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Special Issue on International Conference on Building a Resilient Economy: Policies and Strategies for Sustainable Growth

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JIM QUEST
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As we move into an era increasingly shaped by digital advancements, sustainability concerns, and evolving consumer behaviours, the current issue of the JIM QUEST presents an insightful collection of papers that reflect these global shifts across industries. Each of these papers offers a unique perspective, from Gen Z's impact on the beauty and personal care industry to the transformative role of management information systems (MIS) in the telecom sector. As we examine these studies, the key themes of innovation, sustainability, and consumer engagement emerge as integral forces guiding modern business practices.

The first paper, “Key Forces Shaping Gen Z Views on Indian Beauty and Personal Care Websites,” highlights the growing demand for ethical practices in the beauty industry, particularly among Gen Z. This demographic's increasing preference for online shopping is coupled with a desire for brands that prioritize sustainability and social responsibility. This shift presents both challenges and opportunities for businesses in the Indian beauty sector, urging them to rethink their marketing strategies, sustainability practices, and customer engagement models.

Similarly, the paper “Exploring Environmental, Social, and Governance (ESG) and Corporate Financial Performance (CFP): A Systematic Review” underscores the growing importance of ESG factors in corporate strategies, particularly in developing countries. As businesses strive to improve their financial performance, incorporating ESG practices has become an essential element of long-term success. This paper also aligns with the findings in “Resilient Bottom Line: Evaluating Financial Performance through Sustainable Practices in Healthcare,” where ESG practices were shown to impact healthcare companies' financial performance, though their benefits may take time to materialize.

Green Human Resource Management (GHRM) is another critical topic addressed in the journal. “Mapping the Terrain of Green-HRM: A Comprehensive Bibliometric Analysis” sheds light on the growing body of research on GHRM, revealing a gap in service sector research and a need for more cross-cultural studies. This aligns with the broader trend of businesses recognizing the importance of sustainable practices not only in product offerings but also in their internal operations.

In the realm of finance and technology, the papers “Blockchain Deployment in the Banking Sector” and “P2P Lending Research: A Bibliometric Exploration of Emerging Patterns” delve into the transformative potential of digital innovations. Blockchain's ability to enhance security and transparency in banking, along with the rise of peer-to-peer lending, reflects a profound shift towards decentralized financial systems that could reshape traditional banking models.

Equally important is the role of digital platforms in customer engagement and business growth. The paper "E-CRM Dynamics: Exploring the Pathways to Customer Loyalty via Moderated-Mediation Analysis" reveals how electronic customer relationship management (e-CRM) systems can enhance customer loyalty, with trust playing a pivotal moderating role. This is complemented by "Decoding Privacy: Analyzing Young Adults' Evaluation of Perceived Benefits and Risks in Personalized Digital Marketing," which highlights privacy concerns as a key factor in shaping the effectiveness of personalized digital marketing strategies.

Finally, in the context of regional studies, papers like "Exploring the Use of Digital Payment Apps among Amritsar Residents" and "The Role of Management Information Systems in Telecommunication Companies: A Comparative Analysis Between India and Iraq" explore how digital transformations are playing out differently across regions. These studies underline the importance of understanding local contexts while adopting global innovations, especially when it comes to consumer behavior and digital infrastructure.

As businesses across sectors face increasing pressure to adopt sustainable practices, the importance of strategic resilience becomes evident. Whether in healthcare, finance, or manufacturing, organizations are finding that embracing ESG principles not only aligns with global sustainability goals but also drives long-term profitability. As seen in "From Crisis Management to Opportunity: Harnessing Organisational Resilience in the Pharmaceutical Industry of Himachal Pradesh," the ability to pivot and innovate in response to crises is essential for organizational success.

This issue of the JIM QUEST encapsulates the intersection of technology, sustainability, and consumer behaviour, providing critical insights for businesses looking to thrive in a rapidly evolving global landscape. It is evident that the future of business lies not only in adopting innovative technologies but also in ensuring that sustainability is woven into the very fabric of corporate strategies. For businesses to remain competitive, they must adapt to changing consumer demands, embrace digital transformation, and prioritize sustainability in their operations. These are the key forces shaping the future, and this issue provides a comprehensive look at how organizations can navigate this new paradigm.

Happy Reading!!

Prof. (Dr.) Anubha
Chief Editor

JIM QUEST

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Key Forces Shaping Gen Z Views on Indian Beauty and Personal Care Websites

*Dr. K. Priyadharshini

Abstract

As Gen Z becomes an increasingly influential demographic in the beauty and personal care market, understanding their attitudes and behaviors is crucial for industry stakeholders. Brands and e-commerce platforms need to adapt to the preferences of this generation by enhancing their digital presence, fostering trust, and championing ethical and sustainable practices. This study focuses on understanding the attitudes and preferences of Generation Z (Gen Z) consumers towards Indian beauty and personal care websites, a demographic known for its tech-savvy nature and unique consumer behavior of Gen Z. Preliminary findings reveal that Gen Z consumers exhibit a strong affinity for online shopping, with convenience and a wide product selection being the primary driving factors. This research contributes to the body of knowledge on Gen Z consumer behavior, offering insights that can guide strategies in the ever-evolving beauty and personal care industry. In conclusion, this study provides a comprehensive examination of Gen Z consumers' attitudes and preferences towards Indian beauty and personal care websites, shedding light on the factors that influence their online shopping choices and the challenges they encounter.

Key Words: Beauty, Personal care, websites, Consumer behavior, Attitude, Gen Z, India.

Introduction

The Indian market for personal care and beauty is anticipated to expand at a rate of three percent each year (CAGR 2024-2028). This market is projected to have a revenue of US$31.51bn at the end of 2024. As per Red Seer Strategy's "Beauty Unveiled -- Decoding the Success of Pure-Play Beauty Companies," research states as much. In comparison to other nations, the Indian beauty and personal market (BPC) has the fastest pace of growth. Indian consumers spent $26.3 billion on personal care and beauty products in 2022, and that number is projected to rise to $38.0 billion by 2028. The Indian beauty market is the eighth largest in the world, and according to a report by Euromonitor, it will double in size by 2030. The beauty goods industry has a huge e-commerce market penetration, and the business has been stimulated by economic expansion and customer interest in trying out new, organic products. In areas like Tier 2 and Tier 3, the market for personal care and beauty products is expanding incredibly (Vogue,2023).

According to Statista 2023, in the past two years, many digital brands have emerged in the beauty and personal care segment which gives a clear tough competition to traditional beauty brands. Online sales of cosmetics and personal care items are expected to reach $10 billion in India by 2027. In August 2023, nykaa.com, the top-ranked and most-visited beauty and cosmetics website in India followed by purplle.com and mama earth among the top three beauty and cosmetics websites in India.

The BPC market has seen enormous growth due to middle-class disposable income, changes in lifestyle patterns, and customers wanting to enhance their appearance to boost their confidence. Products such as cosmetics, Lipstick, foundation, mascara, and eyeshadow are examples of cosmetics goods. The beauty and personal care brands also have skincare, hair care, fragrances, personal hygiene items, and some grooming tools along with the cosmetics . Cleansers, toners, moisturizers, and creams for anti-aging are all part of the skincare line (IMARC, 2023).

With strategies like the adoption of e-commerce, the emergence of DTC (Direct to Consumer) brands, raising awareness of clean and natural beauty products like ayurvedic and chemical-free products, and utilising technological advancements in the websites such as artificial intelligence,

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virtual reality, and augmented reality, beauty websites have grown significantly. These technologies enable the firms to provide services like e-trial and digital diagnostics for comprehending skin-related problems.

Generation Z and their views on Beauty and Personal Care

The GenZ generation, which comprises those who were born between 1997 and 2012 and are currently between the ages of 18 and 25, is forcing the beauty industry to reevaluate its long-standing practices and move towards more environmentally friendly ones. Brands are progressively refocusing their efforts to appeal to this consumer group, offering multi-functional products like stacking lip, cheek, and brow gels in addition to clean, vegan formulations, skin tints for a glazed look, and colorful packaging.

The Gen Z group has a major influence on social media where they can voice their opinions, desires, and disapprovals. As a result, brands are making their own decisions to attract Gen Z customers. The Gen Z generation is more interested in being oneself than in dressing like their favorite celebrities or following the latest fashion trends. Stretch marks are worn with pride as tiger stripes, while freckles are flaunted as fashion statements. To enhance their self-care and self-expression, Gen Z has been remarkably successful in showing their trends in social media.

By 2025, Gen Z is expected to make up a substantial chunk of the Asia-Pacific area, making up 26% of the worldwide population. Knowing and serving this generation is essential for the success of beauty brands. This generation is highly adept at using technology, and they have specific tastes and a keen interest in the fashion and cosmetics sectors. The newest beauty trends seem to fit with the sensitivities of Generation Z. Everything from Ayurvedic ingredients to bright, avant-garde cosmetics to retro aesthetics and Korean-inspired techniques are now keeping the beauty industry on its toes. This paper has an objective to find out the factors which affect the purchase of beauty and personal care products

Review of Literature

Perceived Web Quality

Perceived Web Quality is defined as the expected quality of features of the website in fulfilling the expectations and requirements of the customers (Hsiao et al., 2011). In other words, the desirability of a range of characteristics of a website such as its usability, interactivity of the website elements, and overall functionality is referred to as quality (Constantinides, 2004; Petter et al., 2008), i.e., a website of high quality will be easily accessible to the consumers, allow easy navigation through its contents and be responsive to consumer needs (Aladwani, 2006; Al-Debei, 2013). Several studies on website quality have established a significant association between the perceived quality of shopping websites and their perceived benefits (Bai et al., 2008; Dennis, 2011 and Liao et al., 2006;). Levin et al. (2003) pointed out that consumers often prefer touch-and-feel experiences when it comes to shopping. However, several online stores have found creative ways to offer experiences similar to the touch and feel in-store experiences of consumers such as listing out detailed information on the products.Therefore, the quality of information furnished on the website acts as a major contribution to the overall quality of websites (Park & Stoel, 2005).

Hence, we hypothesize that:

H1: Perceived quality will influence the attitude towards Beauty and personal care websites.

Website familiarity

Consumers develop a sense of acquaintance with online shopping stores based on their knowledge of the vendors, search options offered by the website, purchasing interface used by the site, etc. According to Sen and Johnson (1997), consumers evaluated a brand positively through their familiarity from mere possession of products from that brand, i.e., as the consumers grew more familiar with the brands, they believed to possess better knowledge of the brand, which mostly led to favourable evaluation of the brand (Alba & Hutchinson, 1987). Familiar brands also improved brand recall of consumers, thereby vesting the brand with a competitive advantage in the consumer market (Kent & Allen, 1994). Since well-known brands are perceived to be more easily available by the consumers, their attention towards promotions and product information of well-known brands is much higher than brands unknown to them (MacInnis et al., 1991).

