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Management is Synergy

The Journal of Indian Management & Strategy

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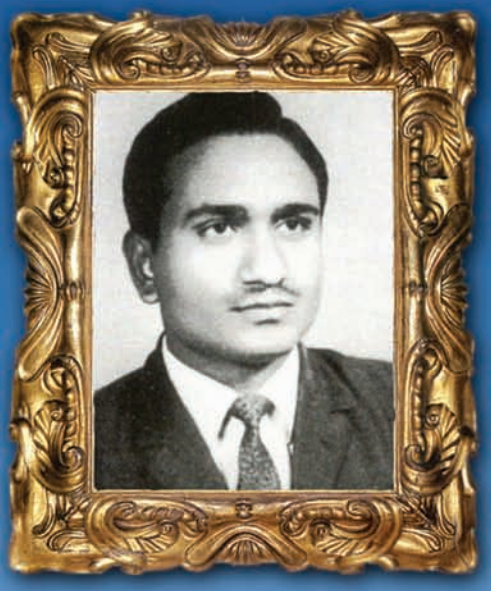
A TRUE VISIONARY

"You see things and you say **Why***? But I dream of things that never were and say* **Why** *not?"*

- George Bernard Shaw



Shri Jagannath Gupta
(1950 - 1980)

Also a true visionary...who dared to dream!
He lives no more but his dreams live on....and on!

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And more dreams to come!

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Editor's Desk

Re-election of Donald Trump as President of the United States introduces a complex dynamic to global trade

The re-election of Donald Trump as President of the United States heralds a significant shift in the global trade landscape, marked by heightened protectionism and potential economic volatility. His aggressive trade policies, characterized by substantial tariffs and a preference for bilateral agreements, challenge established norms of international commerce. While these strategies aim to protect American industries and jobs, they carry the risk of escalating trade tensions and destabilizing the global economy.

Trump's trade agenda notably includes imposing a 25% tariff on steel and aluminum imports from March 4, 2025, aimed at safeguarding domestic manufacturers. However, this move risks triggering retaliatory tariffs from affected countries, such as Canada, Mexico, Brazil, Germany, and South Korea, potentially leading to a global trade war. The reciprocal tariff strategy, aimed at leveling the playing field, could raise taxes on imported goods, impacting consumers and businesses worldwide.

Financial institutions have reacted with caution, with JPMorgan advising investors to lower their stock market expectations due to rising U.S. bond yields, inflation, and the looming risk of trade conflicts. These economic uncertainties, combined with potential disruptions to global supply chains, could lead to slower global trade growth and increased costs for consumers.

India, as a significant trade partner of the U.S., faces particular challenges under Trump's protectionist policies. Historically, the U.S. has criticized India's high tariffs and trade surplus. In response, India may face pressure to lower its trade barriers and increase imports of American goods, including energy and defense equipment. However, this could impact domestic industries and create economic imbalances. Additionally, any restrictive immigration policies concerning H-1B visas could affect India's skilled labor market.

While there are opportunities for enhanced Indo-U.S. economic ties, India must navigate this evolving trade landscape carefully, balancing national interests with external pressures. Globally, Trump's return to power signals a move away from multilateral trade agreements toward protectionism, necessitating cautious diplomacy to maintain international economic stability.

Madhu Vij

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MAPPING THE LANDSCAPE OF LOGISTICS AND FREIGHT TRANSPORTATION IN INDIA: A BIBLIOMETRIC ANALYSIS AND LITERATURE REVIEW

Prof (Dr.) Shikha Gupta* Shubham Bansal**

Purpose: *The logistics industry in India is rapidly evolving with developments in supply chain models, infrastructure, and automation techniques. The goal of the current study is to examine the existing body of literature in the domain of Indian logistics and freight transportation in order to provide metrics for evaluating publications,current standing, prominent focus areas, changing research patterns and provide guidance for future studies.*

Design/methodology/approach:*A sample of 139 documents were extracted from Scopus database post application of inclusion exclusion criteria and subjected to bibliometric methodologies such as evaluation of performance, citation patterns, trend identification, and thematic visualization. Citation analysis was employed to determine the leading significant publications, writers, and journals.*

Findings:*The research on Indian logistics and freight transportation began in 1999 and the last five yearsexperienced significant increase in the research publications. 'The Emerald Emerging Markets Case Studies' was the most productive journal, whereas, Kumar A. was found to be the most productive author. Thematic and content analysis of the publications provided insights about future research directions. The two most developed themes in the domain are Economies Growth and Logistics India. The study notes that there is a need for research in the areas of Sustainable green, Modelling barriers, and Smart decision making.*

Originality/Value: *In addition to providing crucial insights on the current state of research, the study offers recommendations for subsequent studiesand can be used by regulators, practitioners and scholars to achieve their ends.*

Keywords : Logistics, Freight, Transportation, supply chain, India, bibliometric analysis, content analysis, Scopus database, thematic mapping
JEL Code: *C880, R410, Q010*

I. Introduction and Research Questions

Logistics and freight transportation play a vital role for supply chains, which enables the movement of goods worldwide. An efficient logistics and freight transportation system aids in streamlining operations, ensures timely deliveries, and reduces inventory costs. By linking producers with consumers globally, it fuels business growth and connect businesses of all sizes with customers across different regions. An efficient transportation ensures product quality, enhancing customer satisfaction and brand loyalty. Moreover, smooth logistics networks facilitate international trade, promoting economic integration globally (G. Sinha, 2016).

In India, the logistics sector is undergoing a rapid evolution driven by technology, infrastructure advancements, and emerging service providers. The sector is dynamic, presenting both opportunities and challenges. Technological advancements provide avenues for enhanced operational efficiency and competitive advantage (N. Chaudhari, 2019). Through innovative organizational structures, management techniques, and effective implementation strategies, companies can harness technology for logistics innovation. Furthermore, India's thriving e-commerce industry offers logistics providers the opportunity to meet increasing demand for efficient last-mile delivery and tailored supply chain solutions for online retailers.

However, there are certain challenges that hinder efficiency and performance of this sector. Inadequate transportation infrastructure, congested roads, outdated rail networks, and inefficient port facilitieslead to delays, increased costs, and reduced productivity. Additionally, regulatory complexities, such as cumbersome documentation procedures and differing state-level regulations, create significant hurdles for

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seamless freight movement across the country (P. Chandra,2007). The absence of standardized protocols and interoperability among different modes of transport adds to the industry's inefficiencies, resulting in a fragmented supply chain. (C. Thaller et al.,2012) These obstacles not only impede the free movement of commodities but also diminish the competitiveness of Indian companies in the global market. Addressing these challenges is imperative to unlock the full potential of India's logistics sector and stimulate economic growth.

Lately, the Government of India has undertaken initiatives and introduced policy reforms to address the challenges. These efforts involve investments in upgrading transportation infrastructure, including dedicated freight corridors, modernizing ports and airports, and expanding road and rail networks. These upgrades aim to lower transportation costs and enhance connectivity. Policy reforms also aim at promoting multimodal transportation and boosting the use of alternative modes like inland waterways and coastal shipping (P. Chandra,2007). Still, there is a need to tackle infrastructure deficits in transportation, warehousing, and terminal infrastructure to fully benefit from these improvements. Leveraging these initiatives and implementing additional reforms can help in creating a stronger, more efficient, and competitive logistics and freight transportation ecosystem in India. In this context, numerous research studies have been conducted in India and views have been expressed by many research enthusiasts that focus on building efficient transportation models, enhance coordination and adopting new methods of innovation in supply chains.

The principal objective of this research is to provide a comprehensive bibliometric examination of the literature relating to logistics and freight transportation studies in India. It aims to understand the conceptual underpinnings of the sector, identify present research themes and suggest potential areas for scholarly exploration to bridge the research void. To achieve this, we direct our attention tothe research questions listed below:

RQ1: What are thepresent publishing patterns pertaining to the field of freight transportation and logistics research in India?

RQ2: Which publications, authors, and journals have significantly contributed to the body of knowledge?

RQ3: What are the significant themes in the domain that are subject of scholarly interest?

RQ4: What are potential trajectories that future research should pursue?

To address the mentioned questions, the study is organized into sections, which include thepresent one that forward the conceptual framework of the sector illuminating the opportunities and issues thatarise owing to evolving technology and infrastructure advancements. Section 2 details the research approach utilized for extracting, cleaning, and preparing data. Section 3 presents the results of bibliometric and content analysis, while Section 4 offers recommendations for futureresearch. Section 5 summarizes and highlights the conclusions of the study while the shortcomings are acknowledged in Section 6.

II. Research Methodology

2.1 Bibliometric Software

The paper uses bibliometric analysis to examine existing research on Indian logistics and freight transportation. Bibliometrics is a scientific discipline that uses many mathematical and statistical techniques to impartially examine and analyse a given dataset. It is the most appropriate method to deal with big volume of data, spanning from several hundred to several thousand papers (Donthu et al., 2021). Few bibliometric analysis softwares, like Citespace, Pajek, BibExcel, and others are freely accessible on the internet. Each one of them have their own pros and cons in comparison to the others. The study employs the R-studio software's biblioshiny programme (Aria and Cuccurullo, 2017) to achieve research objectives. A thorough assessment of data characteristics, including trends in production within the discipline, leading journals, prolific authors, key organizations, regional and international citations, commonly used keywords, and more can be attempted via the Biblioshiny application, an innovative web-based tool (Moral-Munoz et al., 2020; Xie et al., 2020).Additionally, it is extensively utilised for analysing the social as well as for intellectual structure of the knowledge carrier and for mapping intelligent networks.

a. Database Choice

The most widely used citation databases for bibliometric analysis in the social sciences are Scopus, Web of Science, and Google Scholar. The study uses Scopus for data extraction.

Google Scholarhas proven to be effective as a bibliometric toolbut has been questioned over the representation and quality of data. It is argued that since its records are mostly found in generic domains like.com or.org, the information originates from big businesses to further their ends. Furthermore, there is a disproportionate prevalence of grey scientific literature, such as unpublished papers and instructional aids, and the information it offers cannot be compared to other databases (Aguillo, 2012). On the other hand, the coverage of Web of Science (WoS) is less thorough in certain disciplines including business and management, which leads to an underestimating of the effect of citations (Harzing, 2010). Moreover, since 99.11% of the journals listed in WoS are indexed in Scopus (Singh et al., 2021), using both databases in bibliometric analysis leads to duplicationof data which then has to be excluded, wasting time and effort.Compared to 2000 in Scopus, WoS requires manual processes in case the number of publications exceed 500. Therefore, Scopus was selected for the study on the grounds of data completeness and comprehensiveness.

b. Data Collection and Cleansing

To obtain literature within the domain of Indian logistics and freight transportation, this study used the search terms (freight AND transport*) OR (logistics*)) AND ((opportunit* OR challenge*)) AND ((india*) within the article's title, abstract, and keywords, employing Boolean operators such as AND and OR. This indicates any instance within an article's title, summary, or key terms will be identified and included in the analysis of scholarly metrics. Through this method, a total of 256 documents were retrieved. The search was subsequently narrowed down by applying the following inclusion and exclusion indicators:

1. To maintain the caliber of the research, the study considered exclusively peer-reviewed publications featured in peer-reviewed journals. Excluded were chapters from books, editorial pieces, conference proceedings, review articles, annotations, andvarious other types of non-traditional literature that may have unreliable review processes.

2. Only articles published in English were considered to guarantee clarity and understanding for the investigator.

3. The fields of focus were restricted to 'Corporate Affairs, Organizational Leadership, and Financial Accounting' as well as 'Economics, Statistical Financial Analysis, and Capital Management.'

4. Additionally, only complete publications up to the year 2023 were considered.

After applying the aforementioned data retrieval and cleansing process, 205 documents were extracted which were subjected to manual cleaning through content analysis. The final sample related to the field consisted of 139 articles deemed suitable for the conduct of bibliometric analysis. The information was obtained in CSV format andsubsequently "transferred to Bibliometrix for additionalexamination. Figure 1 illustrates this process.

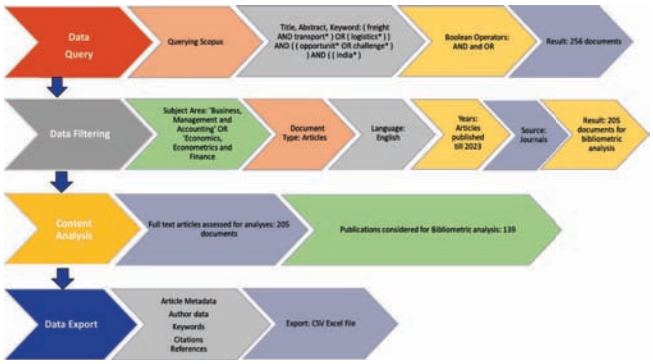

Fig 1: Data collection and cleansing process (Authors' own)

III. Analysis of Data

3.1 Statistical Summary

The primary data information is given in Table 2. It includes 139 documents that were published over a period of almost 24 years (from 1999 to 2023) in 87 journals. This suggests that there is a great deal of room for further academic study in the area of Indian logistics and freight transportation.

Table 1: Main information about data

Description	Results
Timespan	1999:2023
Sources (Journals, books, etc)	87
Documents	139
Annual Growth Rate %	13.29
Document Average Age	6.24
Average citations per document	13
References	5856
Keywords Plus (ID)	249
Author's Keywords (DE)	565
Total number of authors	341
Authors of single- authored documents	25
Co-authors per document	2.7
International co- authorships %	26.62

Globally, 341 writers are engaged in Indian logistics and freight transportation. Collaboration metrics that reflect the level of cooperation among document authors include the authors per document ratio (total number of authors divided by the total number of documents) and co-authors per document count. Impressively, they were 2.45 and 2.7, respectively. Additionally, 26.62% of co-authorships are from outside of the country. This indicates that research on Indian logistics and freight transportation is has a high degree of collaboration. This is further supported by the finding that just 25 (17.9%) of the 139 documents are single-authored. The average age of papers is 6.24 years, and there are 13 citations per document on average.

3.2Publication Trends

Figure 2 displays annual scientific production on Indian logistics and freight transportation between 1999 to 2023. First study in the field surfaced in 1999 in the Scopus database. Due to constant developments in the area, there has been a discontinuous pattern of research in Indian logistics and freight transportation.A perusal of Table 3 shows that years 2022 and 2023 were the most productive years as far as the number of publications are concerned. Additionally, publications published in the last five years represents approximately 57% of the overall publications released. This indicates that academicians, researchers, and scholars are becoming more and more interested in the field of Indian logistics and freight transportation. However, the most fruitful years were not always the most influential ones. For example, the year 2008 had the greatest mean citation count at 85.66, followed by the year 2014 at 37.75. This indicates that papers published during these years were notably influential and significantly shaped the course of research.

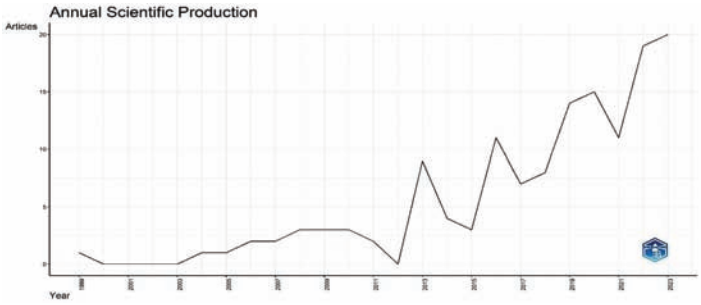

Fig 2: Annual Scientific Production

Table 2: Publication Trends and Citation Metrics

Year	Article Count	Average Number of Citations per Article
1999	1	0
2006	2	9
2008	3	85.66
2009	3	18
2010	3	5
2011	2	0.5
2013	9	7.22
2014	4	37.75
2015	3	7.66
2016	11	21.45
2017	7	6.28
2018	8	21.75
2019	14	11.57
2020	15	9.33
2021	11	18.27
2022	19	11.42
2023	20	2.1

3.3 Journal performance

Table 4 lists the 10 most prolific journals according to the number of publications. 'Emerald Emerging Markets Case Studies' is at the top of the list, with 20 publications, followed by the 'International Journal of Supply Chain Management'. This makes sense because supply chains, market trends, transportation patterns, and sustainable logistics techniques are the main topics of these source journals. Bradford's law of dispersion, which indicates that a limited number of sources offer pertinent knowledge regarding a subject, is illustrated in Figure 3.

It was observed that the most productive journals were not the most prolific ones. As a quality metric for journals, we have employed the Cite Score. There are alternate ways to evaluate a journal, such as Total citations, impact factor, etc., none superior to others. With a Cite Score of 35, 'International Journal of Physical Distribution and Logistics Management' leads at the forefront of the most impactful and productive journals, succeeded by 'International Journal of Logistics Management'.

Table 3: Leading and Highly Impactful Journals

Sources	No. of Articles	Cite Score
Emerald Emerging Markets Case Studies	20	0.14
International Journal of Supply Chain Management	5	0
International Journal of Scientific and Technology Research	4	1.5
Benchmarking	4	8.66
International Journal of Logistics Management	3	32
International Journal of Logistics Systems and Management	3	6
Journal of Advances in Management Research	3	6
Journal of Cleaner Production	3	6
International Journal of Production Research	2	19
International Journal of Physical Distribution and Logistics Management	1	35

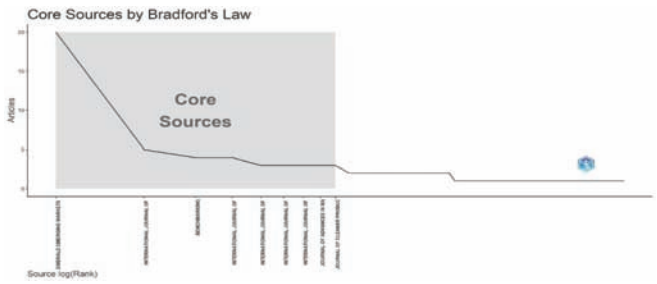

Fig 3: Bradford's Law

3.4Author Influence

The most influential and productive authors in the domain of Indian logistics and freight transportation are examined in this section. The total number of citations obtained for a document has been used to calculate the effect of an authoras opposed to other metrics like H-index or M-index. Table 5 presents the findings.

Table 4: Authors' influence

Author	Articles	Aggregate Citations	Mean Citation Rate per Document	Publication Initiation Year
Kumar A.	7	82	11.71	2020
Mangla S.K.	4	349	87.25	2016
Singh R.K.	4	72	18	2016
Butt A.S.	3	50	16.66	2020
Shankar R.	3	24	8	2006
Abbas H.	2	23	11.5	2020
Anbanandam R.	2	45	22.5	2020
Appolloni A.	2	36	18	2021
Arivazhagan D.	2	1	0.5	2020
Chakraborty S.	2	10	5	2021

With 7 papers under his name, Kumar A. is the most prolific author in the research domain. His first paper 'Evaluating the interrelationships among inhibitors to intermodal railway freight transport in emerging economies: A multi-stakeholder perspective' (Kumar A., Anbanandam R., 2020) was published in 2020 in the 'Transportation Research Part A: Policy and Practice'. In a short span of three years, his contributionto literature on Indian logistics and freight transportation has been remarkable.Content analysis revealed that hemajorly focuses on the impact of intermodal railroads as a freight transportation medium, offering views from a range of angles. Although he has made significant contributions, he is not the most impactful author (ACPD=11.71), likely due to his recent foray into the research field. Among the leading 10 most prolific authors, Mangla S.K. stands out as the most influential (ACPD=87.25). His first paper "Critical success factors for reverse logistics in Indian industries: A structural model" (Mangla S.K., Govindan K., et al., 2016) was published in the 'Journal of Cleaner Production' in 2016. It has received 129 citations, and he has concentrated his research on core sources of reverse logistics especially in Indian industries devising structural models for the same.

Thus, we discover that the most prolific writers are generally not the most influential. Figure 4shows the productivity of authors and their citation trends over time. Horizontal bars show a writer's active years, bubbles show the number of publications he hasauthored, and the colour of the bubbles indicates the citations received.We conclude that the majority of the prominent and impactful authors have beenin the research field for a relatively longer period. This might be one of the reasons for their greater number of citations.

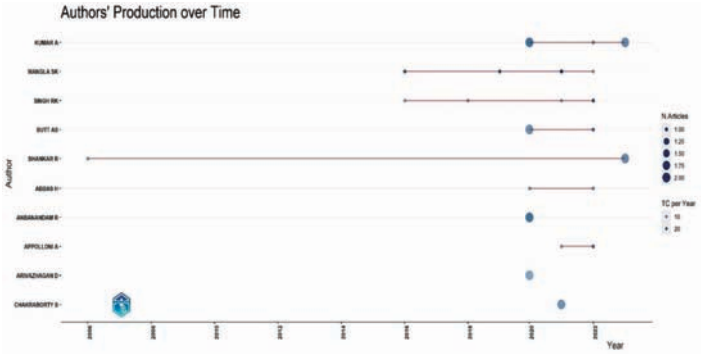

Figure 4: Authors' production over time

3.5 Most influential Documents and their key findings

We conducted a manual content analysis of the top 5 documents based on citation count. The citation count helped us to analyse which documents that are referenced most often by other researchers within the same field. Table 6 exhibits the findings.

