.239	Accepted
H2: Company's Motivation -> Purchase Intention	0.000	0.683	Accepted
H3: Brand Loyalty -> Purchase Intention	0.000	0.309	Accepted
H4: Brand Cause Fit -> Purchase Intention	0.000	0.255	Accepted

H5: Consumer Cause Identification -> Purchase Intention	0.000	0.196	Accepted

As per the results obtained, 'Environmental Concern' influences significantly as Beta=0.239, p=0.002 and H1 is accepted. For 'Company's Motivation' Beta=0.683, p=0.000 which implies 'Company's Motivation' influences 'Purchase Intention' significantly and H2 is accepted. 'Brand Loyalty' construct also has significant influence on 'Purchase Intention' as Beta= 0.309, p=0.000, thus H3 is accepted. 'Brand Cause Fit' has significant influence on 'Purchase Intention' with Beta= 0.255, p=0.000 and H4 is accepted. Finally, 'Consumer Cause Identification' also has significant influence on the 'Purchase Intention' with Beta=0.196, p=0.000 indicating that H5 is accepted.

CONCLUSION AND MANAGERIAL IMPLICATIONS

The study has contributed to better understanding of the concepts of Sustainability Development Goals and Cause related marketing. The model fit of the conceptual model and significance of all the established hypothesis revealed that companies can go ahead with integration of these concepts and develop a successful marketing strategy. The research considered the consumers' perspective on influence of SDG oriented CRM strategy on the consumer's purchase intentions.

It can be concluded that the construct 'Environmental Concern' has a positive and significant effect on consumers' 'Purchase Intention'. Organizations should alter the ways to implement more planet friendly rational into their operations, minimize or eliminate the detrimental impact on environment. The products can be produced in eco-friendly way, products can be updated to green products. All these environmental actions will improve organization's reputation, attract environment concerned customers, and may lead to significant competitive advantage.

Perceived 'Company's Motivation' impacts the consumer's 'Purchase Intention' positively. If the perceived motivation is optimistic, the 'Purchase Intention' would increase. Hence companies must work on building and projecting a positive image. It can be concluded that 'Brand Loyalty' has a positive impact on consumers' 'Purchase Intention'. Marketers should develop cause marketing strategies by including features of sustainability to appeal to both type of consumers which prefer promoting an environmental cause or social cause.

The 'Brand–Cause Fit' helps to build a positive perception of the motivations of the company to support a compatible cause. If the brand and the cause supported share similarities in conducted activities, core values and purposes, then the consumer have confidence that the company is genuinely interested in helping the cause. These positive feelings build positive purchase intentions in consumer's mind. Higher identification between cause and consumer also leads to higher purchase intention.

LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The study focuses on five constructs. Future researchers should identify more constructs relevant to the concept discussed and test their influence on the consumer's purchase intentions.

The study is based on respondents from India. Similar studies can be conducted in other regions or countries to see the impact of cultural differences on the relationships established in the model.

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Digital Marketing Communication: Shaping Online Customer Experience and Sustainable Purchase Intention

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ABSTRACT

Digital technology has revolutionized marketing communication, transforming strategies from static to interactive that resonate with today's dynamic landscape. The present study aims to unravel various underlying factors that influence digital marketing communication (DMC) for designing effective digital promotional strategies. Through exploratory qualitative design, the study conceptualizes the nexus between DMC, Online Customer Experience (OCE), and Sustainable Purchase Intention (SPI). By integrating theories such as ELM, PCT, UTAUT2, and TAM, the study identifies web attractiveness, hedonic motivation, argument quality, privacy concerns, intrusive concerns, subjective norms, perceived usefulness, and perceived ease of use that shape customer attitudes towards DMC. Extensive literature review substantiates the impact of DMC on OCE, ultimately influencing SPI among consumers. The implications of the study extend beyond theoretical understanding, offering actionable insights that can aid marketers to align their DMC strategies with sustainable initiatives, creating a positive impact on customer experience and sustainable growth in the digital era.

KEYWORDS: *Digital marketing communication, Sustainable purchase intention, Online customer experience, UTAUT, ELM.*

INTRODUCTION

Technological advancement has significantly transformed the marketing landscape from conventional offline marketing methods to digital internet platforms. The era of motionless advertisements and impersonal companies has come to an end. In the present day, customers have a strong need for customized interactions, and genuine dialogues in their preferred manner. With the advent of digitalization, online platforms have become a major source of information, entertainment, and interaction with others. People are increasingly spending their time on online activities such as searching for data, product and service exploration, customer reviews/feedback, interaction with companies, etc. Marketers must acknowledge the shifting trend in customers' preferences and strategize their digital communication endeavors.

Digital marketing communication refers to exchanging information between companies and end-users via electronic or digital media. DMC can be broadly categorized into two types: one-way and interactive. One-way communication includes digital ads and customer reviews, (Minnema et al., 2016; Wiesel et al., (2011)) whereas, interactive communication involves e-service chats and online brand communities (Van Dolen et al., 2007). Organizations are recognizing the shift in customer behavior by including digital and social media as a crucial and inseparable element of their corporate marketing strategies (Stephen, 2016). By utilizing these communication channels, marketers

may influence customers' emotions and interests in a manner that accurately perceive the brand identity in desired manner. Websites, Search Engine Optimization (SEO), e-mail marketing, social media marketing, content creation, digital advertising, mobile marketing, viral marketing, affiliate marketing and web analytics are some of the most common digital marketing platforms (Thaha et al., 2021; Alshurideh et al., 2019; Al-Maroof & Al-Emran, 2018; Bala & Verma, 2018; Al-Qaysi & Al-Emran, 2017; Roggeveen et al., 2016; Varnali, 2013). It enables organizations to monitor the real-time performance of their campaigns, optimize their strategies in response to audience engagement, and maximize their return on investment.

The integration of traditional media like radio, television, newspapers, and magazines into handheld devices, coupled with the prevalent use of social media platforms including YouTube, Facebook, LinkedIn, and microblogging sites like Twitter (now X), significantly shapes global culture. Businesses quickly lose customers if their branding or communication strategy goes wrong on social media platforms.

There is a growing trend among online consumers to prioritize environmentally friendly items, prompting entrepreneurs to focus on developing sustainable and eco-friendly options (Zhang et al., 2019). DMC enables marketers not only to achieve their aim of profitability and customer satisfaction but also to play a crucial role in advancing sustainability by spreading environmental consciousness worldwide. DMC combining technology innovation with strategic orientation, is essential for firms aiming to inculcate sustainable behavior among customers. The present study aims to enable organizations to fully leverage DMC in their marketing efforts and to fill the knowledge gap by investigating how digital marketing communication influences sustainable purchase intention in the online sphere. The remaining sections of this article are structured as follows. Section 2 provides a comprehensive literature review and theoretical foundation. Section 3 provides a concise overview of the findings. Lastly, Section 4 elaborates on managerial implications, and in the end, concluding remarks are given.

REVIEW OF LITERATURE

Internet marketing has been defined as the utilization of digital technologies to accomplish marketing goals (Chaffey et al., 2009). E-WoM on social media sites may spread through internet marketing, reaching thousands or millions of audiences (Vilpponen et al., 2006). Previous research has established a positive correlation between the quality of the message and consumer satisfaction, which subsequently influences the purchase intention (Park et al., 2007). According to the Elaboration Likelihood Model (ELM), when people receive messages that are intended to be persuasive, they use two routes to process messages- Central and Peripheral route (Cheung & Thadani, 2012). The central route is analogous to rational thinking by which people pay attention to the message's content and evaluate the argument quality, i.e., the plausibility of persuasive argumentation (Choi & Hand, 2020). Argument quality refers to the argument's persuasive strength (Bhattacherjee & Sanford, 2006). Kim et al. (2016) found that a stronger argument quality positively influences content acceptability. The attractiveness of a website, which is a peripheral route, was found to be a powerful predictor of behaviour intention to use a website (Koo et al., 2014). Interactivity is considered to be a necessary component of websites and social media platforms (Thakur et al., 2023, Wirtz et al., 2013). Social media is among the most effective instruments for digital marketing communication (Karjaluoto et al., 2015). It serves as a significant catalyst for determining whether individuals will continue to purchase a specific product or service or switch to an alternative (Thaworn et al., 2021). Digital marketing communication facilitates the smooth dissemination of marketing information, but also raises security concerns (Nguyen et al., 2024). Information stored on different platforms may potentially be accessed by a third party (Shen et al., 2019). Individuals may not always know how their personal information is gathered without their knowledge or consent (Engel & Eibl, 2015). Data privacy has emerged as a primary concern influencing the disclosure of information across digital platforms (Lowry et al., 2012). Privacy, in this context, is primarily defined as the capacity to maintain a certain level of authority over information (Mazurek and Małagocka, 2019). Customers value their privacy when engaging in

activities such as liking and sharing posts and videos (Inman & Nikolova, 2017). Conversely, intrusiveness can lead to negative emotions, such as disturbance and irritation, as well as behavioral outcomes like escape from sharing information or rejecting permission requests (Li et al., 2002, Li, & Lee, 2002; Wehmeyer, 2007). The concept of intrusiveness can be used to clarify the emergence of negative emotions triggered by online ads (Li et al., 2002). Social influence in the era of social media and word of mouth can boost the use of a particular product/service or guide customers towards a relatively acceptable new technology. Social influence has a favorable impact on behavioural intention in various category of products (Akturan & Tezcan, 2012; Hongxia et al., 2011; Tan et al., 2019; Venkatesh & Zhang, 2010; Yang et al., 2015. Comparison of social influence to the subjective norm reveals the superiority of the later leading to greater adoption in marketing literature (Fishbein & Azjen, 1975, Davis, 1989, Taylor & Todd, 1995). Subjective norms refer to an individual being socially influenced by the opinions of others (e.g., family members, friends and colleagues) and the fact that these opinions affect performance behaviours (Ajzen 1991). Extension of the original UTAUT model introduced by Venkatesh et al. (2012) includes three additional factors, namely hedonic motivation, price value, and habit, and is referred to as UTAUT2. A study conducted in Malaysia using UTAUT2 components validates that users' behavioural intention is primarily influenced by their expectations of performance and effort, as well as by hedonic motivation and enabling situations (Shaw & Sergueeva, 2019).

Technology Acceptance Model (TAM) proposed by Davis (1989) and Bagozzi and Warshaw (1989), helps to examine how app users react to technological developments. Davis (1989) developed the Technology adoption Model (TAM) to describe and forecast user information system adoption over time. The model identifies two main factors: perceived usefulness (the degree to which a person believes that using a particular system would enhance his or her job performance) and perceived ease of use (the degree to which a person believes that using a particular system would be free of effort) (El-Gohary, 2012; Hamidi and Safa bakhsh, 2011).

RESEARCH GAP

Previous studies have examined various aspects of web attractiveness (Campbell et al., 2013; Thoms et al, 2004), privacy concerns (Baek & Morimoto, 2012), intrusiveness in advertising (Bala & Verma, 2018), and hedonic motivations (Ozen & Kodez. 2012), there is limited research integrating these factors within the context of digital marketing communication and online customer experiences. Although research acknowledges the role of online platforms in influencing purchase intentions (Su et al., 2019), there is limited exploration into how these platforms contribute to sustainable practices in online shopping. Further, ELM (Shahab et al.,2021; Dwivedi et al., 2023), UTAUT2 model (Venkatesh et al. 2003, Davis, 1989; Venkatesh et al., 2012), TAM (Lim and Ting 2012; Venkatesh and Davis 2000), and Privacy calculus theory (Proudfoot et al., 2018; Krasnova et al., 2009) have been widely incorporated with reference to DMC but the holistic framework of these theories to examine DMC is scare. The present study aims to fill these gaps. The ELM, UTAUT2, TAM, and PCT models are integrated to corroborate the relationship among digital marketing communication, online customer experience and sustainable purchase intention as shown in fig 1.1.

DISCUSSION

Argument Quality and Digital Marketing Communication

Detailed product evaluations with better argument quality, meaning greater information quality, lead to increased trust from customers (Pavlou & Fygenson, 2006; Mudambi et al., 2010; Mayer et al., 1995). The persuasive power of the argument presented in the online content shared by users determines the quality of the argument (Bhattacherjee & Sanford, 2006). Strength of an argument determines the credibility of digital information (Xiao et al., 2018). The quality of communication is driven by its relevance, timeliness, accuracy, and comprehensiveness (Cheung & Thadani, 2012). Quality of argumentation in marketing communication may impact consumer attitudes (Chu & Kamal, 2008). Arguments quality inspires users to engage in information activities, leading them to assess information with a critical eye (Li et al, 2013). Strong

arguments tend to bring about positive reactions from consumers, whereas poor arguments evoke negative responses from consumers (Chang et al., 2015; Bhattacherjee & Sanford, 2006).

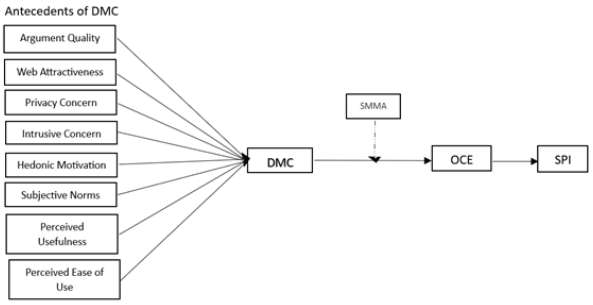

Fig 1: Conceptual framework of Digital Marketing Communication

Web Attractiveness and Digital Marketing Communication

Plamer (2002) states that a website possesses the capacity to effectively engage and interact with diverse target groups, including consumers, and other stakeholders. Previous studies have explored several aspects of web attractiveness, including colour schemes, typefaces, page layouts, images, and text styles (Thoms et al, 2004). Website attractiveness is based on the person's attitudes, beliefs, and preferences towards the visual design, layout, and content of the website (Weick and Sutcliffe, 2001; Sutcliffe, 2002; Campbell et al., 2013). Wu and Tsang (2008) found that website attractiveness increases usage intention. Lee and Yurchisin (2011) studied consumer perception of a website and how these perceptions were related to purchase intentions. Weick and Sutcliffe (2001) suggest that the perception of attractiveness is influenced by design effects, which amplify consumers focus towards a particular medium and its content. Thus, high perceived web attractiveness leads to positive attitude towards DMC.

Privacy Concerns and Digital Marketing Communication

The privacy concerns significantly influence the consumer's level of participation on digital platforms (Chellappa and Sin 2005; Burden et al. 2013; Aguirre et al. 2015; Vance et al. 2008). Consumers frequently express concerns about privacy breaches, despite the fact that they are ready to share personal information in return for perceived benefits (Milne & Culnan, 2002). This dichotomy between consumers' actions and expressed concerns underscores the complex interplay of factors within the realm of privacy considerations in social commerce. Consequently, the consumer's overall attitude towards marketing communication is invariably influenced and shaped by the omnipresent spectre of privacy concerns (Baek & Morimoto, 2012).

Intrusive Concern and Digital Marketing Communication

The intrusion of external stimuli can significantly disrupt and interfere with cognitive processes of an individual, especially when they are fully engaged in complex activities (Tan et al., 2019; Li et al., 2002). Such intrusiveness can pose a challenge to the individual's ability to concentrate, retain information, and manipulate mental representations, leading to a potential decline in cognitive performance (Belanche, 2019). This underscores the importance of maintaining a conducive environment that minimizes distractions and enhances cognitive engagement and productivity (Li et al., 2002). The practice of intrusiveness is frequently criticised in the field of advertising (Belanche, 2019; Tan, Brown, & Pope, 2019; Li et al., 2002). Consumers tend to react unfavourably to digital marketing communication when they perceive them as intrusive (Aaker & Bruzzone, 1985).

Hedonic Motivation and Digital Marketing Communication

Hedonic motivation, which pertains to the intrinsic desire for pleasure and enjoyment, exerts a profound influence on the perceived acceptability and subsequent adoption of various online platforms encompassing online games, social networking sites (SNS), and location-based apps (Liao et al., 2022; Venkatesh, Thong, & Xu, 2012). The influence of hedonic factors is particularly pronounced in shaping the overall customer experience in the online realm, as they play a pivotal role in fostering a sense of pleasure and fulfillment during the purchasing process. This heightened sense of enjoyment and gratification not only enhances user satisfaction but also serves as a catalyst for capturing and retaining the attention of online consumers, thereby significantly impacting their behavioral intentions and decision-making processes (Liu et al., 2020; Kim and Eastin, 2011).

Subjective Norms and Digital Marketing Communication

Subjective norms are a efficient measurement to predict how ready users will be to take part in a social exchange process on a digital platform, such as sharing selfies online. Smith and McSweeney (2007) found that subjective norms affect online consumer attitudes and intentions and that peer approval or disapproval made people more likely to respond positively to digital marketing messages. Cultural aspects of subjective norms in digital marketing focusing on the ways in which cultural factors influence the establishment of these norms and the impact they have on consumer behaviour in online environments (Han & Chung, 2014).

Perceived Usefulness and Digital Marketing Communication

Numerous studies have underscored the significant influence of perceived usefulness on online shopping decisions (Mandilas et al., 2013; Guritno & Siringoringo 2013). Perceived usefulness not only shapes consumers' attitudes and intentions toward online shopping (Nguyen et al., 2024; Singh & Singh, 2022; Ha & Stoel, 2009; Suleman et al., 2018; Cho et al., 2015) but also impacts usage, satisfaction, and performance (Davis, 1989; Mensah, 2019). Positive user attitudes and perceived usefulness were found to be positively correlated, suggesting that consumers are more likely to engage with and positively react to brand messages when they perceive social media content as useful (Chaffey & Smith, 2017).

Perceived Ease of Use and Digital Marketing Communication

Kim and Ko (2012) examined the PEOU of social networking platforms, highlighting the significance of user-friendly interfaces and features in influencing users' opinions. Customer involvement and intensity can make the system easy to use (Zuniarti et al., 2022). People may search and utilize information on a website to assess its reliability (Nangin et al., 2020). According to research on customer acceptance of online services, perceived ease of use is a key factor in Web technology adoption (Pikkarainen et al., 2004, Wu & Tsang, 2008). A favourable impression towards interface may have considerable impact on consumers' attitudes and behavioural intentions towards online advertisements (Cho et al., 2022).

Digital Marketing Communication and Online Customer Experience

Rodriguez and Williams (2020) examined the psychological aspects of digital communication, specifically focusing on how the tone and content of online messages can greatly influence consumer emotions and, consequently, their overall online experience. (Xu et al., 2017) emphasised the significance of integrating digital communication channels to improve the consistency of the online consumer journey. Effective communication, engagement with online content, and interactions with consumers are crucial factors, having significant impact on online customer experiences (Baldus et al., 2015; Brodie et al., 2011; Rose et al., 2012).

Moderating Role of SMMA

OCE affects satisfaction, trust, and repurchase intention (Ha and Perks 2005; Janda and Ybarra 2005; May So et al., 2005; Jin, Park, and Kim 2008). Garcia et al. (2018) emphasize how planned social media marketing improves consumer trust and satisfaction. Consumers and users have varied experiences since they may have distinct sensations and thoughts about the same service activities (Agapito et al., 2013). According to Verhoef et al. (2015), effective social media marketing has the potential to improve the online shopping experience and influence consumer decision-making. According to Seraj (2012), social media platforms create a sense of community and enhance the online experience by facilitating virtual interactions.

Online Consumer Experience and Sustainable Purchase Intention

Liang and Turban (2011) argue that a smooth and pleasurable online shopping experience improves consumers' trust and satisfaction, which in turn affects their willingness to participate in sustainable purchasing. Managing online platforms can greatly enhance consumers' understanding of sustainable products, leading to a greater likelihood of making eco-friendly purchases (Li et al. 2018). The role of online platforms in fostering social influence, indicating that positive interactions and peer recommendations within

virtual communities can positively impact purchase intentions in a sustainable manner (Lu and Lu & Su, 2016).

THEORETICAL AND MANAGERIAL IMPLICATIONS

This research has several theoretical implications for comprehending digital marketing communication and online customer behaviour. The integration of Elaboration Likelihood Model (ELM), Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), Technology Acceptance Model (TAM), and Privacy Calculus Theory (PCT) in the study contributes significantly to the existing literature of marketing in several ways. By integrating multiple established theoretical frameworks, the study offers a comprehensive and holistic understanding of digital marketing communication (DMC). This synthesis allows researchers and practitioners to explore the complex dynamics and underlying mechanisms that influence customers' attitudes and behaviors in the digital realm. Each of the theories brings its unique perspectives thereby enhancing the predictive accuracy of marketing outcomes. The integration of theories from diverse disciplines such as psychology, information technology, and consumer behavior facilitates cross-disciplinary insights into DMC. This interdisciplinary approach enriches the literature by providing a comprehensive understanding of how various psychological, technological, and social factors interact to shape customer perceptions and behaviors in digital marketing contexts.

The integrated framework not only advances theoretical knowledge but also offers practical guidance for marketers and managers. Consumers rely on the quality of arguments presented in marketing communications to make sustainable purchase decision. Logical arguments help consumers understand the value proposition of products or services, leading to increased confidence in their choices. Therefore, Marketers should focus on crafting clear, concise and persuasive content that provides valuable information and addresses customer sustainable needs and preferences. Further, a consistent standard of argument quality across all communications should be ensured better online experience and to uphold the brand's reputation for reliability, expertise, and authenticity.

A well-designed and aesthetically pleasing website conveys professionalism and credibility. Consumers form initial impressions of a website within seconds of landing on it. A well-designed website that provides a positive user experience is more likely to rank higher in search engine results pages (SERPs), increasing visibility and driving organic traffic. Employing professional web designers and user experience (UX) and user interface (UI) experts can help marketers enhance the attractiveness and usability of digital communication. Investing in content creation tools, training, and expertise can enhance the quality and effectiveness of digital marketing communication. Designing visually appealing and user-friendly websites and digital platforms is essential for optimizing conversion rates and achieving marketing objectives. Privacy-conscious consumers value transparency and honesty from businesses regarding their data practices. Lack of transparency or perceived deception regarding data collection and usage can erode trust and credibility, leading to negative perceptions of the brand. Thus, personalization strategies should be balanced with respect for customers' privacy and preferences. Marketers must implement robust data protection measures and comply with privacy regulations to mitigate privacy & intrusive concerns among customers. Adhering to data protection laws, implementing privacy-by-design principles, and conducting regular audits may help ensure compliance and minimize the risk of data breaches or regulatory penalties.

Consumers often use hedonic purchases that offer emotional gratification and sensory pleasure, to express their individuality, environmental conscious attitude, social status, or personal values. Consumers may be motivated to purchase luxury goods, eco friendly or experiential products to reflect their desire for self-expression, creativity, and uniqueness. By emphasizing sensory appeal, emotional benefits, and experiential value, marketers can position their brands as providers of hedonically satisfying experiences that resonate with consumers' desires. Immersive events, pop-up activations, and interactive campaigns allow consumers to engage with brands on a sensory and emotional level, fostering positive associations, brand loyalty and even

to justify premium pricing of the products. Through visual, auditory and tactile stimuli, marketers can create multisensory brand experiences that enhance product desirability, engagement, and memorability.

Consumers often use reference groups, such as friends, family, or opinion leaders, as benchmarks for evaluating their own attitudes and behaviors. Subjective norms drive word-of-mouth marketing and viral sharing of brand-related content among consumers. Marketers can incorporate normative appeals and social comparison cues into marketing messages to align with consumers' subjective norms. Highlighting social trends, popularity indicators, and social acceptance cues may reinforce consumers' perceptions of the brand's alignment with prevailing social norms. Marketers can foster brand communities and online communities to cultivate subjective norms and social identities around their brands. Engaging consumers in interactive discussions, user-generated content activities, and community events strengthens social bonds and reinforces normative expectations. Perceived usefulness directly influences customers' attitude regarding whether to engage with a product, service, or communication channel. Marketers can leverage data analytics and customer insights to personalize digital marketing messages based on individual preferences and behaviors. By monitoring relevant metrics such as engagement rates, click-through rates, and conversion rates, marketers can identify areas for improvement and optimize their strategies to better meet customers' needs and expectations. By using clear and concise messaging to communicate the benefits of sustainable products or services and avoiding jargon and providing straightforward instructions, marketers may improve customers' perception of ease of use and develop positive attitude towards digital marketing communication. This may enrich the online customer experience and further stimulate sustainable purchase intention among customers.

CONCLUSION

In the contemporary landscape of dynamic technological advancement, digital marketing communication serves as a pivotal channel to navigate the complexities of the digital ecosystem. The strategic imperative underscores its pivotal role in fostering online customer experience and driving sustainable purchase intention, thereby solidifying its indispensable significance in modern marketing endeavors. The implications provided in the study offer valuable and practical insights that can be utilized by marketers to shape and refine their communication strategies.

Future research may explore the longitudinal effects of digital marketing communication on Online Customer Experience and Sustainable Purchase Intention to understand how these relationships evolve over time. Additionally, quantitative studies may validate the conceptual model proposed in the study by providing empirical evidence of the impact of DMC on customer attitude and behavior. Furthermore, comparative analyses across different industries or cultural contexts may enhance the understanding of the generalizability. Lastly, investigating emerging technologies and trends in digital marketing communication, such as artificial intelligence and augmented reality, could provide insights into new avenues for marketers to optimize their communication strategies in the ever-changing technological environment.

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An Imperfect Production Vendor-buyer Inventory Model: The Impact of Investment in Reducing Lead Time Variability

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ABSTRACT

The aim of this endeavour develops a single-vendor, single-buyer inventory system that takes into consideration subpar production methods and investments in order to minimise lead time variation. We examine a scenario in the model where the buyer's main time has a normal distribution but is irregular. The customer inspects each lot that it receives from the supplier in order to classify any defective items. With the next delivery, the buyer must return the damaged item to the vendor. Accepted are the shortcomings, which are believed to be fully back ordered. The aim of the model is to minimise the expected additional expense of the organisation while simultaneously controlling the ideal shipping lot size, ideal security factor, ideal objective variance decrease of preparation duration, and ideal frequency of deliveries. A numerical example is also provided to demonstrate the applicability of the proposed paradigm. Based on the results, we understand that by utilising the investment policy to reduce period delivery alteration, such a system may be able to improve service quality at a lower cost. We conclude that system results have been demonstrated to be improved by the investment policy.

KEYWORDS: *Lot sizing, Lead time variance, Shortage, Full backorder, Inventory model.*

INTRODUCTION

Supply chain management is widely recognised as one crucial element to business success because it is a crucial component of the majority of firms and sectors. In order to fulfil customer expectations while keeping costs under control, businesses need to carefully plan and organise their supply chains (Bala, 2014). Companies can gain a lot from successful supply chain management, such as decreased inventories and associated costs. An effective inventory management system can greatly lower the expenses associated with maintaining goods at the producer, distributor, and consumer, as well as construction costs, investments to cut start-up costs, and storage costs (Simchi-Levi, Kaminsky, & Simchi-Levi, 2008). Such a fact alerts us to the possibility that better inventory management could boost the earnings of all organisations involved in the supply chain. Inventory expenses are a significant portion of logistics and transportation costs, according to Hamontree, Ouelhadj, and Beullens (2012). The choices made individually to cut inventory expenses don't produce the best outcome. As a result, one way to get the finest inventory management system is through the collaboration of key decisions throughout the supply chain. They are working to put a plan into action by collaborating and exchanging information to accomplish their shared objectives because the vendor-buyer system anticipates maximize their shared gain at minimal expense. While in this instance, the buyer is the one who consumptions the item after the seller and delivers it to the final consumers, the supplier

serves as the producer. Goyal was the first scholar to compare inventory management to supply chain (1976). In order to send goods from the vendor to the purchaser, he devised a lot-for-lot policy and presented a vendor-buyer inventory model by an infinite rate of manufacturing. In instruction to decrease the joint full cost experienced by the two parties, Banarjee (1987) created a bounded vendor-buyer inventory model, used the proper expense accommodation strategy. Sajadieh and Larsen, Hoque (2011), Goyal (1988), and other expansions in the connected field of investigation with diverse aspects (2015) Inside the vendor-buyer combined inventory model, it is assumed that overall goods are consistently manufactured with high quality. This assumption, however, is unjustifiable because a production process's actual state is imperfect and results in a number of damaged products (which deteriorate). The first researcher to incorporate a production process that was flawed into an economic order quantity model was Porteus (1986). A quality improvement approach was suggested by several researchers to lower the likelihood of production getting out of control. A production process's warranty and rework costs were taken into account when Park and Lee (1992) created a production model. In the meantime, Jauhari (2014a) created inventory models by an imperfect manufacturing procedure and chance of demand by attractive into account varying lead times, shortages, and investment exertions in order to lower the likelihood of an out-of-control event. A vendor-buyer inventory model was also created by Jauhari (2014b) taking into account deterministic demand and a uniformly distributed faulty rate. Sana (2010), Lin (2010a), Lin (2010b), Dey and Giri (2010), and others also created inventory models with flawed production processes (2014 Lead time is a vital factor in supply chain organization when evaluating the chain's effectiveness in conjunction with cost and product quality. While lead period is frequently expected to be fixed in the setting of supply chain inventory models, it is actually stochastic in nature. Production and product distribution operations both depend critically on the presence of lead times in setup, manufacture, or delivery. The procedure is better when the supply chain's lead-time variance is lower. The system will have more uncertainty when the lead-time variance is large. In their investigation, Chaharsooghi and Heydari (2010) provided further evidence that large lead-time variance poses a significantly greater risk than lead-time length (mean). One model assumes that Paknejad, Nasri, and Affisco were responsible for developing the lead time decrease in 1992. The study draws its inspiration from Japanese manufacturing firms' efforts to build trusting relationships with suppliers by reducing lead-time uncertainty. They put forth an investment strategy to shorten stochastic lead eras. (2011) Hayya, and He divided the decrease of lead time into two parts, namely, the decrease of cruel lead time and the decrease of deliver time variance through exponential delivery. While this was going on, Affisco(2008), Nasri, and Paknejad created a single-echelon inventory model that took into account the presence of flawed substances and investments to shorten lead times. Lo (2013) created inventory models with an imprecise production procedure, shorter lead times, and lower setup costs in mind. A partial backorder is assumed in the study when there is a scarcity during the lead time. Lin (2016) created an integrated vendor-buyer inventory model that proceeds into account lead time investments, stochastic lead times, and shortages. Assuming that a decrease in the mean principal time will naturally decrease the lead time variance, Lin (2016) employed an exponential lead time in the model. Many academics have looked into deliver time decreement in the area of inventory modelling, but most of these studies have only looked at mean lead times; there is still little study in this area that looks at lead time variance reduction. In order to minimise Taguchi's quality loss, Ganeshan, Boone (2001), and Kulkarni established a quality improvement model by a variance decrease investment, which is the fundamental model that this research adopts to develop an inventory model through a lead period variance decrease investment. The investment will lower the existing product variance's value in order to accomplish the variance reduction goal. In the future model, which looks at a vendor-buyer inventory structure with constant review strategy, we incorporate these concepts created by Ganeshan et al. (2001) and modify them. We take into account the fact that there is a scarcity and that the production procedure is inefficient before including a plan to lower the variance of the chief time that is usually distributed. The rest of the document is organised as shadows:

Section 2 delivers a description of how the mathematical model was created. The approach taken to arrive at the model's ideal solution is described in Section 3. In light of the numerous parameter uncertainties, Section 4 presents the sensitivity analysis of the model. Section 6 concludes the study by providing a summary.

DEVELOPING MODELS

Description of the system

Figure 1 shows the flow of materials in the vendor-buyer system under investigation. Inside the method, the supplier produces a certain amount of nDT at the level of progress, P, and the purchaser wants a quantity of DT units for every manufacturing cycle to match the final requirements of the customers. It is expected that the yearly rate of construction, P, is constant and superior to the demand (P > D). The items will be delivered to the purchaser and delivered n times per shipments after that the supplier has finished creating a certain amount of DT units in the first consignment. Inside the method, the supplier determination cover the manufacturing setup expense (K), whereas the purchaser will be responsible for the buying expense (A) and the delivery expense (V). The manufacturing process carried out by the vendor is not operating perfectly in the suggested inventory model. The purchaser will ultimately receive a lot of defective items as a result.

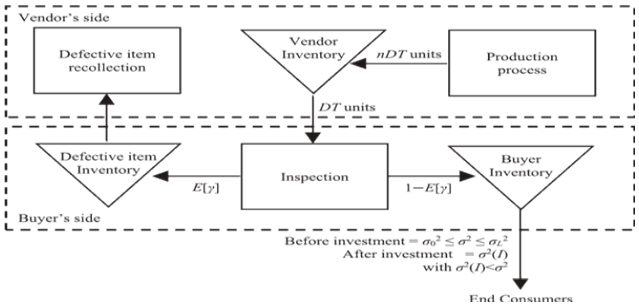

Fig.1. It shows the vendor-buyer system that the model looked at.

To determine if the product is defective or not, the buyer conducts an inspection activity at a cost of $ per unit and an inspection rate of x units per year. What is supposed to be stochastic is the proportion of defective products. Then, up until the conclusion of the inspection procedure, all products identified as defective will be kept in storage. Following that, the seller will receive these defective products back in the following delivery. As a result, the buyer is answerable for the expense of land DT units of defective goods at an inventory costs of hB $/unit/year. The purchaser will begin receiving a warranty reimbursement since the seller of $/unit due to the presence of the flawed goods, though. This type has a full reorder system, which permits shortfalls. Each backordered item will cost the purchaser. Inside this instance, the well-being factor (k) is necessary as the measure of the extremity's standard deviation that corresponds to the intended service level. Typically, company decide on safety-related considerations. For instance, the chance that the quantity of instructions at the period of advance notice is greater than the safety standard is 0.05 (or 5%) for k = 95%. The value of 0.05 has a cumulative likelihood of Z = 1.65, as seen in the normally distributed table Z. The likelihood of each event of type X is denoted by the notation fs(k), and fs(k) is the cumulative circulation function that expresses likelihood in the incident intermission of (, x). In this case, we also take into account a Ganeshan et al.-adopted investment to lessen the lead time alteration (2001). While the lowest lead time alteration is based on the manufacturing process's greatest capabilities, the lead producer time variance (2.0) represents the variation that occurs during the supply chain. The area of the expenditure is to turn the existing lead time variation (valued at 2.0) into the goal time delivery variance (valued at 2.0), in which the quantity of the decrease varies with the level of the investment. The variance decrease will increase in proportion to the quantity of investment. The function constant representing the degree of defect reduction aimed at a specific investment amount is called the lead period variance reduction coefficient, or b. The capital cost, I, is calculated using the fractional cost of reducing defects.

Creating mathematical models

Inside this study, an inventory replenishment model for a scheme with a specific purchaser and vendor is developed, taking into account the many challenges brought on by faulty manufacturing and scarcity. We incorporate a time delivery variation reducing expenditure that uses Ganeshan et al.'s decrease in investment quantity formula (2001). By evaluating a

number of objective functions, including the following, the suggested model seeks to reduce overall yearly shared overall cost in between seller and the purchaser:

optimum component size for a shipment (q*)

The quantity of deliveries (per year) is n*.

k*: safety component

σ^2(I): The goal of reducing lead period variance

We suppose that the time limit is evenly distributed by a mean = μ of and a variance of σ^2, as well as that the market is reliable. The model takes into account the following inventory-related expenses: (a) holding expenses for both supplier (HCv) and customer (HCb) inventory levels; (b) shipping expenses out from the seller to the consumer; (c) consumer buying and ordering; (d) customer investigation; (e) customer backordering; (f) supplier manufacturing set-up; (g) supplier costs associated with production; (h) supplier guarantee; and (i) investor expenses to decrease lead time variance (ICv). The subsequent notations are applied to represent the parameters included in the proposed system:

θ: fractional opportunity cost ($)	s: buyer examination cost ($/unit)
b: variance discount coefficient	x: buyer inspection rate (unit/year)
I: the expanse of investment ($)	a2: production variable cost ($/unit)
σ^2δIÞ: target lead period variance (days)	a1: production fixed cost ($)
Fs(k): cumulative density function aimed at k π: backordering cost σ20: present lead period variance σ2L: minimum lead period variance	hV: vendor annual allotment cost apiece unit invention
f_s(k): probability density function for k	V: vendor delivery cost ($/shipment)
w: warranty cost ($/unit)	A: buyer ordering cost ($/order)
δ: upper limit of the likelihood function of defective yields	P: annual manufacture rate K: manufacture set-up cost
γ: defective point fraction	D: annual demand rate

The model made the following assumptions, among others:

(a) The ratio of supply to consumption is always larger (P > D).

(b) Demand (D) is determined.

(c) The distribution of time lags is regular.

(d) A specific quantity of advanced investment cost can reduce delivery time to the desired value of σ^2(I).

(e) The time delivery variation decrease (σ^2(I)) as well as the amount of money invested (I) have a recognized relation that follows the pattern.

(f) Every time there is a part of a defective product within every lot provided to the customer, the likelihood of that reflecting a normal distribution.

Inside this research, different scenarios are created. The situation without expenditure is Case I, whereas the situation with capital is Case II. The outcomes of the two situations are then contrasted in order to determine which one produces the best benefits for the system. Figure 2 shows the salesperson's and the purchaser's inventory levels.

Without spending money

In Case I, holding costs (HCV), manufacture costs (PCV), manufacture set-up costs (SCV), and warranty costs make up the company's inventory levels (TCVI) (WCVI). You can estimate the yearly supplier holding cost (HCV) as

$$HC_V = h_V\frac{q}{2}\left(n\left(1-\frac{D}{P}\right)\sum_{q-3}^{n+1}\left(E\frac{n\pi x}{1-r}+\frac{20}{p}E\frac{n\pi x}{1-r}\right)-1\right) \quad (1)$$

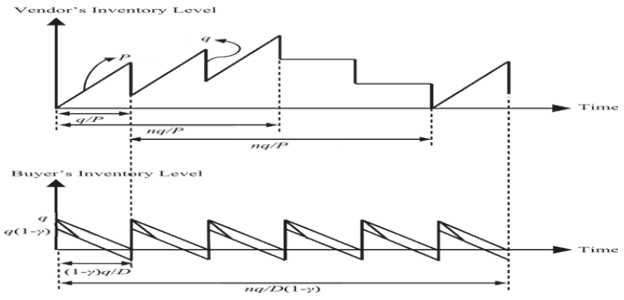

Figure 2: shows the inventory levels at the seller and the buyer (n = 5).

Both fixed and unpredictable operating costs are included in production costs vendor (PCV). The following is a formulation of PCv' function:

$$PC_v = D\left(\alpha_2 p + \frac{\alpha_1}{p}\right)^{nt} + \left(E + \frac{1}{1-y}\right)^{nt} \quad (2)$$

Every phase of the manufacturing operation starts with a vendor setup cost (SCv). The purpose of SC_V is described as shadows:

$$SC_v = \frac{DK}{nq}\left(E + \frac{1}{1-y}\right) \quad (3)$$

As a result of the damaged units, the vendor provides the consumer with vendor warranty cost (WC_v). The following is a list of what WC_v does:

$$WC_v = wD\left(E + \frac{1}{1-y}\right) \quad (4)$$

Since, the function of TCv for Set-up I is as follows

$$TCV_1 = PC_v + HC_v + WC_v + SC_v \quad (5)$$

For Case I, the customer's inventory costs also comprise ordering costs (OC_B), delivery costs (DC_B), holding costs (HC_B), backorder costs (BC_B) and inspection costs (IC_B). In Case I, the yearly buyer holding cost (HC_B) can be computed using

$$HC_B = h_v\frac{q}{2}\left(n\left(1 - \frac{D}{P}\right)(WC_v + wD\left(E + \frac{1}{1-y}\right)\right) \quad (6)$$

Every order that the buyer places with the vendor results in a charge known as the buyer's ordering cost (OC_B). The following formulation describes the role of OC_B:

$$OC_B = \frac{DV}{q}\left(E + \frac{1}{1-y}\right) \quad (7)$$

Delivery cost (DC_B) is the price of shipping that the customer must pay for each dispatch that the supplier makes. The equation below describes how DC_B functions:

$$DC_B = \frac{DV}{q}\left(E + \frac{1}{1-y}\right) \quad (8)$$

The customer has to pay an inspection fee (IC_B) to the seller since every lot it delivers may contain damaged products. The IC_B sum is listed below.

$$IC_B = sD\left(E + \frac{1}{1-y}\right) \quad (9)$$

The likelihood of scarcity for the consumer is caused by the system's presence of setup-time uncertainties. In the event of a lack of inventory, the buyer places a shipment notification, requiring extra charges termed "backordering expenses" to fulfil the requirement within the next period.

The BCB for Scenario I can be computed as

$$BC_B = \frac{D^2}{nq}k\left(E + \frac{1}{1-y}\right) \quad (10)$$

With

$$\Psi(k) = \{ f_s(k) - k[1 - F_{ms}(k)]\} \quad (11)$$

$F_s(k)$ is the probability density function for k based on the conventional normally distributed with = 0 and = 1, and $f_s(k)$ is the increasing distribution function for k.

Based on the purpose of TCB_I aimed at Scenario I is assumed as

$$TCB_1 = HC_B + OC_B + DC_B + IC_B + BC_B \quad (12)$$

The estimated joint total inventory cost (EJTCI (q, n, k)) for Situation I would then be calculated for such a system as

$$EJTC_1(q,n,k) = TCV_1 + TCB_1 \quad (13)$$

In Scenario II, TCVII consists of holding costs, vendor production costs, vendor setup cost, vendor warranty cost and investment cost to decrease lead period variance (ICV). The functions of holding costs, vendor production costs, vendor setup cost and vendor warranty cost have previously remained assumed by Equ. (1), (2), (3) and (4), correspondingly, whereas the function of IC_v is expressed as shadows:

$$IC_V = \alpha\frac{1}{b}\left(\frac{\sigma^2}{\sigma_0^2}\right) \quad (14)$$

The expenditure mechanism described above departs from earlier investigators' interpretation. The researchers in the previously articles published ignored a minimal delivery times variation variable and presumed that such value is always 0, however the proposed formulation takes into account a minimal setup time variation as part of the parameters necessary to calculate the expenditure. The supply procedure, manufacturing activities, material management, etc. all has various uncertain variables; therefore, it would be

extraordinarily challenging to reduce the time delivery variance to zero in practise. Determining the lowest time delivery variance using decision-makers' optimal process effectiveness is what we aim to do with this model.

$$TCV_{11} = HC_v + PC_v + SC_v + WC_v + IC_v \quad (15)$$

The derivation of HCB and BCB in Scenario II's buyer total inventory cost (TCBII) differs from Scenario I's according to such a retailer's expenditure. Equations (16) and (17) generate the HC_B and BC_B functions, respectively.

$$HC_B = h_b(n(1 - \frac{D}{P}(WC_v + \frac{q}{2}\left(E + \frac{1}{1-y}\right)) \quad (16)$$

$$BC_B = \frac{D^2}{nq}\sigma[I]\Psi(k)\left(E + \frac{1}{1-y}\right) \quad (17)$$

Therefore, the projected joint total inventory cost for Scenario II is expressed as EJTCII(q, n, k, 2I).

$$EJTC_1(q,n,k,\sigma^2(I)) = TCV_{11} + TCB_{11} \quad (18)$$

SENSITIVITY EVALUATION

Sensitivity analysis is carried out by altering the values of a number of input parameters and analysing how the model's ideal answer is affected. The maximum limit of the likelihood deficient function (δ), the chance cost fraction (θ), the degree of reducing defects (b), and the increasing load rate are some of the factors that will be explored (D).

Impact on the model's ideal solution

The inventory model created for this reading takes into account a manufacturing process that isn't ideal and produces the same number of damaged items. As stated previously, there exists a quantity of defective products with a frequency and a likelihood density function of f(y) = 1/δ within every lot delivered from the supplier to the customer. Where is the maximum maximum of the cumulative distribution function f(y) inside this instance, quantity of faulty items generated by the system directly correlates with their value. Inversely, greater defective products would be created the greater the value of. For Scenario I and Scenario II, which are both reported in Tables 1 and 2, we give a brief study of the implications of modifications on the model's ideal solution in this section. We note that now the modification to the model's optimum solutions includes q* and k*, according to the findings in Tables 1 and 2. The optimum shipping lot size grows as it is maintained at a higher level, and the level of service also somewhat rises. As a result, the system should raise the lot size of every shipment instead of changing the number of shipments if the manufacturing process efficiency of the system deteriorates and the quantity of faulty products rises to 0.2. In circumstances where storage costs are less than order costs, the organization determination prefer to retain the product in large quantities for a longer retro of time instead of having to instruction or bring too frequently. Even as the value rises, so does the anticipated total cost that will be borne by both companies. In Scenarios I and II, increasing vendor and buyer costs led to an increase in EJTC.

Impact on the model's ideal solution

The vendor determination incurs a fractional cost of the capital asset per unit time for accomplishing lead time variance reduction. In this segment, we offer a straightforward analysis to look into the impact of higher interest rates on the vendor's investment conclusion.

Table 3 presents the findings of the sensitivity analysis of the change in value to the model's ideal explanation.

Table 1. Effects of δ on model's optimal explanation for Scenario I

EJTC	TCB	TCV	k*	n* (shipments)	q* (units)	δ
$5,908.10	$1,757.20	$4,151.00	1.580	3	239	0.20
$5,832.40	$1,744.20	$4,088.20	1.578	3	237	0.18
$5,759.00	$1,731.70	$4,027.30	1.576	3	235	0.16
$5,688.00	$1,719.70	$3,968.40	1.574	3	233	0.14
$5,619.10	$1,708.10	$3,911.10	1.572	3	232	0.12
$5,552.40	$1,696.90	$3,855.50	1.570	3	230	0.10

$5,487.70	$1,686.20	$3,801.50	1.568	3	229	0.08
$5,424.80	$1,675.80	$3,749.00	1.566	3	227	0.06
$5,363.70	$1,665.80	$3,697.90	1.564	3	225	0.04
$5,304.30	$1,656.10	$3,648.20	1.562	3	224	0.02

Table 2. Effects of δ on model's optimum explanation for Scenario II

EJTC	TCB	TCV	k*	n* (shipments)	q* (units)	δ	σ^2(I)
$5,908.10	$1,757.20	$4,151.00	1.580	3	239	0.20	0.0055
$5,832.40	$1,744.20	$4,088.20	1.578	3	237	0.18	0.0055
$5,759.00	$1,731.70	$4,027.30	1.576	3	235	0.16	0.0055
$5,688.00	$1,719.70	$3,968.40	1.574	3	233	0.14	0.0055
$5,619.10	$1,708.10	$3,911.10	1.572	3	232	0.12	0.0055
$5,552.40	$1,696.90	$3,855.50	1.570	3	230	0.10	0.0055
$5,487.70	$1,686.20	$3,801.50	1.568	3	229	0.08	0.0055
$5,424.80	$1,675.80	$3,749.00	1.566	3	227	0.06	0.0055
$5,363.70	$1,665.80	$3,697.90	1.564	3	225	0.04	0.0055
$5,304.30	$1,656.10	$3,648.20	1.562	3	224	0.02	0.0055

Table 3. Effects of θ on model's optimum explanation

EJTC	TCB	TCV	k*	n* (shipments)	q* (units)	σ^2(I)	θ
$5,908.10	$1,757.20	$4,151.00	1.580	3	239	0.0055	$0.06
$5,832.40	$1,744.20	$4,088.20	1.578	3	237	0.0055	$0.08
$5,759.00	$1,731.70	$4,027.30	1.576	3	235	0.0055	$0.09
$5,688.00	$1,719.70	$3,968.40	1.574	3	233	0.0055	$0.05
$5,619.10	$1,708.10	$3,911.10	1.572	3	232	0.0055	$0.09
$5,552.40	$1,696.90	$3,855.50	1.570	3	230	0.0055	$0.10
$5,487.70	$1,686.20	$3,801.50	1.568	3	229	0.0055	$0.16
$5,424.80	$1,675.80	$3,749.00	1.566	3	227	0.0055	$0.14
$5,363.70	$1,665.80	$3,697.90	1.564	3	225	0.0055	$0.12
$5,304.30	$1,656.10	$3,648.20	1.562	3	224	0.0055	$0.18

The value of 2 (I) rises as does, and vice versa (see Fig. 3). In this instance, a greater value of 2 (I) denotes a poorer lead period variance in the system. The investment costs necessary to decrease the lead period variance increase with the fractional cost of As a result, the system will achieve a lesser decrease in lead time variance for the same amount of expenditure. On the other hand, a rise in price changes the choice of the company's service level and the size of the consignment lot. The optimal service level is lower, and the optimal lot extent is larger when it is greater. When the value rises, so does the anticipated combined total cost aimed at the vendor-buyer system.

Impact of b on the model's ideal answer

The decrease coefficient for the functions of σ2(I) is denoted by the parameter b. The possessions that parameter b has on the model's ideal explanation with regard to the investment choice are observed in this section (I). The optimal solution of the model for various b values is shown in Table 4. The assessment of 2 (I) determination somewhat decrease as b rises.

Yet, it has no effect on the best solution for q, k, or n. The scheme will notice a modest decrease in EJTC after the company's perspective for greater values of b. Consequently, we draw the conclusion that changing the value of b will not have a substantial impact on the model's outcome.

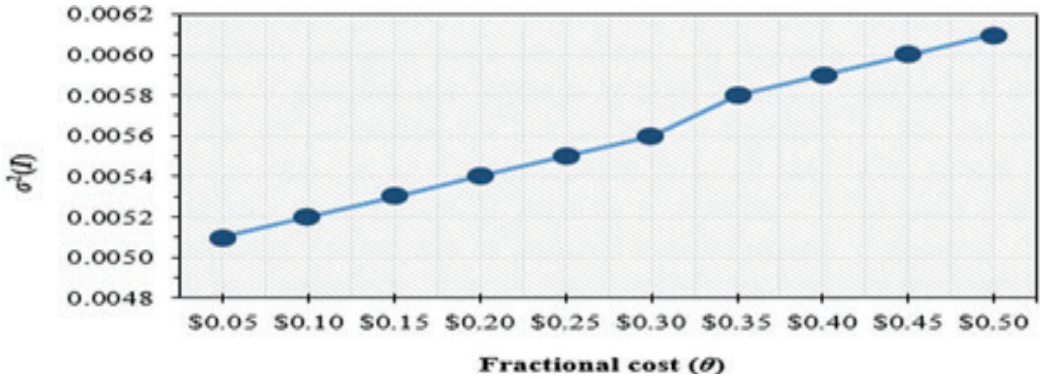

Figure 3: Fractional cost(Θ)

Table 4. Effects of b on model's ideal explanation

EJTC	TCB	TCV	k*	n* (shipments)	q* (units)	$\sigma^2(I)$	b
$5,908.10	$1,757.20	$4,151.00	1.580	3	235	0.0055	0.06
$5,832.40	$1,744.20	$4,088.20	1.578	3	235	0.0055	0.08
$5,759.00	$1,731.70	$4,027.30	1.576	3	235	0.0055	0.09
$5,688.00	$1,719.70	$3,968.40	1.574	3	235	0.0055	0.05
$5,619.10	$1,708.10	$3,911.10	1.572	3	235	0.0055	0.09
$5,552.40	$1,696.90	$3,855.50	1.570	3	235	0.0055	0.10
$5,487.70	$1,686.20	$3,801.50	1.568	3	235	0.0055	0.16
$5,424.80	$1,675.80	$3,749.00	1.566	3	235	0.0055	0.14
$5,363.70	$1,665.80	$3,697.90	1.564	3	235	0.0055	0.12
$5,304.30	$1,656.10	$3,648.20	1.562	3	235	0.0055	0.18

This study takes into account a stochastic requirement with an annual rate that is defined and fixed. We offer a straightforward sensitivity analysis of the existing changing requirements and track the performance of the model's optimal response to such variations in order to assist the judgement in managing demand uncertainty in real-world scenarios. The results of various D levels on the model's ideal explanation for Scenario I and II, accordingly, are summarised in Tables 4 and 5. Market growth will eventually alter the ideal shipping lot size (q*), protection factor (k*), and frequency of deliveries (n*) for Scenario I and II. The amount of the shipping lot and the total integer of shipments will rise along with the annual consumption. This outcome affects the annual storage costs, buying costs, and shipping costs. As a result, the supplier system's anticipated combined overall cost annually will rise as prices rise. On the other hand, a higher demand will result in a fall in the ideal safety factor k. Increasing demand will make it more difficult for the system to meet the requirement while maintaining the same production capacity, reducing the optimum value of k. The choice for the most effective time delivery, reducing the number of variables, is unaffected by changes in D, though.

Table 5. Effects of diverse D on model's optimal explanation

EJTC	TCB	TCV	k*	n* (shipments)	q* (units)	$\sigma^2(I)$	D(units/ year)
$5,908.10	$1,757.20	$4,151.00	1.58	3	235	0.0055	1200
$5,832.40	$1,744.20	$4,088.20	1.57	3	235	0.0055	1300
$5,759.00	$1,731.70	$4,027.30	1.53	3	235	0.0055	1000
$5,688.00	$1,719.70	$3,968.40	1.48	3	235	0.0055	1100
$5,619.10	$1,708.10	$3,911.10	1.59	3	235	0.0055	1300
$5,552.40	$1,696.90	$3,855.50	1.58	3	235	0.0055	1500
$5,487.70	$1,686.20	$3,801.50	1.55	3	235	0.0055	1800
$5,424.80	$1,675.80	$3,749.00	1.56	3	235	0.0055	2000
$5,363.70	$1,665.80	$3,697.90	1.56	3	235	0.0055	2200
$5,304.30	$1,656.10	$3,648.20	1.56	3	235	0.0055	2400

Table 6. Effects of diverse D on model's optimum explanation for Scenario II

EJTC	TCB	TCV	k*	n* (shipments)	q* (units)	$\sigma^2(I)$	D(units/ year)
$5,908.10	$1,757.20	$4,151.00	1.55	3	235	0.0055	1200
$5,832.40	$1,744.20	$4,088.20	1.49	3	235	0.0055	1300
$5,759.00	$1,731.70	$4,027.30	1.52	3	235	0.0055	1000
$5,688.00	$1,719.70	$3,968.40	1.43	3	235	0.0055	1100
$5,619.10	$1,708.10	$3,911.10	1.49	3	235	0.0055	1300
$5,552.40	$1,696.90	$3,855.50	1.47	3	235	0.0055	1500
$5,487.70	$1,686.20	$3,801.50	1.59	3	235	0.0055	1800
$5,424.80	$1,675.80	$3,749.00	1.56	3	235	0.0055	2000
$5,363.70	$1,665.80	$3,697.90	1.56	3	235	0.0055	2200
$5,304.30	$1,656.10	$3,648.20	1.56	3	235	0.0055	2400

The best course of action in terms of reducing time delivery variation would maintain the same regardless of the quantity of demands every year. So, we see that consumption uncertainty only has an impact on the resolutions of q, n, and k and has no impact on the decision of $\sigma^2(I)$.

CONCLUSIONS

This study develops a comprehensive inventory model aimed at a single-vendor, single-buyer system that precedes into account setup time variation, decreased investments, and imperfect manufacture processes. The decrease of the anticipated combined overall cost between the purchaser and the seller is the purpose of this research. Land area, security factors, goal setup time variation, and the frequency of deliveries from the supplier to the customer are among the selection variables in the model. To tackle the optimization challenge, we suggest an iterative process. Unfortunately, the outcome can only secure regional optimal solutions; it cannot promise a world's ideal solution. The findings of this article demonstrate that the system's ability to satisfy demand and anticipated partnership overall price per year will both be improved by the expenditure to decrease time delivery variance. Consequently, we draw the conclusion that investment policy has been shown to enhance system results. To determine how parameter changes affect the best possible solution for the model, we do a straightforward evaluation. According to the findings, we can see that a rise in the percentage of defective products will substantially increase the anticipated extra expense of the system,

while the partial cost of capital and correlation of invested capital have an impact on choices regarding reducing lead time variance and the overall assumed overall expense of the vendor-buyer system. A number of caveats in this paper's proposed paradigm warrant further investigation. Our methodology assumes that vendors have unrestricted access to sufficient funds to fund the significant investments required to reduce lead time variation. But, in reality, the vendor might not have enough cash on hand to fully fund the lead-time investment. The next model can be modified to meet these requirements by working within the constraints of the available resources. The proposed model takes into account a basic supply chain with just a buyer and a seller in the later stages. The logistics chain is more intricate than this. Many vendors and buyers may be components of the supply chain. If we assume that buyers are willing to contribute to the vendor's investment, we can refine the model to find the best way to allocate buyers' contributions. Another avenue for expanding the research is to look into the inspection procedure. The proposed approach presupposes a totally flawless buyer inspection. Human error is a possibility during the inspection procedure. The examiner may label the defective substances as "non-defective" or the faulty ones as "excellent." So, it might be more realistic for an industrial context to incorporate both imperfect inspections and flawed quality into the vendor-buyer paradigm.

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Digital Sustainability Through Educational Transformation: A Review Analysis

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ABSTRACT

Engendering knowledge for emerging technologies and social innovation, educational institutions and the education system plays critical role in advancing and putting into practice the United Nations' (UN) 2030 Agenda for sustainable development (SD) and the digitalization of society. In order to direct actions towards sustainability throughout the entire education system, which includes education, research, campus operations, community outreach, assessment, and reporting 2018, educational institutions must support sustainable development in their infrastructure, decision-making processes, and pedagogical practices. The global technological revolution has exacerbated social and environmental problems. Nonetheless, there is currently a literature vacuum on rigorous evaluations and analyses of digital sustainability in the context of education and educational institutions as important stakeholders. In order to solve this problem, the proposed study identifies the overall state of the art, the theoretical stances in the field, and the potential directions for future research in order to investigate how digital sustainability (DS) might help to fulfil the goals of sustainability in education. The use of multiple methodologies has been implemented, with qualitative content analysis being one of them. In line with this methodology, 40 relevant, well-written publications were subjected to bibliometric analysis using a major indexing database. To close the literary gap, a content study of all the chosen publications was conducted.

KEYWORDS: *Higher educational institutions, Sustainable development, Digitalization, Educational transformation, Digital education, Educational institutions, HIEs.*

OVERVIEW

Sustainable economic development and digital transformation have had a significant impact on educational systems in almost every country in the world in recent times. Nevertheless, it is regrettable that certain nations have not fully benefited from technical advancement in today's rapidly advancing digital world [1]. Lack of digital skills and knowledge is one of the key causes of the gap in technological innovation and acceptance. In comparison to other Southeast Asian nations like Malaysia (69.03), Thailand (55.04), Singapore (90.82), and Indonesia (46.72), Vietnam's Digital Evolution Index (DEI) is low at 46.79. The necessity to support digital change in Vietnam's education system is evidently best served by DEI insights (Knoema, 2021); yet, some researchers have concluded that the process of digitizing schools is difficult (Lindqvist & Pettersson, 2019) [2].

HEIs, a major participant in the country's educational system, aid in catching up in a number of areas related to the development of digital skills in school level learners, minors, and, to a lesser extent, adults. HEIs must use digital technologies and take the lead in fostering the expansion and improvement of their own ecosystems. Higher education institutions must become hubs of digital innovation by offering the training required to handle the paradigm change. One of the cornerstones of the UN's 2030 Agenda for Sustainable Development is high-quality education, with the goal of fostering opportunities for lifelong learning and inclusive, equitable quality education. In an effort to enhance learning and fortify the resilience

of educational systems, UNESCO has started drafting the Declaration on Connectivity in Education. Digital learning can better suit individual needs and lower the cost of training access (OECD, 2020) [3].

Higher education's future lies in the shift to virtual learning. The global context of work and life has been altered by the ongoing COVID-19 epidemic. University systems need to adapt to the digital revolution, where disruptive technological breakthroughs are driving change, in order to remain competitive and continue providing high-quality education. This paper aims to achieve this by describing the challenges and obstacles universities face, the technological tools and strategies they must employ in the current higher education transformation scenario, and the role of higher education institutions in the face of COVID-19 upheavals, along with other commercial enterprises and state institutions [4].

In conclusion, since gradual digitization does not culminate in the total overhaul of the school, it is possible to analyse it through the conceptualization of tiny milestones in the process. Learning entails a complete overhaul of systems and processes, including qualitative adjustments to cultural norms, practices, objects, and activities. This in turn ought to help provide a picture of the many learning tiers and the stages involved in school transformation [5].

For example, we have classified knowledge about climate change as an environmental achievement, but in an academic setting where science is taught to students according to a curriculum designed around government regulations and standardized tests, this knowledge can just as well be classified as an academic achievement. However, the government's K–12 energy efficiency initiatives, which serve as the foundation for this analysis, place a strong emphasis on non-academic accomplishments (such those that benefit the environment, civic involvement, and health). This might be a sign that the knowledge children learn in the classroom is being shared via the prism of conventional academic achievement. While a school-wide approach to resilience is required, if educational institutions continue to use a pedagogy where students rely on their teachers for knowledge, then change is difficult to occur [6].

One-time interventions might not have much of an impact, thus ongoing instruction throughout the school years that focuses on several aspects of sustainability might intelligently shift young kids' perspectives about the environment. By testing alternative instruments, like the Attitudes towards Sustainable Development scale, which is based on measuring numerous aspects of the environment, economy, society, and education in comparable contexts, future research can investigate students' attitudes toward sustainability and their relationship to other variables. An action plan that looks at how the education sector can reduce, adapt, educate, and promote equity needs to be prepared in order to respond to and combat climate change. These materials seek to create a society that is solution-oriented and in which people have the skills and knowledge to affect the economy, society, and environment [7]. Good youth development and peace education are two examples from a variety of professions that have outcomes that are in line with energy efficiency. Our research focuses on the noteworthy findings, organization, and content of multiple peer-reviewed articles that have recently been published and are connected to K–12 environmental education. It shows that the range of the research findings is one of the many ways that the field of environmental education (EE) research is expanding [8].

EDUCATIONAL INSTITUTIONS TOWARDS DIGITALIZATION

Digitization is largely responsible for the fast changes that are occurring in the field of education. The term "digitization" in education describes how digital tools like online learning, virtual classrooms, and digital textbooks are incorporated into regular classroom instruction. The transition to digital learning has been made feasible by technological advancements that allow teachers to deliver pupils individualized lesson plans and curricula. For educators and learners alike, the digitization of the classroom has created a multitude of opportunities. For instance, teachers may now quickly and easily access a wide range of resources, which enables them to design classes that are more engaging for their pupils [9]. Furthermore, examinations and grades are now easier and faster for students to access online than they were in the past. But there are certain drawbacks to digitizing schooling as well. For example,

it might be challenging for educators to stay current with technological advancements or guarantee that every student has access to the tools they need. Concerns regarding student privacy could also arise from the use of digital tools in the classroom. Notwithstanding these obstacles, digitalization in education is here to stay and will keep changing the way we teach and learn. It has already significantly changed the way we learn by giving us new chances for student-teacher cooperation and allowing us to access educational resources from any location [10].