Hence, we hypothesize that ***H2: Familiarity will have a positive attitude towards Beauty and personal care websites.***

Website Trust

Website trust for a brand is a multidimensional concept and has been defined in different ways by researchers (Hassanein and Head, 2007).In online shopping environments, there are multiple risk factors involved during the online shopping (Van der Heijden et al.,2003). According to Barney and Hansen (1994), trust is a mutual understanding between parties that neither of them will misuse each other's expectations. Factors such as integrity, competence, and benevolence impact the purchase intention (Lin, 2011, McKnight et al., 2002) and it is also a belief that a particular vendor is not opportunistic (Gefen et al., 2003) and will keep up the promises (Ganesan, 1994). Previous research on consumer trust in brands showed that there is a direct influence on attitudes and purchase intention (Ashraf et al., 2014, Lin, 2011; Gefen & Straub, 2003). Consequently, we hypothesize that:

H3: Trust has a significant positive image on attitudes toward Beauty and personal care websites.

Perceived website image

Website image refers to the consumers' perceptions of the website such as the name of the website or its logo on the consumers' minds (Barnett et al., 2006). Physical aspects of a website such as its design features, functionality, etc., and behavioral aspects of a website such as interactivity of the website design, etc. have a significant impact on the perceived image of a website.

Website image is an indispensable concept in e-commerce as the website forms the only stimulus, unlike traditional shopping which allows personal interactions within the store, touch and feel of products, and attracts consumers through the physical attractiveness of the stores (O'Cass and Carlson, 2012, Pavlou et al., 2007). Literature pointed out that as a result of consumers' positive brand image of an online retailer, their perceptions of product quality, visual appeal of the products, innovativeness of products, information furnished about the product, quality of services offered, efficiency of transactions, etc. also improved (O'Cass and Carlson, 2012). Changes in the website image frequently result in significant changes in consumers' attitudes towards behaviors (Siegel, 2001 and Vanhamme et al., 2012). Therefore, we hypothesize that:

H4. Perceived website image has a positive association with attitude towards Beauty and personal care websites.

Price promotions

Price promotion is referred to as a financial incentive experienced by consumers in purchasing a product (Oliver and Shor, 2003; Honea and Dahl, 2005). Price promotions can refer to discounts offered by the stores on product price such as free shipping costs, free gifts, special coupons, etc. offered to the consumers, thereby enhancing the loyalty of existing consumer base as well as attracting new buyers through improved public awareness of the vendors (Bagozzi, 1998). As reported by a vast body of literature, marketers of both online and offline stores treat price promotion as an important marketing strategy for improving sales and consequently, the market share of the company (Ailawadi et al., 2009; Grewal et al., 2011).

Price promotions are crucial for online retailers as the preference of consumers for online shopping is predominantly driven by the lowered product prices online when compared to the traditional stores (Grewal et al., 2003; Becerril-Arreola et al. 2013).

A significant impact of price promotions on purchase intention of consumers has been established by a number of researchers (Hsu and Liu, 1998; Oliver and Shor, 2003). Promotions have been found to influence the process of cognitive evaluation of products, thereby affecting consumer purchase intention (Raghubir, 2004). Price promotions have also been found to improve the perceived value of products especially in the case of online retailers (Oliver & Shor, 2003), thereby affecting their purchase decision.

H5. Price promotions have a significant positive association with attitude toward Beauty and personal care websites.

Perceived risk

Risk refers to uncertainties associated with buying a product (Chaudhuri, 2000). A detailed analysis of perceived risks by Jacoby and Kaplan (1972) and Chaudhuri (2000) revealed three important categories of risks, namely, financial risks, performance risks and physical risks. Financial risks refer to the chances for financial loss as a result of a purchase; Performance risks indicate the probability of a product not performing up to its expectations; Physical risks refer to the likelihood of a product being physically harmful. Apart from the three categories, psychological risks which refer to inability of products to satisfy the self-concept of consumers and social risks, which refer to a product not being esteemed by other individuals, have also been identified as significant risks. Literature has established a significant negative impact of such risks on purchase intention of the consumers (Crespo, del Bosque, & de los Salmones Sanchez, 2009; Liao, Liu, & Chen, 2011). Therefore, we hypothesize that:

H6. Perceived Risk has a significant positive relationship with attitude toward Beauty and personal care websites.

Attitude towards the online stores

Consumer attitude toward the Internet as a source of product information and towards the overall concept of e-commerce is an important determinant of their preference for online shopping (Helander & Khalid, 2000). Researchers have established a significant relationship between favorable attitudes toward the Internet and search for product information (Klein, 1998, Blackwell et al., 2001). Positive attitudes toward the online store leading to the willingness of consumers to find more about the website for better product information have also been reported in the previous research (Watchravesringkan and Shim, 2003; Shim et al., 2001).

Attitude and purchase intention

The influence of consumer attitudes on purchase intention has been explored extensively by researchers (George, 2002). Specific to the online shopping context, previous studies have established that consumer attitudes toward online shopping significantly affected their purchase intention (Shim et al.,2001 and Goldsmith and Bridges, 2000). Kim et al. (2003) and Yoh et al. (2003) confirmed this finding specific to online apparel shopping. Therefore, we hypothesize that:

H7. There is a significant positive relationship between attitude and purchase intention towards beauty and personal care websites.

Methodology

Study sample

The sample of participants comprised of Gen Z consumers. Convenience sampling was administered. It was ascertained that the participants had recently purchased apparel from online beauty and personal care websites. A pilot study was conducted with a sample of 100 respondents, who were excluded from the main study.Quantitative method was used to collect the primary data and online self-administered questionnaire was used to collect the data from 372 undergraduate and postgraduate students for the study. Testing theories with students as the respondents has been validated and accepted by researchers such as Calder et al. (1981).

Research procedure

Data collection was carried out with the help of self-administered questionnaires. In filling out the questionnaire, the respondents were requested to recall their latest apparel purchases from different private labels over the period of 6 months. This question was treated as a filter based on which their responses to the other questions were assessed. Questions involving frequency of internet usage, frequency of purchasing apparel, etc. were also included in order to gain a general understanding of suitability of the respondents for the study.

Results

Preliminary Analysis

From the 411 responses obtained in total, 48 responses exhibited missing data and were therefore treated as incomplete. Among the 372 valid responses considered for the study, 19% were men while 81% constituted women respondents. Most of the respondents were post-graduates (69.5%), while a few others were found to be undergraduates (12.1%) and PhDs (12.9%).

Confirmatory Factor Analysis (CFA) was used for the assessment of the measurement model. All observed standardised estimates in the measurement model were above 0.60 ($p<0.0001$) which satisfies the condition of convergent and discriminant validity. The average variance extracted (AVE) for all constructs are above 0.40 but below the minimum criteria of 0.50

Three major results can be understood: all loadings are significant (p-0.001) which shows the applicability of the model, the examined composite reliability showed a satisfying ratio for all the constructs and all loadings reflected nearly a value above 0.60 which motivate us to include the respective factor items in the structural model. The fit indices for the measurement model indicated a good fit. Previous studies (Singh, 2009; Schumacker and Lomax, 2004; Kline, 2005) indicated the ideal ratio required considering the model fit, and it is mentioned. Since the first attempted measurement model yielded good fit, no other modified measurement models were carried further. Also no item was removed during the validation using confirmatory factor analysis.

Hypothesis testing and structural equation model results:
The hypothesis (H1) proposed that website quality positively and significantly influence Online shopping Attitude towards Beauty and personal care websites.The path co-efficient values show that it creates negative influence towards Online shopping Attitude. The T statistics value shows that there is no significant relationship between price conscious and Online shopping Attitude. The hypothesis is rejected based on the path coefficient value and T- statistics that price conscious positively and significantly influence Online shopping Attitude.

The hypothesis (H2) proposed that website image positively and significantly influence Online shopping Attitude. The path coefficient value shows that it creates positive influence on Online shopping Attitude, but it is not significant based on the T-statistics value which is below the required criteria. The hypothesis is rejected that value conscious positively and significantly influence Online shopping Attitude.

The hypothesis (H3) implies that website familiarity creates positive and significant impact on Online shopping Attitude. The path coefficient value shows the positive impact with Online shopping Attitude and also it is significant based on the T-statistics value at 5% level of significance. Thus the hypothesis is accepted that perceived quality creates positive and significant impact on Online shopping Attitude towards Beauty and personal care websites..

The hypothesis (H4) proposed that website trust positively and significantly influences Online shopping Attitude. The path coefficient value ensures the positive impact and the T- statistics value shows the significant impact. The hypothesis is accepted that general deals positively and significantly influences Online shopping Attitude.

The hypothesis (H5) implies that price promotions positively and significantly influences Online shopping Attitude. The path coefficient value implies the positive impact of price promotions towards Online shopping Attitude and it is significant based on the T- statistics value which is significant.

The hypothesis (H6) implies that perceived risk create positive and significant impact on Online shopping Attitude. The path coefficient value shows the Perceived Risk created positive impact with Online shopping Attitude, but its fail to be significant, based on the T-statistics value which is below the required criteria to be significant. The hypothesis is rejected that perceived risk create positive and significant impact on Online shopping Attitude.

The hypothesis (H7) is proposed that Online shopping Attitude creates positive and significant impact on purchase intention. The path coefficient value ensures that Online shopping Attitude create positive impact on purchase intention. The t-statistics value ensures the significant impact between Online shopping Attitude and purchase intention. The hypothesis is accepted that online shopping attitude creates a positive and significant impact on purchase intention.

Partial Least Square-Structural Equation Modelling

In general, performing SEM technique for assessment of hypothesis and construct measurements is advantage (Esposito Vinzi, 2008; Henseler, 2014; Richter, 2015) because allow researchers to evaluate or modify theories/models (Chin, 2000; Chin, 1998; Schubring *et al.*, 2016). Of two main SEM techniques, maximum likelihood (MLE) method (Jöreskog, 1970; Jöreskog, 1978) a covariance-based SEM (CB-SEM) is preferred when the we intend to test a theory and relationships (Gudergan *et al.*, 2008) and focus is on measurement errors (Reinartz *et al.*, 2009). The second well recognized SEM technique is PLS-SEM which helps to assess both casual relationships between indicators and latent constructs (Gudergan *et al.*, 2008). Importantly, MLE required hard and fixed assumption of theory whereas PLS-SEM is flexible in modeling research constructs (Henseler, 2010).PLSSEM is preferred over MLE when we intent to extend "existing structural theory" (Hair *et al.*, 2011, p. 144). Regardless of criticisms (Ronkko and Evermann, 2013), PLS-SEM approaches (Wold, 1975) and its methodology (Lohmöller, 1989) in testing a complex model is advantage because the aim of analysis is "prediction accuracy" (Sarstedt, 2008;Reinartz *et al.*, 2009; Henseler *et al.*, 2014; Sarstedt *et al.*, 2016). However, PLS is also appropriate for exploratory and confirmatory studies (Gefen *et al.*, 2000; Westland, 2007; Schubring *et al.*, 2016).

The model fit indices of the measurement model were RMSEA= 0.044 below 0.10, CFI =0.909 larger than 0.9, IFI=0.963 larger than 0.9, PGFI =0.624 larger than 0.5 and Chisq/df 1.645 less than 5. The values were found to be on par with acceptable model fit values (Joseph F Hair, Black, Babin, Anderson, & Tatham, 2006).