Table 5: Content Analysis of top 10 documents

Title	Author(s)	Journal Name	Journal Year	Citation	Findings
Measuring the impact of renewable energy, public health expenditure, logistics, and environmental performance on sustainable economic growth	Khan, Syed Abdul Rehman; Zhang, Yu; Kumar, Anil; et al.	Sustainable Development	2020	241	Using World Bank data and structural equation modeling, research found that integrating renewable energy in logistics improves economic and environmental performance by reducing emissions. However, higher public health costs exacerbate environmental challenges. Enhanced environmental sustainability benefits both human health and economic prosperity.
Environmental, social, and economic growth indicators spur logistics performance: From the perspective of South Asian Association for Regional Cooperation countries	Khan, Syed Abdul Rehman; Jian, Chen; Zhang, Yu; et al.	Journal of Cleaner Production	2019	163	Using GMM and FGLS, research highlights fossil fuel's profound impact on logistics, with detrimental effects on society and the environment intensifying with greater reliance on non-green energy. In SAARC nations, fossil fuel use correlates with inferior transportation infrastructure and services, higher carbon emissions, healthcare costs, and political instability. Conversely,efficient information exchangeenhance trade and curb carbon footprints. Green energy adoption boosts financial metrics while mitigating social and environmental issues.
Promoting intermodal freight transport through the development of dry ports in Asia: An environmental perspective	Hanaoka, Shinya; Regmi, Madan B.	IATSS Research	2011	118	Secondary data and case study review reveal a surge in freight transport in Asia driven by international trade expansion, with notable environmental concerns. Developing inland dry ports can benefitlandlocked nations. These dry ports, situated away from the coast, streamline customs, rail links, and cargo functions, promoting modal shifts to mitigate road congestion and emissions, fostering sustainable logistics.
E-commerce logistics in supply chain management Implementations and future perspective in furniture industry	Yu, Ying; Wang, Xin; Zhong, Ray Y.; et al.	Industrial Management and Data Systems	2017	96	The study revealed that emerging technologies such as cloud computing, big data analytics, etc will revolutionize e-commerce logistics. These advancements will enhance decision-making, operations, and system efficiencies, enabling swift and informed decisions. Real-world applications provide valuable insights, aiding logistics and e-commerce firms in making informed business decisions.
The cash flow advantages of 3PLS as supply chain orchestrators	Chen, Xiangfeng; Cai, Gangshu; Song, Jing-Sheng	Manufacturing and Service Operations Management	2019	92	The cash-flow model highlights the critical role of third-party logistics providers (3PLs) in the global supply chain. They bridge the gap between buyers and manufacturers worldwide, offering financial assistance, procurement, and shipping services. By securing payment delay agreements from financially stable manufacturers, especially for small and medium-sized firms (SMEs) in developing countries, 3PLs alleviate capital burdens on SMEs.

Source: Authors' Own

The synthesis of findings from the five research papers offers a nuanced understanding of various dimensions shaping the contemporary landscape of logistics and supply chain coordination. Collectively, these papers provide a comprehensive framework for policymakers and industry stakeholders to navigate the evolving landscape of logistics and supply chain management that would facilitate informed decision-making and strategic planning in this dynamic domain.

3.6 Most commonly utilized keywords

A word cloud acts as a visual representationmethod that highlights the occurrence rate of keywordswithin a dataset, where the magnitude of each keyword reflects its occurrence. In Figure 5, the 40 most frequently utilized author keywords are displayed, with "India" and "supply chains" emerging as the most common, each appearing 92 times. Following these, "decision making" and "sustainable development" rank as notable keywords. These terms are frequently employed by authors within the documents.

Figure 5: World could

A word cloud is utilized to highlight the most important and influential keywords related to a topic, offering a clear overview of the research themes. When integrated with additional mapping and enhancement techniques, such as thematic mapping, it becomes a highly valuable resource for bibliometric analysis.

3.7 Thematic Visualization

The thematic visualizationaims to uncover themes within text-based information. According to Aria and Cuccurullo (2018), "Thematic maps are a very intuitive plot and we can analyse themes according to the quadrant in which they are placed." Based on keywords, titles, or abstractions, themes are created. Themes are arranged in this two-dimensional graph according to their centrality and density. A theme's relevance or importance is measured by its centrality, which is represented by the X-axis. Plotted on the Y-axis is the density, which indicates a theme's developmental stage. The centrality and density of a study subject are determined using "central tendency metricssuch as mean and median. From this, themes are classified and organized into four quadrants (see Figure 6), which include the following:

(1) *Upper-right quadrant(Q1)*: Motor-themes. These themes are vital and well-developed because they have high densities and high centralities. This quadrant includes 'Economies Growth' and 'Logistics India,' along with synonyms such as 'freight transport' and 'supply chain'. This quadrant includes both of thestudy's primary subjects, Indian logistics and freight transportation. Despite their obvious distinctions, supply chain and logistics are nevertheless used synonymously today since they developed from one another. Supply chains, in general, focus on the whole sourcing, processing, or manufacturing, and delivery of goods from the raw materials to the end client. Logistics, on the other hand, refers to the business of transporting and storing such commodities across different supply chain organisations. Logistics concentrates on the timely and economical delivery of goods to the client, while supply chain aims to increase operational performance to provide the company with a competitive edge. Themes in this quadrant are ideal for bibliometric studies and systematic literature reviews since they are thoroughly researched and well-developed.

(2) *Upper-left quadrant (Q2)*:Niche themes. This quadrant is characterized by high density and low centrality, indicating that these themes are well-developed yet remain somewhat isolated within the domain due to their lower centrality.

(3) *Lower-left quadrant (Q3)*:Emerging or declining themes. This category consists of themes with low density and centrality, which have the potential to either develop into significant themes or fade away over time. Here, "development" and "rural" are prevalent concepts.

(4) *Lower-right quadrant(Q4)*: Basic themes. The themes in this high centrality/low density quadrant are noteworthy and highly relevant but not sufficiently explored. It includes 'Sustainable green,' 'Smart decision making' and 'Modelling barriers'. Sustainability in supply chains can be achieved through smart decision making incorporating the use of emerging technologies and big data analytics. It has become

extremelycrucial in the wake of societal and environmental challenges faced by our planet presently.Furthermore, with the prevalence of both technological and non-technical obstacles in logistics today, modelling barriers has become increasingly important. But as previously stated, this domain of Indian logistics and freight transportation is not yet sufficiently explored.

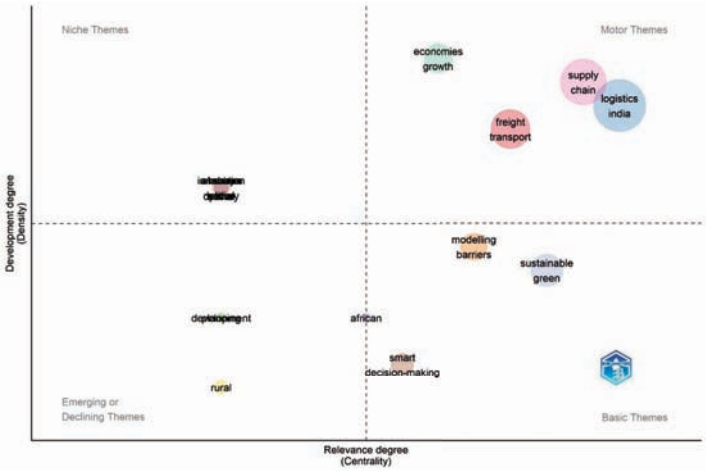

Figure 6: Thematic mapping

IV. Future research directions

Derived from content analysis and thematic mapping, we propose these research directions in the field of Indian logistics and freight transportation:

(1) ***Sustainability and Green Initiatives***- Future research can go deeper into implementing sustainable practices throughout the supply chain, building on the conclusions from recent studies, such as those that highlight the benefits of renewable energy in logistics (Khan S.A.R. et al.,2020) and the potential for green energy resources to improve financial performance (Khan S.A.R. et al.,2019). India's dedication to the adoption of green energy is demonstrated by the fact that, as of December 2022, the country's renewable energy capacity reached 96.95 GW (Ministry of New and Renewable Energy Report, 2023). Multimodal transportation networks, such as inland dry ports, are extremely crucial for lowering emissions and promoting environmentally friendly logistics (Hanaoka S. et al.,2011). By offering effective rail connectivity for cargo transit, the Tughlakabad inland container depot in Delhi, for instance, has considerably decreased traffic and emissions. Further studies on the function of cutting-edge technologies, including big data analytics and cloud computing (Yu Y. et al.,2017), can provide insight into how these advancements might support ecologically friendly transportation options. We can aid in the creation of a more environmentally friendly and sustainable future for Indian logistics and freight transportation by focusing on these research areas and utilising actual case studies.

(2) ***Smart decision making***- Future research can examine how emerging technologies can be effectively used to improve decision-making processes. Insights can be built from recent studies of the revolutionary impact these technologies have had on logistics operations (Yu Y. et al.,2017). Predictive analytics and artificial intelligence, for example, may be used to optimise resource allocation, inventory control, and route planning, resulting in increased efficiency and cost savings. Empirical instances, such the deployment of real-time tracking systems by top logistics companies like Ecom Express and Delhivery, highlight the useful advantages of intelligent decision-making tools in enhancing operational performance. Furthermore, studies such as Paper 8 highlight the significance of using time-cost-distance analysis to assess the performance of multimodal transport routes, offering useful information to decision-makers in choosing the most efficient transportation routes. The logistics industry has reaped substantial benefits from data-driven decision-making, as seen by the dramatic reduction in transit times and fuel consumption achieved by businesses like as BlackBuck and Rivigo through the implementation of route optimisation algorithms. Researchers can aid in the creation of more competitive, adaptable, and agile logistics systems in India by delving further into the incorporation of cutting-edge technology and data-driven methodologies into decision-making processes.

(3) ***Modelling barriers***- Based on the knowledge gained from current research and analysis of the challenges encountered while travelling long distances over multimodal routes, future studies can focus on creating strong modelling frameworks that can recognise and successfully remove these barriers (Wang Y. et al.,2018). For example, using sophisticated techniques such as the integrated Fuzzy Delphi and Fuzzy ELECTRE I approach can assist in evaluating the different barriers that arise in transportation networks, such as weather constraints and problems with customs clearance. Empirical instances, such the obstacles faced during the execution of the Silk Road Economic Belt initiative aimed at enhancing trade and transit ties in Asia (Wang Y. et al.,2018) highlight the intricacy of logistical obstacles and the necessity

of advanced modelling methodologies. Furthermore, the research emphasises how critical it is to assess multimodal transport route performance to pinpoint inefficiencies and bottlenecks (Regmi M.B. et al.,2012). For instance, the Korea-China-Central Asia and Korea-China-Mongolia-Russian Federation corridors have shown important operational difficulties and infrastructural deficiencies thanks to the use of time-cost-distance analysis. Through the development of comprehensive modelling frameworks that incorporate both physical and non-physical constraints, scholars may offer significant insights to industry stakeholders and policymakers about the optimisation of logistics operations, improvement of connectivity, and promotion of sustainable economic growth in India.

V. Summary and Conclusions

Due to the rising focus on supply chain models and transportation in the field of Indian logistics, the current study was undertaken to provide a complete overview of Indian logistics and freight transportation research conducted via bibliometric analysis. Following the application of inclusion-exclusion criteria, a total of 205 documents were obtained from the Scopus database for the time frame spanning 1999 to 2023.The documents were studied for their relevance to the study and finalsample consisted of 139 documentswhichwere examined using the Biblioshiny tool within R-studio software. By employing performance and citation analysis, trend evaluation, and thematic mapping, this study successfully identified publication trends, influential journals, authors, and significant studies within the realm of Indian logistics and freight transportation research. Drawing from the current research landscape, the study offers valuable recommendations for future inquiries in this domain.

There has been a discontinuous pattern in Indian logistics and goods transportation as a result of ongoing innovations in the field. The last two years have been the most productive years as far as number of publications are concerned. Also, over the past five years, accountsfor approximately 57% of the total publications signify a growing engagement of scholars and academics in the research field.Further, papers published in the year 2008 and 2014 were the most impactful as suggested by mean citation count.

'The Emerald Emerging Markets Case Studies' was the most productive journal as suggested by the number of publications. However,'International Journal of Physical Distribution and Logistics Management' was the most influential, with a Cite Score of 35.The journal's publications have had the biggest impact in the research field in recent years.

Among the authors, Kumar A. was found to be the most productive one, with seven publications. His first paper, "Evaluating the interrelationships among inhibitors to intermodal railway freight transport in emerging economies: A multi-stakeholder perspective" (Kumar A., Anbanandam R., 2020), was published in the Transportation Research Part A: Policy and Practice in 2020. In just four years, his contribution to research on Indian logistics and goods transportation has been astounding. It offers a variety of perspectives on the effects of intermodal railroads as a freight transportation medium. However, from the perspective of impact, as determined by average citations per document, Mangla, S.K was found to be most impactful (ACPD= 87.25) as compared to Kumar A. (ACPD= 11.71). The reason may be attributed to the latter's recent entry in the research field.

The manual synthesis of the documents provides a comprehensive view of logistics and supply chain management environment. There are opportunities that can be taken advantage of by the industry practitioners, and challenges the solutions to which can be explored bypolicymakers.Acomprehensive framework for navigating the dynamic field of logistics and supply chain management is essential for informed decision-making and strategic planning.

Thematic mapping of the research field foundIndia's 'economies of growth' and 'logistics' as the'Motor Themes'; barrier modelling, becoming green, and making wise decisions being the 'BasicThemes.'Abibliometric study's most significant contribution is the creation of a prospective research roadmap. On the basis of content evaluation and thematic mapping, it can be summarised thatfurther analysis may be conducted in the domain of 'Sustainability and Green

Initiatives,''Smart decision making,' and 'Modelling barriers.'Emerging technologies and data analytics can significantly assist in smart decision making. This will pave a way to encompass sustainability in supply chains and remove modelling barriers.

VI. Limitations

The study used Scopus databaseowing to its extensive coverage and to prevent duplication. It is possible, nevertheless, that some significant research that is available in alternative databases, including Web of Science and Google Scholar, might have beenoverlooked. Also, research publications in English language only were included in the study. Lastly, the analysis was conducted using the R package's Biblioshiny function. To better portray the visualisations and networks, bibliometric tools such as VOSviewer, Citespace, etc may be used in future research.

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FINTECH ALCHEMY: TRANSFORMING FINANCE, UNRAVELING ENDURANCE, AND CHARTING FUTURE HORIZONS

Mr. Parthasarathi Narayanasamy*
Dr Madhava Priya Dananjayan**

Purpose: *This study delves into the rapidly changing fintech industry, to improve user experience and the financial system. The report examines consumer fintech adoption rates worldwide, focusing on industries, geographical preferences, and service popularity. The evolution of fintech investments, market capitalization trends, and the influence of blockchain on financial services are examined. The development of Robo-Advisors and Neo-Brokers represents a trend towards digital investing solutions. The thorough research offers stakeholders significant insights, including recommendations for localized strategy, cooperation, regulatory frameworks, and adaption to evolving technology developments, putting fintech at the forefront of transformational growth. Keywords: Fintech, Neo-Banking, Robo-Advisors, Blockchain, Digital Banking, Investment, Financial Transparency, Asset Management, and Data Sharing.*

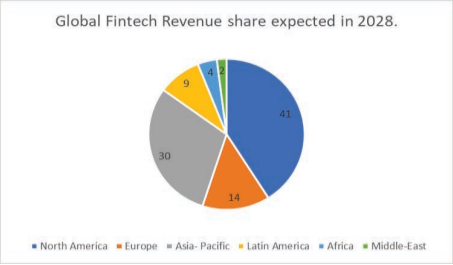
Methodology: *The study employs two key methodologies: Quantitative analysis with 400 Google Form respondentssheds light on fintech adoption drivers, identifying potential areas for expansion across enterprises and communities. Comparative analysis examines fintech adoption in different nations, reaching conclusions about regulatory measures and recommending optimal practices for maximal acceptance.*

Value*: It investigates the overall impact of fintech on financial services, taking into consideration its dimensions, regulatory frameworks, and hazards. It seeks to figure out the elements that drive adoption, and the differences across areas, and to provide solutions for development, efficiency, and cost-cutting, offering valuable insights into the fintech landscape as it unfolds within the financial industry.*

Keywords : *Fintech, digital banking, asset management, blockchain, robo-advisors, neo-banking, investment, and data sharing.*
JEL Code: *G20 - Financial Institutions and Services (General)*

I. Introduction

Fintech has expanded significantly over the last decade, fueled by technical improvements, digitalization, altering client tastes, and governmental backing. As of July 2023, publicly listed fintech businesses had a market valuation of $550 billion, a double from 2019. The fintech environment now includes over 272 unicorns valued at $936 billion, a sevenfold increase in five years. Banking is undergoing radical reorganization, with banks and nonbanks competing in five sectors: daily banking, investment consulting, sophisticated finance, mass wholesale intermediation, and banking as a service. Digital adoption is now a worldwide reality, accounting for 73% of contacts with banks. Fintech's role is expanding in response to increased B2B demand, with 35% of US SMEs adopting fintech for financing and pricing, and 20% of Asian SMEs utilizing fintech for payments and loans in 2022.To accommodate this demand, fintech businesses must manage new rules and maintain enough compliance resources.



Source: McKinsey (2023). Fintech: A new paradigm of growth.
Figure 1: Fintech- A new paradigm of growth

II. Review Of Literature

Fintech research has increased dramatically during the previous six years, owing to advances in IT, AI, machine learning, and data science. Both academia and industry are growing interested in fintech applications. Schueffel (2016)

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describes fintech as an industry that uses technology to improve financial services. The current tendency is to adapt financial solutions by using technology for specialized services such as digital payments, online investing, digital wallets, and cryptocurrencies. Fintech can save time, increase efficiency, and reduce mistakes in financial transactions, resulting in better consumer welfare and happiness.

According to empirical research, mobile money promotes risk-sharing and facilitates more rapid and effective inter-household money transfers (Aron, 2018). According to (Wieser et al., 2019), more fintech adoption boosts remittance transactions while diminishing informal savings. The expanding power of the internet, aided by big data, cloud computing, and artificial intelligence, is driving fintech growth (Puschmann, 2017). Fintech helps to reduce fragility in emerging nations, although its impact on financial stability varies according to market expansion (Fung et al., 2020). Fintech's involvement in improving the customer experience, lowering costs, enabling personalized services, and facilitating analytical decision-making for risk management and lending in the banking business.

III. Research Design and Methods

• The research methodology employed in "Fintech Alchemy: Transforming Finance, Unraveling Endurance, and Charting Future Horizons" utilizes a dual-approach strategy combining quantitative and comparative analysis techniques. The quantitative component involves data collection through Google Forms from 400 respondents, focusing on understanding the drivers of fintech adoption across both enterprise and community levels while identifying potential areas for expansion. This approach allows for a detailed examination of adoption patterns and user behavior across different market segments.

The comparative analysis forms the second major methodological component, involving a cross-country examination of fintech adoption rates. This analysis examines regulatory measures, best practices for maximizing adoption, and regional differences in consumer behavior across markets. The research draws upon diverse data sources, including market capitalization data of major fintech companies, neo-banking transaction volumes, investment volumes in the fintech sector, digital investment assets under management, consumer adoption rates across different countries, and blockchain technology implementation data.

The study employs multiple analytical frameworks to process this data. Market analysis examines capitalization trends, company performance metrics, and industry growth patterns. Geographic analysis compares adoption rates across European countries and evaluates market maturity across regions. Service-specific analysis assesses different fintech services, consumer preferences, and adoption patterns. The methodology also incorporates trend analysis, examining historical data from 2014-2021 and projecting trends up to 2027.

The research methodology enables a comprehensive understanding of the fintech landscape by incorporating both current and historical data. It includes analysis of blockchain technology's impact on financial services, assessment of regulatory frameworks, evaluation of risk factors, and investigation of adoption drivers. However, some limitations should be noted, including the reliance on Google Forms for data collection, which may limit respondent diversity, and a primary focus on developed markets. Despite these limitations, the methodology successfully enables the identification of key trends in fintech adoption, understanding of regional variations in fintech usage, assessment of factors driving fintech growth, and evaluation of future growth potential. This comprehensive methodological approach allows the research to provide valuable insights into the fintech landscape while maintaining academic rigor and practical relevance.

ANALYSIS OF DATA

The market capitalization of the largest fintech companies worldwide in 2024

Fintech Companies	Market Cap (Billion $)
Visa	520
Mastercards	396
Intuit	169
Tencent	146
Fiserv	80
Ant Financial	79
Paypal	66
Stripe	50
Square	44
Nubank	42
Adyen	39
Coinbase	38
Chime	25
Polygon	20
Revolt	18

Figure 2: Companies with Market Capitalization

Source: Statista (2023). FinTech: in-depth market analysis.

Figure 3: Market Analysis

The table depicts the top 15 fintech businesses' market capitalizations in 2024. Visa has a $520 billion market capitalization, followed by Mastercard at $396 billion. The list includes Intuit, Tencent, Fiserv, Ant Financial, PayPal, Stripe, Square, Adyen, Coinbase, Chime, Polygon, and Revolt. Fintech's fast growth presents difficulties for established financial institutions, requiring innovation to remain competitive. Fintech disrupts financial service delivery, occasionally competing directly with traditional banks. Fintech businesses, such as Chime's fee-free checking account, help consumers by making things easier and more affordable. Fintech has had an indisputable influence on the financial services industry, compelling established institutions to react to greater competition and innovation for the benefit of customers, therefore determining the fintech sector's future.