Improve efficiency and optimize performance

When it comes to college and university websites, maintaining the lights on requires a great deal of muscle. Hannah Smith of the Green Web Foundation warned delegates at HE Connect that digital assets are hosted on vast server farms that require massive amounts of energy to power up and cool down. They do not reside "in the cloud." As per the Green Web Foundation, data centres provide for approximately 2% of the global electricity demand, with fossil fuels providing the remaining 60%. The Foundation recommends that you move to a verified green hosting provider in order to help prevent, minimize, or offset carbon emissions related to your educational website [11]. Energy efficiency is also influenced by the design and upkeep of your website and other digital properties, in addition to hosting. To begin with, slow load times affect user experience as well as energy consumption. Energy consumption can be minimized and performance can be optimized with a clean codebase, caching, compressed graphics, and a leaner overall website. Don't be hesitant to simplify or even delete code, as advised by the W3C guidelines [12].

Declutter your content: cleaning out your CMS

If your institution has conducted a web content audit, you have probably come across (unburied?) problems with old PDFs, different resolutions and versions of the same headshot, and other old assets clogging up your CMS. Consider conducting a thorough website inventory as soon as possible if you haven't done one recently. When identifying content overload, Screaming Frog and other similar tools can be a great place to start. Better web governance guidelines in the future can aid in reducing version control problems with PDFs and other downloaded assets.

Utilize content delivery networks (CDNs), digital asset management providers, or even some, possibly underutilized features in your content management system to reduce duplicate image/media assets and speed up load times [13].

Taking out the trash: digital devices, physical waste

The issues go beyond what is cluttering up things behind the scenes or eating up space in the cloud. Significant physical waste has also been produced by technology that is changing quickly. Some would even contend that manufacturers of computers, smartphones, and other gadgets appear to be planning their items' obsolescence. Concerns over the proper disposal of obsolete electronics are developing as more people upgrade their digital gadgets more frequently, whether for personal, professional, or educational purposes. Consider how many gadgets are present on your campus, from desks in every dorm room to administrative offices and research labs. Many college campuses are offering support to their staff, instructors, and students in order to deal with this issue. One illustration is the University of Kansas's information technology department, which provides a detailed explanation of its initiatives to lower e-waste both on and off campus [14].

Consider the sustainability of online archives and digital preservation

Academic libraries have evolved to meet the needs of emerging technologies and shifting social mores, making them indispensable resources. eBooks and online publications take up space even though they don't fill the shelves of the stacks. Many academic librarians, archivists, and scholars have studied the implications of digital preservation and how to strike a balance between being responsible digital citizens and being faithful stewards of information during the past ten years. In a recent study, a team of Harvard experts found that if digital preservation depends too much on technological infrastructure, the organization in charge of maintaining digital content may lose its focus on sustainability. Virginia Tech digital librarians discussed how advancements in HVAC systems and other environmentally friendly collection management techniques emerged in the 1980s. Because of the intangible nature of contemporary technology advancements, digital content managers are now

practically cut off from a "similar physical awareness of the environmental impact in their day-to-day work". Put differently, the saying "out of sight, out of mind" may very well apply when we save things digitally—and this holds true for both a single hard drive and a substantial museum archive [15].

Educating and empowering users

Perhaps training the next generation of environmental stewards is another method for academic institutions to contribute toward digital sustainability. IT departments at many colleges and universities also encourage students to clean out digital clutter on their own devices, even outside of sustainability classes and school-owned websites [16].

DIGITALISATION OF EDUCATION

The problems facing education have never been resolved by integrating technology into the classroom on its own. But education has changed and will continue to change as a result of digitalization in ways that are intricate, constantly changing, and often seem beyond our comprehension. COVID-19, which brought about catastrophic upheavals and new formations in teaching and learning under situations of global emergency, accelerated this transformation. The epidemic also accelerated several "digital divides." Despite the growing interest in technology in education policy, planning, and practice as well as research, many areas that are critical to understanding the digitalization of education remain understudied, and the knowledge that does exist is not distributed adequately [16].

ISSUES TO MANAGE DIGITAL SUSTAINABILITY

Digital Education, the way forward

"Technology can never replace great teachers but technology in the hands of great teachers is transformational" George Couros, the digital age we live in is here. Furthermore, technology now permeates every part of our existence. Schools are not far behind; the education industry is bringing digital to life through online learning and digital classrooms. However, do educational institutions, learners, and society at large view digitization as a threat or as a benefit? Are you aware of this? Globally, an estimated 1.5 million additional employments will be digitized by 2020 [18]. According to a different World Economic Forum study, 65% of kids starting elementary school will work in jobs that don't exist now. Therefore, the education sector must rapidly adapt to meet the growing need for IT skills in order to develop the talent required for the digital economy." It has always been up for discussion. The most obvious reason we hear is that technology has advantages and disadvantages. Although the teacher-student dynamic is still seen as the most motivating way to learn, technology's role as a facilitator has advanced significantly in the twenty-first century. Academics and curricula are not the only aspects of education and learning [19]. A digital classroom is devoid of peer interaction, teacher-student exchanges, and the casual classroom environment. But in these modern times, technology has affected everyone. Let's examine some of the benefits of digital education to get both sides of the debate and a comprehensive understanding of how technology is seen in classrooms. This is why digital learning is the future of education [20].

- Simple method for giving the pupils the content.
- Student access is simple: students have no trouble accessing a variety of resources.

Enables educators and learners to try new things and be creative. Establishes connections between educators, learners, and parents in various places.

- Given the ease of use and the visuals it provides; technology is an essential tool for increasing student engagement.

The abundance of tools available makes research and learning enjoyable.

- There is no repetition or boredom because one can be creative and cut down on printing tasks.

The use of technology in education has disadvantages in addition to the benefits mentioned above. Below is a list of a few: [21]

- Digital technologies shorten an adult's and child's attention span since they are distracting.
- Inappropriate content, video games, especially violence, can have an adverse effect on young adults' mental and physical health;
- Not affordable for everyone;

- Digital tools increase the scope for malpractices during examinations;
- The reliability of information available online is occasionally questioned;

Even though technology can facilitate a great deal of learning, cooperation between parents, educators, and schools can be very beneficial to the group. Teachers use technology to enhance learning when they provide students with high-quality, reasonably priced resources. In summary, technology is vital, but it's actually only a means to an end, as stated by Brian Greenberg. The true secret to success is granting exceptional teachers autonomy and permission to operate in a school." What is required is a forward-thinking educational institution with a strong moral code and a focus on intellectual brilliance. What makes the difference is preparing children to be good citizens and using technology to navigate the global community. Students must have access to a special platform that allows them to "explore, discover, learn, apply, analyse and create." The teaching methodology, facilities, and technology in education are all of the highest caliber. The institution is undoubtedly a step above the rest with its integrated curriculum and global viewpoint [22].

NEED OF DIGITAL SUSTAINABILITY

Digitalization is revolutionizing our interactions with the environment, impacting markets and consumer behavior in addition to monitoring ecosystems and conserving resources. By using digital technology responsibly, we can address a variety of environmental issues, mitigate and prepare for the effects of climate change, and ensure the survival of our planet and future generations. After all, without making use of digital tools and opportunities, we will not be able to bring about the kind of widespread and rapid behavioral change that is necessary for global sustainability. There is no indication that the expanding impact of technology on our society will slow down. As a matter of fact, in practically every industry, digitization is positively correlated with profitability and competitiveness [23]. As a result, an increasing number of firms are making investments in long-term, sustainable digital solutions that facilitate employees' daily tasks and improve organizational efficiency. Digital tools and devices are now essential for corporate operations as a result. Businesses today spend a lot of money on technology in order to automate and streamline processes that frequently need a lot of resources. Many people overlook the fact that purchasing new technology alone is insufficient, though. Additionally, it needs to be customized to the job duties carried out by staff members and the real needs of the company. Technology is essentially useless if it does not function as it should. Mobile devices used by a firm are one instance of this. Giving workers cell phones or other digital devices is simple, but keeping track of a large amount of technical equipment over time can be challenging [24]. In addition, the IT department faces challenges and time constraints in developing sustainable asset management procedures and managing the entire lifecycle of devices. The quantity of electronic waste is increasing along with the number of digital and mobile gadgets. This is a byproduct of our current, fast-paced digitalization. When this waste is produced, a substantial quantity of energy is used and carbon dioxide is released, in addition to the waste's negative environmental effects. To put it another way, the development and use of mobile devices will always have a negative impact on the environment. Circular device management, on the other hand, is the ideal option if, in response to the aforementioned queries, you wish to handle business mobile devices in a more sustainable manner [25]. In this situation, an outside partner that offers administration and support for the duration of the devices' lives can be quite beneficial. This kind of technology, which reduces resource consumption and encourages more responsible use, has a great deal of promise to assist businesses in achieving a more long-term and sustainable digitalization. It also implies that you may optimize the gadgets' lifetime and total worth, creating a win-win scenario [26].

SUCCEED WITH DIGITAL SUSTAINABILITY

In the upcoming years, there will probably be a noticeable increase in the expectations on corporate digital sustainability. As a result, it's critical to be ready and to have a solid grasp of the elements required for sustainable digitalization. What actions can you take, then, to make sure your business is prepared to handle the demands of digital sustainability? Investing in technology that is long-lasting and recyclable is the

main idea here. In addition, you must make sure that the gadgets are compatible with the IT environment, safe to use, and easy to operate. By doing this, your business may lessen its long-term financial impact, minimize its environmental effect, and give staff members the resources they require to work effectively and efficiently [27].

THINGS TO CONSIDER

"Everything that can be digitised should be digitised" — Complete digitization is essential for corporate success if you want to see long-term improvements in sustainability and competitiveness. Why not commit fully now? Recall that investing in technology alone is not the only solution. Digitize in a way that works for your company. An organization that makes constant improvements is typically more prepared for the future [28].

Test your organisation. How digital are you really? What issues do workers deal with every day? Exist any issues pertaining to mobile devices? What changes could be made to procedures and policies, including controlling the security of personal smartphone use, to make them more sustainable? Including a partner can assist your business in resolving these problems.

Innovation and change have always been essential to success. It is only a plus if you can also make your employees' daily lives easier. So, can you improve your routines and communication while preventing production halts and interruptions using functional mobile devices? [29]

Hire based on need, not price. To guarantee the best outcomes, include pertinent sustainability requirements in the acquisition of goods and services. In a contemporary workplace, it is no longer advised to procure using a budget.

Educate and inform the organization's members on cybersecurity and information. By doing this, the business is strengthened and the possibility of unfavourable effects from digitalization and mobile device use is reduced. [30]

STEPS TOWARDS DIGITAL SUSTAINABILITY

Over the past 20 years, there has been a remarkable surge in the number of Internet users throughout the Arab world. With 327 million users in 2022, the region's Internet user base grew dramatically from 28.8 percent in 2012 to 70.3 percent in 2022. Governments in the area are being forced to emphasize the quick adoption of digital technologies with a special emphasis on resolving the digital gap to leave no one behind due to the abrupt surge in digital technology use, which has been further exacerbated by the Covid-19 pandemic [31]. The growing digital divide, characterized by differences in internet access, ICT (information and communications technology) usage, bandwidth distribution, and demographic differences, is a frequently discussed issue of concern. This addresses inequalities in urban and rural areas, gender, and accessibility for those with impairments. A third of people do not use the internet, with women, rural residents, the elderly, and those with disabilities being disproportionately impacted and represented. Apart from hindering the overall adoption of ICTs in society, these problems have also sparked grave worries and challenges for digital transformation and the successful implementation of digital government initiatives. The Arab world must thus solve these problems and reduce the digital divide in order to fully achieve the unmet promise of digital revolution. In order to do this, it will be important to work hard to encourage inclusivity and ensure that every member of society has equitable access to digital technologies [32]. Given this, the Strategic Plan (SP) 2022–2025 of the United Nations Development Programme (UNDP) delves deeply into the advantages and hazards of digital transformation, emphasizing three key areas of change: resilience building, leaving no one behind, and structural transformation. It was discovered that strategic innovation, development finance, and digitization are significant enablers of sustainable development in this particular setting. Governments, corporations, and international organizations must collaborate in order to implement the UNDP Strategic Plan, as these institutions must recognize. By advancing ethical and inclusive digital solutions, this kind of relationship creates an environment that is conducive to long-term, sustainable growth. Encouraging collaboration among governmental organizations, digital enterprises, and other pertinent stakeholders can expedite the transition towards a future characterized by greater resilience and sustainability.

Digitalization has the ability to significantly increase efforts towards equitable growth and economic diversification through the creation of new jobs, especially for women and young people, supply chain connectivity, and financial services and solutions. Cooperation between UNDP and several stakeholders from the digital and private sectors is crucial to advancing positive change, sustainable development worldwide, and the Sustainable Development Goals (SDGs) [33]. Through these strategic alliances, UNDP intends to implement useful programs that address pressing global issues like poverty, inequality, climate change, and access to high-quality healthcare and education. By combining resources and expertise from the public and commercial sectors, these collaborations have proven remarkably effective in developing tailored solutions to address specific local and national issues. India's strong economy was on display during its G20 presidency in 2023, when it contributed 16% to global growth at a growth rate of 7.2%. The tech industry's continuous progress shows improved livelihood options, particularly in rural India, where more than 425 million people have access to the internet. Historic initiatives like Digital India and Aadhaar have empowered millions of people and made India a significant player in the emerging digital economy. To be in accordance with this vision, it is also important to take into account the Sustainable Development Goals (SDGs) of the 2030 agenda, which have a significant influence on India's development strategy [34]. However, in an era where technology is transforming our lives at an accelerated rate, it is crucial to recognize that a substantial portion of the population remains unaffected by these advancements. The Sustainable Development Goals (SDGs) call for worldwide cooperation to guarantee everyone lives in peace, fairness, and prosperity; to eradicate all forms of poverty and inequality; and to halt environmental deterioration and climate change. Following the SDGs and other global targets not only gives us a clear roadmap for implementing social changes, but it also makes it simpler for us to keep track of our progress. In this setting, three major players emerge: the corporate world, the government, and social entrepreneurs. They might serve as equalizers, bridging the gap between high-tech solutions and marginalized rural people. They help make sure that the digital revolution benefits even the most remote regions by bringing new innovations to the "last mile." Unfortunately, India has challenges in achieving the SDGs, the most important of which is the absence of fair financing for meaningful social innovations. To overcome this, we need more cooperation networks and financial options for social innovation. The private sector needs to supply funding, technology, incubation, coaching, and partnerships in order to offer scalable solutions for mainstream finance [35]. Furthermore, a significant obstacle to sustainability and growth is the absence of an ecosystem that fosters social innovators. It will require concerted efforts to provide a supportive environment with the required tools and resources in order to face this task. The absence of robust networks and collaborative efforts among numerous stakeholders poses a significant obstacle to achieving the goals. The SDGs will need to be accomplished through teamwork driven by a shared goal of leveraging technology to effect positive change. All-encompassing problem-solving is made possible by combining expertise from many industries, with a focus on data-driven solutions, networking technologies, and digital innovation to maximize efforts. These problems can be addressed through the intersectionality of technology, which makes it a force multiplier and gives hope for progress. India has seen a significant change as a result of digitalization, with the goals of enhancing data accessibility, promoting inclusivity, and empowering individuals. Since the next six years are crucial for India to become the world's third-largest economy by 2030, leveraging technology also presents an opportunity to accomplish the government's aim of reaching Viksit Bharat by 2047. The Nasscom Foundation has been advancing digital literacy in rural communities in order to achieve this aim since we are aware that inclusive growth needs to go the extra mile in order to make a big difference. The main objective of the Nasscom Foundation is to implement Tech for Good, which is key to the government of India's "Digital India" initiative. In order to provide technology at the grassroots level, we launched the Aspirational Districts Programme in India with the intention of empowering the impoverished populations in the aspirational districts by enhancing access to government programmes and promoting digital literacy. We have already

established digital resource centers in 45 districts across 20 states to promote digital literacy. Another essential component of the nation's economic prosperity is skill. Giving young people the technical skills they need is essential, but there is still a significant skill gap. In order to close this gap, our Skilling and Employability Program trains youngsters from tier 2 and tier 3 cities in soft skills and advanced technical capabilities including Data Science, Cyber Security, IoT, Data Analytics, Python, and Java Full Stack. This will help students land positions in tech-related firms and prepare them for the future. The project impacted almost 6.4 lakh lives in FY 2022–2023. We believe it's crucial to involve marginalized groups in the digital economy, such as rural women entrepreneurs, in addition to skill development. More than a million women have profited from using internet platforms such as YouTube, Pinterest, Instagram, and WhatsApp Business through the Nasscom Foundation's Women Entrepreneurship Programme. These women have been able to market their products, access relevant government programs, and grow their businesses by reaching a wider audience. Additionally, the Nasscom Foundation collaborates with businesses to implement programs aimed at encouraging social entrepreneurship among college-age students. Our TechForChange and Thingqbator programs are great efforts in this regard. These are the kinds of resources that support students' creativity and foster an entrepreneurial spirit. Both programs aim to foster stakeholder engagement in order to establish a robust ecosystem. They are being run in collaboration with Cisco and Cienna, respectively. Furthermore, we work with early-stage entrepreneurs and government agencies such as the BIRAC to deploy health technology appropriate for low-resource settings, especially in rural areas [36].

STEPS TO BE TAKEN FOR DIGITAL AND SUSTAINABLE TRANSFORMATION

In order to meet these objectives and overcome obstacles, organizations in the technology industry such as ours should facilitate sustained digital modernization.

Environmental impact assessment: It is imperative to study the ecological impact and determine whether more sustainable options exist before embracing or implementing new technologies.

Sustainable infrastructure: As the problems section makes clear, technical infrastructure needs to be constructed and maintained in a sustainable manner, utilizing recyclable materials and renewable energy sources, among other things.

Social and ethical responsibility: Users and technology companies alike have a moral and social obligation to take accountability for their digital footprints, uphold moral standards, and support human rights.

Equitable access: Steps need to be done to guarantee that people have equal access to information and technology.

Active participation: As previously said, in order to maintain a sustainable strategy, all stakeholders—including technology suppliers, users, and regulators—must actively participate in decision-making related to technology.

Education and awareness: It's critical to advance education and raise people's understanding of the value of digital sustainability and their personal roles in achieving it.

Laws and regulations: Safeguarding privacy and human rights is just one aspect of the strong foundation that laws and regulations should provide for digital sustainability [37].

CONCLUSION

Technology advancement has changed society in a number of ways. The pandemic accelerated the digital transformation of educational institutions since it made it possible to continue with teaching and learning activities through the use of digital technologies. Furthermore, with the sustainability problems that humanity is currently experiencing, educational institutions are viewed as essential to the formation of responsible citizens and leaders. As a result, utilizing technology to assist students in developing sustainable abilities presents both an opportunity and a difficulty for educational institutions. It is believed that academic institutions may collaborate to address global concerns including social injustice, energy, climate change, education quality, and responsible consumption and production by establishing a link between digital transformation and sustainability initiatives. Teaching law-abiding citizens

and encouraging a sustainable culture across the university system are two ways to achieve this. The fact that a careful review of the body of existing literature also indicated a theoretical vacuum about the role that digital transformation plays in promoting sustainability in learning environments serves to emphasize the novel aspects of this study. It contributes by outlining the overall status of the field's research, theoretical stances, and potential lines of inquiry. A mixed review approach that blended qualitative content analysis and quantitative bibliometric analysis was used to look into these issues. In addition to providing theoretical support to the academic community and directing sustainability and digital practices in educational institutions, this study may be the first to conduct both bibliometric and content analyses in a literature review on the digital transformation of higher education to sustainability. This study especially examines a number of studies that emphasize various tools, tactics, and methods that could help with sustainability initiatives in educational settings.

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Cross-border Mergers and Acquisitions: A Systematic Literature Review to Develop Future Research Agenda

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ABSTRACT

Cross-border mergers and acquisitions (CB M&A) are widely used strategies by businesses to maintain a competitive edge to compete in the fast-paced global marketplace. This research field holds excellent attention among researchers because many aspects are still unexplored. We used a systematic literature review to assists researchers in broadening and improving the rigor of their literature review. A seven-step methodology (SSM) has been introduced for the systematic literature review, following PRISMA guidelines, TCCM framework, and bibliometric analysis, to create a comprehensive dataset from 2010 to 2023 using the Web of Science database. Theory, context, characteristics, and methodology are all examined in the literature. Simultaneously, bibliometric analysis aids in studying and analyzing divergent viewpoints and exploring the field's evolution. The current evaluation reveals the changing patterns in research streams, most prolific nations, co-citation analysis, and central themes in CB M&A literature. Results from bibliometric analysis indicate that valuation and performance are emerging research areas.

Furthermore, the assessment reveals a chance for researchers from underdeveloped countries to advance the underlying research stream considerably. In addition, the study identifies future research directions in CB M&As. This study also incorporates previous researchers' knowledge and provides a research plan for the future.

KEYWORDS: *Cross-border merger and acquisitions, Structured literature review, Seven-step methodology, Bibliometric analysis, TCCM.*

INTRODUCTION

Mergers and acquisitions (M&As) facilitate accelerated corporate growth beyond organic means. Given the challenge of discerning between mergers and acquisitions, prevailing scholarly discourse utilizes the terms "merger," "acquisition," and "M&A" interchangeably. A merger denotes the amalgamation of two enterprises into a singular entity, entailing the consolidation of debt and equity. Conversely, an acquisition refers to the acquisition of one company by another, which may transpire either amicably (with shareholder approval) or contentiously (through purchasing shares from the stock market by the acquiring firm).

Merging with or acquiring an established company can fulfill various objectives. Companies engage in M&As to diversify business, enter foreign markets, gain access to resources, foster deliberate learning, and reinforce market power. Nevertheless, M&A transactions encounter several challenges, including target firm valuation, the establishment of synergies, the integration of human resources, the process of organizational learning, and the need for more experience executing such deals. Consequently, numerous M&A transactions

either fail or fall below expectations. Scholars also examine cross-border transactions to address additional complexities, such as determining an appropriate entry mode for foreign markets and assessing the impact of cultural differences on acquisition performance and organizational learning. M&A subject has been analyzed before, and the main reason for researchers to explore more is that inconsistent results hinder understanding the phenomenon that affects performance. This research aims to demonstrate the themes within the literature on the relationship between Risk, return, and CB M&As and gives direction for approaching research.

In the study by (Chiaramonte et al., 2023), 354 authors and 174 works on M&A in the financial industry from 1987 to 2021 were content- and bibliometrically analyzed. Additionally, a study conducted in 2023 by (Cumming et al., 2023) offers an examination of the main issues and publication trends in the field of finance and accounting research on mergers and acquisitions. It envisions the dynamic view of the extent by average citation per year, annual scientific contribution, maximum cited keywords, co-citation network of keywords, and trending topics. The research will aid in systematically identifying the research area's development. The TCCM framework is used in the study to categorize the literature and, to obtain answers about what elements are commonly used, and help provide future research directions. The present study endeavours to answer four research questions which are as follows:

RQ1: What is the current status of research trends in the area of cross-border mergers and acquisitions?

RQ2: Which sources and studies have had the greatest impact on the literature?

RQ3: What are the newest and most widely discussed research subjects and concerns in the field of cross-border mergers and acquisitions?

RQ4: What are the future research directions for researchers and academics in this domain?

The complete document has been partitioned into distinct sections and subsections. Section 2 provides an overview of the subject matter covered in prior literature. Section 3 outlines the research methodologies employed. Section 4 elucidates the findings derived from the bibliometric analysis, followed by the TCCM analysis. Lastly, the remaining sections of the paper synthesize the conclusion and propose avenues for future research.

PRIOR SYNTHESIS ON RISK, RETURN, AND MERGERS AND ACQUISITIONS

Financial Risk Literature

Financial risk modeling can be categorized into (1) reduced-form models, (2) accounting-based models, and (3) structure-form models. Two often employed accounting-based techniques are the models proposed by (Altman, 1968; Ohlson, 1980). Financial risk may be measured using composite indicators that systematically incorporate several accounting elements. The Altman model consists of five elements that have the highest predictive capacity, while the Ohlson model use nine accounting-based variables. Following the release of Altman's Z-score model, more research has been conducted to expand upon the Z-score model (Agarwal & Taffler, 2007; Altman et al., 2016).

The modelling of financial hazards arising from (Black & Scholes, 1973) and (Merton, 1974) is done by structural-form modelling. Furthermore, reduced-form models make the assumption that the bankruptcy process is determined externally and is not influenced by the firm's core assets (Duffie & Singleton, 1999; Jarrow et al., 1997).

Takeover activities Literature

Wealth and takeover effects of targets

The study conducted by (Berger & Ofek, 1996) investigates the impact of the value effect of diversification on the likelihood of takeovers. The findings demonstrate that companies experiencing greater value losses are more inclined to engage in takeovers. (Schwert, 2000) provides evidence in favour of the utilisation of target management entrenchment and negotiating tactic in hostile takeover conflicts. Gains from hostile takeovers are generated by removing current management, whereas revenues from favorable takeovers are generated via planned collaborations. (Jayaraman et al., 2002) Investigated the influence of wealth on shareholders of target and acquiring funds and found significant improvements in post-merger

performance for target fund owners. (Greenwood & Schor, 2009) further demonstrate that the returns on announcements and the long-term abnormal returns are substantial for targets that are eventually purchased. Briefly, the wealth impacts of objectives are generally good.

Acquirers' Wealth and Takeover Effects

Many studies have discussed post-M&A performance; moreover, compared to research on target shareholders' wealth impacts, research on acquirers' wealth effects needs to be clarified. Related papers include (Rao-Nicholson et al., 2016; Papadakis & Thanos, 2010; Rahman & Limmack, 2004). Previous studies indicate enhancements in the long-term operational effectiveness of corporate acquisitions, as demonstrated by (Rahman & Limmack, 2004; Kumar & Bansal, 2008; Lin & Piesse, 2003). However, there are other papers that record a decline in performance after mergers and acquisitions, such as the work of (Mantravadi & Reddy, 2008). In contrast, several studies indicate that there are no substantial differences in profitability before and after mergers and acquisitions (Papadakis & Thanos, 2010; Dutta & Jog, 2009).

Analysis of Financial Risk and Takeover Activities

The prevailing body of scholarly works regarding the correlation between Risk and takeover predominantly examines the influence of leverage on acquirers' financing of takeovers and subsequent alterations to their capital structure. Enterprises that enhance their leverage after an unsuccessful takeover attempt exhibit diminished susceptibility to being taken over compared to enterprises that refrain from augmenting their leverage. The research suggests that targets that deliberately escalate their leverage act in the utmost interests of their shareholders and mitigate the peril of being acquired. The source cited is (Novaes, 2002). Records indicate that increased leverage may be seen as a positive indication of management's capacity to improve value. However, it can also be interpreted as a bad sign if managers who are not efficient are forced to take on more debt.

Furthermore, according to the dynamic model proposed by (Morellec Zhdanov, 2008), it is predicted that acquirers with lesser leverage are more likely to be successful in takeovers..

RESEARCH METHODOLOGY

Several researchers in previous studies have put forth distinct procedures for conducting a comprehensive literature review (Gupta et al., 2019; Dubey et al., 2017). The results obtained from these comprehensive examinations of the existing literature were utilised to develop a suitable approach for conducting the review in accordance with the research objectives. The PRISMA framework was developed by (Liberati et al., 2009) and is used to carry out the SSM. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework is a set of guidelines and a checklist designed to improve the transparency and completeness of reporting systematic reviews and meta-analyses. The checklist includes items that authors should address when preparing a systematic review or meta-analysis, covering different aspects of the research process, from identifying studies to presenting results. Researchers and practitioners can refer to the PRISMA guidelines to better understand the methodology and results of systematic reviews and meta-analyses, promoting evidence-based decision-making in various fields. Figure 1 summarizes the SSM used to accomplish the research objectives.

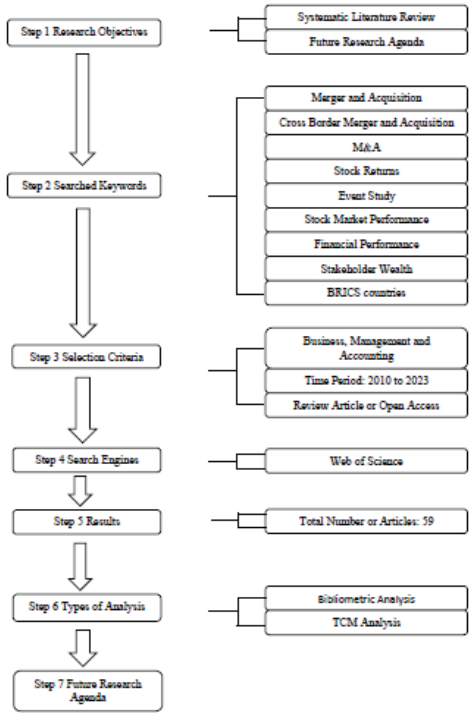

Figure 1: Summary of seven-step methodology

A systematic literature review is a methodical procedure used to locate and choose relevant studies that might provide answers to specific research inquiries (Singh et al., 2020; Srivastava et al., 2020).

Table 1 shows the syntax used in the literary exploration. The articles found using this syntax reflect information discovered in the Web of Science database between 2010 and 2023.

The period spanning from 2010 to 2023 proves highly desirable for conducting a systematic literature review (SLR) aimed at shaping a future research agenda on M&A. This timeframe encapsulates a crucial span of recent history, enabling a comprehensive exploration of the field's most contemporary and pertinent research findings. The years between 2010 and 2023 have witnessed dynamic changes in the global economic landscape, marked by events like economic crises, geopolitical shifts, and technological advancements. Analyzing literature from this period facilitates an in-depth understanding of how these factors have influenced and reshaped cross-border M&A activities. Additionally, the chosen timeframe allows for an examination of evolving legal and regulatory frameworks, industry-specific trends, and the integration of cutting-edge technologies into the M&A process. By focusing on this period; researchers can effectively identify gaps in the existing literature and gain insights that are crucial for formulating a robust and forward-looking research agenda. The 2010-2023 timeframe serves as a strategic window, offering a rich reservoir of knowledge to inform and guide the exploration of future directions in cross-border M&A research.

The database yielded a total of 35,472 documents. A further search was performed with parameters like document type, publication period, and language. Articles published in "English" and open access and review articles as the document type were considered for the respective period of the last 12 years. These search terms yielded 5,402 documents. The search was narrowed to "Business, Management, Accounting, & Business Finance." This filter reduced the results to 298 documents.

The articles' abstracts were carefully read. The screening process was designed to remove irrelevant studies. After that, a total of 153 documents were received. Furthermore, only papers that explicitly focused on CB M&As were considered, and their promising impact on specific outcomes was included in an in-depth screening of the resulting papers. As a result, the final set included 59 studies published between 2010 and 2023.

ANALYSIS

Bibliometric analysis

Bibliometric analysis is used to analyze literature, enabling the inclusion of diverse concepts presented by the writers. Structural analysis is a method that may be used to infer patterns across time, examine themes, identify changes, and determine the most productive institutions, authors, and nations in a certain study field (Aria & Cuccurullo, 2017; Sun & Grimes, 2015). Several software tools are available for doing bibliometric analysis, such as VOS viewer (van Eck & Waltman, 2009), BibExcel (Persson et al., 2009), SciMAT, and R-packages (Aria & Cuccurullo, 2017). This study use the bibliometrix R package in R studio for the purpose of analysis (Aria & Cuccurullo, 2017). R is the chosen choice above other tools because to its fully integrated data visualization capabilities and powerful statistical methods (Aria & Cuccurullo, 2017).

Progress of the Study

CB M&As became a hot-selling field of study nearly two decades ago due to changing economic, financial, and social conditions. Figure 2 depicts the average citation received yearly, and Figure 3 shows the annual scientific production between 2004 and 2022. The highest average citations were received in 2010, followed by 2015, 2019, 2021, and 2023. Annual scientific production was highest in 2015, followed by 2016, 2017, 2021, and 2023.

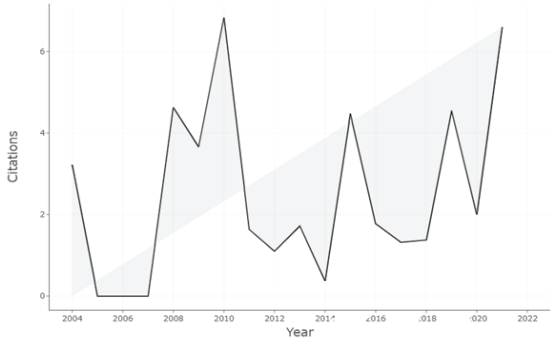

Figure 2: Average citation per year

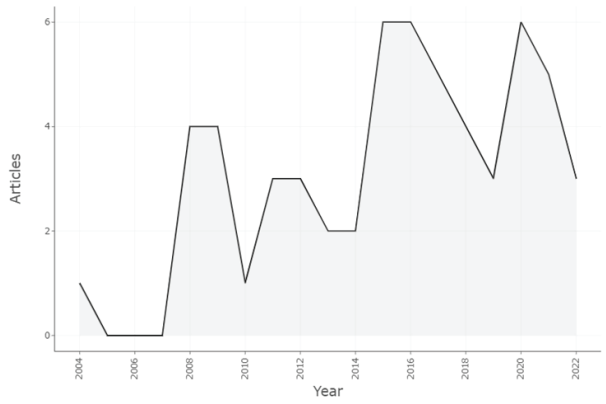

Figure 3:Annual scientific production per year

Most Productive Nations

Table 1 shows the most prolific country, China, which leads the study field of Risk, return, and M&A with a total contribution of 33 publications, followed by the United States of America and the United Kingdom with 26 and 21 articles, respectively.

Table 1: Most Productive Countries

Country	Number of Articles
China	33
USA	26
UK	21
Italy	6
Australia	5
Canada	5
South Korea	3
Turkey	3
Belgium	2
France	2
Greece	2
India	2
Poland	2
Russia	2
Germany	1
Ghana	1
Malaysia	1
Romania	1
Singapore	1
South Africa	1
Spain	1
Vietnam	1

Keyword co-occurrences analysis

Keyword co-occurrence analysis is a valuable method for monitoring research topics and developing areas, as it provides important insight into the content of an article. This analysis involves examining the occurrence of keywords and their relationships within the text. For example, (Lee & Su, 2010) and Kevork & Vrechopoulos, 2009) have utilized this method in their study. Web of Science offers vast sets of keywords. Acquiring firms, Mergers, Acquisitions, Performance, shareholder wealth, takeover, efficiency, information, and gain are some of the most commonly used words. As shown in Figure 5, 'performance' is directly studied with factors such as post-acquisition performance, takeovers, shareholder wealth, and acquiring firm market.

Every node represents a single keyword or keyword plus. Keywords that are close together and have similar colors represent more similarities As shown in Figure 6, the top ten identified keywords are returns, performance, market, acquiring firms, firms, gains, impact, corporate governance, acquisitions, and determinants.

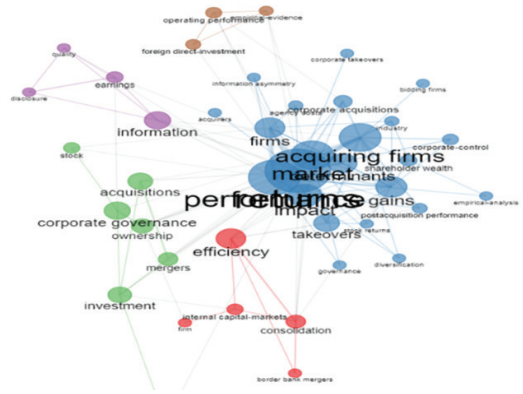

Figure 5: Most commonly used keywords

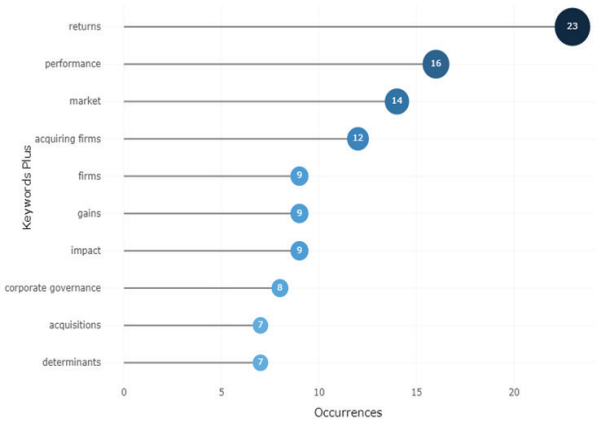

Figure 6: Top ten identified keywords

Trending topics

A trending topic enjoys a brief increase in popularity on many social media sites. The most trending topics were performance, market, takeover, firms, acquisitions, returns, gains, determinants, impact, corporate governance, efficiency, mergers, acquiring firms, information, and consideration, as depicted in Figure 7.

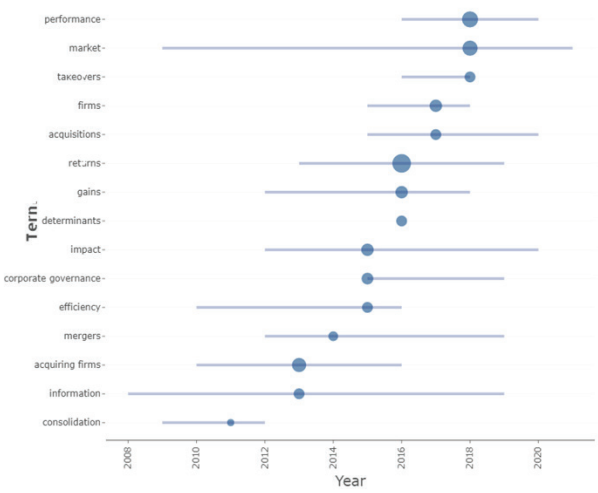

Figure 7: Most trending topics

TCCM analysis

In order to identify the current gaps in the literature and provide potential areas for future study, the TCCM framework, developed by (Paul & Rosado-Serrano, 2019),, is employed. The framework consists of four components: theory (T), context (C), characteristics (C), and methodology (M). The TCCM Analysis serves to address the gaps highlighted in earlier research and provides opportunities for additional exploration (Rajan et al., 2020).Knowledge gaps are identified based on previous research, and references for future research are made.

Theory

The literature divulges prominently used theories in Risk, return, and M&As, as listed in Table 2. Still, the theories that monopolize the area of Risk and return are Agency theory, Stakeholder theory, and behavioural consistency theory. The agency theory of M&As proposed by (Jensen, 1986)suggests thatM&A activityis driven by the manager's incentive to grow a firm beyond its optimal size. According to agency theory, which focuses on risk sharing and agency challenges between shareholders and management, the interests of principals (owners) and their agents (executives) usually must be aligned.

(Goldberg & Nitzsch, 2001) described behavioral finance as a financial market theory that focuses on the behavior of individuals. It is a topic that examines how people behave within certain boundaries and acknowledges that rationality is limited. (Thaler, 1999) argued that behavioral finance combines traditional economics and financial ideas with research that examines psychology and decision-making.

(Freeman, 1999) supported the stakeholder theory, which suggests that a company's main goals should include the interests of all stakeholders (such as customers, employees, society, government, investors, and regulators), rather than solely focusing on maximizing shareholder wealth, as emphasized in finance literature.

Table 2: Theories used to explain Risk, Return, and Mergers and Acquisitions Relationship

Theory	Articles	Articles (%)	Citations
Agency Theory	6	11%	(Chiaramonte et al., 2023, Liu et al., 2020; Amewu & Alagidede, 2018; Hu & Yang, 2016; Shim, 2010)
Behavioral Theory	4	7%	(Chiaramonte et al., 2023, Yang et al., 2022;Zaremba & PŁotnicki, 2016;Lee & Su, 2010)
Stakeholder Theory	4	4%	(Cumming et al., 2023, Ozdemir et al., 2021; Segal et al., 2020)
Pecking Order Theory	2	3%	(Hu & Yang, 2016; feng, 2010)
Free Cash Flow Theory	2	3%	(Cumming et al., 2023, M. Hu & Yang, 2016; Rao-Nicholson et al., 2016)
Resource base Theory	2	3%	(Hsu et al., 2019)
Modern Portfolio Theory	1	2%	(Koerniadi et al., 2015)
Option Pricing Theory	1	2%	(Murray et al., 2017)
Optional hedging theory	1	2%	(Kozol & Oran, 2021)
Signalling Theory	1	2%	(Mateev, 2017)

Monitoring Theory	1	2%	
Block Holder Theory	1		(Mateev, 2017)
Over-Extrapolation Theory	1	2%	(Andriosopoulos et al., 2016)
Capital Structure Theory	1	2%	(Hu & Yang, 2016)
Trade-off Theory	1	2%	(Hu & Yang, 2016)
Theory of Stock-Market-Driven-Acquisitions	1	2%	(Zaremba & PŁotnicki, 2016)
Q theory of takeovers	1	2%	(Dargenidou et al., 2016)
Stewardship Theory	1	2%	(Pham et al., 2015)
Internationalization Theory	1	2%	(Lan et al., 2015)
Endogenous Economic Growth Theory	1	2%	(Hsueh et al., 2014)
Theory of Merger Waves	1	2%	(Hornstein & Nguyen, 2014)
Theory of Finance	1	2%	(Shim, 2010)
Efficient market Theory	1	2%	(Zollo & Meier, 2008)
liquidity Theory	1	2%	(Mateev, 2017)
No theory	35	59%	(Rao-Nicholson et al., 2016)

Context

Tables 3, 4, and 5 summarise findings about the contexts examined in the relationship between Risk, Return, and M&A. Our analysis indicates that most reviewed studies are conducted in the United States of America (23%) and Europe (18%).Further, the investigation revealed that many studies were conducted for developed economiesonly. There are rare studies that undertake a multi-country analysis. The issue of data collecting and data comparison in the cross-national examination may be a possible cause. Since the results of the single-country study cannot be compared, they offer only preliminary insights. Further, with respect to industries, most of the papers focused on the financial, Banking, Insurance, and manufacturing sectors.

Table 3: Countries Investigated in the Review Articles

Country	Articles	Articles (%)	Examples
USA	12	20%	(Chiaramonte et al., 2023, Suk& Wang, 2021; Cui & Chi-Moon Leung, 2020; Li & Zhang, 2020; Wangerin, 2019; Wu & Chung, 2018; Chang & Tsai, 2013)
China	7	12%	(Ding et al., 2021; Chen et al., 2020; Liu et al., 2019; Du & Boateng, 2015)
Europe	6	10%	(Cummins et al., 2015; Chalencon & Mayrhofer, 2018)
Emerging economies	4	7%	(Chiaramonte et al., 2023, Dranev et al., 2019; (Arık & Kutan, 2015)
India	3	5%	(Cumming et al., 2023, Kinateder et al., 2017; Gunasekaran & Selvam, 2011)
Vietnam	2	3%	(Pham et al., 2015)
Canada	2	3%	(Andre et al., 2004)
Britain	1	2%	(Mateev, 2017)
Russia	1	2%	(Mateev, 2017)

South Africa	1	2%	(Amewu & Alagidede, 2018)
Brazil	1	2%	(Zhu & Jog, 2012)
Argentina	1	2%	(Zhu & Jog, 2012)
Czech	1	2%	(Zhu & Jog, 2012)
Not specified	17	29%	(Rao-Nicholson et al., 2016; Dey & Hoda, 2016; Alexandridis et al., 2009)

Table 4: Developed v/s Developing Economies

Country	Articles	Articles (%)	Examples
Developing Economies	30	51%	(Chiaramonte et al., 2023,Ding et al., 2021; Liu et al., 2019; Chen et al., 2020; Du & Boateng, 2015;Gunasekaran & Selvam, 2011)
Developed economies	21	35%	(Cui & Chi-Moon Leung, 2020;Li & Zhang, 2020; Wangerin, 2019; Chang & Tsai, 2013; Andre et al., 2004)
Not Specified	8	14%	(Cumming et al., 2023,Rao-Nicholson et al., 2016; Dey & Hoda, 2016; Alexandridis et al., 2009)

Table 5: Sectors Investigated in the Review Articles

Sector	Articles	Articles (%)	Examples
Financial Sector	8	13%	(Chiaramonte et al., 2023, Hornstein & Nguyen, 2014; Chang & Tsai, 2013)
Banking	4	6%	(Cumming et al., 2023, Chalencon & Mayrhofer, 2018; Goddard et al., 2012)
Manufacturing	3	5%	(Wangerin, 2019; Chang & Tsai, 2013; Craninckx & Huyghebaert, 2010)
Drugs	2	3%	(Trujillo et al., 2019)
Telecommunications	3	5%	(Wangerin, 2019; Hornstein & Nguyen, 2014)
Insurance	3	5%	(Chalencon & Mayrhofer, 2018)
Service	3	5%	(Hornstein & Nguyen, 2014; Craninckx & Huyghebaert, 2010)
Energy	2	3%	(Wangerin, 2019; (Hornstein & Nguyen, 2014)
Electronics	2	3%	(Wangerin, 2019)
Logistics	2	3%	(H. Liu et al., 2019)
Mobile Phone	1	2%	(Hsu et al., 2019)
Consumer non-durable goods	1	2%	(Wangerin, 2019)
Consumer durable goods	1	2%	(Wangerin, 2019)
Chemical	1	2%	(Wangerin, 2019)
Computers	1	2%	(Wangerin, 2019)
Software	1	2%	(Wangerin, 2019)
Wholesale	1	2%	(Wangerin, 2019)
Retail	1	2%	(Wangerin, 2019)

Healthcare	1	2%	(Wangerin, 2019)
Medical	1	2%	(Wangerin, 2019)
Fintech	1	2%	(Dranev et al., 2019)
Food	1	2%	(Craninckx & Huyghebaert, 2010)
Non Specific	40	67%	(Rao-Nicholson et al., 2016; Arık & Kutan, 2015; Arslan & Simsir, 2015; Cummins et al., 2015)

Characteristics

To encourage relationship-building research, extensive literature has been focused on obtaining the verdicts of the domain's most essential characteristics. Our review indicates that researchers have investigated a variety of variables in analyzing the relationship between Risk, Return, and M&As. We have classified these variables followingly.

Independent Variables

In most studies, Stock prices, return on assets, and cash flows from operations have been taken asindependent variables (Cumming et al., 2023,Murray et al., 2017; Hsueh et al., 2014; L. Lin & Piesse, 2003). Thus, most research studies analyze the impact of M&A activities on the financial performance of acquirer and acquiree companies, with an implicit assumption that the causality cannot flow the other way.

Dependent Variables

Finally, theobjective of the study is to determine the relationship between Risk, Return, and mergers and acquisitions. The dependent variable in most of the studies is CAR,BHAR, and AR (Chiaramonte et al., 2023, Rao& Mishra, 2020; Chalencon & Mayrhofer, 2018; Murray et al., 2017; L. Lin & Piesse, 2003).

Control variables

The primary focus of the researchis not control variables, but having their consistent values helps to establish proper relationships between independent and dependent variables. Deal characteristics and methods of payments are primarily used as controlled variables.

Methodology

Almost every year since 2000, publications on cross-border M&A operations have been published Table 6. This shows that this study topic is not stagnant, but rather evolves throughout time with new ideas and discoveries.

The majority of the discovered publications (N = 42) are quantitative empirical research, with the remainder being qualitative empirical (N = 10), conceptual (N = 4), and mixed-methods empirical (N = 3). Due to difficulty in obtaining data from exogenous shocks (for example, COVID-19) there has been a growing recognition of the importance of conceptual articles

The quantitative investigations used various data gathering methods, such as surveys (N = 20) and secondary data sources (N = 24). Survey data collection is frequently influenced by respondent and common method biases (Viswanathan & Kayande, 2012). To address this issue, some research have utilized longitudinal surveys including 8 participants, multi-informant surveys involving 10 participants, and multi-country surveys involving 6 participants. The researchers in the papers included in our review sample made deliberate attempts to gather data during both the pre- and post-merger phases (Cho et al., 2014) and from both the acquiring and acquired entities (Sarala & Vaara, 2009). Regarding data processing, linear regression analysis was the most often employed approach (N = 29), followed by event study based structural equation modeling (N = 17) and multivariate regression modeling (N = 8). The qualitative sample investigations included case study (N = 4), ethnographic (N = 4), and critical incident method (N = 2) techniques. Data was gathered through interviews, including in-depth and semi-structured interviews, as well as by observations and document analysis.

The research employed various methods, as presented in Table 6, including different types of regression analysis, empirical analysis, systematic literature review, case analysis, and structural equation modeling. However, there is a gap in exploring mixed methodologies and strategies, such as meta-analysis and other econometric tools. Further investigation and utilization of these methodologies can provide valuable insights into this area of research.

Table 6: Research Approach Employed in the Review Articles

Research Method	Articles	Articles (%)	Examples
Linear Regression	29	49%	(Ozdemir et al., 2021; Li & Zhang, 2020)
Event study	17	29%	(Kinateder et al., 2017; Murray et al., 2017; Zaremba & PŁotnicki, 2016)
Multivariate Regression Model	8	13%	(Chiaramonte et al., 2023,Murray et al., 2017; Lee & Su, 2010)
Difference in difference analysis	3	5%	(Liu et al., 2019)
Literature Review	3	5%	(Chiaramonte et al., 2023, Zollo & Meier, 2008)
CAMP	2	3%	(Cumming et al., 2023), Zaremba & PŁotnicki, 2016)
Cross section regression	2	3%	(Kinateder et al., 2017)
Sensitivity analysis	1	2%	(Cumming et al., 2023, Rao & Mishra, 2020)
Correlation analysis	1	2%	(Ozdemir et al., 2021)
Calendar-time portfolio analysis	1	2%	(Andre et al., 2004)
Multiple Regression	1	2%	(Rao & Mishra, 2020)
multivariate regression analysis	1	2%	(Liu et al., 2019)
ANOVA Test	1	2%	(di Patti, 2009)
Chi-square test	1	2%	(Kumar & Bansal, 2008)

DISCUSSION AND CONCLUSION

The findings of this study are derived from an analysis of bibliometric data and an extensive literature review utilizing TCCM analysis. A total of 59 articles sourced from the Web of Science database were employed for this purpose. The bibliometrics package provided by R Studios was utilized to uncover trends about Risk, return, and CB M&As.

The primary focus of the initial research question was to highlight critical research areas. Through keyword research, we explored emerging domains within the research field. In contrast, keyword co-occurrence analysis facilitated the identification of interconnections between crucial research areas and the clustering various domains. Notably, recent years have seen specific keywords, such as returns, performance, market, and acquiring firms, emerge as highly cited, indicating their significant impact.

The second research question delved into previous studies' theories, contexts, characteristics, and methodologies. The most prevalent theories in this field encompass agency, stakeholder, and behavioral theories. The contexts examined within the risk-return and CB M&As domain predominantly focused on sectors such as finance, banking, telecommunications, insurance,manufacturing, and services in developed countries. Methodologies such as case analysis, review papers, and structural equation modeling were commonly employed. In bibliometric analysis, specific topics demonstrated greater significance due to their higher citation counts, indicating their influential and valuable nature. However, despite their importance, a few articles may go unnoticed, and the potential of newer articles might not be fully realized at a given time. Hence, repeating citations and descriptive bibliometric analyses is crucial.

The existing literature on CB M&A, Risk, and return presents intriguing avenues for further exploration in terms of theory development, contextual analysis, distinctive features, and methodological advancements. Addressing the following scientific questions, which have yet to be fully explored, is essential: What impact do risk and return practices have on CB M&A? How can these mergers and acquisitions be leveraged to enhance outcomes while reducing costs? Numerous theoretical

models, including transaction cost theory, resource-based theory, and dynamic capability theory, can be employed to analyze the influence of Risk, return, and cross-border mergers and acquisitions across diverse sectors and multiple nations. Additionally, conducting research across various locations can establish the generalizability of the findings. In addition to review papers, case studies, and structural equation modeling, various other methodologies can be employed to enhance the research in this field further.

IMPLICATIONS OF THE STUDY

The implications of a SLR on CB M&As extend significantly to managerial considerations. As managers play a pivotal role in overseeing and executing M&A strategies within multinational corporations, the findings of such a review offer actionable insights. Firstly, understanding the factors influencing M&A success or failure enables managers to refine risk management strategies, incorporating robust due diligence processes and proactive risk mitigation plans. Cultivating cultural competence among management teams becomes imperative, as the SLR may underscore the pivotal role of cultural understanding in the achievement of successful cross-border integrations. Strategic planning processes can be fine-tuned based on insights into evolving trends, ensuring alignment with broader organizational goals. Managers should remain vigilant regarding changes in policies and regulations, engaging in government affairs to navigate legal complexities adeptly. The role of technology in M&A success, as highlighted by the review, prompts managers to explore and adopt innovative technologies that streamline processes and enhance decision-making. Effective stakeholder communication becomes paramount, necessitating managers to prioritize transparent communication with employees, investors, and local communities to build trust and mitigate potential challenges. The dynamic nature of cross-border environments underscores the need for organizational flexibility and adaptability, calling for managers to instill these qualities within their teams. Talent management strategies should be robust, addressing cultural integration challenges and ensuring a seamless transition during M&A activities. In essence, the managerial implications derived from the SLR guide managers in navigating the intricacies of cross-border M&A, fostering strategic decision-making, and enhancing overall organizational effectiveness in the global business landscape.

FUTURE RESEARCH DIRECTIONS AND LIMITATIONS

Future research endeavors can effectively address the identified gaps and unexplored avenues within the field. Despite garnering considerable scholarly interest,CB M&As warrant further attention and investigation. To enhance our understanding of this phenomenon, we have identified several study topics to facilitate more comprehensive data analysis.

We have employed a strategic approach to visualize the identified themes. Figure 8 illustrates a thematic map constructed based on two key dimensions: density (y-axis) and centrality (x-axis). The centrality of a given subject is measured, capturing its importance within the overall research landscape. Simultaneously, the density of a chosen theme is measured, reflecting the concentration or prevalence of research in that area. The resulting diagram is divided into four sections, each representing specific characteristics and patterns within the thematic map.The topics located in the lower left quadrant encompass emerging or declining themes within the research landscape. These areas contain new concepts that have the potential to either advance and contribute to the field or gradually diminish in relevance.

On the other hand, the fundamental or cross-cutting themes are situated in the lower right quadrant of the map. These topics exhibit a lower density, indicating a lesser research volume, but possess a high centrality, implying their critical importance. Extensive scholarly inquiry has been dedicated to these subjects.

Moving to the upper left section, we find themes characterized by a high density but a low centrality. These topics have developed significantly but must be more cohesive and connected to the broader research framework. Finally, the upper right corner of the map represents areas of dense concentration and high centrality. The themes in this quadrant are extensively developed and fundamental, serving as pivotal focal points within the research domain.

The scale of the thematic map corresponds to the theme's components. The thematic map in Fig. 8 is based on 2010 to 2023. We utilized the most popular

keywords. However, the items in the clusters are set to a minimum frequency of 4 in the 'bibliometrics' program. Each subject has a maximum of three sample labels.

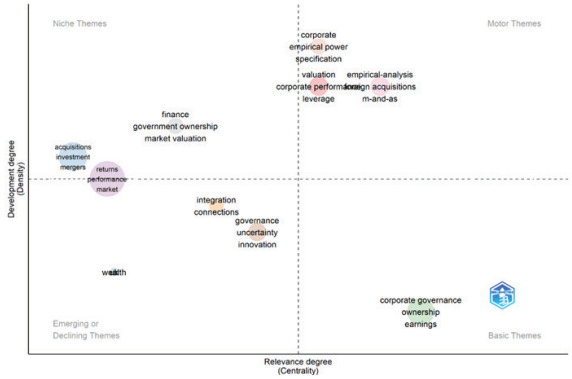

Figure 8: Thematic Map

The first cluster on the thematic map encompasses the field of governance, incorporating topics related to corporate governance, ownership, and corporate earnings. These topics are classified as fundamental or transversal, characterized by high centrality and low density. Extensive research has been conducted in these areas, making it challenging to identify new directions as most issues have already been addressed.

Additional research theme clusters focus on governance, wealth, and integration, which are part of the emerging theme clusters within the literature onCB M&As. These clusters explore the management and organization of CB M&As through various approaches. The motor themes within these clusters play a significant role due to their high centrality and density. Within the literature on CB M&A, themes such as the valuation of corporate performance, industry-based specifications, and leverage are representative topics that belong to this particular section of the thematic map. Market valuation, return performance, and investment mergers are highly developed but independent themes. Although these themes exhibit a high density, their centrality is relatively low. Nonetheless, these topics hold substantial potential, offering researchers ample opportunities to contribute significant advancements in the field through their work.

Apart from the above, there has been a wealth of research on CB M&As, especially delving into cultural differences and their impact in the context of developed countries like the US, UK, and Canada(Shimizu et al., 2004).There needs to be more information in India about the financial success of CB M&As vs. domestic ones.

M&A activities are strategic decisions to accelerate company growth and maximize shareholder wealth. Existing literature consistently demonstrates that shareholders of the target company benefit from the announcement of M&As. However, the literature regarding the wealth effects on shareholders of the acquiring company needs to be more consistent.

While the impact of macroeconomic conditions on the volume of M&A operations has been explored, little attention has been given to analyzing the financial outcomes of acquiring firms after mergers, particularly in the context of developing economies. Furthermore, several significant variables, such as the reasons for merger and acquisition failures and comparisons of success across different types and industries, still need to be examined.

The substantial volumeof CB M&As presents an opportunity to test various hypothetical approaches and develop a comprehensive M&A theory. In this regard, emerging markets offer an intriguing field for new research, especially when developed-country corporations acquire enterprises in developing markets, which present unique challenges. Conversely, there has been a notable increase in CB M&As originating from emerging nations in recent years, targeting established and other emerging markets. Therefore, it is worthwhile to investigate whether existing theoretical models adequately describe organizations' behavior and decision-making processes in emerging markets or if revisions are necessary.

The main aim of this study was to add to the current body of knowledge on cross-border mergers and acquisitions (CB M&As). It is important to mention that the research solely relied on a single Web of Science database. When performing a bibliometric analysis, it is advisable to assess various databases. Therefore, future researchers may want to do another bibliometric study by include more databases such as Scopus and Google Scholar. This would offer a more exhaustive and resilient examination of the literature in this particular topic.

It is critical to recognize that bibliometric methodologies have limitations, notably a lack of context. Although citation and co-citation analyses were performed in this study, bibliometric techniques do not allow for a comprehensive assessment of how a given reference is being used, such as acknowledging its existence, constructing an argument, critiquing, or validating through alternative theories or techniques. To solve this constraint, it is advised that content research and contextual study of references be incorporated to reveal more linkages and gain a more profound knowledge of the M&A business.

It should be noted that M&A research only includes some published studies on the topic. For example, the keywords picked may have overlooked specific works. Furthermore, relying primarily on publications from top-ranked journals has a drawback in that other journals with less influence may have been excluded from the study.

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The Impact of Emotional Intelligence on Work Life Balance of Dual Career Couples

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ABSTRACT

In this competitive world, employees are expected to perform their roles both effectively and efficiently. Emotional Intelligence is significant for anticipating organizational responsibility and employee's work execution in light of the fact that most positions require the capacity to oversee feelings and emotions. Work-life balance is an important issue in today's era and the different strategies used by dual career couples to manage their work and their personal life can have a great impact on the society. The focal point of the following paper is to identify the importance of emotional intelligence for work life balance among dual career couples. Descriptive Design was adopted the study. In this study the primary data is collected for the rationale of collecting data. Stratified random sampling technique is used to include the respondents as samples for this study. The sample size of 500 dual career couples working in any service sector in the Delhi/NCR region is included as respondents for this study. SPSS v21 is used as the statistical tool for data analysis. Before evaluating the data, reliability and validity were tested. Descriptive statistics such as frequency, percent, mean, standard deviation, skewness, kurtosis, correlation, and regression methods are employed in the early phases using SPSS. For significance testing, Pearson's Chi Square was employed. Confirmatory Factor analysis, PLS-SEM has been used to investigate the connection between dependent and independent variables. Distress contributes to lower organizational performance, decrease in overall performance of dual career couples, high error levels and poor working quality, high personnel turnover, absenteeism leading to work life imbalance. The results suggest that emotional labour have positive connection with work life balance of dual career couples working in service sector, when the intensity of emotional labour became high then the value of dual career couples health and job performance simultaneously became high, it even raises the stage of job satisfaction.

KEYWORDS: *Emotional labour, Dual career couples, Emotional intelligence, Service sector, Performance, Job satisfaction, Work life balance.*

INTRODUCTION

Emotional Intelligence (EI): Emotional Intelligence is an art to manage our emotions and others too intelligently. EI creates an ability to perceive, evaluate, understand, respond to, and influence others. It is a process of mindfulness. There are three theoretically allied mental procedures: evaluating and communicating feelings in oneself and others, directing beliefs in oneself and others, and utilizing senses in a versatile way, which suggests emotional data. Coming up next are concise depictions of such psychological procedures: Discerning and demonstrating vehemence in oneself and others: People that correctly understand certain feelings but react to them could generally become best accepted either by the staff we interact. In relation, those who get the possibility of becoming more influential instructional leaders can recognize and create regard for the people all over each other. Regulating emotion in oneself and many others: however people treat it is really significant (monitor, evaluate, and adapt mood swings) their feelings and distribute and modify the emotional responses of others—the guideline of one's beliefs and mind-sets converts into positive and negative successful states. Hysterical intelligent

people are adept at positioning themselves in positive, powerful countries and can encounter viable negative states that have dangerous results. They can likewise actuate a beneficial outcome on others, which brings about an incredible social impact, which is a noteworthy part of the initiative. Adaptively utilizing feelings: people can be useful or maladjusted in the manner they utilize their feelings. Opinions can assist to produce numerous tentative arrangements, improve dynamic by an enhanced thoughtfulness of emotional response, and improve persistence under challenging tasks.

WORK – LIFE BALANCE (WLB)

The idea of work life balance (WLB) has been transcendent, perhaps as it is just barely a question of contention yet additionally what makes balance. In the current review, we all would balance between work and life activities as far as generally speaking fulfillment with the harmony among work and non-work instead of struggle/conflict or absence/lack of contention. In this unique situation, notice that we don't concentrate on family as the particular non-work space in contemporary society, people can be accepted to have numerous different interests, needs, and obligations outside work than their family as it were. Thusly, our review utilizes the terms individual life or non-work to incorporate family just as others, as for example companions, and different parts of significance in people's close to home lives that should be adjusted according to work.