Discussion and Conclusion

Several studies in the past have been conducted to study online beauty and personal care websites. However, the purchasing behaviour of Indian Gen Z especially in the case of Indian Beauty and Personal care has not been studied extensively. Therefore, the present study aims to bridge this research gap by uncovering the determinants of online apparel shopping attitudes and behaviours among Gen Z consumers.

Generation Z consumers are in the age group between 18-21 and within that age group, the consumers with the age of 20 are mostly involved in online shopping towards Beauty and personal care websites . Most of the generation Z consumers prefer to use laptop and mobile for online shopping than the desktop. For online shopping, female respondents are tend to buy more than the male in the generation Z consumers. The purchase frequency of the respondents for online Beauty and personal care products varies from one respondent to other.

In general, the results exhibit that Indian youngsters prefer online shopping for Beauty and personal care. It is also understood that the website attitude of the youth population was highly dependent of all the six determinants studied, namely, quality, familiarity, image, risk, price promotions and trust. Website attitudes in turn exhibited a significant impact on purchase intention.

The finding that website familiarity was a major determinant of online shopping attitude was in line with previous studies such as Sen and Hohnson 91977), Kent and Allen (1994), etc. who exhibited that consumers would choose websites that were reputed, commonly known and listed in topmost search engines. Familiarity also assists Gen Z consumers in understanding the latest trends in Beauty and personal care.

Trust as a significant determinant suggests that without trust, the consumers would fail to develop a habit of purchasing apparel online. Previous studies also states that Trust as a major factor influencing consumer online shopping attitudes (Gefen and Straub, 2003; Hassanein and Head, 2007 and Lin, 2011). Therefore, consumers' trust that the vendor is genuine, cares for their best interests, will stay honest in any situation and advertises only authentic information significantly affects their attitudes towards online shopping.

Perceived risk was also found to be a major factor determines the online shopping attitude of consumers. The study reveals that the young consumers still fear the various risks associated with online shopping such as paying online and doubts regarding quality of products. They feared that their personal information might be misused. They also expressed their fear that the products might differ in reality from the information specified by the vendor on the website. Regarding price promotions, the study revealed that the youngsters looked forward to discounts and other promotional offers while choosing online shopping. This is understandable as the respondents were college students, financially dependent on their parents and therefore consistently tried to save with their every purchase. The study suggests that with more price promotions, the youngsters tend to shop more, clearly exhibiting the reason behind the success of promotional sales such as the Big Billion sale, Clearance sale, etc. in India. To summarize, young consumers' attitudes towards Beauty and personal care websites are majorly influenced by the factors studied. Perceived risk played the deciding role in purchase of products online. While shopping for Beauty and personal care online websites, young Indian consumers will choose labels based on website familiarity aspects, followed by website image and then website quality. These factors were influenced by trust and perceived risk of buying online.

Managerial Implications

The above findings provide valuable insights for online Beauty and personal care retailers. The study exhibits that younger consumers were more favourable towards online shopping and that they commonly used laptop or mobile for shopping purposes. The youngsters also exhibited satisfactory awareness of the different Indian online Beauty and personal care products. Since most of the consumers were found to use mobile apps for purchasing, the promotional activities of the companies can focus on mobile devices such as using SMS to deliver news on latest offers. Consumers' doubts regarding mismatch of products given on website with reality can be eliminated by the retailers with the help of virtual fit options. This will allow the consumers to carry out a virtual trial before actually buying the product. It is also apparent that options such as cash on delivery have not been successful enough in eradicating consumers' fear of online payments. This emphasizes the need for retailers to look into betterment of security options, which in turn will improve purchase intention of consumers. Overall, it is understood that the young consumers have a clear idea of their online shopping notions, which needs to be understood by the online retailers to improve their marketing strategies.

Limitations and Future Research

To improve the generalization of the study findings, the study should also be carried out involving respondents of different cultures across different countries ensuring equal distribution of respondents from rural, semi-urban and urban areas. In the future, mediating effects between the constructs studied can also be explored. Inclusion of variables related to post-purchase behaviour such as satisfaction, negative experiences, etc. will also help the researcher to gain a deeper understanding of the research problem.

Figure :1 Conceptual Framework

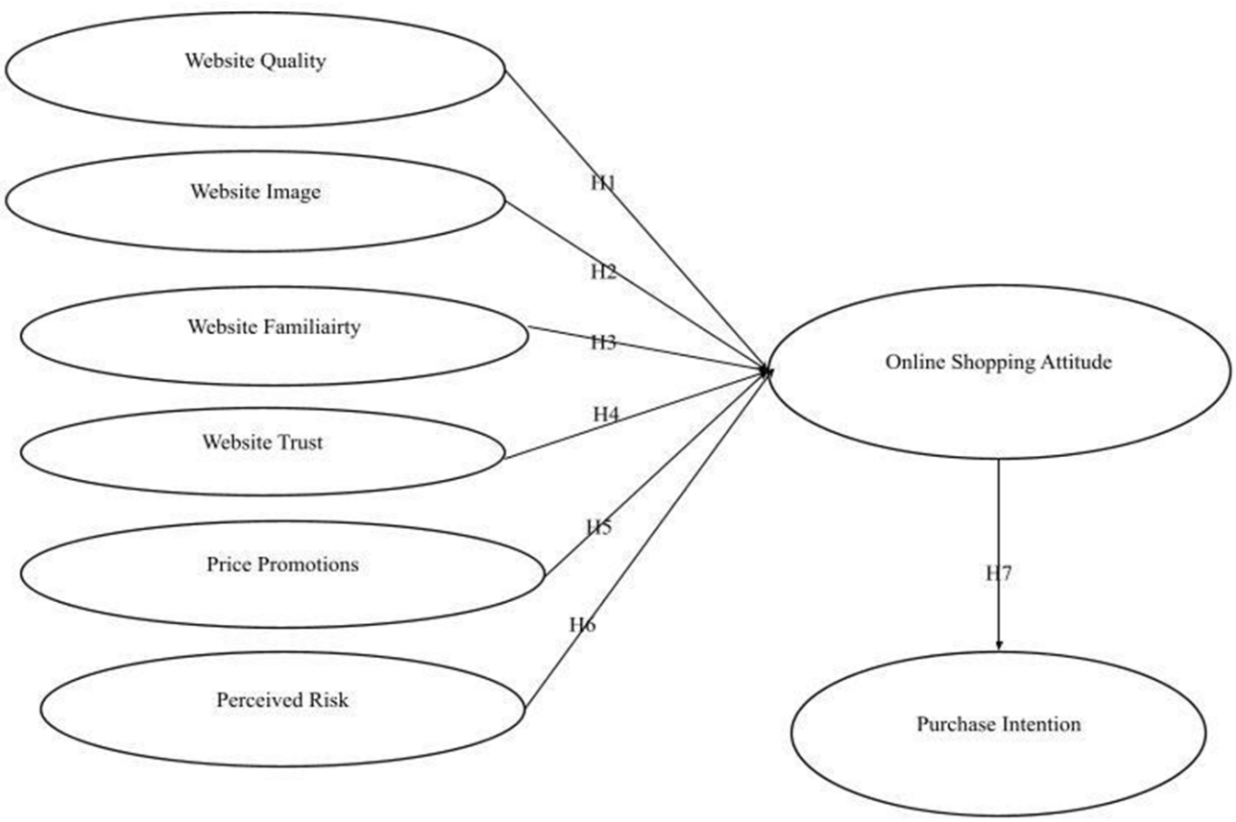

Figure :2 – Structural Equation Modeling

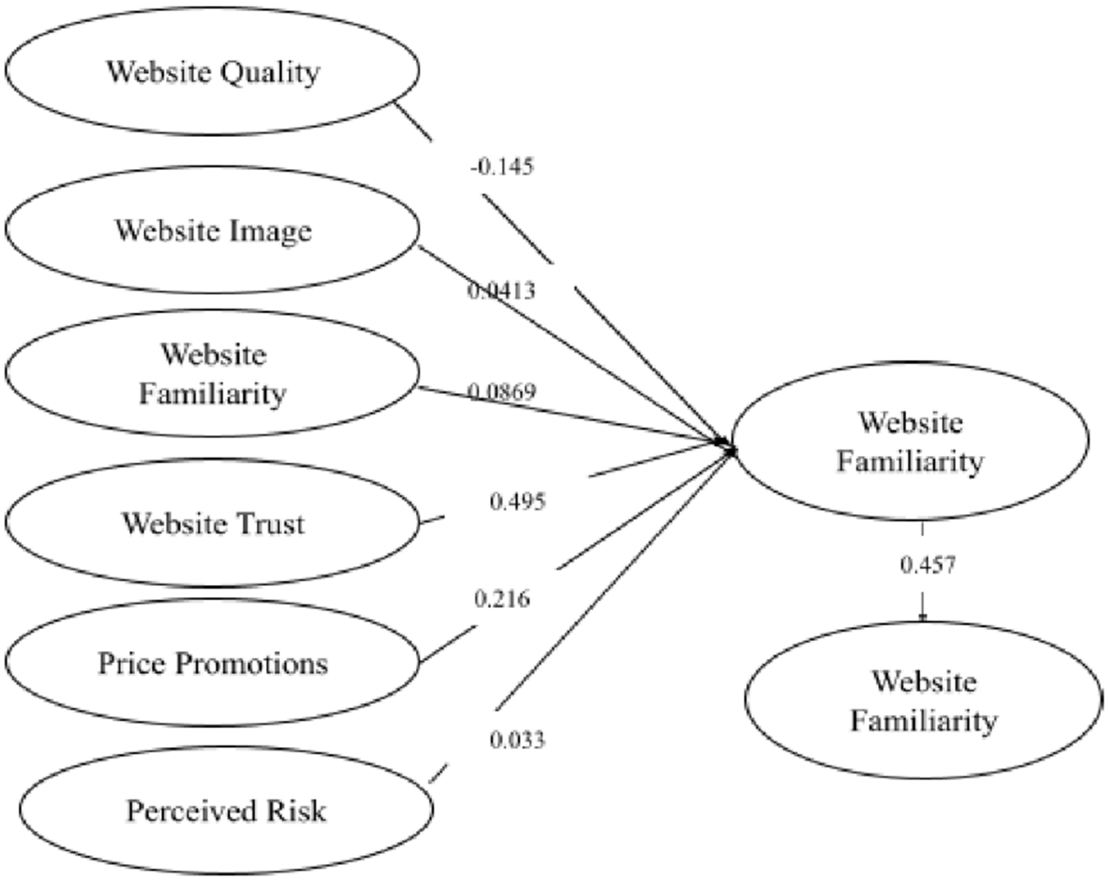

Table 1:Research instrument

Measures	Measurement scale	Supporting literature
Website Quality	4-item scale	(Teo et al.,2008)
Website Familiarity	4-item scale	(Veloutsou and Moutinho 2009)
Website Image	4-item scale	(Wu,2004)
Perceived Risk	4-item scale	(Kim and Lennon, 2013)
Price Promotions	4-item scale	(Seouk and Bailey,2008)
Website Trust	4-item scale	(Teng & Laroche, 2007).
Website Attitude	4-item scale	(Teng & Laroche, 2007)
Purchase Intention	5-item scale	(Teng & Laroche, 2007).