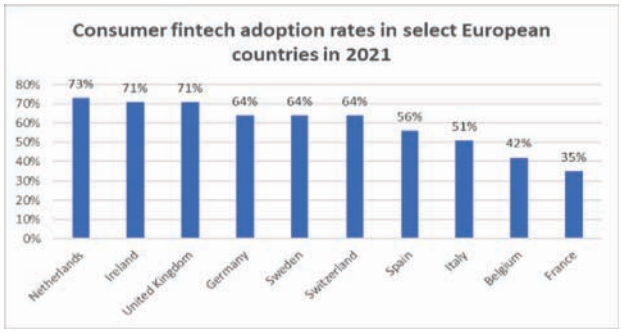
COMPARATIVE ANALYSIS

Cross-country research finds varying consumer fintech adoption percentages in Europe for 2021, even among similarly related countries. These rates are displayed in the table below, which provides insight into the variables impacting fintech growth.

Countries	Adoption Rates
Netherlands	73%
Ireland	71%
United Kingdom	71%
Germany	64%
Sweden	64%
Switzerland	64%
Spain	56%
Italy	51%
Belgium	42%
France	35%

Figure 4: Fintech adoption percentages in Europe

According to data research, the Netherlands, Ireland, and the United Kingdom have the greatest fintech adoption rates, which approach 70%, due to tech-savvy people, supportive regulatory regimes, established fintech ecosystems, and significant investments. Germany, Sweden, Switzerland, and Spain score lower, with percentages ranging from 51% to 64%, which can be attributed to differences in financial inclusion and consumer perception. Italy, Belgium, and Luxembourg fall behind, with percentages of 42% or lower, showing space for development in fintech infrastructure as well as negative consumer attitudes. The comparative research emphasizes the importance of financial literacy, economic growth, demography, technological trust, and customer willingness in influencing fintech persistence across countries.



Source: Statista (2023). Fintech Google (Google Finance); Various sources (Company reports)

Figure 5: Fintech Reports of various companies

A report released by EY in 2019 on the "Global Fintech Adoption Index" analyses the key contributing factors for fintech adoption. It was inferred that they had somewhat the same results as discussed above. Apart from this, the report also analyzed the willingness of the SMEs (Small and Medium Enterprises) to share their data. This sharing of the data by the businesses and consumers of fintech products is extremely important as the value proposition of fintech is highly dependent on the interoperability and the willingness of the parties to transfer data between organizations.

FINTECH ADOPTION RATES ACROSS VARIOUS FINANCIAL SERVICES

Share of digitally active population using various fintech services by country, 2019.

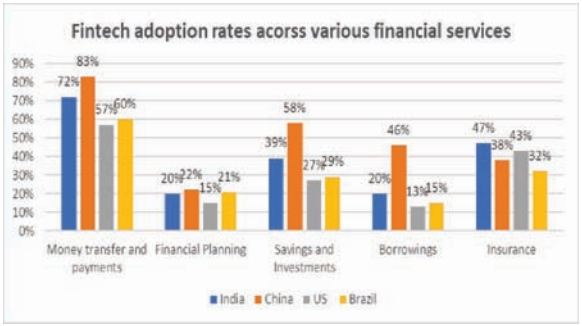
An analysis of the percentage of people using various financial services across the globe is crucial for the comparative analysis. The below table shows the percentage of people using various financial services in different

countries in 2019. The countries chosen for the study were India, China, the US, and Brazil.

Countries	Money transfer and payments	Financial Planning	Savings and Investments	Borrowings	Insurance
India	72%	20%	39%	20%	47%
China	83%	22%	58%	46%	38%
US	57%	15%	27%	13%	43%
Brazil	60%	21%	29%	15%	32%

Figure 6: Fintech services by countries.

India, China, and Brazil have the greatest fintech adoption rates, with India leading at 87% because of government initiatives, smartphone accessibility, and e-commerce appeal. China, with an 83% adoption rate, benefits from a technologically competent populace and supporting policies. The United States lags with a 57% adoption rate, owing to a mature financial system, dominating incumbent banks, and privacy and security concerns.



Source: Statista (2023). Fintech Google (Google Finance); Various sources (Company reports)

Figure 7: Financial services by various companies

Analyzing the specific services, money transfers and payments is the most widely used fintech service across all countries. This is likely because it is relatively a simple and opportune way to send and obtain money.

Savings and investment are the least used services in most countries. This could be due to a lack of financial literacy, low levels of disposable income, or a preference for traditional investment products.

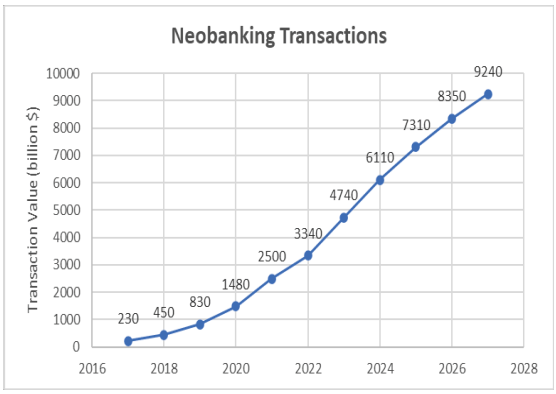
GROWTH IN NEO - BANKING TRANSACTIONS

The figure displays Neo-Banking transactions over a decade, combining historical data and future estimates. Neo-banking, a digital approach to banking using mobile applications, is expected to surpass $3 trillion by 2025, demonstrating high acceptance and usage increase.

Year	Transaction Value (billion $)
2017	230
2018	450
2019	830
2020	1480
2021	2500
2022	3340
2023	4740
2024	6110
2025	7310
2026	8350
2027	9240

Figure 8: Neo-Banking Transactions.

The table below indicates a constant rise in transaction value from 2017 to 2025, with forecasts predicting the greatest growth between 2024 and 2025, rising from US$6.11 trillion to US$7.31 trillion. Potential factors include the growth and popularity of fintech companies that provide alternative financial services, greater internet and smartphone usage, and a trend away from traditional banking.

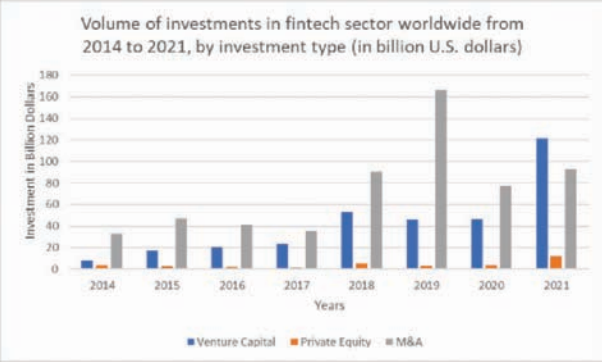


Source: Statista (2023). FinTech: in-depth market analysis.

Figure 9 :Neobanking in-depth market analysis.

Moreover, consumers are increasingly looking for convenient, affordable, and accessible financial solutions. Neo-banking transactions can often be faster, cheaper, and more user-friendly than traditional banking methods.

VOLUME OF INVESTMENTS IN FINTECH SECTOR WORLDWIDE FROM 2014 TO 2021



Source: Statista (2023). FinTech: in-depth market analysis.

Figure 10: Volume of investments in Fintech

In the initial years, the investment was largely made on the Venture Capital and Private Equity segments which showed growth potential for the Fintech industry. The industry was booming, and large investments were made in the same.

2021 shows major investments in the Fusions and Procurements which describes the competitiveness of the industry. The segment is maturing as per the investment avenues. The competitiveness in this industry, on a positive note, will improve the development of innovations in the industry. The industry will witness the future-ready technologies as the new companies enter the realm of Fintech, as well as when investments get pumped in.

Figure 11: Major investments in the Fusions and Procurements

FINTECH AND BLOCKCHAIN TECHNOLOGY: FUTURE SCOPE

Blockchain, a crucial breakthrough of the Fintech Revolution, is tied to Bitcoin. It is a safe, translucent, and tamper-proof distributed database. In its initial stages, blockchain is altering finance, with dramatic implications for money flow and management.

What is Blockchain Technology

Distributed ledger technology, or blockchain, may be used to execute, record, and validate any form of transaction. It enables instantaneous transaction and contract authentication between parties without requiring central authority permission.

Types of Blockchain:

• Public: These entirely randomized blockchains are also known as "permissionless." Since they are accessible to anyone, anybody may read and write data to and from the ledger. One instance of a public network is Bitcoin.

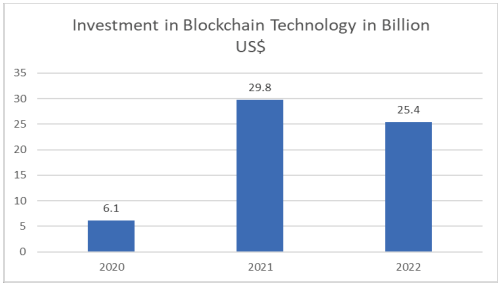
• Private: These blockchains are restricted in network access, enabling only a certain organization or group of individuals to edit or view the blockchain's current state. around the years, financial institutions from all around the world have expressed an extensive amount of interest in using private blockchains for tasks like database administration and auditing. Examples of private blockchains are R3's Corda and the Hyperledger Project.

•Consortium: These networks differ from private blockchains in that they are operated by a group of businesses or organizations through a consensus-based process. These blockchains are somewhat centralized, thus access to them can be either public or private.

A New Era of Banking Services.

Blockchain technology has emerged as a powerful tool for producing tamper-proof financial transaction records, making changes or data deletion more difficult. Its use in Fintech promotes transparency by identifying transaction parties, which reduces the risk of contract breaches and financial crimes. Automation of data entry and validation reduces mistakes while improving data quality. Significant cost reductions, estimated by McKinsey at $4 billion for cross-border payment processing, $1 billion in decreased operating expenditures, and potential regulatory fines of $2

to $3 billion, demonstrate blockchain's disruptive potential in banking. Furthermore, an annual loss reduction of $7 to $9 billion due to fraudulent activities demonstrates the technology's relevance.



Source: Statista (2023). FinTech: in-depth market analysis.
Figure 12: Investment in Blockchain

Streamlining Trade Finance with Blockchain - Marco Polo Trade Finance Network

Marco Polo, a trade finance network founded on a private blockchain platform, has made substantial strides in modernizing the traditionally slow and paper-intensive trade finance process.

Challenges in Trade Finance:

• Lack of Disclosure: Information scattering among parties leads to errors and delays.Fraud and inconsistencies in paperwork can cause disruptions and financial losses.

• High expenditures for paper processing, human verification, and intermediary fees.

• Complex procedures and paper processing lead to slower response times.

Marco Polo's Blockchain Solution:

Marco Polo eliminates intermediaries and paper processing, resulting in significant cost reductions.

• Automated procedures and real-time data sharing lead to faster turnaround times, expediting trade cycles.

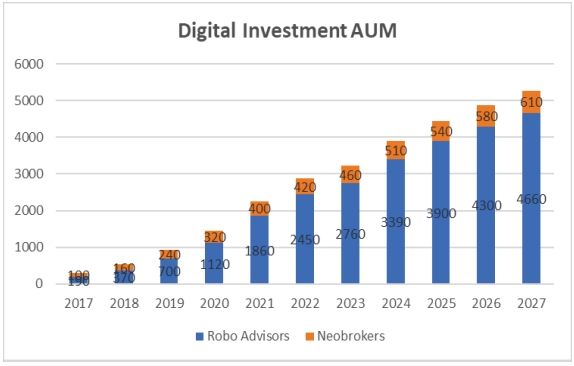
Results and Impact:

• New Opportunities: Marco Polo is researching blockchain applications in trade finance, including supply chain financing and risk management solutions.

DIGITAL INVESTMENTS ASSETS UNDER MANAGEMENT (AUM)

Year	Robo Advisors (billion $)	Neo-brokers (billion $)
2017	190	100
2018	370	160
2019	700	240
2020	1120	320
2021	1860	400
2022	2450	420
2023	2760	460
2024	3390	510
2025	3900	540
2026	4300	580
2027	4660	610

Figure 13:Digital Investments Assets Under Management (AUM)



Source: Statista (2023). Fintech Google (Google Finance); Various sources (Company reports)
Figure 14: Digital Investment AUM Analysis

Over the last six years, both Robo-Advisors and Neo-brokers have seen significant increases in Assets Under Management (AUM). Neo-brokers doubled from $100 billion to $510 billion, while Robo-Advisors grew tenfold from $190 billion in 2017 to a predicted $3390 billion by 2024. Robo-advisors have continuously exceeded Neo-brokers in terms of growth, indicating that investors prefer automated investment management over traditional brokerage services. Predictions show a 23% increase in Robo-Advisor AUM and a 21% increase in Neo-broker AUM between 2023 and 2024, highlighting the increased popularity and utilization of these digital investment platforms. Technological developments, low fees, increasing financial knowledge, and the COVID-19 epidemic all contribute to this trend.

IV. Results And Discussions

Comparative Analysis of Consumer Fintech Adoption Rates in European Countries

Comparative research of consumer fintech adoption rates in various European countries in 2021 finds considerable differences across nations. The Netherlands, Ireland, and the United Kingdom have the greatest adoption rates, which may be ascribed to a digitally active populace, supportive regulatory bodies, developed fintech ecosystems, and significant venture capital investments. Reduced adoption rates in countries such as Italy, Belgium, and Luxembourg, on the other hand, demonstrate that fintech infrastructure requires improvement and that consumers have negative perceptions of it. This study emphasizes the complexities of elements influencing fintech adoption, including financial literacy, economic development, demographics, faith in technology, and a desire to utilize fintech services. These findings are consistent with EY's 2019 Global Fintech Adoption Index, which emphasizes the need to understand local differences for effective fintech integration.

Fintech Adoption Rates Across Various Financial Services

In 2019, fintech adoption rates diverged throughout India, China, the United States, and Brazil. India, China, and Brazil have higher adoption rates, which are driven by booming and innovative fintech ecosystems that meet the needs of unbanked or underbanked people.

Projected Value of Neo-banking Transactions

The projection that the value of Neo-banking transactions would top $9 trillion by 2027 illustrates a substantial shift towards non-traditional financial services. The rising trend, notably between 2024 and 2025, reveals the increasing popularity of fintech companies that offer alternative goods and services. Increased internet and smartphone usage, convenience, affordability, and user-friendliness are all contributing to this growth. This data is helpful for businesses, governments, and investors since it gives insights into the emerging non-banking financial services sector as well as potential areas for future study.

Volume of Investments in the Fintech Sector Worldwide

The trend of investments in the fintech sector from 2014 to 2021 shows that the industry is changing. While the early years saw significant investments in Venture Capital and Private Equity, 2021 represents a shift towards Mergers and Acquisitions to demonstrate industry competitiveness. This trend represents the sector's expansion, as more investment spurs innovation and the formation of new businesses. The competitiveness, as seen by strong M&A activity, alludes to a positive path for the sector, nurturing future-ready technologies and contributing to overall growth.

Fintech and Blockchain Technology: Future Scope

The ongoing development of blockchain technology will play a significant role in how fintech expands in the future. A paradigm shift in financial services might arise from its capacity to execute transactions that are secure, transparent, and resistant to manipulation. Enhanced efficacy, enhanced financial transaction openness, and significant cost savings are notable outcomes. The benefits highlighted correspond to McKinsey's estimations of potential savings for banks across a variety of areas. The fintech sector has possibilities as well as obstacles as blockchain technology advances and displays its revolutionary potential for reducing fraud, improving data quality, and revolutionizing financial services.

Recommendations:

1. Localization Strategies: Fintech companies may use demography, legal frameworks, and financial literacy to boost adoption rates in certain locations.

2. Absorbing investments across fintech categories, including blockchain, may unlock the industry's growth potential.

3. Collaboration and Innovation: Traditional financial institutions should engage with fintech businesses to foster innovation and fulfill changing customer expectations.

4. To promote fintech growth, policymakers should update regulatory frameworks that balance consumer protection with innovation.

5. Improve financial literacy and awareness, especially in areas with low fintech adoption rates, to increase the acceptability of digital financial services.

6. Embracing Technological Trends: Blockchain technology can enhance efficiency, transparency, and security in financial transactions.

V. Conclusion

Finally, this research explores the exacerbated landscape of the fintech industry, looking for chances to improve user experience, strengthen the financial system, and navigate the shifting dynamics of this developing sector. Our investigation, which employed a rigorously structured solution method that includes quantitative research and comparative analysis, provided critical insights into the factors driving fintech adoption and the revolutionary forces steering the industry's future.

A comparative study of consumer fintech adoption rates across European countries found variances due to digital resilience, regulatory support, and investment climate. These nuanced distinctions underscore the complexities of fintech adoption, emphasizing the significance of tailored strategies that account for regional peculiarities.

Analyzing fintech adoption in numerous economies, including Brazil, China, India, and the United States, revealed regional preferences and the popularity of specific services, as well as varying adoption rates. Payments and money transfers were popular throughout the world, but savings and investment services lagged, most likely owing to underlying factors such as income and financial education.

The fintech industry has matured, as seen by the shift from venture capital and private equity to a focus on mergers and acquisitions. Blockchain technology revolutionized the game by making transactions secure, transparent, and immutable.

The advent of Robo-Advisors and Neo-brokers, which resulted in a tenfold increase in Assets Under Management, reflected a greater social trend towards digital investment solutions. These platforms, driven by technological advancements, cost-effectiveness, and a swelling flood of financial information, are poised to play a crucial role in the evolving financial services landscape.

In summary, this research places the fintech industry at the vanguard of disruptive change, with unprecedented potential and challenges. The insights gathered pave the way for informed decision-making, ensuring stakeholders are well-equipped to manage the complicated fintech landscape and contribute to the sector's long-term success.

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GENERATIVE AI IN BUSINESS TRANSFORMATION: THE ROLE OF AI IN OPERATIONAL EFFICIENCY, INNOVATION, AND ETHICAL IMPLICATIONS

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Purpose: *This study explores the transformative potential of ChatGPT and other generative AI technologies inenhancing operational efficiency, fostering innovation, and improving customer engagement, with aspecific focus on small and resource-constrained businesses. It investigates the adoption and impact ofthese tools through theoretical models, including the Technology Acceptance Model (TAM), Resource-Based View (RBV), and Diffusion of Innovations (DOI).*

Design/methodology/approach: *A mixed-methods approach was employed, incorporating case studies, surveys, and interviews tocollect empirical data. This interdisciplinary framework evaluates the implications of generative AI inbusiness operations, supported by both quantitative and qualitative analyses.*

Findings: *The research highlights that generative AI, particularly ChatGPT, serves as a catalyst for businesstransformation by improving decision-making, streamlining operations, and fostering customer-centricinnovations. However, the findings also underscore challenges such as ethical concerns around dataprivacy, bias, and transparency. Success stories demonstrate actionable strategies for effective andsustainable AI adoption.*

Originality/value: *This paper provides a novel interdisciplinary perspective on the adoption of generative AI in small andresource-constrained businesses, offering actionable insights for overcoming challenges and responsibly leveraging these technologies for long-term value creation and business growth. The studyemphasizes the importance of ethical AI practices to ensure trust and sustainability in deployment.*

Keywords : Generative AI, ChatGPT, business innovation, operational efficiency, ethical AI,automation, customer engagement, organizational change, decision-making support.
JEL Code: *M2, O32, M3*

I. Introduction

The rapid advancement of technologies related to artificial intelligence (AI) has reshaped the spectrum of business operations, enabling unprecedented levels of automation, innovation, and customer engagement. Among these innovations, generative AI tools like ChatGPT have garnered significant attention for their versatility and transformative potential. ChatGPT, developed by OpenAI, exemplifies the application of natural language processing (NLP) powered by the transformer architecture, a breakthrough in AI research introduced by Vaswani et al. (2017). AI's ability to generate appropriate text which is coherent, and contextual has made it a valuable asset for businesses seeking to enhance productivity and adapt to a dynamic market environment.

Generative AI's significance extends beyond technical innovation to its impact on digital transformation across industries. Studies by Brynjolfsson et al. (2018) highlight the role of AI in complementing human capabilities, enhancing decision-making, and creating value through automation and personalization1. Moreover, Kaplan and Haenlein (2019) emphasize the transformative potential of generative AI in customer-facing applications, where conversational agents like ChatGPT streamline interactions and improve satisfaction1.

The emergence of generative AI aligns with broader trends in digital transformation, where organizations leverage data-driven technologies to gain competitive advantages. For startups and small businesses, which often operate under resource constraints, ChatGPT offers a scalable solution to

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challenges such as limited human capital and high operational costs. Huang and Rust (2021) demonstrate how AI-driven automation reduces the burden of routine tasks, enabling firms to focus on strategic objectives. Furthermore, Duan et al. (2019) argue that generative AI plays a significant role in improving agility and responsiveness in uncertain market conditions.By automating tasks ranging from customer service to content creation, generative AI enables businesses to allocate resources more efficiently and prioritize innovation. McKinsey's (2022) research supports this, showing that organizations adopting AI technologies experience up to 40% increases in productivity through task automation1. In the marketing domain, Kietzmann et al. (2021) illustrates how tools like ChatGPT optimize content generation, offering high-quality, customized communication at scale1.Despite all these benefits, the utility of generative AI is not without challenges. Ethical concerns, including algorithmic bias and data privacy, require careful consideration to avoid unintended consequences. Binns (2018) and Mittelstadt et al. (2016) highlighted the need for accountability andtransparency in AI systems to ensure fairness and build user trust. OpenAI's own technical guidelines advocate for iterative feedback mechanisms to mitigate biases in ChatGPT's outputs, aligning with broader calls for responsible AI deployment.