Table: 1 Command Effects Of Stress On Dual Career Couples

Physiological Changes	Psychological Changes	Behavioral Changes
Headache	Anxiety	Anger outburst
Muscle tension or pain	Depression / Loneliness	Substance abuse
Chest Pain	Anger/ Aggression	Social isolation/ withdrawal
Fatigue	Lack of Motivation	Absenteeism
Sleeplessness	Restlessness	Rudeness

LITERATURE REVIEW

According to the study investigated by Mehr Fatima Shamsi & Sara Asad in their research (Emotional Maturity, Forgiveness, and Marital Satisfaction among Dual Earner Couples, 2021) the role of emotional maturity and forgiveness as correlates and predictors of marital satisfaction among dual earner couples. Results also showed that forgiveness of others ($\beta = .20$; $p < .05$) and forgiveness of situations ($\beta = .22$; $p < .05$) were significant predictors of marital satisfaction among dual earner couples. Findings of this study imply that family life educators in the future should consider emotional maturity and forgiveness when contemplating about enhancing marital quality. Another study done by (Ayesha Siddiqa & Sana Majeed, 2021) in their work Perceived Stress, Emotional Intelligence, Coping Strategies, And Marital Adjustment In Dual Earner Couples states that there was a significant negative correlation between Perceived Stress and marital adjustment ($r= -0.25$, $p=0.001$), whereas, Emotional Intelligence ($r=0.46$, $p=0.000$) and Coping Strategies ($r=0.15$, $p=0.033$) have significant positive relationship with Marital Adjustment. The findings also depicted that there was no gender difference regarding the study variables. As per Payne on Kambiz and Majid, the expression "The capacity to appreciate people on a profound level - IT" was first used to portray an individual's capacity to manage dread, agony, and want in 1985 in a review named "Accentuation on Emotional Intelligence, Organizational Citizenship, and Employee Satisfaction" (2013). In any case, Salovey and Mayer proposed another perspective on the EI in 1990, alluding to it as broad knowledge, a sort of friendly insight that incorporates the capacity to screen, separate, and apply data to one's own and others' feelings. Maria and Ioanniss contended in their paper that Salovey and Mayer extended and characterized capacity to understand people on a deeper level to incorporate a singular's capacity to precisely see, appreciate, and express passionate sentiments, as well as access and sentiments when they help thinking, enthusiastic information, and passionate capacity to manage. Understanding one's own emotions, feelings, causes, and effects is a strong skill. A person who is emotionally intelligent can recognise various emotions and devise a precise and effective action plan to address various situations and scenarios. The ability to recognise, interpret, use, and control emotions skilfully might be a talent, ability, or personality trait. Emotional

intelligence is directly linked to employee performance in practically any position (Rexhepi & Berisha, 2017). In their study "Emotional intelligence–a review and evaluation study." Furthermore, emotional intelligence aided an organization's overall performance and financial success.

METHODOLOGY

The responses from the questionnaire were collected on Google Forms. All the responses were directly uploaded on an excel sheet. The respondents were both men and women; dual-career couples working in different service sectors in Delhi- NCR. All the respondents were willing to fill up the questionnaire; this topic was so relevant from their point of view they were able to connect with each question. The questionnaire was formulated in the form of a link which was shared with them through either "Whatsassp, Email,or even Text SMS". Stratified random sampling technique is used to include the respondents as samples for this study. The sample size of 500 dual career couples working in any service sector in the Delhi/NCR region. SPSS v21 is used as the statistical tool for data analysis. Before evaluating the data, reliability and validity were tested. Descriptive statistics such as frequency, percent, mean, standard deviation, skewness, kurtosis, correlation, and regression methods are employed in the early phases using SPSS. For significance testing, Pearson's Chi Square was employed. Confirmatory Factor analysis, PLS-SEM has been used to investigate the connection between dependent and independent variables.

Quantitative analysis was used for the present research study to inspect the phenomenon from different perspectives of dual career couples working in the service sector in the Delhi-NCR region regarding balancing Emotional Intelligence.

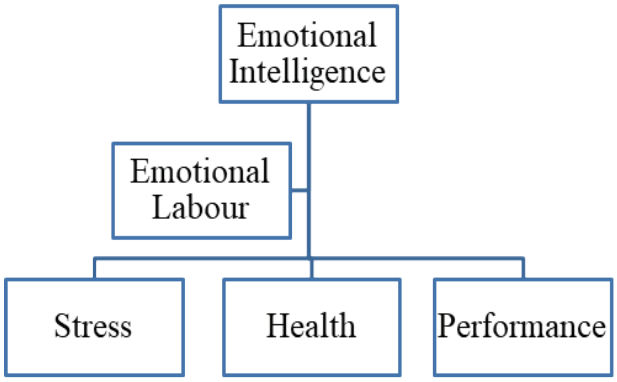
RESEARCH OBJECTIVES

1. To verify the factors affecting the emotional intelligence, emotional labour and work related stress in an organization.
2. To swot up impact of emotional intelligence and emotional labour on work related stress.
3. To swot up the impact of work related stress on dual career couple's health.
4. To swot up the impact of work related stress on dual career couple's performance.

RESEARCH HYPOTHESES

- H1: There exists a significant impact of emotional intelligence on emotional labour.
- H2: There is a significant impact of emotional labour on work related stress.
- H3: There exists a significant impact of emotional intelligence on work life balance
- H4: There exists a significant impact of work related stress on dual career couple's health
- H5: There exists a significant impact of dual career couple's health on performance

Figure: 1 Conceptual Framework



MEASUREMENT ITEMS

- Self –awareness
- Self regulation
- Self- Motivation
- Self – Competence
- Role ambiguity
- Underutilization of skills
- Work overload
- Surface acting
- Deep acting
- Emotional Consonance
- Suppression

Table: 2 Summary Of Scale Item Reliability And Rationality Review, As Well As Factor Loadings Of Measurement Items

Measurement items	Abb.	No. of items	Inter -Item Correlation	Item-Total Correlation	α	KMO	TVE %	Standardized factor loading
Self-Awareness	SAWR	5	0.304-0.476	0.458-0.504	0.729	0.742	54.57	0.585-0.764
Self-Regulation	SRG	13	0.273-0.530	0.398-0.557	0.734	0.767	48.506	0.541-0.763
Self-Motivation	SMT	8	0.341-0.423	0.470-0.512	0.710	0.749	53.557	0.610-0.750
Self-Competence	SCMT	23	0.169-0.511	0.310-0.604	0.720	0.756	47.667	0.541-0.757
Role Ambiguity	RAMG	9	0.240-0.511	0.385-0.629	0.733	0.715	54.667	0.468-0.779
Underutilizations of Skills	USL	3	0.184-0.521	0.337-0.599	0.760	0.811	48.112	0.493-0.778
Work Overload	WOL	4	0.179-0.525	0.422-0.538	0.730	0.743	42.643	0.549-0.714
Surface acting	SAG	5	0.272-0.488	0.453-0.562	0.747	0.767	58.124	0.657-0.755
Deep acting	DAG	3	0.245-0.356	0.368-0.612	0.741	0.778	61.587	0.624-0.789
Emotional Consonance	ECE	2	0.189-0.472	0.377-0.624	0.739	0.746	66.427	0.589-0.758
Suppression	SPR	3	0.242-0.538	0.388-0.538	0.742	0.747	59.782	0.610-0.763

Key: α-Cronbach's Alpha; **KMO**-Kaiser-Meyer-OlkinMeasure of Sampling Adequacy; **TVE**-Total Variance Explained (calculated dimension-wise)

Note: Extraction method-Principal Component Analysis; **Rotation method**- Varimax with Kaiser Normalization (Rotation Converged in 6 iterations)

PRELIMINARY DATA REVIEW

Demographic Data of Respondents

Table: 3 Demographic profile of the respondents

Variable		Frequency	Percentage
Age	20-25 yrs.	20	4%
	25-30 yrs.	48	9.6%
	30-35 yrs.	142	28.4%
	35-40 yrs.	130	26%
	40-45 yrs.	158	31.6%
	45-50 yrs.	66	13.2%
	50 yrs. and above	56	11.2%
State/ district	Bihar	178	35.6%
	Haryana	98	19.6%
	Allahabad	164	32.8%
	UP	112	22.4%
	Delhi	132	26.4%
Qualification	Uneducated	246	49.2%
	Below 5th	58	11.6%
	5th to 8th	34	6.8%
	8th to 10th	30	6%
	Above 10th	132	26.4%
Monthly income	10k to 15k	232	46.4%
	15k to 20k	80	16%
	20k to 25k	75	15%
	Above 25k	113	22.6%

From the table it is discovered that 20(4%) respondents were from the age group of 20-25 yrs, 48(9.6%) respondents were from the age group of 25-30yrs, 142(28.4%) respondents were from the age group of 30-35 yrs, 130(26%) respondents were from the age group of 35-40yrs, 158(31.6%) respondents were from the age group of 40-45 yrs, 66(13.2%) respondents were from the age group of 45-50 yrs and 56(11.2%) respondents were from the age group of above 50 yrs. The table shows that 178(35.6%) respondents were from Bihar, 98(19.6%) respondents were from Haryana, 164(32.8%) respondents were from Allahabad, 112(22.4%) respondents were from U.P. and 132(26.4%) respondents were from Delhi. On the basis of qualification, they are classified into 5 categories. 246(49.2%) respondents are uneducated, 58(11.6%) respondents' education level is below 5th, 34(6.8%) respondents' education level is 5th to 8th, 30(6%) respondents' education level is 8th to 10th and 132(26.4%) respondents' education level is above 10th.The table also shows that, the monthly income of 232(46.4%) respondents is 10k to 15k, the monthly income of 80(16%) respondents is 15k to 20k, the monthly income of 75(15%) respondents is 20k to 25k and the monthly income of 113(22.6%) respondents is above 25k.

Table: 4 Summary of Construct Reliability and Rationality Review for Scale Item

Constructs	Composite reliability (CR)	Cronbach's α	Average variance extracted (AVE)
Emotional labour	0.874	0.805	0.637
Emotional intelligence	0.835	0.828	0.784
Health	0.885	0.861	0.701
Presentation	0.887	0.839	0.751
Stress	0.891	0.867	0.789

Constructs Considered in the Conceptual Investigation Model -Two exogenous latent factors (emotional intelligence (EMIT) and emotional labour (EML)) and three endogenous latent constructs (stress (STR), health (HLT), and performance (PRM)) were included in the suggested conceptual study paradigm. The term "endogenous construct" refers to a latent, multi-item construct whose variability is explained by one or more factors in the model. It is the same as "dependent variables." (Jonathan, 2013). Although it is impossible to measure a latent construct directly, one or more variables can be utilised to do so. Extant literature was used to identify latent constructs in this investigation. At least four and no more than six components made up each build (after final survey, EFA and CFA).

Table: 5 Constructs of Investigation Model

Constructs	Description of the constructs	Number of items	Items
EML	Emotional labour	4	DAG, ECE, SAG, SPR
EMIT	Emotional intelligence	4	SAWR, SCMT, SRG, SMT
HLT	Health	9	H1, H2 ----H9
PRM	Performance	7	PRM1, PRM2-------PRM7
STRS	Stress	3	RAMG, USL,WOL

Table above shows each build's standardized course coefficient and importance. The normalized way coefficients were viewed as huge and positive at the p0.01 and p0.05 levels, suggesting that the theories were acknowledged. Above all else, as indicated by H1, the ability to appreciate individuals on a profound level fundamentally affects enthusiastic work. Second, the results of the current review back up the hypothesis that passionate work influences feelings of anxiety (H2). Third, According to explore, the capacity to understand individuals on a deeper level altogether affects work pressure (H3). The discoveries of this study support the possibility that one's wellbeing affects the way in which they introduce themselves, affirming a beneficial outcome (H5) and affirming that capacity to appreciate individuals at their core altogether affects pressure (H4).

Table: 6 Summary of SEM Results and Hypotheses Testing

Hypothesis	Path	Path Coefficient	Standard Error	t-static	P	Contrast
H_1	EMIT→EML	0.530	0.051	10.453	0.000	Supported
H_2	EML→STRS	0.438	0.047	9.387	0.000	Supported
H_3	EMIT→STRS	0.398	0.049	8.181	0.000	Supported
H_4	STRS→HLT	0.550	0.040	13.751	0.000	Supported
H_5	HLT→PRM	0.827	0.018	44.823	0.000	Supported

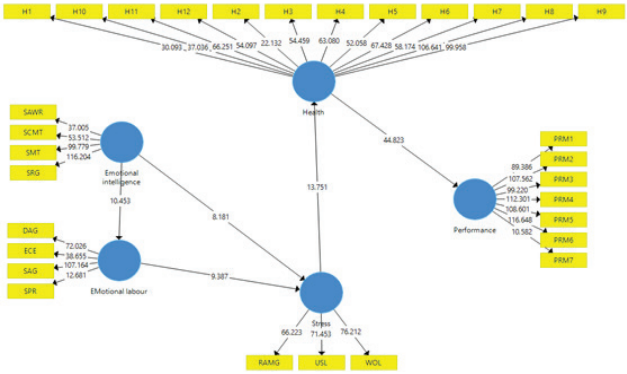


Figure: 2 SEM: standardised-path estimation
(Source: PLS-software)

HYPOTHESIS TESTING

The structural model was estimated by using PLS-SEM. The review theories outlined as per the proposed primary model were tried. The normalized way coefficients were viewed as critical and positive at $p<0.01$ and $p<0.05$, which showed that there existed solid proof in acknowledgment of the hypothesis. "First of all, the influence of emotional intelligence on emotional labour is significant, accept H1. Second, the results of the present study confirm the influence of emotional labour on stress (H2). As for the influence of stress on health, a positive effect (H3) is confirmed. Third, the results of the present study confirm the influence of health on performance, a positive effect (H4) is confirmed and Fifth, emotional intelligence significantly impacts on stress (H5) is confirmed."

CONCLUSION

The higher level of Emotional Intelligence among dual career couples, the better they perform in companies or organizations. Individuals with a high emotional

intelligence have peaceful and sound lives they are more satisfied with their work, life and themselves. They are able to construct a solid social support system for their partner (Miao et al., 2017). Emotional Intelligence thus has a major influence on reducing stress. The greater the EI level, the better your work performance and the lower the EI level, the higher your employment burnout also, dual career couples face work life imbalance due to lack of emotional intelligence. This is a negative forecast of job burnout at employee level. The outcomes might be a breakthrough in reducing the burnout of employees to managers of companies or organizations. You may employ diverse emotions to address daily difficulties and to compensate for work dissatisfaction (Nastasa and Farcaş, 2015). As the findings show, initiatives to strengthen the EI level of dual career couples will successfully slow down or eliminate burnout, it will also lead to a sound work life balance. There are negative effects of emotional imbalance both on personal grounds and on professional grounds. Stress, sadness, panic disorder and workplace dissatisfaction are felt by employees. EI creates a good connection with one's 'head and heart' therefore; individuals who have higher emotional intelligence have more peace within themselves and outside themselves. Employees that are emotionally constant might strive to adapt their sentiments more sensitively to unique conditions. Emotional intelligence predicts the sense of situational demands that in turn determine the kind of emotional work.

But most research has shown that emotional intelligence and work stress are significant. In other words, the ability to manage with stress rises when an individual's emotional intelligence increases. Experts thought that dysfunctional stresses may have an effect on the operations of a company and also influence its workers' well-being. Stress in the working environment was associated with malingering, frequent attrition and lack of quality productivity. Stress resulted in fatigue, irritation, absence of effective communication, and issues/errors in excellence.

The morale and motivation of employees significantly influenced high stress levels. Longer exposure to stress can lead to a number of mental and physical issues without adequate coping methods. "For example, stress can lead to gastrointestinal issues caused by stress, irritable bowel syndrome, acidity, acid reflux, sleeplessness, depression, heart disease, etc. In addition, stress can lead to high-risk behaviour, including such smoking, drinking and drug addiction." Stress-related diseases have increased absenteeism and attrition impacting businesses' profitability. Similar effects have also been found in investigations done by "Oginska et al., (2005) Matthews et al., (2006), Montes-Berges et al., (2007)."It is therefore said that the capacity to limit bad feeling such as wrath, self-doubt, tension and anxiety is 'emotional intelligence.' Therefore, individuals must prioritize themselves and their mental well being (emotionally intelligent). Stress contributes to lower organizational performance, decrease in overall performance of employees, high error levels and poor working quality, high personnel turnover, absenteeism, disturbed work life balance and disorders like anxiety, emotional disorder; depression as well as other diseases.

SUGGESTIONS

Dual career couples have to work on improving their emotional intelligence this may help them manage stress, establish strong ties, empathize with everyone, and achieve objectives. Every personnel should pay attention to their physical, mental calmness, and psychological well being. 'Meditation' can be one way which helps to balance mind and body functioning. Two-way communication among management and employees is essential. Coping techniques with problem solving skills can be practiced among working couples for a balance between work and life. One must make sure that our emotions are always utilized in order to avoid 'emotional hijacking' while decreasing the consequences of stress on the organization and its employees. Organizations must pay attention on dual career couple's physical health and mental health because it has direct impact on their productivity. An emotionally developed and sound person can increase productivity and can create milestone.

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Sailing Towards Sustainability: Exploring New Avenues in Green Marketing Communication

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ABSTRACT

The present study aims to explore and evaluate various antecedents crucial for advancing the domain of Green Marketing Communication. Based on single cross-sectional survey, the study collects data from 164 green apparel customers across four states (Punjab, Haryana, Uttar Pradesh and Rajasthan) of Northern India. By adopting Exploratory Factor Analysis, the study corroborates 12 factors, out of which Environmental Consciousness, Harmful Environmental Ramifications, Emotional Connect with Nature, Strategic Process Oriented Communication, and Strategic Image Oriented Communication dominate among all.

The study emphasizes that a holistic comprehension of these factors not only cultivates a favorable consumer disposition towards green initiatives but also acts as a countermeasure against adverse phenomena such as green buzzwords and greenwashing. Moreover, the research extends actionable insights to marketers, aiding them in formulating sustainable green communication strategies tailored to contemporary market dynamics.

The originality of the study lies in its comprehensive integration of cognitive, affective, individual, and strategic perspectives. Through these multidimensional aspects, marketers can fortify their promotional strategies, paving the way for sustained competitive advantages and meaningful contribution to the evolving landscape of green marketing communication.

KEYWORDS: *Green marketing communication, Strategic orientation, Cognitive factor, Affective factor, Personality traits, Environmental concern.*

INTRODUCTION

Green Marketing Communication

The changing ideological framework of modern marketing necessitates organizations to develop and implement sustainable marketing orientation (Liu et al., 2020; Yang et al., 2015; Bailey et al., 2018). UN Sustainable Goals at the international level and various campaigns by regulatory authorities at the national level are steadily enhancing the environmental awareness of society (Kang and Hur, 2012). Consumers are becoming environmental conscious from all over the world (Curlo,1999; Gurau and Ranchhod, 2005) and are demanding green products and services. Companies are expected to integrate environment-friendly activities while performing their fundamental marketing practices (Grebmer and Diefenbach, 2020). A survey carried out by the BCG Group indicates that majority of respondents (87%) believe that companies should reflect environmental responsible behavior in

their marketing activities (Kachaner et al., 2020). In light of the increasing need for environmental friendly initiatives and regulatory requirements, businesses are incorporating ecological considerations into their strategies, objectives, and operations (Lin et al., 2017). Merely implementing a sustainable approach is insufficient for companies to generate positive environmental, social, and economic effects. It is also essential for them to effectively communicate their green initiatives to consumers. However due to increasing environmental awareness & skepticism among consumers, marketers face challenges in achieving this objective (Grebmer and Diefenbach, 2020). The proliferation of skepticism can be ascribed to several factors, including the increasing number of corporations advocating their environmental claims, customers lodging grievances with regulatory bodies regarding deceptive assertions (Knight, 2008). Many a times, customers are not aware of the positive environmental effects of eco-friendly practices since businesses do not always communicate in a manner that is compatible with the consumer's preconceived notions. Therefore, Juwaheer et al. (2012) consider green communication as a major weak area of practitioner. Thus, designing clear, authentic & relevant green marketing communication is crucial to cultivate a positive consumer attitude towards the brand (Testa et al., 2011; Singla et al., 2023).

Green Apparel Industry in India

Fast fashion industry is growing at exponential rate since last two decades (Kautish and Sharma, 2019). India is emerging as one of the largest economies in the world. Due to this, increasing disposable income has amplified the appetite for fashion-oriented consumption. Total revenue generated from the Indian apparel industry is US $ 96.47 bn in 2023. According to United Nations Fashion Industry Charter for Climate Action, more than 10% of global warming is produced by textile industry superseding the combined emission of aviation and shipping sector. To minimize the negative impacts of this industry on environment, it is imperative for the society to shift from their conventional purchase behavior to eco-friendly purchase intention (Jaini et al., 2020). In this context, green communication plays a pivotal role in disseminating knowledge and providing information to consumers regarding the distinct advantages of eco-friendly apparels, with the ultimate aim of encouraging them to embrace a sustainable behaviour (Stoica, 2021).

LITERATURE REVIEW

In the recent past, there has been a notable resurgence in the concept of sustainability. Green marketing research is gaining vast attention of academician (Peattie and Crane, 2005). One of the most contentious aspects of green marketing is communication, which is frequently criticized for oversimplifying complex environmental issues through the presentation of green products (Peattie and Charter, 2003). Green marketing communication can be described as a strategic approach to disseminate pertinent environmental information, enlighten consumers about the sustainable practices of a company through green messages, and influence their purchasing behaviour towards environmental friendly products (Dinh et al., 2023; Lin et al., 2021; Stoica, 2021; Šikić, 2021). GMC encompasses diverse communication tools including green advertising, sales promotion, personal selling, green publicity etc. (Jamal et al., 2022). The use of green communication is found to have a favourable impact on the customers attitude who possess either analytic or intuitive cognitive types (Kim et al., 2018). Taufique (2022) validates that there is an indirect influence of cognitive factors on green consumer behaviour via attitudes. The cognition of consumers also has an impact on the interpretation of green messages and ecological claims. Luchs and Mooradian (2012) examine the role of emotions in shaping consumer responses to green advertising and find that emotions affect the relationship between ad content and attitude towards ad. Edell and Burke (1987) also explore the role of feelings in understanding advertising effects and reveals that emotions significantly influence individuals' attitudes towards advertisement and the brand. For effective GMC, both cognitive as well as affective factors are being studied by Taufique (2021) as antecedents of green consumer behaviour and found that consumers' environmental values and emotional affinity towards nature affect green consumption behaviour positively. Hartmann et al., (2014) investigate the impact of cognitive evaluation of threats, emotional reaction of fear, and coping efficacy on consumers' response to green advertising. The findings demonstrate that both cognitive and the fear arousal (emotions)

due to exposure environment related threat appeals significantly augment intentions to engage in pro-environmental behaviors. Moreover, there is a strong positive association between beliefs regarding the level of cognitive threat and emotional fear response. Hartmann and Ibanez (2006) propose simulation of consumers emotion for constructive outcomes. In addition, Pooley and O'Conner (2000) argued that people's emotions, rather than their knowledge, has a significant influence on their perspectives towards the environment. Yoon et al., (2020) explored the impacts of green marketing initiatives and advertisement appeal styles on consumer perceptions. Drawing upon a sample size of 711 US consumers, the findings of the study revealed that advertisements featuring a public service cause generated more favourable affective perceptions among consumers. On the other hand, advertisements utilizing a hard-sell appeal evoked more positive cognitive perceptions. Furthermore, the results demonstrated a positive relationship between affective and cognitive perceptions and affective and cognitive attitudes toward the advertisement, respectively. These attitudes, in turn, influenced persuasion and behavioral intentions. Thus, examination of affective and cognitive factors in conjunction is essential, as studying them individually does not yield satisfactory results in terms of influencing attitude and subsequent behavior (Iozzi, 1989). By appealing to the consumer's social conscience, advertisers expect to successfully persuade them to make a sustainable purchase (Laroche et al., 2001; Polonsky, 2011).

Environmentally responsible purchase behaviour is simultaneously affected by personality traits, individuals who exhibit higher levels of agreeableness and openness assign more significance to social and environmental issues (Luchs and Mooradian, 2012). Another important factor is environmental concern which refers to the level of individuals' apprehension about environmental issues and their willingness to personally contribute for an effective solution (Dunlap & Jones, 2002). Due to the correlation between environmental concern and environmentally friendly behavior, the concept of "environmental concerns" has consistently attracted attention in the field of marketing and consumer behavior research (Albayrak et al., 2013). Consumers, who are more concerned about environment, react positively to green communication (Grimmer and Woolley, 2012). Pickett-Baker and Ozaki (2008) discovered that individuals having high concern for the environment tended to possess a positive attitude towards eco-friendly products, perceiving them as more captivating and pertinent. Numerous studies affirm the positive influence of environmental concerns on pro-environmental consumer behavior (Dangelico et al., 2021; Sadiq et al., 2021; Testa et al., 2011). Similarly, D'Souza and Taghian (2005) observed that individuals with high environmental concern exhibited a more favorable attitude towards green advertisements.

Research Gap

Consensus exists in the marketing and consumer psychological literature regarding the substantial amount of research devoted to identifying GMC determinants. Researchers have deliberated several aspects of GMC (specifically cognitive factor, affective factors, personality traits & Strategic orientation) that may significantly affect the consumer attitude towards green messages (Chwialkowska, 2018; Taufique, 2022; Šikić 2021; Aagerup et al., 2019). Despite the numerous academic efforts for communication mix (i.e. Mao and Zhang, 2013; Davari and Strutton, 2014, Chang et al., 2021; Koo et al., 2006; Dinh et al., 2023), GMC is still in its nascent stage (Grimmer and Woolley, 2012).

Moreover, EFA methodologies have diverse applications in marketing field, but it is not yet explored in case of green marketing communication. Thus, this paper attempts to fill the research gap by exploring the factors affecting GMC of green apparel industry.

RESEARCH METHODOLOGY

Research Design

After an extensive review of the existing literature, A set of scales and items that measure the consumer attitude towards GMC has been compiled. In phase I, initial 85 items related to the instrument are pooled based on the extensive literature review. Some measurements were adapted from previously developed scales (Table I) i.e. Cognitive & Affective Factors, Personality Traits and Environment Concern while to measure Strategic Orientation (SO), statements were developed after scrutinizing the relevant literature using deductive approach.

Table 1: Operational Constructs & Sources

Sr. No.	Operational Constructs	Sources
1.	Cognitive Factor	(Mostafa, 2007; Taufique et al., 2014)
2.	Affective Factors	(Taufique, 2022; Müller et al., 2009)
3.	Environmental Concern	(Sabbir and Taufique 2021; Albayrak et al. 2013; Mostafa, 2007)
4.	Personality Traits	(Martinez and John 1998)

Sources: Authors' Compilation

The relevance and appropriateness of each statement was examined. In order to ensure the simplicity and comprehension of questions, ambiguous wordings and technical jargon were removed. Afterward, to obtain the content validity, pooled items were sent to three subject experts. Thereafter, items have been reduced to 42 to eliminate redundancy and duplication. Finally, items with sufficient face and content validity are considered for further stage of scale development.

Pre-Testing

In order to reduce the measurement error and minimize the misunderstanding and cognitive burden on the actual respondents, pre-testing was conducted (Boateng et al. 2018). Various commercial establishments, shopping complexes, outlets etc. were visited to assess the awareness level of different age cohorts about green apparels & green communication. During the screening process, it was observed that youth are more aware of green apparel brands and their positive impact on environment. Based on these insights, youth were contacted for final data collection. Birks and Malhotra (2006) recommended a modest sample size ranging from 15 to 30 for pre-testing (pp. 346). Based on judgment sampling, 15 respondents who were aware of GMC and Green Apparel Brands were selected for pre-testing. Responses were collected on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). After completing the questionnaire, respondents were asked to explain the problem encountered during the survey. Accordingly, appropriate modifications were adopted in the instrument. To examine the internal reliability of the measurement items, Cronbach Alpha was calculated. The reliability coefficient value for each construct was more than the prescribed limit of 0.70 indicating a satisfactory level of reliability (Cronbach, 1951; Birks and Malhotra, 2006, pp. 314).

Sampling Method

In this study, multistage and judgement sampling method were adopted to identify appropriate respondent. 175 youth respondents from four states of Northern India namely; Haryana, Punjab, Rajasthan and Uttar Pradesh were selected based on their awareness level of green communication & green apparel brands. Youth are considered to be comparatively more environmental conscious (Prakash et al., 2018) whose purchase decisions are driven by sustainable behavior. Huge spending by youth on clothing and fashion products (Kautish et al., 2019; The Hindu, 2017) makes this segment lucrative, thus contribution of GMC in driving their purchase behavior may provide useful insights to the apparel industry (Khare and Varshneya, 2017; Gupta and Syed, 2022). Data have been collected in phase I, a pilot study is conducted to measure students' awareness towards GMC and green apparel. Based on the insight from pilot study, eligible students were contacted in phase II (hybrid mode) for final data collection. 175 respondents from four states of Northern India (Haryana- 16%, Punjab- 24%, Rajasthan- 27% and UP- 33%) were approached for data collection. However, effective sample size is 164 out of which 62% were Female and 38% were male with a majority of sample (85%) ranging between 21-23 age group.

Data Analysis

Exploratory factor analysis is adopted in this study which is frequently utilized in the fields of psychology and education (Hogarty et al., 2005). It enables researchers to explore the primary dimensions in order to generate a theory or model based on a relatively extensive collection of underlying constructs often represented by a series of items (Henson and Roberts, 2006; Thompson, 2004).

The total sample size consists of 164 participants. Hair et al. (2010) posited that a minimum sample size of 100 should be employed. In order to evaluate the appropriateness of the sample sizes for factor analysis, it is recommended to utilize the Kaiser-Meyer-Olkin

(KMO) measure of sampling adequacy and Bartlett's test of sphericit. The KMO index, which ranges from 0 to 1, indicates the suitability for factor analysis, with a value of 0.50 considered acceptable, while Bartlett's test of sphericity should yield a significant result ($p < 0.05$) for factor analysis to be deemed appropriate (Hair et al., 2010). High value of KMO (0.814) and significant test value of Bartlett's Test of Sphericity (Table II) indicate the suitability and adequacy of data for applying the EFA.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.81
Bartlett's Test of Sphericity	Approx. Chi-Square	7152.12
	df	861
	Sig.	.00

Sources: Authors' Compilation

The study used Principle Component Analysis to run EFA. The principal component analysis (PCA) method is widely utilized for this purpose, as stated by Henson and Roberts (2006) and Thompson (2004). Additionally, the varimax rotation method is employed to determine the number of factors (Thompson, 2004).

RESULTS & DISCUSSION

The fit model encompasses 12 factors and 42 items. The model comprising of eight factors elucidates 87.17% of the variance in the configuration of item associations.

Table 3: Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance	Total	% of Variance
1	8.97	21.36	21.36	8.97	21.36	5.55	13.22
2	5.75	13.70	35.06	5.75	13.70	5.16	12.28
3	4.25	10.12	45.17	4.24	10.12	3.77	9.00
4	3.16	7.52	52.70	3.16	7.52	3.69	8.79
5	2.48	5.90	58.60	2.47	5.90	3.38	8.05
6	2.22	5.29	63.88	2.22	5.29	3.35	7.99
7	1.97	4.70	68.58	1.97	4.70	2.58	6.14
8	1.88	4.48	73.06	1.88	4.48	1.94	4.60
9	1.72	4.09	77.15	1.71	4.09	1.93	4.60
10	1.55	3.70	80.85	1.55	3.70	1.85	4.41
11	1.37	3.27	84.13	1.37	3.27	1.72	4.10
12	1.28	3.04	87.17	1.27	3.04	1.67	4.00

Extraction Method: Principal Component Analysis

Sources: Authors' Compilation

The aggregate variance is illustrated in Table III. It is observed that twelve factors are having eigenvalues greater than 1, as shown in Table IV. Additionally, each factor exhibited a reliability coefficient (alpha) exceeding 0.70 (Table V).

Table 4: Factor Loading

Factors	Items	Mean	Std. Dev.	Commu-nality	Eigen values	Factor Loadings
F1- Environmental Consciousness						
	I can easily identify environment friendly symbols and phrases.	3.42	1.24	0.95		1.0
	I know what the term 'greenhouse gas' means.	3.39	1.19	0.95		1.0
	I am well acquainted with the term 'climate change'.	3.42	1.17	0.95	8.97	1.0
	I have enough knowledge about prevailing environmental issues.	3.65	1.31	0.93		1.0
	I am well aware of the term 'global warming'.	3.79	1.28	0.91		0.9
	I have adequate knowledge about the term 'green product'.	3.76	1.26	0.88		0.9
F2 Harmful Environmental Ramifications						
	Modern development threatens wildlife.	4.39	1.07	0.88		0.88
	Over the next several decades, thousands of species of plants and animals will become extinct.	4.49	0.98	0.87		0.87
	Environmental protection measures are beneficial for mankind.	4.52	1.02	0.89	5.75	0.87
	I am worried that human ingenuity will soon bring a major ecological catastrophe.	4.39	0.96	0.86		0.87
	I feel that environmental protection measures are essential to enhance the quality of life.	4.43	0.99	0.87		0.86
	I am concerned about the severe effect of pollution on public health.	4.45	1.00	0.80		0.83
F3- Emotional Connection with Nature					4.24	
	Whenever I feel unhappy, I always find relief in nature.	4.57	0.78	0.80		0.87

	When I spend time in nature I feel very relaxed and calm.	4.78	0.76	0.87	4.24	0.86
	Direct contact with nature makes me feel a strong connection with it.	4.60	0.77	0.80		0.84
	I feel relaxed and have a pleasant feeling of intimacy when spending time in nature.	4.60	0.74	0.75		0.79
	I aspire to have close proximity with nature.	4.68	0.66	0.65		0.74
F4- Strategic Process Oriented Communication						
	It depicts the non-polluting/ less polluting production process.	3.44	1.48	0.92	3.16	0.933
	It emphasizes on production process with low carbon emissions.	3.49	1.55	0.94		0.928
	It claims the production process to be based on less energy consumption.	3.49	1.51	0.92		0.917
	Green marketing communication asserts the use of natural resources/energy in the production process.	3.32	1.41	0.85		0.893
F5- Strategic Image Oriented Communication						
	It represents company's efforts to reduce the greenhouse gases.	2.88	1.33	0.86	2.47	0.91
	It emphasises the company's endevours to preserve natural resources.	2.96	1.28	0.84		0.91
	Green communication focuses on how company is preserving the ecosystem.	2.86	1.15	0.82		0.87
	It shows company's effort to use alternative renewable energy sources.	2.94	1.36	0.81		0.87
F6- Strategic Product Oriented Communication		2.22			2.22	

	In the message content, the product is shown to be non polluting/ less polluting.	4.57	0.90	0.89	2.22	0.88
	The green message claims the product to be energy efficient.	4.30	0.90	0.86		0.87
	The Green Message reflects the recyclable quality of the product.	4.549	0.902	0.866		0.86
	It focuses on low carbon emission of the graeen product.	4.31	0.80	0.82		0.85
F7- Strategic Environment Oriented Communication					1.97	
	It represents the facts related to the increasing carbon dioxide level.	4.71	0.74	0.91		0.91
	Green marketing communication shows the increasing level of global warming.	4.51	0.85	0.88		0.90
	It shows the worsening pollution level due to consumption habit.	4.53	0.76	0.82		0.86
F8- Meticulousness					1.88	
	Does a thorough job.	3.35	1.21	0.95		0.97
	Lazy.	3.21	1.44	0.95		0.96
F9- Negative Propensity					1.71	
	Relaxed, handles stress well.	2.94	1.40	0.94		0.94
	Nervous.	3.07	1.50	0.93		0.94
F10- Sociability					1.55	
	Outgoing, sociable.	2.79	1.57	0.92		0.93
	Reserved.	2.93	1.36	0.92		0.92
F11- Creativity					1.37	
	Active imagination.	4.23	1.12	0.88		0.93
	Few artistic interests.	3.75	1.30	0.86		0.87
F12- Congeniality					1.27	
	Trusting.	3.29	1.74	0.85		0.91
	Find fault with others.	3.16	1.19	0.83		0.89

Sources: Authors' Compilation

Table 5: Cronbach Alpha

Factor Component	No. of Items	Cronbach's Alpha
F1	6	0.98
F2	6	0.96
F3	5	0.91
F4	4	0.96
F5	4	0.93
F6	4	0.94
F7	3	0.91
F8	2	0.94
F9	2	0.92
F10	2	0.9
F11	2	0.81
F12	2	0.75

Sources: Authors' Compilation

F1: Environmental Consciousness

First factor has been loaded with 6 items having a good factor loading ranging from 0.97- 0.926 and communalities values ranging between 0.948 and 0.878. It is evident that factor 1 encompasses the items related to individual consciousness and understanding regarding the surrounding environment. This factor represents an individual's perception, knowledge, and recognition of the natural surroundings and sustainable products. This factor delineates various indicators, including an individual's ability to identify "environment friendly symbols & phrases", their level of knowledge about environmental issues, "green products". Based on these attributes, this factor is labelled as Environmental Consciousness which plays a crucial role in shaping an individual's attitudes and behaviours towards the green marketing communication.

F2: Harmful Environmental Ramifications

Second factor has been loaded with 6 items with a factor loading ranging from 0.882 to 0.826 and communalities values ranging between 0.887 and 0.802. This factor demonstrates the genuine apprehension of individuals about current & potentially damaging effects that their activities may have on the environment in the long run. Attributes like "Modern development threatens wildlife", concern for "plants and animals' extinction", "ecological catastrophe", "effect of pollution on public health" role of "environmental protection measures" showcase the genuine care and deep concern about the harmful consequences of human actions on the environment. Based on these attributes, this factor is labelled as Harmful Environmental Ramifications.

F3: Emotional Connection with Nature

Third factor represent 6 items with a factor loading ranging of 0.868 to 0.736 and communalities values ranging between 0.797 and 0.645. This factor underscores the intrinsic deep-rooted and inherent linkages that exist between human beings and the natural surroundings, emphasizing the importance of fostering a sense of responsibility and stewardship towards the natural world. The connection between these two entities is fundamental and integral, illustrating the interdependence and interrelationship that characterizes their shared existence. It is crucial to acknowledge and comprehend this intricate relationship, as it has far-reaching implications and impacts on various dimensions of human existence and the natural world. This factor highlights the intimate relationship that individuals share with their surrounding environment, emphasizing the multifaceted ways in which human beings are interconnected with the natural world. Thus, this factor is called as Emotional Connection with Nature.

F4: Strategic Process Oriented Communication

Factor fourth is loaded with four items having a factor loading of 0.868 to 0.736 and communalities values ranging between 0.797 and 0.645. This particular factor represents company's overall strategic approach to communicate their ecological processes involved in the production of goods or services. The strategic orientation pertains to the company's deliberate choices and decisions to communicate with various stakeholders, such as employees, customers, suppliers, and the general public, about the ecological aspects of its production processes. By examining this factor, one can gain insights into how the company prioritizes and values its ecological responsibility. Essentially, this factor support company's broader approach to manage its communication practices in relation to its ecological production processes.

F5: Strategic Image Oriented Communication

Fifth factor represent 4 items with a factor loading ranging of 0.910 to 0.869 and communalities values ranging between 0.856 and 0.814. This factor serves as an indication of the company's strategic orientation specifically in relation to communicating its ecological efforts to establish and enhance reputation and image within the industry and among its stakeholders. Through this strategic communication, the company seeks to demonstrate its dedication towards sustainable development and its efforts to minimize ecological footprint. By effectively communicating these efforts, the company aims to establish itself as a leader in the industry and gain recognition for its environmentally friendly practices. In summary, this factor encompasses the company's strategic approach to communication in the context of its ecological efforts, with the ultimate goal of building and strengthening its reputation and image in the marketplace.

F6: Strategic Product Oriented Communication

Four items have been clustered in factor 6 with a factor score of 0.880 to 0.847 and communality value of 0.894 to 0.817. The company's strategic orientation is centred around communicating the sustainable and environmental friendly aspects of its products. The communication strategy adopted by the company in this regard serves as a reflection of its commitment to create products that are not only economically viable but also socially responsible and environmentally conscious. By effectively conveying the sustainable and environmentally friendly aspects of its product, the company aims to not only attract environmentally conscious customers but also contribute to a larger movement towards a more sustainable and environmentally friendly society.

F7: Strategic Environment Oriented Communication

Factor 7 represent 3 items with a factor loading ranging of 0.911 to 0.856 and communalities values ranging between 0.914 and 0.820. The factor depicts the strategic orientation of a company to communicate the deteriorating environmental conditions and the subsequent worsening pollution levels, which can be attributed to the consumption habits. More specifically, this strategic orientation focuses on the way in which the company inculcate the sustainable behaviour among consumers by exhibiting the pathetic environmental conditions whose cause can be attributed to the consumption habits of individuals and society as a whole. Based on these elements, the factor is labelled as Environment Oriented Communication.

F8: Meticulousness

Factor 8 represent 2 items with a factor loading ranging of 0.972 to 0.856 and communalities values ranging between 0.914 and 0.820. This factor is intricately connected to the various personality traits that are exhibited by an individual, encapsulating the complex nature of one's character. It serves as a tangible representation and indicator of the extent to which an individual embodies and exhibits the quality of conscientiousness, which refers to their level of self-discipline, organization, and adherence to rules and responsibilities in their day-to-day life and interactions with others.

F9: Negative Propensity

Factor 9 comprises 2 items with a factor loading ranging of 0.942 to 0.939 and communalities values ranging between 0.936 and 0.928. This factor pertains to the personality characteristics representing individual's temperament. It indicates the extent to which an individual embodies the trait of Neuroticism, a psychological construct that encompasses an individual's propensity to experience negative emotions and emotional instability.

F10: Sociability

Factor 10 contains 2 items with a factor loading ranging of 0.931 to 0.922 and communalities values ranging between 0.921 and 0.915. This particular factor pertains to the individual's inherent personality traits exhibiting the level of extroversion a person possesses. Extroversion is a psychological construct that denotes the extent to which an individual is inclined towards seeking external stimulation and deriving energy from social interactions. This factor therefore, captures the essence of an individual's inclination to be outgoing, sociable, and assertive in their daily interactions with others.

Factor 11: Creativity

Factor 11 is denoted by 2 items with a factor loading ranging of 0.93 to 0.873 and communalities values ranging between 0.881 and 0.859. This particular factor is concerned with the individual's personality traits that indicate the level of creativity they possess. The term "creative" describes the ability to think and express oneself in original and innovative way. It encompasses the capacity to generate unique ideas, solutions, and interpretations. Understanding and measuring creativity can provide valuable insights into a person's cognitive abilities and problem-solving skills.

Factor 12: Congeniality

Factor 12 represent 2 items with a factor loading ranging of 0.906 to 0.890 and communalities values ranging between 0.848 and 0.829. This particular factor pertains to the personality characteristics that are indicative of the extent to which an individual place his trust in others and views them as faithful. It involves an individual's inherent beliefs and attitudes towards the reliability and dependability of others, as well as their willingness to place their confidence in the actions and intentions of those around them.

IMPLICATIONS & SUGGESTIONS

The insights derived from empirical investigation will assist both researchers and managers to comprehend multifaceted nature of green marketing communication. Researchers may understand various factors that shape the dynamics of GMC & practitioner can make informed decisions and implement effective communication strategies.

This study identified that Environmental Consciousness is a prominent factor of GMC. It is crucial to note that consumers' knowledge and understanding about the environmental issues emerge as a decisive factor in shaping their attitudes and perceptions towards Green marketing communication. Marketers must integrate prevailing consumer perceptions, concerns and expectations regarding environmental sustainability. The phenomenon of increased consumer scepticism & mistrust towards various ecological claims and the rising number of green washing litigations can potentially be addressed effectively by adopting a suitable and well-thought-out strategic orientation during the process of designing and implementing GMC campaigns. It is of utmost importance for marketers to strategically create social awareness about the authenticity and credibility of their claims by transparently disclosing the environmental certifications and credentials. This proactive approach not only helps to establish trust, but also strengthens and reinforces consumers' commitment and loyalty towards the brand or business.

In light of the growing apprehension among consumers regarding "Harmful Environmental Ramifications", it is imperative for marketers to modify their communication strategies in order to accentuate the sustainable characteristics of their products or services. Marketers must place a strong emphasis on their endeavor to utilise sustainable materials, the adoption of energy-efficient production processes, and the unwavering dedication of the company to reducing its carbon footprint. As Emotional Connection with Nature is revealed to be another important dimension of GMC, it becomes imperative for marketers to harness and capitalize on this profound emotional connection. One effective approach is to develop and implement advertising campaigns that successfully evoke feelings of connection, awe, and appreciation for the natural environment. In order to achieve this, it is crucial to employ persuasive imagery and storytelling techniques that effectively showcase the vast array of natural landscapes, the captivating beauty of wildlife, and the enchanting allure of outdoors. Furthermore, marketers can also strategically emphasize and highlight the brand's significant contribution and active involvement in environmental conservation efforts and initiatives. By doing so, marketers can effectively resonate with those consumers who are emotionally connected to nature, thus fostering an even deeper emotional bond with the brand. Focusing on process-oriented communication will potentially contribute to reduce and eventually eliminate consumer scepticism towards marketer's environment friendly commitment. In this regard, it is proposed that marketers should actively incorporate and reflect their sustainable production processes, which encompass the various stages and activities involved in the creation and manufacturing of products or services with minimal negative impact on the environment

in their green communication efforts. By doing so, marketers can potentially enhance their credibility and authenticity in the eyes of consumers, as well as provide them with the necessary reassurance and confidence in the claims and messages being communicated. Furthermore, it should involve the careful formulation and execution of a well-coordinated and integrated approach to green marketing communication & tactics that are capable of effectively conveying the company's genuine commitment to environmental sustainability and its efforts to minimize any negative impact on the environment.

CONCLUSION

Adopting a philosophical perspective, the study elevates the existing paradigm of GMC research by transitioning it from a purely conceptual framework to an empirical domain. By doing so, it successfully combines both existing and novel elements of GMC, thereby providing a framework that can be utilized to design the companies' strategies pertaining to green communication. Future scope of study lies in examining the other stakeholders' perspectives regarding GMC based on qualitative research designs. Future research endeavors may concentrate on facilitating subsequent advancements by exploring the relation with a wide range of endogenous variables, such as green brand equity, corporate reputation, and sustainable purchase intention.

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Distributed Ledger Technology (DLT) in Higher Education: An Extended Approach to Technology Adoption

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ABSTRACT

Blockchain technology represents a potential game-changer for traditional business practices and could revolutionize higher education in numerous ways. The research study was undertaken to investigate the attitudes and behaviors of educated individuals toward the role of distributed leger technology in higher education. This study is of considerable importance to professional colleagues and researchers. Its aim was to enhance the technological model by including critical factors such as perceived security, privacy, trust, and ease of use. Response was obtained from 218 respondents through an exhaustive survey employing a validated scale. The researchers analyzed the proposed connections within the framework through the utilization of PLS-SEM. The study's outcomes emphasize the beneficial effects of the factors integrated into the model on participants' intentions to adopt blockchain technology in the teaching-learning system. Data privacy and system security notably found as substantial influencers on perceived usefulness, ease of use, and trust in blockchain technology. Encouragingly, participants expressed trust in the security and reliability of blockchain technology, along with its potential integration in higher education.

KEYWORDS: *Distributed Ledger Technology (DLT), Perceived usefulness, Ease of use, and trust.*

INTRODUCTION

The rapid technological advancement and the extensive adoption of electronic devices profoundly impacted human existence, resulting in fundamental shifts across various domains.This technological advancement has caused significant shifts in market landscapes and has notably impacted the economy. In this context, blockchain technology has emerged as a groundbreaking and disruptive force with substantial potential, finding applications across various sectors such as finance, manufacturing, agriculture, healthcare, and government. This study delves into distributed ledger technology and teaching learning as a relatively underexplored area with promising prospects. It can transform processes like supply chain management by improving traceability, authenticity, automation, and cost-effectiveness. These enhancements ultimately result in enhanced logistics performance and increased customers involvement. Moreover, blockchain enables secure and transparent transactions, facilitating streamlined processes for payments, grants, and scholarships. Smart contracts on blockchain platforms can automate these transactions, reducing administrative burdens and enhancing efficiency. Furthermore, blockchain enhances data security and privacy by giving individuals control over their personal information. This is particularly crucial in education, where sensitive data like student records are involved. Additionally, blockchain facilitates the creation of decentralized learning platforms, fostering collaboration and knowledge sharing without the need for intermediaries.

Overall, blockchain technology holds the potential to promote trust, transparency, and efficiency in education, ultimately benefiting students, institutions, and other stakeholders.

Current technological landscape, higher education has embraced new teaching paradigms, such as hybrid learning and flipped classrooms, to enhance student interaction. Blockchain technology's dynamic nature

offers valuable support to educational institutions in certification, record authentication, and addressing issues such as counterfeiting and security. Despite being in its nascent stages, blockchain presents significant opportunities for creating personalized learning pathways and enhancing educational infrastructure. For instance, distributed ledger technology can be applied to maintaining student achievements, which can be used to verify their qualifications and competencies to potential employers.

Despite the growing interest in leveraging blockchain within education, there is a dearth of literature examining individual adoption intentions. Understanding individual attitudes and behaviors towards adopting advanced technologies like blockchain is crucial for assessing its scalability. The research investigates the adoption behavior of educated individuals toward distributed ledger technology using the Technology Adoption Model. The model is a widely accepted framework for studying technological adoption, and it considers factors such as perceived usefulness, ease of use, and external influences (Denter et al., 2023). Further study was found to be useful for educational institutions and policymakers adopting blockchain technology to enhance the learning experience.

DISTRIBUTED LEDGER EDUCATION FRAMEWORK

Distributed Ledger technology has emerged as a disruptive force, transforming established business practices across numerous industries. Its integration into diverse sectors such as medical services, supply chain management, financial services, power generation and distribution, industrial production, consumer goods, and biological sciences highlights its versatility and promise (Baiod et al., 2021). Post-secondary education has also become a prime focus for blockchain technology. In higher education, blockchain presents an exciting opportunity to overhaul traditional methods. Its fundamental features, like document integrity, transparency, permanence, and trust, have the capability to transform different facets of academic processes. Through the utilization of blockchain, educational institutions can streamline activities related to student records, credential verification, and academic honesty. Furthermore, blockchain solutions have the ability to bolster data security, mitigate fraudulent practices, and cultivate stronger trust among the stakeholders (Ocheja et al. 2022). The integration of blockchain in tertiary education goes beyond administrative tasks; it holds promise for reshaping teaching and learning approaches.. Educators can provide students with more adaptable and personalized educational experiences by introducing decentralized learning platforms and credentialing systems. Additionally, blockchain-powered tools enable the creation and validation of digital credentials, empowering learners to demonstrate their competencies and accomplishments securely and verifiably (Guustaaf et al., 2021). When investigating adoption trends, the research utilizes the technological model founded on the reasoned action theory suggests that human actions are influenced by their intentions to engage in those actions. Davis introduced the essential notions of usefulness and use within TAM (Venkatesh, 2000).

Perceived utility explores an individual's view of how implementing a specific system would enhance their job effectiveness. Moreover, the decision to embrace novel technology pivots on its perceived efficiency in the professional realm. Easy operation assesses individual extent and the adoption of new technology as straightforward (Moon & Kim, 2001). Intuitively user-friendly technologies alleviate apprehensions and instill a positive disposition toward adoption. Within this framework, attitude signifies the spectrum of one's sentiments, be they positive or negative, regarding technology usage. Research has shown that individual attitudes act as precursors to concrete actions, with the introduction of new technology playing a pivotal role in reshaping these attitudes, potentially leading to systemic transformations (Farooq et al., 2019). TAM has emerged as a dependable tool for forecasting adoption intentions concerning novel technologies, albeit necessitating customization to suit specific environmental contexts. TAM has been extended to include perceived security, confidentiality, and confidence. The utmost significance of security and confidentiality is widely recognized, frequently acting as major obstacles to technology adoption. Security apprehensions are construed as hindrances to selecting or deploying new technological solutions. Perceived security and privacy are crucial elements of

trust when it comes to sharing personal information It pertains to the belief that personal information should be protected, kept confidential, and accessed only by authorized persons. To ensure the privacy and security of personal information, it is important to implement a range of measures. Maintaining privacy and security is crucial for building trust with customers, as well as complying with legal and ethical obligations. By taking a proactive approach to data privacy and security, organizations can protect sensitive information, prevent data breaches, and maintain positive relationships with their customers. Such assurances engender with the system, with previous research validating the significant influence of system reliance on overall trust. Furthermore, The significance of trust cannot be overstated when it comes to technology adoption. It has emerged as a potent predictor of individual attitudes towards new technologies. Trustworthy technology is more likely to be embraced by individuals, while a lack of trust can lead to skepticism and reluctance. Therefore, building trust is pivotal in shaping adoption behaviors and ensuring the successful implementation of technological advancements (Wu & Chen, 2005).

The proposed relationship for study:

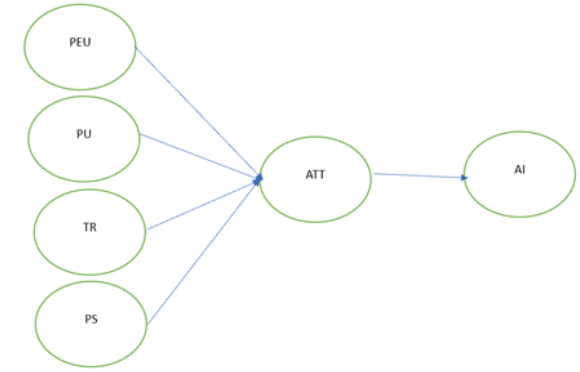
H1: Perceived ease of use has a significant influence on attitude.

H2: Perceived usefulness has an impact on attitude.

H3: Trust has an impact on attitude.

H4: Perceived security has an impact on attitude.

H5: Attitude has an impact on adoption intention.



Note: PEU- Perceived Ease of Use; PU- Perceived Usefulness; TR- Trust; PS: Perceived Security; ATT- Attitude; AI- Adoption Intention.

Figure 1: Conceptual Framework

METHODOLOGY

The focus is on the adoption of new technologies using well-established theoretical framework known as the Technology Adoption Model (TAM). A validated measurement scale has been selected for the study, which enables researchers to assess various constructs relevant to the TAM. The chosen measurement scale is widely recognized as a reliable tool for evaluating the four main components of the TAM: PEU, PU, ATT, and AI. These components are considered vital forces influencing users' decision to accept innovation. The study introduces two additional latent constructs, perceived security and privacy (PSP) and trust (TRT), to provide a more comprehensive understanding of individuals' perceptions and attitudes toward blockchain technology adoption. PSP refers to individuals' perceptions of the security and privacy of their personal information when using blockchain technology. Trust (TRT) refers to individuals' trust in the technology and the entities that use it. To measure participants' attitudes, the study uses a semantic differential scale that allows respondents to present their sentiments from "extremely bad" to "extremely good." This scale assigns corresponding numerical values to each point along the scale, ranging from 1 to 7. By using the TAM and introducing new constructs, the study intends to contribute to the adoption of new technologies and provide insights for practitioners and policymakers. The study approach utilized in the research was designed to provide a nuanced exploration of blockchain technology. This Likert scale format was chosen because it facilitates a more detailed analysis of the participants' perceptions and beliefs regarding various aspects of blockchain technology. By using this scale, the researchers can better understand the participant's feelings about the technology and identify any potential barriers to its adoption.

FINDINGS AND DISCUSSION

The data analysis for this study was conducted utilizing two main software tools: JASP and SMART-PLS. Initially, descriptive statistics of the data were computed using SPSS 21.0. This involved summarizing and examining the characteristics of the dataset to gain a preliminary understanding of its distribution, central tendencies, and variability. Descriptive analysis helped

in identifying any patterns, outliers, or anomalies within the data before proceeding to more complex analyses. Structural equation modeling (SEM) was carried out following the descriptive analysis using Smart-PLS 2.0. The analysis in Smart-PLS 2.0 was conducted in two distinct steps:

Measurement Model Assessment

Before delving into an examination of how different variables relate to each other, it's crucial to ensure each measurement item's reliability and validity. This ensures that the data collected accurately reflects the underlying constructs being studied.

The consistency can be evaluated by calculating the composite reliability (CR) statistic. This statistic is used to assess the extent to which the related terms within each construct measured the same underlying concept. It is a crucial measure of the reliability of a scale or instrument. Composite reliability is a type of reliability coefficient calculated by combining the item loadings and error variances of the related terms within a construct. In other words, if the related terms within a construct are measuring the same underlying concept, then the composite reliability will be high. Researchers often use composite reliability as a measure of internal consistency because it takes into account both the item loadings and error variances. This is important because a scale may have high item loadings but still have low internal consistency if the error variances are high. Conversely, a scale may have low item loadings but still have high internal consistency if the error variances are low. By considering both factors, composite reliability provides a more accurate assessment of the internal consistency of a scale or instrument. In Table 1, the composite relability values for adoption intention , attitude, perceived ease of use (PEU), perceived security and privacy, perceived usefulness, and trust were all found to be above 0.7. This suggests that each construct's items demonstrate strong internal consistency, implying favorable reliability (Fornell & Larcker, 1981).

Table 1: Outer Model Result

Construct	Item	Loading	AV	CR
PEU	PEU 1	0.817	0.665	0.845
	PEU 2	0.831		
	PEU 3	0.323		
	PEU 4	0.772		
PU	PU 1	0.754	0.765	0.901
	PU 2	0.876		
	PU 3	0.874		
	PU 4	0.869		
TR	TR1	0.771	0.667	0.843
	TR2	0.859		
	TR3	0.876		
PS	PS1	0.768	0.63	0.854
	PS2	0.865		
	PS3	0.776		
ATT	ATT 1	0.831	0.776	0.859
	ATT 2	0.876		
	ATT 3	0.776		
AI	AI1	0.82	0.742	0.873
	AI2	0.976		
	AI3	0.743		

T The AVE metric is crucial as it quantifies the proportion of variance captured by the construct's indicators, in contrast to the variance attributed to measurement error. Our findings reveal that the AVE values for all constructs under investigation comfortably surpassed the recommended benchmark of 0.5. This outcome is significant as it implies variance in each construct is effectively explained by its associated items, underscoring the robustness of the constructs. To further validate our findings, we embarked on establishing validity. In this analytical approach, the comparison was conducted by contrasting the square root of the Average Variance Extracted (AVE) values, strategically positioned along the diagonal of the correlation matrix, with the latent variable correlation. This methodological framework assesses the discriminant validity among constructs within a research model or dataset. The square root of the average amount of variance captured by each construct's indicators, serves as a benchmark for evaluating the degree of distinction or uniqueness between constructs. Placed along the diagonal of the correlation matrix, these values offer insights into the constructs' individual variance explained by their indicators. The off-diagonal values within the correlation

matrix represent the correlations or relationships between different constructs. By comparing these off-diagonal values with the square root of the AVE values, researchers can discern whether the constructs possess adequate discriminant validity. Specifically, if the off-diagonal values are consistently lower than the square root of the AVE values for each construct, it indicates that the constructs are sufficiently distinct from one another. This comparison process facilitates the identification of potential issues, such as construct overlap or redundancy, which may undermine the validity and reliability of the research model. Ensuring robust discriminant validity is essential. This pattern indicates that the measurement items exhibit a strong level of both convergent and discriminant validity, as noted by Chiu & Wang (2008). Such a distinction ensures that the items are closely related within constructs and sufficiently distinct across different constructs. Moreover, the study took a close look at the reliability of the measurement items by examining their loadings. Loadings serve as an indicator of the strength of association between each item and its corresponding construct. Remarkably, all item loadings in this study exceeded the threshold of 0.7. This finding indicates high reliability, suggesting that each item is a dependable measure of its respective construct. In sum, the evidence presented herein strongly supports the conclusion the items employed are highly effective in expanding the variable. They not only meet but exceed the standard criteria for reliability and validity. This comprehensive analysis and its implications are detailed further in Table 2, providing a clear and robust foundation for the study's findings.

Table 2: Forner Lacker Criteria

	PEU	PU	TR	PS	ATT	AI
PEU	0.839					
PU	0.546	0.806				
TR	0.442	0.358	0.739			
PS	0.458	0.242	0.256	0.802		
ATT	0.332	0.445	0.446	0.456	0.841	
AI	0.665	0.437	0.376	0.342	0.336	0.854

Structural Model Assessment

The study used non-parametric bootstrapping, a statistical resampling technique to analyze the proposed relationship. In the structural model, the presence of a beta coefficient is an important indicator of the strength. The study provides strong evidence to the proposed relationships. The core variables of the model predict attitudes for the distributed ledger technology. This supports Hypotheses 1 and 2, with corresponding path coefficients of $\beta = 0.168$ and $\beta = 0.337$, and corresponding t-values of 5.325 and 9.778, respectively. Additionally, the study revealed that attitude serves as a robust predictor of inclination or willingness of students, educators, administrators, and other stakeholders within the higher education sector to embrace and utilize blockchain technology for various purposes. This encompasses a broad spectrum of potential applications, ranging from academic credential verification and management to research data integrity, student records management, and administrative processes optimization. The decision-making process behind individual adoption intention for blockchain in higher education is influenced by various factors and considerations. These may include perceived usefulness, perceived ease of use, perceived credibility of the technology, perceived compatibility with existing systems, trust in the technology and its providers, as well as individual attitudes, beliefs, and motivations. Perceived usefulness refers to the extent to which individuals believe that blockchain technology can facilitate or enhance their tasks, processes, or activities within the educational context. For example, students may perceive blockchain-based credentialing systems as more convenient and secure than traditional paper-based transcripts, while educators may see potential in blockchain for securely recording and verifying academic achievements or research data. Perceived ease of use relates to individuals' perceptions of how easy or difficult it is to use blockchain technology. This encompasses factors such as user-friendliness of blockchain applications, availability of user support and training, and compatibility with existing technological infrastructure in educational institutions. Perceived credibility of the technology refers to individuals' trust in the reliability, security, and authenticity of blockchain systems and platforms.