Table – 2:Demographic profile of the respondents

	Frequency	Percent
Gender		
Male	62	17.7
Female	288	82.3
Age		
18	94	26.9
19	63	18.0
20	120	34.3
21	73	20.9
Mode of shopping		
Desktop	33	9.4
Laptop	132	37.7
Tablet	82	23.4
Mobile	103	29.4
Frequency of shopping		
Frequently	106	30.3
Occasionally	90	25.7
Rarely	94	26.9
Very rarely	60	17.1
Total	372	100.0

Table 3:Measurement model

Second Order Construct	First Order Construct	Item	Outer Loading	AVE	Composite Reliability	Cronbach Alpha
Purchase Intention		PI1	0.780550	0.646319	0.935938	0.912072
		PI2	0.870025			
		PI3	0.872612			
		PI4	0.879005			
Online shopping Attitude		PBA1	0.777940	0.641487	0.899876	0.860143
		PBA2	0.819602			
		PBA3	0.805898			
		PBA4	0.803502			
		PBA5	0.797769			
	Website Quality	WQ1	0.875431	0.668311	0.946988	0.929246
		WQ2	0.866368			
		WQ3	0.863592			
		WQ4	0.803160			

	Website Familiarity	WF1	0.858038	0.631355	0.915633	0.883570
		WF2	0.828402			
		WF3	0.873877			
		WF4	0.811504			
	Website Image	WI1	0.731442	0.670960	0.841274	0.748377
		WI2	0.823062			
		WI3	0.688968			
		WI4	0.772479			
	Website Trust	WT1	0.720321	0.632676	0.837398	0.833677
		WT2	0.845539			
		WT3	0.820283			
		WT4	0.810115			
	Price Promotions	PP1	0.874572	0.648138	0.871291	0.841690
		PP2	0.847350			
		PP3	0.815095			
		PP4	0.824725			
	Perceived Risk	PR1	0.736757	0.603272	0.840372	0.834176
		PR2	0.804084			
		PR3	0.737889			
		PR4	0.641453			

Table 4-Results of Hypotheses Testing and Structural Relationships

Hypothesis	Path	Path Coefficient	Standard Error	T Statistics	Decision
H1	Website Quality ▼ Online shopping Attitude	-0.145098	0.098718	1.469827	Not Supported
H2	Website Image ▼ Online shopping Attitude	0.041312	0.103518	0.399083	Not Supported
H3	Website Familiarity ▼ Online shopping Attitude	0.089685	0.122228	2.033751	**Supported**
H4	Website Trust ▼ Online shopping Attitude	0.495439	0.126622	3.912740	**Supported**
H6	Price Promotions ▼ Online shopping Attitude	0.216792	0.107140	2.023447	**Supported**
H7	Perceived Risk ▼ Online shopping Attitude	0.033805	0.103554	0.326449	Not Supported
H8	Online shopping Attitude ▼ Purchase Intention	0.457747	0.086742	5.277133	**Supported**

Table 5: Structural Equation Model Result

Fit indices	X2	df	X2/df	GFI	IFI	CFI	NFI	RFI	RMSEA
Measurement	877.39	515	1.645	0.94	0.96	0.90	0.97	0.97	0.037
Structural	1022.66	530	1.754	0.90	0.95	0.91	0.96	0.95	0.043
Acceptable value			< 3	>0.9	>0.9	>0.9	>0.9	>0.9	<0.08

Table – 6: Results of R^2 and Q^2 Value

Sl. No	Endogenous Variable	R^2	Q^2
01.	Online Shopping Attitude	0.550025	0.277
02.	Purchase Intention	0.209532	0.125

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Exploring Environmental, Social, and Governance (ESG) and Corporate Financial Performance (CFP): A Systematic Review using Theory, Context, Characteristics, and Methodology (TCCM)

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Abstract

Environmental, Social, and Governance (ESG) practices have gained significant importance due to rising concerns over climate change, ethical business practices and corporate social responsibilities. The adoption of ESG practices is also increasingly viewed as a crucial catalyst for corporate financial performance (CFP). However, the relationship between ESG and CFP is still not clear. This study aims to bridge this research gap by providing a holistic understanding of the ESG and CFP relationship. The research endeavours to utilize a three-step methodology encompassing PRISMA guidelines; Theory, Context, Characteristics, and Methodology (TCCM) framework, followed by a moderator-mediator model proposed by authors. The authors reviewed 157 research articles published between 2014 and 2022. The TCCM framework served as the foundation for this study, with a focus on addressing four key research questions: (i) Which theories or concepts have been explored to elucidate the relationship between ESG and CFP?; (ii) In what contexts and frameworks has the research been conducted and being used for?; (iii) Which of the characteristics that have been analyzed?; (iv) What methodologies were used in the studies? The findings of the study reveal that ESG-CFP is an emerging research area with a growing number of publications. The study also identified two major theories commonly used in the ESG-CFP research stream: "Stakeholder theory" and "Legitimacy theory." The authors also emphasise the critical role of developing countries like India in the field of ESG-CFP, highlighting the need for scholars and academicians to contribute more significantly to the core literature in this area. The authors proposed a conceptual "moderator-mediator" framework.

Keywords ESG; Environmental, Social and Governance; Financial Performance, Systematic Review; TCCM; Theory, Context, Characteristics, Methodology; Moderating, Mediating

JEL: G30, O16, L20, Q50

1. Introduction

Corporations now consider environmental, social, and governance (ESG) objectives apart from maximizing shareholder wealth (Friede et al., 2015; Ketter et al., 2020; van Duuren et al., 2015). The environment, natural resources, and humans have been squeezed by the fast growth of the manufacturing and service industries. Global happenings like Covid-19 pandemic and unusual climate changes have exposed companies worldwide thus triggering discussions on ESG metrics. ESG means Environmental, Social and Governance factors used to measure how sustainable or impactful socially an investment is in a business entity (Friede et al., 2015; Ketter et al., 2020). The term 'ESG' first emerged in a report released by the United Nations Global Compact in 2004 (UN Global Compact, 2004). Since then, the idea has attracted considerable attention, particularly among companies (Broadstock et al., 2021; Zhou et al., 2022; Li et al., 2021; Huang, 2022). Effective ESG practices offer several competitive advantages to businesses like improved operational efficiencies; reduced cost of finances (Wong et al., 2021) and higher market valuation. ESG allows investors to take a step back from financial statements, and assess the businesses' operations and future strategies from a non financial angle, which complements the former (Yu et al., 2021; Sharma et al., 2021). In the wake of the growing significance of ESG, firms need to be alive to its possible effects on their operations and financial performance if they are to protect their Corporate Financial Performance (CFP) over the

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long term. Assessing a business's financial health, profitability, and capacity to attract investment that will satisfy the needs of shareholders is important as indicated by Combs et al. (2005) and Richard et al. (2009). Knowledge concerning the correlation between ESG and CFP has been growing but is still intricate. The primary objective of this structured literature review is to bridge these gaps by utilizing the Theory, Context, Characteristics, and Methodology (TCCM) framework propounded by Paul & Criado (2020) as well as Paul & Rosado-Serrano (2019) in the analysis of 157 publications from 2014 to 2022. The paper delves into theories, contexts, characteristics and methods employed in studies on ESG and CFP thereby coming up with a conceptual framework called 'moderator-mediator model' which will help understand ESG-CFP relationships better.

2. Methodology

The methodological approach used in the study includes three phases which are the PRISMA protocol (Moher, 2009), TCCM framework for systematically reviewing research articles, and moderator-mediator model proposed by the authors.

2.1 PRISMA Protocol

In order to ensure the unbiased and transparent selection of articles, the PRISMA protocol was used (Figure 1). The Web of Science (WoS) database was utilized to search for and choose research papers. The search terms used were "ESG" OR "Environment Social Governance" OR "Environmental Social Governance" (Topic) AND "corporate financial performance" or "CFP" or "Firm performance" or "financial" or "economic performance" or "bottom line" (All Fields) AND "theory" or "context" or "Characteristics" or "methodology" or "theor*" or "moderating" or "mediating" or "independent" or "dependent" or "moderat*" or "mediat*" or “industr*" or countr*" (All Fields). The study was limited to the disciplines of business, management, economics and business finance. Only papers written in English were included for review. Finally, 157 papers from 2014 to 2022 were selected. Figure 1 presents a detailed process followed by authors for selection of research papers based on PRISMA protocol.