This paper showcases the multifaceted role of AI in transforming business operations. It aims to bridge the gap between theoretical understanding and practical applications of generative AI, focusing on its implications for operational efficiency, innovation, and customer engagement. Furthermore, the study addresses critical ethical considerations, such as algorithmic bias and data privacy, to provide a balanced perspective on AI adoption.

II. Review of Literature

Theoretical Background

3.1.1 The rise of Artificial Intelligence (AI)

This field dates back to the mid-20th century but it has undergone substantial transformations over the years in terms of theory, research focus, and practical applications specially when we talk in terms of businesses. The foundation of AI was laid by British mathematician Alan Turing, whose concept of the Turing Test (Turing, 1950) remains a key milestone in AI development. Turing proposed that a machine could be said to "think" if it could engage in conversation indistinguishable from that of a human. This test remains a benchmark for evaluating the conversational ability of AI models.

The 1950s and 1960s saw the first steps toward machine intelligence, when John McCarthycoined the term “artificial intelligence” in the year 1956. Following that, Marvin Minsky focused on building systems that could simulate human reasoning. The early approaches, such as symbolic AI, were based on explicit programming of rules and logic to replicate human cognition. These systems were limited by their inability to handle ambiguous situations or learn from experience.

This field began to evolve from 1980s onwards with the advent of machine learning which enabled systems to improve their performance by learning from data. There was a rise of neural networks in the 1980s, particularly the backpropagation algorithm (Rumelhart et al., 1986), marked a significant shift from rule-based systems to statistical learning models. However, limitations in computational power and the availability of data slowed progress.

The late 1990s and 2000s witnessed rapid advancements due to increased computational capabilities and the availability of large datasets. In the year 1997, something amazing happened in the field of AI when IBM's Deep Blue defeated chess champion Garry Kasparov, symbolizing the huge potential of AI to excel in highly structured problem-solving tasks. This victory, along with other notable achievements, spurred renewed interest in AI research.

Deep learning, which uses neural networks with many layers isa subset of machine learning. This has led to breakthrough advancements inspeech recognition, natural language processing andcomputer vision related areas. Theprogress of advanced models likeGPT (Generative Pre-trained Transformer) which is based on advanced NLP frameworks has revolutionized the ability of machines to understand and create human-like language. OpenAI's ChatGPT, based on the GPT architecture, is a prominent example of how large language models could be utilisedwidely,i.e from content generation to automated customer service and personalized learning (Vaswani et al., 2017; Brown et al., 2020).

3.1.2 Generative AI's Evolution

Unlike earlier AI systems that focused on narrow tasks, generative models can create coherent text, images, or other

content in response to user inputs. ChatGPT, a variant of GPT-3, uses the transformer architecture to generate text which is human like, leveraging massive datasets and sophisticated training techniques. Its applications in customer service, education, and business operations are reshaping industries by offering scalable solutions to improve efficiency, engagement, and personalization.

3.1.3 Theoretical Frameworks for AI Adoption

The study of AI adoption is often guided by theoretical frameworks that help explain the reasons for the organizations and individuals to adopt new technologies. One of the most widely used models in technology adoption proposed by Davis in a989 was is the "Technology Acceptance Model (TAM)". TAM states that ease of use and perceived usefulness are the major factors which influence the adoption of aAI technology. In the case of ChatGPT, businesses &educational institutions are more likely to adopt it if they find it easy to use and believe it enhances operational efficiency or improves learning outcomes (Venkatesh et al., 2003).

Additionally, there was a theory proposed by Rogers in 1962 which is called as"Diffusion of Innovations" which gives insights into how new technologies spread within society. According to DOI, the adoption of technologies is influenced by factors like its compatibility with existing software's and the relative significance. For instance, businesses find AI tools like ChatGPT attractive because they offer a clear advantage in terms of operational efficiency and customer engagement.

AI and ChatGPT

The advent of generative AI, particularly ChatGPT, has marked a significant milestone in artificial intelligence development. Generative AI is increasingly recognized as a transformative technology in diverse sectors, enabling automation, enhancing decision-making, and fostering innovation (Bubeck et al., 2023).

Applications in Business Operations

ChatGPT has demonstrated utility across various business functions, including customer service, marketing, and decision support.Organizations have integrated ChatGPT to improve customer query resolution. For instance, H&M's adoption of ChatGPT-based chatbots resulted in a 30% improvement in customer satisfaction scores (Smith et al., 2023). In marketing, ChatGPT automates tasks such as copywriting, ad generation, and social media management. Bai, X., Zhuang, S., Xie, H., and Guo, L. (2024) examines the application of predictive AI technologies in the use of financial market predictions and further investment. Their study discusses how AI can enhance data processing and predictive accuracy in financial markets. The paper emphasizes the use of AI to optimize data management and its workflows, contributing to more efficient market predictions and trading outcomes.Vrontis et al. (2022) present a systematic review on how AI, robotics, and advanced technologies are transforming human resource management (HRM)and their effects on employee performance and organizational outcomes.

Applications in Education

Elbanna and Armstrong (2023) researches about the future potential of using GPT models to be integrated into education, emphasizing its ability to enhance teaching and learning experiences. The paper discusses how ChatGPT can be adapted to educational settings, focusing on its future impact in personalized learning, student engagement, and administrative tasks. They showcase both the sides ie future opportunities and challenges which can be faced by using AI in Education transformations. However, concerns about academic integrity persist, as ChatGPT can be misused for unethical practices such as plagiarism and cheating (Lo, 2023). The integration of ChatGPT into personalized learning systems offers significant opportunities for enhancing higher education. Abas et al. (2023) identify the tool's potential to provide immediate feedback, adapt to diverse student needs, and facilitate interactive learning environments. These capabilities align with the principles of personalized learning, which prioritize individual learning preferences and paces. The study highlights ChatGPT's ability to create engaging and responsive educational experiences, which are especially critical in higher education where student diversity in learning styles is prominent. Järvelä et al. (2023) explore the collaboration between human beings and artificial intelligence (AI) to enhance socially shared regulation in learning. Their study discusses how AI can support collaborative learning by improving social regulation and providing timely feedback, which can significantly improve educational outcomes.Gašević, Siemens, and Sadiq (2023) explore how AI can empower learners by enhancing learning processes and outcomes in education. Memarian and Doleck (2023) review the FATE principles—Fairness, Accountability, Transparency, and Ethics—in AI and its future application in higher education, focusing on how to integrate these principles into AI-driven

educational tools to reduce biases and ensure transparency.

Applications in Healthcare

ChatGPT has been utilized in healthcare for tasks such as triage, appointment scheduling, and patient education.AI tools have reduced the administrative burden in healthcare facilities by automating initial assessments and directing patients to appropriate care pathways (Babylon Health, 2023). Studies report a 25% reduction in administrative workloads after implementing AI-assisted triage (Jones et al., 2023).Generative AI also aids in creating educational material for medical professionals, streamlining patient communication, and summarizing complex medical literature (Huang et al., 2023). Mann et al. (2023) explore the role of AI in translational medicine, particularly through an interview with ChatGPT. The article examines how AI bridges the gap between basic science and clinical applications, contributing to advancing medical research and practice.Chen et al. (2023) examine the implication of human-made design in addressing biases in AI, discussing the challenges of designing equitable and unbiased AI systems, with focus on healthcare applications. Beets et al. (2023) conduct a review of the perception of AI in healthcare in the USA by the public, highlighting concerns about data privacy, trust in AI-driven decisions, and the help of AI in improving healthcare delivery.

Ethical Challenges

The adoption of ChatGPT has raised ethical concerns, which includes bias, data privacy, and accountability.Several studies highlight biases embedded in ChatGPT's outputs, often reflecting the limitations of its training data. For instance, biases in financial recommendations led to disparities in credit approvals (Binns, 2018; Wach et al., 2023).Handling sensitive data, particularly in healthcare and financial services, poses risks related to data breaches and non-compliance with regulations like GDPR (Teladoc Health, 2023). The opaque nature of generative AI models challenges accountability, especially in high-stakes decision-making scenarios (Floridi et al., 2018).In her article, Minudri (2023) discusses how content which is trusted and innovations in AI are key to foster organizational agility for learning leaders. She explores how AI can enhance learning strategies and enable more adaptive, efficient processes in corporate learning environments, emphasizing the importance of content quality and AI integration in driving success.

Limitations of ChatGPT

Despite its versatility, ChatGPT has limitations that impact its effectiveness. ChatGPT may produce responses that are contextually plausible but factually incorrect, which limits its reliability in critical applications (Brown et al., 2020).Chowdhury and Sadek (2016) discuss the multifaceted nature of artificial intelligence, highlighting its potential to revolutionize various fields through enhanced efficiency, decision-making, and automation. However, they also address the limitations and risks, such as ethical issues and its potential for the displacement of job emphasized the need for responsible AI development and its deployment for the public and business use.

III. Research Design and Methods

This study works on secondary data analysis methodology, synthesizing existing literature, industry reports, and case studies to evaluate AI impact on operational efficiency, innovation, customer engagement, and ethical considerations. By integrating theoretical insights with publicly available performance metrics, this methodology provides a framework for understanding the transformative potential of generative AI tools comprehensively.

Research Design

The research is structured as an exploratory study, combining theoretical analysis with empirical evaluation of secondary data. This dual approach enables a deeper understanding of ChatGPT's role in modern business practices. The study is guided by the following objectives:

- To assess how AI automates processes and reduces resource demands.
- To explore AI role in enhancing creativity and introducing novel business strategies.
- To evaluate improvements in customer satisfaction and interaction quality.
- To analyze potential risks related to algorithmic bias, transparency, and data privacy.

Data Collection

The study relies exclusively on secondary sources to gather data, ensuring a robust and diverse foundation for analysis:

Academic Literature: Peer-reviewed journals on generative AI, organizational theories, and business transformation.

Industry Reports: Insights from leading consultancies, including McKinsey, Deloitte, and Gartner. Example: McKinsey's report on AI-driven productivity gains across industries.

Case Studies: Documented case studies highlighting ChatGPT's applications in sectors such as e-commerce, healthcare, and education.

Technical Documentation and White Papers: OpenAI's documentation on ChatGPT's capabilities and ethical frameworks.

Benchmarking Data: Performance metrics from public sources, such as changes in Net Promoter Scores (NPS), response times, and operational costs post-ChatGPT implementation.

Analytical Framework

The data which was collected using the Content Analysis which includes systematic review and thematic coding of qualitative data to identify recurring patterns, such as efficiency gains and ethical risks. The data was also analysed on Comparative Metrics which includes comparison of pre- and post-implementation metrics, such asNet promoter score and Customer satisfaction scores (e.g., NPS/CSAT), Average response times for customer queries, Operational cost savings, content production rates in marketing.Framework Application usingTheoretical models such as the TAM, RBV, DOI were used to contextualize findings.

Hypotheses

H_{01}: ChatGPT does not significantly enhance operational efficiency by automating routine tasks and reducing response times.

H_{02}: Businesses using ChatGPT for content generation do not experience higher innovation indices than those relying on traditional methods.

H_{03}: ChatGPT adoption does not improve customer satisfaction and engagement through personalized interactions.

H_{04}: Ethical concerns, such as bias and data privacy risks, do not present barriers to ChatGPT's widespread adoption.

IV. Results and Discussions

Customer Satisfaction Scores (CSAT/NPS): ChatGPT enhances customer satisfaction by providing timely, accurate, and personalized responses. Documented implementations in retail and healthcare illustrate significant improvements.

Table 1: Customer Satisfaction Scores (CSAT/NPS):

Industry	Pre-Implementation CSAT/NPS	Post-Implementation CSAT/NPS	Improvement	Source
Retail (H&M)	65	85	+30%	Gartner, 2022. AI and Retail Trends Report
Healthcare (Babylon)	50	75	+25%	McKinsey, 2023. Digital Healthcare Transformation Report

Interpretation: H&M utilized ChatGPT for automated customer support, achieving a 30% increase in satisfaction scores due to faster query resolution and tailored responses. Babylon Health's AI-powered triage system reduced response times for initial consultations, leading to a 25% boost in patient satisfaction.

Response Times for Customer Queries: Reducing response times is one of ChatGPT's most notable benefits. Industries like e-commerce and telecommunications have implemented ChatGPT to handle large volumes of routine queries, resulting in faster resolution times.

Table 2: Response Times for Customer Queries

Industry	Pre-Implementation Avg. Response Time (mins)	Post-Implementation Avg. Response Time (mins)	Improvement	Source
E-commerce (Shopify)	12	6	-50%	Shopify, 2022. Shopify Blog
Telecommunications	15	9	-40%	Vodafone, 2023. Vodafone AI Strategy Whitepaper

Interpretation: Shopify integrated ChatGPT to assist merchants with FAQ resolution, reducing average query response times by half. Vodafone utilized AI for basic customer support inquiries, cutting response times by 40%.

Operational Costs: By automating routine tasks, ChatGPT helps organizations achieve significant cost savings. This is particularly evident in customer service-heavy industries.

Table 3: Operational costs

Industry	Pre-Implementation Costs (Annual)	Post-Implementation Costs (Annual)	Cost Savings	Source
E-commerce (eBay)	$1,200,000	$840,000	-30%	Shopify, 2022. Shopify Blog
Telecommunications	$1,000,000	$750,000	-25%	Vodafone, 2023. Vodafone AI Strategy Whitepaper

Interpretation: eBayReduced staffing requirements for customer service by automating 70% of routine queries, resulting in a 30% cost reduction.Vodafone lowered operational expenses by 25% through ChatGPT-assisted support.

Content Production Rates: Generative AI accelerates content creation processes, doubling production rates in marketing and publishing industries.

Table 4: Content production rates

Industry	Pre-Implementation Output (Units/Month)	Post-Implementation Output (Units/Month)	Improvement	Source
Marketing (HubSpot)	50	100	+100%	HubSpot, 2023. HubSpot Case Study
Publishing (Penguin)	60	120	+100%	Penguin Random House, 2023. Annual Report

Interpretation: ChatGPT-generated content allowed marketers to double their monthly output while maintaining high quality. Penguin Random House streamlined editorial workflows resulted in a 100% increase in manuscript editing and promotional content generation.

Ethical Challenges: Ethical concerns remain a critical barrier to the widespread adoption of ChatGPT. Issues of bias and data privacy have been documented across industries.

Table 5: Ethical Challenges

Challenge	Industry	Example	Source
Algorithmic Bias	Financial Services	Bias observed in credit scoring models, requiring retraining with diverse datasets.	OpenAI, 2022. Responsible AI Practices Report
Privacy and Compliance	Healthcare (Teladoc)	Ensuring HIPAA compliance for patient data when using AI-assisted triage tools.	Teladoc Health, 2023. Annual Report

Interpretation: Financial firms noted disparities in AI-generated credit recommendations, underscoring the need for robust bias mitigation strategies. Teladoc Health implemented strict compliance measures to safeguard sensitive patient information, aligning with regulatory requirements.

Results of Hypotheses Testing

- H_{01} is rejected: ChatGPT significantly enhances operational efficiency, reducing response times by up to 50% and operational costs by 25-30%.
- H_{02} is rejected: Businesses using ChatGPT for content generation demonstrate higher innovation indices, doubling their content production rates.
- H_{03} is rejected: ChatGPT adoption improves customer satisfaction and engagement, with NPS increasing by 25-30%.
- H_{04} is not rejected: Ethical concerns, such as bias and data privacy risks, remain significant barriers to ChatGPT's adoption.

Discussion

The findings confirm ChatGPT's transformative potential in improving operational efficiency, customer satisfaction, and content production while highlighting ethical challenges.Reductions of up to 50% in response times and 30% in operational costs across industries like e-commerce and telecommunications validate its role in resource optimization.Businesses can handle higher workloads with minimal resource expansion, aligning with the Resource-Based View (RBV).Customer satisfaction improved by 25-30%, driven by ChatGPT's personalized and accurate interactions, particularly in retail and healthcare. Generative AI strengthens customer relationships, enhancing loyalty and retention, supporting the Technology Acceptance Model (TAM).ChatGPT doubled content production rates in marketing and publishing, demonstrating its creative efficiency. By augmenting human creativity, it accelerates ideation and delivery, resonating with theories of computational creativity. Issues like bias and privacy risks persist, as seen in financial services and healthcare. Businesses must implement bias audits and comply with regulations to mitigate risks, ensuring responsible AI adoption.

V. Conclusion

This study examined the potential of AI model and its application in modern business operations, offering measurable improvements in efficiency, customer satisfaction, net promoter score. The findings validate hypotheses regarding ChatGPT's role in reducing operational costs, enhancing customer interactions, and driving innovation. However, few ethical issues such as algorithmic bias and data privacy concerns remain significant barriers to adoption.

By strategically integrating ChatGPT considering these challenges also, the businesses grow to their full potential to streamline operations and foster creativity. Future research should focus on long-term impacts, sector-specific applications, and evolving regulatory landscapes to ensure sustainable implementation.

VI. Limitations of the Study

This study has several limitations that must be acknowledged to contextualize the findings. The study focuses on a few of industries and further companies, which mayhinder the diverse applications and impacts of ChatGPT in other sectors. This limitation restricts the generalizability of the results, particularly for domains with unique operational complexities or limited AI adoption.

Another limitation arises from the rapidly evolving nature of AI technologies. As generative AI tools like ChatGPT continue to advance, the findings of this study may become outdated, reflecting only a snapshot of current trends rather than a comprehensive long-term analysis. Additionally, while the study discusses ethical challenges such as algorithmic bias and data privacy, it does not delve deeply into the socio-cultural, legal, and regulatory implications of deploying ChatGPT across different geographic regions.

Lastly, the study predominantly relies on performance metrics reported by organizations, which may be influenced by biases in reporting or a lack of standardization in evaluating AI outcomes. Future research incorporating longitudinal studies and primary data collection could address these limitations, offering a more robust understanding of ChatGPT's impact and potential

Scope for Future Study

Future studies on ChatGPT and similar generative AI tools present significant opportunities to expand understanding and address existing gaps. First, empirical research involving primary data collection, such as surveys, interviews, or experimental studies, could provide richer insights into the practical challenges and perceptions of ChatGPT users. This would complement secondary data and enable a more comprehensive analysis of adoption dynamics across diverse industries. Additionally, sector-specific studies focusing on underrepresented domains, such as public administration, rural education, and logistics, could uncover novel applications and industry-specific barriers.

These studies could shed light on how AI tools evolve within organizations and their implications for business strategy over time. Moreover, the adoption of regulatory frameworks for AI deployment is a critical area for exploration. Research addressing algorithmic fairness, data privacy compliance, and the mitigation of biases in AI systems could guide responsible implementation practices.

Finally, cross-cultural studies investigating the adoption and reception of ChatGPT in different regions and socio-economic contexts could provide valuable insights into its global applicability. These studies would help identify cultural and regional factors influencing AI acceptance, ensuring that future AI tools are inclusive and adaptable to diverse needs.

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BRAND INTIMACY AND YOUNG EARNERS – EXPLORING THE RELATIONSHIP

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Purpose: *This study attempts to explore the relationship between brand intimacy and young earners' brand consumption behaviour – investigating factors that influence the young consumers' brand engagement.*

Research Design/Methodology: *The main tools in this study have been literature reviews supported by personal in-depth interviews and a survey through a questionnaire with 5-point Likert Scale. The survey was conducted among earning young individuals in Guwahati city – both males and females. Guwahati has been considered to be the hub for young people from all neighbouring states in the North East India. This way a triangulation approach has been adopted for a layered analysis.*

Findings: *Results show a substantial level of brand intimacy among young earners ($p < 0.05$). Contrary to expectations, income level did not indicate any significant relationship ($p > 0.05$) with brand intimacy as a factor. The personal interviews indicated other factors such as brand community, brand trend awareness through social media and peer influence.*

Originality/Value: *This study provides insights into a segment of brand consumers which has not been explored before by other studies. Young earners play a major part among brand consumers and generallythe young community is seeing a steady growth. More than 50% of India's population is below the age of 25 years and 65% below the age of 35 years (Word Population Prospects 2022-UN).These insights from the study are expected to give useful direction to brand managers targeting the earning youth in the North East region of India.*

Keywords : *Young Earners, Brand Intimacy, NE Youth, Brand Culture*
JEL Code: *M310.*

I. Introduction

Since the evolution of brands during the 1500s and more particularly in the 19th and 20th centuries, youths have been seen as the major catalysts or driving force behind the popularity of a brand culture (Britton, 2015; Weiser, Chris & Freitas, 2007). Globally, attitude of young people towards brands has been a major factor in the success of global brands (Chu & Huang, 2010).

Brand intimacy or affinity is developed over a period of time through pro-active behaviour of consumers towards brands that comprises of emotional need fulfilment (Natarelli & Plapler, 2017). As a result of such emotional intimacy, brand consumers -- particularly the youth, actively participate in propagating brands' core messages consciously or sub-consciously that leads to creating brand communities among the youth.

In a broad terminology, Brand Relationship is the relationship that a consumer feels with a brand or brands of her/his choice (Veloutsou, 2007). A brand almost gets a persona with visible or felt attributes in the mind of the consumer, that embodies into building an intimate relationship for the consumer.

Intimacy or affinity is a relationship which is emotionally very personal in nature. It is a relationship which goes beyond customer engagement (Fournier, 1994). In fact, brand intimacy is the inner relationship between the customer and a brand's aura which can manifest into brand loyalty for life. An emotional connection is essential to upgrade a relationship into brand intimacy. However, every customer who feels an emotional connection with a brand might not necessarily reach to the intimacy state. Such customers might have occasional disconnect with the brands purchased, as opposed to the intimate ones who are die-hard fans of the brands they use on a daily basis.