This includes considerations such as the immutability of data recorded on the blockchain, transparency of transactions, and the absence of centralized control or manipulation. Perceived compatibility with existing systems examines how well blockchain technology aligns with the existing technological, institutional, and regulatory frameworks within higher education. This involves assessing whether blockchain solutions can seamlessly integrate with existing databases, learning management systems, and administrative processes without causing disruption or inefficiencies. Trust in the technology and its providers involves confidence in the reliability, security, and ethical use of blockchain technology, as well as trust in the entities responsible for developing, implementing, and maintaining blockchain solutions in the higher education sector. Individual attitudes, beliefs, and motivations also play a significant role in shaping adoption intentions for blockchain in higher education. Positive attitudes towards innovation, a desire for improved efficiency and transparency, and a belief in the transformative potential of blockchain technology can all contribute to higher levels of adoption intention among stakeholders. Overall, individual adoption intention for blockchain in higher education is a multifaceted phenomenon influenced by a combination of perceived benefits, usability, credibility, compatibility, trust, and personal attitudes and motivations. Understanding these factors is crucial for effectively promoting and facilitating the adoption of blockchain technology in the higher education sector. , with a path coefficient of $\beta = 0.505$ and a t-value of 18.269, supporting Hypothesis 3. Moreover, the study extended and strengthened the predictive capacity of individual adoption intention for blockchain within the higher education system by integrating trust and perceived security and privacy. Trust is found to have a significant positive impact on individual attitudes, with a path coefficient of $\beta = 0.316$ and a t-value of 11.333, confirming Hypothesis 4. Furthermore, the study demonstrated that perceived security and privacy substantially positively influence trust, and ease of use and usefulness, respectively. These findings support Hypotheses 5 with respective path coefficients of $\beta = 0.582$ and corresponding t-values of 22.839. Overall, the study provides valuable insights into the factors that influence individuals' intentions to adopt blockchain technology in higher education.

Table 3: Inner Model Result

Hypothesis	Path	Estimates	Decision
H1	PEU--ATT	0.342**	Accepted
H2	PU--ATT	0.541***	Accepted
H3	TR--ATT	0.316***	Accepted
H4	PS--ATT	0.453**	Accepted
H5	ATT--AI	0.332**	Accepted

CONCLUSION

In numerous research endeavors, the adoption model has been a versatile framework, applied in different aspects to explore individuals' inclinations toward embracing novel technologies. Despite the widespread proliferation of blockchain technology, its practical utilization has not met initial expectations, remaining relatively limited in real-world applications. Recognizing this discrepancy between potential and actual adoption, this study endeavors to delve into the intentions behind adopting blockchain technology within the sphere of higher education. In light of the relentless march of technological progress, the proposed extended model offers a fresh perspective on the adoption dynamics of blockchain innovation. Through meticulous analysis, the study has unveiled compelling insights into the factors that significantly shape individuals' intentions to adopt blockchain within higher education settings. Of particular note is the pivotal role played by perceived security and privacy, which substantially influence individuals' utility and trustworthiness of blockchain technology. The findings underscore respondents' prevailing confidence regarding the security and reliability of implementing blockchain solutions within higher education institutions. Furthermore, the study underscores the indispensable nature of bolstering security measures with blockchain technology, emphasizing the imperative for educational institutions to invest in fortifying their infrastructural frameworks. This investment aims to establish secure environments and robust systems and platforms to safeguard users' sensitive data from threats like unauthorized tampering, deletion, or fabrication. The indispensable management practices are central to the successful integration of blockchain technology in education. Such support fosters a collaborative environment among institutional stakeholders, laying the groundwork for

seamless implementation and adoption. Moreover, the study advocates for formulating guidelines within the educational system to streamline the acceptance of disruptive innovations such as blockchain. The study also highlights the significance of governmental intervention through enacting awareness among stakeholders regarding the manifold benefits of distributed ledger technology within the higher education sector. As public awareness grows and the tangible benefits of technology implementation become increasingly evident, the diffusion of blockchain adoption is expected to gain momentum among various segments of society.

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An Empirical Study on Perception of Shopping Online in the Digitization Era Among Millennial and Gen Z

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ABSTRACT

Objective: The research aims at identifying the factors affecting the consumer perception of shopping online. This paper focus on developing a conceptual framework that will make the reader to have a concise understanding about consumer purchase intention online. This study further compares the perception of online shopping among Millennial and Gen Z.

Design/Methodology/Approach: The sample of 427 were taken from consumers who prefer to shop through online mode. A quantitative method of survey was used as an appropriate technique to meet the research objectives. The survey collected a total of 427completed questionnaire. Tools are used for comparing and analyzing the consumer's preference on online shopping. The independent factors considered in questionnaire are perceived risk, performance expectancy, social influence, facilitating conditions, effort expectancy, price, trust, hedonic motivation, and security which affects behavior intention to utilize online shopping.

Finding: The result showed that the factors mainly facilitating conditions, performance expectancy, price, trust plays very significant role in understanding behaviour intention of the customer to shop online.

KEYWORDS: *Online shopping, Consumer intention, Questionnaire, Regression, Conceptual model.*

INTRODUCTION

Sustainable products gaining wide exposure when using less energy as possible, does not deplete natural resources and was made under the social acceptance parameters. These products are so designed to minimize the level of impact on environment which safeguard the resources for upcoming generations (Armutcu & Tan, 2023). Substantially, Gen Z generation grow up with digitalized mindset, technology-savvy and with strong environmental attitude to protect resources keeping in mind the pace of change due to the globalized online world (Surahman & Lesmana, 2023). Gen Z believes as same as other generation that helping environment is important aspect but they pay more attention and efforts to do so. So, shifting from traditional market purchase to online purchase was a compelling need of Gen Z. Online shopping poses with convenient purchase, money saving, range of variety, quick access and easy return policies which easily attract the current generation (Stofejova & Kral, 2023). Such online purchase characteristics are blend with Gen Z requirement. Gen Z has their different opinion concerning spending with an aim to save money, brand authenticity preferring sustainable products (Limayem & Khalifa, August 2000). This transformation has not only reframed the marketing strategies but also provided sharp turn

to consumer behavioral aspects. The study signifies various factors which attribute towards consumer purchase intention for online shopping is discussed as quick technology adoption customers are more prone to online shopping (Liu, Bernardoni, & Wang, 2023). Such technological upgradation leaves marketers under pressure to bring advancement to their industry align to customer centric products.

LITERATURE REVIEW

With a rapidly expanding global trend toward online purchasing or e-commerce, it has caused changes in the way individuals conduct business. Theory of reasoned action (TRA) says the technology acceptance model (TAM) states the two important beliefs among consumers are ease of using andusefulness adding to it E-retailer may be more appealing to promote the Internet purchasing.Students from higher educational background are more likely to purchase online (Yulihasri, Feb 2011). It is now observed that One of the business distributions channels that is expanding the quickest is online retail however the two primary reasons people decide whether or not to purchase online are simplicity of use and enjoyment as now online shopping platforms have become fancierand have several more options than the offline shops (T. Ramayah, 2005)(Pauzi, Thoo, Tan, & Muharam, 2017). utilization of thenotion that is, of planned behavior as a theoretical foundation the aim of the study was to find outthe connections between desire to purchase online and the consumer attitude towards shopping online, perceived behavioral control, and subjective norm, two out of the three factors, including subjective norm and attitude toward online purchasing, were shown to be strongly related with intention to do online shopping (Lim, Osman, Salahuddin, Romle, & Abdullah, 2016). A substantial effect on internet buying behavior was behavioral control and intentions. Additionally, the outcomes offer compelling evidence for the beneficial benefits of individual innovation on mind-set and online shopping intentions (Limayem & Khalifa, August 2000). The individual is prone to get influenced by media such as Instagram Twitter, and Facebook because social media has become a major online platform for consumers to communicate. It is important to consider the factors that include social influences, hedonic motivations, enabling conditions, perceived risk, and perceived trust which influence the consumer mindset to purchase groceries online (Pauzi, Thoo, Tan, & Muharam, 2017). Additionally, consumer sentiments towards global environment using green products is still under progress as author identifies that Gen Z pose green gap between actual behavior and purchase intention due to the price mindset (Jesus et al., 2024). On the same note, green apparel and green perceived value also significantly affect purchase intention of Gen Z towards online purchase (Isa et al., 2020). (Armutcu & Tan, 2023)(Nekmahmud & Naz, 2022) instigate two mediating variable as sustainability knowledge and perceived value implies the change in consumer behavior in positive way. Similar study with respect to fashion industry pose age and gender as moderator to build significant relationship between purchase behavior and online marketing tactics (Djafarova & Bowes, 2021). The paper concluded that young age and wealth of consumers are main component which describes ease of usefulness, hedonic motivation for online shopping.

RESEARCH METHODOLOGY

This study employs a descriptive research and empirical analysis approach. Random sampling is followed as a technique toget information about electronic banking. A structured questionnaire is created for this study, and 427consumers from Delhi-NCR who use online shopping are chosen as a sample.

As per minimum sample size required for quantitative analysis is 385 (Cochran W.G., 1963). Thumb rule for sample size is no. of factors multiplied by 25, for 9 factors multiplied by 25 = 225. Sample size considered in the study is 427, hence it fufills the requirement of minimum sample size. The variables that are independent are measure dusing five point scale of Likert (where “1” representing strongly disagree to “5” which represents strongly agree) Frequency table,charts, histograms, and percentages will be used to present and interpret the data.

Various statistical tools such as Cronbach Alpha, regression, structured equation modeling, Moderation analysis, R square and f square have been applied on the research data. MS Excel and SMARTPLS 4.0 have been used for analyzing and interpreting the respondent

data. Tools are used for comparing and analyzing the consumer's preference on online shopping.

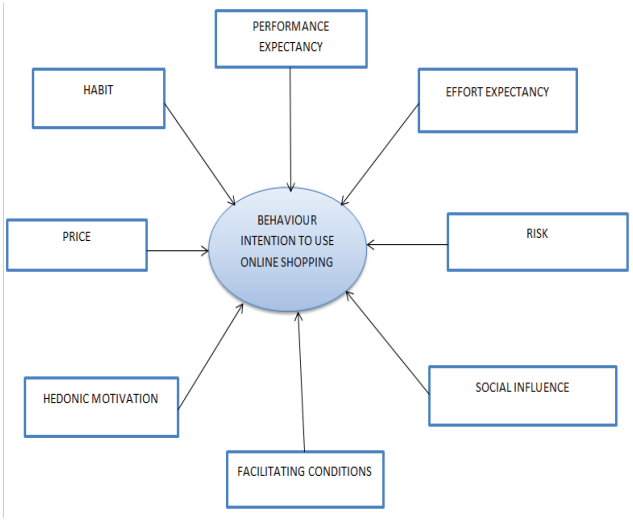

Figure 1: The model for research

The independent factors considered in questionnaire are perceived risk, performance expectancy, social influence, facilitating conditions, effort expectancy, price, trust, hedonic motivation, and security which are effecting behavior intention to shop online.

HYPOTHESIS FRAMING:

H1 – Performance expectancy shows a significant positive effect on behavioral intention to use online shopping.

H2- Effort expectancy shows a significant positive effect on behavioral intention of using online shopping.

H3- Social Influence shows a significant positive effect on behavioral intention of using online shopping.

H4- Facilitating Conditions shows a significant positive effect on behavioral intention of using online shopping.

H5- Hedonic Motivation shows a significant positive effect on behavioral intention of using online shopping.

H6- Price value shows a significant positive effect on behavioral intention of using online shopping.

H7- Habit shows a significant positive effect on behavioral intention of using online shopping.

H8- Risk shows a significant positive effect on behavioral intention of using online shopping.

OBJECTIVES OF THE RESEARCH STUDY

1. To identify the factors influencing the behavioral intention of using online shopping
2. To compare perception towards online shopping among Millennial and Gen Z.
3. To conceptualize a research model to establish a relationship between independent factors affecting behavioral intention to shop online i.e., dependent variable.

DATA ANALYSIS

Demographic Analysis

Table 1: Demographic analysis

Demographic	Frequency	Percentage
Gender		
Male	209	48.94%
Female	218	51.05%
Age Group		
GEN Z	220	51.25%
MILLENNIAL	207	48.47%
Occupation		
10th Passed	87	20.37%
12th Passed	111	25.99%
Graduate	127	29.74%
Post-Graduate	102	23.88%

The quantitative results clearly shows that 48.94% were male respondents and rest 51.04% respondents were female.The age group id divided in to gen z (51.52%) and millennials (48.47%), The highest percentage of respondents, 29.74%, are graduates, followed closely by those who have completed their post-graduation, accounting for 23.88%.Individuals who have passed their 12th grade represent 25.99% of the respondents, while those with a 10th grade education make up 20.37%. First, measurement model is assessed then structural model is analysed through PLS Modelling.

INFERENTIAL DATA ANALYSIS

Pilot Analysis

Pilot study was executed with 58 sample size from consumers from Delhi -NCR. It was found that four

items outer loading value was below 0.70 hence could not meet reliability and validity criteria, therefore they were deleted and final 26 items were considered for study. Items deleted after Pilot analysis were PE 1, BI2, H3 and FC3.

Measurement Model Assessment

Reflective measurement model is assessed through evaluation of the following:

Factor loading of all the constructs are well above the threshold loading I.e., 0.70 (Hulland, 1999) as shown in above figure 2. Construct's reliability is measured through Cronbach alpha (Fornell and Bookstein, 1982). A minimum score of 0.7 is necessarily required to assess the latest variable as internally consistent. In the study, values of Cronbach's alpha are above 0.700. Hence, the model shows good internal consistency. Here Cronbach's value is also more than the 0.80 for all constructs which depicts excellent internal consistency in the model. From the below table it is clear that the latent variables has sufficient reliability. Construct's Cronbach value which are greater than 0.70 are all acceptable (Nunnally and Bernstein, 1994).

Table 2: Reliability and Validity- Output of Confirmatory factor analysis (CFA)

CONSTRUCT	INDICATOR	LOADING	CRONBACH'S ALPHA
BEHAVIORAL INTENTION	BI1. I intend to continue use of online shopping in the coming future.	0.922	0.812
	BI3. I plan to continue the use of online shopping frequently.	0.913	
HABIT	H1. I would trust online shopping products to be as good without any errors.	0.916	0.832
	H2. I believe online shopping applications would be trustworthy.	0.934	
PRICE	PR1. Online shopping platforms are reasonable priced.	0.814	0.846
	PR2. Online shopping platforms are more value for my money.	0.913	
	PR3. At the current price, the online shopping platforms offers a good value.	0.895	
PERFORMANCE EXPECTANCY	PE2. Use of online shopping increases my chance of finding things that are important to me.	0.754	0.785
	PE3. Shopping online helps to achieve things more quickly.	0.823	
	PE4. Shopping online helps increasing my productivity.	0.896	
EFFORT EXPECTANCY	EE1. Learning to use online shopping platforms is quite easy for me.	0.840	0.864
	EE2. My interaction while using online shopping applications is very clear and understandable.	0.811	
	EE3. I find online shopping easy to use.	0.887	
	EE4. It is quite easy for me to get skillful at using platforms to shop online.	0.826	

SOCIAL INFLUENCE	SI1. People that matter for me believe that I should be using online shopping platforms.	0.818	0.831
	SI2. People by whom my behavior gets influence think I should use E-shopping platforms.	0.882	
	SI3. Shopping online is preferred by people whose opinions i value.	0.892	
FACILITATING CONDITIONS	FC1. I have the necessary resources to use online shopping applications.	0.949	0.845
	FC2. I have the necessary knowledge to use online shopping applications.	0.950	
	FC4. I can get access to help when I am having difficulty using online shopping applications.	0.703	
HEDONIC MOTIVATION	HM1. Use of online shopping applications is more fun.	0.904	0.892
	HM2. Use of online shopping applications is more enjoyable.	0.923	
	HM3. Use of online shopping applications is more entertaining.	0.893	
RISK	R1. I would not feel totally safe riding in an online shopping application.	0.754	0.724
	R2. I would feel i must be cautious when I use an online shopping application..	0.886	
	R3. I would feel there is a risk involved with using an online shopping application.	0.761	

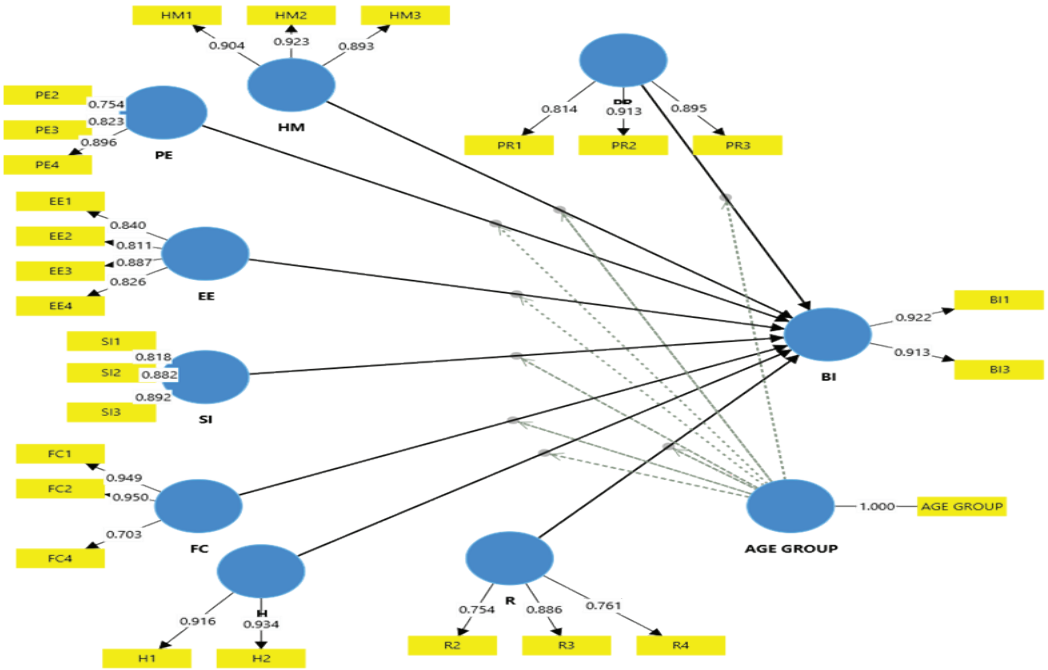

Figure 2: The Measurement Model - Latent construct's outer loading values

Assessment of Structural Model

For assessment of the structural model, the study has applied R square measure, which is most commonly used for structural model assessment. It measures the explained variance of all latent variables to its total variance. There is one endogenous variable in the model, the R2 value of BI being 0.758. Hence, the endogenous variable are explaining variance above 0.67, the model is explaining substantial variance by its latent variables.

Table 3: To evaluate R^2 (R-square) and f^2 (f-square)

CONSTRUCTS	f-square	R-square	R-square adjusted
FC-> BI	0.007	0.773	0.758
EE -> BI	0.020		
H -> BI	0.002		
HM -> BI	0.061		
PE -> BI	0.192		
PR -> BI	0.026		
R -> BI	0.160		
SI -> BI	0.025		

f^2 effect size assesses the influence of particular exogenous latent type variable upon an endogenous type of variable (Giao and Vuong, 2019). Evaluating the effect size of every path is another approach towards structural model analysis (Cohen, 1988). Effect size measures if there was significant impact of an independent latent variable upon a dependent type of variable. In the structural model, f sq values of 0.02, 0.35, 0.15 and suggest a small, large, medium effect of an exogenous variable on the endogenous variable (Chin, 1998).

Table 4: Results of hypothesis testing and structural relationships

Hypothesis relationship	T statistics	P values	Hyp. No.	Result
PE -> BI	1.987	0.045	H1	supported
EE -> BI	2.559	0.011	H2	supported
SI -> BI	2.324	0.021	H3	supported
FC-> BI	1.041	0.299	H4	Not supported
HM -> BI	5.216	0.000	H5	supported
PR -> BI	2.646	0.008	H6	supported
H -> BI	1.043	0.297	H7	Not supported
R -> BI	5.439	0.000	H8	supported

The result showed that the social influence, performance expectancy, Hedonic motivation, effort expectancy, price and risk plays a significant role in determining behavioural intention of using online shopping platforms. Facilitating condition and habit have shown insignificant effect on intention of using online shopping platforms.

Moderation analysis

Hypothesis testing

Table 5: Result of SEM - Hypothesis testing

Relationship	Hypothesis No.	T statistics	P value	Result
AGE x PE -> BI	H9	5.118	0.000	is supported
AGE x EE -> BI		3.454	0.008	is supported
AGE x SI -> BI		5.212	0.000	is supported
AGE x FC -> BI		0.186	0.858	is Not supported
AGE x HM -> BI		4.459	0.000	is supported
AGE x PR-> BI		0.185	0.853	is Not supported
AGE x H -> BI		0.908	0.364	is Not supported
AGE x R -> BI		2.431	0.032	is supported

Slope Analysis

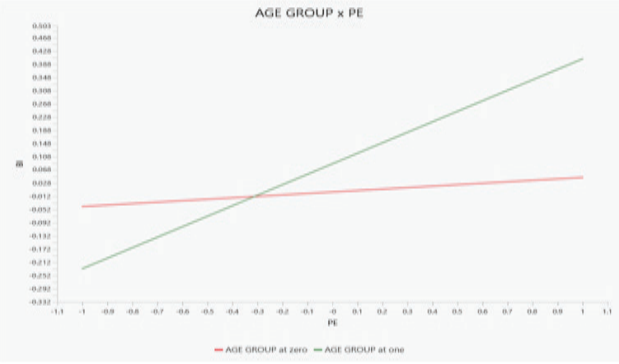

Figure 3: Slope analysis- AGE x PE -> BI

The findings are also clear from the above slope analysis that Gen Z feels that online shopping is very useful and it helps in extending their behavioural intention. On the contrary, the above graph reflects intention to shop online doesnot increases with increase in Performance expectancy in case of Millennial.

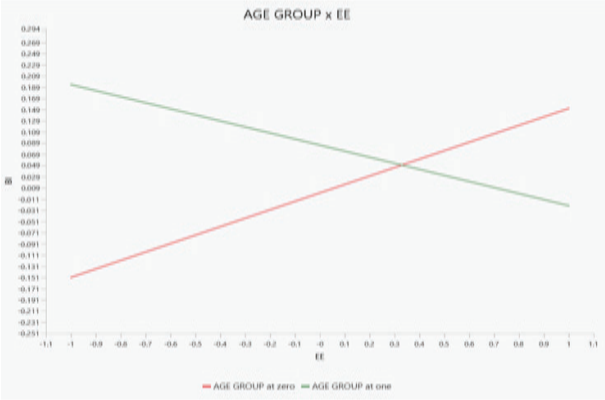

Figure 4: Slope analysis- AGE x EE -> BI

The findings are also clear from the above slope analysis that Millenial feel that their effort reduces and intention to shop online increases whereas Gen Z feels more apps needs to be considered. They need to consider the variety, colour and design available in online shopping which becomes a tedious task, hence requires more effort.

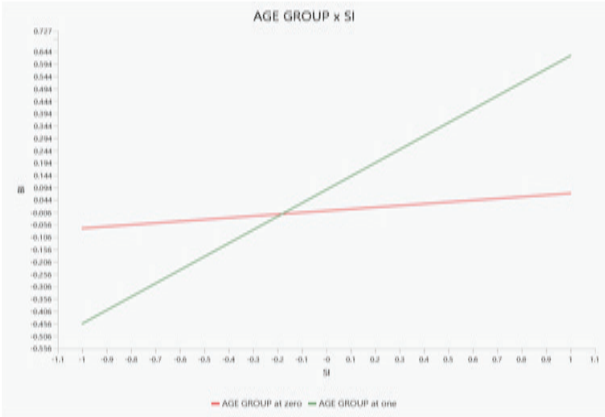

Figure 5: Slope analysis- AGE x SI -> BI

The findings are also clear from the above slope analysis that Gen Z social factor is high, they perceive near ones online shopping platform as important and try to follow. Millennial being more educated and mostly working professionals, make their own decision.

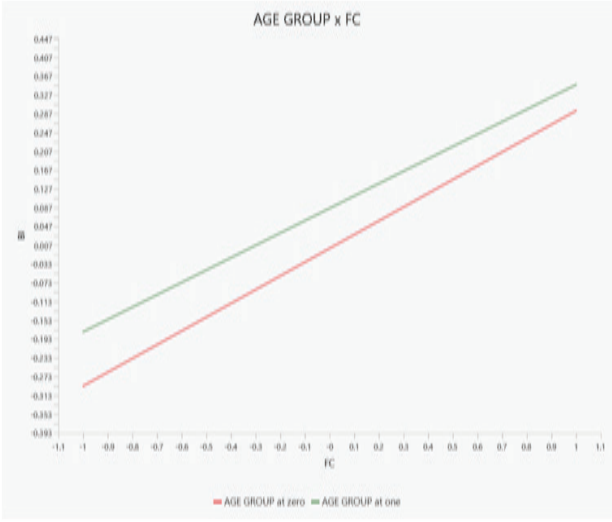

Figure 6: Slope analysis- AGE x FC -> BI

The findings are also clear from the above slope analysis that all age groups are showing trend line in almost similar direction which shows that with increase in facilitating condition, means support of technology on mobile, laptop and other online shopping platforms their intention to use online shopping platforms increases.

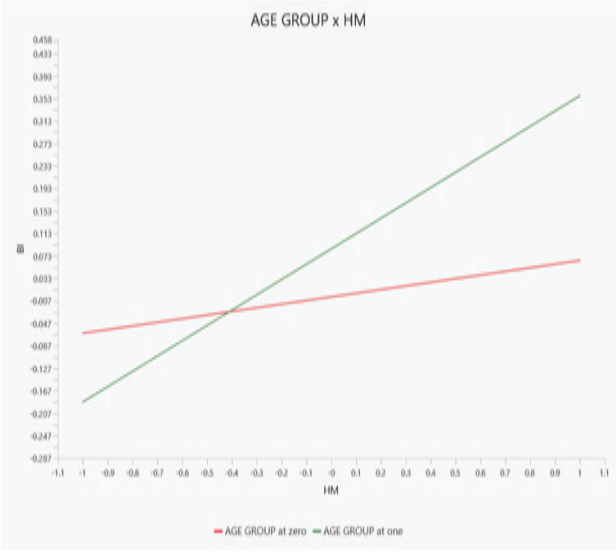

Figure 7: Slope analysis- AGE x HM -> BI

The findings are also clear from the above slope analysis that Gen Z use online shopping applications for fun also but Millennial being more educated and mostly working professionals, does not use it fun.

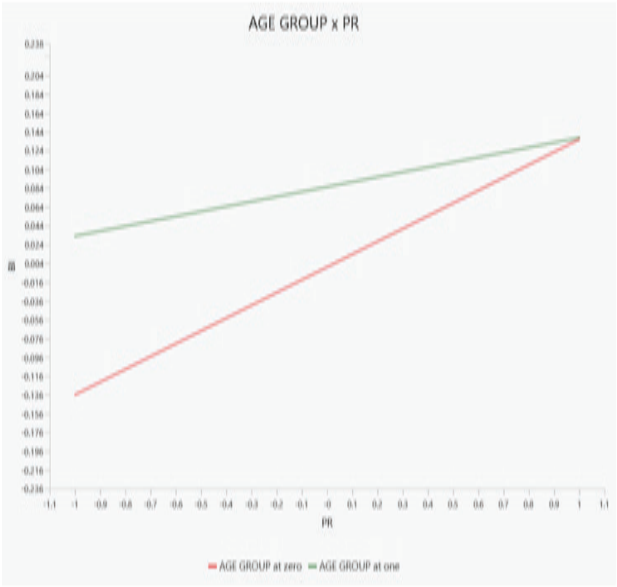

Figure 8: Slope analysis- AGE x PR -> BI

The findings are also clear from the above slope analysis that all age groups are showing trend line in almost similar direction. Slope depicts that Price does not much impact their behaviour to shop online.

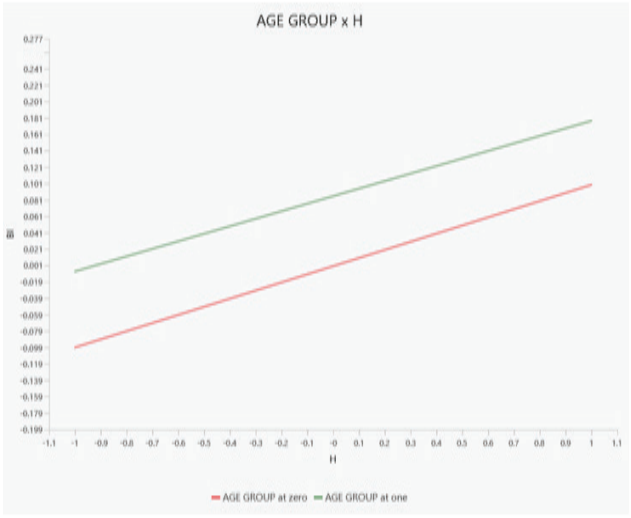

Figure 9: Slope analysis- AGE x H -> BI

The findings are also clear from the above slope analysis that all age groups are showing trend line in almost similar direction which shows that with habitual attitude their intention to use online shopping platform increases.

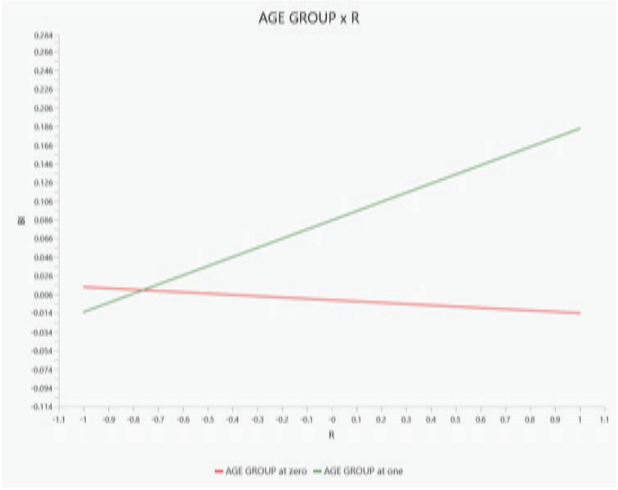

Figure 10: Slope analysis- AGE x R -> BI

The above slope depicts that Gen Z has shown that they perceive risk in online shopping more as compared to Millennial.

FINDINGS AND DISCUSSION

The table provides a comprehensive overview of the constructs, indicators, and psychometric properties in a research study focusing on factors influencing the intention of online shopping platforms from Gen Z and Millennial point of view. The research model have extended UTUAT2 constructs with Risk as an individual determinant. Each construct, including Effort Expectancy (EE), Performance Expectancy (PE), Social Influence (SI), Hedonic motivation (HM), Facilitating Conditions (FC), Habit (H), Risk (R), Price (Pr), and Behavioral Intention (BI), is assessed through multiple indicators. Factor loading for each indicator indicate a strong relationship with their connected constructs, where the values range from 0.614 to 0.905 for BI2 and EE3 respectively. The internal consistency of each constructs is measured by their Cronbach's alpha value, with the values ranging from 0.736 to 0.930, indicating good to excellent reliability. Thereafter structural modelling is done, and hypothesis results are discussed indicated the significance role of hedonic motivation, performance expectancy, social influence, effort expectancy, price, and risk. Moderation analysis through hypothesis testing and slope analysis shown that age moderates the relationship between hedonic motivation, performance expectancy, effort expectancy,

risk, social influence, and the intention to shop online respectively. Overall, the study demonstrates strong psychometric properties, indicating that the research model effectively captures the intended constructs related to online shopping intention.

MANAGERIAL IMPLICATION

The research study provides meaningful and valuable insights about the consumers intention of using online shopping. The results can ultimately be used by many online shopping applications to frame new strategies to cater wider market and reach to new audience. The novel integrated research model framed in the study contribute to the knowledge bank and also narrow down the research gap in exploring factors impacting the consumer acceptance rate for online shopping applications.

CONCLUSION

In conclusion, the paper has identified from critical review of literature the most important factors that need to be considered in understanding the behavior intention towards the use of online shopping. This study conceptualized a framework which will explore the significant factors that affects the behavior intention to shop online. Online shopping is prevailing phenomenon in India; hence it is very noteworthy to understand the determinants the intention of customers. The result shall help the online retailers to develop strategies that will sustain the customer interest to accept online shopping. This study is a pioneer in understanding the perception of Millennial and Gen Z to shop online with respect to consumers in Delhi-NCR. Further the study also focuses on extension of UTAUT2 with risk. In today's world, the need is to understand the difference in opinion of Millennial and Gen Z to shop online. The proposed research model successfully confirms the applicability of UTAUT2 theory along with risk. The findings of the study strongly support the factors that are , hedonic motivation, performance expectancy, social influence, effort expectancy, price and risk reflects that they play significant role in determination of the consumer intention towards online shopping.

LIMITATIONS AND FUTURE RESEARCH DIRECTION

Considering time and budget constraints, sample size of 427 consumers from Delhi-NCR, India was considered. Larger sample size shall enhance the validity of the data and also aid in generalization of results. The research talks about the quantitative methodology ignoring the advantages of qualitative study. Qualitative study deals with subjective feelings of consumers during online shopping. Future research can be improved by considering senior citizen opinion in online shopping.

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AI's Remarkable Impact: Transforming Consumer Buying Behavior

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ABSTRACT

Artificial intelligence (AI) is quickly changing how we live our lives, changing how we communicate with the outside world, how we make decisions, and how we interact with organizations. With the development in machine learning, natural language processing, and data analytics, AI is transforming the way we communicate, purchase, and consume. This study focuses on how artificial intelligence affects consumer decisions while making purchases. The study of changing consumer behavior is the main emphasis of this article, which is predicated on the idea that AI apps would use a variety of analytics techniques to gather additional information about users and their needs. The goal of this article is to look into how artificial intelligence is affecting consumer behavior by using various analytics to understand more about the needs and preferences of users. In this study, Data is collected through secondary sources like journals, publications, and other project sources. As per the study's findings, firms can enhance their ability to target and convince customers to make purchases by leveraging the data gathered by these systems. This article also discusses the impact of artificial intelligence (AI) on consumer behavior and how it may determine future market trends.

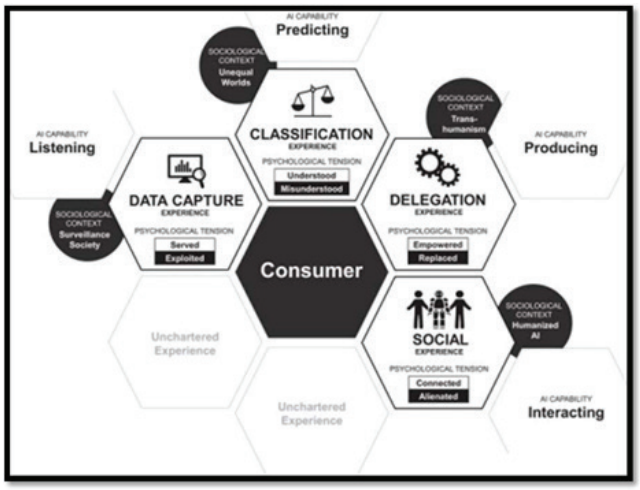
KEYWORDS: *Artificial intelligence, Consumer, AI, Consumer buying behavior.*

INTRODUCTION

After more than ten years of development, we can now declare with certainty that artificial intelligence is intelligent enough to be used in the future. The direction artificial intelligence is taking will determine our future and will significantly affect many different businesses. Artificial intelligence is expected to have an impact not just on businesses but also on consumer behavior and habits, as widespread consumer-brand engagement throughout the buyer's journey will spur significant innovation. The current research in this area has demonstrated that artificial intelligence, contrary to popular belief, has a substantial impact on the end user and influences the industry more than other manufacturing businesses. Artificial intelligence (AI) is quickly changing how we live our lives, changing how we communicate with the outside world, how we make decisions, and how we interact with organizations. AI is transforming how we interact, shop, and consume information thanks to developments in machine learning, natural language processing, and data analytics.

It's a common belief in the industrial sector that some industries will be more impacted by AI than others. Recent research, however, suggests that customers will notice the impact of AI far more. In other words, artificial intelligence is influencing the way people buy today.

Contrary to popular opinion, recent studies have shown that AI will have a considerably higher impact on consumers than on other kinds of economic organizations. Put another way, AI is already influencing how consumers browse for products.



The Consumer AI Experience

This diagram shows the possible benefits and drawbacks from the perspective of the customer, and guides the managers to temper their emphasis on benefits by considering the drawbacks.

Data acquisition, for example, can serve or exploit customers, categorization can understand or misinterpret them, delegation can empower or replace consumers, and social interactions can connect or alienate them.

Types of AI Marketing Tool

1) Predictive analytics: Predictive analytics is one of the most widely used tool. It entails evaluating data from multiple sources in order to precisely forecast consumer behavior. Users can utilize predictive analytics to uncover trends in consumer behavior that will help them plan their marketing approach.

2) Chatbox: It is another kind of AI marketing tool, which is becoming more and more common in customer support. It is now simpler to meet each customer's unique needs and it has ability to evaluate data on consumer interactions and offer individualized advice.

3) Natural language processing (NLP): Natural language processing (NLP) is a rapidly developing subject in AI marketing technology. NLP enables you to mine client evaluations, comments, and feelings to discover new information about your target market.

4) Machine learning: Machine learning is another popular AI marketing tool used to forecast consumer behavior. By gathering insights from consumer interactions, this type of technology can automatically enhance your marketing strategy by increasing conversions and minimizing churn.

5) Recommendation engines: These are excellent at forecasting what the clients are most likely to purchase and making product recommendations, both of which have a big effect on your bottom line. These AI-powered solutions examine the preferences and past purchases of their clients to provide tailored recommendations that improve user interaction and increase revenue.

LITERATURE REVIEW

At that point, the data that was gathered becomes the basis for customizing recommendations for every single customer. Microsoft and Google have lately made investments in fresh AI initiatives. A variety of AI technologies have been used by online merchants to better understand their clientele and deliver top-notch support.

Rani.P (2014) conducted a study to investigate the elements influencing customer behavior. The study's focus was on the consumer's role in the decision-making process as well as a number of specifications and characteristics. The study came to the conclusion that in order to attract customers, successful consumer-oriented market service providers need function as psychologists.

Eze & Adenike.B (2016) looked at the variables influencing consumers' actions when it comes to consumer products marketing in Nigeria. The goal of the study was to investigate how societal factors affect the way that customers buy clothes in the market. The study found that factors such as money, age, and quality of income influence customer purchase decisions. Their study looked at the elements that influence Nigerian consumers' purchase decisions. The study sought to determine how much sociocultural factors influence

customers' purchasing decisions. Consumers' spending behaviors were found to be influenced by their age, high income, and available finances. "The focus of this research is to develop an analytic tool that can support online vendors in predicting patron behavior according to Dentsu AISAS perspectives, and the author concluded that research can collect data from online pagers about consumable goods."

Shyna. K (2017) carried out research on the application of AI in online commerce in 2017. The author talks about the function of artificial Intelligence (AI) reasoning in e-commerce and how it can be used in various industry sectors. The remarkable capacity of computerized reasoning to gather, evaluate, and suggest actions based on unusually enormous volumes of data has completely changed the way we work and live. Online companies are currently implementing this technology in order to identify trends in consumer browsing, transactions, credit applications, account information, etc.

Kietzmann (2018) insights massive amounts of structured and unstructured data are processed using artificial intelligence (AI). Conventional datasets are classified as "structured data," which includes records of transactions, browser histories, and demographic data. This type of data is easily arranged in a spreadsheet and can be processed by artificial intelligence in real time with precise results through sophisticated computations

Sponder & Khan (2018) highlights that most data created by consumers is unstructured, it can be challenging to organize and present in a way that is understandable to humans (such as in spreadsheets).

Chamas.P et al (2019) concluded that while research can gather data from online pagers about consumable goods, their actual research focuses exclusively on non-consumable goods. The study's focus is on developing an analytical tool that can support online vendors in predicting patron behavior based on Dentsu Aisas perspectives.

Chaffey & Chadwick.E (2019) focused computerized system that uses data to mimic the best human performance on a task is called artificial intelligence (AI). The most significant aspect of artificial intelligence is Big Data, which is the term for the analytical techniques and plans that utilize the data that companies collect from their global online customer interactions. Big Data is the historical information gleaned from the internet, and its main attributes are its vast volume, speed, and diversity.

Khrais.L (2020) Research on how significant developments in e-commerce technology are used to affect consumer choices. This study demonstrates that, while AI systems have aided the development of the e-commerce sector, concerns about their ethical viability persist, notably with the concept of explainability. They looked at important technological advancements in e-commerce that try to influence consumer behavior in favor of certain organizations and products. This study shows that, while AI systems have enhanced e-commerce, there remains debate about whether they are morally sound, particularly the concept of explainability. This work proposed updating ML models to make them easier to understand and interpret in order to develop explainable XAI systems.

Objectives

- To understand the AI application in marketing and learn about the need and requirement of consumer through AI
- To understand more about how people perceive interactions with artificial intelligence.
- To understand how AI impact Consumer buying behavior.

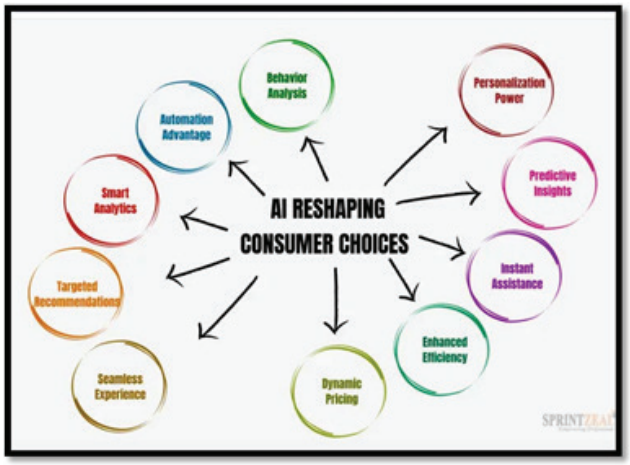
RESEARCH METHODOLOGY

The paper drew on many analyses, publications, journals, and secondary sources. Because artificial intelligence in marketing is a relatively new field, there isn't much research accessible. Since artificial intelligence is still a relatively new field, the majority of research in this area is either ongoing or has not yet been finished. Nonetheless, research on AI across a range of domains is available and contributes to our understanding of the technology's business applications.

AI AND CONSUMER BUYING BEHAVIOR

When combined, AI and consumer behavior provide insightful information. Retailers discover a logical link between AI and customer behavior. Because there is a lot of data available, it is difficult to compile proof

and analyze how people shop these days. AI makes this simple. The true value of AI is shown when it is combined with information gathered from human sources to analyze customer behavior.



To thrive in the marketing industry, using AI to evaluate customers' online purchasing behavior becomes crucial. New AI capabilities, such as personalized marketing messages, force customers to look at the deals the business is offering. Behavioral marketing is the cause of all of this.

Understanding Customer Behavior and its importance

A marketing strategy must be based on an understanding of customer behavior. Consumer behavior can assist organizations in better tailoring their marketing messages to the needs of their target audience by showing that group's preferences and dislikes. Here are specifics about the importance of understanding consumer behavior:

Identify Potential consumers: Businesses can identify potential consumers by analyzing consumer behavior and then target them with offers and marketing messages that cater to their needs. Enhanced Customer Engagement: Businesses can tailor communications and engagement strategies to optimize positive interactions by having a better understanding of the ways and locations in which customers interact with their brands.

Improving Customer Experience: By comprehending consumer behavior, companies can design a smooth customer journey that leads prospects to conversion while removing any potential roadblocks like difficult-to-navigate websites or convoluted checkout procedures.

Measure Marketing Campaigns: By revealing what works and what doesn't, customer behavior analysis aids in the quantification and measurement of marketing campaign effectiveness.

Targeted Product Development: Understanding consumer behavior can help designers build unique products or improve existing ones to meet market needs. Finally, understanding consumer behavior may help businesses develop highly targeted marketing campaigns, sustain brand loyalty, and remain competitive. Businesses may improve the customer experience by predicting their audience's wants via consumer behavior analysis.

Predicting Customer behavior with AI marketing tools

AI marketing solutions have drastically revolutionized the way organizations interact with their customers. Implementing artificial intelligence technologies allows businesses to gain previously unreachable insights into customer behavior. Consumer behavior forecasting is one of the most useful applications for these techniques.

Large volumes of client data, including their spending patterns, preferences, and purchasing patterns, can be analyzed using AI marketing solutions. Businesses can better understand consumer behavior and anticipate future actions with the use of this study. Then, businesses may create audience-targeting marketing techniques that work.

In order to foresee customer behavior, businesses must first understand the many types of AI solutions. Machine learning and predictive modeling are the two most common forms of AI techniques used to forecast consumer behavior. Predictive modeling analyzes trends in historical consumer behavior data, whereas machine learning uses algorithms that continuously increase their accuracy by learning from patterns.

Consumer behavior research may help businesses by providing valuable insights into how customers utilize their products and services. These technologies can help forecast website abandonment, upsells, and cross-sells. They can also provide data to help improve client

experiences and reduce attrition. AI marketing can help find the best clients to target as well as the most efficient ways to approach them.

Businesses require the appropriate information and resources in order to provide reliable forecasts. Investment in data collection, data processing, and analytical abilities are necessary for this. Inaccurate assumptions or a lack of data may cause outcomes to be interpreted incorrectly, which may lead to targeting tactics that are unproductive.

In conclusion, companies looking to anticipate consumer behavior trends can reap big rewards from deploying AI marketing solutions. Businesses can make data- driven decisions to optimize their marketing efforts and overall customer experience by leveraging machine learning and predictive modeling analytics to obtain meaningful insights about their consumer base.

Ways by which AI Will Influence Consumer Behavior

Understanding all the information and seeing how AI is impacting consumers will help groups and sponsors remain prepared. You can change your business and advertising methods to give your customers more of what they need, but only to the extent that you think about them and how they continue.

1) Search Engines utilization by Consumers: Normally functioning websites will drastically alter consumer behavior and decision-making. We observe that a buyer's typical expenditure at each encounter is essentially rising thanks to these websites. Normal locales put customers through a far more intelligent channel, enabling them to make a purchase before customer fatigue sets in or the customer becomes distracted.

2) Customer Loyalty: Research shows that 49% of users would return to an online location if artificial intelligence (AI) was available. The customer is paired with suitable hosts and postings, as well as experiences and surroundings that will enhance their stay. When the customer receives help like this, they are less likely to shop somewhere else the next time they need a break.

3) Convenience for Customers: AI is creating a vast array of possible outcomes that will greatly enhance the buying experience for the customer. This suggests that businesses must continue to look for trends.

4) Consumer Use of Speech Recognition: Currently, the majority of voice search users are limited to using devices such as Amazon Echo, which they utilize for a variety of purposes. Nevertheless, a growing number of consumers are using discourse recognition search to obtain information even more quickly and precisely.

5) Consumer Trust in Brand: By providing a remarkable measure of important worth as a consequence of their customers' nuances, firms can easily fabricate trust with consumers. Here's where AI becomes useful. Customers trust AI-driven products that personalize the experience and provide a large amount of substantial value, as demonstrated by Google Now and similar products.

Challenges in implementing AI marketing tools for customer behavior prediction

1) Data quality: The caliber of the data used has a direct bearing on how effective AI marketing solutions are. Accurate and pertinent data collection can provide challenges.

2) Data security and privacy: Organizations must make sure they abide by all applicable data protection laws in light of the growing concern over data security and privacy. Integration with current systems: When integrating AI marketing tools with current systems, compatibility problems could arise and interrupt day-to-day business operations for the company.

3) Resources and skills: Implementing AI marketing solutions requires a team with specific knowledge. Organizations must also allocate adequate cash and resources, especially time, to the endeavor.

4) AI biases and ethical issues: AI marketing technologies are not immune to biases that might negatively effect prediction accuracy. When developing and implementing AI marketing solutions, ethical considerations including avoiding discrimination should be taken into account.

5) Complexity and scalability: Putting AI marketing technologies into reality may be challenging and time-consuming. It also requires a lot of preparation and organization to scale them up.

In order to surmount these obstacles, entities must ascertain their objectives, comprehend their data requirements, and guarantee they possess the requisite resources, proficiencies, and know-how to proficiently execute and employ AI marketing instruments. By resolving these problems, businesses may fully utilize artificial intelligence's capacity to forecast consumer behavior and promote expansion and profitability.

CONCLUSION

Customers are naturally curious about how AI will affect their lives, since they stand to benefit personally from the technological advancements. When a consumer has the opportunity to buy, businesses will change their marketing methods to target them specifically. It makes use of the information offered by the systems. This article discusses the impact of artificial intelligence (AI) on consumer behavior, as well as its potential to determine future market trends. To remain competitive in today's dynamic retail marketplaces, retailers must shift toward digitization of their processes. Artificial intelligence (AI) is one type of technology that helps marketers focus on potential clients.

Artificial intelligence (AI) will transform how consumers interact with businesses, having a big impact on the marketing industry. To prepare for the changes that will come with the era of artificial intelligence, marketers must learn how to better understand and influence consumer behavior at every stage of the purchasing process by using AI into their marketing strategies.

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ESG Taxonomies and Framework: A Country Wise Analysis of Sustainable Finance

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ABSTRACT

Globally, one can find a growing need on business organisations to take social responsibility seriously. The financial performance of a firm is closely linked to its information disclosure of ESG operations, and this is being scrutinised by a wider range of stakeholders because of the inconsistent findings of current research. These stakeholders include consumers, workers, communities, regulators, and investors. In light of the lack of an integrated analytical framework worldwide that particularly assists businesses in developing indices and indicators that gauge an enterprise's sustainability. Thus, the company's management processes and code of ethics can have an impact on the primary factors that determine the quality of ESG reporting. Sustainable finance can be found to be highly beneficial in scaling up the field and so promoting the achievement of significant objectives such as the UN Sustainable Development Goals and the Paris Agreement. This study looks at the framework for classifying and contrasting the taxonomies in use today.

KEYWORDS: *Environment, Social, and Governance (ESG), Sustainable development, Environmental policy, Green banking, Green initiatives, Sustainable finance.*

INTRODUCTION

In order to support both the expansion of company and sustainable development overall, business enterprise now plays a very essential and important function. Businesses all over the world are realizing more and more that there are other situational elements that continue to present problems in the face of business, and that profits are not the only motivator for success in the modern world. Worldwide, there is a growing need on business enterprises to take social responsibility seriously. The financial performance of a company is closely linked to its information disclosure of ESG activities, and this is being scrutinized by a wider range of stakeholders, including customers, employees, communities, regulators, and investors, due to the varied findings of previous research. As a consequence of the lack of an integrated analytical framework that particularly assists businesses in developing indices and indicators that gauge an enterprise's sustainability. Thus, the company's management processes, and code of ethics can have an impact on the primary factors that determine the quality of ESG reporting. In the light of the issue, it has become substantial important for business enterprises to strategies the evolving economic scenarios into newer business opportunities to generate wealth, and moreover to keep them invested in business.

Most people would agree that sustainable finance is essential to supporting the transition to a more sustainable economy. One may argue that the most effective way to achieve the aim is through the creation of taxonomies, and that this has received less attention. As a result, attention must be drawn to the following

crucial questions:

- What exactly is a taxonomy, and what does it serve?
- What are the main factors to consider when creating a sustainable finance taxonomy?
- What are the guiding principles for an efficient design more broadly?

A collection of principles known as a taxonomy for sustainable finance serves as the foundation for determining if and how much a financial asset would support certain sustainable aims. By defining the kind of data required to evaluate an asset's sustainability advantages and categorize it according to how well it supports specific sustainability goals, it aims to provide a clear message to investors and other stakeholders and help their decision-making.

Four essential defining qualities can be used to categorize taxonomies:

1. Objective. Which sustainability objectives are backed?
2. Scope. Which businesses, sectors, and activities are included?
3. Target. How is the objective converted into a quantifiable objective?
4. Output. What form of information is offered?

Lately, the degree to which taxonomies support sustainability objectives will depend on how long investors are willing to invest in an asset with a taxonomy-based designation. Well-designed taxonomies may increase investor interest and market transparency by persuading investors that their money is genuinely helping to accomplish certain environmental goals. Therefore, by ensuring that investors can quickly identify assets that do not match the sustainability benefits required for the label, well-designed taxonomies safeguard market integrity. Conversely, firms that are less sustainable are incentivized to improve their performance by market integrity. Longer-term investor interest in sustainable finance markets is also sustained by it.

Although, while taxonomies play a significant role in sustainability policy, they are insufficient to enable the swift expansion of sustainable finance and climate action. An effective system of governmental incentives that can be based on taxonomies is required to mobilize the full potential of private sector resources toward sustainable projects. This includes fiscal policy (like a carbon tax), central banking actions (like raising limits on carbon-intensive assets), and financial regulatory actions (like taking climate-related financial risks into account).

OBJECTIVE OF THE STUDY

- To study and understand essence and adaptability of ESG framework and taxonomy;
- To study the current standpoint and, determine its progress globally;
- To study the major jurisdictions and present status of taxonomies in those.

RESEARCH METHODOLOGY

Secondary data served as the study's foundation. Magazines, websites, journals, reports from the Indian government, ESG regulatory bodies, and other sources have all been used to gather data and information. The sources include scholarly publications, yearly reports, research papers, and bank websites. Numerous efforts and problems were found and coherently presented after a thorough literature study.

FIVE JURISDICTIONS

Several governments have begun to enact laws to define sustainable finance products formally. For instance, the EU (European Union) proposed a regulation in May 2018 on the conception of a framework to support sustainable investment. The co-legislators of the EU approved this rule in December 2019, and it was made public in the EU official journal in June 2020. A taxonomy, which is more comprehensive than a definition, is a system of classification. tn the case of EU taxonomy, it serves as a framework for outlining what criteria an economic activity must meet in order to be regarded as environmentally sustainable in EU law. Through the OECD's engagement, experts from OECD Secretariat's (Environmental Directorate) have made significant contributions to the formulation of the EU taxonomy. The Peoples's Bank of China released a Green Bond Endorsed Project Catalogue in 2015, popularly referred as "the Chinese taxonomy", which predates the EU's sustainable finance taxonomy.

Three other nation's definition of sustainability are included in the analysis: France, the Netherlands, and Japan. Definitions of sustainable finance have been used in France for a while. It established the GreenFin label and the ISR (Investissement Socialement Responsible) mark as two labelling programs for investment funds. Since 1995, the Dutch State has also had green loan and green fund legislation. Additionally, these two nations have issued sovereign green bonds, enabling discussions of the guidelines for what qualifies as an eligible expense under those frameworks. Japan, a significant player outside the EU's financial markets, lacks a taxonomy or definitions of sustainable investments and hasn't produced any sovereign green bonds. However, Japan has published a frame work for green bonds that is mapped out in the definitions. A greater percentage of nations have established, are developing, or have expressed interest in constructing taxonomies and definitions. A larger group of nations may be compared in later work on taxonomies. Some nations, like Kazakhstan and Canada, have stated that they intend to pass laws defining sustainable finance. In the latter instance, the OECD has started working on the taxonomy's design. Additionally, in 2018, Indonesia, became one of the nation's participating in the OECD's Clean Energy Finance and Investment Mobilisation (CEFIM) program, issued a sovereign green bond. Furthermore, Indonesia has created a roadmap for sustainable finance that includes norms for banks.

HISTORY AND PRESENT STATUS OF EU TAXONOMY

The European Commission (EC) unveiled a draft "Regulation on the Establishment of a Framework Sustainable Investment" in March 2018. This criterion set the foundation for the taxonomy of ecologically friendly economic activity. The High-Level Expert panel on Sustainable Finance (HLEG), a panel of experts the EC established in December 2016, advised the EC to take this action. Developing a comprehensive European green finance plan fell to the HLEG. The Technical Expert Group (TEG) was founded by the European Commission (EC) in June 2018 to assist in the development of the technical screening requirements for the taxonomy, among other things. As an observer, the OECD was present at the TEG. Concurrently, a Member States Expert Group was established. These groups initiated the discussion on whether or not taxonomy legislation should be enacted at the state level and in the financial markets, as well as how the taxonomy should be created. Following these discussions, the taxonomy rule was adopted in December 2019 by the European Commission, European Parliament, and Council of Europe, the EU's co-legislators. The EC also created the International Platform on Sustainable financing (IPSF) in September 2019 to promote global collaboration and, when required, coordination in the area of environmentally sustainable financing.

The EU taxonomy intends to serve as a classification scheme that offers a shared understanding of what defines a sustainable activity, i.e., the requirements that an economic activity must meet in order to be eligible for inclusion as contributing to EU sustainability objectives. To achieve objectives like improving transparency and reorienting cash flows towards sustainable investment, the classification system can be established. At the EU level, no such categorization system existed at the time (it does now), and market-based approaches that are now in use don't necessarily align with the objectives of EU environmental and sustainability policies. The of goals of the EU legislators was to define sustainability as including social and governmental considerations in addition to climate goals. The following six environmental goals have been determined for the EU taxonomy:

1. Mitigation of climate change
2. Adaptation of climate change
3. Utilizing water resources sustainably and safeguarding marine life
4. Making the shift to a circular economy
5. Prevention and control of pollution
6. Preservation and rehabilitation of ecosystems and biodiversity.

The suitability of the NAC E classification system in the context of mapping investments to establish conformance with the Paris Agreement is another potential problem. The NACE reporting system shares all of GDP accounting's weaknesses in terms of its ability to account for environmental sustainability.

Additionally, NACE does not include several recent transitional activities or industries, such as Carbon Capture and Storage. Some modifications to the current NACE framework have been made in the TEG report for its own goals. For instance, there is no special NACE code for structures. Currently, NACE codes are not assigned to the preservation, creation, restoration, or related services of natural capital. The Classification of Resource Management Activities (CREMA) and Classification of Environmental Protection Activities (CEPA) codes were introduced to the NACE codes as a result of these inadequacies.

The draft EU taxonomy was developed with the following guiding ideas in mind:

- Technology neutrality: As long as all technologies contribute equally to achieving environmental goals, there should be no discrimination against them based on the selected criteria.
- Dynamic and evolving tool: Because of the dynamic nature of the shift and the unpredictability of technology, the thresholds need to be revised. Under some conditions, the thresholds are gradually lowered to make them consistent with a chosen transition pathway. The EC platform, which is scheduled to replace the TEG in 2020, will be in charge of evaluating and changing the criteria as necessary.
- Easy to understand and use: The taxonomy must be simple to use and shouldn't take too much time or money for users to understand because its intended audience is individuals who work in the financial markets.
- Facilitating transitional activities as opposed to a "binary" or "green or not" perspective. Three categories of economic activity are covered by the taxonomy:

  i) Activities that meet the requirements for a net zero CO2 economy by 2050 and have very low, zero, or net negative emissions are considered low carbon currently. A few instances involve afforestation, zero-emission vehicles, and renewable energy.

  ii) Efforts that help the economy shift to a net zero economy by 2050. Over time, the list of those activities could need to be narrowed and amended more frequently. Renovations to buildings, the production of electricity up to 100 grammes CO2/kWh, or autos producing less than 50 grammes CO2/kilometer are a few examples.

  iii) Actions that make it possible to reduce emissions in the first two categories of activities mentioned above. For example, they can install energy-efficient boilers in buildings or produce wind turbines, if certain requirements are satisfied.

DEFINITION OF SUSTAINABLE FINANCE IN JAPAN OVER TIME AND THEIR CURRENT STATE

No legislation definition in the case of Japan qualifies as a "taxonomy" in the strict sense. No green sovereign bonds have been released by Japan. The principle-based sustainable finance guidelines that the Japanese government has so far released provide metrics guidance but no thresholds.

Japan, which boasts the third-largest economy in the world, is home to some of the most important financial institutions worldwide. Tokyo is another asset, being one of the main global financial centres. As the host country in 1997, Japan was instrumental in bringing the international negotiations on the Kyoto Protocol under the auspices of the UN Framework Convention on Climate Change (UNFCCC) to a close. The Bank of Japan is a member of the Central Banks Network for Greening the Finance System (NGFS). Emerging sustainable finance practises in Japan include the growing use of environmental, social, and governance (ESG) principles in financial decision-making, as well as the rise of the green bond and sustainable investment markets.

Japan outpaced other nations and Europe in its 307 percent increase in sustainable asset investment between 2016 and 2018. The Japanese green bond rules were released in 2017 by the Ministry of the Environment (MOEJ) in Japan. The objective was to facilitate the issuance of more domestic green bonds while adhering to the Green Bonds Principles of the International Capital

Markets Association (ICMA), easing the financial and administrative burdens on issuers, and ensuring the veracity of their environmental consequences. The 2017 regulations were based on fundamental ideas rather than having stringent qualifying criteria or restrictions. The ICMA Green Bond Principles were updated in 2020, and the green bond rules were updated to reflect this and add more products.

According to the JGBG, "green bonds" are defined as "bonds issued by companies, local governments, or other organisations to raise funds for green projects both domestically and internationally." According to MOEJ 2020, "serious negative social impacts" should not be present in the projects that are funded. Sustainability bonds must follow the same regulations as green bonds. According to the criteria, green bonds must include and reflect the following four elements:

1. Utilisation of the resources
2. Procedure for selecting and evaluating projects
3. Stewardship of the proceeds
4. Reporting and independent evaluation

SUSTAINABLE FINANCE DEFINITIONS AND TAXONOMIES IN CHINA: A HISTORICAL AND CURRENT EXAMINATION

In the case of China, no legislative definition qualifies as a taxonomy that is comparable to the EU's. China hasn't issued any green sovereign bonds. There are specific parameters but no thresholds in China's green credit regulations, and there are no metrics or criteria in the country's green bond regulations. China is a leader in sustainable and green finance. China is the world's largest economy, therefore reaching the environmental objectives of the planet will depend greatly on its efforts to define sustainable finance, establish sustainable finance markets, and shift investment from environmentally damaging to ecologically helpful enterprises. China took a leading role in international cooperation on climate financing and change. China announced its Nationally Determined Contribution and accepted the Paris Agreement on June 30, 2015. According to this contribution, China's carbon dioxide emissions will peak in 2030 and decrease by 60% to 65% per GDP unit from 2005 levels by 2030. In December 2017, China became a member of the Central Banks Network for Greening the Financial System (NGFS) during the One Planet Summit. China also started implementing its 2013 Belt and Road Initiative (BRI) blueprint into practice.