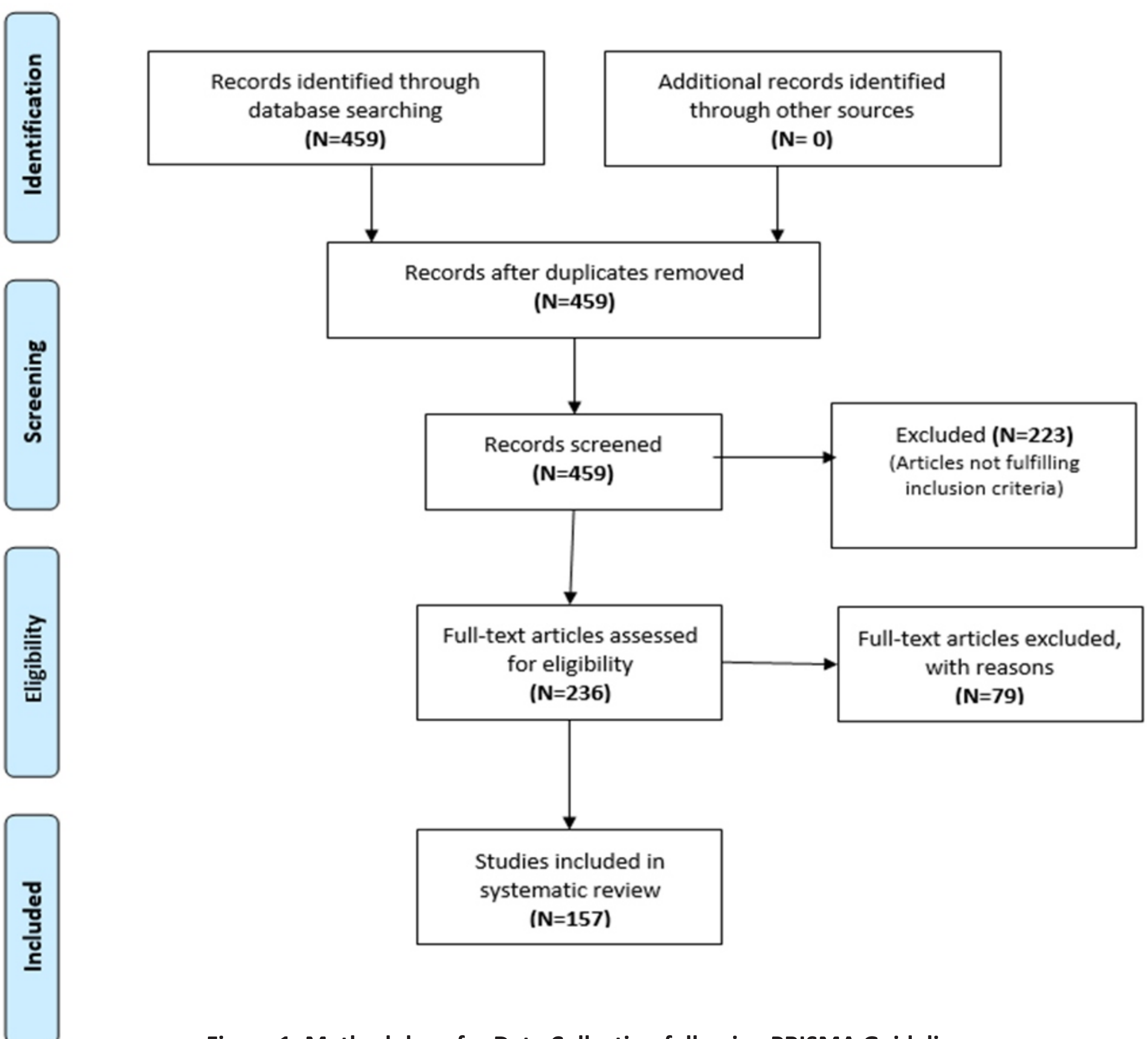

Figure 1. Methodology for Data Collection following PRISMA Guidelines

2.2 TCCM Framework

When conducting the systematic review of the existing literature, the authors of this study employed the TCCM method. Established Theories, Characteristics, Contexts, and Methodologies from a Wide Range of Studies are Collected under the TCCM. The TCCM framework is an indispensable tool for analysing the results of a systematic literature review. We began by reviewing the several possibilities advanced in the ESG-CFP literature. A number of popular theories were uncovered, including the legitimacy theory, stakeholder theory, shareholder theory, resource-based view theory, agency cost theory, and institutional theory. The conceptual frameworks required to describe the relationship between ESG and CFP were built using these theoretical frameworks as a starting point. The second step involved an examination of the broader setting by focusing on many countries where studies on ESG-CFP have been conducted. The next step was to investigate the characteristics that influence the correlation between ESG and CFP. Independent, modifying, mediating, and dependent factors were all identified and examined in the selected publications. Through a comprehensive examination of these factors, the intricate dynamics contributing to our understanding of the ESG-CFP relationship were unravelled. Lastly, the fourth step involved, the primary methodological features employed in the literature on ESG-CFP were critically evaluated. The methodologies used in the selected studies were assessed for their rigor, reliability, and validity.

2.3 Moderator-Mediator Model

In this study the authors have proposed a conceptual framework based on the moderator-mediator model. The aim of this framework is to highlight the significance of moderating and mediating variables in the ESG-CFP relationship. For this the authors analysed the selected set included in the literature. Further, the authors segregated studies based on various variables being used as moderating or mediating variables and analyzed the studies based on the above variables.

3. TCCM Findings

3.1 Theory

Considerable progress has been made in the field of ESG-CFP research, with stakeholder theory and legitimacy theory emerging as dominant theoretical perspectives (Donaldson & Preston, 1995; Tavares & Dias, 2018) (Table 1). Stakeholder theory emphasizes prioritizing the interests of all stakeholders, challenging the traditional focus on shareholder wealth maximization (Freeman, 1999; Battisti et al., 2019, 2022; Jensen, 2001). Legitimacy theory highlights the importance of organizations conforming to societal norms and expectations to maintain their social license to operate (Suchman, 1995). Other theories supporting the ESG-CFP relationship include Stewardship theory, Institutional theory, Slack Resource theory, Good Management theory, and Information Asymmetry theory (Hernandez, 2007; Claassen & Ricci, 2015). Stewardship theory views management as custodians of organizational assets, aiming to safeguard stakeholder interests. Institutional theory suggests that maintaining corporate legitimacy offers economic and non-economic benefits. Good Management theory suggests that strong social performance enhances a company's reputation and improves financial performance. Slack Resource theory proposes that financially robust companies allocate more resources to ESG initiatives, positively influencing their financial performance. On the other hand, scholars based on Agency theory and Trade-off theory argue that sustainability efforts can be perceived as a waste of company resources (Nguyen, 2020). Agency theory is based on the view that there is conflict of interest among management and shareholders, suggesting that diverting resources to ESG activities may not be in the best interest of shareholders. Trade-off theory suggests a trade-off between fulfilling ESG obligations and achieving optimal financial performance in the short run. This perspective aligns with the view that costs associated with ESG investments can impact financial outcomes.

Table 1. Theories used to explain ESG-CFP Relationship

Theory	Articles (%)	Explanation	Examples
Stakeholder Theory	47%	Stakeholder theory is an ethical concept that encompasses the consequences of business decisions, trends, profits, and their overall impact on various stakeholders which include shareholders, employees, financiers, government, customers, suppliers, and others.	Saygili, et al., 2022; Linnenluecke, 2022; Li et al., 2021; Huang, 2022; Kabir Hassan et al., 2021; Sepulveda-Alzate et al., 2021; Garzón Jiménez & Zorio-Grima, 2021; Nekhili et al., 2021; Vural-Yavas, 2021; Kim & Lee, 2020; Xie et al., 2019; Garcia-Blandon et al., 2019
Legitimacy Theory	16%	Legitimacy theory states that organizations continuously try to ensure that they carry out activities in accordance with societal boundaries and norms.	Eliwa et al., 2021; Sepulveda-Alzate et al., 2021; Reber et al., 2021; Garzón Jiménez & Zorio-Grima, 2021; Shakil et al., 2021; Giannarakis et al., 2014

Agency Theory	14%	Agency theory examines the relationship between principals and agents, focusing on conflicts of interest and mechanisms to align their interests and reduce agency costs	Dong et al., 2022; Garzón Jiménez & Zorio-Grima, 2021; Melis & Rombi, 2021; Nekhili et al., 2021; Shahbaz et al., 2020; Araissi et al., 2016
Institutional Theory	9%	Institutional theory suggests that organizations conform to externally established rules, norms, laws, and sector-specific best practices in order to align their processes with the institutional environment.	Eliwa et al., 2021; Sepulveda-Alzate et al., 2021; Melis & Rombi, 2021; Araissi et al., 2016; Li et al., 2021
Good Management Theory	7%	If company is performing social activities, it will lead to increased reputation of the company among its stakeholders, ultimately leading to good financial performance (Waddock & Graves, 1997).	Daszynska-Zygadlo et al., 2020; Vural-Yavas, 2021; Isaksson & Woodside, 2016;
Theory of Asymmetric Information	5%	Asymmetric information arises when there is an imbalance in the amount or quality of information held by different parties involved in a transaction. In the context of ESG, the theory of asymmetric information pertains to the uneven distribution of information regarding a company's ESG practices and performance between the company itself and its stakeholders. This means that one party may possess more comprehensive or superior information about the company's ESG efforts, creating a disparity in knowledge and understanding among the involved parties.	Feng & Wu, 2021; Reber et al., 2021; Garzón Jiménez & Zorio-Grima, 2021
Slack Resource Theory	5%	Under the slack resource theory, a company should have a good financial position to contribute to ESG activities.	Chen et al., 2021; Chams et al., 2021; Qureshi et al., 2021
Resource Based View	5%	According to the resource-based view (RBV) theory, organizations possess diverse resources and capabilities that serve as the primary drivers for establishing sustainable competitive advantages.	Zahid et al., 2020 ; Garcia & Orsato, 2020 ; Nirino et al., 2021 ; Zhou et al., 2022
Trade-Off Theory	5%	The trade-off theory posits that implementing sustainability practices incurs additional costs, leading to a reduction in profitability. Companies that allocate resources to sustainability activities are likely to experience lower profits. Therefore, there is a trade-off between ESG initiatives and financial profitability.	Qureshi et al., 2021; Buallay et al., 2021; Chen et al., 2021

Stewardship Theory	4%	Stewardship theory asserts that managers, as stewards of a company, have a responsibility to protect and enhance shareholders' wealth through firm performance while considering the interests of other stakeholders.	Tilba, 2022; Garzón Jiménez & Zorio-Grima, 2021; Zhou et al., 2022
Theory of Firm	2%	The theory of the firm is a fundamental concept in microeconomics that posits the primary motive of companies is profit maximization. According to this theory, businesses operate with the goal of generating the highest possible financial returns. This notion highlights the fundamental nature of profit maximization as a key driver behind the establishment and continued existence of firms.	Huang, 2022
Impression Management Theory	2%	According to impression management theory, individuals and organizations have the ability to strategically choose which aspects of their identity to present in different situations. In essence, impression management involves efforts to ensure that the image perceived by others accurately reflects the intended impression. Organizations may engage in impression management strategies to enhance their reputation and gain stakeholder support in relation to their ESG practices.	Reber et al., 2021
Corporate Culture Theory	2%	Corporate Culture Theory is an approach that focuses on the role of organizational culture in shaping the behavior, values, norms, and practices within a company.	Yoon et al., 2021
Managerial Opportunism Hypothesis	2%	The Managerial Opportunism Hypothesis posits that senior executives prioritize their personal interests over those of shareholders and other stakeholders, thereby causing harm or detriment to these individuals or groups.	Qureshi et al., 2021
Negative Synergy Theory	2%	Negative synergy in the ESG realm could refer to situations where the integration of ESG practices within an organization does not lead to improved outcomes or value creation.	Qureshi et al., 2021
Theory of Planned Behaviour (TPB)	2%	TPB is a psychological theory that helps in predicting human behavious on various factors like human attitude and its control on surrounding.	Sultana et al., 2018

Financial Theory	2%	According to financial theory, the primary objective of firms is to maximize the wealth of shareholders. Firms are advised to find a harmonious equilibrium between maintaining adequate liquidity within the company and actively engaging in ESG practices.	Chan et al., 2017
No Theory	30%		Jitmaneeroj et al., 2016; Busch et al., 2016; Limkriangkrai et al., 2017

3.2 Context

In the field of ESG and CFP research, it is crucial to examine the various contexts in which these studies are conducted. The choice of countries and industries can significantly influence the outcomes and generalizability of research findings. Table 2 summarises the findings regarding the countries investigated in ESG-CFP relationship. The analysis clearly reveals that a significant majority of the studies examined in the review were conducted in the United States of America (23%) and Europe (18%). In simple terms, the review suggested that the literature on motivations for greater ESG-CFP relationship has traditionally been linked to advanced economies only (Cheng et al., 2013). However, emerging markets, despite being a major contributor of businesses around the world, have not yet find significant place in the current ESG-CFP literature (Baughn et al., 2007; Dobers & Halme, 2009; Chauhan and Kumar, 2018; Daugaard, 2019). Additionally, the analysis indicates that the majority of the studies reviewed were conducted within a single country, lacking a broader international scope. There are few studies (Eliwa et al., 2021; Kabir Hassan et al., 2021; Sepulveda-Alzate et al., 2021; Buallay et al., 2021; Miralles-Quiros et al., 2019) that undertakes a multi-country analysis. The issue of data collecting and data comparison in the cross-national examination may be a possible cause. Since the results of the single-country study cannot be compared, they offer only preliminary insights. Further with respect to industries, most of the papers focused on non-financial listed firms (Dong et al., 2022; Saygili, et al., 2022; Eliwa et al., 2021; Kabir Hassan et al., 2021; Melis & Rombi, 2021) with few exceptions (Daszynska-Zygadlo et al., 2020; Shakil et al., 2021; Miralles-Quiros et al., 2019).