1(a)Relevance of Brand Intimacy Studies

Brand custodians across various consumer (goods and service) industries carry out studies to check the level of engagement with their customers. Occasionally business magazines publish findings with captions such as "World's Most Loved Brands". Such lists include brands from all over the world viz. Amazon, Intel, Disney, Nike, McDonald, Coke, Microsoft, Nestle, Mercedes-Benz et al. However, such studies are generic in nature based on certain time-specific

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surveys mostly done online. These surveys definitely give an idea as to the followers of a brand through numbers but they cannot pin-point the intimacy level for a particular set of customers. Brand intimacy studies for all practical purposes, help in managing brand relationships with customers where the brands themselves become active partners in a two-way communication with their fans (Natarelli, M, & Plapler, R. 2017). Disciplines within Marketing like Customer Relationship Management and Strategic Brand Management, experts actively seek to enhance brand engagement levels with their customers through such studies (Fournier, 1994).

Brand relationship as a subject does not stand in isolation; rather it is very much interdisciplinary with contributions coming from many theoretical academic fields such as social psychology, sociology, cognitive psychology, economics, cultural studies, anthropology etc.

In recent times an extensive study conducted on literatures about brand relationship (Fescherin& Heinrich, 2014) concluded that the subject is particularly interdisciplinary with literatures majorly contributed from communication, applied psychology, business management and marketing.

1(b) Guwahati : The "lone-deemed" Metro city in the North East

Guwahati with a population of 9,62,334 in 2021, has been growing with many urban attractions including some of the premium higher educational institutions, hotels, sports facilities and international standard stadiums, multi-specialty hospitals, the lone international airport of the region, multi-cuisine restaurants, shopping malls and multiplexes etc. Influx of

people specifically youth from all other NE states, live in the city for different reasons such as study, jobs, sports, self-employment etc., "making" it the most suitable place to gather an appropriate sample of "young earners". Many of these youth have to stay back in the city who are attached to their employment or businesses.

II. Review Of Literature

There exist a number of literatures on Brand Intimacy or Brand Affinity across different disciplines of studies such as Management, Psychology, Behavioural Studies and more specifically within Marketing and Brand Management studies. There however is variation as to how intimacy is defined across these disciplines. Marketing studies offer clearer understanding on the subject, which is concerned about understanding Intimacy or Affinity in a customer engagement (CE) or customer relationship management (CRM) or more contemporarily customer experience management (CEM) perspective. In light of the literature reviewed, personal meetings with 16 working young people in the age group 18-36 years were conducted. Various information was gathered and re-established, which are presented hereunder.

2(a) Youth of North East – A Connected World

In contemporary India the youth in the NE region are abreast of information and awareness about other parts of the country and vice versa (Baruah, 2020). This is primarily due to extensive travel and inter-people communication taking place through various channels which have been available during the last two decades or so. A major contributor to this connectivity is taken to be the interactive social media platforms in addition to the existing other electronic media like television and radio. It is a sort of revolution in social media platforms in connecting the people, especially the youth of the region, who are very much part of the global virtual community in most aspects (Fennel S., Kaur P., Jhunjhunwala A., Narayanan D., Loyola C., Bedi J. and Singh Y., 2018). The youth in the North East today are assumed to be surfing, reading, enjoying and making friends on the net just the same way as their compatriots does in other parts of the country. The economically empowered young community is also considered to be savvy and brand-conscious (Zamindar, 2021).

2(b) Internet Technology & Digital Marketing

Technology has been affecting human behaviour and lifestyle since the Industrial Revolution and the rise of consumerism and its evolution over the decades since the end of World War – II (NYHS, Growth & Turmoil, www.wams.nyhistory.org). Technology in developing newer items of 'need satisfaction' as well as 'need creation' has been seen in a plethora of fields. Giant strides have been made in reaching out to prospective consumers through the use of technology, particularly in the field of media and communication, where Silicon Valley is helping in hijacking minds with particular vulnerability in youth of today with their intense obsession to digital media. With the advent of digital marketing and specifically the social media platforms the scenario in marketing communication has changed for all times to come (Corniani, 2006).

2(c) Youth And Their Icons

An icon could be defined as someone whom a large number of followers look up to either as an inspiration or simply as an undefined love and respect for the person who has achieved great success in her or his field of work. In the earlier societies most youth icons used to be social reformers and people who sacrificed their lives for the greater good of the country or society at large. The other category of icons who dominated

the social lives of youth in the past few decades came from the entertainment industry and sports (Bansal, 2013) After the advancement of the internet and the usage of modern technology, today there are many icons who are individual achievers in technology invention and usage or self-made business owners and entrepreneurs. Many of the youth consciously begin following their icons early in life and for some, the icon never gets replaced. These icons generally have a strong impact on the lives of youth and their social behaviour while trying to copy the icons' choices and their lifestyles. These encompass many elements from the way of dressing, personal grooming, choice of fashion labels and even sometimes mannerisms.

The other big factor among young people is the peer pressure (Hassan, Hurrah & Lanja, 2014). At this age they become ego or self-centric and cannot afford to lag behind their mates in what they wear, eat or do. The newly acquired purchasing power gives an impetus to them to experiment and choose the brands they wish to be seen with, as they also want to be in the brand user communities and want to be seen and discussed in their peer groups. This also makes them more brand- conscious and enjoys the pleasure of such brand association.

2(d) Youth, Economic Freedom and Social Media

The youth, particularly the ones with new found economic freedom as young earners living in the urban centres are believed to be fashion conscious (Dhiman, Chand and Gupta, 2018). As active consumers of fashion brands, they would form a substantial category for brand marketers to target. At the same time this group is generally considered to be impulsive buyers (Lin & Chuan, 2014) and liberals at experimenting and testing out new trends among available alternatives. A brand culture among the youth is still evolving in the self-conscious youth of today, in an environment of increasingly materialistic and competitive consumerism prevalent across age groups in general.

2(e) From 'Brand Consciousness' To 'Brand Intimacy'

Various neuro-marketing studies have illustrated that by creating strong emotional links with brands can build strong connections with their consumers. It is suggested that by keeping a consumer emotionally and cognitively engaged, one can influence the purchase intention of the consumer (Dutta & Mandal, 2020). Inducing positive emotions and vibes is vital to creating great customer experiences and thereby in converting regular customers into loyal ones. Moreover these loyalists are more likely to recommend the brand compared to regular or casual customers. According to a study when the functional attributes of a product cease to have any effect on a brand, it is the emotional value of consumers which determines the status of the brand in the market (Ghorbanzadeh & Rahehagh, 2021). A classic example of such emotional connect was exemplified during the 1985 experiment to change the original formula by introducing a "new Coke" in USA by the Coca Cola company, after extensive market research was carried out to go for the change. However finally once launched, it boomeranged tremendously affecting Coke's market as most consumers got emotional over the change saying the company had no right to "take away their Coke". The company had to abandon the "new Coke" project instantly (Oliver, 1986).

Brand intimacy is a very deep emotional connect of a consumer and a brand which is not to be confused with brand loyalty. While brand loyalty can exist without any intimacy, brand intimacy definitely involves brand loyalty. Brand loyalty can be affected by incentives or rewards programmes, while brand intimacy is about how a consumer feels the emotional connection with that brand. Intimacy therefore is not dependent on any reward or incentives programme (Rodrigues & Rodrigues, 2019).

2(f) Conceptual Framework of Brand Intimacy

In the history of brand marketing, a number of models or approaches have been propounded. One of the primary approach methodologies developed by Eias St. Elmo Lewis in 1898 was the Hierarchy of Effects model popularly known as AIDA model, where A=Attention, I=Interest, D=Desire and A=Action. This model was developed for understanding brand marketing from an Advertising and Sales perspective, which became popular with marketing companies and advertising agencies.

Studies into a consumer's journey from the mere brand purchaser to becoming a hardcore brand fan with emotional attachment, where a brand almost gets personified for the consumer, started much later, when concepts like Customer Relationship Marketing (CRM), Customer Experience Management (CEM) and Neuro Marketing came into being within the larger scope of Marketing.

Unlike AIDA approach, where the process ends with Action i.e. when a consumer makes a purchase, intimacy or affinity models actually go beyond this basic level and try to explore the path from Brand Consciousness to Brand Intimacy. Essentially therefore intimacy studies go much beyond the scope of the AIDA model. Neuro-marketing studies try to explore the triggers and stimuli that work inside a consumer's brain which forces a consumer to convert from a mere brand purchaser to being in an intimate relationship with a brand.

The progression from Brand Consciousness to Brand Intimacy may be indicated as follows:

Table-1: Descriptive Model of Brand Intimacy Journey

STAGES	PROCESS	RESULT
1.INTRODUCTION	a) Awareness through brand messages and stimuli b) Recognition of need (by self and/or external influences). c) Felt need in conscious & sub-conscious mind.	Learning
2.ASSESSMENT	a) Self-interpretation or Self-questioning "Is it for me?" b) Development of aspirational need (to be in brand community) c) Assessing available options to invest in.	Convincing
3.ACTION	a) Familiarity and awareness about self-status improvement. b) Becomes ritual, part of routine purchases. c) Homogenous feeling with brand community.	Acquiring
4.EMOTION	a) Evokes certain nostalgia about the brand used. b) "Feels good and confident" about using the brand. c) Creates exceptional emotional attachment with the band.	**Bonding**

In this journey, a consumergoes through a progression while developing an intimate bond with a brand. It starts with the creation of awareness which could be due to various factors such as:

External: Advertising communication, social media, word of mouth, brand communities, internet surfing etc.

Internal: Recognition of need, a conscious search for information, window shopping etc.

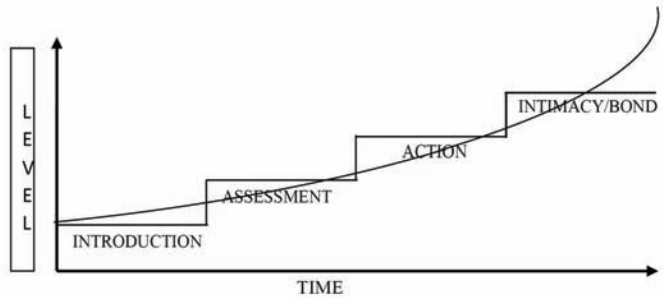
In the assessment phase, the consumer does an internal verification of the felt need which is triggered also by the aspiration level to be in the brand community. In this phase the economic considerations such as price, value or worth of item etc come in.

In the action phase, actual investment takes place on a brand, which is followed by a feeling of strong association on the possession of the brand that occurs deep inside the consumer's brain. The consumer also becomes aware of the status improvement and gets into 'inclusive feeling' in the brand community. In the later part of this phase, it becomes a regular practice for the consumer to purchase the brand.

The Emotion phase actually lands the consumer into a phase where the intimacy is strongly felt with the brand, almost giving a personification to the brand as a "close friend" for the consumer. Feels good and confident to be seen with the brand of choice.

The progression towards such an intimate bond or affinity can be understood as shown in Fig-2

Figure-1: Brand Intimacy Development Over Time



III. Research Methodology

A triangulation approach has been taken for the study. In addition to Personal Interviews and Literature Reviews, a sample survey was conducted among 120 earning young people in Guwahati in the age group of 18-36. Out of 20 statements on a five-point Likert Scale (where Strongly Agree-1 and Strongly Disagree-5 were extremes with middle neutral point as 3), 9 statements were administered to measure the existence of Brand Intimacy and 11 statements were administered to examine whether the intimacy is triggered by social and emotional need fulfilment.

OBJECTIVES of THIS STUDY

This study explores the nature of "brand intimacy" specifically of earning youth in the north east region of India from various disciplines of work by talking to them – both males and females. The study tries to look at two specific questions:

a) Does Brand Intimacy exist in the working youth of North East India?

b) Is Brand Intimacy triggered by social and emotional need fulfilment?

The scale of reliability analysis showed the value to be 0.89 for the existence of brand intimacy and 0.89 for emotional trigger for intimacy – which being above 0.70 are acceptable values in the Cronbach Alpha reliability test. The questionnaire was distributed using Google Form and shared online with young people along with a brief of the objective so that fair and honest responses were received.

Part-A of the questionnaire consisted of questions relating to the demographics such as age group, gender, income level, education level, occupation sector and tenure.

Part-B consisted of a total of 20 items broken into two groups as already described above.

IV. Results and Discussion

Demographics: 64 (53.3%) of respondents were Females and 56 (46.7%) were males. The break ups as per age group were:

18-24 = 36 (30%)

25-30 = 36 (30%)

31-36 = 48 (40%)

For occupation sector the result was as under:

Govt. Sector = 24 (20%)

Private Sector = 72 (60%)

Self-Employed = 24 (20%)

For academic qualification the results were as under:

High School = 4 (3.3%)

Senior Secondary School = 4 (3.3%)

Graduate = 60 (50%)

Post Graduate &above = 52 (43.4%)

For income (in Rupees per month) the results were as under:

10,000 to 20,000 = 16 (13.3%)

20,001 to 30,000 = 44 (36.7%)

30,001 to 40,000 = 36 (30%)

40,000 and above =24 (20%)

As for work tenure the results achieved were:

Less than 2 years = 40 (33.3%)

2 years up to less than 5 years = 32 (26.7%)

5 years and above = 48 (40%)

Correlation Analysis:

For this study, two sets of collected data were analysed to test the following Hypotheses:

Hypothesis-1

H0 = There is an intimacy between brands and young earning people.

H1 = There is no intimacy between brands and young earning people.

In Table-I the various p-values and Sig. values achieved for the first group of 9 items related to Brand Intimacy and Age (young people) and Income (Earning) are shown:

The Sigma values are less than 0.05 on following key items in their relation to Age Factor (Young) are observed as follows:

1. Active User of brand = 0.005

2. Personality Aspiration=0.029

3. Purchase Frequency=0.049

4. Confidence Seeker=0.003

Brand Fanatic=0.026

On other items, namely Trend Seeker, Natural Attachment, Ego Satisfaction, Quality Consideration – the Sig. value is more that 0.05. Hence on the 4 items there is no significant

Table-2: BRAND INTIMACY CORRELATION with AGE & INCOME

		Active User 1	*Personality Aspiration 2*	*Purchase Frequency 3*	*Confidence Seeker 4*	Trend Seeker 5	Natural Attachment 6	Ego Satisfaction 7	Quality Conscious 8	*Brand Fanatic 9*
AGE	*Pearson Correlation*	***.47***	***.39***	***.36***	***.51***	***.34***	***.22***	***.05***	***.24***	***.38***
	Sig.	***.005***	***.029***	***.049***	***.003***	.058	.239	.754	.179	***.026***
	N	120	120	120	120	120	120	120	120	120
INCOME	*Pearson Correlation*	.22	.11	.06	-.15	-.13	-.33	.16	.25	-.19
	Sig. (2-tailed)	.198	.528	.701	.474	.516	.082	.428	.202	.343
	N	120	120	120	120	120	120	120	120	120

relationship with the age factor. However in all 9 items the Pierson's p-value is +ve the lowest being 0.05 (Ego Satisfaction) and highest being 0.51 (Confidence Seeker).

In consideration of the fact that on 5 key items signifying affinity or intimacy with branded products, the hypothesis accepted to conclude that **"There is brand intimacy for young earning people."**

On the other hand, it is observed that for all 9 items Sig. value is more that 0.05 in their correlation with Income (Earning) and in 4 items the Pierson's p value is also –ve. Hence it may be concluded that **Income factor has no significant impact on Brand Intimacy**.

The second set of data having 11 items related to Emotional Need Fulfilment were tested to check whether Brand Intimacy is triggered by these items.

Hypothesis-2

Ho = Brand intimacy is triggered by emotional need fulfilment of young earning people.

H1 = Brand intimacy is not triggered by emotional need fulfilment of young earning people.

In Table-II the various p-values and Sig values achieved for the first group of 9 items related to Emotional Triggers and Age (young people) and Income (Earning) are presented:

Table-3 : EMOTIONAL TRIGGER CORRELATION with AGE & INCOME

		Social Life 1	*Seek Brand Message 2*	*Social Acceptance 3*	*Peer Influence 4*	*Follow Social Media 5*	*SM Influence on Purchase 6*	*Pro-Active Promoter 7*	*Impress Opposite Sex 8*	*Show Off 9*	*Brand Trend Fixation 10*	*High SM Usage 11*
AGE	*Pearson Correlation*	***.48***	***.44***	***.34***	-.05	***.36***	***.34***	***.24***	***.16***	***.31***	***.41***	***.34***
	Sig. (2-tailed)	***.003***	***.009***	***.049***	.781	***.046***	.054	.156	.336	.081	***.006***	.050
	N	120	120	120	120	120	120	120	120	120	120	120
INCOME	*Pearson Correlation*	.16	-.10	.10	.15	-.05	-.29	-.22	.12	.09	-.21	.24
	Sig. (2-tailed)	.366	.646	.644	.406	.813	.130	.273	.502	.612	.280	.170
	N	120	120	120	120	120	120	120	120	120	120	120

The Sigma values as observed are less than 0.05 on the following key items in their relation to Age Factor (Young):

1.Social Life = 0.003

2.Seeking Brand Message=0.009

3.Social Acceptance=0.049

5.Following Social Media=0.046

10.Brand Trend Fixation=0.006

On other items, namely Peer Influence, Social Media Influence on Purchase, Pro-active Promoter, Impressing Opposite Gender, Brand Show Off, High Social Media User –

the Sig. value is more that 0.05. Hence on the 6 items there is no significant relationship with age factor. However on 10 items the Pierson's p value is +ve the lowest being 0.16 (Impressing Opposite Gender) and highest being 0.048 (Social Life).

In consideration of the fact that on 5 key items signifying that Emotional Needs trigger intimacy with branded products, the hypothesis is accepted to conclude that **"Brand intimacy is triggered by emotional need fulfilment of young earning people."**

On the other hand, it is observed that for all 11 items Sig. value is more that 0.05 in their correlation with Income (Earning) and in 5 items the Pierson's p value is also –ve. Hence it may be concluded that **Income factor has no significant impact on Emotional Need Fulfilment Trigger**.

5. PERSONAL IN-DEPTH INTERVIEWS:

To enrich our understanding of the perspectives of the young earners, personal in-depth interviews were conducted alongside the main questionnaire survey. The qualitative insights gathered through these interviews offer a deeper exploration of themes that emerged from the quantitative data.

Approach: 16 participants (ages 18 to 36) were selected through purposive sampling to ensure diverse perspectives. Semi-structured interviews were conducted exploring topics such as:

- Awareness on brands
- Influencers in Brand purchase decision
- Brand purchase behaviour vis-à-vis Earnings
- Brands followed on Social Media or otherwise
- Motivating factors to brand following
- Active promotion of brands and participation in brand communities
- Recalling brands that are being purchased

Each interview lasted about 45 minutes and responses were noted down.

Key Themes:

a) Awareness about brands: Brand awareness was high among all participants and most common recalled brands were into categories of: fashion garments, eye glasses, cosmetics (for the women), footwear and mobile.

b) Brand Purchases: Out of 16 participants, 9 were committed to brand purchases – the other 7 being casual purchasers of branded items. A notable finding was "I always plan and buy my branded items and not whimsically. I save money and buy it about every 3 months." This reinforces the survey data on reinforcing the significant positive correlation between age and purchase behaviour (p=36/Sig.=0.050); age and brand fanatic (p=40/Sig.0.029).

c) Participation in Brand Communities: Even though all 16 participants were heavy to medium users of social media on a daily basis, only 10 were following brands on social media and out of that only 7 were active in sharing posts about brands they use. There was no clear indication about social media's influence on brand purchase decisions. However the statement, "Presence of brands in social media definitely helps me in understanding latest trends" – showed participants' dependence on social media for information about brands they follow.

d) Decision Influencers/Motivators: Out of 16 casual to heavy brand users, 13 were influenced by friends and one was by his younger brother who works in Ahmedabad in Gujarat. One participant closely follows his father that included his choice of colour as well (White) for most clothing items. "I have seen my father using mostly white colour items since my childhood, which is a colour I always liked." Significant positive correlation has been observed between age and emotional trigger as seen in the quantitative analyses relating to: Social Life (p=0.48/Sig.=0.003) and Social Acceptance (p=0.34/Sig.=0.049).

e) Brand Name recall: In all regular brand purchasers, brand recall was very high and prompt. Strong categories were fashion clothing, footwear, eye glasses, mobiles, perfumes and cosmetics.

V. CONCLUSION

These insights reveal positive and strong correlation of young earners with brands, however they do not pinpoint exact nature of that relationship. The in-depth interviews contributed with valuable nuances to add value to the study to holistically understanding the complex landscape surrounding the young earners' brand intimacy.

During the last three decades most of the international brands in almost all product categories have come into India, in addition to home-grown brands. The North East is a growing market and it would make more sense for marketers to focus on this market where brand intimacy exists among the young earners. It is a compulsion for brand managers to attract and lure the young earners into becoming their intimate brand loyalists for future prospects. This study is therefore important from a marketing point of view as there exists fierce competition between existing brands.