The catalogue has not yet been officially translated in to English, however unofficial summary translation has been determined that there is no measurements or thresholds. It only includes a list of the qualified sectors. Both industrial policies and environmental considerations are the foundation of the catalog. For instance, the catalog does not apply quantitative, technology-neutral thresholds like the EU taxonomy does, yet the synopsis claims that it lists a list "high priority" hydropower project. The following six green industry subcategories are listed in the catalog:

1. Manufacturer of efficient in terms of energy
2. Industry of clean production
3. The clean energy sectors
4. Environmental and ecological industries
5. Infrastructure modernization with a green touch
6. Eco-friendly services

SUSTAINABLE FINANCE DEFINITION IN THE NETHERLAND

Three distinct programs in the Netherlands have produced definitions of sustainable finance, but no uniformity taxonomy. Most of the definitions are principles. The Netherlands has been influential in encouraging the financial system to offer climate risks more attention. The Dutch Central Bank, De Nederlandsche Bank, established the sustainable Finance Platform in 2016. Its objective was to increase knowledge and awareness of sustainable financing within the financial sector. The DNB, working with central banks and financial authorities, founded the global Network on Greening the Financial System (NGFS), which is headed by a member of the DNB Governing Board. The UN Principles on Responsible Investment (PRI) were signed for the first time by De Nederlandsche Bank, a central bank. Additionally, the € 1.7 billion capitalized state-backed green investment organization Invest-NL was introduced in 2020.

The framework for the creation of sustainable finance definitions in the Netherlands was provided by the following initiatives and activities:

1. The 2019 Sovereign Green Bond
2. Green funding schemes are utilized for a range of retail initiatives, primarily related to renewable energy, greenhouses, and organic farming.
3. Green mortgage program: to enhance buildings' energy efficiency.

CROSS-COUNTRY CASE STUDY

For the purpose of cross-country comparative research, we have taken Energy Sector's medium to high capital companies of Japan, UK and Singapore abiding TCFD

- The worldwide energy supply firm INPEX CORPORATION (INPEX); JAPAN is based in Japan. The primary operating operations include exploration, development, production, sales, and manufacturing of natural gas, oil, renewable energy, and other related energy. As required by the TCFD, they began disclosing data pertaining to climate change in 2018. They have modified their board level governance of climate-related matters in the last several years, partly due to the suggestions made by the TCFD. Prior to 2017, their health, safety and environment section managed climate-related concerns and, where necessary, worked with the corporate strategy & planning unit to bring important matters to the board. They assigned the corporate strategy & planning division control of climate-related issues early in 2017, and in 2018 they established a climate change strategy group within that division. About thirty managers from each corporate division and business of the company, who had been vetted by the CEO, also made up the group. The long-term strategy and medium-term business plan of INPEX, INPEX Vision @2022, are based on the climate-related opportunities that were identified during the process. Consequently, their board started supervising climate-related matters in a more interdisciplinary and methodical manner.

They found that implementing the TCFD recommendations had a significant influence on INPEX as a whole and that climate-related risks and opportunities are not limited to certain business divisions. The board's supervision of climate- related concerns has improved as a result of the governance improvements they implemented. It is now more ingrained across the whole company. The creation of the cross-divisional working groups made it evident how important it is to have a centralized, dedicated climate role with well-established procedures. Also, a proactive promotion of climate-related responses from the top was also essential. Their company's attitude toward climate change at all levels was established after they established a "Corporate Position on Climate Change" at the board level and gave it impetus by presenting their medium- and long-term strategy under the direction of a director and the CEO. As per the determination towards sustainable operations, they have the motivation to continually enhance their internal governance of climate-related concerns because to this shift in perspective.

- A global provider of energy services and solutions, CENTRICA PLC is incorporated in both England and Wales. Its primary business is supplying energy to residential clients in Great Britain and Ireland. It also offers low-carbon energy solutions to business customers abroad and ender supply to commercial customers in Great Britain. They were among the first to implement TCFD, and in their 2022 reporting, they demonstrated complete compliance for the second year in a row. The board has set up Centrica Leader Team (CLT) providing ongoing oversight and challenges on climate strategy with support of TCFD working group and group risks and controls committee to integrate climate change into strategy. Since the governance of climate change is an issue that the board considers to be of growing importance, it permeates every aspect of the business, from their board to employees. The board, and in particular to Group Chief Executive, regularly engages with investors, the government, and regulators on climate change, whether it is to learn more about their Climate Transition Plan or to discuss the technologies and incentives required for the UK to reach net zero. The strategy calls for being a net zero corporation by 2045 and assisting their clients in becoming net zero by 2050.In 2022,

in addition to other risks, transitional and physical climate risks were primarily addressed using their ERM Framework, allowing them to efficiently detect, evaluate, and manage risks in a group-wide manner. Their ERM Framework now evaluates major risks over a time horizon of 0 to 3 years, and developing risks over a longer duration of 3 to 20 years. Climate change was elevated to a primary risk in 2021 and 2022 as a result of this approach.

- Leading provider of energy and urban solutions, SEMBCORP INDUSTRIES, SINGAPORE, is motivated by a mission to do good and contribute to the creation of a sustainable future. With its worldwide presence and industry experience, Sembcorp, with its headquarters located in Singapore, is able to provide creative solutions that aid in the energy transition and sustainable development. The company intends to become a leading provider of sustainable solutions and shift its portfolio towards a greener future by prioritizing the growth of its renewable and integrated urban solutions businesses.

ESTABLISHING EFFECTIVE TAXONOMIES: FIVE PRINCIPLES

Alignment with verifiable interim milestones and high-level policy objectives

Unaligned with high-level policy objectives, a sustainable finance taxonomy is unlikely to be of sustained benefit in and of itself. The course of policy development is determined by high-level policy objectives. Any marked asset will be subject to continued market or regulatory scrutiny in the absence of such alignment. When investors examine the green label's inner workings, their interest will eventually diminish in assets that do not advance policy-relevant objectives. In other words, unaligned taxonomies ultimately run the danger of being unsustainable due to "Transitional risks". Designing efficient sustainable finance taxonomies should therefore be guided by alignment with high-level policy objectives. Although high-level sustainable policy objectives may change and vary across nations, there is widespread agreement among nations on what they should be (191 nations are parties to the Paris Agreement, and 193 nations have adopted the Sustainable Development Goals). When policy objectives are long-term, realistic intermediate targets that are within the investment horizon of investors and that make it clear what the target is and how it could possibly be measured should be employed.

Concentrate on a single goal ("One taxonomy, One objective")

Taxonomy's main objective is to give investors a clear indicator. There must be a clear connection to the underlying goal in order to send out a clear signal. Information value naturally decreases when multiple objectives are combined. For instances, it is commonly accepted that ESG grading presents difficulties for investors. The is referred to as "aggregate confusion" in a well-known work. Aggregation also makes it possible for greenwashing, as even when sustainability performance is accurately evaluated, inadequate results superior success in another area might be underweighted or even cancel out. Enabling investors who want to specialize in particular areas of the sustainable universe more options by providing one signal relating to one objective. The "do-no-significant-harm" (DNSH) principle, which states that if a taxonomy supports one purpose, it should also not be affecting in terms of other objectives, is the foundation of many current taxonomies. It is significant to remember that a full and comprehensive a group of top-level goals for sustainability policy must be defined and measured in order for the DNSH concept to be fully implemented. The DNSH principle can be difficult to verify in real-world situations. The signaling value of more focused taxonomies is likely to be reduced by DNSH if the thresholds are not set very high or The DNSH concept is not utilized sparingly; rather, it is only used in scenarios in which measuring the alternative aims is simple.

Result-based approach utilizing clear, uncomplicated key performance indicators (KPIs)

Investors have clarity on the non-financial benefits that are offered by an asset, activity, or entity thanks to a taxonomy built on quantitative outcomes. Many of the other criteria can be supported by using straightforward and transparent key performance indicators to measure outcomes. It enables granular analyses, enables investors to confirm an asset's sustainability performance,

and it can be directly connected to the underlying sustainability goal. Thus, choosing the appropriate KPI is essential for outcome-based taxonomy, especially to close any gaps that a KPI with only no link to the sustainability target might create. The performance of sustainability must be the primary priority, enabling investors to immediately invest in them based on their current sustainability policies. The range of quantifiable results and, consequently, sustainability goals that sustainable finance taxonomies can handle will increase as disclosures progress and relevant KPIs become more widely available across industries and countries. Only a trustworthy taxonomy can give investors (and other stakeholders) a signal that will aid in their decision-making. In reality, specialized companies certify the sustainability advantages of an asset using the set of guidelines and benchmarks specified in the underlying taxonomy.

Whenever feasible, entity-based information is incorporated

A taxonomy that disregards entity-based data raises the danger of fostering mild forms of "greenwashing", which refers to labeling that may be deceptive even in the absence of fraud. Taxonomies must be effective in influencing incentives at the entity level, where the majority of investment decisions are made. The extent to which green finance is supporting transformation is called into question if a company can designate some activities as green without altering its overall carbon impact. While certifying and verifying green operations has accounted for a large portion of the infrastructure built up for the green bond market thus far, taxonomies should, if feasible, include entity-based information to motivate policymakers to support high-level policy objectives.

Enough thoroughness, encompassing both excellent and poor sustainability performance

Before a taxonomy can provide a signal that helps investors make decisions, investors need to be able to determine with a certain level of detail if an asset fits into their investment strategy. Binary taxonomy outputs (e.g., "green" vs. not green) severely limit the range of possible investment strategies based on such taxonomies. The more frequently skewed distribution of issuer's sustainability performance is a key characteristic. For instance, about 40% of the world's carbon emissions are produced by the 1% of companies with the highest carbon intensity. As a result, in order to meet global sustainability goals, companies with poor environmental performance must improve. Those companies whose performance in terms of sustainability is crucial for accomplishing high-level legislative objectives cannot be identified by a taxonomy that is exclusively intended for businesses with strong environmental performance.

	AUSTRALIA	HONG KONG SAR, CHINA	INDIA	JAPAN	SINGAPORE	THAILAND	UNITED KINGDOM
EXCHANGE-LED ESG REPORTING FRAMEWORK							
Regulation, Principles and Guidance	ESG reporting guide for Australian companies	ESG reporting guide (HKEX) Main Board listing rules, Appendix 27	Guidance document on ESG disclosure (BSE)	Environmental reporting guidelines (Ministry of Environment, 2012)	Sustainability reporting guide (SGX-ST listing rules, practice note 7.6)	Guidelines for sustainability reporting (2010 Vol.)	LSE group guide to ESG reporting (No listing rule requirement)
Obligation Regime	Voluntary	Comply-or-explain	Partially Mandatory	Voluntary	Climate reporting is mandatory for following industries: Food, Agriculture, Forest products and Energy industry	Voluntary	Voluntary

Year of Implementation	2011	2012	2018	2003	2016	2010	2018

CONCLUSION

The initiates' dimensions vary. The EU Taxonomy primarily categorises sustainability and distinguishes it from non-sustainability, however Pillar III ESG mandates risk disclosures for ESG risks and is relevant to banks and investment firms. What effect does this have on risk management? The scope of NFRD is broader since it covers listed businesses in addition to banks and insurers. It is anticipated that the NFRD modification would make clear what information businesses must provide about the risks to and effects of their operations. Country-wise regulatory measures aimed at promoting sustainability are outlined in this paper; they are either in the early stages of consultation or are about to become legally enforceable. While the four rules center on environmental, social, and governance reforms as well as the sustainability framework, there are differences in technique, strategy, and timeliness. Eventually, it becomes clear that there is a conflict between the regulations and the initiatives. Many duplications of requirements will result from the inclusion of ESG in Pillar III regulatory disclosures, the MDA's non-financial reporting directive, and the IASB accounting standards, which will make it difficult for the companies to provide clear, consistent financial and non-financial reports. One crucial step that regulators must take to improve market transparency is to reconcile and integrate the regulations governing the disclosure obligations on ESG, EU-taxonomy, and risk disclosures.

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An Analytical Investigation on Workforce Effectiveness that Lead to Acceptance of HR Analytics in Organizational Culture: A Sustainable Approach

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ABSTRACT

In the modern era where there is much advancement in the utilization of human resources has now evolved in data data-driven manner to facilitate organizational function. Modern management works with innovative tools and techniques in the context of HR Analytics. Apart from that, human resource analytics is another important system and secure procedure to enhance the creativity and productivity of personnel. Along with that, there is a big impact of data analytics that is attached to HRM and analysis in this particular research study. The purpose of this research study is to analyze the concept of factors that lead to the adoption and application practices of HR Analytics with workforce effectiveness. Apart from this, the impact of HR analytics on workforce effectiveness and performance to organizational culture. Therefore this paper has adopted several types of techniques and methods for collecting more information to analyse the data. Hence, the research has used methods like primary and part of investigation and sources for collecting some genuine data about HR analytics and HRM. Apart from that the research has used qualitative techniques for exploring the analyzing the collected data in a synchronized manner.

KEYWORDS: *Workforce efficiencies, HR analytics, Organizational value creation, HR professional, Strategic decision.*

INTRODUCTION

The evolution of HR Analytics in traditional Indian culture has provided a sense of statistical and business value analysis in a more defined manner than before. Therefore, (Debanjana Deb Biswas and 2 Saswati Mukherjee, n.d.). Different tools evaluate and examine the market trends at the organizational level to provide better performance. HR analytics plays a vital role in managing HR manager work like forecasting demand and supply of personnel, predicting and preventing employee turnover during uncertain times, job satisfaction, employee sentiments,and the decision to address employee concerns as well as business proactive nature. This system implements strategies that identify the critical skills needed for organizational culture and initiates an adaptable and competitive workforce. HR analytics also monitor employee satisfaction and mental wellness during challenging times. (P. MADHAVI LAKSHMI1 & P. SIVA PRATAP2, 2016)

Thus, HR analytics draws conclusion-based strategic decisions that are more likely optimistic and enhance human capital management. The practice of adopting HRA will enhance organizational competitive advantage by retaining talented employees and engaging them with organizational goals. On the contrary, the failure to adopt HRA can hurt business outcomes in financial terms which could help the firms to be in sustainable improvement.

The effectiveness of the workforce empowers the business to make evidence-based decisions, manage performance, and establish a competitive edge even amidst the most challenging circumstances. Moreover, it has streamlined the data to gather useful information

that aids in optimum decision-making (Shivam Tomar & Dr. Mamta Gaur, 2020).

Workforce effectiveness stands as the cornerstone of organizational performance. It encompasses various facets such as employee engagement, productivity, satisfaction, and retention(Surabhi Gupta, 2017). By leveraging HR analytics, organizations can gain valuable insights into these dimensions, enabling them to optimize their human capital strategies for enhanced performance and competitiveness.

However, the acceptance of HR analytics within organizational cultures is not merely a technological challenge but a cultural one. It requires a paradigm shift in mindset, where data is embraced as a cornerstone of decision-making processes (Hila Chalutz Ben-Gal, n.d.). This necessitates fostering a culture that values evidence-based insights and encourages experimentation and innovation.

Outline the objective

The objective of the study is –

1. To determine the factors for competencies of HR Analytics.
2. To examine the acceptance of HR Analytics in sustainable business
3. To explore the application of HR Analytics in organizational culture

LITERATURE REVIEW

The integration of HR analytics into organizational culture represents a transformative shift in how human resources are managed and optimized. This section reviews existing literature to provide insights into the factors influencing the acceptance of HR analytics within organizational cultures and its relationship with workforce effectiveness.

Numerous studies have highlighted the significance of workforce effectiveness in driving organizational performance. For instance, research by Delery and Doty (1996) emphasizes the role of human resource management practices in enhancing firm performance. Similarly, Becker and Huselid (1998) argue that effective HR practices contribute to higher levels of employee productivity and organizational profitability.

The acceptance of HR analytics within organizational cultures is influenced by various factors. Venkatesh et al. (2003) proposed the usage of Human Resourse Analytics in normal HR working condition, which suggests that perceived usefulness and ease of use are key determinants of technology acceptance. Applying this model to HR analytics, Marler and Boudreau (2017) found that perceived usefulness, data quality, and organizational support significantly impact the acceptance of HR analytics initiatives. Building data literacy and developing analytical skills are essential for the effective utilization of HR analytics. According to research by Laursen and Thorlund (2010), organizations need to invest in training programs to enhance employees' ability to interpret and leverage analytics insights. Moreover, Marler and Boudreau (2019) emphasize the importance of developing data-driven competencies across HR functions to drive organizational performance.(H.H.D.P.J. Opatha, 2020)

With the help of big data analytics in HRA, the management has provided the potential gap in the organization in terms of workforce, minimizing cost and mitigating the chances of bad recruitment. As the selection of the "right person for the right choice "is vital for organizational growth, the importance of big data analytics is great here(S. Zeidan1 and N. Itani2, n.d.).

In the overall hiring purpose, HRA reduces the significant energy of HR professionals and money for the entire procedure. The next stage is education where HRA has increased employee strategy and the training to employees for tracking the trends of turnover and retention to denote the organizational investment. The HRA takes preventive and potential risks easily with the support of data data-driven system, job performance, employment history, profile updates, and online activities. Predicting workforce effectiveness, the right candidate for the right place, and accomplishing a specific job role with data analytics and people analytics. It works with the comparison of different prospects focusing on the hunting tools of big data analytics(S. Zeidan1 and N. Itani2, n.d.).

Results from the previous study assert that HR professionals are the most important concept for gaining and maintaining competitive advantage

through analytics. The advantage of the global business economy has led to the adoption of innovation at the institutional level and shows the connection between both performance effectiveness and strategic HRM. However, it yields success in terms of the organization's performance and the decision-making processes in HR(S. Zeidan1 and N. Itani2, n.d.)

In summary, the literature review highlights the interconnectedness of workforce effectiveness, acceptance of HR analytics, and organizational culture(Dr. Indranil Bose & Dani Jose, 2018). By understanding the factors influencing the adoption of HR analytics and addressing key dimensions such as leadership support, data literacy, and ethical considerations, organizations can foster a sustainable approach to integrating analytics into HR practices(S. Zeidan1 and N. Itani2, n.d.). This holistic approach not only enhances workforce effectiveness but also drives organizational performance and competitiveness in today's dynamic business landscape.

RESEARCH METHODOLOGY

The methodology employed in the study titled "An Analytical Investigation on Workforce Effectiveness that Lead to Acceptance of HR Analytics in Organizational Culture: A Sustainable Approach" has adopted the mixed strategy to explain the intricate relationship between workforce effectiveness with the adoption of HR Analytics. The study focuses on a sample of 188 respondents who are in human resource management and have undergone training to adopt HR Analytics.

The primary data collection comprises surveys, interviews, and archival data. The survey tool is developed to capture analytical and quantitative insights on information related to business value creation, data sophistication, and performance competencies in HR personnel in different posts. Additionally, archival data, including the company's survey reports, disclosures regarding HR analytics.

The quantitative data will undergo statistical analysis with the Statistical Package for the Social Sciences (SPSS). This software interprets in well understandable way with the usage of various methods. The descriptive statistics will provide an overview of the dimension of industry, income status, and metrics of performance with a combination of correlation and regression to understand the relationship between workforce effectiveness and the adoption of HR Analytics. The study also incorporates advanced tools to explore the relation among various firm performances and factors contributing to green growth.

The study also incorporates the advanced extension of SPSS in statistical technique through SPSS AMOS. AMOS facilitates the exploration of complex relationships into the understandable interplay between workforce effectiveness and the adoption of HR Analytics with strategic human capital management. The research is committed to exploring the ethical guidelines, ensuring participants' confidentially, and obtaining informed consent.

In summary, the research methodology integrates quantitative and qualitative approaches to empirically understand the role of workforce effectiveness in strategic human capital management that are engaged in HRM.

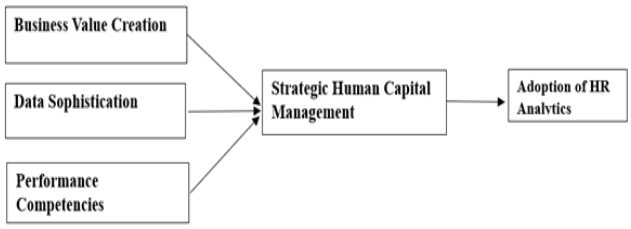
Problem Statement

The study states that HR Analytics has created a better organizational culture for better decision-making. Hence, examining the factors that lead to acceptance and application of HRA in combination with sustainable business strategy. The question arises from the fact that top competitive companies are using innovation in analytics so why not others are using similar support systems as an integral part in HRM? It studies what are the significant measures that lead to the adoption of HR analytics with organizational desires and what HRA can deliver to organizational culture.

In the quest for competitive and competent in the global environment, in general, it is impulsive to adopt such high tech for better appreciation and upgradation. It is much needed for HR professionals to explore and understand the recent hiring and retaining process as an important part of a company's success. Companies like SAP America, Sysco, and Marriott Vacation Club are effectively using HRA to track major aspects of Strategic components like leadership, incentives, engagement, absenteeism, and other trends. The reason is why are not others accepting as a financial advantage? If an organization desires to adopt it, then

what is a connection between the organization's desire and workforce effectiveness?

Research Models and Hypothesis

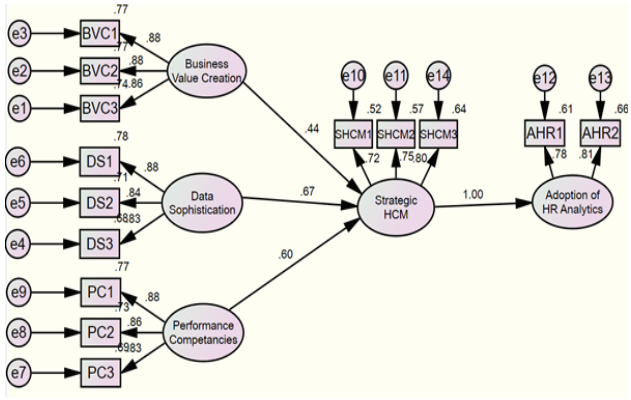


H 1: There has been a positive significance between the Business value creation and strategic human capital management

H 2: There has been a positive significant between data sophistication and strategic human capital management

H 3: There has been a positive significance between the performance competencies and strategic human capital management

H 4: There has been a positive significance between strategic human capital management and the adoption of HR Analytics.



Analysis and Interpretation

Table – 1, titled "An Analytical Investigation on Workforce Effectiveness that Lead to Acceptance of HR Analytics in Organizational Culture: A Sustainable Approach". The table is structured into six main categories: Gender (Male and Female), Age (under 25 age, 25 – 30, 30 – 40, 40 and above), level of organization (small, medium, large, government), etc.

The data is presented in terms of frequencies and percentages for each subcategory. In terms of the gender category, of 190 participants where 57.4% comprise the male category. This shows the dominance of male in field of HR.

Demographic Profile

		Frequency	Percentage (%)
Gender	Male	108	57.4%
	Female	80	42.6%
Age	Under 25	53	28.2%
	25 - 30	42	22.3%
	30 - 40	33	17.6%
	40 and above	60	31.9%
Level of education	Undergra-duate	46	24.5%
	Graduate	51	37.1%
	Post Graduate	45	13.9%
	Professional	46	24.5%
Have you undergone HR Analytics training	Yes	105	55.9%
	No	83	44.1%
Current Position	HR Generalist	49	26.1%
	HR Manager	54	28.7%
	HR Specialist	45	23.9%
	HR Director	40	21.3%
Type of organization	Large	43	32.9%
	Medium	49	26.1%
	Small	49	16.1%
	Government	47	25.0%
Year of service	Less than 2 years	89	47.3%
	More than 2 years	99	52.7%

The types of organizations are categorized into small, medium, and large, government. Small and medium organizations have been using HR Analytics at 16.1% and 26.1% respectively. The large organization comprises the major proportion with 32.9% respectively. This shows that the acceptance of HR Analytics has been more in large organizations where the maximum workforce has been trained with adoption in work culture. The proportion for training given to HR

managers has been significant at 55.9%, which shows the gradual acceptance of HR Analytics.

The SPSS (Statistical Package for the Social Sciences) view suggests that the data in the table may have been analyzed or processed using SPSS, a statistical software commonly employed for data analysis in research studies. The presented tabular description provides an important contextualizing analysis of the impact of workforce effectiveness and the adoption of HR Analytics with strategic decision-making for human capital management.

Understanding the organization structure with the level of training of HR personnel allows us to interpret how the strategic decision-making allow the acceptance of HR Analytics in Indian organizational culture. The acceptance may vary across different age groups, genders, types of organization, and training of HR analytics.

KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.978
Bartlett's Test of Sphericity	Approx. Chi-Square	3056.948
	df	91
	Sig.	0.000

The above table has a crucial role in evaluating the dataset's suitability for factor analysis in the research. The Kaiser-Meyer-Olkin (KMO) measure used for adequate sampling , recorded at 0.978, signals a high level of appropriateness for factor analysis, indicating that the variables display a significant correlation between the factors.

The result of the KMO value reflects a substantial sampling adequacy, reinforcing the credibility of the ensuing factor analysis of various component, Moreover, Bartlett's Test of sphericity, presenting the result in form of an approximate Chi-Square value of 3056.948, 91 degrees of freedom and a significance value of .000, supports the decision to move ahead with factor analysis. The statistically significant Chi-square value suggests that the correlation matrix has significant relationships among the variables. In combination with both of these tests, the finding states that dataset reliability and validity for factor analysis, establish a robust foundation for a meaningful factor between the chosen variable.

Factor, Cronbach's Alpha, Composite, and Average Variance Extracted (AVE)

	Factors	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
BVC1	0.868	0.906	0.880	0.671
BVC2	0.888			
BVC3	0.877			
DS1	0.878	0.894	0.905	0.761
DS2	0.878			
DS3	0.861			
PC1	0.874	0.897	0.906	0.763
PC2	0.888			
PC3	0.858			
SHCM1	0.866	0.904	0.916	0.784
SHCM2	0.883			
SHCM3	0.906			
AHR1	0.896	0.898	0.899	0.817
AHR2	0.911			

This table presents a comprehensive overview of various factors under consideration in the study, including environment consciousness, green innovation, and sustainable reporting along with sustainable entrepreneurship. The table includes key reliability and validity measures for each factor. Notably, Cronbach's Alpha values represent internal consistency and range from 0.894 – 0.906, indicating robust reliability across the dimension. Composite reliability values are reported for several factors, signifying consistency in measurement.

The Average Variance Extracted (AVE) values, ranging from 0.671 to 0.817, provide insights into the convergent validity captured by the items within each factor. The factors related to business value creation, data sophistication, and performance competencies

demonstrate strong internal consistency and reliability, thus enhancing the credibility of the measurement in the study. Thus, these findings underscore the reliability and validity of the relationship of sustainable adoption of HR analytics and workforce effectiveness.

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
Strategic Human Capital Management	<---	Data Sophistication	.447	.044	10.079	***	par_10
Strategic Human Capital Management	<---	Business Value Creation	.274	.032	8.576	***	par_11
Strategic Human Capital Management	<---	Performance Effectiveness	.390	.040	9.711	***	par_12
Adoption of HR Analytics	<---	Strategic Human Capital Management	.901	.086	10.527	***	par_13
BVC3	<---	Business Value Creation	1.000				
BVC2	<---	Business Value Creation	1.037	.068	15.286	***	par_1
BVC1	<---	Business Value Creation	1.103	.073	15.211	***	par_2
DS3	<---	Data Sophistication	1.000				
DS2	<---	Data Sophistication	1.085	.080	13.568	***	par_3
DS1	<---	Data Sophistication	1.131	.078	14.468	***	par_4
PC3	<---	Performance Effectiveness	1.000				
PC2	<---	Performance Effectiveness	1.100	.079	13.926	***	par_5
PC1	<---	Performance Effectiveness	1.107	.077	14.386	***	par_6
SHCM1	<---	Strategic Human Capital Management	1.000				
SHCM2	<---	Strategic Human Capital Management	1.029	.101	10.142	***	par_7
SHCM3	<---	Strategic Human Capital Management	1.066	.098	10.829	***	par_8
AHR1	<---	Adoption of HR Analytics	1.000				
AHR2	<---	Adoption of HR Analytics	1.246	.102	12.248	***	par_9

CONCLUSION

The integration of HR analytics into organizational culture represents a transformative journey towards fostering workforce effectiveness and driving organizational success. Through an analytical investigation into this dynamic relationship, this study has uncovered key insights and implications for organizations seeking to adopt a sustainable approach to HR analytics.

Firstly, workforce effectiveness stands as the linchpin of organizational performance. By leveraging HR analytics, organizations can gain valuable insights into various dimensions of workforce effectiveness, including employee engagement, productivity, satisfaction, and retention. These insights enable informed decision-making processes, leading to the optimization of human capital strategies and enhanced organizational performance.

Secondly, the acceptance of HR analytics within organizational cultures is contingent upon several critical factors. Leadership endorsement, organizational support, and data literacy emerge as key determinants influencing the adoption of analytics initiatives. Leadership plays a pivotal role in championing analytics initiatives and fostering a culture of data-driven decision-making. Moreover, investing in data literacy programs and developing analytical skills across the organization are essential for maximizing the utility of HR analytics.

In conclusion, a sustainable approach to integrating HR analytics into organizational culture requires a concerted effort across multiple dimensions. By aligning HR analytics initiatives with strategic objectives, fostering leadership buy-in, investing in data literacy, and upholding ethical standards, organizations can cultivate a culture where HR analytics becomes ingrained in decision-making processes. This holistic approach not

only enhances workforce effectiveness but also drives organizational performance and competitiveness in today's dynamic business landscape.

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Assessing the Link between ESG Criteria and Financial Performance of NIFTY 50 Index Companies

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ABSTRACT

Environmental, social, and governance (ESG) factors are becoming increasingly important due to changing legal frameworks and shifting investor interests among banks, institutional investors, and individual investors. In response, companies are reassessing their plans and realizing that to open up new growth prospects, sustainable development is crucial. Businesses that incorporate ESG factors into their models not only get a sustainable competitive edge but are also protected from the negative consequences of technical or regulatory shifts. The present study is based on the ESG performance which is measured by CRISIL ESG score. The paper focuses on investigating the impact of ESG score on the Indian Companies' financial performance which are listed in NIFTY 50. The study investigates the connection between ESG ratings and firms' financial performance studied using variables like ROA, ROE, EPS, ROI and NPM . The relationship between ESG_SCORE and financial performance indicators appear to vary across different metrics. These findings suggest that while ESG considerations might influence certain financial performance metrics like Basic Earnings Per Share, their impact on other metrics is less clear.

KEYWORDS: *CRISIL, ESG scores, Financial performance, Nifty 50 companies.*

INTRODUCTION

The rising importance of environmental, social, and governance (ESG) considerations stems from evolving regulatory frameworks and the changing priorities of banks, institutional investors, and individual investors. In response, businesses are reevaluating their strategies, recognizing that sustainable development is essential for unlocking additional growth opportunities. Incorporating ESG factors into their models not only shields businesses from the adverse effects of technological or regulatory shifts but also provides a lasting competitive edge, as evidenced during the COVID-19 pandemic. Moreover, organizations embracing ESG principles demonstrate greater resilience in crisis management, enabling quicker recovery and fostering innovation for adapting to the evolving landscape. Financial institutions integrating ESG criteria into their decision-making processes boost investments in sustainable ventures, thereby facilitating the mobilization of capital crucial for achieving objectives like the European Green Deal and global climate commitments. As major investors increasingly prioritize ESG performance, akin to credit ratings, companies are compelled to demonstrate active and responsible practices to attract funding. This underscores the analogy between ESG ratings and credit ratings, with both reflecting the overall health and sustainability of businesses.

On the other hand, financial performance is a critical measure that reflects a company's capacity to utilize its key resources and generate revenue, providing insights into its overall financial health over a specific period. Analysts and investors commonly assess the financial performance of companies within the same industry

or sector to gauge their competitiveness and potential for growth. Financial performance encompasses various aspects, including revenue generation, asset and liability management, and stakeholder protection. Key financial performance indicators (KPIs) serve as metrics to evaluate a company's financial well-being, aiding management, board members, research analysts, and investors in assessing its performance relative to peers and identifying areas of strength and weakness.

Different aspects of a company's performance are highlighted by a number of commonly used financial success indicators. The amount of money left over after subtracting direct production costs is known as gross profit, and it gives information about how well a company's pricing and production methods are working. Conversely, net profit is the remaining revenue following the subtraction of all necessary business expenses and taxes, signifying the total profitability and operational efficiency. Return on Assets (ROA) provides information about a company's operational effectiveness and asset utilization by gauging how well it uses its assets to create profits. By measuring how well a corporation makes profits for investors in relation to the amount of equity invested, return on equity, or ROE, assesses the profitability of a company's equity investments. This measure is essential for evaluating the business's capacity to produce profits for its owners. These financial performance indicators give stakeholders insightful information about several facets of a business's performance and financial health, empowering them to evaluate the company's competitive standing in the market and make well-informed decisions.

The intersection of Environmental, Social, and Governance (ESG) factors with financial performance has become a focal point in contemporary financial research. Various studies in recent times have focused on identifying relationship between ESG scores and financial performance of the company. Few organizations provide ESG Scores for the companies on various parameters which is based on their assessment framework. Any company in India to provide ESG scores needs to be approved by SEBI for the same. CRISIL is one such recognized organization to provide such ESG scores for companies. CRISIL is credit rating information services of India limited which ranks companies based on their ESG assessment framework. Reaching the ESG score, weights are assigned to all three attributes as 35% for Environmental parameters, 25% for social profile of the organization and 40% for corporate governance.

The CRISIL evaluation framework is a comprehensive tool designed to assess companies across three key dimensions: environmental, social, and governance (ESG). With a robust structure comprising 275 assessment parameters and over 500 data points, it offers a thorough examination of each aspect.

Environmental profile: Green product adoption and biodiversity conservation strategies are examined, as well as GHG emissions, energy use, waste management, water management, and resource exploitation. With 40 characteristics, the social profile assesses things like worker and employee management, stakeholder participation, product quality, and community ties.

In addition, a number of characteristics are used to measure corporate governance, including disclosure procedures, shareholder relations, board composition, independence, and management record. Of these, 35 parameters are exclusive to the fiscal 2022 framework and 65 to the overall governance assessment. This meticulous framework enables a holistic understanding of a company's performance, ensuring transparency and accountability in its operations.

The paper focuses on investigating the impact of ESG score on the Indian companies which are listed in NIFTY 50. The present study is based on the ESG performance which is measured by CRISIL ESG score.

LITERATURE REVIEW

The intersection of Environmental, Social, and Governance (ESG) factors with financial performance has become a focal point in contemporary financial research. Smith and Brown (2023) identified a positive correlation between ESG scores and financial performance across European companies, corroborating findings by Kumar and Gupta (2023) who noted ESG integration's positive influence on stock returns in emerging markets. However, the literature reveals significant gaps concerning the NIFTY 50 companies, India's leading stock market index.

Jones and Lee (2024) emphasized the global importance of ESG factors in investor decision-making, while Patel and Singh (2024) specifically found a significant relationship between ESG scores and market valuation in Indian firms. Similarly, Chen and Liu (2023) and Sharma and Verma (2023) shed light on sustainable investing's growth and the relationship between ESG scores and risk-adjusted returns in India, respectively. Nonetheless, there remains a need for comprehensive studies focusing specifically on the NIFTY 50 companies to discern unique nuances in the Indian context.

Further complicating the landscape is the research by Thompson and White (2024) and Mehta and Kumar (2024), which suggest that ESG-rated companies may exhibit resilience during market downturns and that corporate governance plays a pivotal role in enhancing ESG performance and financial outcomes. These findings underscore the need for an exploration of the intricate interplay between ESG scores, financial performance, and corporate governance within the NIFTY 50 universe.

The broader literature supports a positive correlation between ESG performance and financial outcomes, with Khan, Serafeim, and Yoon (2016) highlighting better financial performance, reduced cost of capital, and decreased volatility for companies with high ESG scores. However, Flammer (2015) suggests sectoral variations, indicating that the influence of ESG on financial performance might differ across industries. Additionally, investor perspectives are shifting towards ESG-focused portfolios, as indicated by MSCI (2020), suggesting potential out performance during market downturns.

Despite these insights, the literature reveals several research gaps. Most notably, there is a scarcity of studies focusing on emerging markets like India, especially within the context of the NIFTY 50 companies. Temporal considerations also arise, emphasizing the need for up-to-date research reflecting the rapidly evolving ESG landscape. A sector-specific analysis could further enrich our understanding, while establishing causal relationships necessitates rigorous methodologies beyond mere correlation studies.

Scholars have paid close attention to the growing body of research on the connection between Environmental, Social, and Governance (ESG) scores and financial performance, investors, and policymakers alike. Several empirical studies have indicated a positive correlation between ESG scores and financial performance across various markets and sectors. For instance, Smith & Brown (2023) and Kumar & Gupta (2023) found positive associations between ESG scores and financial performance in European companies and emerging markets, respectively. Similarly, Jones & Lee (2024) and Patel & Singh (2024) underscored the rising importance of ESG factors in investor decision-making and observed significant relationships between ESG scores and market valuation in global and Indian contexts.

However, despite the growing body of literature, there remain substantial research gaps that warrant further exploration, especially concerning the NIFTY 50 companies and the Indian market. Firstly, there is a conspicuous absence of comprehensive studies focusing explicitly on the NIFTY 50 companies, necessitating a deeper investigation into this specific market segment (Smith & Brown, 2023; Kumar & Gupta, 2023; Jones & Lee, 2024; Patel & Singh, 2024). Secondly, while some studies have explored the relationship between ESG scores and financial outcomes in the Indian market, there is a need for more nuanced insights tailored to the Indian context (Jones & Lee, 2024; Patel & Singh, 2024; Chen & Liu, 2023; Sharma & Verma, 2023).

Furthermore, the interplay between ESG scores, financial performance, and corporate governance within the NIFTY 50 universe remains underexplored (Thompson & White, 2024; Mehta & Kumar, 2024). Such an exploration could shed light on how corporate governance practices influence ESG performance and, subsequently, financial outcomes. Additionally, while existing studies provide valuable insights into the positive correlation between ESG scores and financial performance, there is a paucity of research focusing on emerging markets like India, with most studies being conducted in Western markets (Flammer, 2015; MSCI, 2020).

Moreover, the rapidly evolving landscape of ESG investing necessitates up-to-date research using the latest data, such as the ESG score data provided by CRISIL for 2022 (Flammer, 2015; MSCI, 2020). A temporal

analysis would enable researchers to capture the dynamic nature of ESG investing and its evolving impact on financial performance. Lastly, while correlations between ESG scores and financial performance are evident, establishing causal relationships necessitates rigorous methodologies, such as longitudinal studies or event studies (Khan, Serafeim, & Yoon, 2016).

While the body of research on the subject offers insightful information about the connection between financial performance and ESG ratings, there is a pressing need for more granular, up-to-date, and region-specific research, particularly focusing on the NIFTY 50 companies in India. Addressing these research gaps can offer invaluable insights for investors, policymakers, and corporate leaders aiming to integrate ESG considerations into investment decisions and corporate strategies.

RESEARCH METHODOLOGY

The study is based on secondary data for 50 listed companies incorporated in NIFTY 50. CRISIL ESG scores are utilized for the ESG performance of the company and financial data is extracted from companies' website and other online platforms. Accounting as well as market-based measures are used as firms' financial performance representatives. OLS through E views is used for empirical investigations.

The CRISIL ESG score is available for the fiscal year ending 2022, so the period of the study is fiscal year ending 2022. Financial matrices are undertaken for the study for the same duration.

Objectives of the Study

1. To investigate the attributes of ESG scores published by the CRISIL.
2. To examine the relationship of ESG scores and financial performance of the 50 companies incorporated in NIFTY 50.

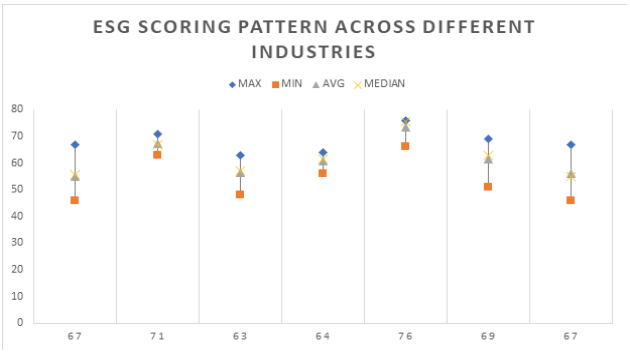
The study investigates the connection between ESG ratings and firms' financial performance studied using variables like ROA, ROE, EPS, ROI and NPM.

Variables used in the study

1. ESG Rating: This is an objective scoring system used to evaluate a firm's performance regarding environmental, social, and governance (ESG) concerns. It quantifies a company's efforts and effectiveness in areas such as sustainability practices, social responsibility, and corporate governance standards.
2. ROA: A financial indicator called the Return on Assets ratio assesses how profitable a business can make use of its assets. It evaluates the effectiveness of an organization's asset management and operational efficiency by analyzing how well it uses its resources to produce earnings over a specified time frame.
3. ROE: Return on Equity is a crucial financial indicator that assesses the profitability of a business by calculating the return on shareholder equity. is a crucial measure of a company's financial success and the production of shareholder value. It shows how well a company is using shareholder investments to generate profits.
4. EPS: A key indicator of a business's profitability and financial stability is earnings per share. It stands for the percentage of earnings allotted to each outstanding share of ordinary stock in a corporation. Dividends are subtracted from the company's net income, and the resulting amount is then divided by the total number of outstanding shares to determine EPS.
5. ROI: A performance statistic called return on investment is used to evaluate an investment's profitability in relation to its cost. Investors use it extensively to assess and contrast the profitability of various investment opportunities since it gauges how well an investment generates profits.
6. NPM: A financial statistic known as the net profit margin calculates a company's profitability by dividing its net income by total revenue. It provides insight into a company's profitability at the operational level, indicating how well it is managing its expenses relative to its revenue and highlighting its ability to convert sales into profits.

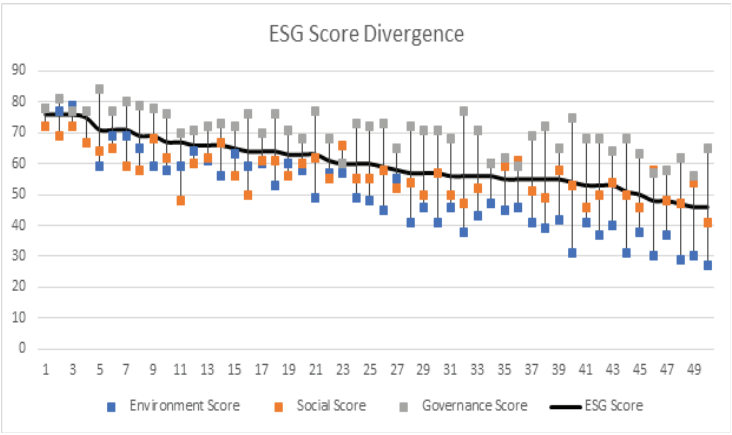
(Source: Author's Own)

Figure 1: ESG & Factor Wise Distribution



(Source: Author's Own)

Figure 2: ESG scoring pattern across different industries



(Source: Author's Own)

Figure 3: ESG Score Divergence

DATA ANALYSIS AND INTERPRETATION

Table1 : Regression Analysis

Dependent Variable: ESG_SCORE
Method: Least Squares
Date: 04/13/24 Time: 11:32
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.133056	1.825580	1.716198	0.0929
ENVIRONMENT_SCOR...	0.383165	0.016341	23.44756	0.0000
SOCIAL_SCORE	0.175576	0.026672	6.582819	0.0000
GOVERNANCE_SCOR...	0.394186	0.024782	15.90638	0.0000

R-squared	0.988201	Mean dependent var	60.18000
Adjusted R-squared	0.987432	S.D. dependent var	8.153352
S.E. of regression	0.914053	Akaike info criterion	2.734761
Sum squared resid	38.43265	Schwarz criterion	2.887723
Log likelihood	-64.36903	Hannan-Quinn criter.	2.793010
F-statistic	1284.252	Durbin-Watson stat	2.166365
Prob(F-statistic)	0.000000		

The regression results indicate that all three component scores (Environment, Social, and Governance) are statistically significant predictors of the ESG_SCORE, with strong positive relationships. The model explains approximately 98.82% of the variability in ESG_SCORE, suggesting that the model fits the data very well.

Table 2: Descriptive Statistics

Date: 04/13/24 Time: 11:38 Sample: 1 50						
	ESG_SCORE	**NPM__**	**ROA__**	**ROE__**	**ROI__**	**BASIC_EPS**
Mean	59.77778	38.03867	10.31800	19.53356	12.36142	59.15667
Median	58.00000	14.06000	6.890000	15.10000	9.100000	41.31000
Maximum	76.00000 46.0000	989.6000	49.91000	97.20000	51.00000	270.3300
Minimum	0	-5.130000	-2.170000	-6.970000	-1.600000	-6.530000
Std. Dev.	8.019547	145.6236	9.983547	18.65664	10.48279	58.16021
Skewness	0.203432	6.407089	1.663470	2.350968	1.570294	1.979111
Kurtosis	2.312924	42.37807	6.840814	9.408131	5.864101	7.262952
Jarque-Bera	1.195524	3215.317	48.41323	118.4481	33.87445	63.45051
Probability	0.550041	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	2690.000	1711.740	464.3100	879.0100	556.2640	2662.050
Sum Sq. Dev.	2829.778	933073.7	4385.533	15315.09	4835.110	148834.8
Observations	45	45	45	45	45	45

The ESG scores appear to be relatively normally distributed with a moderate level of variability.

The net profit margins show a wide range of values, with potential outliers at both ends. This may require further investigation to understand the reasons for such extreme values. The financial performance metrics (ROA, ROE, ROI, and EPS) exhibit varying levels of distribution characteristics, with some showing potential for outliers and non-normal distributions.

Table 3 : Correlation Matrix

	ESG_SCORE	**NPM__**	**ROA__**	**ROE__**	**ROI__**	**BASIC_EPS**
ESG_SCORE	1.000000	-0.254838	-0.004292	-0.018785	0.029295	-0.110661
NPM__	-0.254838	1.000000	0.624631	0.411822	0.297204	-0.098604
ROA__	-0.004292	0.624631	1.000000	0.812295	0.802361	0.274634
ROE__	-0.018785	0.411822	0.812295	1.000000	0.854495	0.438715
ROI__	0.029295	0.297204	0.802361	0.854495	1.000000	0.447807
BASIC_EPS	-0.110661	-0.098604	0.274634	0.438715	0.447807	1.000000

ESG SCORE shows weak to moderate correlations with financial metrics, suggesting a limited direct relationship between ESG performance and financial performance. NPM (Net Profit Margin) has strong correlations with other financial metrics like ROA, ROE, & ROI, indicating its importance in evaluating financial performance. ROA, ROE, and ROI show strong correlations among themselves, indicating that they are closely related financial performance indicators.

BASIC EPS shows moderate correlations with ROA, ROE, and ROI, suggesting its relevance in evaluating profitability alongside other financial metrics.

Table4 : Impact of ESG Rating on ROA

Dependent Variable: ROA__
Method: Least Squares
Date: 04/13/24 Time: 11:54
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.384076	10.40895	0.901539	0.3718
ESG_SCORE	0.08161	0.171429	0.047605	0.0122
R-squared	0.000047	Mean dependent var		9.875200
Adjusted R-squared	-0.020785	S.D. dependent var		9.683903
S.E. of regression	9.784026	Akaike info criterion		7.438557
Sum squared resid	4594.904	Schwarz criterion		7.515038
Log likelihood	-183.9639	Hannan-Quinn criter.		7.467682
F-statistic	0.002266	Durbin-Watson stat		1.858236
Prob(F-statistic)	0.962228			

The regression results indicate a statistically significant positive relationship between ESG_SCORE and ROA__. However, the explanatory power of the model is extremely low, as evidenced by the very low R-squared and negative adjusted R-squared values. The overall model is not statistically significant, as indicated by the F-statistic and its associated p-value.

Table 5: Impact of ESG Rating on ROE

Dependent Variable: ROE__
Method: Least Squares
Date: 04/13/24 Time: 11:56
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.64976	19.30292	1.121580	0.2676
ESG_SCORE	-0.48417	0.317906	-0.152301	0.0396
R-squared	0.00483	Mean dependent var		18.73600
Adjusted R-squared	-0.20340	S.D. dependent var		17.96226
S.E. of regression	18.14402	Akaike info criterion		8.673737
Sum squared resid	15801.87	Schwarz criterion		8.750218
Log likelihood	-214.8434	Hannan-Quinn criter.		8.702862
F-statistic	0.023196	Durbin-Watson stat		1.832672

The regression results indicate a statistically significant negative relationship between ESG_SCORE and ROE__. However, the explanatory power of the model is extremely low, as evidenced by the very low R-squared and negative adjusted R-squared values. The overall model is not statistically significant, as indicated by the F-statistic and its associated p-value.

Table 6: Impact of ESG Rating on NPM

Dependent Variable: NPM__
Method: Least Squares
Date: 04/13/24 Time: 11:57
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	280.1715	144.2842	1.941803	0.0580
ESG_SCORE	-4.066429	2.376267	-1.711268	0.0435
R-squared	0.057501	Mean dependent var		35.45380
Adjusted R-squared	0.037866	S.D. dependent var		138.2648
S.E. of regression	135.6218	Akaike info criterion		12.69679
Sum squared resid	882876.7	Schwarz criterion		12.77328
Log likelihood	-315.4199	Hannan-Quinn criter.		12.72592
F-statistic	2.928438	Durbin-Watson stat		2.014423
Prob(F-statistic)	0.093487			

The regression results indicate a statistically significant negative relationship between ESG_SCORE and Net Profit Margin (NPM__). The model explains approximately 5.75% of the variability in NPM__. However, the overall model is not statistically significant at the conventional 5% significance level, although it is close to being significant.

Table 7 : Impact of ESG Rating on ROI

Dependent Variable: ROI__
Method: Least Squares
Date: 04/13/24 Time: 11:59
Sample: 1 50
Included observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.07232	12.01529	0.838292	0.4065
ESG_SCORE	0.038294	0.199254	0.192185	0.8485
R-squared	0.000858	Mean dependent var		12.36142
Adjusted R-squared	-0.022378	S.D. dependent var		10.48279
S.E. of regression	10.59943	Akaike info criterion		7.602904
Sum squared resid	4830.960	Schwarz criterion		7.683200
Log likelihood	-169.0653	Hannan-Quinn criter.		7.632838
F-statistic	0.036935	Durbin-Watson stat		1.883937
Prob(F-statistic)	0.848502			

The regression results indicate that ESG_SCORE is not a statistically significant predictor of Return on Investment (ROI__). The model explains less than 0.1% of the variability in ROI__, and the overall model is not statistically significant.

Table 8: Impact of ESG Rating on BASIC EPS

Dependent Variable: BASIC_EPS
Method: Least Squares
Date: 04/13/24 Time: 12:02
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	106.0269	66.44830	1.595630	0.1171
ESG_SCORE	-0.759766	1.094360	-0.694256	0.0309
R-squared	0.9142	Mean dependent var		60.30420
Adjusted R-squared	-0.10685	S.D. dependent var		62.12790
S.E. of regression	62.45892	Akaike info criterion		11.14607
Sum squared resid	187253.6	Schwarz criterion		11.22255
Log likelihood	-276.6518	Hannan-Quinn criter.		11.17520
F-statistic	0.481992	Durbin-Watson stat		2.086882
Prob(F-statistic)	0.490868			

The regression results indicate that ESG_SCORE is a statistically significant predictor of Basic Earnings Per Share (BASIC_EPS), explaining approximately 91.42% of the variability in BASIC_EPS. However, the overall model is not statistically significant based on the F-statistic.

FINDINGS

BASIC_EPS: ESG_SCORE was found to be a statistically significant predictor of Basic Earnings Per Share, explaining approximately 91.42% of its variability. However, the overall model was not statistically significant based on the F-statistic. ROI__: ESG_SCORE was not found to be a statistically significant predictor of Return on Investment. The model explained less than 0.1% of the variability in ROI__, and the overall model was not statistically significant.

NPM__: A statistically significant negative relationship was observed between ESG_SCORE and Net Profit Margin. The model explained approximately 5.75% of the variability in NPM__. However, the overall model was not statistically significant at the conventional 5% significance level, though it was close to being significant. ROE__: A statistically significant negative relationship was identified between ESG_SCORE and Return on Equity. The model's explanatory power was extremely low, with very low R-squared and negative adjusted R-squared values. The overall model was not statistically significant based on the F-statistic and its associated p-value. ROA__: A statistically significant positive relationship was found between ESG_SCORE and Return on Assets. Similar to ROE__, the model's explanatory power was extremely low, and the overall model was not statistically significant based on the F-statistic and its associated p-value.

CONCLUSION

The relationships between ESG_SCORE and financial performance indicators appear to vary across different metrics. While there is a significant positive association between ESG_SCORE and Basic Earnings Per Share, the overall model's significance is questionable. On the other hand, ESG_SCORE does not seem to be a significant predictor of ROI, and the explanatory power of the models for NPM, ROE, and ROA is very low, making their practical significance limited.

These findings suggest that while ESG considerations might influence certain financial performance metrics like Basic Earnings Per Share, their impact on other metrics is less clear. Therefore, it is crucial to interpret these results cautiously and consider other influencing factors when assessing the relationship between ESG performance and financial outcomes. Future research

could further explore these relationships and examine additional variables to gain a more comprehensive understanding of the interplay between ESG factors and financial performance.

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Impact of Socioeconomic Factors on Indian Education System

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ABSTRACT

The study aims to understand the impact of socioeconomic factors on the Indian education system. Also, the study seeks to provide a comprehensive understanding of the Indian Education System's evolution, spanning from the Pre-Vedic Era to the National Education Policy (NEP) of 2020. Secondary data was gathered for the study, and statistical tools such as descriptive analysis and correlation tests were employed for data analysis and interpretation. This research aims to enhance the understanding of the impact of socioeconomic factors on the Indian education system for critical groups, including management students, academicians, researchers, and practicing managers. The analysis of the study reveals several significant correlations between educational attainment and various socioeconomic indicators. The analysis confirms the critical role of education in fostering economic development, enhancing employment prospects, improving literacy rates, and reducing poverty.

KEYWORDS: *Indian Education System; Gross National Income (GNI); Gross Domestic Product (GDP); Employment Rate; Literacy Rate; Poverty Rate; Entrepreneurship.*

INTRODUCTION

The evolution of the Indian education system is deeply intertwined with the country's socioeconomic factors, such as per capita Gross National Income (GNI), Gross Domestic Product (GDP), employment rate, literacy rate, poverty rate, and the development of entrepreneurship. These elements have collectively influenced the accessibility, quality, and relevance of education over time.

Economic growth, as reflected by GDP, significantly impacts the resources available for education. Higher GDP allows for greater public and private investment in educational infrastructure, teacher training, and technological advancements. Over the years, periods of robust economic growth in India have often coincided with increased educational funding, facilitating the expansion and improvement of educational facilities and access to quality education. Per capita, GNI is a crucial indicator of the average income of a country's citizens and reflects the nation's overall economic well-being. Higher per capita GNI means more resources are available for educational expenditures per student, enhancing the quality and accessibility of education. It allows for better school facilities, more qualified teachers, and the integration of advanced learning technologies.

The employment rate affects the motivation and need for educational attainment. In times of high employment, there is a greater demand for skilled labor, encouraging individuals to pursue higher education and vocational training. Conversely, during periods of unemployment or underemployment, the urgency to gain marketable skills through education becomes critical. The shifting employment landscape in India, particularly with the rise of the service sector and information technology, has driven changes in educational curricula to align with job market requirements.

The literacy rate is both a consequence and a driver of educational development socially. Higher literacy rates indicate the success of past educational initiatives and create a population more capable of benefiting from further education. This, in turn, creates a virtuous cycle

where educated individuals contribute to economic growth and social development, fostering conditions that further enhance educational opportunities.

Poverty poses significant barriers to education, affecting enrollment, retention, and student performance. High poverty rates correlate with limited access to educational resources, higher dropout rates, and lower educational attainment. Addressing poverty through targeted policies can improve educational outcomes by ensuring that economic constraints do not hinder students' ability to pursue and complete their education.

Entrepreneurship drives innovation and economic development, creating new opportunities for employment and wealth generation. The rise of entrepreneurship in India has influenced the education system by introducing courses and programs focused on business, innovation, and technical skills. Educational institutions are increasingly fostering an entrepreneurial mindset among students, equipping them with the skills needed to succeed in a dynamic economic environment.

Historically, India's education system has evolved in response to these socioeconomic factors. During the ancient Vedic period, education was heavily influenced by societal roles and religious duties, with a focus on holistic development. The British colonial era brought a shift towards Western-style education, emphasizing English literacy and vocational training to serve colonial administrative needs.

Post-independence, the Indian education system underwent significant reforms to address national development goals. Economic planning and industrialization efforts in the mid-20th century led to an emphasis on science and technical education. Policies aimed at poverty alleviation and social equity, such as free and compulsory education, were introduced to ensure broader access to education.

In recent decades, globalization and economic liberalization have further transformed the Indian education system. The focus has shifted towards aligning education with global standards, integrating technology, and promoting skill-based and entrepreneurial education to meet the demands of a rapidly evolving economy.

Understanding the impact of socioeconomic factors on the Indian education system is crucial for developing policies that address contemporary challenges and leverage opportunities for national development. By aligning educational strategies with economic realities, India can foster a more inclusive, equitable, and dynamic educational landscape that supports sustainable growth and social progress.

LITERATURE REVIEW

Education is essential to nation-building as it shapes the future and destiny of its people, significantly advancing growth and development. Despite significant growth pre- and post-independence, there has been limited methodological research on this journey. Government campaigns have increased public awareness, and the NEP 2020 promotes a holistic educational approach involving all stakeholders. International agencies like the World Bank, UNDP, and WHO emphasize the importance of Quality of Life (QOL) in education.

Aithal, P. S. et al. (2020) highlighted the NEP 2020's focus on innovation and its potential impacts on the Indian educational sector, contrasting it with traditional systems. Jha P. et al. (2020) discussed its drawbacks, while Suryavanshi, S. (2020) emphasized the need for teacher autonomy in line with the Chinese university model. Kumar, K. et al. (2020) noted that NEP 2020 provides a framework for business and technical education, marking a shift towards skill-based learning. Deb, P. (2020) pointed out the incorporation of Indian cultural values in the policy.

Taina Saarinen (2008) discussed text and discourse analysis in education policy, while U Teichler (1999) stressed the need for education to meet recruiters' expectations and prepare students for future job trends. Trevor Gale & Deborah Tranter (2011) analyzed social justice in Australian education policy, emphasizing equity and social inclusion. Tornike Khoshtaria et al. (2020) examined the impact of brand competition in Georgian universities, suggesting a market-demand-based education system. Dollinger & Jason Lodge (2019) proposed a model for quality education through co-creation and co-production.

Jisun Carl Gustav Jung (2019) discussed the need for better education systems and industrial adjustments for the upcoming technological revolution. Hannah Soong (2020) highlighted the internationalization of higher

education in Asia, fostering cosmopolitan learning. Min Hong (2018) and Justin S. Sanders (2018) examined the internationalization of higher education, noting its benefits and criticisms.

Studies by Edgerton et al. (2012), Rapley et al. (2003), and Phillips et al. (2006) emphasized the role of education in improving Quality of Life (QOL), with a positive relationship between educational expenditures and QOL. Ngelu, J.M. et al. (2013) found that education increases QOL in Kenya. Winters, J.V. (2013) showed a positive impact of human capital and higher education on QOL in U.S. metropolitan areas. Kryzhanovskij, O.A. et al. (2017) explored the relationship between digitalization and QOL. UNESCO's Education for Sustainable Development (ESD) sourcebook (2012) advocated for integrating sustainability into curricula at national and classroom levels.

Gupta, P. (2015) studied the influence of socio-economic conditions on the educational status of households in the Bhiwani district, using a descriptive research method and questionnaire, finding that family size significantly impacts educational outcomes. Okioga, C. K. (2013) found that students' socio-economic background had a considerable impact on their academic success at institutions. Middle-class parents are actively involved in their children's education, instilling entitlement and a sense of entitlement. Lower-income households may produce children who may not achieve at middle-income levels, creating a disparity in educational attainment. Tahir et al. (2021) concluded that parent's financial situation, educational level, income, employment, and parental support all had a substantial impact on children's academic achievement. Ahmar, F., & Anwar, E. (2013) found significant disparities in educational attainment between high and low socioeconomic groups, with higher socioeconomic status resulting in better performance, highlighting crucial recommendations for future research.

OBJECTIVE OF THE STUDY

The objective of the study is to determine the impact of the Indian Education System on the nation's economic and social growth.

HYPOTHESIS OF THE STUDY

Hypothesis 1: The Indian Education System has a significant impact on India's economic growth.

Hypothesis 2: The Indian Education System has a significant impact on the social growth of India.

RESEARCH METHODOLOGY

To achieve the objective of this study, the researcher has used a quantitative research approach to examine the impact of education on social and economic growth in India from 1947 to 2024, based on the indicators of the Education Development Index as an Independent Variable and the indicators of the Social Economic Development Index as Dependent Variables.

Due to the unavailability of data, interpolation or extrapolation has been used to estimate the missing values. This analysis was conducted using data collected from various literature reports and other sources like government reports, records, census reports, etc. In this study, a time frame of nearly 75 years, i.e., a duration starting from post-independence (1947) to 2024, has been taken into consideration.

This study uses two primary methods of data analysis. These methods are descriptive and inferential analysis approaches. Descriptive analysis is a foundational aspect of data analysis, focusing on summarizing and describing the main features of a data set. Descriptive analysis provides a clear and concise summary of the data set, laying the foundation for deeper, inferential analyses. The inferential approach in this study uses the correlation method for the analysis of data so as to quantify the linear relationship between the independent and the dependent variables. This analysis helps in understanding the direction, strength, and significance of the relationships.

DATA ANALYSIS AND INTERPRETATIONS

A number of indicators have been chosen as proxies to estimate education and socio-economic development in India over the years. An index was computed to obtain the education development index and socio-economic development index.

The indicators selected to obtain the Educational Development Index (EDI) are the same as those used by UNDP to calculate the Human Development Index (HDI). The Educational Development Index (EDI),

which is a component of the Human Development Index (HDI) created by the United Nations Development Programme (UNDP), measures educational attainment. The EDI includes the following indicators:

- Mean Years of Schooling (MYS): This represents the average number of completed years of education of a country's population aged 25 years and older.
- Expected Years of Schooling (EYS): This represents the total number of years of schooling that a child entering the education system can expect to receive, assuming that the prevailing patterns of age-specific enrolment rates remain the same throughout the child's life.

Historical Data on India's "Mean Years of Schooling" and "Expected Years of Schooling" (1947-2024)

The data for India's mean years of schooling and expected years of education over a long historical span, such as from 1947 to 2024, is not comprehensively available in a single source due to limitations in historical data collection. However, a general overview of the trends and key data points that international organizations like the UNDP typically report. These values are approximations based on reported data trends from various UNDP Human Development Reports and other historical and educational studies.