Table 2. Countries Investigated in the Review Articles

Country	Articles (%)	Examples
United States of America	23%	Tilba, 2022; Feng & Wu, 2021; Kabir Hassan et al., 2021; Reber et al., 2021; Kim & Lee, 2020; Qureshi et al., 2021; Melis & Rombi, 2021; Miralles-Quiros et al., 2019; Chan et al., 2017; Eliwa et al., 2021; Sepulveda -Alzate et al., 2021; Reber et al., 2021; Garzón Jiménez & Zorio -Grima, 2021; Shakil et al., 2021; D.Z.X. Huang, 2021
Europe	18%	Buallay et al., 2021; Melis & Rombi, 2021; Nirino et al., 2021; Vural -Yavas, 2021; Miralles-Quiros et al., 2019; Lagasio & Cucari, 2019; Isaksson & Woodside, 2016; Girerd-Potin et al., 2012; Profitlich et al., 2021; Eliwa et al., 2021
Latin America	9%	Sepulveda-Alzate et al., 2021; Garzón Jiménez & Zorio -Grima, 2021; Duque -Grisales & Aguilera -Caracuel, 2021; Martinez -Ferrero et al., 2020; Lagasio & Cucari, 2019
China	7%	Dong et al., 2022; Zhou et al., 2022; Chen et al., 2021; Buallay et al., 2021
Africa	5%	Kabir Hassan et al., 2021; Daszynska-Zygadlo et al., 2020; Lagasio & Cucari, 2019
Japan	4%	Miralles-Quiros et al., 2019
India	2%	Buallay et al., 2021
Korea	2%	Yoon et al., 2021
No specific country	33%	Jitmaneeroj et al., 2016; Busch et al., 2016

3.3 Characteristicsa

The reviewed studies in the field of ESG-CFP research have examined various variables related to ESG and CFP. According to Table 3, ESG is commonly considered as the independent variable, with studies focusing on how ESG activities influence a company's financial performance (Dong et al., 2022; Zhou et al., 2022; Chen et al., 2021; Eliwa et al., 2021; Feng & Wu, 2021; Kabir Hassan et al., 2021; Reber et al., 2021; Yoon et al., 2021; Kim & Lee, 2020; Buallay et al., 2021; Daszynska-Zygadlo et al., 2020). Some studies also explore moderating effects, where additional factors such as board diversity, financial slack, and international diversification can influence the relationship between ESG and financial performance (Campanella et al., 2020; Qureshi et al., 2019; Aguilera-Caracuel et al., 2014; Surroca et al., 2009; Waddock & Graves, 1997; Duque-Grisales & Aguilera-Caracuel, 2021) (Table 4). Mediating variables, which explain the underlying mechanisms connecting the independent and dependent variables, have been less explored in ESG-CFP research (Table 4). Only a few studies consider mediating factors such as corporate social responsibility committees, customer loyalty, stakeholder engagement, employee relations, innovation, operational efficiency, risk management, sales and marketing, media coverage, and supplier relations (Martinez-Ferrero et al., 2020; Atz et al., 2019; Vishwanathan et al., 2019; Atz et al., 2022; Whelan & Atz, 2021). The dependent variable in most studies is corporate financial performance (CFP), measured through indicators like return on assets (ROA), competitive advantage, and corporate reputation (Dong et al., 2022; Saygili et al., 2022; Zhou et al., 2022; Chen et al., 2021; Daszynska-Zygadlo et al., 2020) (Table 5). While integrating ESG practices can lead to positive effects such as cost reduction and improved product quality, not all studies consistently show a direct improvement in corporate profitability due to the high costs associated with sustainability goals (Alsayegh et al., 2020; Chen et al., 2015; Zhai et al., 2018; Buallay, 2019).

Table 3. Independent Variables

Characteristics / Variables	Articles (%)	Examples
Environmental Social Governance Composite Scores	37%	Zhou et al., 2022; Chen et al., 2021; Eliwa et al., 2021; Feng & Wu, 2021; Kabir Hassan et al., 2021; Reber et al., 2021; Yoon et al., 2021; Kim & Lee, 2020; Daszynska-Zygadlo et al., 2020; Pirtea et al., 2021; Nekhili et al., 2021; Shahbaz et al., 2020; Miralles-Quiros et al., 2019; Minutolo; Nekhili, Boukadhaba, Nagati, et al., 2021 et al., 2019
Environmental Social & Governance Scores (Individually)	9%	Yoon et al., 2021; Kim & Lee, 2020; Buallay et al., 2021; Shahbaz et al., 2020; Limkriangkrai et al., 2017
Board Diversity	5%	Shahbaz et al., 2020; Dong et al., 2022; Martinez-Ferrero et al., 2020
Tobin's Q	4%	Chams et al., 2021; Qureshi et al., 2021
Financial Leverage	4%	Giannarakis et al., 2014
Percentage of Women Directors	4%	Shakil et al., 2021; Araissi et al., 2016
Free Cash Flows	2%	Chams et al., 2021
Market-to-book Ratio	2%	Qureshi et al., 2021
Book Value Per Share of Stocks	2%	Miralles-Quiros et al., 2019
Earnings Per Share	2%	Miralles-Quiros et al., 2019
Return on Equity	2%	Qureshi et al., 2021
Return on Assets	2%	Qureshi et al., 2021
Chief Financial Officer Compensation	2%	Profitlich et al., 2021
Director's Liability and other related variables	2%	Melis & Rombi, 2021
Corporate Controversies	2%	Nirino et al., 2021
Religiosity	2%	Terzani & Turzo, 2020

Materiality/ Immateriality of ESG	2%	Kim & Lee, 2020
Corporate Social Irresponsibility Coverage	2%	Kolbel et al., 2017
Altman's Z Score	2%	Chan et al., 2017
CEO Duality	2%	Giannarakis et al., 2014
Greenhouse Gas Emissions	2%	Giannarakis et al., 2014
KZ Index	2%	Chan et al., 2017
Economic Policy Uncertainty	2%	Vural-Yavas, 2021

Table 4. Moderating and Mediating Variables

Characteristics / Variables	**Articles (%)**	**Examples**
Total Quality Management	2%	Chams et al., 2021
Environmental Social Governance Composite Scores	2%	Qureshi et al., 2021
Environmental Social & Governance Scores (Individually)	2%	Qureshi et al., 2021
Financial Slack	2%	Duque-Grisales & Aguilera-Caracuel, 2021
Geographical International Diversification	2%	Duque-Grisales & Aguilera-Caracuel, 2021
ESG Controversies	2%	Shakil et al., 2021
Competition	2%	Vural-Yavas, 2021
Franchising Strategy	2%	Kim & Lee, 2020
Employee Board Representation	4%	Nekhili, Boukadhaba, Nagati, et al., 2021
Investment Horizon	2%	Sultana et al., 2018
CSR Committee	2%	Martinez-Ferrero et al., 2020

Table 5. Dependent Variables Investi gated in the Review Articles

Characteristics / Variables	**Articles (%)**	**Examples**
Return on Assets	21%	Saygili, et al., 2022; Chen et al., 2021; Kim & Lee, 2020; Buallay et al., 2021; Chen et al., 2021;Daszynska-Zygadlo et al., 2020; Pirtea et al., 2021; Shahbaz et al., 2020; Miralles-Quiros et al., 2019; Xie et al., 2019
Tobin's Q	19%	Dong et al., 2022; Saygili, et al., 2022; Zhou et al., 2022; Chen et al., 2021; Daszynska-Zygadlo et al., 2020; Nekhili et al., 2021; Shahbaz et al., 2020; Kim & Lee, 2020; Miralles-Quiros et al., 2019; Nekhili, Boukadhaba, Nagati, et al., 2021; Xie et al., 2019
Environmental Social Governance Composite Scores	14%	Profitlich et al., 2021; Chams et al., 2021; Shakil et al., 2021; Martinez-Ferrero et al., 2020; Vural-Yavas, 2021; Shahbaz et al., 2020; Giannarakis et al., 2014
Environmental Social & Governance Scores (Individually)	7%	Chams et al., 2021; Vural-Yavas, 2021; Shahbaz et al., 2020; Giannarakis et al., 2014

Return on Equity	5%	Buallay et al., 2021; Pirtea et al., 2021
Cost of Debt	4%	Eliwa et al., 2021; Feng & Wu, 2021
Stock Returns	4%	Limkriangkrai et al., 2017; Araissi et al., 2016
Return on Net Assets	2%	Chen et al., 2021
Return on Invested Capital	2%	Chen et al., 2021
Market Risks - Total Market Risk, Idiosyncratic Risk, Systematic Risk	2%	Kabir Hassan et al., 2021
Volatility - Total Volatility, Idiosyncratic Volatility	2%	Reber et al., 2021
Degree of Tax Avoidance - BTD (Difference between net income and taxable income)	2%	Yoon et al., 2021
Customised Credit Rating Scale	2%	Kim & Lee, 2020
Compensation - Total compensation, Performance based compensation	2%	Melis & Rombi, 2021
Financial Risk	2%	Kolbel et al., 2017
Corporate Financing decisions	2%	Limkriangkrai et al., 2017
EBIT	2%	Pirtea et al., 2021
Stock Prices	2%	Miralles-Quiros et al., 2019
Corporate Efficiency	2%	Xie et al., 2019
Investment Decision	2%	Sultana et al., 2018
Corporate Social Responsibility	2%	Chan et al., 2017
Not Specified	2%	Nirino et al., 2021

3.4 Methodology

Table 6 and 7 gives an overview of research approach and research methods employed in the articles. The review indicates that more than 80% of the studies are based on quantitative approaches (Daszynska-Zygadlo et al., 2020; Pirtea et al., 2021; Shakil et al., 2021; Martinez-Ferrero et al., 2020; Terzani & Turzo, 2020; Nekhili et al., 2021; Shahbaz et al., 2020; Kim & Lee, 2020; Miralles-Quiros et al., 2019; Minutolo et al., 2019). Furthermore, very few studies have used qualitative approaches (Table 6). Qualitative research focuses on exploring and understanding phenomena through methods such as interviews, observations, or textual analysis. Qualitative approaches can provide in-depth insights into the experiences, perspectives, and contexts surrounding the ESG-CFP relationship. However, their limited use in the reviewed studies suggests a prevalence of quantitative methods in this field. Table 7 presents the analytical methods that have been predominantly used in the reviewed articles. The review further suggests that regression analysis, particularly multiple regression, is the most frequently employed method.