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RETAIL ATMOSPHERICS: A BIBLIOMETRIC ANALYSIS AND FUTURE RESEARCH AGENDA

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Purpose: *The retail industry, one of the largest and fastest-growing sectors globally, faces challenges in adapting to technological advancements and changing customer behaviors. Retail atmospherics, which include both tangible and intangible elements such as store layout, design, scent, music, and online atmospherics, play a critical role in shaping customer behavior and enhancing the overall customer experience. This study aims to fill a significant gap in the literature by conducting a comprehensive bibliometric analysis of research on retail atmospherics.*

Design/Methodology/Approach: *Drawing from 177 articles published between 1994 and 2024, this bibliometric review uses tools like VOSviewer and Biblioshiny to identify key trends, influential authors, countries, and leading publication outlets in the field of retail atmospherics. The study also explores the conceptual and intellectual structures underlying this body of research, offering insights into the evolution of this domain over time.*

Findings:*The analysis reveals a growing interest in retail atmospherics, particularly in multi-sensory environments, digital atmospherics, and the impact of emerging technologies such as artificial intelligence (AI) and the metaverse on customer behavior. The study highlights the increasing prominence of research in these areas, reflecting the sector's response to technological advancements and shifting customer preferences.*

Originality/Value:*This research offers a comprehensive review of nearly three decades of retail atmospherics literature, providing valuable insights for both academics and practitioners. By mapping out the evolution of the field, the study identifies emerging areas of research and suggests new avenues for exploration, particularly in terms of leveraging innovative strategies to enhance retail environments in both physical and digital spaces.*

Keywords : *Retail Atmospherics, Customer Behaviour, Bibliometric Analysis, Digital Retail, Customer Experience, DAST Framework*
JEL Code: *M31, L81, Z33*

I. Introduction:

The retail industry is one of the largest industries around the world, It will grow from $28846.57 billion in 2023 to $31310.6 billion in 2024 at a compound annual growth rate (CAGR) of 8.5%, which is the size of economies of many countries. The retailindustry has observed disruptions due to the pandemic, customer behaviour and technological advancements. Hence, it is difficult for many retailers to keep pace with technological advancements and increase customer patronage both online and offline. To convert walkers into stoppers and stoppers into shoppers, retail atmospherics plays a major role.

Retail atmospherics combines tangible and intangible dispositions that influence customer behaviour. These tangible and intangible dispositions consist of factors such as retail store layout, design, scent, music, colour, temperature and even crowding in the store environment (Kumar et al.,2010).Due to the popularity and adoption of online retail worldwide, researchers also synthesize the literature on online atmospherics. For instance, Soon et al. (2023), defined web atmospherics as the purposeful designing of the online retail environment to induce customer response and subsequently favourable outcomes.

During COVID-19 times retailers had seen a downfall in patronage at stores, after the pandemic to win back customers and to make them visit stores, retailers have relied on atmospherics. The main purpose is to create unique and memorable customer experiences through strategically enhanced retail atmospherics.

In the last few years, researchers have synthesized the literature around Retail atmospherics. For instance, Van et

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al., (2024) explored the impact of store atmospherics on urban bottom-of-pyramid customers' behavioural intentionsto purchase apparel. Likewise, Pal and Srivastava (2024) researched about the role of retail atmospherics and multi-sensory environments in customer patronage intention. As the majority of retail businesses and customers shifted to an online shopping environment after the pandemic hence few authors also studied website atmospherics and customer stickiness (Pang et al.,2024). Retail atmospherics have also been investigated in the fields of luxury (Guzzetti et al.,2024) and virtual retail design (Warden et al,2024).

Despite the significant studies available on retail atmospherics, the author was not able to find any review study focused on retail atmospherics. Several researchers have reviewed the research trends in sensory marketing (Antunes & Veríssimo,2024) and retail environment design(Steen et al.,2024) but specific studies related to retail atmospherics are missing. Hence the present study addresses the important gap in the literature by presenting the first review study of available literature on retail atmospherics. Specifically using bibliometric analysis, the research is aimed to answer the research questions outlined below:

Rq1: What are the current trends in publications with respect to Retail Atmospherics?

RQ 2: What are the most influential authors, most productive countries, and publication outlets in the field of retail atmospherics?

Rq3: What is the conceptual and intellectual structure of retail atmospherics research?

II. Review of Literature

In a competitive market full of identical, retailers need to manage the customer experience effectively. The customer experience spans many stages and retailers need to manage the experience at every possible touch point. Out of many factors i.e. merchandise availability, price, and location atmospherics is a crucial component to manage customer experience. Retail atmospherics are essential for any retailing strategy because they help to create a shopping context that motivates customers to purchase (Poncin, & Mimoun,2014). Kotler (1973) defined "Retail atmospherics as the efforts to design buying environment to produce a specific emotional effect in the buyer that enhances his purchase probability". The main sensory dimensions of atmospherics are visual, olfactory, aural and tactile.

The DAST framework Design, Ambient, Social and Trialability have been conceptualized by researchers forin-store and out-store touchpoints. The framework expands the traditional framework of retail atmospherics by incorporating out-store touchpoints i.e. social media, websites, flyers, and shipping materials. By considering these additional touchpoints DAST framework expands the horizon of atmospherics for better customer engagement (Roggeveen et al.,2020). Outdoor atmospherics in retailing also emerged as one of the domains which not only caught researchers' attention but also had an impact on customer engagement (Bloch & Disfani,2018).

Many studies have focused on specific components of retail atmospherics and their individual impact, rather than considering atmospherics as a whole. For instance, Manzoor et al., (2024) studied the impact of ambient aroma on consumer impulse buying behaviour, Zhang et al., (2024) discussed the impact of bright light, Yuan & Yang (2024) tried to find out relationships among happy songs, store brand image, and store brand awareness and Raja et al., (2024) analyzed musical retail therapy. Further Dennis et al., (2012) investigated digital signage as a tool of retail atmospherics. Digital signage has also been studied in mall environments (Roux et al.,2020), and in various store formats i.e. grocery retailers (Garaus et al.,2017). Many researchers studied digital signage from the perspective of outcomes i.e. impact of digital signage on emotional targeting (Garaus et al.,2021). The impact of digital signage also has been observed in sales of retail stores and overall purchases made by customers (Roggeveen et al.,2016).

With the advent of technology, many technological advancements are being adopted by retailers, and some are being incorporated in research studies.e-atmospherics emerged as an extension of retail atmospherics(Poncin & Mimoun,2014). Applications of Metaverses have been extended into many fields. Similarly, many retailers have implemented the metaverse in virtual store atmospherics. Metaverse in virtual stores' atmospherics can impact online trust and shape consumer impulse buying (Dang Quan et al.,2024).AI-powered technologies are also used by retailers to enhance retail atmospherics. In today's digital era, these enhanced retail atmospherics generate higher aesthetic reactions and higher absorption, resulting in a higher intent to purchase (El Abed, & Castro-Lopez, 2024). The technologies that became integral parts of retail atmospherics

and evolved with time include smart displays, robots, avatars, click-and-flick smart windows, smart shelves and digital tags name a few (Grewal et al.,2020).

A few researchers have also expanded the concept of e-atmospherics to include digital atmospherics. Digital atmospherics can be defined as the use of digital devices such as digital signages, digital screens and memory mirrors in a physical store environment (Kim et al.,2020).The most prominent use of digital atmospheres has been noticed in sports and luxury stores.

III. Research Methodology

The research study adopts the Bibliometric analysis methodology suggested by Donthu et.al (2021). A stepwise procedure has been followed to assess the research published in the domain of Retail Atmospherics. Bibliometrics is a statistical method that involves quantitative analysis of documents related to a chosen topic or domain (Yu et al.,2020).The authors have shortlisted the papers based on identifying relevant keywords, filtering the data based on selected parameters, and ensuring that only relevant research papers are considered. After that, we have used bibliometric tools to conduct the analysis.

Step 1: **Identification and Selection of the Database for Literature Search**

The Scopus database was selected for searching literature related to retail atmospherics. Scopus is a globally accepted database and delivers the most comprehensive view of the world's research output in the fields of science, technology, medicine, social science, arts and humanities (Sweileh,2018). Scopus database is recognized as the largest abstract and citation-based database (Mishra et al.,2021), covering a wide range of domains.

Step 2: Keyword Identification

The authors mined the Scopus database with the keywords "Retail Atmospherics" on May 28, 2024. The search for literature on the Scopus database has been done by using the keyword string (TITLE-ABS-KEY (retail AND atmospherics), which results in 224 documents.

Step 3: Initial Results of Literature Search

The initial search results in 224 documents from the Scopus database.

Step 4: Inclusion and Exclusion Criteria

To include only relevant research about results, Language (English) criteria were used, which filtered articles published in other languages such as Croatian, Slovenian and Turkish results 222 documents. The next criterion for inclusion is articles, which filtered out book chapters, conference papers, reviews and editorials and the final output is 177 documents. After loading the datasheet authors observed that publications are from year 19, as the retail atmospherics field is a niche, hence authors did not apply a publication year filter. Finally, 177 studies were selected for further analysis.

TITLE-ABS-KEY (retail AND atmospherics) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (DOCTYPE , "ar"))

Step 5: Bibliometric and Network Mapping Tools

To perform a bibliometric analysis, VOS viewer and biblioshiny software have been used. VOSviewer is a visualization platform which can analyze and reveal the pattern of publications in various databases (McAllister et al.,2022). VOSviewer is a free computer platform for constructing and viewing bibliometric maps (Van & Waltman,2010).

IV. Results and Discussion

4.1 Descriptive Indicators

This study conducted a bibliometric analysis of 177 articles published from 1994 to 2024 in 81 scholarly sources. Most of the documents were multi-authored in the 177 articles contributed by 385 authors. Further, these 177 articles received 48.36 as an average citation. The annual growth rate of the domain is only 1.36% but the citation rate is quite high. Authors keywords are 582 and international co-authorship is 26.8%, Table 1.

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	1994:2024
Sources (Journals, Books, etc)	81
Documents	177
Annual Growth Rate %	1.36
Document Average Age	9.45
Average citations per doc	48.36
References	10542
DOCUMENT CONTENTS	
Keywords Plus (ID)	224
Author's Keywords (DE)	582
AUTHORS	
Authors	385
Authors of single-authored docs	21
AUTHORS COLLABORATION	
Single-authored docs	24
Co-Authors per Doc	2.68
International co-authorships %	27.68
DOCUMENT TYPES	
article	177

Table 1 : Descriptive Analysis

The authors have also analyzed most cited papers in the domain. The top 10 most cited articles are shown in Table 2.

Document	Title	Year	Local Citations	Global Citations	LC/GC Ratio (%)
Michon, R., Chebat, J. C., & Turley, L Journal of Business Research	Mall atmospherics: the interaction effects of the mall environment on shopping behavior	2005	25	237	10.55
Morrison, M., Gan, S., Dubelaar, C., & Oppewal, H Journal of Business Research	In-store music and aroma influences on shopper behavior and satisfaction	2011	24	226	10.62
Spence, C., Puccinelli, N. M., Grewal, D., & Roggeveen, A. L Psychology & Marketing	Store atmospherics: A multisensory perspective	2014	23	344	6.69
Puccinelli, N. M., Goodstein, R. C., Grewal, D., Price, R., Raghubir, P., & Stewart, D. Journal of Retailing	Customer experience management in retailing: understanding the buying process	2009	17	622	2.73
Summers, T. A., & Hebert, P. R Journal of Business Research	Shedding some light on store atmospherics: influence of illumination on consumer behavior.	2001	14	164	8.54
Ballantine, P. W., Jack, R., & Parsons, A. G., International Journal of Retail & Distribution Management	Atmospheric cues and their effect on the hedonic retail experience	2010	12	134	8.96
Roschk, H., Loureiro, S. M. C., & Breitsohl, J. Journal of Retailing	Calibrating 30 years of experimental research: a meta-analysis of the atmospheric effects of music, scent, and color	2017	11	174	6.32
Roggeveen, A. L., Grewal, D., & Schweiger, E. B Journal of Retailing	The DAST framework for retail atmospherics: The impact of in-and out-of-store retail journey touchpoints on the customer experience	2020	11	154	7.14
Chebat, J. C., & Michon, R. Journal of Business Research	Impact of ambient odors on mall shoppers' emotions, cognition, and spending: A test of competitive causal theories	2003	11	493	2.23
Sharma, Arun, and Thomas F. Stafford Journal of Business Research	The effect of retail atmospherics on customers' perceptions of salespeople and customer persuasion:: An empirical investigation	2000	10	135	7.41

Table 2: Most Cited papers of the domain

4.2 Country and Affiliation Statistics

The top countries as per the publications shown in figure 1. The research in the field has been dominated by the USA with 29, single-country publications and 13 multiple-country publications. This has been followed by the United Kingdom and India with 17 and 16 documents respectively. In the top 5 countries, Australia produced only SCP (single country publication), it has 6 documents in total.

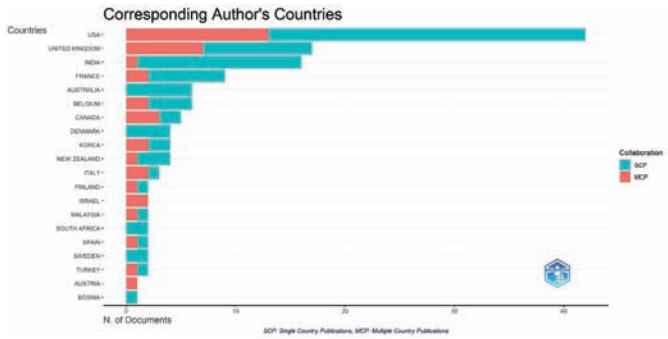

Figure 1 : Countries and Affiliation Status

4.3 Keyword Analysis

We used VOSviewer to analyze the information related to Keywords. A total of 766 keywords have been identified from 177 documents. The minimum threshold of occurrence has been set at 3, and 46 keywords were able to cross this threshold.The top 5 keywords from the analysis are atmospherics(52 occurrences), retailing (33), retail atmospheric (33) and consumer behaviour occurred 12 times. Another interesting finding of study is some authors used retail atmospherics while others used store atmospherics and store atmosphere, store ambience. The size of the circle in the figure represents the occurrence of keywords. As depicted in figure 2 retail atmospherics is connected through sensory marketing, retail environment, in-store experience, store design, and consumer behaviour.

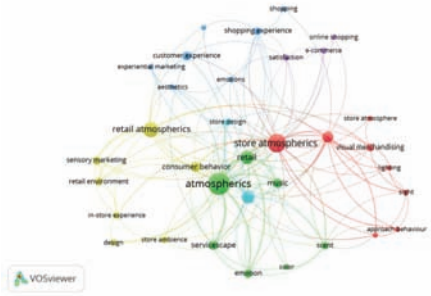

Figure 2 : Keyword Analysis

4.4 Most Influential Articles on Retail Atmospherics

The tablelists the 10 publications on retail atmospherics with the highest global and local citations. Global citations can be referred to as the total citations received from a document indexed in the bibliographic database while local citations are referred to as citations by the author from the same field. The ranking is based on the most locally cited document in which “Mall atmospherics: the interaction effects of the mall environment on shopping behavior” is at the top with 25 citations. Other articles include Morrison et al. (2011) &Spence et al.,(2014) also among the top three. Based on global citations, if the table is analyzed, "Customer experience management in retailing: understanding the buying process," published in 2009, received a maximum 622 citations. The study has emphasized on role of elements of consumer behaviour i.e. information processing, memory, and retail atmospherics in various stages of the buying process. A research paper by Chebat and Mechan (2003) titled” Impact of Ambient Odours on Mall Shopper's Emotions, cognition and Spending: A Test of Competitive Causal Theories” ranked second with 493 citations in the

field. This research is based on atmospheric cues and the cognitive theory of emotions. The paper explains about processing of store atmospherics among mall shoppers.

It has also been observed that older studies received more citations than newer ones. There is a huge difference between the numbers of global and local citations, hence to reduce the ill effect of citation count, an LC/GC ratio has been used. Two articles authored by Ballantine et al., (2010) and Summers et al., (2001) with LC/GC ratios 8.96 and 8.54 were able to enter in top four slots, which implies the relevance of these articles in other domains rather than retail atmospherics.

4.5 Most Influential Sources

To analyze the most influential source in the domain, one must consider the h index, g index and m index (Alkhammash,2023).h-index can be explained as a metric that attempts to quantify the productivity and citation impact of publication (khan et al.,2024), while g index is computed based on citations received by the journal. M-index can be explained as the h index divided by the duration of the journal's active career. On analyzing the publication productivity Journal of Business Research is at the top with 40 publications followed by the International Journal of Retail and Distribution Management (15),Journal of Retailing and Consumer Services (14) and International Review of Retail and Distribution Management (9) publications. Although the top journal "Journal of Business Research" does not belong to the retail domain but is at the top of the index, this validates the acceptability of retail atmospherics among other domains also.

Source	h_index	g_index	m_index	TC	NP	PY_start
JOURNAL OF BUSINESS RESEARCH	20	23	0.8	2562	23	2000
INTERNATIONAL JOURNAL OF RETAIL AND DISTRIBUTION MANAGEMENT	11	15	0.611	464	15	2007
JOURNAL OF RETAILING AND CONSUMER SERVICES	9	14	0.29	445	14	1994
INTERNATIONAL REVIEW OF RETAIL, DISTRIBUTION AND CONSUMER RESEARCH	7	9	0.389	200	9	2007
JOURNAL OF RETAILING	7	10	0.304	1545	10	2002
JOURNAL OF MARKETING MANAGEMENT	5	6	0.385	121	6	2012
JOURNAL OF GLOBAL FASHION MARKETING	4	5	0.364	57	5	2014
EUROPEAN JOURNAL OF MARKETING	3	3	0.25	117	3	2013
INDIAN JOURNAL OF MARKETING	3	3	0.25	24	3	2013
JOURNAL OF CONSUMER MARKETING	3	3	0.5	49	3	2019

Table 3: Most Influential Sources

4.6 Bibliographic Coupling

Bibliographic coupling analysis has been performed to establish the relationship between similar articles with the help of citation analysis. The author performed a bibliographic analysis with the help of VOSviewer software. On the chosen threshold of a minimum of 20 citations, 93 meet the criteria out of 177 documents. This results in a total of 6 clusters as shown in figure. The node size represents how often documents cite the same document, and the link denotes their linkage. Cluster 1 (redcolour) consists of 19 items, the cluster is mainly related to atmospheric constructs i.e. smell, music, light, power aisles and so on. Cluster 2 (green in colour) consists of 18 documents. The main focus of articles of this cluster is on the impact of atmospherics on customer experience. The interesting observation is the research in this cluster is either based on retail atmospherics as a whole or combines two constructs such as music and aroma(Morrison et al.,2011). Cluster 3 (blue colour) also consists of 18 items, the majority of documents of this cluster are focused on retail atmospherics in the mall scenario. Cluster 4 (yellow colour) consists of 17 items, the cluster comprises studies related to consequences of retail atmospherics such as pleasure, enjoyment (Menon& Kahn,2002) & shopper's emotion (Chebat & Michon 2003). The next cluster is cluster 5 (turquoise colour), which contains 11 items and studies based on digital signages and nonverbal cues. The last cluster is the smallest one, having only 6 items. the studies are based on various demographics and geographical segments.

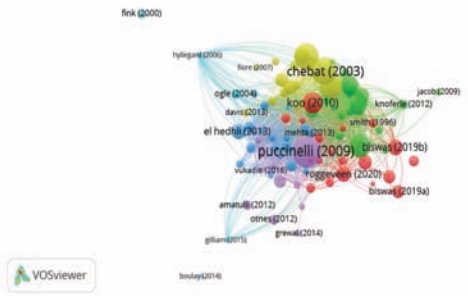

Figure 3: Authorship collaboration between the countries

V. Conclusion

The present paper analyzed the trends in the Retail atmospheric domain at the global level. The study used a bibliometric technique to investigate 177 shortlisted articles from year 1994- 2024. The analysis specified the evaluation of the retail atmospheric domain from the web to e-atmospherics and now adoption of augmented and virtual reality as an extension. USA leads the research with the contribution of a maximum number of publications, and a maximum number of citations also has been received by authors of USA. Interestingly, the number of single-author articles is greater than that of multiple-author documents in

this domain. According to our analysis, this is due to the various components of retail atmospherics playing different roles in different product offerings and retail formats, and authors not collaborating in multifunctional areas.

In the present study, only Scopus has been used as a significant database while other popular databases like Web of Science have not been considered for the study, this is the major limitation. In addition to that, the search is only based on one keyword i.e. "Retail Atmospherics". Only one keyword has been chosen to keep the study focused and easier to interpret. Hence future research can be conducted on strong keywords i.e. store atmospherics, web atmospherics, sensory experience, retail atmospherics and consumer behaviour.

In the future researchers can explore the areas of integration of augmented and virtual reality in store environments. Researchers can also focus on the countries where retail is in still its nascent stage, this will help them to understand the impact of retail atmospherics.