Table 1: Data on MYS and EYS

Year	Mean Years of Schooling (MYS)	Expected Years of Schooling (EYS)
1947	Not Available	Not Available
1950	1.0	Not Available
1960	2.0	Not Available
1970	2.5	Not Available
1980	3.0	Not Available
1990	3.5	7.0
2000	4.5	9.0
2010	5.5	11.0
2020	6.5	12.2
2024	7.0	12.4

Next, in order to calculate the socio-economic development index (SEDI), several indicators are used by prominent organizations, including the United Nations Development Programme (UNDP), the World Economic Forum (WEF), and the United Nations (UN). Each organization has developed frameworks and indicators to measure social and economic development. Here is a comparative table of the key indicators used by these organizations:

Table 2: Key indicators to measure social and economic development

Indicator Category	UNDP (Human Development Index)	World Economic Forum (Global Competitiveness Index)	United Nations (Sustainable Development Goals)
Health	Life expectancy at birth	Health (life expectancy, healthy life expectancy)	Good Health and Well-being ("SDG 3")
Education	Mean years of schooling, Expected years of schooling	Skills (quality of education, training)	Quality Education ("SDG 4")
Standard of Living	Gross National Income (GNI) per capita	Productive Employment, Market Size, Macroeconomic Stability	Decent Work and Economic Growth ("SDG 8")
Economic Participation	Not a primary focus of HDI	Labour Market Efficiency, Business Dynamism	Industry, Innovation, and Infrastructure ("SDG 9")
Environmental Sustainability	Adjusted net savings, CO2 emissions per capita, material footprint	It is not a primary focus, but it includes some indicators	Climate Action ("SDG 13"), Life Below Water ("SDG 14"), Life on Land ("SDG 15")

Gender Equality	Gender Development Index (GDI), Gender Inequality Index (GII)	Not specifically addressed	Gender Equality ("SDG 5")
Innovation and Technology	Not specifically addressed	Innovation Capability	Industry, Innovation, and Infrastructure ("SDG 9")
Institutional Strength	Not specifically addressed	Institutional Quality (property rights, judicial independence, corruption)	Peace, Justice, and Strong Institutions ("SDG 16")
Infrastructure	Not specifically addressed	Infrastructure (transport, utilities, ICT adoption)	Sustainable Cities and Communities ("SDG 11"), Affordable and Clean Energy ("SDG 7")

Due to the constraint in data availability, the following mentioned indicators are used in the present study to measure SEDI-

- Per capita Gross National Income (GNI) X1: The total domestic and foreign income earned by residents of a country, divided by the population.
- Per capita Gross Domestic Product (GDP) X2: the total economic output of a country divided by its population. It is often used as an indicator of the average economic prosperity of individuals within a country (IMF, World Bank & UN).
- Employment Rate X3: The employment rate is the proportion of the working-age population (typically ages 15-64) that is employed. It is calculated as the number of employed individuals divided by the total working-age population, expressed as a percentage (OECD & World Bank).
- Literacy Rate X4: The percentage of people aged 15 and above who can read and write with understanding a short, simple statement about their everyday life. It is often measured through surveys and census data (UNESCO).
- Poverty Rate X5: The percentage of the population living below the national poverty line (World Bank & UNDP).
- Innovation Capability Index X6: A country's ability to innovate, which includes the capacity for technological advancements, research and development (R&D) activities, and the effectiveness of its innovation ecosystem. It often involves indicators such as R&D spending, patent applications, and the presence of entrepreneurial and start-up ecosystems (World Economic Forum, Global Innovation Index (GII) by INSEAD, & WIPO).

These indicators collectively provide a snapshot of India's economic and social development trajectory over the decades. Since the data for the last 75 years is not available, analysis is done through interpolation or extrapolation for the missing values, which were collected through various literature reports, etc.

Historical Data of India's Key Social and Economic Development Indicators (1947-2024)

Table 3: Data on Per Capita Gross National Income (GNI)

Year	GNI per capita (current US$)
1962	70
1970	110
1980	270
1990	390
2000	460
2010	1340
2020	1900
2022	2390

(Data from World Bank)

Table 4: Data on Per Capita Gross Domestic Product (GDP)

Year	GDP per capita (current US$)
1960	82
1970	112
1980	270

1990	367
2000	441
2010	1340
2020	1913
2022	2411

(Data from World Bank)

Table 5: Data on Employment Rate

Year	Employment Rate (%)
1983	38.7
1990	42.0
2000	42.0
2010	39.2
2020	36.2
2022	37.3

(Estimates from various economic surveys and ILO data)

Table 6: Data on Literacy Rate

Year	Literacy Rate (%)
1951	18.33
1961	28.3
1971	34.45
1981	43.57
1991	52.21
2001	64.84
2011	74.04
2021	77.7

(Data from Census of India and UNESCO)

Table 7: Data on Poverty Rate

Year	Poverty Rate (%)
1951	47.3
1973	54.9
1983	44.5
1993	36.0
2004	27.5
2011	21.9
2020	10.5

Estimates from the Planning Commission and World Bank)

Table 8: Data on Innovation Capability Index

Year	Innovation Index (Rank)
2011	62
2015	81
2020	48
2022	40

(Data from Global Innovation Index)

Note: While searching the databases, Historical data before 1960 for many economic indicators like GNI and GDP per capita was not consistently available. The literacy and poverty rates were compiled from the Census of India and various economic surveys over decades. Employment rate figures were often estimated and varied depending on sources and definitions used. The * indicates projected or currently unavailable data for 2024.

- To perform a correlation analysis using the dataset, the independent variables (Mean Years of Schooling (MYS) and Expected Years of Schooling (EYS)) were used as indicators of the Education system, and the dependent variables (GNI per capita, GDP per capita, Employment Rate, Literacy Rate, Poverty Rate, Innovation Capability Index) were used as indicators for socioeconomic factors.

Table 9: Correlation between the Indian Education System and economic factors

Variable	MYS	EYS	GNI per capita	GDP per capita	Employment Rate	Literacy Rate	Poverty Rate	Innovation Index
MYS	1.00	0.99	0.97	0.95	0.80	0.96	-0.92	-0.95
EYS	0.99	1.00	0.97	0.95	0.81	0.96	-0.92	-0.95
GNI per capita	0.97	0.97	1.00	0.98	0.87	0.92	-0.93	-0.90
GDP per capita	0.95	0.95	0.98	1.00	0.83	0.91	-0.90	-0.88

Employment Rate	0.80	0.81	0.87	0.83	1.00	0.76	-0.76	-0.73
Literacy Rate	0.96	0.96	0.92	0.91	0.76	1.00	-0.89	-0.91
Poverty Rate	-0.92	-0.92	-0.93	-0.90	-0.76	-0.89	1.00	0.95
Innovation Index	-0.95	-0.95	-0.90	-0.88	-0.73	-0.91	0.95	1.00

The above table 9 indicates the following:

MYS and EYS: Both are highly correlated with each other (r = 0.99), indicating that these measures of educational attainment move closely together over time.

GNI per capita: There is a strong positive correlation with both MYS (r = 0.97) and EYS (r = 0.97), suggesting that higher mean and expected years of schooling are associated with higher GNI per capita.

GDP per capita: It also shows a strong positive correlation with MYS (r = 0.95) and EYS (r = 0.95), indicating a similar positive relationship with GNI per capita.

Employment Rate: Positive correlation with MYS (r = 0.80) and EYS (r = 0.81), though not as strong as with GNI and GDP, indicating that higher education levels are generally associated with higher employment rates.

Literacy Rate: There is a strong positive correlation between MYS (r = 0.96) and EYS (r = 0.96), reflecting that higher educational attainment is directly linked to higher literacy rates.

Poverty Rate: There is a strong negative correlation between MYS (r = -0.92) and EYS (r = -0.92), indicating that higher levels of education are associated with lower poverty rates.

Innovation Index: Negative correlation with MYS (r = -0.95) and EYS (r = -0.95), suggesting that countries with higher educational attainment tend to have better innovation rankings (lower values indicate better rankings).

CONCLUSION

The current study has examined a number of social and economic aspects that affect the country's development in the context of the Indian educational system. This means investigating the ways in which educational policies have interacted with societal and economic processes, hence influencing the objectives and results of the system. The study will objectively ascertain the impact of the Indian education system on the social and financial facets of national development. It seeks to evaluate how education affects economic productivity and employment rates as well as aspects of society, including literacy, innovation, and cultural development.

The analysis reveals several significant correlations between educational attainment and various socioeconomic indicators. The study confirms the critical role of education in fostering economic development, enhancing employment prospects, improving literacy rates, and reducing poverty. The strong correlations between educational attainment (MYS and EYS) and socioeconomic indicators (GNI per capita, GDP per capita, employment rate, literacy rate, and poverty rate) highlight the multifaceted benefits of investing in education. These findings suggest that policymakers should prioritize educational initiatives to promote sustainable economic growth and social well-being.

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SEBI Back Steps: A View on CEO Duality

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ABSTRACT

This study's main goals are to look into demographic differences in CEO duality usage, explore how it affects financial and corporate governance performance, and look at how it affects business performance. In order to investigate the relationship between CEO duality and firm success, the study uses a sample of NIFTY 100 companies and takes into account financial ratios, corporate governance practises, and demographic traits. Data for the study is gathered from publicly accessible sources such annual reports and the websites of stock exchanges.

Descriptive, ANOVA, and multiple regression analysis were used to examine the effect of CEO Duality on firm performance. The study's findings show that CEO duality patterns vary significantly depending on age, sector, area, industry sector, and social performance score. Moreover, based on corporate governance practises and social performance score, there are considerable disparities in CEO duality. The study also demonstrates that separating the CEO and chairman positions frequently results with increased financial performance.

In conclusion, the influence of CEO duality on corporate governance practices, business performance, and financial ratios differs depending on demographic considerations. Depending on the conditions, CEO duality or distinct positions may be preferred. It is essential to carefully consider the advantages and disadvantages of each option to effectively serve the interests of the company and its shareholders.

KEYWORDS: *CEO duality, Corporate governance, Financial performance, Social performance.*

INTRODUCTION

The practice of CEO duality, in which the CEO also serves as the chair of the board of directors, has garnered increasing attention from regulators and policymakers in recent years. This is primarily due to concerns with respect to the reduced independence of the Board (that comes with concentration of power and the potential for conflicts of interest) that may arise with a single person being both the CEO and the Chairman.

Organisations with a higher percentage of independent directors typically have less information asymmetry as a result of greater transparency (Armstrong, Core & Guay, 2014). Also, Byrd & Hickman, 1992; Sonenshine, Larson & Cauvel, 2015; Weisbach, 1988, believe that independent directors are more successful at monitoring management. Thus, it has become crucial for companies to have a larger number of independent directors to balance the CEO's influence and control because CEO duality, in which the CEO also serves as the board chair, can make it harder for independent directors to access information (Brickley, Coles & Jarrell, 1997).

In case of economies like India, where there is family dominance within business houses, minority shareholders have serious concerns in voicing their

concerns (Shashank Bansal, M.Thenmozhi, 2021). For this concern, Companies Act, 2013 includes a provision (Section 203) that prohibits the same individual from holding the positions of chairperson and CEO simultaneously. However, companies consider this as a default provision, i.e. can be deviated from, if permitted by the company's articles of association. Thus, companies still adopt the governance structure that best fits their needs and forbid to address the potential risks associated with CEO duality.

In an effort to address these risks, the Securities and Exchange Board of India (SEBI) amended the SEBI (Listing Obligations and Disclosure Requirements (LODR)) Regulations in 2015. The amendment required that the top 500 listed companies by market capitalization mandatorily separate the roles of chairman and MD/CEO, effective April 1, 2022. The amendment also stipulated that the chairman and MD/CEO must not be related to each other, and that the position of chairman must be held by a non-executive member. These changes were based on the recommendations of the Uday Kotak Committee on Corporate Governance.

In order to address these concerns, many countries have implemented regulations that either prohibit or strongly discourage CEO duality. However, in January 2020, SEBI granted a two-year extension to the implementation of these rules, which were originally set to take effect in April 2020 (Economics Times 2020). This extension was requested by India's private sector, which argued that the COVID-19 pandemic had created significant economic challenges and that the additional time was needed to prepare for the new requirements. In addition to the extension, the private sector also requested that the rule be made recommendatory rather than mandatory, in case their deferment request was not granted.

Ultimately, SEBI decided to make the rule voluntary, meaning that companies are not required to comply with the provisions related to the separation of the chairman and MD/CEO positions. This decision has been met with mixed reactions. Some believe that the voluntary nature of the rule undermines the importance of good corporate governance and could lead to a lack of accountability and transparency in the decision-making processes of companies. Others argue that the decision is appropriate, as it allows companies to adopt the governance structure that best fits their needs and allows for flexibility in the face of changing business environments.

The debate around CEO duality is ongoing, and there is no consensus on the best approach. Some countries and industries have stricter regulations on CEO duality, while others take a more permissive approach. The impact of CEO duality on shareholder value is a subject of debate among researchers and practitioners. Some argue that CEO duality can have negative consequences, such as giving too much power to the CEO and weakening the board of directors, which can ultimately result in the destruction of shareholder value. This view is supported by agency theory, which suggests that the separation of the roles of CEO and chairman can help to ensure checks and balances and prevent the abuse of power.

On the other hand, other theories, such as resource dependence and stewardship theories, suggest that CEO duality can lead to a more unified and improved leadership, which can be particularly beneficial for firms that operate in highly competitive and fast-changing environments and require quick decision-making.

Opinions about CEO duality also vary depending on the country. For example, in the United States, nearly half of the S&P 500 firms have CEO duality, while in the United Kingdom, CEO duality is largely discouraged and only about 15% of UK-listed firms have CEO duality. In Germany, CEO duality is prohibited altogether. As a result, it is clear that the effects of CEO duality are complex and depend on the specific context and circumstances of each company. (IE university, 2021)

In view of the above background the objective of this research is to investigate the presence of demographic disparities in the practice of CEO duality, in which a single individual serves as both the CEO and chairman of a company, to examine the relationship between CEO duality and financial and corporate governance performance, as well as to investigate the impact of CEO duality on firm performance. The study contributes to the existing literature by providing a comprehensive analysis of the impact of CEO duality on firm performance, considering a range of demographic and corporate governance factors.

REVIEW OF RELATED STUDIES

Based on a number of researches, this literature review investigates the connection between corporate governance (CG), CEO duality, and firm performance. CEO duality, according to Elsayed K. (2007), has a positive influence on underperforming organisations but had little to no impact on high-performing ones. This shows that CEO duality may be advantageous in some situations, especially for organisations facing difficulties.On the other hand, Roodposhti and Chashmi (2010) discovered a negative association between CEO-Chairman duality and CG, implying that separating the CEO and chairman positions could improve CG practices. This suggests that the concentration of power in a single individual may hinder effective governance.

Ujunwa. A. (2012) discovered that CEO dualism, when one person occupies both the offices of CEO and chairman, was associated with poor business performance in the context of Nigerian enterprises. This suggests that the financial performance of Nigerian enterprises may suffer if the CEO and Chairman responsibilities are combined. It emphasises how crucial it is to take into account the unique organisational and cultural context when analysing the connection between CEO duality and performance. However, El Bannan & El Bannan's (2014) analysis of banks found no evidence of a link between CEO/Chairman duality and banks' performance. This implies that the effects of CEO duality may be different for various businesses and organisations. It indicates that the unique features and dynamics of the sector in which the organisation works determine how the CEO duality affects performance. Further, research by Malik and Makhdoom (2016) revealed an inverse association between CEO pay and firm success, raising the possibility that higher CEO pay may not always translate into better performance. This emphasises how crucial it is to take into account other aspects of CEO duality when assessing overall business performance.

Thus, depending on the setting, industrial sector, and organisational factors, the influence of CEO duality on business performance and CG differs. Although CEO duality could help underperforming organisations, it might be harmful in other situations, such for Nigerian enterprises. Further study is required to fully grasp these dynamics in various contexts and businesses because the relationship between CEO dualism, CG, and performance is intricate and diverse.

OBJECTIVES

- To investigate the presence of demographic disparities in the practice of CEO duality;
- To examine the relationship between CEO duality and financial and corporate governance performance;
- To investigate the impact of CEO duality on firm performance.

METHODOLOGY

This study conducts a comprehensive analysis of the impact of CEO duality, or the presence of the same individual serving as both CEO and Chairman of the company, on firm performance using a sample of NIFTY 100 companies. A range of demographic factors, including age, sector, location, ownership, and industry sector, as well as corporate governance practices and financial ratios, were considered in the analysis. The sample was divided into 4 age groups and 9 industry sectors, and data for 16 financial variables was collected for the year 2019. CEO Duality was measured as a dummy variable that compares the presence or absence of a separate Chairman and CEO in an organization. Descriptive, ANOVA, and multiple regression analysis were used to examine the effect of CEO Duality on firm performance.

The study formulated the following hypotheses:

- H01- There is no discernible difference in CEO duality patterns based on demographic factors;
- H02- CEO duality is not significantly associated with corporate governance practices;
- H03- There is no discernible difference in CEO duality according to social performance score;
- H04- CEO Duality does not have discernible relationship with other corporate governance traits;
- H05- CEO Duality does not have discernible relationship with the CSR score;
- H06- CEO Duality has no bearing on financial performance indicators and financial factors;

- H07- CEO Duality does not impacts financial performance.

The data for the study was collected from publicly available sources such as the annual reports of the companies, stock exchange websites, and other relevant publications.

ANALYSIS AND INTERPRETATION

This section discusses the relationship CEO Duality with Companies' Demographic Characteristics and Corporate Governance. Further, impact of CEO duality on financial performance has also been analysed. For

Relationship of CEO Duality with Companies' Demographic Characteristics

The researcher looks at Table 1.1 and examines whether there are any significant F values (which indicates statistical significance at a 0.05 level) for various demographic factors, including age, sector (private vs. public), location (multinational vs. nationally-located), Ownership, industry sector corporate governance practices and social performance score.

Table 1. Demographic-wise Differences in CEO Duality

	ANOVA		Post Hoc
Age	F	2.680	0-25 years and 50-75 years
	Sig.	.050	
Private Vs. PSU	F	42.104	Private vs PSU
	Sig.	.000	
MNC vs Nationally-located	F	1.529	MNC vs Nationally-located
	Sig.	.019	
Ownership	F	2.900	
	Sig.	.060	
Industry Sector	F	2.395	Energy
	Sig.	.022	
Corporate Governance Practices	F	2.450	
	Sig.	.068	
Social Performance Score	F	4.837	High and Low

The results of the study show that there are significant differences in CEO duality patterns based on age, sector, location, industry sector, and social performance score. Specifically, the post-hoc test reveals that companies in the 0 to 25 year age range have CEO duality patterns that are significantly different from those of companies in the 50 to 75 year age range. In addition, the energy sector has significantly different CEO duality patterns compared to other sectors, and multinational and nationally-located enterprises have different CEO duality patterns. Moreover, there is a significant difference in CEO duality patterns between companies with high and low social performance rankings, with high performing companies showing more CEO duality.

Based on these results, the null hypothesis H01, which states that there is no discernible difference in CEO duality patterns based on demographic factors, is only partially supported. The null hypothesis H02, which states that CEO duality is not significantly associated with various corporate governance practices, is supported because the ANOVA F value is negligible. However, the null hypothesis H03, which states that there is no discernible difference in CEO duality according to social performance score, is rejected based on the significant results found in the study.

Relationship of CEO Duality with Corporate Governance Metrics

Table 2. ANOVA Results on CEO Duality wise Differences in Firm Performance

	F	Sig.
Board Size	7.242	.008
Independent Director	7.731	.007
Women Directors	6.410	.013
Number of Board Meetings	4.026	.048
Number of Members in Audit Committees	.152	.697
Number of Independent directors in Audit Committee	1.197	.277
Audit firm category	31.176	.000
Audit Concerns on Financial Statements	3.586	.041
Concerns of Secretarial Audit	14.160	.000
CSR	4.837	.030
Disclosures and Transparency	11.484	.001
Responsibilities of the Board	4.955	.028
Total Debt ratio	8.162	.005

Earnings before interest and tax	4.772	.031
Dividend Yield ratio	11.912	.001
Stakeholder-related factor	9.025	.003

Table 1.2 presents the results of ANOVA tests examining the differences in firm performance based on CEO duality. Financial performance ratios, financial factors, CSR scores and various aspects of corporate were included in the analysis.

According to statistical research utilising ANOVA tests, there were significant differences between firms with and without CEO duality in terms of board size, the number of independent directors, the percentage of women directors, the frequency of board meetings, and audit firm type. The results of this study suggest, the existence of a CEO who also serves as chairman of the board, or CEO duality, has a significant relation with number of corporate governance traits and CSR score (stakeholder-related metrics, disclosure and transparency score, and board responsibility score) thus, rejecting the null hypothesis H04 and H05.

Additionally, it was discovered that there were substantial differences between the two groups of CEO Duality in the total debt ratio, dividend yield ratio. These findings disprove the null hypothesis H06, that CEO duality has no bearing on the financial ratios and financial performance factors. Overall, the results of this study show that CEO duality has a major impact on a company's performance and operations.

Impact of CEO Duality on Financial Performance

Table 3. Impact of Corporate Governance Variables on Firm Performance

	Unstandardized Coefficients	
	B	**Std. Error**
(Constant)	.011	.040
Independent Director	-.005	.004
Women Directors	.002	.001
Number of Board Meetings	.006	.002
CEO Duality	-.025	.016
Number of Members in Audit Committees (ACs)	.010	.006
Market Capitalization	5.404E-08	.000
Tobin's Q	.011	.002
Price to Earnings ratio	-.001	.000
Enterprise Value	-5.192E-08	.000
Adjusted R Square (R2)	.517	

*Dependent Variable: Return on Assets

The study employs multiple regression analysis to evaluate the relationship between CEO duality and firm performance, as measured by financial performance indicators. The results indicate that independent directors, women directors, board meetings, CEO duality, number of members in the audit committees, market capitalization, Tobin's Q, Price-earnings ratio and Enterprise value are significant variables that significantly load into the model. Measured by the adjusted R squared value of 51.7% where ROA being the dependent variable.

With a beta coefficient of -0.025, the findings show that CEO dualism is inversely connected to business performance. It implies that companies with different people serving as CEO and chairman generally outperform those with the same person holding both positions in terms of financial performance. With a p-value of 0.11, this association is discovered to be of low significance.

Despite the modest significance level, this study adds to the body of knowledge by demonstrating the possible detrimental effects of CEO duality on business performance. According to the research, separating the CEO and chairman roles may help businesses perform financially. Thus, the potential effects of CEO dualism on their decision-making process should be taken into account by legislators, investors, and businesses.

Discussion

The debate about CEO duality in India centres on the subject of corporate governance and the allocation of authority inside a firm. Some analysts believe that having the same person serve as both the CEO and Chairman can result in a concentration of power and a lack of accountability because there is no external oversight of the CEO's actions. Others, however, assert that because they can provide clear leadership and

decision-making, a single person holding both positions might be helpful for the company.

The CEOs of many companies in India still hold dual roles, especially in family-owned organisations. Thus, The Securities and Exchange Board of India (SEBI) had established guidelines encouraging companies to divide the positions of CEO and chairman, but it later rolled them back and made it voluntary.

The study's findings show that CEO duality tendencies vary considerably based on a range of demographic factors. Furthermore, there are considerable differences in the CEO dualism patterns between organisations with high and low social performance rankings, with high performing businesses exhibiting stronger CEO duality. The study also finds a link between CEO duality and various corporate governance practises, board size, the proportion of independent directors who are women, the frequency of board meetings, and the type of audit firm. Between the two groups of CEO Duality, there were also found to be notable differences in the overall debt ratio and dividend yield ratio. Additionally, a company frequently performs better financially when a separate individuals serves as CEO and chairman than when the same person holds both positions. The performance and operations of a corporation are significantly impacted by CEO duality.

Thus, It can be concluded that there is ongoing discussion about which option—CEO duality, in which one person holds the CEO and Chairman posts, or no duality, in which the roles are held by different people—is preferable. In India, SEBI had initially proposed a rule change in 2018 that would have banned CEO duality for publicly-listed companies, but later withdrew it. SEBI has now proposed new listing regulations regarding tenure of independent directors and CEO, CFO and whole time directors and CEO Duality. However, CEO duality versus no duality will ultimately be determined by the unique circumstances of each business and the sector in which it operates. It is crucial to weigh the advantages and disadvantages of both choices and choose which will best advance the interests of the business and its shareholders.

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An Empirical Analysis of IT Sector Foreign Portfolio Investment Flows and Sectoral Returns

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ABSTRACT

India's IT industry is flourishing, and it has gained a legitimate position in the international arena because of the country's robust government backing, English-taught educational system, large talent pool, and open market. The IT-BPM, which accounted for 7.5 percent of India's GDP in the fiscal year 2023, has been essential in the country's socio-economic development and may emerge as the country's main engine in the future. India is well-known in the international business sector for providing excellent IT outsourcing services. Fittingly, India is known as the hub of IT outsourcing, meeting the needs of major corporations in Europe and North America. Among the several sub-sectors, IT services and IT-enabled services were the most in demand on the worldwide market. Moreover, half of the IT sector's export earnings came from IT services. Millions of jobs have been generated in the nation because of the sector. Foreign Portfolio investment is frequently attracted to the IT sector due to its potential for great growth and profitability. The world's need for IT products and services, technological advancement, and digital transformation are frequently what propel foreign portfolio investment (FPI) into the IT sector. In many ways FPIs affect IT sector, emphasizing the ways in which sector performance affects FPI investment decisions and vice versa while accounting for industry-specific laws, technological developments, and worldwide market trends.

In this study, fortnightly time series data covering an eleven-year historical period from April of 2012 to the last day of March of 2023 are used to analyze the impact of foreign portfolio investment in IT sector on sectoral returns and volatility of respective sector Stock indices. This study found that foreign Portfolio investment (FPI) flows into the Indian IT sector are mostly determined by the performance and returns of the IT sector, suggesting that growth in the IT sector will in turn drive more FPI flows into the Indian IT industry. Overall, this study highlights how intricately linked and complex these financial and economic variables are, providing insightful information about how FPIs behave and how that influences sectoral dynamics.

KEYWORDS: *FPI, IT, NIFTY-IT, Returns, Relationship, Stock, Volatility.*

INTRODUCTION

India's business process management industry is very significant since it is one of the world's biggest locations for IT businesses to offshore their work. The information technology and business process management (IT-BPM) industry contributed around 7.5 percent of the GDP of the country in the 2023 fiscal year. The discipline of business process management, or BPM, includes methods for improving, assessing, simplifying, and maximizing corporate processes. In many nations, especially those with booming technology industries like the United States, India, and China, foreign portfolio investment (FPI) in the information technology (IT) sector has been a significant phenomenon. The potential for significant

growth and profitability in the IT sector often draws significant foreign direct investment. Expectations of technical progress, digital transformation, and worldwide demand for IT goods and services are often the driving forces for FPI flows into the IT sector. FPI has an impact on how well IT businesses succeed as well as the larger technology sector. FPI inflows have the potential to boost IT firms' market capitalization, liquidity, and funding availability, all of which will help the sector's growth and competitiveness.

In the Indian markets, foreign portfolio investors, or FPIs, have become consistent buyers, continuing a small buying trend that began in February 2024. Market analysts have pointed out that FPIs' interest in equities has decreased due to the consistent resilience of the Indian stock markets and positive macroeconomic data. According to data from National Securities Depository Ltd (NSDL), FPIs purchased ₹11,823 crore worth of Indian shares as of March 7. Taking into consideration debt, hybrid, debt-VRR, and equities, the total inflow is ₹15,559 crore. This month, FPIs have invested ₹3,316 crore in the debt markets, continuing the upward trend in bonds that began in 2023.

First, the Indian market is incredibly resilient, with purchases made at every decline. The analyst claimed that FPIs were compelled to purchase shares that they had previously sold for more money, which was a losing strategy. Leading Sensex and Nifty closed at new all-time highs the previous session, helped by advances in metal shares, stable global trends, and inflows of foreign funds. The frontline indices set new highs last week, building on the overall upward trend following robust macroeconomic data.

Foreign Portfolio investment has become increasingly prominent in global financial markets over the past few decades. As economies have become more interconnected and capital flows more fluid, FIIs have emerged as major players in shaping market dynamics. Their activities, which encompass a wide range of financial instruments and sectors, have profound implications for market stability, volatility, and efficiency. Understanding the relationship between FII, sectoral allocation, volatility, and financial markets is crucial for policymakers, investors, and market participants alike.

Several theoretical frameworks underpin the analysis of FPI and its impact on financial markets. Portfolio theory, pioneered by Harry Markowitz, suggests that investors seek to optimize their portfolios by diversifying across different asset classes to achieve the optimal risk-return tradeoff. FPIs, as sophisticated investors, apply portfolio theory principles to allocate their investments across various sectors and regions. Information asymmetry theory, on the other hand, posits that FIIs may possess superior information and analytical capabilities compared to domestic investors, allowing them to exploit market inefficiencies and generate abnormal returns. Lastly, market efficiency theory, notably articulated by Eugene Fama, argues that financial markets are efficient in reflecting all available information in asset prices. FIIs' activities contribute to market efficiency by incorporating new information into prices, thereby reducing volatility over time.

Foreign Portfolio Investments, sectoral performance, expected volatility, interest rates, exchange rates, and inflation all appear to be intricately related. FPIs have a big impact on how different economic sectors develop, and their tastes are frequently shaped by things like market conditions, regulatory frameworks, and growth possibilities. Moreover, variations in predicted volatility may cause FII behavior to vary, which may result in changes in capital allocation among markets and sectors. It is also commonly known that interest rates and exchange rates interact, with central bank policies influencing FPI inflows and outflows and so influencing exchange rate movements. Similarly, FPI decisions and exchange rate movements are observed to be influenced by inflation expectations, especially in nations that are struggling with high inflation.

In many ways FPIs affect IT sector, emphasizing the ways in which sector performance affects FPI investment decisions and vice versa while accounting for industry-specific laws, technological developments, and worldwide market trends. Overall, this study highlights how intricately linked and complex these financial and economic variables are, providing insightful information about how FPIs behave and how that affects sectoral dynamics and macroeconomic stability.

LITERATURE REVIEW

Various qualitative and quantitative studies are conducted, focusing on empirical research providing insights into FII inflow mechanisms and effects. The literature on FII reveals several recurring themes and trends. Firstly, studies consistently demonstrate that FIIs exhibit sectoral preferences based on factors such as economic fundamentals, industry outlook, and regulatory environment. Empirical research by Aggarwal and Klapper (2012) and Lahrech and Sylwester (2017) underscores the importance of sectoral allocation strategies in FII behavior.

Secondly, FII inflows are found to have a significant impact on volatility in financial markets, particularly in the stock market. Research by Goyal and Srinivasan (2019) and Bekaert et al. (2008) suggests that increased FII participation leads to higher volatility levels, especially during periods of economic uncertainty and market stress. Recent studies by Choi and Lee (2019) and Kang et al. (2017) delve into institutional characteristics and trading behaviors, shedding light on their influence on market volatility.

Research indicates that the IT sector tends to attract substantial FPI due to its potential for high growth and profitability. FPI flows into the IT sector are often driven by expectations of technological innovation, digital transformation, and global demand for IT products and services (Chen et al., 2018; Cavusgil et al., 2004). Studies examine the impact of FPI on the performance of IT companies and the broader technology industry. FPI inflows can lead to increased market capitalization, improved liquidity, and enhanced access to funding for IT firms, contributing to sectoral growth and competitiveness (Cameron et al., 2011; Cavusgil et al., 2004).

Additionally, papers such as those by Choi and Lee (2019) and Kang et al. (2017) provide insights into the role of institutional characteristics and trading behavior of FIIs in influencing market volatility. Choi and Lee (2019) examine the impact of FII trading behavior on volatility in Korean stock markets. While in emerging markets, Kang et al. (2017) look into the connection between FII ownership and stock return volatility. One area of interest for investigation is the volatility of FPI flows in the IT industry. The volatility of FPI flows in the IT sector is a subject of research interest. While FPI can provide much-needed capital and expertise to IT companies, it also exposes them to market fluctuations and external shocks. Studies explore strategies for managing FPI-related risks and mitigating the impact of sudden capital outflows (Gompers and Metrick, 2001; Li et al., 2020).

Bhattacharya and Arora (2021) and Lou et al. (2020), explore the impact of FII trading on market volatility and efficiency. Bhattacharya and Arora (2021) investigate FII trading strategies and their effects on Indian stock market volatility, while Lou et al. (2020) examine how FII trading affects return predictability and market efficiency in China.

Literature discusses the role of regulatory policies in shaping FPI trends in the IT sector. Changes in government regulations, tax policies, and trade agreements can influence investor sentiment and FPI flows into IT companies, impacting their competitiveness and market performance (Kang et al., 2019; Subramanian and Prasad, 2020).

Furthermore, studies by Ghosh and Sengupta (2017) and Kim and Singal (2000) delve into the impact of FII flows on sectoral returns and market contagion, respectively. Ghosh and Sengupta (2017) analyze the sectoral allocation strategies of FIIs and their impact on sectoral returns in India, while Kim and Singal (2000) investigate the transmission of volatility across markets due to FII flows.

Researchers have extensively examined the impact of FIIs on sectoral performance, finding that these investments significantly influence various sectors within an economy (Borensztein et al., 2002; Henry, 2000). Moreover, studies suggest that changes in expected volatility prompt adjustments in FII behavior, potentially leading to shifts in capital allocation across sectors and markets (Bollerslev et al., 1992; Phylaktis and Ravazzolo, 2005). The interplay between interest rates and exchange rates is well-documented, with central bank policies impacting FII inflows and outflows, thereby affecting exchange rate dynamics (Engel and West, 2005; Fratzscher, 2012). Similarly, inflation expectations influence FII decisions and exchange rate movements, particularly in economies facing high inflation rates (Mishkin, 2011; Neely and

Rapach, 2011). Econometric techniques are commonly employed to analyze the causal relationships between these variables, revealing nuanced interactions (Johansen, 1991; Sims, 1980). Furthermore, research highlights the differential impact of FIIs on various sectors, considering industry-specific regulations, technological advancements, and global market trends (Borensztein et al., 2002; Henry, 2000). Overall, the literature underscores the complex nature of these economic and financial variables and provides valuable insights into the behavior of FIIs and their implications for sectoral dynamics and macroeconomic stability.

FPI in the IT sector is also linked to innovation dynamics. Research suggests that FPI can stimulate technological advancement by providing funding for research and development, fostering collaboration with global partners, and facilitating the adoption of new technologies (Chen et al., 2018; Lin and Chen, 2021).

Despite the progress in understanding the relationship between FII, sectoral allocation, and volatility, several gaps and controversies remain in the literature. Firstly, there is a lack of consensus on the exact mechanisms through which FII inflows affect market volatility. While some studies suggest a stabilizing effect of FIIs on markets, others point to increased volatility due to herding behavior and speculative activities.

Moreover, there is a dearth of research examining the differential impact of FII sectoral allocation on market dynamics beyond the stock market. Future studies could explore the effects of FII inflows on volatility across various asset classes, including bonds, currencies, and commodities.

Additionally, research often focuses on the stock market, leaving gaps in understanding FII impacts across other asset classes. Future studies could explore effects on bonds, currencies, and commodities.

The synthesis of literature underscores the complex interplay between FII, sectoral allocation, volatility, and financial markets. While FIIs play a crucial role in capital formation and market liquidity, their activities can also exacerbate volatility, posing challenges for market participants and regulators alike. Understanding the underlying drivers of FII behavior and their implications for market stability is essential for informed decision-making and policy formulation.

This literature review provides valuable insights into the relationship between FII, sectoral allocation, volatility, and financial markets, with a specific focus on the stock market. Despite significant progress in understanding these dynamics, further research is warranted to address existing gaps and controversies, informing policymakers and investors about the implications of FII inflows on market stability and efficiency.

OBJECTIVE OF THE STUDY

Considering Nifty IT returns over an eleven-year period, this study aims to investigate and explore the inter-relationships and association both short- and long-term between flows of foreign portfolio investment in the Indian IT sector and the returns of IT stocks on the Indian equity market.

METHODOLOGY & DATA ANALYSIS

For a period of eleven years, from April 2012 to March 2023, the current analysis makes use of the weekly time series data of the FPI in the IT sector and the Sectoral index of the IT sector from the NSE, or Nifty IT along with the data of VIX, Interest rate, CPI, and Exchange rate USD-INR.

The official NSDL website is where the fortnightly time series statistics of FPI in the IT sector are gathered, and the National Stock Exchange website is where the Nifty-IT data data is obtained.

This paper uses the Granger causality test to achieve the study's declared objective. For the FPI-IT and Nifty IT series, the sequence of assimilation is first tested using the Augmented Dickey-Fuller (ADF) test. The Granger causality test is another tool used in the study to assess if one variable's prospective expectedness influences another. Typically, a Granger causality test is used.

Variables are cointegrated with each other if their linear combination is stationary in place of two series stationarity. The cointegration technique can be used to determine whether there is a long-term link between the variables under investigation if the selected data are assimilated in a comparable sequence. Any new information entering them results in a lead-lag association lasting a shorter amount of time. The Johansen cointegration test necessitates choosing the right lag length for the analysis. A problem with

either over- or under-parameterization arises when an incongruous lag length is chosen. The aim of the same is to verify that the residuals of the variables do not exhibit autocorrelation. Using the Akaike information criterion (AIC), the right lag duration is determined.

The maximum Eigen value and trace test statistics are used to assess if cointegration—which denotes the presence of a long-term link between variables—exists among the variables. A linear combination between the variables is suggested by a higher Eigen statistic score. Only in cases where the Eigen values exhibit expressive diversity from zero does the co-integrating relationship between the variables become evident. In order to confirm that there is a cointegrating vector among the series, it is then advised to look at the trace statistic.

Vector Auto Regression (VAR) is estimated using the various nominated lags through the Akaike information criterion following the Johansen cointegration technique. The VAR model is used to determine whether the model maintains normalcy, whether there is no subsequent association between any of the model's chosen series, and whether the long-term relationship has been reaffirmed.

Table 1: Descriptive Statistics

STATISTIC	FPI- IT	Nifty-IT
MEAN	-482.3902	15502.14
ST. DEV.	2103.102	8404.672
SKEWNESS	-1.994483	1.144131
KURTOSIS	11.65444	3.160885
JARQUE-BERA	2171.902	125.8502
SUM	-276892.0	8898226.
SUM SQ. DEV	2.53E+09	4.05E+10
OBSERVATIONS	574	574

Table 1 displays statistical instants of the sectoral index of the IT sector, or Nifty IT Index, and the weekly time series data of the FPI in the IT sector. The analysis discovered that Nifty IT had greater mean values than FPIs in the IT sector for the whole study period (April 2012 to March 2023). The values of skewness and kurtosis provided insights into the underlying distribution of both series. The variables for the study period had positive kurtosis and negative skewness, according to the results. Skewness and kurtosis show the distribution's similar shape and contour. Given that both variables appear to have high Jarque-Bera values, it is likely that their respective series deviate greatly from the normal distribution.

Table 2: Augmented Dickey Fuller Test(ADF)

	t-statistics	Probability
FPI-IT at Level	-9.050281	0.0000
Nifty-IT Returns at Level	-23.65695	0.0000

The Nifty IT return series and the FPI in the IT sector series are stationary at level, according to the results of the Augmented Dickey Fuller Test, which are shown in Table 2.

Table 3: Granger Causality Test

Null Hypothesis	F-statistics	Probability
Nifty-IT does not granger cause FPI-IT	33.1127	3.E-14
FPI-IT does not granger cause Nifty-IT	4.65325	0.0099

Furthermore, the Granger causality test is used to examine the lead-lag relationship between FPI in the IT industry and Nifty-IT returns. The study unequivocally refutes both the hypothesis that Nifty-IT does not cause FPI-IT and vice versa. It has been found that Nifty IT granger causes FPI flows in the IT sector while analyzing the causal relationship between Nifty-IT and FPI movement in the IT sector. This demonstrates that Nifty IT values are useful in predicting the short-term movements of FPI in the industry and FPI flows in IT sector are also affecting the sector returns.

Table 4: Johansen Cointegration Test

VARIABLES		Number of Hypothesised Equations	Maximum EIGEN Value	Critical Value at 0.05 Level	TRACE Statistic	Critical Value at 0.05 Level	Probability
FPI- IT	Nifty-IT	None	125.6910	40.07757	199.4651	95.75366	0.000

FPI- IT	Nifty-IT	Atmost 1	41.23703	33.87687	73.77415	69.81889	0.0055

The Johansen Cointegration test results, which show that there is no cointegrating vector between FII in the IT industry and Nifty-IT, are shown in Table 4. The fundamental premise of the test is denied since the Eigen value and Trace values for both series are greater than their tabular values at the 5% level of significance. Rejecting the null hypothesis shows that there is at least one co-integrating vector between FPI in the IT sector and Nifty-IT prices in the study, and that there is a long-term relationship between FPI in the IT sector and Nifty-IT. This suggests that there are some long-term informational similarities between Nifty-IT and FPI in the IT sector.

Table 5: Var Estimates (Dependent Variable NIFTY-IT)

	Coefficient	Standard Error	t-statistics
FPI- IT(-1)	0.049967	0.01726	2.89425
FPI- IT(-2)	-0.024797	0.01676	-1.47912
Nifty-IT(-1)	0.993266	0.04306	23.0690
Nifty-IT(-2)	0.008134	0.04335	0.18765
C	30.71545	47.7036	0.64388
R-Squared	0.996096		
Adjusted R-Squared	0.996068		

Table 6: Var Estimates (Dependent Variable FPI-IT)

	Coefficient	Standard Error	t-statistics
FPI- IT(-1)	0.780166	0.04109	18.9886
FPI- IT(-2)	-0.128612	0.03990	-3.22362
Nifty-IT(-1)	0.641866	0.10247	6.26411
Nifty-IT(-2)	-0.680157	0.10315	-6.59356
C	399.6920	113.527	3.52068
R-Squared	0.648037		
Adjusted R-Squared	0.645554		

Prior to running the VAR test, it is verified that both sample values are normal and the variable series satisfies the stability requirement. The proper lag length, which is determined to be two in the study, is selected using the Akaike information criterion (AIC). It was discovered that there is no serial correlation in any of the variable series during the validation of the VAR Residual Sequential Connexion LM Tests. Therefore, based on the findings of the Johansson Cointegration Test, it can be concluded that the study's VAR model supports the fundamental condition for variables time series, which shows the long-term association between FPI in the auto sector and Nifty-IT. Lag values in the VAR equation are obtained for error correction, which modifies the connection in the short run while maintaining the long run. The VAR framework results displayed in Tables 5 and 6 demonstrate that FIIs in the IT industry and the Nifty IT Index itself both have a significant influence in the movement of the Nifty IT Index. According to the current analysis, the sector's FPIs have a major role in explaining the current Nifty IT values in the Indian stock market. This indicates that when NIFTY IT is the dependent variable over a longer period of time, the VAR model fits in suitably and has a strong explanatory ability to describe the Nifty IT values.

CONCLUSION & DISCUSSION

The current study looked at how returns in the Indian IT industry were affected by foreign Portfolio investment in the sector. In addition to the influence, the relationship between FPI flows in the IT industry and Nifty IT returns was also ascertained by using the Granger Causality and Johansen co-integration tests to analyze the fortnightly time series data over an eleven-year period, starting from the April 2012 and ending in the last day of month March of 2023. The study's two variables show tighter co-movements and are strongly integrated. The IT sector's returns and FPI movements appear to be moderately connected, according to results. Throughout the course of the study period, the FPI and IT sector returns appear to follow erratic movements, according to the Jarque-Bera statistic and the Kurtosis values of both variables. The Nifty IT returns and FII flows in the IT sector are deemed stationary by the Augmented Dickey Fuller Test. A bidirectional Granger Causality from Nifty-IT to FII-IT movements and FII-IT movements to Nifty-IT is identified by the Granger Causality test that was applied to the data. This test provides reassurance on the short-term correlation

between FPI movements and IT sector returns. The long-term correlation between FPI movements in the IT sector and returns was confirmed and proved by the results of Johansen's Co-integration Test.

The results of the Vector Auto regression test indicate that the historical Nifty IT values and the values of the FPI movements in the IT sector considerably aid researchers in forecasting the Nifty IT value. This study found that foreign Portfolio investment (FPI) flows into the Indian IT sector are largely determined by the performance and returns of the IT sector. This suggests that bolstering the IT sector will draw additional FPI flows into the Indian IT industry and keep FPI from leaving or splitting off from the Indian IT sector. This would further propel the IT sector toward sustained expansion, which will further help the Indian economy overall.

The digital transformation and outsourcing trends have demonstrated enormous development potential for the IT sector, especially in nations like India.IT companies are appealing to international investors because they frequently have strong business models and steady earnings. The industry is kept active and forward-thinking by constant innovation and the adoption of new technologies. In the IT sector, FPI has a major impact on the performance of the Nifty IT index. To understand this link, a variety of elements must be analyzed, including the status of the global economy, industry-specific advancements, and investor attitude. The strong development prospects of the information technology industry persist in drawing substantial foreign investment, which underpins the Nifty IT index's good returns.

Higher gains in the Nifty IT index are typically the result of greater FPI inflows since foreign investors inject significant capital, which raises demand and stock prices. Better performance is generally a result of positive attitude among foreign investors, which often reflects confidence in the sector's growth potential. The demand for IT services around the world affects the index businesses' income and profitability. Exchange rate changes can affect profits since many IT companies get a sizable amount of their income in foreign currencies. The index may be impacted by modifications to laws governing IT operations and foreign investment. The success of the IT sector can be greatly impacted by foreign portfolio investment (FPI), which is why there is a close relationship between FPI inflows and the returns of the Nifty IT index.

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The Effect of Working Capital Optimization of TATA Steel on Corporate Financial Health

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ABSTRACT

The research paper examines how effectively managing working capital impacts the financial well-being of TATA Steel, a leading global steel manufacturing company. Through ratio analysis and correlation techniques, the study assesses how different aspects of The management of working capital affects the overall financial stability and performance of the company. The analysis focuses on important financial ratios such as the current ratio, quick ratio, inventory turnover, and accounts receivable turnover to provide a thorough understanding of the company's liquidity, efficiency, and profitability. The goal is to clarify the link between efficient working capital management and corporate financial health, providing valuable insights for stakeholders and financial managers looking to optimize working capital for improved financial performance.

KEYWORDS: *Working capital, Profitability, Financial health.*

INTRODUCTION

In the rapid-paced world of business today, it's essential for agencies to effectively control their working capital to maintain monetary health and operational efficiency. Working capital, that is the difference between an enterprise's current assets and current liabilities, performs a vital role in ensuring clean commercial enterprise operations and monetary stability. By optimizing operating capital, an organization can enhance its liquidity, reduce financial danger, and enhance profitability.

TATA Steel, a large participant in the global steel industry, offers an exciting case for studying the effect of working capital management on a company's monetary fitness. Due to the capital-extensive nature of this industry, powerful management of working capital elements together with stock, debtors, and money owed payable is vital for keeping operations and accomplishing financial success. This research paper aims to investigate the effect of working capital efficiency on the financial health of TATA Steel. The study will use ratio analysis and correlation techniques to understand the link between working capital and different indicators of financial performance. Key financial ratios such as the current ratio, quick ratio, stock turnover ratio, and debtors turnover ratio will be examined to assess the company's liquidity, efficiency, and profitability.

Working capital is the difference between current assets and current liabilities and is crucial to the day-to-day operations of a business. In today's fast-changing business environment, effective working capital management is crucial for a company's financial well-being. It represents the funds required for day-to-day operations and is vital for maintaining operational liquidity, meeting short-term obligations, and supporting business expansion. Optimizing working capital is a strategic priority for companies across various industries, as it directly impacts important financial metrics and performance indicators.

As global markets evolve and competitive pressures intensify, the effective utilization of working capital

becomes increasingly paramount for businesses seeking to enhance profitability, mitigate risks, and create long-term shareholder value. The significance of working capital optimization is underscored by its profound impact on liquidity management, cash flow dynamics, and overall financial resilience. Consequently, understanding the intricate relationship between the management of working capital and corporate financial health is crucial for managers, investors, and stakeholders alike.. The research will address the following questions:

How does optimizing working capital components affect TATA Steel's liquidity and financial stability?

How does managing working capital affect a company's profitability?

How can TATA Steel enhance its working capital management practices to improve overall financial health?

OBJECTIVES OF THE STUDY

- To assess how working capital optimization affects TATA Steel's liquidity.
- To analyze the relationship between working capital efficiency and operational performance.
- To study the effect of working capital components on TATA Steel's profitability.
- To provide strategic recommendations for enhancing TATA Steel's working capital management practices.

Company under study

TATA Steel is one of the world's largest manufacturers and suppliers of the global conglomerate TATA Group.. After its incorporation in 1907, the firm has grown to become a major worldwide manufacturer of steel, operating in 26 countries, including Europe, Southeast Asia, and India, and having a presence in over 50 nations. TATA Steel is well known for its dedication to operational excellence, sustainability, and innovation.

Among the earliest steel mills in Asia, TATA Steel's flagship factory in Jamshedpur, India, is one of the most advanced and efficient integrated steel plants in the world.

Hot-rolled, cold-rolled, coated steel, rebar, wire rods, tubes, bearings, and specialty steels designed for use in the automotive, construction, engineering, and consumer goods sectors are just a few of the many steel products that the firm produces. Among the well-known brands within the TATA Steel umbrella that are renowned for their dependability and quality are Tata Steelium, Tata Shaktee, Tata Tiscon, Tata Pipes, and Tata Structura. In the areas where it works, the corporation actively participates in social responsibility and community development projects, supporting the advancement of infrastructure, healthcare, and education.

TATA Steel is the biggest steel manufacturer in India because of its integrated steel factories, mines, and service facilities. Major components of the company's global operations are handled by TATA Steel Europe, formerly known as Corus, which has important production sites in the UK and the Netherlands. The company's activities in Singapore, Thailand, and Vietnam, which meet the region's increasing need for steel, demonstrate its presence in Southeast Asia. The strategic vision and operational excellence of TATA Steel are spearheaded by a group of seasoned individuals. The organisation upholds robust corporate governance protocols, guaranteeing openness, responsibility, and moral business behaviour. The profile of TATA Steel is defined by its long history, wide range of products, dedication to sustainability, impressive financial results, and global footprint. The company continues to evolve, focusing on innovation and sustainable growth to maintain its leadership in the steel industry.

LITERATURE REVIEW

Mathuva (2010): This research focused on Kenyan firms and discovered that different elements of WCM (such as stock management, debtors, and creditors) have varying effects on profitability. It highlighted that reducing the collection period of debtors and increasing the payment period of creditors can enhance profitability.

Niresh (2012): The study on Sri Lankan manufacturing firms revealed that efficient WCM significantly contributes to better financial performance. It suggested that firms with shorter cash conversion cycles tend to perform better financially.

Aktas, Croci, and Petmezas (2015): This study examined whether WCM is value-enhancing and found that efficient WCM positively impacts firm performance and investment decisions. They demonstrated that firms with optimal WCM levels tend to invest more efficiently and generate better financial outcomes.

Uguru, Chukwu, and Elom (2018): The research on Nigerian brewery firms identified a positive relationship between efficient WCM and profitability. It showed that firms with better inventory and receivables management practices enjoy higher profitability.

Aftab Khan and Saeed Khan (2019): This study examined the influence of WCM on the profitability of Indian firms. It concluded that effective management of inventory and receivables significantly enhances profitability. The study also pointed out that companies should make efforts to improve the cash conversion ratio (CCC) to improve financial results.

Wambia and Jagongo (2020): Their research on Kenyan insurance companies found that effective WCM practices, especially those that optimize the cash conversion cycle, significantly improve financial performance. They emphasized the role of prompt collection of receivables and efficient inventory management

Patel and Sharma (2021): This research highlighted that Indian pharmaceutical companies benefit from efficient WCM by maintaining optimal inventory levels and managing receivables effectively. A shorter CCC was associated with better financial performance in the sector.

Kumar and Singh (2022): The study revealed that FMCG companies in India that effectively manage their working capital components, particularly through efficient inventory management and receivables collection, experience enhanced profitability and liquidity.

Sharma and Gupta (2023): Sharma and Gupta found that the IT sector in India benefits from reduced CCC. Firms that manage their accounts receivable and inventory efficiently while optimizing their payables report higher profitability.

Srinivasan and Rao (2023) in their study focused on the textile industry, indicating that firms with lower inventory days and better receivables management are more profitable. It stressed the importance of maintaining a balance in working capital to avoid liquidity issues.

These studies collectively highlight that effective WCM is a critical factor in improving a firm's financial health. They demonstrate that optimizing elements of working capital—such as stock, debtors, and creditors—can lead to improved profitability, better investment decisions, and enhanced credit ratings, all of which contribute to the overall financial health of a firm.

METHODOLOGY

The study uses a quantitative methodology to investigate how working capital optimisation affects TATA Steel's overall financial stability. The study analyses the link between working capital components and financial performance metrics using correlation and ratio analysis approaches. The research depends on secondary data obtained from TATA Steel's financial statements, annual reports, and pertinent trade journals. A five-year timeframe of data collection (2019–2023) will be used to guarantee a thorough examination.

In order to assess working capital management and financial health, key financial ratios such as the Current Ratio (CR), Quick Ratio (QR), Debt-Debt-Equity ratio (DER), Inventory Turnover Ratio (ITR), Debtors Turnover Ratio (DTR), Asset Turnover Ratio (ATR), Return on Assets (ROA), Return on Capital employed (ROCE), and EBITDA/Turnover will be calculated from the data collected. Working capital ratios and financial health indicators will be compared using the Pearson correlation coefficient. The direction and intensity of the correlations will be established with the use of this statistical technique.

DATA ANALYSIS

Table -1 depicts the Key financial ratios of TATA Steel. Working Capital Ratios have been calculated through CR, QR, DER, ITR, DTR, and ATR. ROA, ROCE, and EBITDA/Turnover are the Financial Health Indicators.

Table 1

RATIOS	2018-19	2019-20	2020-21	2021-22	2022-23
Liquidity and Solvency Ratios					
CR	0.73	0.81	0.61	0.62	0.86
QR	0.25	0.38	0.39	0.22	0.33
DER	0.42	0.49	0.24	0.3	0.3
Turnover Ratios/Activity Ratios					
ITR	6.1	5.2	6.4	7.8	6.2
DTR	45.6	52.1	26.1	40.6	40.6
ATR	72.19	60.26	60.52	72.3	68.77
Profitability Ratios					
ROA	7.66	4.48	8.24	14.87	6.6
ROCE	16.26	9.54	14.38	29.59	12.78
EBITDA/Turnover	29.38	24.98	33.84	39.88	21.84

Source: Compiled by author

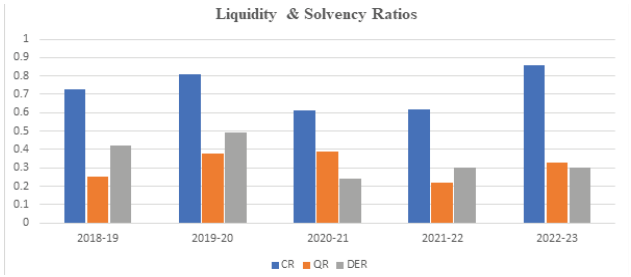

Figure 1

Source: Compiled by author

The current ratio measures the company's ability to use its short-term assets to pay its short-term liabilities. A ratio greater than 1 indicates that the business is having more current assets than short-term liabilities. As can be seen in Figure -1, TATA Steel only has 73% of the current assets required to pay its current liabilities in 2018–19, with a current ratio of 0.73. This raises the possibility of liquidity problems.

Over the five years, the current ratio fluctuates but generally improves, reaching 0.86 in the last year, indicating better liquidity compared to earlier years. The company's quick ratio ranges from 0.22 to 0.39 over the five years. A QR of less than one shows that it would be difficult for the business to meet its short-term obligations if it doesn't sell goods, which might lead to liquidity issues. Even if the quick ratio gradually increases over time, it always stays below 1, demonstrating a dependence on inventories to cover short-term needs. The debt-to-equity ratio throughout the five years varies from 0.24 to 0.49. A smaller percentage implies that the firm depends more on equity funding, which lowers financial risk and improves solvency.

In 2018-19, the ratio is 0.42, showing that TATA Steel's debt level is 42% of its equity. This suggests moderate reliance on debt financing. The ratio decreases in the subsequent years, reaching its lowest point of 0.24 in

the third year before slightly increasing again. This indicates a decrease in reliance on debt financing, which could improve the company's solvency position.

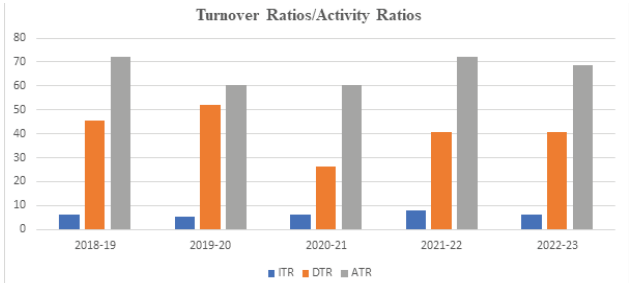

Figure 2

Source: Compiled by author

TATA Steel's inventory management efficiency fluctuates over the five years, with a notable peak in the 2021-22. The overall trend shows generally good inventory management. The efficiency of receivables collection is high initially, peaks in 2019-20, then drops significantly in 2020-21 before stabilizing at a good level in the last two years. Utilising assets to produce revenues is very efficient in 2018-19 and 2021-22, with a dip in 2019-20 and 2020-21. The overall trend shows effective asset utilization, with some variability.

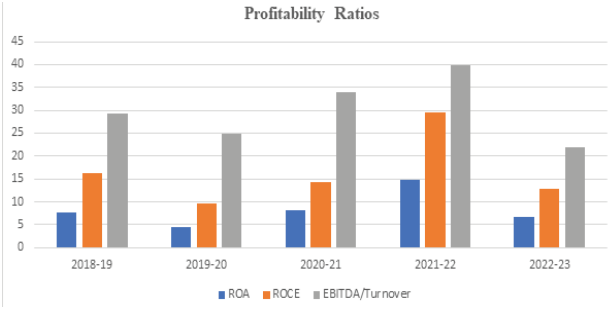

Figure 3

Source: Compiled by author

These profitability ratios from Figure -3 suggest that TATA Steel has experienced periods of strong financial performance, particularly in 2020-21 and 2021-22, indicating efficient asset and capital utilization and high operating profitability. However, there are also periods of decline, which may point to challenges in maintaining consistent profitability and operational efficiency.

Table 2. Correlations

Ratios			ROA	ROCE	EBITDA/ Turnover
CR	Pearson correlation	1	-.712	-.647	-.944*
	Sig. (2-tailed)		.177	.238	.016
	N	5	5	5	5
ROA	Pearson correlation	-.712	1	.989**	.878
	Sig. (2-tailed)	.177		.001	.050
	N	5	5	5	5
ROCE	Pearson correlation	-.647	.989**	1	.846
	Sig. (2-tailed)	.238	.001		.071
	N0	5	5	5	5
EBITDA/ Turnover	Pearson correlation	-.944*	.878	.846	1
	Sig. (2-tailed)	.016	.050	.071	
	N	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Compiled by author

Table -2 depicts the correlation matrix. Given that the p-value of 0.177 is greater than the significance level of 0.05, it may be concluded that there is no statistically significant link between return on assets and current assets. There is no significant link between current assets and return on capital employed, as evidenced by the correlation between the current ratio and return on capital employed, which has a p-value of.238—more than the significance level of 0.05. The strong negative link between current assets and EBITDA/turnover, as indicated by the Pearson correlation coefficient of -0.944, suggests that TATA Steel's operating profitability tends to decline considerably when its current assets grow. There is statistical significance in this link, as indicated by the p-value of 0.016.

CONCLUSION

This study looked at how working capital optimization affects the corporate financial health of TATA Steel over five years, utilizing ratio analysis and correlation. The results offer a thorough understanding of the business's liquidity, financial viability, and operational efficiency. The findings suggest that while TATA Steel is improving its financial health, particularly in reducing reliance on debt financing, it continues to face challenges in liquidity management. The strong negative correlation between current assets and key profitability measures indicates potential inefficiencies in working capital management that need to be addressed. To enhance its financial health further, the company should focus on optimizing its liquidity strategies to ensure better short-term financial stability without over-relying on inventory. Future research with a larger dataset is recommended to validate these findings and provide deeper insights into the financial dynamics of the company.

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https://www.tatasteel.com/investors/integrated-reportannual-report/

Adoption of Online Banking by Customers: A Sustainable Development of the Banking Sector

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ABSTRACT

Technological developments in electronic banking have given rise to innovative approaches to handling routine financial transactions, especially through the route for internet banking. Services for online banking have gained traction quickly over the world; at the summit five financial countries, More than 50% of contracts are now electronic. This has led towards the banking industry's steady expansion and development. In the online setting, the standard, using the technology attractiveness version (TAM), the acceptability of online banking can be tested. To test the model, 268 survey respondents were used.

KEYWORDS: *Online banking, Customer behaviour, Technology and adoption sustainable development.*

INTRODUCTION

There has been a significant movement in banking delivery channels toward self-service channels such as the internet since the mid-1990s.To put it another way, monetary products and services. In the last several years on the internet, Rapid adoption by banks has led to the situation. About 55% of private banking clients have a deal with their online bank that bank.

Device price among non-public Banking clients on-line banking become utilized by folks who have access to the internet providing services (Sheshunoff, 2000; Orr,2001). Despite the wide spread use of internet banking, when trouble arises. Robinson (2000) for instance discovered that 50% of internet users who have tried it had given up banking services will not become active users. One prominent and intriguing dissimilarity between Banks in the United States and Europe differ in that US banks are not required to be permitted to have a wide spread branch banking system full coverage; applicable to the whole nation (Pyunetal.,2002).

The purpose of this paper is to expand upon our knowing what drives people's decisions online Bank customers' openness.

Information system adoption studies consumer-centric perspective, which holds that people make purchases based on using the internet to access the banking industry's electronic direct banking service and hence more understanding of the variables that impact data.

Another objective of this paper is to evaluate the impact of the opinion of the client of online banking services on customer's adoption of online banking services i.e. how customer's perceived utility and perceived simplicity of usage may impact consumer acceptance of online financial offerings.

This paper also aims to analyze the impact of online banking services on sustainable development of banks.

LITERATURE REVIEW

Online Banking Acceptance

Banking publications, for example, have dedicated special issues to the subject of online banking's adoption during the last five years. There are two main drivers behind the growth and popularity of internet banking. To begin, providing online banking services results in significant savings for financial institutions. Once established, the conduit for internet banking is

shown to be the least expensive means of distributing banking goods. Secondly, many consumers found that going into a branch required too much time and effort. (Karjaluotoetal.,2003).