Table 6. Research Approach used to Review Articles

Research Approach	Articles (%)	Examples
Quantitative		
Secondary Data	81%	Linnenluecke, 2022; Profitlich et al., 2021; Chen et al., 2021; Eliwa et al., 2021; Feng & Wu, 2021; Kabir Hassan et al., 2021; Sepulveda-Alzate et al., 2021; Chams et al., 2021; Reber et al., 2021; Yoon et al., 2021; Kim & Lee, 2020; Qureshi et al., 2021; Garzón Jiménez & Zorio-Grima, 2021; Buallay et al., 2021; Melis & Rombi, 2021
Survey (Primary)	2%	Isaksson & Woodside, 2016

Mix (Both Primary and Secondary)	2%	Cubas-Díaz & Martínez Sedano, 2018
Qualitative		
Primary Data	4%	Khemir, 2019; Eccles et al., 2020
Secondary Data	12%	Tilba, 2022; Li et al., 2021; D.Z.X. Huang, 2021; Lagasio & Cucari, 2019; Busch et al., 2016;Gillan et al., 2021; Huang, 2022

Table 7. Research Methods

Research Method	Articles (%)	Examples
Linear Regression	7%	Zhou et al., 2022; Buallay et al., 2021; Melis & Rombi, 2021; Xie et al., 2019
Multiple Regression	26%	Profitlich et al., 2021; Kim & Lee, 2020; Daszynska-Zygadlo et al., 2020; Duque-Grisales & Aguilera-Caracuel, 2021; Daszynska-Zygadlo et al., 2020; Pirtea et al., 2021; Shakil et al., 2021;Martinez-Ferrero et al., 2020; Vural-Yavas, 2021; Shah; Kim & Lee, 2020baz et al., 2020; Miralles-Quiros et al., 2019; Minutolo et al., 2019; Kolbel et al., 2017
Generalised Method of Moments	9%	Dong et al., 2022; Garzón Jiménez & Zorio-Grima, 2021; Nekhili et al., 2021; Nekhili, Boukadhaba, Nagati, et al., 2021;
Panel Vector Autoregressive Model	4%	Chen et al., 2021; Qureshi et al., 2021
Pooled Ordinary Least Squares Regression	9%	Eliwa et al., 2021; Kabir Hassan et al., 2021; Yoon et al., 2021; Nirino et al., 2021
Logistic Regression	5%	Feng & Wu, 2021; Melis & Rombi, 2021; Chan et al., 2017
Principal Component Analysis	5%	Sepulveda-Alzate et al., 2021; Terzani & Turzo, 2020; Girerd-Potin et al., 2012
Structural Equation Modelling	4%	Pirtea et al., 2021; Sultana et al., 2018
Distributed Lag Regression Methodology	2%	Chams et al., 2021
Regression Residual	2%	Reber et al., 2021
Pearson correlation	2%	Garcia-Blandon et al., 2019
Kruskal-Wallis and Mann-Whitney tests	2%	Garcia-Blandon et al., 2019
Data Envelopment Analysis	2%	Xie et al., 2019;
Non-Parametric Regression	2%	Xie et al., 2019
Expectation Maximization (EM) clustering and the Bayesian Network classifiers with Tree Augmented Naïve Bayes (BN-TAN) Partial Least Square (PLS)	2%	Jitmaneeroj et al., 2016
Fama and French 3-factor model in realized	2%	Araissi et al., 2016
Hausman- Taylor	2%	Saygili, et al., 2022
Conceptual Papers	12%	Tilba, 2022; Gillan et al., 2021; Khemir, 2019; Eccles et al., 2020; D.Z.X. Huang, 2021; Lagasio & Cucari, 2019; Busch et al., 2016

4. Future Research Agenda

The aforementioned review has significantly enhanced the authors' understanding of the evolution of the literature on ESG-CFP over the past 9 years. Drawing upon this systematic literature review, the authors propose a future research agenda within each domain of the TCCM framework (Table 8).

Table 8. Future Research Directions

	Particulars
Theory	❖ Collaboration among researchers from different fields is essential for fully grasping the complexities of the trade-offs in ESG factors and CFP relationships. By bringing together insights from disciplines like management, finance, sociology, and psychology, researchers can uncover valuable perspectives on these intricate dynamics. ❖ For instance, blending Institutional Theory from management with finance theories like Modern Portfolio Theory can reveal how external pressures and institutional norms shape CFP when ESG factors are considered. Sociological theories like Impression Management Theory can aid in understanding strategic communication and stakeholder perceptions in ESG reporting. Additionally, psychological theories can illuminate the influence of executive characteristics and values on ESG adoption and its impact on financial outcomes, as illustrated by the Upper Echelons Theory (Li et al., 2021). ❖ Through interdisciplinary collaboration, researchers can cultivate a comprehensive understanding of the ESG-CFP relationship and unearth novel opportunities for sustainable business strategies.
Context	✔ Existing research on the relationship between ESG and CFP has generally concentrated on developed and politically stable countries, with less emphasis given to emerging economies such as India (Baughn et al., 2007; Dobers & Halme, 2009; Chauhan and Kumar, 2018; Daugaard, 2019). More research is required to understand dynamics of emerging countries. ✔ Most studies in ESG-CFP field have been conducted within a single country, providing limited insights into cross-country variations (Eliwa et al., 2021; Kabir Hassan et al., 2021; Sepulveda-Alzate et al., 2021; Buallay et al., 2021; Miralles-Quiros et al., 2019). Future research should emphasize cross-country comparative studies to identify country-specific factors, regulatory frameworks, and institutional contexts that impact ESG and CFP relationship.
Characteristics	✔ The majority of previous research has examined the relationship between ESG and CFP by treating ESG as the independent variable and CFP as the dependent variable. These studies focused on how ESG activities impact firm financial performance, assuming that the causation only flows in one direction. However, this assumption restricts the generalizability of the findings. Therefore, it is crucial for future researchers to investigate the causal relationship between ESG and CFP, considering CFP as the independent variable. ✔ Most of the past research renders us with an inconclusive view with regard to the impact of incorporating ESG issues on the firm's performance. Future researchers should investigate the mechanisms affecting ESG and firm performance by analyzing the mediating and moderating variables that can impact the underlying relationship.
Methodology	✔ The widely used methodology in ESG-CFP research includes regression analysis, review papers and structure equation modelling. Future research can integrate mixed-method approaches for analysing ESG-CFP nexus (Dawadi et al., 2021; Malina et al., 2011; Leech & Onwuegbuzie, 2010). ✔ Future research should prioritize the inclusion of qualitative methods such as interviews, case studies and textual analysis to study the ESG-CFP relationship.

5. Conceptual Framework

In this section, the authors have proposed a conceptual framework in the form of a “moderator mediator model. ” This model will further help researchers in expanding their knowledge on ESG-CFP relationship. The literature analysis conducted in previous sections served as the foundation of this model. As highlighted in Section 3.3 of the analysis, there is a dearth of studies that have considered moderating and mediating variables in analysing the ESG-CFP relationship. Therefore, the authors through this framework aim to bridge the knowledge gap centered around ESG-CFP relationship as presented in Figure 2. The following subsections shed light on several moderating and mediating variables and their impact on ESG-CFP relationship.

5.1 Moderating Variables

Firm Characteristics

Firm features denote a company are peculiar attributes that may impact how it responds to ESG practices and also affect financial performance such as size, industry, ownership structure, leadership style among others (Aguilera-Caracuel, 2021). The previous researches brought out financial slack as one of the key factors (Duque-Grisales & Aguilera-Caracuel, 2021). This is because organizations with more money at their disposal can easily engage in activities related to environmental social governance. Moreover, it was also found out that various ownership types like family business or non-family enterprises; state owned companies vis-à-vis private owned ones have different patterns towards investment into ESG where each would adopt different strategies, structures due to their level risk taking behavior being different from one another (Sun et al., 2023). Furthermore, manager characteristic particularly leaders' styles too play part in determining how efficient a given organization will be at realizing its goals hence connecting them with CFP through ESG (Li et al., 2021). Board diversity, specifically the participation of women and cultural diversity, has also been associated with improved ESG transparency and sustainability participation (Martinez-Ferrero et al., 2020). Overall, these factors may contribute in shaping the relationship between ESG practices and CFP.

Internationalisation

As firms expand worldwide, they need to meet many market needs to succeed in the global market (Duque-Grisales & Aguilar-Caracuel, 2019). Understanding how going global affects the connection between ESG practices and CFP is crucial. It reveals the significance of sustainability practices for firms operating in diverse cultures, laws, and market conditions. When firms go global, they encounter varied cultural norms, laws, and market scenarios. This impacts how effectively ESG practices function. Therefore, examining the impact of going global on the connection between ESG practices and CFP assists firms in diverse cultural, political, and economic settings.

Business Environment

The business world plays a big role in connecting ESG and CFP. Money things like market situations, people's buying power, and money steadiness can change how a company's ESG plans work out. Things like what people care about, what people want, and what shareholders hope for, push the need for good products or services and can change how well businesses doing the ESG stuff do. Getting better tech at work can help do ESG things, make work better, and help how much money a company makes. Rules and laws can give firms a push to do ESG work, which can change their money wins. Things like laws, trade deals, and world stuff, can make rules, help firms sell things, and change what people think about ESG.

5.2 Mediating Variables

Operational Efficiency

How well a company makes money and uses resources is called operational efficiency. According to Atz et al., 2022; Whelan & Atz, 2021, operational efficiency is a key driver for better financial performance and sustainability. Companies that effectively integrate ESG principles into their operations combined with higher levels of operational efficiency are more likely to experience positive financial performance as a result of reduced waste, increased productivity, and enhanced cost-effectiveness.

Innovation

Innovation acts as a crucial mediator between ESG practices and CFP. Companies that embrace innovative strategies to tackle sustainability issues often reap financial rewards. Making the business through the creation of eco-friendly products, usages of sustainable processes and satisfying customer demands can maintain the good performance in the aspect of finance by the saving costs, increasing market share and boosting up of the reputation (Lombardi & Secundo, 2020). Essentially, innovation is the post to flow through which ESG initiatives are transformed into the real financial outcomes that make a visible difference. It ensures that companies consciously perceive that these two matters are intertwined, and not in contrast to each other, since their investment in this front will eventually return in the form of profits.

Risk

Risk encompasses the possibility of unwanted results that are derived from the uncertainties because of the events or conditions. Risk in the context of the connection between ESG factors and CFP is this way: aside from financial, operational and reputational risks (Giese at al, 2019) it involves regulatory risk as well. It might function as a more closely bonding element for this relationship influencing the chain of ESG cuts and firm performance. Companies committing themselves to such issues would be elemented with both positive and negative risks. On the positive side, handling ESG problems allows you to diminish the risk of default by increasing brand reputation, enticing ESG-specialized investors, and boosting asset efficiency. From this stand point of perspective, the argument is that higher ESG ratings serves as a shield for firms against default risk and the performance of the firm is positively enhanced. Alternatively, the association with ESG activities could boost the probability of a default due to concerns about incurring additional / outstanding costs and uncertainties. This statement implies that mistakes in assessing the pros and cons of green ESG projects might increase the possibility of failure and, consequently, the economic consequences of the projects might be questionable. Therefore, risk constituently performs as a wedge that alters the interoperability of ESG practices and CFP. Moreover, the role of the mechanisms and dynamics of this mediation process needs to be furthered studied however understandable they seem.