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INCOME INEQUALITY AND DEVELOPMENT: AN ARDL BASED APPROACH

Ms. Mani Govil*

Purpose: *India even as one of the world's fastest growing economies while taking rapid strides in poverty reduction, still demonstrates alarming income inequality as a persistent problem. This paper aims to examine the impact of changes in the share of manufacturing & services to GDP, human capital(HDI) and Government expenditure on income inequality in India in the post reform period 1991-2020.*

Design/methodology/approach: *The study uses auto-regressive distributed lag (ARDL) model which is equally effective in case of endogeneity of explanatory variables and facilitates the identification of long run estimators to study long-run cointegration between the variables and estimate short-term dynamics.*

Findings: *The analysis shows that HDI reduces while contribution of manufacturing & services to GDP and government expenditure worsens income inequality in the long run. The results confirm cointegration among the factors in the long and short run.*

Originality/value: *The study adds to the literature on determinants of income inequality providing insight into the role of rising contribution of manufacturing and services to GDP on income inequality rather than just economic growth.*

Keywords : *income inequality, human capital, manufacturing and services, government expenditure, ARDL.*
JEL Code: *I31, O15, I24*

I. Introduction

Extreme income inequality in its various forms assumes mounting significance in recent times in developing countries such as India while pandemic exacerbated the situation and the global economy faces headwinds due to fragile global economic conditions. Gini index, the widely used metric of income inequality ranging between 0 and 100 (0 indicating equal distribution of income) increased consistently from 42.3 in 1991 to 46.7 in 2004 falling to 40.9 in 2020 with spurts in 2009-2011 after-which it consistently fell. This is alarmingly high when compared to other countries (Himanshu, 2019, Chancel and Piketty, 2017). World Inequality Database (WID) Report, 2021 relegates India in the bracket of 'extreme inequalities' and 2024 Asia-Pacific Human Development Report paints a rosy picture of its long-term progress but in the face of enduring disparity and serious threat to economic growth, social and financial stability. State of Inequality in India Report, 2022 states that whereas the rich 10 percent account for 64 percent, the bottom 50 percent hold mere 22 percent of total income and the top 1percent earning almost thrice as much as the bottom 10percent .

The rising share of income of top 10 percent (H10), top 1 percent (H1) and decline in the share of bottom 50 percent is shown in table 1 which will only lead to multidimensional deprivations. H10 increased from 34.4 in 1990 to 40.9 in 2010 and 57.1 in 2020 while HI almost doubled from 10.7 in 1990 to 21.7 in 2020. Consequently share of the bottom 50 percent fell from 20.3 in 1990 to 18.5 in 2000 to 13.1 in 2020(WID database). The growth rate of income of the bottom 50percent has been reported at 3.9percent from 2017-18 to 2019-20, while the top 10percent has grown by 8.1percent exacerbating the issue. The issue gained prominence with increasing studies and debates around the world, prominent ones being a book by French economist Thomas Piketty (2014) who calls it an "enormous problem with no simple solution" suggesting progressive tax on capital as a plausible solution. At the global level too, UN has included income inequality as a sustainable Development Goal. Extensive studies have attributed persistent income disparity to factors such as liberalization, high returns to education, size of land holdings, imperfections in the credit and labour markets, institutional capacity, regional variations and increasing share of profits in national income.

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Table 1: Share of top 10percent, top 1percent and bottom 50percent

years	H10	H1	Bottom 50percent
1990	34.4	10.7	20.3
1995	39.3	13.4	18.9
2000	40.9	15.5	18.5
2005	46.6	19.7	16.5
2010	53.2	21.6	14.3
2015	57.1	21.7	13.1
2020	57.1	21.7	13.1

Source: WID database

The present study examines the impact of wage polarization (due to sectoral growth), advances made in human capital and Government expenditure on the distribution of income over three decades (1991 to 2020) in India.

While there have been numerous general and country-specific studies (although giving conflicting results) on effect of economic growth on income inequality, empirical studies on the effect of sectoral growth and human development on income inequality, however have been limited.

Rising contribution of manufacturing and services to GDP

Economic reforms embarked upon in 1991 and policies thereafter ushered in a period of high growth especially in services, a sector with low employment elasticity. Table 2 shows the steady fall in the percentage share of primary sector to GDP and consequent rise in industry and services from 62 in 1991 to 72 percent by 2020 with the tertiary sector alone rising from 38 percent to 55 percent growing at an average rate of 7.3 percent approx. The ICT sector including IT services, ITeS BPM, engineering and R&D, software and hardware, which now contributes about 9 percent of India's GDP significantly increased the demand for skills and competition among workers. KLEMS data also shows employment in industry and services increasing from 15 percent and 20 percent in 1991 to 23 percent and 34 percent in 2020 respectively(table 2). The contribution of medium and high-tech manufacturing value added in manufacturing rose from 40 percent in 1990 to 44.6 percent in 2020 obviating higher demand of skilled workforce. Capital/skill intensive services such as post and telecommunication, financial services and business services have grown in double digits for most of the post-reform years and even the capital intensity of the labour intensive services such as trade, hotels, transport and storage, public administration and defence, education, compulsory social security has been surging(Prakash 2023). Rising role of technology required skilled workforce especially in sectors such IT-related services and telecommunications (Atkinsen, 1975).

Table 2: Composition of GDP and employment

Percentage share of GDP and employment in Indian economy							
Sector	1991	1995	2000	2005	2010	2015	2020
Share in GDP							
Agriculture, Hunting, Forestry and Fishing, Mining	39	36	32	27	22	20	17
Industry	24	25	24	26	29	28	27
Services	38	41	44	47	49	52	55
Share in Employment							
Agriculture, Hunting, Forestry and Fishing, Mining	65	64	61	57	51	45	43
Industry	15	15	15	17	21	23	23
Services	20	21	24	25	28	31	34

Source: KLEMS database

Advancement in Human Capital development

S curve hypothesis suggests that at low stages of development higher HDI reduces income inequality but shows increasing inequality for countries at higher stage of development (Tribble, 1999). On the other hand, advancement in human capital can aggravate income inequality due to the skill-biased growth in manufacturing and services and the high returns to education for better educated youth. Studies highlighting technology led growth favouring higher skills give evidence of wage polarisation towards skilled workers (Sarkar, 2010; Ghose, 2023; Kijima,2006). While the real wages of least skilled workers, characterised by the 10th percentile group improved by only 40 percent, for the most skilled workers it doubled from 1983 to 1999.

To measure the effect of skills level on income inequality, HDI has been used as a proxy for skill and education level. Although the HDI encompasses three dimensions of human development—health, education, and standard of living—it is presumed that variations in these dimensions reflect corresponding changes in skill levels. HDI levels in India have although improved from 0.44 in 1991 to 0.63 in 2020 it ranked just 132 out of 191 countries in 2021, much lower than its neighbours Sri Lanka, Bhutan and Bangladesh.

India's pattern of growth stands in need of higher education due to demand for a sizeable amount of educated workers in financial and public services(Mazumdar, 2022). In 2011-12, as per a study, the wages of workers with primary, middle, secondary, and tertiary education received wages in the ratio of 1.1: 1.3 : 2.1 : 4.1 and education was seen estimated to contribute 36 percent to wage inequality (Dev, 2018).

Re-distributive effect of Government expenditure

Government expenditure increased steadily from 24.6 percent to 29 percent of GDP during 1991 and 2020 while in absolute terms it almost tripled from 1.86 lakh crore to 5.41 lakh crore. Social sector expenditure in India (including education, rural development, health, food security, urban poor welfare etc) has undergone growth of 15 per cent annually during 2017-2022 increasing from USD 135 billion to USD 276 billion . However at 1.4 percent of GDP (for social sector excluding health) it still lags behind an average of 2.5 percent for other developing countries as per the World Social Protection Report 2021.

Rich literature available gives conflicting views on government expenditure with some indicating that while government expenditure may have an ameliorative impact on income inequality in developed countries the same may not be true in developing countries(Salotte2018) due to poor quality of institutions (Anderson et al. 2017), existence of a large informal sector, inadequate social spending, poor access by low-income households further restricts the reach and effective transfer programs. Excessive expenditure on secondary and tertiary education spending, low in-kind spending, regressive universal price subsidies such as energy subsidies further inflate income inequality.

The structure of this paper aiming to examine long and short run relationship between income inequality and factors aligned by previous studies is as follows: section 2 highlights relevant literature and section 3 presents data sources and methodology. Econometric result of the study is discussed in Section 4 and Section 5 presents conclusion and policy suggestions.

II. Literature Review

Recent studies on inequality have focused on numerous causative factors such as economic growth, wage polarization favouring higher skilled workers in managerial and technical positions, high returns to education, size of land holdings, structure of the economy, international trade,financial deepening and regional variations (Subramaniam and Jayaraj 2006; Chancel and Piketty 2017; Rani etal 2017; Sarkar and Mehta 2010; Mazumdar 2017; ; Himanshu 2019;) .

Ganaie et al. (2018) in their exploration of the impact of per capita GDP, price level, liberal trade, government spending and agriculture's contribution to GDP on inequality in India from 1963 to 2007 identified these variables as co-integrated. The results indicated that in the long run, per capita real GDP and inflation worsen overall inequality, while the share of agriculture in the total GDP, trade openness and government expenditure have a significant positive impact on income equality. Theyson (2015) affirmed the traditional inverted U-shaped Kuznets relationship concerning GDP but identified an S-curve relationship for HDI, life expectancy, and education indices, as they exhibit a negative relationship with inequality.

Applying panel regression on 95 economies over 1980 to 2014, Lee (2018) affirms that achieving higher educational attainment reduces educational inequality and hence income

inequality. Rising skill premium has been highlighted by Autor(2014) as a determinant of growth of wage inequality in the United States in the face of growing demand of skills during the last 5 decades and stagnating supply of college-educated workers. Dev (2018) focuses on skill-related disparities in wages and recommends social protection for the unorganized sector to advance equality of opportunity .

Explaining rising inequality since 1990-91, Sinha(2004) argues that inequality declines in the second stage of development when the share of secondary sector increases but increases in the third stage of development which corresponds to services taking over industry's contribution forming an S-curve. Sarkar(2010) identified wage polarization in urban India as a cause for earning-inequality during from 1980 till 2012 due to changes in occupational structure. It finds growth in the share of employment in low and high paid jobs by 5 and 8 percentage points respectively while in middle-paid jobs, employment decreased by 13 percentage points during 2005-12. Steady rise in Gini coefficient post 1993 was attributed mainly to decelerating employment growth and it becoming skill biased(Ghose, 2023).

Examining the determinants of income inequality in 18 countires of Latin America using multivariate linear regression, Sada(2019) found factors such as education, women friendly policies and low end wages to be statistically significant while taxation and social expenditure as insignificant.

Income inequality in India was worst among the salaried households trailed by self-employed and casual labour (Rani etal 2017). Analysing the determinants of income and labour income inequality, Rani U etal(2016) found that labour contributes 87 percent to total income in 13 G20 countries over 2005-2015. Using co-integrating models Rout (2022) confirms co integration between natural calamity, innovation, economic development, human capital and income inequality in the short and long run. Human capital development was found to aggravate income inequality in the short run and technical innovation in the long run.

Examining the role of fiscal policy in enhancing income distribution, Salotti (2013) studied 20 advanced economies and concluded that raising government spending by 2 to 5 points reduces Gini index by 1 point over 40 years. Openness, civil liberties and education were found to have a leveling effect while population growth exerted opposite effects; however, all factors had low statistical significance. Taxes on profits, income and capital gains were reported to reduce wealth inequality significantly while GDP per capita exacerbates it(Aye et al., 2022). By another opinion, low taxes and spending levels, meager direct tax revenue, less progressive tax and spending mix and a greater reliance on regressive indirect taxes impede the achievement of a fairer income distribution in developing countries as concluded by Bastagli (2012) in his study. Public spending especially on health and higher education was found to be regressive due to presence of large informal sector.

Taxes and social transfers are not able to reverse the rising trend of inequality of income (Prasad N 2008) . This is attributed to the weaker progressiveness of tax systems, limited social spending budgets in developing countries, and the presence of informal sectors. However the study observed that taxes and transfers have been effective in countries like Brazil, Mauritius, and Malaysia. Highlighting the role institutional development, Blancheton(2021) finds that income inequality reduces with higher public expenditure after rising in the initial stages while assessing the association of income inequality with government intervention in Asia and the Pacific from 1998 to 2014. Market driven policies with higher economic freedom was effective only when public policy facilitates land reform and the government funds public and social services to the full extent (Joumard 2014).

In their analysis of welfare state redistribution theories, Andersen et al. (2011) emphasized on a comprehensive approach which can adequately evaluate welfare state redistribution using taxation and income transfers. They concluded that countries with varying demographic profiles would experience different impacts on poverty and inequality even with similar income support policies.

III. Research Design and Methods

The data series include Gini Index of net income (post-tax, post-transfer) extracted from the Standardized World Income Inequality Database (SWIID) has been used as a measure of income inequality. The long-run and short term relationship of income inequality with the HDI, contribution of manufacturing and services to GDP ratio and Government Expenditure is tested using auto-regressive and distributive lag (ARDL) cointegration model, with lag order

zero and one variables in the data set. This method is superior since it is equally effective in case of endogeneity of explanatory variables and facilitates the identification of long run estimators. It also captures the short-term dynamics or adjustments of the dependent variable in response to changes in the independent variables.

Annual time series data from 1990-91 to 2019-20 of the chosen variables have been taken from RBI and World Bank. Contribution of manufacturing & services to GDP (Mfrser_GDP) and Government expenditure(GE) has been taken from RBI database and Human Development Index (HDI) , a measure of progress in major aspects of human development from United Nations Development Program data(UNDP, 2016). The variables have been transformed in natural logs for empirical study.

The following equation represents the ARDL model employed in this study :

$$\Delta LGINI_t = C_0 + \delta_1 LGINI_{t-1} + \delta_2 LHDI_{t-1} + \delta_3 LGE_{t-1} + \delta_4 LMfrser\_GDP_{t-1} + \sum^{p}_{i=1} \phi_i \Delta LGINI_{t-i} + \sum^{q}_{j=1} \omega_j \Delta LHDI_{t-j} + \sum^{q}_{l=1} \varphi_l \Delta LGE_{t-l} + \sum^{q}_{m=1} \gamma_m \Delta LMfrser\_GDP_{t-m} + \varepsilon_t$$

(Equation 1)

Where $\delta i'$ are the long run coefficients, C0 the drift and et the white noise error.

Before applying ARDL test, stationarity of all variables was confirmed using the Augmented Dickey-Fuller, unit root test and it was ensured that variables are not integrated of order 2 or higher. ARDL bounds testing approach is then applied and equation (1) estimated employing ordinary least squares (OLS) method to study cointegration and relationship in the long run. The following hypothesis among the variables is tested.

Null Hypothesis H0: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ i.e., cointegration does not exist among the variables, against the alternative,

Alternate Hypothesis $H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$ i.e., cointegration does exist among the variables.

Cointegration is tested by measuring the F statistic and comparing with the lower and higher critical values. Null hypothesis is rejected when the computed F statistic is higher than the upper bound critical value but accepted when the F-statistic is lesser than the lower bound critical value. The result becomes inconclusive in case F-statistics falls between the lower and upper bound,

In the second step, if the variables exhibit co-integration, long run coefficients are estimated under the assumption that the error terms are not serially correlated.

In the final step, error correction model(ECM) is used for short-run dynamics and to measure the speed of correction to long run equilibrium. This is specified as per the following equation:

$$\Delta LGINI_t = \mu + \sum \phi_i \Delta LGINI_{t-i} + \sum \omega_j \Delta LHDI_{t-j} + \sum \varphi_l \Delta LGE_{t-l} + \sum \gamma_m \Delta LMfrser\_GDP_{t-m} + \zeta ecm_{t-1} + \varepsilon_t$$

(Equation 2)

Here $\phi, \omega, \varphi, \gamma$ and η are the short-run dynamic coefficients and error correction term (ecm) measures the digression from the long run equilibrium and its coefficient (ζ) indicates the speed at which disequilibrium between variables is adjusted to their long run equilibrium. A highly significant negative value of ecm_{t-1} establishes a stable long run equilibrium relationship .

Finally the dynamic stability of the model is tested using the recursive residual cumulative sum of (CUSUM) test and the cumulative sum of squares (CUSUMSQ) test.

IV. Results and Discussions

Unit root test for nonstationarity results indicates that all the variables are I(0) or I(1) and none of them are I(2) series, hence co-integration can be used to examine long run equilibrium relationships. The test gives conclusive result based on the F-statistic, lower bound critical and the upper bound value. Since the value of the F-statistic were found to be above the lower and above bound, there exists cointegration among the chosen variables in the long term. Conditional ARDL long run model for Gini coefficient was then estimated using ARDL (1, 1, 1, 2) order. The negative coefficient of HDI implies that improvement in HDI reduces income inequality significantly in the long run while contribution of manufacturing and services to GDP and government expenditure both have a positive and significant value thus worsening income inequality(table 3). This conforms to past studies on developing countries criticizing social sector spending for being inadequate and providing limited access to employment and pension (Salotti(2013), Kappel(2010), Kundu (2022)).

The outcome of short run dynamics estimated by the error correction model are reported in table 4. The results show that the signs of the coefficients of the variables in the short run are maintained even in the long run. The positive and significant coefficient for Government expenditure and contribution of manufacturing and services implies that increase in both generates higher income inequality. HDI is seen to have a negative but not a significant effect on inequality at five percent significance level. The speed of adjustment at which disequilibrium is corrected is then examined from the ECM coefficient. The coefficient of ECM t-1 estimated at -0.21, implies that any divergence in the short run is reduced by 21 percent over each year in the long-run.

Cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ) plots were found to lie within the critical boundaries at five percent level of significance, hence validating the stability of the long and short run variables.

Table 3(Long run co-efficients)+

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HDI	-1.63	0.58	-2.80	0.01
LOGGE	0.70	0.24	2.92	0.01
MFRSERV_GDP	1.81	0.72	2.51	0.02

EC=GINI-(-1.6325*HDI+0.6989*LOGGE+1.8090*MFRSERV_GDP)

Table 4 (Short run co-efficients)

ARDL Error Correction Regression
Dependent Variable:D(GINI)
Selected Model:ARDL(1,1,1,2)
Case3:Unrestricted Constant and No Trend
Sample 1991-2020
included observations:28
ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	-0.68	0.09	-7.22	0.00
D(HDI)	-0.07	0.05	-1.50	0.15
D(LOGGE)	0.23	0.05	4.42	0.00
D(MFRSERV_GDP)	0.57	0.19	3.00	0.01
D(MFRSERV_GDP(-1))	0.51	0.20	2.57	0.02
CointEq(-1)*	-0.21	0.03	-7.15	0.00
R-squared	0.78	Mean dependent var		0.00
Adjusted R-squared	0.74	S.D.dependent var		0.01
S.E. of regression	0.00	Akaike info criterion		-8.31
Log likelihood	122.33	Hannan-Quinn criter.		-8.02
F-statistic	15.99	Durbin-Watson stst		-8.22
Prob(F-statistic)	0.00			

V. Conclusion

In light of burgeoning income inequality, this paper aims to enrich the literature by providing fresh perspective on how human capital, government expenditure and rising contribution of manufacturing and services in India's GDP affect distribution of income. The study considers human capital as an important indicator of equality of opportunity which can reduce wage polarization arisen by the skill gap. Growth in manufacturing and services have borne rich dividend in terms of increase in India's per capita income making it the world's fifth-largest economy and expected to occupy the third-largest position by 2030. The service sector has been forecasted to provide 70 million jobs over the next decade and manufacturing sector expects to see sustained economic activity and higher investments. However, growth in individual skill-intensive sub-sectors within the tertiary sector is much higher in the high-earning financial, communication and public services compared to the low-earning domestic services aggravating income inequality.

The study validates a long run significant impact of human capital, contribution of manufacturing and services to GDP and government expenditure on income inequality. Taking Gini index and HDI as a measure of income inequality and human capital respectively, government expenditure and growing share of manufacturing and services are seen to worsen income inequality, whereas human capital improves

it significantly. This conforms to the widely held belief that developing countries lack appropriate re-distributive programs and undertake regressive spending programs. Quality of institutions, kind of governance, effectiveness of social programs, size of social spending are imperative for better income distribution. The study recommends greater reliance on targeted social expenditures, broadening the coverage of public pension systems and conditional cash transfer programs in this regard.

Since increase in the returns to tertiary education have been seen to significantly increase skill premium, suitable public policies have to be formulated to equip the work force with the required skills and education capabilities. Providing quality education to all sections of society has been rightly included in United Nation's sustainable development goal. Low levels of wages discourages expenditure on education while the rich spend more on education and get employed in higher paying jobs aggravating income inequality. This vicious cycle continues and is complex to break. Impetus to labour-intensive sectors and flexibility in functioning of labour markets should also be the goals of public policy. Future research in wage inequality within the sub-sectors of manufacturing and services can shed light on skill intensity and demand of skilled workers in these sub-sectors impacting income inequality.

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BLINKIT: MAGIC IN MINUTES!

Dr. Bhavana Adhikari, Ritu Bundela, Shriya Srivastava, Lakshaya Shukla Anshita Jain, Gaurav Mirani, Dr. C Shekhar Upadhyay*

Raman and Ishita with their two children were binging on Netflix on the weekend evening. Suddenly the doorbell rings, when Ishita opens the door, their family friends Sharma's were Standing. Mrs Sharma then yelled " Surprise!", both the families were joyed to meet each other and decided to have a fun filled weekend at home. Both the families were enjoying the evening together. As it was Tea time, Ishita proceeded to her kitchen. Soon her jollity turned into dismay as she realised there was no milk in the kitchen to prepare tea. Then Ishita called her husband and said " We don't have any milk to prepare tea. Please go down and bring some milk from the building store" to which Raman replied " It's weekend evening, the building store remains closed in the evening". This panicked Ishita, she was worried what she would serve to their guests. Then Raman said " Don't worry, Let's blinkit. Within 10 minutes we will get milk and let us order some ice cream and chocolates for the children". While Ishita was preparing for snacks, the blinkit order arrived. Then all the adults enjoyed tea and snacks and Children enjoyed their ice creams."

Introduction

Blinkit, formerly known as Grofers, has emerged as a leading player in the quick commerce industry in India. This case study explores its evolution, operational strategies, and the impact of dark stores on its business model.

BLINKIT: How it Started

Background of Blinkit

• Founding: Blinkit was founded in December 2013 by Albinder Dhindsa and Saurabh Kumar. The duo aimed to address inefficiencies in the grocery supply chain.