According to the research, the most common justifications for using online banking are the time and money savings and the convenience of not having to leave the house.

Several studies find that customers who bankonline represent the most lucrative and affluent clientele for financial institutions. So, it's clear that no bank can afford to dismiss the potential of the internet these days.

For example, Luxman(1999) predicts that the internet channel will become even more significant in the future, particularly in rural areas .

Customers might quickly identify difficulties in managing financial matters, such as paying bills,when they are unable to conduct banking transactions directly from their place of residence or place of business.

Technology Acceptance

There are several benefits to investing in an information system for businesses, including cost savings, increased productivity without a corresponding increase in overhead, and enhanced product or service quality (Lederer et al., 1998). Davis (1989), Venkatesh (1996), and Davis and Succi (1999) have all underlined the importance of user acceptance and enthusiasm for a new information system to its overall success in the market. Users' buy-in is crucial to the success of any information system, and without it, an organisation would only get limited returns (Davis,1993; Davis and Venkatesh, 1996). Users' openness to a new information system predicts how quickly and thoroughly they'll adopt it, both in terms of behavioural changes and investments of time and energy (Succi and Walter,1999).

The success of a system may be judged by how well it meets the demands of its users, which is apurely subjective metric. Like the success of an information system, the adoption of computers may sometimes be gauged by how often that system is used. the system is used has a direct bearing on how successful it is; ineffective systems are not used. It is, therefore, crucial to investigate why some individuals choose to utilise information systems while others choose notto (IS). Both system architects and programmers may benefit from this information (Mathieson,1991)

Perceived Utility and Usability (PU and PEOU, respectively) relate to attitude toward use, which in turn relates to intention, and finally to behaviour, according to the technology acceptance

Model

The "TAM" suggests that these two points of view are very crucial to the general public's positive attitude about computers.

Performance optimism in online banking refers to the expectation or belief that one's online banking experience will be smooth, efficient, and reliable. It encompasses various factors, including website responsiveness, transaction speed, security, and overall user experience. Here's how performance optimism manifests in online banking:

1. Website Speed: Users expect online banking platforms to load quickly and respond promptly to their commands. Slow loading times can lead to frustration and may even cause customers to abandon transactions.
2. Transaction Processing: Customers anticipate that transactions, whether they are fund transfers, bill payments, or account inquiries, will be processed swiftly without any delays or errors. Any hiccups in transaction processing can undermine trust in the platform.
3. Security Measures: While users value speed and efficiency, they also prioritize security. They anticipate robust security measures to be in location to shield their sensitive financial facts from unauthorized get right of entry to or fraudulent activities. A balance between performance and security is crucial.
4. User Interface: A well-designed and intuitive user interface contributes to performance optimism. Clear navigation, easy access to essential features, and minimal friction in completing tasks enhance the overall user experience and foster confidence in the platform.

5. Reliability: Consistency in performance is vital. Users want assurance that the online banking system will be available whenever they need it and that it will function reliably without frequent downtime or technical

Perceived Usefulness(PU) and Perceived Ease of Use (PEOU)

According to TAM, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are two key constructs in the Technology Acceptance Model (TAM), which is widely used in understanding users' acceptance and adoption of technology, including online banking platforms.

1. Perceived Usefulness (PU): PU refers to the volume to which a person believes that using a specific technology will enhance their job overall performance or make obligations less complicated to perform. In the context of online banking, PU reflects the user's perception of how beneficial the online banking platform is in facilitating financial transactions, managing accounts, and accessing banking services compared to traditional methods. Factors influencing PU in online banking may include efficiency, convenience, time savings, and access to a wider range of banking services.
2. Perceived Ease of Use (PEOU): PEOU refers to the diploma to which a user perceives that using a generation could be freed from attempt. It encompasses factors along with ease of getting to know, ease of navigation, and readability of instructions. within the context of on-line banking, PEOU displays the consumer's notion of how easy it's miles to interact with the online banking platform. elements influencing PEOU may additionally encompass intuitive consumer interface design, clean

H1: Customer adoption of online banking services is correlated with the perceived utility of the services.

H2: Customers' acceptance of online banking services and their perception of its ease of use are related.

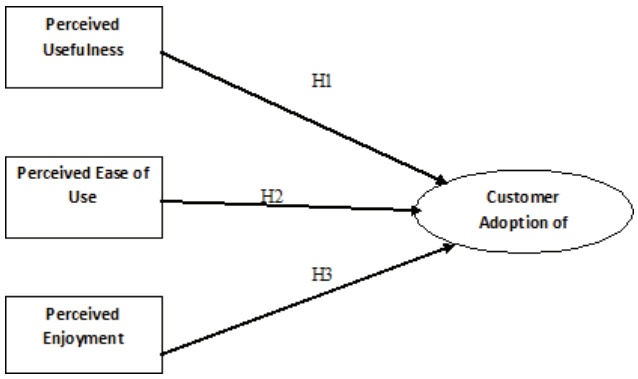
Perceived Enjoyment

The term "enjoyment" is used to describe how much of a positive experience it is to use a computer (Davis etal.,1992). Perceived pleasure (PE) is an inherent incentive to utilise information systems,in contrast to the PU, which may be considered as an extrinsic reason. Davis et al. (1992), Igbaria et al. (1995), and Teo et al. (1999) are just a few of the researchers that have shown that PE has a large impact on students' future plans to utilise computers. Igbariaet al. (1995) discovered that PE had a positive correlation with usage time but not with task frequency or volume.

Igbaria et al. (1994) and Moon and Kim (2001) are only two of the research that have looked at how people feel while they are engaged in a playful activity. Perceived enjoyment, as defined by Igbaria et al. (1994), is defined as the act of engaging in an activity for no apparent reward beyond the act itself. In other words, they discovered a positive correlation between system use and enjoyment. Perceived play fulness, according to Moon and Kim (2001), is made up of three components: focus, curiosity, and pleasure. They found that people's expectations about the Internet's fun nature affected their likelihood of actually using it. Given this, we hypothesise that PE has a role in how people feel about using online banks:

H3: There exists a relationship between perceived enjoyment and customer adoption of online banking services.

Conceptual Framework



RESEARCH METHODOLOGY

This research used a survey conducted in Delhi NCR in 2022 as its primary source of information. A total of 427 questionnaires were sent out, with a 63% response rate based on the 268 that were really returned. University classrooms, two barber shops, and a mid-sized retail

establishment all participated by having students fill out questionnaires. A representative sample was obtained with respect to key demographic variables (e.g. age, income, and education). Appendix shows a copy of the questionnaire that inquired about demographic information, attitudes about, and experiences with, internet banking. Likert scales with five-point responses ranging from "strongly agree" to "strongly disagree" were utilised for the survey's polling. There has been prior usage of this measure in studies pertaining to TAM (e.g., Igbaria et al., 1995; Teo et al., 1999). In addition, the response "not sure" was acceptable for the vast majority of queries. Experts in the banking industry were consulted while the questionnaire was being drafted and refined. Because of these insights, the questionnaire underwent some last-minute tweaks before being completed.

The provided knowledge was selected as the indication for success based on prior research on computer and information systems acceptability. The adoption of Internet banking was selected as the dependent variable in this study. This is consistent with previous research that has also used actual usage as its metric of interest (Legris etal.,2003).

DATA ANALYSIS

Reliability and Validity Analysis

Exploratory Factor Analysis

The coefficient alpha test, also known as Cronbac's alpha, was used to assess the items' reliability. The measure's result, which is fairly excellent, is displayed in Table 2 (above 0.70 is acceptable).

Further adequacy testing was carried out using the KMO statistic (Kaiser Meyer–Olkin). The outcomes are displayed in Table 1.

KMO and Bartlett's Test

Table 1

Measuring the Kaiser-Meyer-Olkin sample	.876
Approximately Chi-Square	2113.653
The Bartlett Test for Sphericity df	163
Sig.	.000

Confirmatory Factor Analysis

To conduct the validity test, CFA was conducted in AMOS v21. PEOUs, PUs, PEs, and CAs were the four components that were used in the CFA.

Convergent Validity

The dataset has demonstrated convergence, as seen by metrics of both CR and AVE surpassing acceptable bounds. According to Table 2, value of CRs ranges from 0.711 to 0.895, which is greater than the acceptable range of 0.7, and AVE is higher than the acceptable range of 0.5, with a range of 0.603 to 0.694.

Discriminant Validity

The square roots of mean variances explained by diagonally taken measures must be greater than those not diagonally taken (correlations across constructs). Table 2 indicates that the construct is discriminately valid since it shows greater values.

Discriminant Analysis

Table 2

	CR	AVE	MSV	PEOU	PU	PE	CA
PEOU	0.905	0.694	0.506	**0.703**			
PU	0.875	0.639	0.392	0.624***	**0.799**		
PE	0.732	0.603	0.406	0.640***	0.626***	**0.750**	
CA	0.687	0.713	0.517	0.667	0.712	0.744***	**0.798**

Overall Fit of Model

Completed measurements and structural model fit indices are available. With CMIN(∑2) = 237.046, df = 122, CMIN/df(∑2/df) = 1.847, $p<0.05$, and measurement indices of badness (RMR, RMESA, ECVI) and goodness of fit, key statistics in the framework show components framed in a simultaneous way. The following values are obtained using framework: GFIs=0.891, AGFIs=0.752, CFIs=0.835, RMRs=0.045, and RMSEAs= 0.055.

Path's Coefficients with Regard to Framework

Framework evaluation was carried out using AMOSv21. All of the hypotheses, with the exception of H2, whose p value is 0.039, which is less than p value of 0.05, are significant according to the measurements, with p less than 0.01. The accompanying table, which displays

the relationships between the variables, provides the specifics of each hypothesis.

Table 3 Hypothese Testing Results

Hypotheses Relationship	Path Estimate	SE	CR	P	Result
H1:CA<--- PEOU	0.440	0.052	8.412	***	Supported
H2:CA<--- PU	0.128	0.065	1.967	**	Supported
H3:CA<---PE	0.397	0.057	6.928	***	Supported

Notes: *p<0.10; **p<0.05; ***p<0.001

Source: Author' scalculation

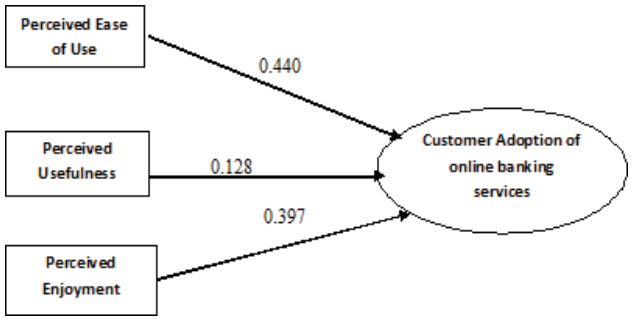


Figure 2: Result

CONCLUSION

The adoption of online banking by customers signifies a pivotal development in the sustainable evolution of the banking sector. This research underscores several key findings that illuminate the dynamics and implications of this transition.

Firstly, the increasing reliance on online banking services is driven by a confluence of factors including technological advancements, customer convenience, and the pursuit of operational efficiency by banks. The seamless integration of digital platforms has not only enhanced customer experience but also contributed to the broader agenda of financial inclusion by extending banking services to previously underserved populations.

Secondly, the sustainability of the banking sector is intricately linked to its ability to adapt to changing consumer behaviors and technological landscapes. Online banking facilitates a reduction in the environmental footprint of banking operations through diminished reliance on physical infrastructure and paper-based processes. This aligns with global sustainability goals and the banking sector's commitment to corporate social responsibility.

Moreover, the research highlights the importance of robust cybersecurity measures and customer education in fostering trust and confidence in online banking systems. As cyber threats become more sophisticated, banks must invest in advanced security protocols and continuously educate their customers on safe online banking practices to mitigate risks.

Finally, the findings suggest that the successful adoption of online banking requires a collaborative effort between banks, regulatory bodies, and technology providers. Regulatory frameworks need to evolve in tandem with technological advancements to ensure a secure and fair banking environment. Meanwhile, technology providers must innovate continually to offer scalable and user-friendly banking solutions.

In conclusion, the adoption of online banking is not merely a trend but a fundamental shift towards a more sustainable, efficient, and inclusive banking ecosystem. By embracing digital transformation, the banking sector can not only enhance its operational capabilities but also contribute to the broader socio-economic development goals. Future research should focus on longitudinal studies to assess the long-term impacts of online banking adoption and explore emerging technologies that could further revolutionize the sector.

We can determine that the suggested model is appropriate for investigation by using discriminant analysis, EFA, CFA, and reliability tests.

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A Study on Factors Influencing the Adoption of Electric Vehicles in the National Capital Region of Delhi

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ABSTRACT

India requires a significant boost in clean mobility to achieve its Sustainable Development Goals. By aiming to derive approximately 40% of its total electricity capacity from non-fossil fuel sources by 2030, it is crucial for India to adopt innovative solutions and technologies. The global push towards addressing environmental concerns has led to a strong promotion of Electric Vehicles (EVs) worldwide. This study focuses on exploring the factors that affect the willingness of consumers in Delhi NCR to purchase Electric Vehicles. Through empirical research utilizing SPSS statistical tools, the study identifies several influential factors including the perception of economic benefits, environmental concerns, social influence, self-image, and attitude which impact the purchasing intentions of Indian consumers regarding Electric Vehicles.

KEYWORDS: *Electric vehicles, Adoption, Sustainability, Purchase intentions, Environmental concerns, Financial incentives, Charging infrastructure.*

INTRODUCTION

Negative climatic changes, generally induced by major enterprises or MNCs (Multinational companies), especially in the last two decades, are largely responsible for the growing consumer preference for green technology. Because of this, companies are increasingly considering environmentally friendly systems and green technology as a key driver of strategic transformation. In order to stay ahead of the competition and ensure their long-term viability, several industries, including agriculture and the automotive sector, have begun to invest in green technology. One of the challenges that individuals' faced is scarcity, which is caused by limited resources and the fact that only a few countries have a monopoly on fossil fuels extraction and refining. Most of the energy supplies on a global scale come from fossil fuels, with the transportation sector using nearly 90% of them (Shukla, 2021). The adoption of green technology is at the forefront of this movement toward more sustainable energy sources, which has grown in response to growing worries about climate change, global warming, and energy independence.

La Jamais Contente was the first electric vehicle ever created. Its peak speed was 62 miles per hour when it was first created in 1890. Much progress has been achieved and interest in these vehicles has grown since then. Electric vehicles made occasional appearances on the market, particularly during periods of very unpredictable oil prices, but none of them were able to capture a sizable portion of the car industry's revenue. As a matter of fact, hardly nobody is talking about or buying EVs. In India, when Mahindra & Mahindra introduced the REVAi electric car to the market in 2010, the demand for conventional vehicles remains high and just a small number of units have been sold. In spite of this, EVs are currently being regarded as a key component of environmentally friendly technology (Kumar, A., et. al., 2018). Electric vehicles (EVs) have been the subject of research and development for 127 years, but despite this, they are still a niche product with a number of drawbacks that prevent them from competing in the mainstream automotive industry.

Vehicles devoid of internal combustion engines and hydrocarbon fuels are about to be adopted by the Indian

automobile industry. A combination of strong motivation, the desire for environmental protection, and reliance on fossil fuels is poised to cause a huge upheaval. The number of electric cars in India is increasing by 37.5% every year, according to the Society of Manufacturing Electric cars. By 2030, India hopes to have achieved its goal of being a fully electric nation. Nevertheless, the feasibility and accessibility of charging infrastructure in India poses a significant challenge to the expansion of electric cars as envisioned by SMEV. Considering the aforementioned, researching the economic feasibility of electric cars and the charging infrastructure needed for them is an enticing goal. Therefore, it is suggested that comprehensive research be conducted on the pioneering pilot project in India involving an application-based fleet operator and an oil company to deploy 100 electric vehicle units and establish charging infrastructure (Kambli, 2022). The electric motors or motors of an EV are propelled by electrical energy stored in rechargeable batteries. Electric vehicles' rapid and controlled acceleration is a result of the electric motor's quick torque. When compared to cars powered by internal combustion engines, electric vehicles (EVs) are seen as more environmentally friendly and efficient. When compared to cars powered by internal combustion engines, electric vehicles are approximately four times more efficient in utilizing the energy input to overcome road loads.

Without a doubt, one technological advancement that has the potential to mitigate environmental problems associated with rising greenhouse gas emissions is the electric car. Also, they think that unless there are additional incentives like tighter environmental regulations, higher petrol prices, and compensation, the adoption of EVs would be quite limited. Everyone knows that government rebates are crucial to getting people to buy electric vehicles. The underlying financial invalidity, or the inadequate allocation of things, is one reason why dispersal is predicted to expand so slowly. This is because EV growth and consumer adoption are negatively affected by some aspects connected to emission reduction and information appropriability (Chawla, et. al., 2023). Electric vehicle (EV) prices are skewed compared to ICEV costs due to market flaws, which discourages both manufacturers and consumers from buying a flood of AVs. The inability of electric vehicle production and usage to combat climate change is a result of external costs; the economic model of the nineteenth century implies that government initiatives should be employed to adapt to such a situation. It is believed that requirement mechanisms, like consumer incentives, would play a pivotal role in these legislative endeavors throughout the early stages of industrialization.

Faster Adoption and Manufacturing of Electric Vehicles (FAME) and the National Electric Mobility Mission Plan (NEMMP) are two of the many programs that the Indian government intends to launch to deal with the supply-side issues that have been preventing the widespread adoption of electric vehicles. NEMMP exemplifies the goal of the Indian government to hasten the adoption and production of electric vehicles (Bansal, et. al., 2021). Similarly, the FAME strategy aims to increase demand for electric vehicles by subsidizing their purchase and enhancing the availability of charging stations. In the initial round of FAME, "a total of 3,43 billion Indian rupees (INR) (~US$47 million)" was used as an incentive by the government to assist 2,78,000 electric vehicles in various forms. In April 2019, the second phase of FAME, with a considerable "budget of INR 100 billion (~US$1.36 billion)", was initiated by the Indian government. The objective is to establish a strong infrastructure for electric vehicles over the following three years. Electric vehicle sales in India remain low despite several initiatives aimed at boosting the supply of the vehicles. The number of electric automobiles sold in India in 2019 and 2020 was a meager 3,400. This demand trend indicates that the desire of Indian car consumers for EVs is crucial to the success of all government programs. For instance, extensive charging systems on roadways may increase demand for electric vehicles in India if buyers there are concerned about the shorter EV range, even though price reductions may not be enough to sway Indian consumers to buy EVs (Bhat, et. al., 2022).

REVIEW OF LITERATURE

As the world is concerned about environmental deterioration and the geopolitical impacts of the damage being caused. The automobile industry looked forward to embarking on the attainment of production and implementation of electric vehicles. In the purview of the same Shetty, D. K. et. al., (2020) aimed to identify that several environmental and

social-technical hurdles hindered the widespread use of electric vehicles in developing Asian economies. A survey-based study found that buying behavior was influenced by perceived monetary benefits, functional attributes, and EV knowledge. When designing electric vehicles, policymakers should have kept these things in mind. In the contrary, Tarei, P. K. et. al., (2021) stated that emissions from vehicles increased due to concerns about global warming and diminishing natural resources. However, obstacles remained. This study utilized hybrid MCDM methods to rank and prioritize EV hurdles in India. Based on the findings, the main elements that influenced adoption were performance, range, pricing, charging infrastructure, and customer awareness. Having this knowledge helped manage obstacles and develop strategies.

Also, Singh, V., et. al., (2021) addressed that India lagged behind other world leaders in electric vehicle adoption due to a lack of clear rules and plans, similar to the United States, China, Norway, and Germany. The report suggested that in order to support the new industry, there should have been increased collaboration between the government and corporations, as well as additional funding for research. To support the above statement, Patyal, V. S., et. al., (2021) examined roadblocks that prevent EVs from becoming widely used in India that have been identified through a literature analysis and the endorsement of industry professionals. A list of thirteen such impediments has been compiled. To assist legislators in creating sustainable energy regulations and help EV producers simulate these obstacles, the ISM and MICMAC models were utilized. On the other hand, Dhar, S. et. al., (2017) analyzed ANSWER-MARKAL, a model of India's energy system, which was used to examine the role of EVs in the country. By 2050, electric vehicles had a significant market share, while electric four wheelers had a smaller one. In addition, the analysis showed that EV push policies led to a significant increase in the adoption of EVs but did not lead to a significant reduction in CO_2 emissions. Policy sequencing was deemed critical for attaining co-benefits, as the research emphasized the importance of policies that advanced EV technology and robust climate policies. Chhikara, R., et. al., (2021) also explored difficulties with infrastructure, high production costs, legislative backing, and government investment were the main reasons that pushed the mainstream adoption of battery electric vehicles in India. While Dua, R., et. al., (2021) emphasized that the Indian government considered adopting PEVs as a means to address climate change, energy insecurity, and air pollution.

Experts believe that India will fall short of its 30% PEV sales goal by 2030 due to high initial prices, a lack of regulations, and an inadequate charging infrastructure. In support, Ashok, B., et. al., (2022) highlighted that electric vehicles (EVs) were necessary in underdeveloped nations due to infrastructural problems and a lack of technical preparedness. To facilitate the transition to EVs, it suggested hybrid electric cars as an intermediate propulsion system. It emphasized the importance of overcoming obstacles and offering appropriate technologies for a successful implementation. Singh, V., et. al., (2020) reviewed 211 scholarly publications published between 2009 and 2019 to examine the factors that influenced consumer adoption of electric cars (EVs). Researchers categorized potential factors into demographic, situational, contextual, or psychological categories. Future studies could benefit from the findings. Although Kumar and Alok, (2020) conducted an integrated evaluation of 239 papers with the goal of integrating and synthesizing knowledge on electric cars. Variables were classified into five groups, attention was drawn to changes in certain regions, and researchers and policymakers were provided with advice on how to measure variables with long-term effects.

HYPOTHESES DEVELOPMENT AND RESEARCH MODEL

Based on the literature review, it can be concluded that the adoption of electric vehicles is influenced by various factors. The factors can be summarized in the form of a proposed research model in the figure 1 as shown below.

The present study attempts to test the following hypothesis:

1. There is a significant impact of perception of economic benefits on electric vehicle adoption.
2. There is a significant impact of environmental concern on adoption of electric vehicles.
3. There is a significant impact of social influence & self-image on adoption of electric vehicle.
4. There is a significant impact of price on electric vehicle adoption.

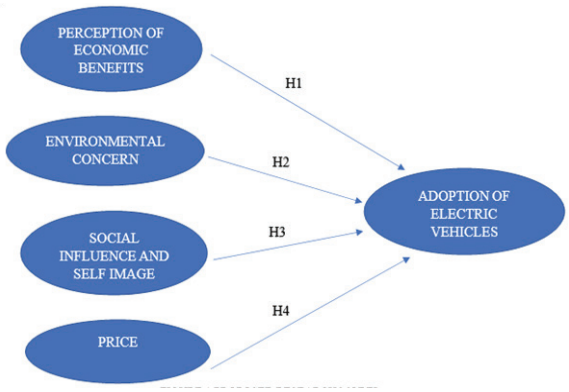

Figure 1 Proposed research model

RESEARCH OBJECTIVES

- To explore the factors influencing the Adoption of Electric Vehicles in Delhi NCR
- To confirm the factors influencing the Adoption of Electric Vehicles in Delhi NCR
- To determine the most influential factor affecting the adoption of electric vehicles.

RESEARCH DESIGN

The present study uses exploratory and descriptive research design. The sample size is 234 and the sampling area is Delhi NCR. The study uses convenience sampling technique for drawing the sample. A questionnaire was administered with a five-point Likert's scale, with strongly agree rated as 5 and strongly disagree rated as 1. The collected data was coded in SPSS and exploratory factor analysis was applied.

ANALYSIS

Out of 234 responses, 65.8% were aged between 21-30 years, and 28.2% were aged less than 20 years. 73.1% of the respondents were males while 26.9% were females. 57.7% of the respondents hold a bachelor's degree while about 35% hold a master's degree. About 74.4% of the respondents belong to the student category while about 17.5% are employees. About 97.4% of the respondents were aware about the concept of electric vehicles and about 73.9% have experienced electric vehicles before.

EXPLORATORY FACTOR ANALYSIS

To test the reliability of the data, the Cronbach's alpha was used. It was found out to be 0.964 which implies that the data is consistent and can be relied upon.

Table 1 Reliability Statistics

Cronbach's Alpha	N of Items
.964	28

Exploratory Factor Analysis was applied using SPSS. For this, the pool of 18 items were subjected to exploratory factor analysis. It reduced items to five factors. To check the sampling adequacy, Kaiser-Meyer-Olkin measure was used, whose value came out to be 0.944 which is above the acceptable limit.

Table 2 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.944
Approx. Chi-Square		2595.895
Bartlett's Test of Sphericity	df	153
	Sig.	.000

The items were clubbed into 5 components namely, Perception of Economic Benefits, Environmental Concerns, Social Influence & Self Image, Pricing and Electric Vehicle Adoption as shown in the Rotated Component Matrix as below:

Table 3 Rotated Component Matrix

	Component				
	1	2	3	4	5
SI2	.821				
SOI4	.786				
SI4	.768				
SI1	.761				
SI3	.750				
SOI2	.615				
EC2		.835			
EC3		.809			
EC4		.776			
EC1		.624			
EC5		.619			
PEB5			.759		
PEB4			.723		
PEB6			.597		
PEB7			.509		
P1				.775	
P2				.762	
EVA1					.988

CONFIRMATORY FACTOR ANALYSIS

All the hypotheses were tested using Structural Equation Modelling.

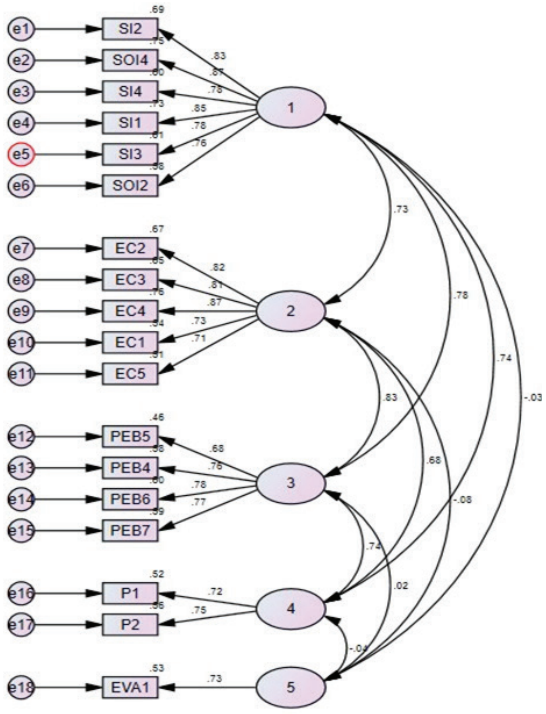

Figure 2 Model Fit

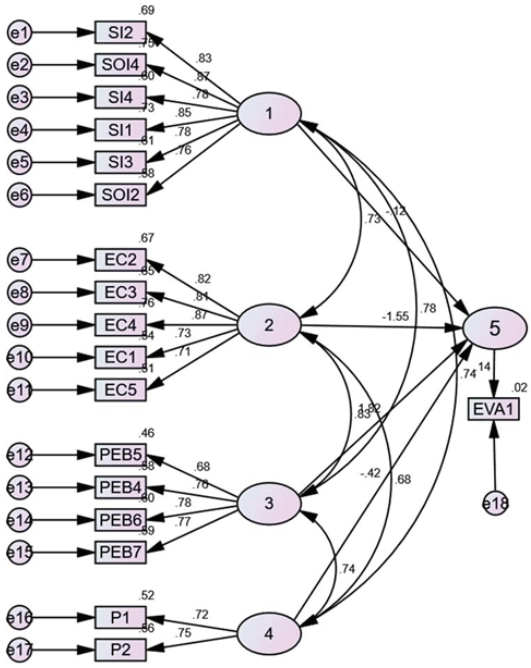

Figure 3 Structural Model

*SI- Self Image

*SOI- Social Influence

*EC- Environmental Concerns

*PEB- Perception of Economic Benefits

Table 4 Hypotheses Conclusion

HYPOTHESES	PATH	ESTIMATE	S.E.	C.R.	P	STATUS
HI	EVA – PEB	0.419	0.328	1.279	***	Accepted
H2	EVA–EC	-0.294	0.215	-1.369	0.171	Rejected
H3	EVA-					
SOI&SI	-0.021	0.172	-0.122	0.903	Rejected	
H4	EVA – P	-0.090	0.245	-0.367	0.714	Rejected

CONCLUSION

The primary goal of the research paper was to determine the factors influencing the adoption of electric vehicles in Delhi NCR. The present study is significant as electric vehicles are considered to be the 'future vehicles. Thus, determining the factors which influence the adoption of electric vehicles will help automobile companies and the government in the right decision-making.

The present study was set up with four independent variables namely Perception of Economic Benefits, Price, Environmental Concern, and Social Influence & Self Image. Considering these independent variables, four hypotheses were set for testing. The model for the study was found to be significant. The results of the hypotheses are mixed, which indicates that the Perception of Economic Benefits is the most significant factor influencing the adoption of Electric Vehicles for the sample under study.

The perception of economic benefits plays a crucial role in influencing the adoption of electric vehicles (EVs) in India for several reasons:

- Cost savings: EVs have lower operating costs compared to conventional internal combustion engine vehicles. Electric vehicles have fewer moving parts, require less maintenance, and have lower fuel costs since electricity is typically cheaper than gasoline or diesel. The perception of these cost savings motivates consumers to consider EVs as a financially advantageous option.
- Government incentives: The Indian government has implemented various financial incentives and subsidies to promote the adoption of electric vehicles. These incentives include tax benefits, purchase subsidies, and reduced registration fees for EVs. The perception of these incentives being beneficial in terms of lowering the overall cost of ownership encourages individuals to switch to electric vehicles.
- Fuel price stability: The price of conventional fuels, such as gasoline and diesel, is subject to fluctuations in global oil markets. In contrast, the cost of electricity used to charge EVs is generally more stable. The perception of fuel price stability with EVs provides a sense of financial security to consumers, as they can better predict and plan their transportation expenses.
- Potential for savings on operational expenses: In India, many individuals rely on public transportation or commercial vehicles for their daily commuting needs. Fleet operators and taxi services, for instance, can significantly benefit from the adoption of electric vehicles due to reduced fuel and maintenance costs. The perception of these potential operational savings creates a strong incentive for fleet operators to transition to EVs.
- Long-term cost considerations: Electric vehicles have a higher upfront cost compared to traditional vehicles, primarily due to the cost of batteries. However, as technology advances and economies of scale improve, the perception is that the upfront cost of EVs will decrease over time. The perception of long-term cost considerations is vital for potential EV buyers to evaluate the overall financial benefits of owning an electric vehicle.

By addressing these economic factors and promoting the perception of cost savings, the adoption of electric vehicles in India can be accelerated, leading to reduced emissions, improved air quality, and a sustainable transportation system.

FUTURE SCOPE OF THE STUDY

The research paper titled "Factors Examining the Purchase Intention of Consumers for Electric Vehicles in Delhi NCR" presents a rich understanding of the factors influencing consumer behaviour towards EV adoption in the region. Building on this foundation, here are some potential areas for future research:

- Consumer Decision-Making Process: Investigate the consumer decision-making process in detail, including the stages consumers go through from initial awareness to final purchase decision. Understanding the key influencers, information sources, and decision-making criteria can provide valuable insights for marketers and policymakers to design targeted interventions at each stage.
- Psychographic Factors: Explore the psychographic factors that influence consumers' purchase intention for EVs. This can involve studying consumers' values, beliefs, lifestyles, and personality traits to better understand the psychological drivers behind their decision-making. This research can help in segmenting consumers based on their psychographic profiles and developing tailored marketing strategies.
- Economic Analysis: Conduct an economic analysis to evaluate the long-term cost- effectiveness of EV adoption in Delhi NCR. Compare the total cost of ownership of EVs with conventional vehicles, considering factors such as purchase price, maintenance costs, fuel/charging costs, and potential resale value. This analysis can provide a comprehensive assessment of the economic benefits and incentives required to drive widespread EV adoption.
- Policy Evaluation: Assess the impact of existing policies and regulations on EV adoption in Delhi NCR. Evaluate the effectiveness of financial incentives, charging infrastructure initiatives, and other supportive measures implemented by the government. Identify gaps, barriers, and

opportunities for policy improvements to accelerate EV adoption in the region.

- Adoption in Different Market Segments: Study EV adoption patterns across different market segments, such as individual consumers, fleet operators, and commercial enterprises. Examine the factors that drive or hinder adoption within each segment and develop strategies to target these specific markets effectively.

- Technology Acceptance and Innovation: Investigate consumer attitudes towards emerging EV technologies, such as autonomous driving, vehicle-to-grid integration, and battery advancements. Assess the impact of these technological advancements on consumer purchase intention and identify potential barriers to their adoption.
- Sustainable Charging Infrastructure: Research the development of sustainable and renewable energy-based charging infrastructure for EVs in Delhi NCR. Explore the integration of solar power, grid optimization, and energy storage solutions to ensure a reliable and environmentally friendly charging ecosystem.
- Cross-Cultural Studies: Conduct cross-cultural studies to compare the factors influencing EV purchase intention between Delhi NCR and other regions/countries. Analyze the cultural, social, and economic differences that shape consumer behavior and provide insights for designing context-specific strategies.

By exploring these future research directions, scholars and stakeholders can gain a deeper understanding of the factors driving or inhibiting EV adoption in Delhi NCR. The findings can inform policy decisions, marketing strategies, and infrastructure development plans to foster a sustainable and widespread transition towards electric mobility.

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Examining the Effects of Consistent Psychological Counseling for Employees in the Workplace

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ABSTRACT

In recent years, the importance of mental health in the workplace has garnered increased attention as organizations recognize its profound impact on employee well-being and organizational success. The modern workplace presents numerous stress and anxiety areas that can adversely affect employees' psychological health, leading to decreased productivity, problem of absenteeism, and increased turnover rates. In view of this phenomenon, progressive organizations have begun to prioritize mental health initiatives to support their employees effectively.

This research paper examines the significant advantages of implementing regular psychological counseling programs for all employees in the workplace. By synthesizing existing literature and empirical studies, this paper aims to illustrate the positive impact of such initiatives on employee mental health, job satisfaction, productivity, and organizational outcomes. Through an exploration of various psychological counseling approaches and their applications in organizational settings, this paper advocates for the integration of counseling services as a fundamental component of employee support and development strategies. Ultimately, it emphasizes the importance of proactive mental health initiatives in fostering a conducive work environment for individual and organizational success.

KEYWORDS: *Employee well-being, Psychological counseling, Organization performance.*

BACKGROUND

In recent years, the importance of mental health in the workplace has garnered increased attention as organizations recognize its profound impact on employee well-being and organizational success. The modern workplace presents numerous stress and anxiety areas that can adversely affect employees' psychological health, leading to decreased productivity, problem of absenteeism, and increased turnover rates. In view of this phenomenon, progressive organizations have begun to prioritize mental health initiatives to support their employees effectively.

Statement of the Problem

Despite increase in awareness about stress, many workplaces still lack having a holistic approach to address the mental health issues of their employees. Employee assistance programs (EAPs) have been traditional approach to address this issue, but it is reactive measure, which may not adequately address underlying issues or promote long-term well-being. As a result, there is a imperative need to explore proactive interventions, such as regular psychological counseling programs, to nurture a supportive and stress free work environment.

Purpose of the Study

The primary purpose of this study is to examine the potential benefits of implementing regular psychological counseling programs for all employees in the workplace. By exploring existing literature and empirical evidence, this study seeks to elucidate the positive impact of such initiatives on employee well-

being, job satisfaction, productivity, and organizational outcomes. Furthermore, the study aims to identify best practices and strategies for the effective integration of counseling services into organizational frameworks.

Research methodology

The existing literature and empirical studies have been used in this paper to illustrate the positive impact of psychological on employee mental health, job satisfaction, productivity, and organizational outcomes. An exploration of various case studies has been done to assess psychological counseling approaches and their applications in organizational settings,

Research Questions

To guide this inquiry, the following research questions will be addressed:

1. What are the key benefits of implementing regular psychological counseling programs for all employees in the workplace?
2. How do psychological counseling interventions contribute to improving employee well-being, job satisfaction, and productivity?
3. What are the most effective strategies for integrating counseling services into organizational support and development frameworks?
4. What are the potential challenges and barriers to implementing regular psychological counseling programs in the workplace, and how can they be addressed?

THE IMPORTANCE OF EMPLOYEE MENTAL HEALTH

Understanding Psychological Well-being

Psychological well-being refers to an individual's emotional, cognitive, and social abilities, which indicate their mental health and ability to bounce back from challenges. It includes elements like positive feelings, a sense of direction, self-acceptance, independence, healthy relationships, and personal development. Workers who have strong psychological well-being are more capable of handling stress, adjusting to new situations, and nurturing positive connections with others, both at work and in their personal lives. Additionally, psychological well-being is closely linked to job satisfaction, productivity, and loyalty to the organization, playing a crucial role in determining overall success in the workplace.

Prevalence of Mental Health Issues in the Workplace

The prevalence of mental health issues in the workplace is a widespread problem that affects employees in all industries and positions. Common challenges include stress, anxiety, depression, burnout, and substance abuse. Factors such as job demands, deadlines, conflicts, insecurity, and work-life balance contribute to these issues. Unfortunately, the stigma surrounding mental illness often prevents employees from seeking help, leading to worsened symptoms and performance. Research shows that untreated mental health issues can result in absenteeism, presenteeism, reduced job satisfaction, and higher turnover rates, ultimately harming organizational productivity and profitability.

Impact on Organizational Performance

The mental well-being of employees significantly influences organizational performance. Employees facing mental health challenges are more likely to experience decreased productivity, impaired decision-making, reduced creativity, and lower job satisfaction. They are also at risk of absenteeism and presenteeism, which can lead to decreased team morale, missed deadlines, and compromised work quality, ultimately impacting the organization's success. On the other hand, organizations that prioritize employee mental health tend to have higher levels of engagement, retention, and productivity. By investing in mental health initiatives, organizations can create a supportive work environment that promotes employee resilience, creativity, and long-term success. Recognizing the importance of employee mental health is crucial for organizations looking to improve workplace productivity, engagement, and overall performance. By acknowledging the prevalence of mental health issues in the workplace and their effects, organizations can implement proactive strategies to support employee well-being and cultivate a positive work environment conducive to success.

ROLE OF PSYCHOLOGICAL COUNSELING IN EMPLOYEE SUPPORT

Definition and Scope

Psychological counseling in the workplace involves a range of therapeutic interventions designed to support employees' mental health and well-being. This can include individual counseling, group therapy, workshops, and psychoeducation sessions. The goal is to not only address clinical diagnoses but also to help employees develop coping skills, resilience, and overall psychological functioning. Counseling services may be offered by licensed mental health professionals, such as psychologists, counselors, or social workers, either within the organization or through external providers. The aim is to provide employees with a confidential and supportive environment where they can explore and address personal and work-related challenges, develop coping strategies, and improve their overall quality of life.

Types of Counseling Interventions

Psychological counseling interventions in the workplace can take various forms, tailored to meet the diverse needs of employees. Some common types of counseling interventions include:

- Individual Counseling: One-on-one sessions between an employee and a counselor or therapist, focusing on addressing personal concerns, stressors, and emotional issues. Individual counseling provides a confidential space for employees to explore their thoughts and feelings, set goals, and develop coping strategies.
- Group Therapy: Structured therapeutic sessions involving a small group of employees who share similar challenges or goals. Group therapy provides a supportive environment for participants to share experiences, receive feedback, and learn from one another under the guidance of a trained facilitator.
- Workshops and Skill-building Sessions: Interactive sessions focused on developing specific skills, such as stress management, communication, conflict resolution, and mindfulness. Workshops may include psychoeducational components to enhance participants' understanding of mental health issues and self-care practices.
- Crisis Intervention: Immediate support provided to employees experiencing acute psychological distress or crisis situations, such as trauma, bereavement, or critical incidents in the workplace. Crisis intervention aims to stabilize employees' emotions, ensure their safety, and connect them with appropriate resources for ongoing support.

Approachability and Suitability

Ensuring that psychological counseling services are accessible and acceptable is essential for effectively supporting employees' mental health. Accessibility involves removing barriers that may prevent employees from seeking or accessing counseling services, such as stigma, cost, time constraints, and logistical challenges. Organizations can promote accessibility by offering flexible scheduling options, providing confidential and convenient counseling spaces, and ensuring adequate coverage through employee assistance programs (EAPs) or health insurance plans. Additionally, raising awareness and reducing stigma surrounding mental health can encourage employees to seek support when needed. Acceptability refers to how well counseling services align with employees' preferences, values, and cultural backgrounds. To enhance acceptability, organizations should offer a diverse range of counseling modalities and approaches that cater to employees' diverse needs and preferences. This may include providing options for virtual counseling, offering services in multiple languages, and ensuring cultural competence among counselors and therapists. By prioritizing accessibility and acceptability, organizations can create a supportive environment where employees feel empowered to seek help and access the resources they need to thrive both personally and professionally.

BENEFITS OF REGULAR PSYCHOLOGICAL COUNSELING

Enhancing Employee Well-being

Regular psychological counseling is essential for improving employee well-being by offering a safe and confidential space for individuals to address personal and work-related challenges. Through counseling sessions, employees can learn coping mechanisms, enhance resilience, and gain a deeper understanding of their thoughts, emotions, and behaviors. By tackling

issues such as stress, anxiety, depression, and conflicts, counseling helps employees manage their emotions more effectively, leading to better mental health and an increased sense of well-being. As employees develop emotional stability and psychological strength, they are better equipped to handle work-related stress and maintain a healthy work-life balance, ultimately improving their overall quality of life.

Improving Contentment and Engagement

Studies have demonstrated that regular psychological counseling can enhance job satisfaction and engagement in employees. By tackling issues like work-related stress, interpersonal conflicts, and career dissatisfaction, counseling provides support and empowerment to employees. Through counseling, employees can clarify their career goals, improve communication skills, and better handle workplace challenges, ultimately leading to higher job satisfaction and engagement. Additionally, interventions focused on self-awareness and personal growth can help employees find purpose and satisfaction in their work, increasing motivation and commitment to organizational objectives.

Increasing Efficiency and Performance

Consistent psychological counseling can greatly benefit employee productivity and performance. By tackling mental health issues like anxiety, depression, and burnout that can hinder cognitive abilities, counseling assists employees in staying focused, concentrated, and mentally agile. Additionally, counseling sessions that focus on improving stress management, time management, and problem-solving skills can help employees meet deadlines, manage work pressures, and adapt to changes more successfully. As employees achieve improved emotional well-being and psychological strength, they are better prepared to excel in their roles, resulting in heightened productivity, efficiency, and overall performance.

Nurturing a Positive Organizational Culture

Regular psychological counseling plays a crucial role in cultivating a positive organizational culture by encouraging open communication, trust, and mutual respect among employees and leaders. By normalizing conversations about mental health and well-being, counseling helps to reduce stigma and create an environment where employees feel comfortable seeking support when needed. Additionally, counseling interventions focused on enhancing interpersonal skills, conflict resolution, and teamwork can strengthen relationships and promote a sense of camaraderie among employees. When employees feel valued, supported, and respected in the workplace, they are more likely to positively contribute to the organizational culture, resulting in greater cohesion, collaboration, and overall success. In essence, regular psychological counseling offers a multitude of benefits for both employees and organizations, including improved well-being, job satisfaction, and engagement, as well as increased productivity and performance. By investing in counseling services as part of a comprehensive employee support and development strategy, organizations can establish a work environment that prioritizes mental health and fosters individual and collective achievements.

IMPLEMENTATION STRATEGIES

Integration into Employee Wellness Programs

Integrating regular psychological counseling into employee wellness programs is a strategic approach to promoting mental health and well-being in the workplace. By incorporating counseling services alongside other wellness initiatives, such as fitness programs, nutrition counseling, and stress management workshops, organizations can provide comprehensive support to employees' physical, mental, and emotional health. This integration ensures that counseling services are easily accessible and widely promoted to employees as part of their overall wellness benefits. Additionally, organizations can leverage existing wellness program infrastructure, such as communication channels, wellness portals, and incentive programs, to raise awareness and encourage utilization of counseling services.

Training and Development of In-house Counselors

Training and developing in-house counselors is a cost-effective strategy for expanding access to psychological counseling services within organizations. By investing in training programs for HR professionals, managers, or designated employees, organizations can build internal capacity to provide basic counseling support, referrals, and crisis intervention to employees. Training

programs may cover essential counseling skills, such as active listening, empathy, conflict resolution, and crisis management, as well as legal and ethical considerations. Moreover, organizations can facilitate ongoing professional development and supervision to ensure that in-house counselors maintain competence and adhere to best practices in counseling.

Caution and discretion Measures

Ensuring confidentiality and privacy is crucial for the success of workplace counseling programs. Organizations must establish clear policies and procedures to safeguard employees' personal information during counseling sessions. This may involve providing private counseling rooms, utilizing secure electronic record-keeping systems, and restricting access to personal information to authorized personnel only. It is also important for organizations to communicate confidentiality policies to both employees and counselors, emphasizing the importance of maintaining confidentiality and outlining the limits of confidentiality in situations where there is a potential risk of harm. By prioritizing confidentiality and privacy, organizations can create a safe and supportive environment where employees feel comfortable seeking help without fear of judgment or negative consequences.

Assessing Effectiveness and Feedback procedures

Assessing the impact of psychological counseling programs on employee well-being, job satisfaction, and organizational outcomes is crucial. Organizations can use various quantitative and qualitative measures, such as pre- and post-counseling assessments, employee surveys, focus groups, and key performance indicators (KPIs) related to absenteeism, turnover, and productivity, to evaluate program effectiveness. It is also important for organizations to gather feedback from employees about their counseling experiences, including satisfaction with services, perceived benefits, and suggestions for improvement. By consistently collecting and analyzing data on program effectiveness and employee feedback, organizations can make informed decisions about program enhancements, resource allocation, and future initiatives to better address the mental health needs of their employees. Implementing psychological counseling programs in the workplace requires integrating counseling services into employee wellness programs, investing in training and development of in-house counselors, prioritizing confidentiality and privacy measures, and establishing mechanisms for evaluating effectiveness and gathering employee feedback. By following these implementation strategies, organizations can create a supportive work environment that prioritizes employee mental health and well-being, ultimately leading to organizational success and sustainability.

CASE STUDIES AND SUCCESS STORIES

Company A: Google - Inclusive Employee Support

Google, renowned for its innovative workplace culture, places a strong emphasis on the well-being of its employees as a key factor in its success. Recognizing the significance of mental health, Google provides extensive counseling services as part of its employee support initiatives. Through its Employee Assistance Program (EAP), Google offers access to licensed therapists who conduct confidential counseling sessions for employees dealing with personal or work-related challenges. These sessions cover a wide range of issues, including stress, anxiety, career development, and interpersonal conflicts. Additionally, Google offers mindfulness and meditation programs to help employees manage stress and enhance their mental well-being. The positive impact of Google's counseling services is evident in the high levels of employee satisfaction and retention. Employees feel supported and valued by the company, fostering a positive work environment that encourages innovation. Furthermore, Google's focus on employee well-being aligns with its mission to cultivate a culture of inclusivity, collaboration, and personal growth.

Company B: Starbucks - Cultivating a Supportive Workplace Culture

Starbucks, a well-known coffeehouse chain, has made it a priority to create a supportive workplace culture that values the well-being of its employees. Recognizing the significance of mental health, Starbucks has implemented various initiatives to support the mental and emotional well-being of its employees. Through the Starbucks Employee Assistance Program (CUP Fund), employees have access to mental health resources such as confidential counseling services and financial assistance for personal hardships. Additionally, Starbucks offers

wellness programs like meditation and yoga sessions to help employees manage stress and achieve a healthy work-life balance. The positive impact of Starbucks' supportive workplace culture is evident in the high levels of employee satisfaction and engagement. Employees feel valued and supported by the organization, leading to increased loyalty and commitment. By prioritizing employee well-being, Starbucks has created a positive work environment where employees can thrive both personally and professionally. These examples underscore the importance of prioritizing employee mental health and well-being in creating a positive workplace culture and driving organizational success. Companies like Google and Starbucks demonstrate their dedication to their employees' overall well-being by offering comprehensive counseling services and fostering a supportive environment.

CHALLENGES AND CONSTRAINTS

Stigma associated with Mental Health

Implementing regular psychological counseling programs in the workplace is difficult due to the stigma surrounding mental health. Despite growing awareness, employees may be reluctant to seek counseling services out of fear of judgment, discrimination, or negative consequences from their peers or superiors. Stigma can hinder access to support and discourage employees from openly addressing mental health concerns. Overcoming stigma necessitates continuous education, awareness initiatives, and the establishment of a culture of acceptance and understanding within the organization.

Resource Constraints

Implementing regular psychological counseling programs in the workplace is a challenge due to resource constraints. Organizations, especially smaller businesses or those with tight budgets, struggle to allocate enough resources such as funding, staff, and infrastructure to support counseling services. This can lead to long wait times for appointments, understaffing, and limited access to specialized services. Overcoming these constraints may involve strategic planning, partnerships with external organizations, and advocating for more investment in employee mental health initiatives.

Resistance to Change

Resistance from employees and leaders can hinder the implementation of workplace counseling programs. Some employees may doubt the need for counseling, while leaders may worry about costs and productivity. Overcoming this resistance requires clear communication, engagement with stakeholders, and leadership support. Organizations must highlight the benefits of counseling, address concerns openly, and involve employees in decision-making to build support for the program. To overcome these challenges, a comprehensive approach is needed to address both individual and organizational obstacles. By increasing awareness, allocating resources, and promoting a culture of acceptance, organizations can create an environment where employees feel empowered to prioritize their mental health. This will lead to a happier, healthier, and more productive workforce.

FUTURE DIRECTIONS AND RECOMMENDATIONS

Policy Initiatives

Policy initiatives are essential for promoting employee mental health and facilitating the implementation of counseling programs in workplaces. Governments may choose to pass laws that require or encourage organizations to offer mental health support, create workplace guidelines to guarantee the quality and availability of services, and provide tax benefits to promote investment in employee well-being programs.

Pragmatic Strategies for Organizations

There are several practical strategies that organizations can use to successfully implement and maintain psychological counseling programs in the workplace. These strategies involve showing leadership dedication to employee wellness, involving employees in the design and evaluation of programs, providing training for managers and HR professionals, and creating ways to measure and evaluate program effectiveness for ongoing improvement.

CONCLUSION

In summary, incorporating regular psychological counseling programs in the workplace is crucial for

promoting a culture of well-being and support for employees. This paper has examined the benefits, challenges, and future directions of implementing such initiatives. Regular psychological counseling has been proven to improve employee well-being, job satisfaction, and productivity, as well as contribute to a positive organizational culture. By offering counseling services, organizations show their dedication to supporting employees' mental health and creating a work environment where individuals can thrive personally and professionally. However, challenges like mental health stigma, limited resources, and resistance to change need to be addressed to ensure the success and sustainability of counseling programs. Future research, policy implications, and practical strategies can help organizations advance in this area. In conclusion, prioritizing employee mental health through regular psychological counseling programs is not only a moral obligation but also a strategic investment in organizational success. By investing in employee well-being, organizations can build a resilient, engaged workforce capable of achieving collective goals, leading to long-term success and prosperity.

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COVID-19's Impact on Stock Market Volatility: Evidence from Selected NSE Indices

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ABSTRACT

The advent and spread of novel COVID-19have impacted the entire world in an extraordinary and unparalleled manner. Due to the uncertainty prevailing in the market and the follow-up destabilising effects of the global pandemic; the interruptions arose in the worldwide market resulting in sharp instability. The capital market of India too responded to the pandemic and saw sharp instability in the following days to the outbreak of pandemic. With this in mind, the authors evaluated COVID-19's impact on the Indian stock market, with a particular emphasis on the NSE. The research evaluated how the COVID-19 pandemic affected NSE index volatility, particularly focusing upon concentrating on the segments-IT, automobiles, NSE- 50. For this purpose, daily stock market returns were used over the period of November 1, 2018-December31, 2020. The effect of the pandemic on the volatility of the chosen indices was evaluated using the GARCH Model. The analysis revealed that the volatility was due to shock or news in pre-COVID period whereas volatility was found to be caused by persistence in post- COVID period. Further, the Volatility was found to be decaying in case of Nifty Auto and Nifty Index, while volatility was found to be exploding in Nifty IT index. The study report can offer insightful information on the Indian stock market and has applications in real life.

KEYWORDS: *COVID-19, Stock market, Volatility, NSE, GARCH, Pre- Covid, Post-Covid.*

BACKGROUND

The deadly and infectious coronavirus has spread its tentacles across the globe and had affected people across the world. The capital of China's Hubei province, Wuhan, is where the global COVID-19 (coronavirus) pandemic started in December 2019. As individuals struggle to manage, Covid-19 has expanded to 213 countries worldwide, placing billions of people under lockdown. Covid-19 emerged out to be one such pandemic that all the industries in the economy have been badly hit by it. All the borrowers and lenders in the economy have been badly hit by it and thus creating it to be one of the worst pandemics to hit the century of all times impacting every nook and corner of the economy including banks, financial institutions and stock markets. In an attempt to combat the Covid-19 epidemic from spreading, numerous nations all throughout the globe had taken few radical measures to slower down the pace of human-to-transmission as the disease is highly contagious. These measures ranged from imposing social distancing norms, keeping away from pointless journeys., and a restriction on gatherings.(Nicola et al., 2020) By March 2020's end, approximately hundred nations worldwide had successfully implemented a few lockdown restrictions that adversely affected their economic and social pursuits.

The COVID-19 rapidly worsened, and the pandemic's outbreak had catastrophic effects; the actions taken to stop the disease's transmission notably influenced the stock market and the level of global financial activity. The world economy is expected to fall drastically in 2020 by 3%, as per the IMF's April 2020 World Economic Outlook (WEO). This is far worse than what happened during the 2008–2009 financial crises.

Less than the development rates throughout the 2008 worldwide economic meltdown and the 2015 oil shock, the development predicted the districts in the Middle East and Central Asiaare estimated to plummet from 1.2% in 2019 and fall of 2.8% in 2020.IMF forecasts also reveal that in2020 will see a substantial impact on the GDP development of the Middle East and North Africa (MENA) area. In 2020, it might drop to - 4.2% for countries that trade oil and - 0.7% for countries that import it. (Apr. 2020; IMF, Regional Economic Outlook). Anxiety associated to COVID-19 is just going to make the stock market and financial sector's issues worse. Generally, the perception across the globe related to stock market (particularly equities) is negative due to the uncertainty regarding the duration of the pandemic combined with already deteriorating investor confidence. It will especially affect the developing economies due to decline in economic activities that will further push to worsen the asset quality. This tragedy has totally shaken up the financial sector, and this fear is likely to resonate across the stock markets globally. The review that the authors have adopted looks at how the Covid-19 epidemic affected the Indian stock exchange between January 1, 2019, and December 31, 2021. (a year before and after the advent of the pandemic), taking into account the aforementioned economic factors and providing a detailed insight into the impact of Covid-19 on Indian financial market.

Since there aren't many empirical data points from India, this study aims to advance the conversation and investigation. To explore the impact of volatility in stock index price due to the pandemic episode and the lockdown strategy adopted by the Indian government, the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model has been adopted as the review technique to make the study significant.

An important finding of the study reveals the volatility across the various sectors of the notable Indian securities exchange, NSE Nifty.

LITERATURE REVIEW

Arun and Ozili (2020) studied the effect of the COVID-19 spillover effect on the he global financial system. To reduce the impacts of the coronavirus, they conducted an empirical analysis into the maintenance of social separation, with a specific focus on four countries: North America, Africa, Asia, and Europe. When examining the effects of the public health, monetary, fiscal, and social distancing policies that were implemented at the time, they drew on observations from the real world. According to the study, the total number of days under lockdown, decisions made about monetary policy, and restrictions on overseas travel all had a big influence on the amount of economic activity. and, consequently, the opening, closing, lowest, and maximum stock prices of major stock exchange indices. The analysis came to the conclusion that a lockdown policy implemented for one month in any country would be detrimental to the economy since it would negatively affect stock market indexes. In 2020, Raef Bahrini conducted research on how the new coronavirus affected stock market returns, paying close attention to data from GCC nations. During the COVID-19 flare-up day by day returns of the significant securities exchange records in the GCC nations declined as the quantity of affirmed cases expanded. It was likewise seen that GCC financial exchanges are affected in emphatically by the raw petroleum cost and unfavorably by the varieties of the suggested unpredictability in the worldwide financial exchange. A study conducted by Liu et al. (2020) looked at the interim effects of COVID-19 on the stock exchanges of 21 developed nations, including the UK, Germany, Japan, Korea, USA, and others. They adopted the event study methodology and focused primarily on data on the closing prices of the stock market indexes on a daily basis between February 21, 2019, and March 18, 2020. The study's conclusion was that there is an adverse, substantial influence of COVID-19 on the financial market returns of every afflicted country as well as every important sector. Moreover, discoveries demonstrate that COVID-19 have critical unfavorable consequences for significant stock market indices performance with those in Asia enduring a more prominent effect as far as unusual returns are concerned. Zhang et al. (2020) utilized basic statistical tools and analysis examination to investigate the connection between securities exchange fluctuations and the COVID-19 episode in worldwide monetary business sectors. They used financial exchange data from March 27, 2020, onward, for the top ten polluted countries by quantity of cases that have been verified

(including Japan, South Korea, and Singapore). They discovered that the global financial, fiscal, monetary, and stock markets are extremely vulnerable and dangerous as a result of the epidemic. The fluctuations and the corresponding risks of the multitude of nations have expanded considerably among February and March 2020. They gave a thorough analysis of the US stock market, which in March 2020—when the country's first wave of risk was sent off—struck the circuit breaker mechanism four times in ten days. However, stock markets in Europe and Asia had also had sharp increases, so it wasn't just the US stock markets that suffered. They emphasized that as long as the pandemic persists, there will be a lot of uncertainty. Azimili (2020) investigated how the novel coronavirus, COVID-19, affected the level and composition of risk-return reliance in the United States. Quantile regression emerged as the preferred method. A left tailed uneven dependent system between different sector returns and market portfolio was found in quantile regression (QR) results. In the upper quantiles, the level of correlation between market portfolio and returns has grown since the COVID-19 outbreak. Additionally, the outbreak has shifted from a left-to right-tailed dependency. The relationship between GSIC and stock return was also taken into account by the researcher, who determined that the GSIC return connection revealed unbalanced arrangement with left tail adversely influence double than the upper tail infulence. Using the WHO proclamation on March 11, 2020, and the Federal Reserve Bank declaration on April 9, 2020, as two occasions that address the shock and the stimulus, Harjoto et al. (2020) applied the approach of event study. The findings showed that COVID-19 had a mostly detrimental effect on global stock exchanges. The United States, the United Kingdom, Germany, France, Spain, and Italy were the top six countries affected by the pandemic up until July 2020. Cepoi (2020) looks at the impact of COVID19-related news on stock exchange returns in these countries. He used the quantile regression methodology from February 3, 2020, to April 17, 2020, and came to the conclusion that the media inclusion causes returns in the higher and center quantiles to fall. Furthermore, the financial impact on various businesses is hindering the returns from the 50th to 75th quantiles. Ibrahim Yousuf examined and evaluated the effect of the coronavirus on the seven indexes' standard deviations. In addition, he looked at how COVID-19 affected the volatility of the stock market for these indices and how the number of new cases and their growth rate each day affected the standard deviations of these index returns using the GARCH Model.

GAP ANALYSIS

Most of the research studies conducted in the past have found the stock markets to be volatile after the advent of the pandemic. However, the earlier studies have been conducted in different countries and different investor groups. Despite the fact that extensive literature is available on the effect of covid-19 on industrialized nations, very few authors have studied and tried to uncover the aspect from the point of view of an emerging economy such as India while focusing upon specific NSE indices, particularly focusing upon the segments-IT, automobiles and Nifty- 50 as a whole. It shall be interesting to see whether similar results are seen in the present study also.

OBJECTIVES OF THE STUDY

- To study the influence of COVID- 19 on volatility of NSE Auto Index
- To assess the influence of COVID- 19 on volatility of NSE IT index
- To scrutinize the volatility of NSE 50 due to outburst of COVID-pandemic.

HYPOTHESIS OF THE STUDY

To test whether price changes are independent or not.

Ho1: Null Hypothesis - COVID- 19 affects the volatility of NSE Auto Index

Ha1: Alternate Hypothesis - COVID- 19 does not affect the volatility of NSE Auto Index

Ho2: Null Hypothesis - COVID- 19 affects the volatility of NSE IT Index

Ha2: Alternate Hypothesis - COVID- 19 does not affect the volatility of NSE IT Index

Ho3: Null Hypothesis - COVID- 19 affects the volatility of NSE 50 Index

Ha3: Alternate Hypothesis - COVID- 19 does not affect the volatility of NSE 50 Index.

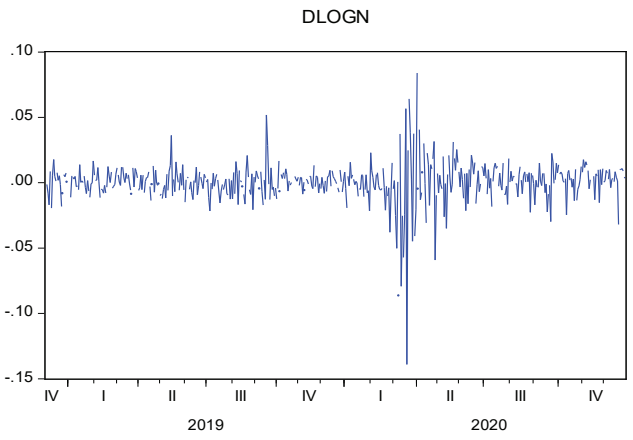
Hypothesis was tested at 5% significance level.