• Rebranding: In December 2021, Grofers rebranded to Blinkit to align with its vision of providing express grocery delivery, promising deliveries within ten minutes.

In December 2013 by Albinder Dhindsa and Saurabh Kumar Started Grofers. Having met each other while working for Cambridge Systematics during the late 2000s, they teamed up to enter the grocery delivery space. Their goal was to solve the problems (both on customer as well as merchant end) associated with the unorganized nature of the supply chain sector. The startup piloted in Delhi NCR before reaching other cities in India.

After seven years of operations as an online grocery delivery service, Grofers collaborated with Zomato. And rebranded itself as Blinkit, a express grocery delivery in India, by building dark stores across cities. We going to learn about the dark store and it role in making the quick/express delivery a feasible solution.

The Quick Commerce Model

Quick commerce focuses on delivering products rapidly, typically within 10-30 minutes. Blinkit's model leverages dark stores—fulfillment centers designed for online orders rather than in-person shopping.

Key Features of Blinkit's Quick Commerce:

• **Dark Stores**: These are strategically located warehouses that facilitate rapid order fulfillment. They lack customer interaction spaces, focusing solely on inventory management and efficient delivery.

• **Localized Inventor**y: Each dark store maintains a curated inventory based on local demand, allowing for quick access to high-demand items.

• **Technology Integration**: Advanced order management systems and AI-driven analytics optimize inventory levels and predict demand.

In July 2021, the company reported delivering over 7000 groceries in 15 minutes in Gurgaon. A month later, in August 2021, it introduced 10-minute delivery in the top-12 cities, after completing over 20,000 under-15-minute deliveries per day across 10 cities. On 13 December 2021, Grofers changed its brand name to Blinkit in line with its vision to embrace quick-commerce.

Blinkit aimed to revolutionize the way people shop, making it faster, easier, and more convenient. Services provided by Blinkit are Grocery Delivery, Food Delivery, Pharmacies: Medicines and health products, Pet Care, Electronics and printing services.

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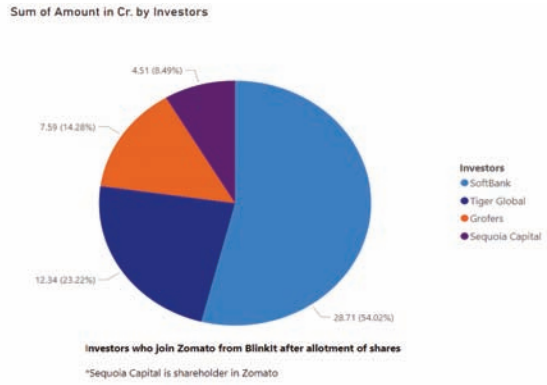
Blinkit collaborates with local businesses, including Retail stores, Restaurants, Pharmacies and FMCG brands. Blinkit has received funding from notable investors like SoftBank, Tiger Global, and Sequoia Capital.

Despite its success, Blinkit faces challenges such as intense competition from established players like Amazon Pantry and Big Basket. The logistics of managing a vast network of dark stores also requires continuous optimization.



BUILDING BLINKIT AS A BRAND

The Beginning: A Flash of an Idea

At the initial stage Grofers were quite popular, particularly in big cities for delivering products in span of 90 minutes. Customers loved the concept of placing orders from their phones while sitting at one place for necessities and having them delivered right to their homes at their convenience. However, the business dealt with strong competition from other huge companies like Amazon and Big Basket.

Marketing Strategies

Blinkit has employed innovative marketing techniques to establish its brand:

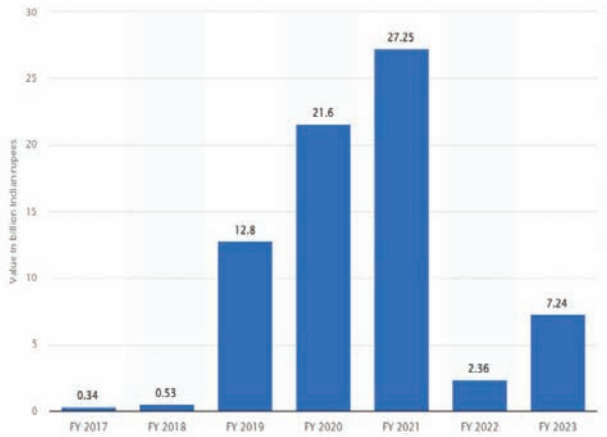
1. Rebranding Campaigns: The transition from Grofers to Blinkit emphasized speed with taglines like "Blink, and it's delivered."

2. Social Media Engagement: Active presence on platforms like Instagram and Twitter using memes and relatable content to connect with younger audiences.

3. Influencer Collaborations: Partnering with influencers to showcase quick deliveries has broadened their reach among tech-savvy consumers.

A New Name: A Fresh Start

Grofers understood that in this highly competitive market, modification would be necessary with trends. Then, Grofers made a bold decision to rebrand itself in 2021. They observed an increasing trend wherein consumers were demanding lightning-fast delivery and rebranded itself as Blinkit. It growth ever since showen in the graph.



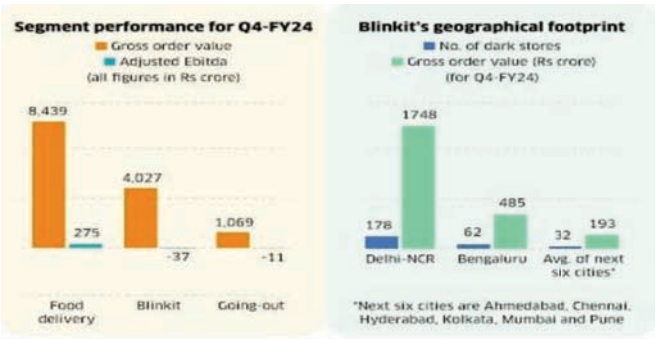
Source : Economic Times

Zomato Acquiring: A New Chapter

Zomato, a multinational food delivery and restaurant aggregator company, aimed to enter the e-commerce grocery market, which was dominated by players like Amazon Pantry, Big Basket, Grofers, and Swiggy. Despite multiple attempts, Zomato faced challenges in establishing a foothold in the quick commerce grocery and essentials delivery sector.

In April 2020, during the COVID-19 lockdown, Zomato launched a 45-minute grocery delivery service to address the shutdown of restaurants. However, once the lockdown was lifted, the company shifted back to its core food delivery services. Zomato made another attempt in July 2021 but had to discontinue the service in September 2021 due to logistical issues.

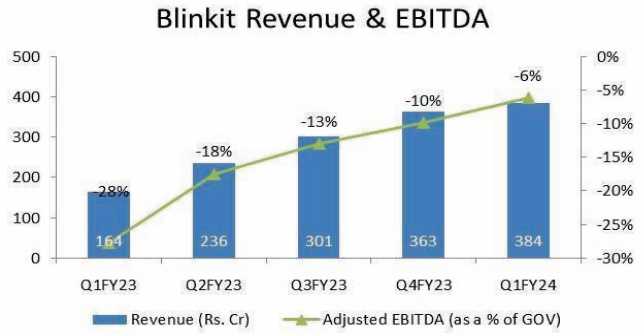
Finally, Popular meal delivery service Zomato purchased Blinkit in 2022. With this acquisition, two significant participants in the internet delivery market were brought together.



source : tech

Presently: Towards a Bright Future

Blinkit is one of India's top grocery delivery services today. They are always coming up with new ideas to broaden their consumer base and enhance their offerings. Zomato's backing has put Blinkit in a strong position for future development and success. The company's success in rebranding as Blinkit can be related to the new identity and increased exposure it earned. As a result of the company's constant efforts to increase both the speed and user-friendliness of its offerings, it has grown to become one of India's most reputable names for quick grocery delivery.



Source : Moneywork4me

In this way, **Blinkit has changed from Grofers, an ordinary grocery delivery service, into a company focused on convenience, quickness, and smoothing consumers' lives in a fast-paced world.**

PUBLICIZATION OF BLINKIT

Introducing Innovative marketing and digital marketing techniques that accompanied this shift helped Blinkit grow its following and creating a powerful brand:

1. Rebranding with a focus on performance

•Old Strategy: Grofers concentrated on providing a broad range of food by online delivery, which could take several hours or even a day.

•New Approach: Blinkit concentrated on delivering products within ten minutes. Their marketing highlighted this speedy service, demonstrating that they were all about speed with memorable taglines like "Blink, and it's delivered."

•"Blinkit," their new name, was selected to convey their quick-to-think, modern, and vibrant personality.

2. Social Media Campaigns

Blinkit started to post often on Facebook, Instagram, and Twitter. They produced entertaining and captivating content that demonstrated how quickly they could deliver food. They frequently used memes and current events in their funny social media postings to appeal to younger viewers. They understood that their content needs to be both educational and entertaining in order to attract to tech-savvy, busy individuals. They also promoted client comments on social media, establishing a two-way dialogue that gave their clients a sense of being heard.

3. Marketing using Influencers

Blinkit worked with influencers to highlight the quickness and ease of use of their services. These influencers created quick films, such as reels or tales, demonstrating how Blinkit quickly delivered their goods. Blinkit was able to reach a larger audience with this kind of digital marketing, particularly young, working professionals who appreciate time-saving solutions.

4.App and Push Notifications

Blinkit's app evolved as the focal point of their advertising campaigns. The app was revamped to be more user-friendly, quicker, and simpler.

•By providing clients with precise delivery time updates via the app, trust would be fostered. The usage of push notifications was clever. Blinkit reminded users to restock on necessities or offered out timely information about specials and offers. Because of this, consumers continued to be interested in and frequent the app.

5.Offers and Discounts

Blinkit's consistent discounts, rebates, and exclusive offers helped it draw in new clients and keep hold of existing ones. To further entice users to use the service, they teamed with mobile wallets and payment apps such as Paytm and PhonePe to give exclusive discounts. People who enjoy saving money while shopping easily were the target audience for these offers, which were aggressively advertised through digital ads, emails, and social media posts.

6. Festive & Special Campaigns:

Blinkit ran themed offers and festive discounts during festivals like Diwali and Holi. To appeal to consumers' celebratory mood, they incorporated vibrant imagery and joyous language into their advertisements and social media posts. Sales were increased and Blinkit was able to stand out during the busy shopping seasons thanks to these promotions.

7.Hyper-targeting and local SEO:

Blinkit concentrated on hyper-targeting particular areas for its 10-minute delivery service and enhanced its visibility on

local search engines. When someone searched for "grocery delivery near me," Blinkit was frequently the first item that came up. To make sure they could fulfil their promise of providing delivery services, they also employed location-based advertisements to target residents of locations where Blinkit had delivery centres.

8. Partnerships

In order to increase its reach, Blinkit has partnerships with businesses such as Swiggy and Zomato. Additionally, they collaborated with Pepsi, Nestlé, and other food manufacturers to offer combo packages that were advertised on their internet platforms.To summarise, Blinkit prioritized speed, convenience, and consumer interaction in their marketing and digital marketing methods. They developed a brand that not only guaranteed quick deliveries but also remained relevant and engaged with its customers in creative, entertaining ways through influencer marketing and smartphone notifications. Their rapid growth was facilitated by this technique in the highly competitive online grocery delivery market.

By combining these marketing and digital marketing strategies, Blinkit has been able to establish itself as a leading grocery delivery service in India and attract a loyal customer base.

Source: X.com

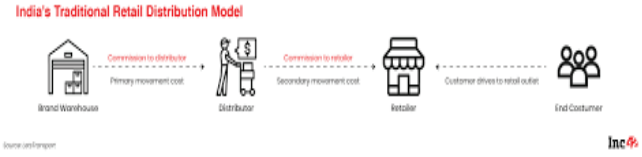
CONCEPT OF DARK STORES

Source : Quickworks

1. How do traditional retail stores stand apart from these new Dark Stores?

- *Dark Stores*: Dark stores are centres for fulfilment created specifically for shopping online rather than providing service to in-person clients. They operate as warehouses, but their primary emphasis is on order selection, arrangement, and direct shipment to customers generally in densely settled areas.

-*Differences from Traditional Store*: differential from traditional retail environments, dark stores lack any customer interaction spaces or product display. They have been created for fast fulfilment and delivery, setting up products to facilitate the speed of order picking. Frequently, they are found in cities that are easy to get to for prompt delivery to consumers.



Impact of Dark Stores

Dark stores have transformed Blinkit's operational framework:

- Speed of Delivery: With dark stores located close to consumers, deliveries can be made within 10-20 minutes.
- Cost Efficiency: Centralized inventory reduces overhead costs associated with traditional retail spaces.
- Quality Assurance: Frequent restocking ensures that customers receive fresh products promptly.

2. How do the operations of Blinkit's dark stores fit into the overall architecture of online grocery delivery service?

Blinkit runs a dark store network that reinforces its quick-commerce approach to delivering groceries and essentials in a few minutes once an order has been placed. These stores are

currently functioning as hyperlocal fulfilment hubs, which facilitate Blinkit's holding of a curated inventory of preferred items and deliver them rapidly to specified geographical territories.

Here's how they function:-

- Localized Inventory: Dark stores position themselves to target small geographic areas, usually within a 2-3 km distance. The result is that last-mile delivery is much quicker.

- *Order Reception and Fulfilment*: Once a user places an order via the Blinkit app, the system immediately links the order to the closest dark store. Employees of the store collect items from shelves, organize them well, and ready them for shipment.

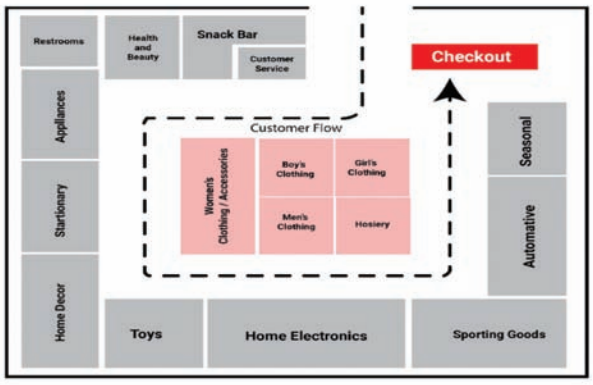
Source : medium

3. Supply Chain Processes Concerning Inventory Management, Storage, and So Forth for Blinkit Dark Stores

Inventory Management: Using local consumption patterns, Blinkit sources high-demand items for each dark store through data-driven insights. This situation decreases the need for high stock levels and sustains a rapid stock turnover. The business is in the habit of verifying product availability and filling up stocks from nearby distribution centres.

Storage: Unlike conventional stores that group products for customer browsing, Blinkit's dark stores design their areas for faster product picking. Groups frequently organize items according to the frequency of orders and their closeness to each other. In various cases, swiftly moving items including milk, bread, and eggs can be arranged together.

Product Replenishment: Frequent stocking of inventory by Blinkit's central supply chain ensures that customers are able to obtain products at all times. In real time, stock monitoring causes the initiation of replenishment orders when inventory amounts fall below a defined threshold.



Source : business model innovation

4. How Do These Businesses Maximize the Speed and Effectiveness of Product Delivery for Their Consumers?

Proximity to Consumers: Dark stores are intentionally positioned close to consumers in order to reduce the time it takes for deliveries. Using a hyperlocal framework, this ensures that we can provide deliveries within 10-20 minutes.

Optimized Layouts: The design of Blinkit's dark stores focuses on order picking efficiency, with products stored to cut down the time workers spend finding them. In a frequently ordered line-up, items are housed in reachable spots.

Batching Orders: By using technology, Blinkit is able to aggregate orders that are going to adjacent addresses or placed at the same time. This decreases the number of trips and simplifies delivery routing for greater efficiency.

Source : wezome

5. The Technologies or Strategies Blinkit Relies on for Managing Dark Stores

Order Fulfilment Systems: The order management systems at Blinkit automate the tracking and management of every part of the fulfilment process, from intake of orders to delivery. The system assigns orders to stores, monitors picking and packing, and improves routing for delivery.

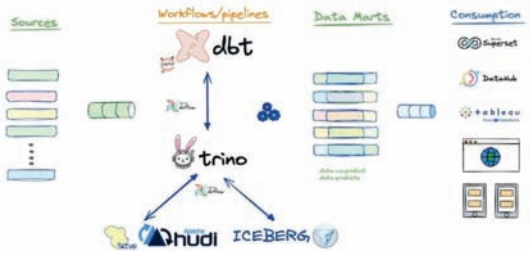
Last-Mile Delivery: Blinkit's team for last-mile delivery uses

algorithms to help define the most effective delivery routes. The key to fast delivery for Blinkit is using hyperlocal dark stores that function in a narrow local setting.

AI and Predictive Analytics: AI drives inventory and demand forecasting for Blinkit, which helps estimate product demand according to local consumption trends and makes certain that dark stores have the optimal products available at the right time.

Real-Time Inventory Tracking: Blinkit uses real-time tracking to keep tabs on items in shops and notify users about stock availability in real time.

Delivery Efficiency: Blinkit may enhance delivery speed by using a zonal delivery system, in which agents manage specific areas and, as a result, reduce transit times.



Source : Blinkit blog

6. How does the dark store framework guarantee that Blinkit maintains freshness and quality in its products?

Frequent Restocking: Dark stores emphasize considerably the frequent restocking of products, particularly fresh produce, dairy, and perishable items. Blinkit holds smaller inventories that are constantly rotated in order to ensure that new items are always in stock.

Cold Chain for Perishables: Blinkit applies temperature-controlled storage for items, including dairy, meat, and frozen products. From the moment they are stored away in the dark store until delivery, this confirms the freshness of the products.

Quality Control: Multiple quality checks are carried out by Blinkit—during supplier selection and at both the dark store and while readying for delivery. All products that do not conform to quality requirements are thrown away.

Source : wezome

7. Effects of the Dark Store Model on Both Businesses and Customer Experience Business Impact:

Cost Efficiency: Blinkit saves on retail space costs, and simultaneously advantages from centralized inventory management and less expensive storage.

High Turnover: Striving for rapid product movements, Blinkit efficiently cycles its inventory, leading to better profit margins and little waste, largely in categories including perishable items.

Scale: The fast formation of small dark stores is one of Blinkit's key strengths, which allows them to quickly increase their network, needing fewer large retail properties, thereby fostering efficient scaling.

Source : business model

Customer Experience:

Speed of Delivery: What sets apart customers is the fast delivery time (often taking 10-20 minutes), which is an important selling factor for urban customers seeking convenience.

Availability of Products: Consistent restocking keeps important items intact, therefore, bating anger for consumers when specific goods are in short supply.

Quality Assurance: Combining quick delivery and prompt inventory updates elevates the entire shopping experience, making certain that customers only get fresh and quality products fast.

Source : self, Economics Times

Conclusion

In conclusion, Blinkit exemplifies the integration of advanced supply chain management practices in the fast-paced grocery delivery sector. The company's ability to efficiently manage its supply chain is pivotal to its success and competitive advantage in the market. Several key factors contribute to Blinkit's effective supply chain management:

Supplier Relationships: Blinkit has established strong relationships with a network of reliable suppliers. This ensures a consistent flow of high-quality products, enabling the company to meet customer demands swiftly.

Centralized Warehouse System: The strategic placement and management of central warehouses allow for optimized inventory levels and reduced delivery times. Real-time inventory tracking systems play a crucial role in managing stock levels effectively, ensuring that popular items are readily available.

Advanced Order Management: Through a user-friendly app and website, Blinkit simplifies the order placement process for customers. The incorporation of data analytics helps anticipate customer needs, enabling personalized recommendations and faster order processing.

Efficient Delivery Logistics: Blinkit employs a sophisticated delivery logistics framework, utilizing a fleet of vehicles optimized for last-mile delivery. Advanced routing algorithms enhance delivery efficiency, allowing for timely deliveries even in high-demand situations.

Real-Time Tracking and Customer Engagement: The implementation of real-time tracking systems enhances transparency in the delivery process. Customers can monitor their orders, which boosts satisfaction and trust in the service.

Return and Refund Management: Blinkit's customer-centric approach extends to handling returns and refunds smoothly, maintaining customer satisfaction even when issues arise.

Overall, Blinkit's supply chain management is characterized by agility, responsiveness, and a strong focus on customer experience. The company continually adapts to market demands and leverages technology to optimize its operations. As the grocery delivery market evolves, Blinkit's proactive approach to supply chain management will be crucial in sustaining its growth and ensuring long-term success.

Moving forward, it will be essential for Blinkit to explore innovations such as automation in warehousing, further integration of AI in logistics, and expansion of its supplier base to mitigate risks and enhance scalability. By continually refining its supply chain processes, Blinkit can not only maintain its competitive edge but also set new standards in the grocery delivery industry.

As Blinkit continues to evolve, its emphasis on innovation and efficiency will be critical in navigating the challenges of the competitive grocery delivery market. By maintaining its focus on customer needs and leveraging technology, Blinkit is well-equipped to drive sustainable growth and set benchmarks for excellence in supply chain management.

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This radio is being run by the students and is providing an opportunity to develop programmes for community broadcast. The radio station is used by the college as laboratory for training students specializing in radio broadcast and they work in close coordination with community representatives and leaders. At present the radio broadcasts daily for eight hours with original programme of four hours in morning which is repeated in the afternoon. The students are encouraged to explore the needs of the society, thereafter, they conceive, design and broadcast their own programmes in a real life environment.

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To prepare and equip students with requisite skills to face the corporate world, Personality Development sessions are organised to help build self-awareness and develop a positive attitude amongst students to cope with time and stress issues.

For further information contact:

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