RESEARCH METHODOLOGY

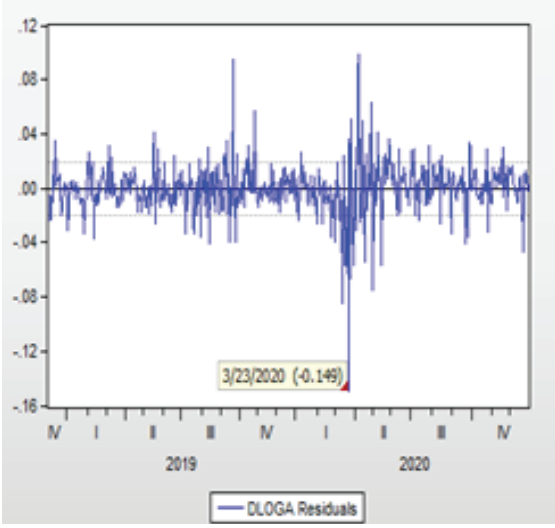
Unit root tests are used to test check for the stationarity properties in the data series. If the series is stationary, then the absence of a unit root can be inferred from the data series and vice versa. Numerous tests have been established to test the existence of such property in the data set. In this study, uses the Augmented Dickey Fuller (ADF), Phillip Perron test, and KPSS test for testing unit roots. The null hypothesis for ADF test and Phillip Perron test is presence of a unit root, whereas When using the KPSS test, the null hypothesis is that the data is stationary. The data used in this study is BSE Nifty returns comprising of 513 daily returns. The data is taken from December 2018through December 2020. The impact on stock market volatility has been examined using GARCH (1,1) model. GARCH model has been applied by dividing the data series under two parts, that is, the period before and after the crisis. Before introducing the modelling using GARCH and to test the volatility in the study period (before and after the pandemic), the present study surveys whether there is conditional heteroscedasticity in the data series, that is, ARCH affect. Since the residual square from the previous day has a significantly influence on volatility, lag 1 has been used for the GARCH (1,1) Model's development.

Chart-1

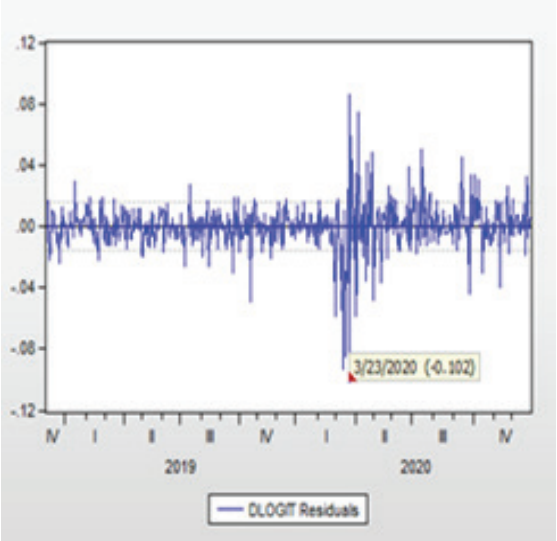
NSE 50



Nifty Auto Graph



Nifty it Graph



ANALYSIS AND INTERPRETATION

UNIT ROOT TEST

Stationarity suggests brief effect of any information whereas presence of unit root indicates permanent result of the shock or information. For stochastic processes, testing the presence of unit root is a prerequisite. The unit root is necessary, but not an essential condition for the random walk hypothesis. A series is called stationary if the average value and covariance of the series are independent of time. The present study employs PSS test, elaborated Dickey Fuller (ADF) and

Phillip Perron test for determining whether the data under consideration is stationary or unstationary.

Unit root test (UR Test) results for the daily NIFTY closing value are presented in Tables 1, 2, and 3. Augmented Dickey Fuller Test (ADF) is considered a very important UR test when the sample size is large. The tests of Philip Perron and KPSS were also performed to determine the significance of a Unit Root.

Unit root is existing in the null hypothesis for the ADF test.

H_o: There is a unit root in Stock Returns

H_a: There is no unit root in Stock Returns

Table 1: ADF Test Results

Null Hypothesis: Returns has a unit root						
			t-Statistic (NSE AUTO)	t-Statistic (NSE IT)	t-Statistic (NSE 50)	Prob.*
Augmented Dickey-Fuller test statistic			-22.97121	-11.18609	-7.000165	
Test critical values:	1% level		-3.442919	-3.442970	-3.443805	0.0000
	5% level		-2.866976	-2.866999	-2.867367	
	10% level		-2.569727	-2.569739	-2.569936	

Source: Author's own compilation

Table 1 results are the ADF test. ADF test results gives the evidence that the data is stationary in nature.

Table 2: Phillip Perron Test

Null Hypothesis: RETURNS have a unit root					
		t-Statistic (NSE AUTO)	t-Statistic (NSE IT)	t-Statistic (NSE 50)	Prob.*
Phillips-Perron test statistic		-22.99411	-25.90068	-24.88375	
critical values at levels of significance:	1% level	-3.442919	-3.442919	-3.443149	0.0000
	5% level	-2.866976	-2.866976	-2.867078	
	10% level	-2.569727	-2.569727	-2.569781	

Source: Author's own compilation

The Phillip Perron test comprises of an automatic modification to the non-Augmented Dickey-Fuller technique in order to permitauto-correlated residuals. null hypothesis of non-stationarity is rejected at the 5% level of significance, the. So, Philipp Perron test also gives the same results that are associated with the ADF test.

Table 3: KPSS Test

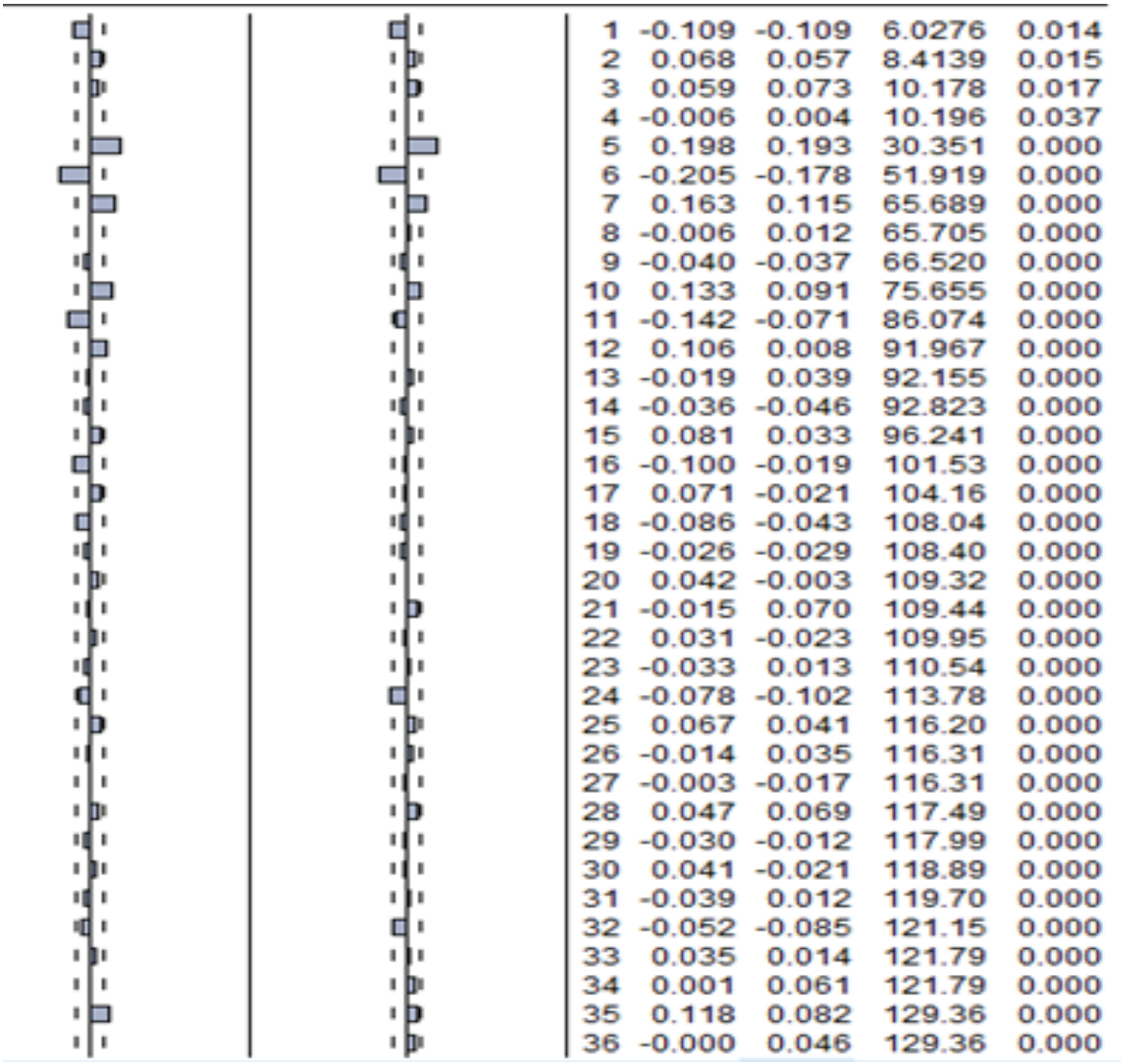
Null Hypothesis: RETURNS are stationary						
			t-Statistic (NSE AUTO)	t-Statistic (NSE IT)	t-Statistic (NSE 50)	Prob.*
Statistics of test			0.241965	0.316480	0.152791	0.0000
critical values at levels of significance		1%	0.739000	0.739000	0.739000	
		5%	0.463000	0.463000	0.463000	
		10%	0.347000	0.347000	0.347000	

Source: Author's own compilation

The null hypothesis is predicated on the reverse assumption in the KPSS test. The null hypothesis should be accepted as a result of the KPSS test and is also evident from the LM Stat value which also confirms the same. This test is also useful to compare the test results with ADF and Phillip Perron test to check if the outcome of unit root is superior.

Correlogram

Autocorrelation Test of Daily Returns of NIFTY



1	-0.109	-0.109	6.0276	0.014
2	0.068	0.057	8.4139	0.015
3	0.059	0.073	10.178	0.017
4	-0.006	0.004	10.196	0.037
5	0.198	0.193	30.351	0.000
6	-0.205	-0.178	51.919	0.000
7	0.163	0.115	65.689	0.000
8	-0.006	0.012	65.705	0.000
9	-0.040	-0.037	66.520	0.000
10	0.133	0.091	75.655	0.000
11	-0.142	-0.071	86.074	0.000
12	0.106	0.008	91.967	0.000
13	-0.019	0.039	92.155	0.000
14	-0.036	-0.046	92.823	0.000
15	0.081	0.033	96.241	0.000
16	-0.100	-0.019	101.53	0.000
17	0.071	-0.021	104.16	0.000
18	-0.086	-0.043	108.04	0.000
19	-0.026	-0.029	108.40	0.000
20	0.042	-0.003	109.32	0.000
21	-0.015	0.070	109.44	0.000
22	0.031	-0.023	109.95	0.000
23	-0.033	0.013	110.54	0.000
24	-0.078	-0.102	113.78	0.000
25	0.067	0.041	116.20	0.000
26	-0.014	0.035	116.31	0.000
27	-0.003	-0.017	116.31	0.000
28	0.047	0.069	117.49	0.000
29	-0.030	-0.012	117.99	0.000
30	0.041	-0.021	118.89	0.000
31	-0.039	0.012	119.70	0.000
32	-0.052	-0.085	121.15	0.000
33	0.035	0.014	121.79	0.000
34	0.001	0.061	121.79	0.000
35	0.118	0.082	129.36	0.000
36	-0.000	0.046	129.36	0.000

Source: Author's own compilation

The Table 3 represents Correlograms at 36 lags for testing autocorrelation for NIFTY. There are three columns of correlation coefficient for all the periods (autocorrelation, Q - statistics, and p - value). Further, this is confirmed from the Correlogram that there was significant volatility both in the upward as well as in the downward direction and also ARCH affect is evident in the data set.

Table 4: Estimates of Garch (1,1) for NSE-Auto Index

GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)

	Pre-COVID period	Post-COVID period	Pre-COVID period	Post-COVID period	
Variable	Coefficient	Coefficient	Prob.	Prob.	
C	-0.000662	0.001091	0.4962	0.3226	
VARIANCE EQUATION					
C	1.24E-05	1.52E-05	0.0426	0.0145	
RESID(-1)^2	0.084081	0.109704	0.0004	0.0000	
GARCH(-1)	0.868394	0.854008	0.0000	0.0000	
R-squared	-0.000042	-0.000814	Mean dependent var	-0.000560	0.000450
Adjusted R-squared	-0.000042	-0.000814	S.D. dependent var	0.015707	0.022512
S.E. of regression	0.015707	0.022521	Akaike info criterion	-5.494910	-5.180519
Sum squared resid	0.059457	0.135932	Schwarz criterion	-5.437241	-5.127066
Log likelihood	668.8841	700.7799	Hannan-Quinn criter.	-5.471679	-5.159053
Durbin-Watson stat	1.868135	2.110445			

Source: Author's own compilation

The coefficient of ARCH terms are 0.084081 and 0.109704 in the before and after pandemic period respectively. Further, the coefficient of GARCH term is 0.868394 and 0.854008 those sub periods. The addition of these coefficients is 0.9527 in the selected sub period before pandemic and is 0.9637 in the sub period after pandemic. Since this summation is closer to 1, it the condition of a valid GARCH model. Further, their coefficients are also found to be significant. In case of RESID (-1)^2 , the value of probability is 0.0004 in both the sub periods. The "p" values of GARCH (-1) are also found to be significant for the subgroups. The value of Durbin Watson stat is 1.868135 in the before-covid period and is 2.110445 in the after-covid period. Since the Durbin-Watson statistic is closer to 2 in both the periods, The statistical model is acceptable and fit since the error terms do not auto-correlate. The coefficients of these terms indicate that the volatility in NSE Auto index is due to Shock or news in the Period after the surge of Covid cases and is caused by Persistence in the period before the onset of pandemic.

Table 5: Garch (1,1) Estimates for Nse-It Index

	1/1/2019 to 31/12/2019	1/1/2020 to 31/12/2020			1/1/2019 to 31/12/2019	1/1/2020 to 31/12/2020
Variable	Coefficient	Coefficient			"p" value	"p" value
		0.002200				0.0030
C	7.16E-05			C	1.0000	
Ar(1)	0.004999			Ar(1)	1.0000	
Ar(2)	0.005001			Ar(2)	1.0000	
Ma(1)	0.004998			Ma(1)	1.0000	
Ma(2)	42169.47			Ma(2)	0.9987	
Variance Equation						
C	4.26E-10	1.24E-05			0.5291	0.0275
RESID(-1)^2	0.149896	0.267675			0.9999	0.0000
GARCH(-1)	0.580806	0.739814			0.3711	0.0000
R-squared	1.000000	-0.000346	Mean dependent var		7.16E-05	0.001826
Adjusted R-squared	1.000000	-0.000346	S.D. dependent var		0.010034	0.020152
S.E. of regression	2.40E-07	0.020155	Akaike info criterion		-18.80983	-5.418497
Sum squared resid	1.36E-11	0.108872	Schwarz criterion		-18.69449	-5.365044
Log likelihood	2283.989	732.7879	Hannan-Quinn criter.		-18.76337	-5.397030
Durbin-Watson stat	2.120810	2.339053				

Source: Author's own compilation

The ARCH term's coefficient i.e. RESID (-1)^2 is 0.149896 in the Before-covid period and is 0.267675 in the after the pandemic period. The GARCH term's coefficient GARCH (-1) is 0.580806 and 0.739814 in the before and after period respectively. The sum of ARCH and GARCH term (0.7307 + 1.0078489) is closer to 1. These satisfy the conditions of a valid model so it can used to measure the impact on volatility. Further, the coefficients of these variables are found to be significant. since the value of probability is less than 0.05 in case of these variables. This leads to a conclusion that the volatility in NSE IT index is due to Persistence in both the periods, that is Before and after the pandemic.

• In case of RESID (-1)^2 , the value of probability is 0.0004 and 0.0000 in 1/1/2019 to 31/12/2019 and 1/1/2020 to 31/12/2020 respectively. As far as GARCH (-1) is concerned, the value of probability is 0.0000 both the periods. Durbin Watson stat's value is 2.120810 and 2.339053 in the year 2019 and 2020 respectively. The error terms are free from auto correlation which indicates that It is appropriate and the well fitted statistical model. To summarize the information technology discussion, it has been observed closely that this sector the has played a very vital role even in the trying times like this from occupying a bigger share of the buyer wallet to enabling more traditional brick-and-mortar firms to take care of business to contributing more on to understanding the consequences of and confronting the pandemic. The primary justification for Growing interest in programming and web-based media platforms is driving this industry's economic growth. which helped one and all to stay connected and communicate even in remote locations while observing the norms of lockdown. This caused an impact on the Nifty- IT index.

Table 6: Estimates Of Garch (1,1) for NSE-50 Index

	1/1/2019 to 31/12/2019	1/1/2020 to 31/12/2020			1/1/2019 to 31/12/2019	1/1/2020 to 31/12/2020
Variable	Coefficient	Coefficient			Prob.	Prob.
	7.16E-05				1.0000	0.2875
	0.004999	0.000907			1.0000	
	0.005001				1.0000	
	0.004998				1.0000	
C	42169.47				0.9987	
Variance Equation						
		8.67E-06				0.0066
C	4.26E-10		2285.441	4.242849	0.5291	
RESID(-1)^2	0.149896	0.141864	0.387035	2.954930	0.9999	0.0000
GARCH(-1)	0.580806	0.824925	0.016601	-9.136827	0.3711	0.0000
	1.000000				7.16E-05	
R-squared		-0.000380	Mean dependent var			0.000529
	1.000000				0.010034	
Adjusted R-squared		-0.000380	S.D. dependent var			0.019438
	2.40E-07				-18.80983	
S.E.		0.019441	Akaike info criterion			-5.750166
	1.36E-11					-5.696424
Sum squared resid		0.100539	Schwarz criterion		-18.69449	
	2283.989					
Log likelihood		771.6471	Hannan-Quinn criter.		-18.76337	-5.728578
Durbin-Watson stat	2.120810	2.282349				

Source: Author's own compilation

- The ARCH term's coefficient i.e. RESID (-1)^2 is 0.149896 in the year 2019 and is 0.141864 in the period from 1/1/2020 to 31/12/2020. The GARCH term's coefficient: GARCH (-1) is 0.580806 in the period before the outburst of pandemic and is 0.824925 in the period post the surge of Covid in India. The addition of both of these coefficients in these two different periods is 0.73702 in the before period and is 0.9667 in the after period. which is less than 1. This is indicative of the fact that the conditions of a valid GARCH model are satisfied.
- Further, the coefficients of the ARCH as well as GARCH terms are found to be significant and reveal that any volatility in NSE IT index is due to Persistence in both the periods, that is Before and after the pandemic. since the value of probability is less than 0.05 in case of these variables. In case of RESID(-1)^2 , the value of probability is 0.9999 in the period before crisis and is 0.0000 in the period after the pandemic crisis. As far as GARCH (-1) is concerned, the value of probability is 0.3711 and 0.0000 in the before and after period respectively. The value of Durbin Watson stat in these two periods is 2.120810 and 2.282349 respectively. The absence of auto-correlation is indicated by the value of Durbin-Watson. The coefficients of ARCH and GARCH terms indicate that the behavior of NSE 50 index has changed post the surge of pandemic cases in India. NSE's volatility is caused by persistence in the period from 1/1/2019 to 31/12/2019 whereas it is caused by a shock or news in the period from 1/1/2020 to 31/12/2020. The coefficient of ARCH term is found to be greater than the GARCH term in the year 2019, whereas the opposite was found to be true in the year 2020.

CONCLUSION

The surge in COVID cases contributed to an uncertainty in the market conditions. The destabilizing effects of the global pandemic led to commotions in the markets worldwide which further led to severe instability. The present study investigated the impact on stock market volatility using daily data from December 2018-2020 using GARCH (1,1) model. The model has been applied by dividing the data series under two parts, that is, the before-crisis and after-crisis period. The analysis's results focusing on Nifty50, Nifty auto and Nifty IT revealed that the volatility has increased considerably post the surge in severities from the pandemic. The spikes in the returns of these indices reveal that the fluctuations in the return have increased after the crisis. NSE- IT index played a very vital role even in the trying times The economy will continue to thrive as, in the midst of these crises, people realized how important technology and the internet are to our safety and to facilitating correspondence among different individuals.

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Cognitive Biases Influence Decision-making Processes in Management

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ABSTRACT

The cognitive process of selecting a belief or course of action from two or more options—some of which may be irrational or rational—is known as decision-making. Terry, George R. (1991). Cognitive biases have a major impact on managerial decision-making processes, frequently producing less-than-ideal results. (Tversky and Kahneman, 1974; Kahneman, 2011; Korteling and Toet, 2020). The study undertakes a comprehensive literature review approach and aims to assess the assertion that cognitive biases impact decision-making and explores the prominent ones among the many cognitive biases and identifies the research gaps within management context. To address the research questions, a narrative approach is used to compile the publications and illustrative studies. One of the limitations of the paper is that it is a narrative review rather than a systematic one. Nonetheless, it is intended to be helpful and adds to the body of knowledge already available on cognitive biases and provide insightful recommendations for decision support systems and managerial practices. There are three identified research gaps. The first is the disregard for individual variations in cognitive biases; not all managers are equally susceptible to biases. The second is not carrying out analyses tailored to a particular industry, which would have otherwise shown subtle variations in the effects of cognitive biases and third to study how particular cognitive biases affect big data decision-making and the context of digitalization.

Conclusion

There were two key conclusions. First, the results show how cognitive biases in management decision-making are persistent and have an impact on organisational performance. Second, the analysis of the literature reveals that a dozen cognitive biases influence managerial decision-making, with confirmation bias, overconfidence and the framing effect being the most prevalent biases. To help managers and organizational leaders avoid cognitive biases, enhance decision-making, and foster a more rational and fruitful decision-making environment within the company, this paper offers practical guidance and mitigation measures.

KEYWORDS: *Decision making, Cognitive biases, Bounded rationality, Strategic decisions, Organization, management.*

INTRODUCTION

Making decisions is always accompanied by uncertainty and imperfect information (Nutt and Wilson, 2010). Cognitive biases and information overload both influence the decision-making process. Citroen (2011) also makes the argument that information is valuable when making decisions; in fact, using complete knowledge and using the right tactics are related. But these days, it's getting harder and harder to evaluate the best strategic option because there's so much information available. Because of this, it's important to conduct study on the connections between "cognitive biases" and " decision-making." Research studies have intriguing ramifications for business and academics, particularly in the areas of strategy and decision-making. This work advances our knowledge of cognitive biases and strategic decision-making by proposing a decision-making model (analysis, decision, onboarding, and control).

Important Elements of the Decision-Making Process

The screening's findings demonstrate how decision-making has been extensively researched over time, mostly using qualitative methods. The focus of earlier research was on how much predetermined biases can serve as the foundation for wise strategic choices. The four separate stages of decision-making—initiation, ratification, implementation, and monitoring—were identified by Fama and Jensen (1983). The simplification process's constituent parts—problem identification and goal formulation, alternative development, appraisal, and selection—were the focus of Schwenk's (1984) study.

Applications of organizational learning and adaptability were studied by Fiol and Lyles (1985). According to Simon (1993), the steps in the decision-making process are determining the circumstance that necessitates a decision, establishing potential courses of action, weighing the available options, and choosing one of these possibilities. According to a study by Fredrickson (1986), when an overall strategy is not institutionalized, a particular organizational structure is established. Scholars such as Baum and Wally (2003) examined the relationship between centralised or decentralised strategic decision-making procedures and corporate performance; they specifically showed that decision-making functions better in dynamic marketplaces.

Eisenhardt and Zbaracki (1992) viewed decision-making processes as a political system in which "powerful people get what they want." To sum up, previous studies have focused on different phases of the decision-making process, which typically entails the following actions: (1) determining the objectives to pursue; (2) obtaining relevant information; (3) selecting a course of action from a variety of options; (4) completing tasks; and (5) managing the result.

Factors influencing making of decisions

Simon (1993) and Cyert and March (1963) pointed out that cognitive constraints usually impose limitations on the "bounded rationality" of decision-makers. This implies that people often evaluate changes considering their preexisting beliefs, attitudes, and prejudices. Moreover, Eisenhardt and Zbaracki (1992) suggest that political and boundedly rational processes could be the motivations for strategic choices. Thus, people who make strategic decisions are thought to be mentally limited. Companies commonly adopt prior successful approaches because they think that prior success has a beneficial impact on decision-maker's satisfaction (Audia et al., 2000). The association between performance and rapid decision-making has been studied in this scenario. Executives typically use tactics to integrate critical decisions with tactical preparation, speeding up the decision-making process (Eisenhardt, 1989).

There is a connection between decision-maker's age and the decision-making skill, notwithstanding Wiersema and Bantel's (1992) investigation of the relationship between the top management team, demography, and strategy-related organisational performance. Specifically, as one gets older, the probability of correctly detecting information value rises. Moreover, older decision-makers usually lack confidence in their decisions. Examining the impact of variety on group dynamics has also been an objective of research on the topic. According to Knight et al. (1999), interpersonal issues within the team are positively connected with functional variety. According to the authors, "group processes play an important role in shaping a manager's mental models." The quality of decision implementation, environmental instability, decision-making, and the execution of organisational procedures are general

aspects that can impact the process, according to policy options and analytical planning methodologies. (Whittington, 1996). For example, gathering data and applying analytical methods improves the validity of conclusions. According to Dean and Sharfman (1996), other factors that "play important roles in influencing decision effectiveness" are environmental instability and the quality of decision implementation. Citroen (2011) emphasized the critical role that information plays in decision-making and found a connection between using precise approaches and possessing complete knowledge. Elbanna (2006) lists several factors, including political behaviour, how the larger context is interpreted, and the existence of process competency, that may have an impact on how decisions are made.

In the dynamic and complex environment of organizations, decision making by managers plays a critical role in shaping the direction and success of the business. However, decisions made by managers are often susceptible to various cognitive biases, leading to suboptimal outcomes and negative consequences for the organization. Cognitive biases, rooted in heuristics and mental shortcuts, can distort judgment, and impair decision-making processes. Understanding the impact of these biases on managerial decisions is essential for improving organizational effectiveness and performance. This paper aims to investigate the influence of cognitive biases on decision making in management context within organizations. There are several models of human behaviour, according to Simon (1993), and the cost and accessibility of information largely determines how applicable any model is. In addition, people gather and analyse data to enhance their comprehension of their surroundings (Daft and Weick, 1984). To become transformative leaders, new managers must acquire and use specific skills to make both global and micro decisions (Caldwell et al., 2012). However, in a situation such as this, decision-makers must be able to do two things: they must be able to see patterns and signals, which enables them to adjust their strategy, business model, and vision; and they must work to meet the objectives of the organization. "Framing effects" might make it difficult to select and analyze large amounts of data and spot patterns, which require specialized cognitive abilities (De Martino, 2006). People make decisions easily; thus, businesses need to investigate how particular choice biases affect the decision-making process in the context of management. Considering that cognitive processes and cognitive biases are considered "valuable metrics for identifying process enhancement activities," careful consideration is needed (Barberà-Mariné et al., 2019).

Additionally, since managers' cognitive processes alter over time and have an impact on how strategically organizations make decisions, entrepreneurs often defy human reason. To identify the critical determinants of strategy formation in mitigating decision biases—especially cognitive ones—the current state of research studies about decision biases and strategic decisions suggests, therefore, a relationship between bounded and constrained rationality, potential biases, and strategic decisions (Hirshleifer, 2008).

Strategic decisions and the biases

Depending on the kind of decision-making process used, the assessment of strategic possibilities may have an impact on strategic decisions. (Amason, 1996; Audia et al., 2000; Baum and Wally, 2003; Eisenhardt, 1989; Schwenk, 1984). Dean and Sharfman, 1996. Strategic decisions can be defined as: (1) assigning the resources and capabilities required to meet strategic objectives; (2) influencing the structure and direction of the organization; and (3) shaping "the course of a firm." Shrivastava and Grant (1985) and Chandler (1962) both take up Simon's (1993) definition of a decision as "a complex social process generally extending over a considerable period of time".

Top level management teams typically commit to long term planning when making strategic decisions, which calls for either reactivity or proactivity in the creation of strategies. The relevant performers must first gather and evaluate all pertinent data to make judgments (Calabretta et al., 2017). This analysis must be done both logically and intuitively.

This implies that heuristics, cognitive biases, interpersonal dynamics, and factors related to diversity, or demographics can all influence how decisions are made. An additional challenge for decision-makers is the need for process efficacy to guarantee that decisions are effectively incorporated into strategy, especially in rapidly evolving markets. Eisenhardt (1999) asserts that

to enhance their ability to identify patterns and obstacles, foster conflict, and swift resolution, hone their strategic thinking, keep a constant pace throughout the process, and impart appropriate and timely behaviour, decision-makers must cultivate collective intuition.

Ultimately, managers must pay close attention to the gathering and selection of data to make the best strategic decisions during a period of changes like digitalization, which generate a vast amount of information. For these reasons, we investigate and comprehend the ways in which decision biases impact the role of strategic decisions; moreover, we concentrate on the setting of phased transition, where the assessment of strategic decisions gets increasingly intricate.

PURPOSE

- To examine the prevalence of cognitive biases in managing decision-making, pinpoint the most common cognitive biases influencing managerial decision-making, and examine the consequences of biases in decision-making.
- To identify the research gaps in the literature with respect to decision making in management.

LITERATURE REVIEW

Studies have connected several cognitive biases to management decision-making, including framing effects, availability heuristic, confirmation bias, anchoring bias, and overconfidence. These predispositions have the potential to cause managers to make poor judgements, inefficient use of resources, and strategic mistakes by causing them to act irrationally or sub optimally. Despite a wealth of studies on cognitive biases, little is known about how they specifically affect organisational settings, especially when it comes to managerial decision-making.

In management, decision-making is a multifaceted process that is impacted by several variables, including cognitive biases. Systematic departures from rationality in judgement and decision making, known as cognitive biases, can provide less than ideal results in organisational contexts (Tversky & Kahneman, 1974). The purpose of this review of the research is to investigate how cognitive biases affect decision-making in management situations by emphasising important biases, their consequences, and mitigating measures.

Decision-Making is crucial in organizational management

Decision-Making is undeniably critical in organizational management, serving as the cornerstone of effective leadership and strategic direction. Decisions made by managers influence various aspects of organizational functioning, including resource allocation, goal setting, and performance evaluation (March & Simon, 1958). Whether it involves day-to-day operational choices or long-term strategic planning, the quality of decision making directly impacts organizational success and sustainability. Moreover, the complexity and uncertainty inherent in today's business environment amplify the significance of decision making, as managers must navigate a myriad of factors and variables to make informed choice. (Eisenhardt & Zbaracki, 1992) Consequently, understanding the principles and processes underlying decision making is essential for managers to effectively lead their organizations toward achieving their objectives. By leveraging empirical research and theoretical frameworks on decision making, managers can enhance their decision-making capabilities and contribute to organizational performance.

Managers often influenced by cognitive biases

Cognitive biases frequently affect managers, and this can have a big impact on how they make decisions in organisational settings. Cognitive biases are innate cognitive tendencies that cause people to consistently stray from making logical decisions and judgements. (Tversky & Kahneman, 1974,1979). These biases can manifest in various forms, such as confirmation bias, anchoring bias, framing effect and overconfidence bias, among others. For example, confirmation bias may lead managers to selectively seek out information that confirms their pre-existing beliefs or hypotheses while disregarding contradictory evidence (Nickerson, 1998). Similarly, anchoring bias may cause managers to overly rely on initial pieces of information or reference points when making decisions, leading to suboptimal results. Cognitive biases have the potential to skew management judgement, impede decision-making procedures, and ultimately impede the effectiveness of organisations. It is imperative that managers identify and mitigate cognitive biases to make well-informed and logical

judgements that are consistent with organisational goals.

Cognitive Biases

Although the term "bias" is used in literature in a variety of ways, it frequently refers to an unreasonable belief that prevents one from making a decision based on available knowledge (Schwenk, 1986; Simon et al., 2000). Some writers claim that behavioural or cognitive biases promote decision-making (Johnson et al., 2013), while others believe that, under specific conditions, cognitive biases are strategies for implementing the best possible behaviours (Marshall et al., 2013).

Cognitive biases are commonly characterized as "cases in which human cognition reliably produces representations that are systematically distorted compared to some aspect of objective reality" (Haselton et al., 2015). According to Das and Teng (1999), "cognitive biases are an ever-present ingredient of strategic decision-making." To be more specific, they classified cognitive biases into four categories: (1) illusion of manageability; (2) previous beliefs focused on limiting aims; and (3) insensitivity to outcome likelihood. Cognitive biases have already been identified as essential elements in strategic planning and decision-making (James and Barnes, 1984; Schwenk, 1986; Busenitz and Barney, 1997; Hodgkinson et al., 1999; Deligonul et al., 2008). Furthermore, it appears that entrepreneurs have a diverse set of personal qualities, including perceptions, beliefs, and prejudices (Shepherd and Williams, 2015). Several performance metrics, including logical sufficiency, accuracy, and processing speed, can be used to detect cognitive biases (Haselton et al., 2015).

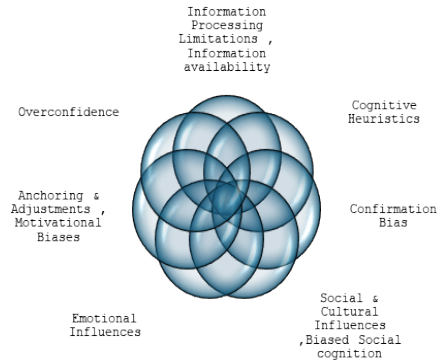
Given that cognitive biases appear to be a recurring theme in the literature framework, and, more importantly, because they meet Barberà-Mariné et al.'s (2019) criteria, making them "useful measurements for detecting process improvement actions," more attention is being paid to their role. Traits such as risk perception (Simon et al., 2000) and illusion of control (Keh et al., 2002) have an impact on one's ability to perceive, seize, and adjust strategic decisions.

The role of cognitive biases

The hypothesis that managers interpret the environmental transformations they face based on their experiences, values, and perception informs their decision-making process has led several authors to study the relationship between individual traits and the formulation of strategic decisions within organizations. In terms of how entrepreneurial cognition changes over time, for instance, several authors have demonstrated that entrepreneurs are not cognitively homogeneous; it is emphasized that younger managers tend to be more overconfident than their older colleagues. Moreover, different cognitive biases influence how certain events are understood in different ways. These biases are defined as "common types of mental shortcuts used to make judgments" (Simon et al., 2000).

Thus, certain team behaviours and talents are produced by cognitive biases (Wiersema and Bantel, 1992). More generally, decision-making is associated with the use of biases and heuristics since "different individuals may utilize biases and heuristics to different degrees" (Busenitz and Barney, 1997). In particular, the authors asserted that managers in large businesses tend to be less representative in decision-making than entrepreneurs, who also exhibit greater levels of overconfidence.

Various causes of cognitive biases are highlighted in following figure



Amason (1996) asserts that affective conflicts weaken decisions while cognitive conflicts strengthen them. These conflicts come up when decisions are being made. Hunt et al. (1989) investigated the relationship between analytic, intuitive, and mixed-in-type cognitive styles and the frequency with which a person selects or supports analytic advisors during three phases of a simulated decision-making process. Olson et al.'s 2007 study on cognitive diversity attempted to show how

different viewpoints can lead to constructive conflicts, which in turn have a beneficial effect on decision-making. (Meisner and Wulf, 2017) investigated the same cognitive variety and found potential avenues for enhancing strategy process outcomes. (Miller et al. 1998) asserted that executive diversity has an indirect effect on company performance and discovered a negative correlation between comprehensiveness and cognitive diversity. A relationship between decisions and risk perception appears during the decision-making process, according to Simon et al. (2000); in this scenario, cognitive biases are the main determinant of risk levels. Even (Keh et al. ,2002) investigated the inverse link between the assessment of opportunities and the perception of risk. Specifically, the authors noted that two cognitive biases influencing entrepreneur's perceptions of opportunity evaluation are the illusion of control and belief in the law of small numbers. Additionally, cognitive biases including overconfidence and the illusion of control were explored by (Simon et al. ,2000).

According to Hodgkinson et al. (1999), to minimize biases, cognitive mapping must be done before making decisions. In their 2003 study, Crossan and Berdrow examined how organizational learning affects strategy, paying particular attention to the discovery and utilization stages. Additionally, they discovered that when leadership techniques inhibit interpersonal conflict, there is a larger strategic consensus, and that organizational learning is linked to changes in cognition and behaviour. In their 2000 study, Khatri and Ng explored the function of intuition in strategic decision-making, showing that it is more frequently applied in extremely uncertain situations. (Halpern ,1989) highlighted that highly dependable firms, where minimizing human errors is crucial, have decision-making processes that are swift and precise.

Impact of Cognitive biases in decision making

The impact of cognitive biases on decision making is profound and far-reaching, affecting individuals, organizations, and society. Cognitive biases, inherent in human cognition, can lead decision makers to deviate from rational judgment and make systematic errors in their decision-making processes (Tversky & Kahneman, 1974). These biases influence various aspects of decision making, including information processing, risk assessment, and choice selection (Kahneman & Tversky, 1979). For instance, confirmation bias, where individuals selectively seek out information that confirms their pre-existing beliefs, can result in the overlooking of contradictory evidence, and reinforce flawed decisions (Nickerson, 1998). Similarly, overconfidence bias may cause decision makers to overestimate their abilities and underestimate risks, leading to suboptimal outcomes (Moore & Healy, 2008). Additionally, anchoring bias, where decisions are disproportionately influenced by initial reference points, can constrain the consideration of alternative options, and distort decision outcomes (Tversky & Kahneman, 1974). The cumulative effect of these biases can lead to poor decision outcomes, missed opportunities, and organizational inefficiencies. Recognizing and mitigating cognitive biases is therefore essential for improving decision-making effectiveness and achieving better organizational performance.

Confirmation Bias

Confirmation bias in management contexts can significantly impact decision-making processes and outcomes. This bias is the propensity for people to ignore contradicting data in favour of information that supports their preexisting views or assumptions (Nickerson, 1998).

In managerial decision-making, confirmation bias can lead to selective information processing, where managers favour data that supports their initial assumptions, leading to skewed analyses and flawed conclusions (Baron, 2008). For example, a manager may selectively interpret market data to support the launch of a new product while ignoring indicators suggesting potential market saturation. This bias can result in poor decision outcomes, missed opportunities, and increased organizational risks. Addressing confirmation bias in management requires awareness-building efforts, such as training programs, that help managers recognize and challenge biased information processing. Additionally, fostering a culture that encourages constructive debate and the consideration of alternative viewpoints can help mitigate the impact of confirmation bias on decision-making processes.

Points highlighted in this bias are:

- Prevalent among managers, leading to selective information processing.
- Influences decision outcomes by reinforcing preconceived beliefs.

Overconfidence

Overconfidence bias in management contexts can significantly influence decision-making processes and organizational outcomes. This bias is the tendency for managers to exaggerate their own skills, expertise, or chances of success while making decisions (Moore & Healy, 2008). Overconfidence bias can result in excessive risk-taking, inadequate assessment of uncertainties, and disregard for potential dangers while making managerial decisions (Kahneman & Lovallo, 1993). For example, a manager might exhibit overconfidence in the success of a new product launch, leading to the allocation of excessive resources without fully evaluating market demand or competitive factors. This bias can result in strategic errors, financial losses, and missed opportunities for the organization. Addressing overconfidence bias in management requires interventions such as training programs to raise awareness of the bias and its potential consequences. Additionally, implementing decision support tools and encouraging a culture of constructive scepticism can help mitigate the impact of overconfidence bias on decision-making processes.

A ubiquitous cognitive bias known as overconfidence bias affects people's decisions and choices in a variety of contexts and plays a major role in decision making. The nature of overconfidence bias, its underlying mechanisms, its ramifications for decision-making, and methods to lessen its impacts are all covered in this essay. The propensity for people to overestimate their skills, expertise, or the veracity of their conclusions is known as overconfidence bias (Moore & Healy, 2008). It can take many different forms, such as overestimating one's abilities, expertise, and chances of success in unknown circumstances.

The mechanisms underlying overconfidence bias are complex, often stemming from cognitive and motivational factors. Cognitive factors include selective attention to positive information, faulty self-assessment, and the availability heuristic, where individual's base judgments on readily available information (Kahneman & Lovallo, 1993). Motivational factors, such as the desire for self-enhancement or the need to maintain a positive self-image, also contribute to overconfidence bias.

Overconfidence bias can have profound implications for decision making, particularly in managerial contexts. Managers affected by overconfidence bias may make overly optimistic assessments of their projects or initiatives, leading to excessive risk-taking and strategic errors (Bazerman & Moore, 2009). This bias can also hinder effective collaboration and innovation within organizations, as overconfident individuals may dismiss alternative viewpoints or feedback from others.

Mitigating overconfidence bias requires awareness-building efforts and strategies to promote more cautious decision making. Implementing decision support tools, fostering a culture of open dialogue and constructive criticism, and encouraging managers to consider multiple perspectives can help counteract the negative effects of overconfidence bias (Russo & Schoemaker, 1992).

In conclusion, overconfidence bias poses a significant challenge to decision making, influencing individuals' judgments and choices in various domains. Understanding the nature of overconfidence bias, its underlying mechanisms, and implications for decision making is essential for promoting more informed, rational decision-making processes. By implementing strategies to mitigate overconfidence bias, organizations can enhance decision-making effectiveness and achieve better outcomes. Points highlighted in this bias are:

- Managers exhibit overly optimistic views of their abilities and outcomes.
- Results in excessive risk-taking and failure to consider uncertainties.

Overconfidence bias, a prominent cognitive bias, refers to the tendency of individuals to overestimate their abilities, knowledge, or the accuracy of their judgments (Moore & Healy, 2008). This bias leads people to have excessive confidence in their beliefs or decisions, often disregarding or underestimating potential risks or uncertainties (Kahneman & Lovallo, 1993).

In the context of management, overconfidence bias can have significant implications for decision-making processes and organizational outcomes. Managers affected by overconfidence bias may exhibit a misplaced sense of certainty in their strategic plans or business initiatives, leading them to take on overly ambitious projects or initiatives without fully assessing the associated risks (Bazerman & Moore, 2009). This can result in costly mistakes, missed opportunities, and negative repercussions for the organization. Overconfidence bias can also impact interpersonal dynamics within organizations. For instance, overconfident managers may be less receptive to input or feedback from subordinates, believing their own judgments to be superior. This can hinder effective collaboration, diminish employee morale, and impede innovation within the organization.

Mitigating overconfidence bias requires awareness-building efforts and strategies to encourage more cautious decision making. Implementing decision support tools, fostering a culture of open dialogue and constructive criticism, and encouraging managers considering other points of view might assist mitigate the detrimental impacts of overconfidence bias in management contexts. (Russo & Schoemaker, 1992).

In conclusion, overconfidence bias poses a significant challenge to decision making in management, impacting both individual managers and organizational performance. Recognizing and addressing this bias is essential for promoting more informed, rational decision-making processes and achieving better outcomes within organizations.

Framing Effect

The framing effect is one type of cognitive bias or thinking error. It illustrates how information presentation has a big impact on how decisions are made. Because leaders' framing of circumstances has a disproportionate impact on how teams perform, framing aids in team alignment. "Framing" refers to the presentation of an option as either a gain (positive) or a loss (negative). People are frequently biased to select the choice they see as a gain over the one they consider a loss, even when both options lead to the same result.

It is the technique of influencing someone's decisions depending on the mental image you have conjured up. A skilled leader may boost sales and employee motivation by using framing. The framing effect postulates that our judgments are influenced by the language, situations, and circumstances in which they are presented.

It is the phenomena where people's decisions are impacted more by the presentation or framing of information than by the information itself (Tversky & Kahneman, 1981). The framing effect draws attention to the psychological biases present in decision-making by showing how little alterations in language or context can result in different choices.

The framing effect operates through several cognitive mechanisms, including the manipulation of reference points, risk perception, and the use of heuristics. Individuals tend to anchor their decisions on initial reference points presented to them, leading to biased judgments (Tversky & Kahneman, 1981). Moreover, framing can influence how individuals perceive risks, with positively framed messages leading to risk-averse choices and negatively framed messages resulting in risk-seeking behaviour. In management contexts, the framing effect can significantly influence decision-making processes and outcomes. For example, presenting a decision as a potential gain may lead managers to take a more risk-averse approach, while framing the same decision as a potential loss may encourage more risk-taking behaviour (Kahneman & Tversky, 1979). Additionally, it can influence perceptions of risk, resource allocation, and strategic priorities within organizations. Addressing the framing effect in management requires awareness-building efforts, such as training programs, to help managers recognize how framing can bias their decisions. Furthermore, providing decision-making frameworks that encourage considering multiple perspectives and framing options in different ways can help mitigate the impact of the framing effect on decision-making processes.

The framing effect manifests in various real-world scenarios in management, such as advertising, public policy, and healthcare. For instance, marketers often use positively framed messages to promote products, emphasizing the benefits and gains associated with their use (Levin et al., 1998). In public policy, policymakers

may frame issues in ways that evoke emotional responses or highlight certain aspects to sway public opinion and garner support for their initiatives. In healthcare, the framing of medical information can influence patient preferences and treatment decisions (McNeil et al., 1982). The framing effect has significant implications for decision making across diverse domains. It can lead individuals to make choices that are not necessarily in their best interest, as decisions are influenced by the presentation of information rather than its substance. Moreover, the framing effect can exacerbate biases and distort perceptions, leading to suboptimal outcomes and decision errors.

Mitigating the framing effect requires awareness-building efforts and strategies to promote more rational decision making. Individuals can learn to recognize framing techniques and critically evaluate information presented to them. Decision support tools, such as decision trees or scenario analysis, can also help individuals make more informed choices by systematically considering different framing perspectives (Kühberger et al., 1999).

In conclusion, understanding the mechanisms underlying the framing effect and its implications for decision making, individuals can become more adept at recognizing and mitigating its influence. By promoting awareness and employing strategies to counteract framing biases, individuals can make more informed, rational decisions across various contexts.

Implications for Organizational Performance

The implications of addressing cognitive biases for organizational performance are significant and multifaceted. By recognizing and mitigating cognitive biases, organizations can enhance various aspects of performance, including decision-making effectiveness, strategic planning, risk management, and innovation. Improved decision-making effectiveness leads to better strategic choices and more informed resource allocation, ultimately contributing to organizational success (March & Simon, 1958). Moreover, addressing biases in strategic planning processes ensures that decisions are based on objective analysis and consideration of alternative perspectives, enhancing the organization's ability to adapt to changing market conditions and achieve its long-term objectives (Mintzberg, 1994). Mitigating biases in risk management processes enables organizations to accurately assess and mitigate potential risks, reducing the likelihood of costly errors and improving overall resilience (Kahneman & Tversky, 1979). Additionally, fostering a culture that encourages critical thinking and diverse viewpoints stimulates innovation and creativity, driving competitive advantage and long-term growth (West, 2002). Overall, addressing cognitive biases has profound implications for organizational performance, shaping its ability to navigate challenges, capitalize on opportunities, and achieve sustainable success.

- **Cognitive biases can lead to suboptimal decisions and hinder performance**

Cognitive biases, inherent in human decision-making processes, have been widely recognized as significant contributors to suboptimal decisions and performance hindrances within organizational contexts (Kahneman & Tversky, 1974). These biases, stemming from heuristic mental shortcuts and subjective interpretations of information, often lead decision makers to deviate from rational decision-making principles. For instance, confirmation bias, where individuals seek information that confirms their existing beliefs, can result in the neglect of contradictory evidence and the reinforcement of flawed decisions (Nickerson, 1998). Similarly, overconfidence bias leads decision makers to overestimate their capabilities and underestimate risks, leading to excessive risk-taking and strategic errors (Moore & Healy, 2008). Anchoring bias, another prevalent cognitive bias, influences decision makers to rely heavily on initial pieces of information, limiting the exploration of alternative options and distorting decision outcomes (Tversky & Kahneman, 1974). These biases collectively contribute to suboptimal decision making, hindering organizational performance, and impeding the achievement of strategic objectives (Dane & Pratt, 2007). Thus, understanding and mitigating cognitive biases are imperative for organizations to enhance decision-making effectiveness and improve overall performance.

- **Addressing biases improves decision-making effectiveness and organizational outcomes.**

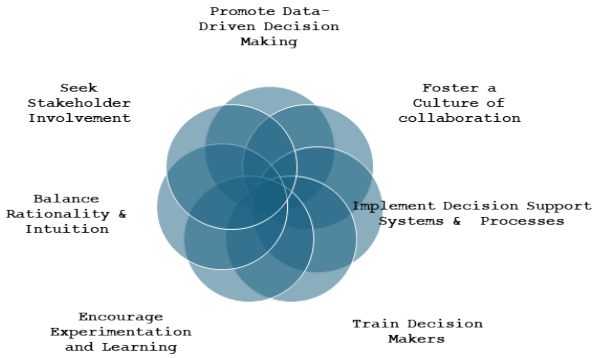
Addressing cognitive biases is crucial for improving decision-making effectiveness and enhancing

organizational outcomes. By implementing strategies to mitigate biases, organizations can foster a more rational and evidence-based decision-making process, leading to better outcomes and performance. For instance, training programs aimed at raising awareness of cognitive biases among decision makers can help individuals recognize and challenge biased thinking patterns (Stanovich & West, 2000). Additionally, decision support tools, such as decision trees or scenario analysis, can provide decision makers with structured frameworks for considering multiple perspectives and reducing the influence of biases (Klein et al., 2003). Moreover, fostering a culture of open-mindedness, constructive debate, and diversity within decision-making teams can help mitigate groupthink and reduce the impact of biases on collective decision outcomes (Janis, 1972). By proactively addressing cognitive biases, organizations can improve their decision-making effectiveness, enhance strategic planning processes, and ultimately achieve better organizational outcomes.

- **Mitigating biases enhances strategic planning, risk management, and innovation.**

Mitigating cognitive biases not only improves decision-making effectiveness but also enhances various aspects of organizational function, including strategic planning, risk management, and innovation. Organisations can promote a more logical and evidence-based decision-making process, which will improve performance and results, by putting measures to reduce biases into practice. (Mintzberg, 1994). Additionally, mitigating biases in risk management processes enables organizations to assess and mitigate potential risks, leading to more informed decision-making and reduced exposure to unforeseen threats (Kahneman & Tversky, 1979) more accurately. Furthermore, by fostering an environment that encourages critical thinking and diverse viewpoints, organizations can stimulate innovation and creativity, as individuals are more likely to challenge conventional wisdom and explore novel solutions (West, 2002). Overall, mitigating cognitive biases not only improves decision-making processes but also enhances strategic planning, risk management, and innovation, thereby contributing to organizational success and competitiveness.

Following figure highlights recommendations for improved decision making



Practical implications

There are implications for academics and professionals who wish to assess how particular decision-making factors affect the formulation and application of strategic decisions. In this way, it highlights the need of decision-makers controlling their cognitive biases and choosing the appropriate data from a large collection to adjust to different changes.

Mitigation Strategies

Addressing cognitive biases is essential for improving decision-making effectiveness in management. Mitigation strategies may include raising awareness among decision makers, implementing decision support tools, and fostering a culture of critical thinking and constructive debate (Stanovich & West, 2000; Klein et al., 2003).

Cognitive biases pose significant challenges to decision making in management context, affecting organizational performance and strategic outcomes. Understanding these biases, their implications, and strategies to mitigate their effects are essential for promoting rational decision making and enhancing organizational effectiveness.

APPROACH /METHODOLOGY

This paper reviews existing academic and scholarly literature thru research publications with majorly from Scopus Indexed Journals and few others to organise and summarize the findings and provide insights on the existing work done on the cognitive biases in decision making in organizations. The review of existing works shall synthesize knowledge, contextualize the research,

and identify the research gaps where knowledge addition can be done. It will influence the direction of future research by highlighting emerging trends & unresolved questions.

KEY FINDINGS

Cognitive biases are prevalent in decision-making in organizations. Overconfidence bias along with confirmation bias & framing effect are studied in this paper which are prominently indicated out in literature review affecting the organizational decision making in management. Implications of biases in organizational performance is studied and the research gap and directions for further study are indicated.

- **Significant biases indicated in this paper in management context**

According to Moore and Healy (2008), overconfidence bias is the propensity for people to overestimate their skills or the veracity of their opinions. When it comes to management, overconfidence bias can result in poor decision outcomes, excessive risk-taking, and inadequate uncertainty assessment (Kahneman & Lovallo, 1993).

Most common cognitive bias in decision-making is confirmation bias, where people prefer to ignore contradicting data in favour of information that supports their preexisting ideas. (Nickerson, 1998). In management, confirmation bias can lead to the selective processing of information, reinforcing preconceived notions, and hindering objective decision making (Baron, 2008). The framing effect is a cognitive bias that affects people in management when they are presented with options and decide between them based on whether they have positive or negative connotations.

Implications for Organizational Performance

The impact of cognitive biases on decision making has significant implications for organizational performance. Biased decision making can lead to strategic errors, financial losses, and missed opportunities, ultimately affecting the competitiveness and sustainability of organizations (Eisenhardt & Zbaracki, 1992).

The consequences of cognitive biases on managerial decisions are far-reaching. Firstly, it can limit creativity and innovation by stifling alternative perspectives and ideas. When managers only focus on confirming evidence, they neglect potentially valuable insights from dissenting voices or critical feedback. Our ability to make decisions can be significantly impacted by cognitive bias. Implicit bias can lead to erroneous logic, bad decision-making, and inefficient problem-solving. These prejudices often impair our judgment, warping our views and keeping us from considering all our options and opposing points of view. Discrimination against individuals or groups based on their ethnicity, gender, age, religion, or other characteristics can result from workplace bias. This can show up in choices about employment, promotions, and chances for professional growth, leading to unfair treatment and a lack of diversity in the workplace. Both internal (like perception) and external (like digitalization) elements impact and facilitate decision-making. In particular, the strategic significance of cognitive biases seems to be critical when examining the associated influence on strategic decisions in times of environmental transformation.

- **Research Gap & Directions for future study**

There are two identified research gaps. The first is the disregard for individual variations in cognitive biases; not all managers are equally susceptible to biases. The second is not carrying out analyses tailored to a particular industry, which would have otherwise shown subtle variations in the effects of cognitive biases.

Subsequent research endeavours may be able to pinpoint a particular environmental transformation situation where cognitive biases significantly impact strategic decision-making. The emergence of big data, for example, provides an illustrative framework for assessing the function of reasoning and judgement. Citroen (2011) and Speier et al. (1999) claim that information overload influences strategic choices. In this way, the equilibrium between logical and intuitive decision-making is being upset by the rise of big data and the move towards data-driven enterprises (Calabretta et al., 2016). For these reasons, it is recommended that future research investigate the circumstances in which cognitive biases pose a legitimate obstacle to the development and application of strategic judgements. With a particular emphasis on the big data role and the digitalization context, future research might explore the role of specific cognitive biases in each proposed decision-making process.

RESULTS & DISCUSSION

The thorough investigation showed that managerial decision-making processes throughout all firms are rife with cognitive biases. The most common biases were overconfidence bias, which occurs when managers have an inaccurate and misleading opinion of our abilities, intelligence, or aptitude, and confirmation bias, which occurs when managers look for data to support their preexisting notions. Managers tended to be overconfident, which resulted in excessive risk-taking and inadequate assessment of uncertainty. The Framing effect comes in second. These prejudices weakened strategic goals, raised organizational risks, and resulted in less-than-ideal actions. Research suggests that risky-choice (gain/loss) framing effects and overconfidence influence management decision-making. Managers need to come up with targeted, practical solutions to lessen the impact of cognitive biases on judgment.

March and Shapira (1987) conducted a review on managers' perceptions of risk and found that most managers (1) believe they take calculated risks and are less risk-averse than their peers, (2) see risk as largely controllable, and (3) credit knowledge and skill for this controllability. We propose that specific and reliable measures of cognitive biases need to be created or enhanced to solve that problem.

The findings highlight the critical need for organizations to address cognitive biases in decision making to improve performance and achieve strategic goals. Strategies for mitigating cognitive biases include enhancing decision maker's awareness through training and education, implementing decision support systems to counteract biases, promoting diversity in decision-making teams to reduce groupthink, and fostering a culture that encourages critical thinking and constructive dissent. By recognizing and mitigating cognitive biases, organizations can enhance the quality of decision making, mitigate risks, and gain a competitive advantage in today's complex business environment. Points of discussion are as below:

- **Cognitive biases have significant impact on how organisations make decisions**

Cognitive biases have significant implications for decision making in organizations, influencing the quality, effectiveness, and outcomes of managerial decisions. These biases, stemming from innate cognitive processes, can lead decision makers to deviate from rational decision-making principles and distort their judgment (Tversky & Kahneman, 1974). Confirmation bias, for example, occurs when people look for evidence to support their preconceived notions. This can lead to biased information processing and the disregard of contradicting data (Nickerson, 1998). According to Moore and Healy (2008), decision-makers who suffer from overconfidence bias may also overestimate their own talents and underestimate hazards, which can result in overly optimistic decisions and a higher risk of making mistakes. Furthermore, the investigation of other possibilities and the results of decisions might be restricted by anchoring bias, which occurs when decisions are unduly impacted by starting reference points (Tversky & Kahneman, 1974). All these cognitive biases influence how decisions are made in companies, which emphasizes the need for interventions to lessen their effects and increase the efficacy of decision-making.

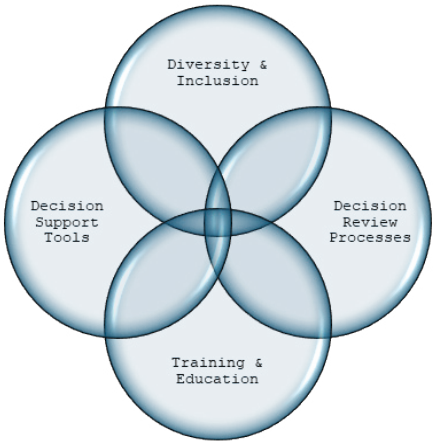
- **Awareness and mitigation strategies are essential to counteract biases**

Awareness and mitigation strategies are essential to counteract cognitive biases and improve decision-making processes in organizations. Increasing awareness among decision-makers about the existence and impact of cognitive biases enables them to recognize and challenge biased thinking patterns (Stanovich & West, 2000). This awareness empowers individuals to adopt a more critical and analytical approach to decision making, thereby reducing the influence of biases. Additionally, by using mitigation strategies like diverse decision-making teams, debiasing techniques, and decision support technology, the impact of cognitive biases can be reduced (Klein et al., 2003).

For example, decision support tools provide decision-makers with structured frameworks for evaluating options and reducing the influence of biases, while diverse decision-making teams can offer different perspectives and counteract groupthink (Janis, 1972). By prioritizing awareness and mitigation strategies, organizations can enhance decision-making effectiveness and improve overall performance.

- **Strategies may include training programs, decision support tools, and fostering a culture of critical thinking**

Organisations can use a variety of strategies to reduce cognitive biases in decision-making, such as critical thinking culture development, decision support systems, and training initiatives. Decision-makers can be equipped with the knowledge and abilities to identify and confront biassed thought patterns through training programmes designed to increase their awareness of cognitive biases (Stanovich & West, 2000). Furthermore, decision-support technologies can help decision-makers reduce the impact of biases and systematically evaluate possibilities. Examples of these tools include software applications and structured decision-making frameworks (Klein et al., 2003). Furthermore, encouraging an environment of critical thinking, receptivity, and productive discussion within the company can motivate people to challenge presumptions, question received wisdom, and consider other points of view (Janis, 1972). By putting these tactics into practice, organisations can improve decision-making efficiency and overall performance.



CONCLUSION

In conclusion, cognitive biases present serious obstacles to making wise decisions in organisational management settings. In terms of creating the appearance of control, managers tend to overestimate their skills. The importance of identifying and addressing these biases is emphasised in this paper as a means of enhancing decision-making processes and organisational effectiveness.

Organisations can reduce the detrimental effects of cognitive biases and make better, more logical judgements by putting the right mitigation methods into place. This will provide them a competitive advantage in the market. Future studies should assess the long-term efficacy of mitigation techniques as well as investigate other aspects impacting cognitive biases in organisational settings. Concluding highlights are brought out as below:

- **Cognitive biases influence decision making in management within organizational contexts**

Cognitive biases exert a significant influence on decision making in management within organizational contexts. These biases, rooted in the innate cognitive processes of individuals, often lead managers to deviate from rational decision-making principles, resulting in suboptimal outcomes (Tversky & Kahneman, 1974). For example, confirmation bias, where managers seek information that confirms their pre-existing beliefs, can lead to the overlooking of contradictory evidence, and reinforce flawed decisions (Nickerson, 1998). Overconfidence bias may cause managers to underestimate risks and overestimate their abilities, resulting in overly optimistic decision making (Moore & Healy, 2008). Additionally, anchoring bias, where decisions are disproportionately influenced by initial reference points, can limit the exploration of alternative options, and distort decision outcomes (Tversky & Kahneman, 1974). These cognitive biases collectively shape managerial decision making within organizational contexts, highlighting the need for interventions to mitigate their impact and improve decision-making effectiveness.

- **Awareness and mitigation are crucial for improving decision outcomes and organizational performance.**

Awareness and mitigation of cognitive biases are essential for improving decision outcomes and enhancing organizational performance. By increasing awareness of cognitive biases among decision-makers, organizations can empower individuals to recognize and challenge biased thinking patterns, leading to more objective and rational decision-making processes (Stanovich & West, 2000). Furthermore, introducing mitigation methods such as decision support systems and training programs can arm decision-makers with

the tools and skills they need to effectively combat biases (Klein et al., 2003). Moreover, fostering a culture that encourages critical thinking, open-mindedness, and constructive debate can further facilitate the mitigation of biases and improve decision outcomes (Janis, 1972). Overall, awareness and mitigation of cognitive biases play a key role in enhancing decision outcomes and driving organizational performance.

Following figure brings out the results in decision making when biases are addressed

- **Organizations must prioritize efforts to address biases and foster a culture of rational decision making.**

Organizations must prioritize efforts to address biases and encourage a culture of rational decision making to mitigate the negative impacts of cognitive biases on organizational performance. Implementing strategies to counteract biases, such as training programs to raise awareness among employees and decision-makers, can help individuals recognize and mitigate biased thinking patterns (Stanovich & West, 2000). Furthermore, organizations can introduce decision support tools and frameworks that promote systematic and evidence-based decision making, reducing the influence of cognitive biases (Klein et al., 2003). Furthermore, cultivating a culture that encourages critical thinking, constructive debate, and diversity of viewpoints can assist reduce groupthink and improve decision-making quality (Janis, 1972). By prioritizing efforts to address biases and cultivate a culture of rational decision making, organizations can improve decision outcomes, enhance strategic planning processes, and ultimately achieve better management and organizational performance.

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