Stakeholder Engagement

Stakeholder engagement as a critical part of business is a complex task comprising the active involvement of key stakeholders in the process aimed at correct achievement of set targets and environmental problems innovation. On the other side, it provides a conduct of accountability by making organizations to work with stakeholders in the decision-making process, addressing their concerns, and transmitting elaborate actions and performance records to them. Stakeholder engagement is an in-between role that may either facilitate a good link between ESG practice and CPF or create a barrier. The stakeholders with a proactive participation policy can provide useful information on emerging ESG topics that are highly significant to the stakeholders. In response, organizations shall match their own practices. Such alignment may give rise to financial benefits through the favourable influence on image, ditto on investment and risks. The stakeholder engagement thence serves as a medium, this entire process is helping create venues where ESG-factors can find their way to decision-making strategic approaches thus culminating in CFP.

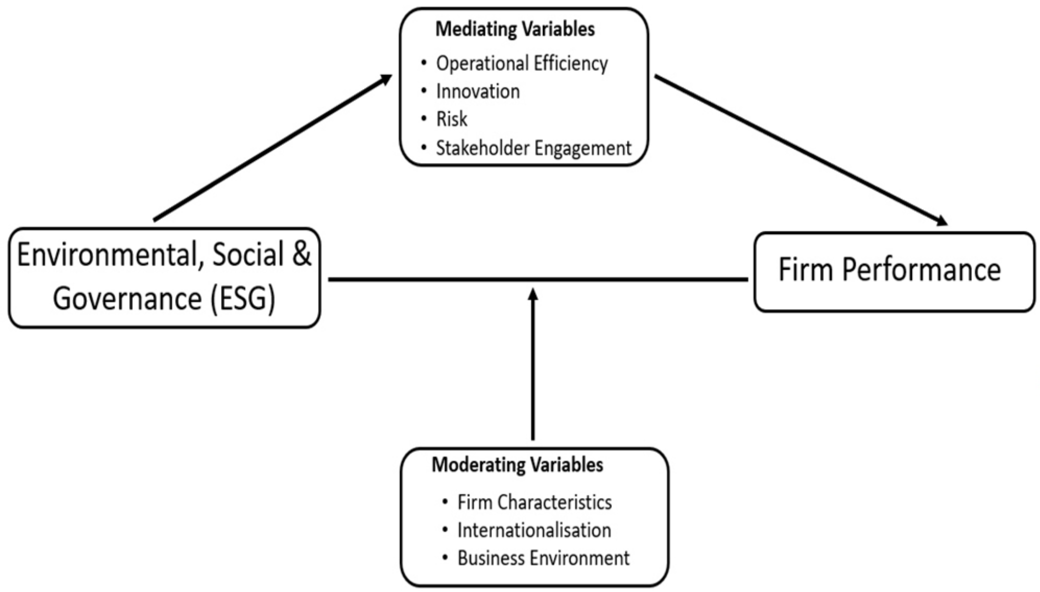

Figure 2. Moderator Mediator Model

6. Conclusion

In order to scrutinize the intricate dynamics of the ESG-CFP relationship, our research undertook a systematic literature review, analyzing 157 articles over an extensive nine-year period (2014-2022). Employing a robust two-step methodology that encompassed systematic article selection using PRISMA criteria and TCCM framework, we unveiled emerging research themes and trends within this domain. Two major theories are identified in ESG-CFP research stream: "Stakeholder theory" and "Legitimacy theory". Furthermore, the review emphasises the need for researchers from emerging countries to make more noteworthy contributions to the ESG-CFP literature. Moreover, the review indicates that the majority of previous research has focused on analysing the influence of ESG activities on CFP, with the underlying premise being that causality cannot flow in the opposite direction. In future, more comprehensive studies need to be undertaken for an in-depth exploration of the impact of CFP on ESG, thus taking CFP as the independent variable. Proposing an integrated framework enriched with moderating and mediating variables, our study purposes to provide a comprehensive analysis of the ESG-CFP relationship, benefiting researchers, academicians, and managers. Additionally, the paper charts future research directions for each TCCM element, anticipating a trajectory of enhanced and higher-quality research in this burgeoning field, evident from the substantial increase in publications since 2015.

7. Implications

7.1 Theoretical implications

This study provides valuable theoretical insights and distinguishes itself as one of the pioneering works in applying the TCCM framework to investigate the link between ESG and CFP. The research extensively examines and analyses crucial theories, contexts, characteristics, and research methods pertinent to the relationship between ESG and CFP. The conceptual framework provided by the authors will help in the effective adoption of ESG practices that will help in the achievement of CFP. The research undertaken in this paper has the potential to motivate more inquiries using the TCCM framework and moderator-mediator paradigm, thereby finding new possibilities for exploration in this rapidly expanding subject.

7.2 Practical Implications

The results of this study hold significant implications for managers, policymakers, investors, and academics. For managers, it is crucial to include ESG principles into their organization's strategies and actively engage with stakeholders. This proactive approach will enable firms to strengthen their long-term sustainability and competitiveness. Policymakers should design policies and structures that favour ESG practices and stimulate research collaboration. Investors should factor in ESG issues when making investment decisions and create investing strategies that prioritize ESG criteria. Academics should persist in investigating the correlation between ESG factors and CFP, particularly in emerging economies. These practical implications offer valuable guidance for well-informed decision-making and strategic development, facilitating the alignment of financial objectives with sustainability goals.

8. Limitations

The study has some limitations. One of the limitations arises from the initial step of conducting a systematic literature review. It is possible that this process introduces subjective biases due to the diverse cognitive structures of different researchers involved, which may result in inconsistencies in the outcomes. In the future, additional statistical techniques, such as meta-analysis, may prove invaluable in addressing this challenge and advancing our comprehension of the subject matter. Second, for the purpose of the research, a total of only 157 papers were considered. In order to carry out a study that is both comprehensive and all-encompassing, subsequent scholars may choose to concentrate on a larger collection of papers. Thirdly, while the authors employed numerous relevant keyword combinations to retrieve research articles from the Web of Science database, there is a possibility that some terms were overlooked, potentially resulting in the omission of pertinent publications. This is a possibility despite the fact that the author used a multitude of relevant keyword combinations. Finally, inaccuracies in data extraction and calculation may have arisen due to the author's potential challenges in accurately and appropriately extracting information and data from the chosen papers. Such errors could have resulted in the inclusion of papers that did not accurately represent the studied population.

Declaration

The article is an original work of authors and the same has not been published earlier in any other publication.

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Mapping the Terrain of Green-HRM: A Comprehensive Bibliometric Analysis Using Scopus Database

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Abstract

Green Human Resource Management is an HRM methodology that goes the extra mile to think outside the box and bring environmental sustainability into the picture regarding human resource activities. Managing human resources sustainably (GHRM) is a new term arising from the growing business movement to protect the environment. However, there are few bibliometric analyses of the development, trends, and collaborative networks in environmentally sustainable HR practices. The lack of this component emphasises the need for the current inquiry. Biblioshiny and VOS Viewer software are used to answer the three research questions. Scopus database containing 357 records from 2000 to 2022 was used. Based on the data, 2019, 2020, 2021, and 2022 were highly productive years for GHRM paper publication. The study uses Scopus Database research documents to create visuals and tables. According to this data, the most referenced work in GHRM was Green Human Resource Management: A Review and Research Agenda, and the most cited author was Yusoff, Yusliza Mohd, from University Malaysia Terengganu in Malaysia. This study shows that service sector research is scarce. However, manufacturing studies are rising. Furthermore, GHRM research differs across developed and developing countries. Hence, cross-cultural and multicultural studies need to be prioritised.

KEYWORDS: Sustainability in HRM, Green-HRM, Green Practices in HR, Bibliometric Analysis, VOS Viewer, and Scopus Database.

1. Introduction

The increasing significance of integrating environmental management and human resource management, also known as "green HRM," which refers to the use of HRM policies to encourage resource sustainability inside corporate structures and organisations in general and environmental sustainability, in particular, is becoming more apparent in today's organisations, which have a heightened awareness of this phenomenon. Sharma & Gupta (2010) and Jabbour & Santos (2008) say this has become crucial since global production and consumption levels have expanded and the environment has suffered. To address this problem, the protection of the environment has emerged as a top concern for society, and to preserve its natural resources for the benefit of future generations, organisations have begun to take the appropriate steps (Pinzone et al., 2016).

Today, the field of environmental sustainability is a programme area with significant momentum using existing HRM techniques, processes and strategies, but in a different context. Organisations have attempted to meet corporate environmental objectives by merging Green HRM practices, such as environmental training programs, with traditional human resource management (Jabbour, 2013). This combination of Green HRM practices has been introduced to reduce their impact on the environment. The interplay between human resources and environmental management systems is a dynamic process that is not well understood; as such, the concept of GHRM has been recently suggested by some authors (Jabbour & Santos, 2008). The notion of GHRM has evolved from an economic to an ecological and sociological viewpoint, dubbed a triple bottom line. As a result, the word GHRM has acquired much popularity in recent years.

Furthermore, instead of focusing on social or economic issues, sustainability strategies inside firms are typically discussed in connection to environmental bottom-line problems (Piwowar-

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Sulej, 2021). This is one reason for this transition (Elkington, 1998). GHRM is a strategy in which Human resource management (HRM) practices reduce the wasteful use of materials and energy and eliminate pollution caused by company activities. As a consequence of industrialisation, the global manufacturing sector is widely held to contribute to several types of environmental degradation in developed and underdeveloped countries. Similarly, Tanova & Bayighomog's (2022) research on the service industry shows essential things about the current state of Green Human Resource Management in service industries, such as the fact that different studies measure green HR practices in different ways. As a result, the global manufacturing sector's managerial activities necessitate a critical evaluation, and as such, include those HRM strategies that strengthen the environmentally friendly utilisation of resources (Bahmani & Farmanesh, 2023; Goel et al., 2022; Zoogah, 2011). As a result, the idea of GHRM calls for the immediate attention of businesses worldwide. These businesses need to develop a competent labour force suitable for the long-term sustainability of the environment, and that can play an essential part in finding solutions to the most pressing environmental problems (Masri & Jaaron, 2017; Sobaih et al., 2020). A broad phrase used to describe administrative Strategies for Human Resources practices, GHRM is crucial to realising the sustainability concept (Kramar, 2014). It also helps the HR department of the organisations to implement environmentally sound policies in the organisations (RENWICK et al., 2012).

Since GHRM is becoming more popular, this bibliometric analysis illuminated the field by addressing the following research problems that have evolved due to its prominence.

RQ1: What is the overall number of Green-HRM-related articles and their global distribution pattern across developed and developing nations?

RQ2: What are the highest journals with the most citations?

RQ3: Who are the most well-known authors and those who have received the most citations within the context of GHRM?

2.0 Literature Review

According to Sharma & Gupta (2010), Singh et al. (2020), Tang et al. (2018), "Green HRM promotes sustainable resource use in businesses via HRM policy. It improves environmental sustainability overall. Green initiatives include knowledge capital preservation and environmentally friendly activities as part of Corporate Social Responsibility". Similarly, Latan et al. (2018) say that GHRM's features and metrics impact workers' lives and productivity and make it more likely that environmental concerns will be considered in their day-to-day work. Renwick et al. (2013a) say that companies are incorporating GHRM principles into their hiring processes by highlighting eco-friendly responsibilities in job postings or asking candidates about their experience with sustainable development in job interviews. They can boost their organisation's image and trustworthiness among prospective workers due to their efforts to recruit high-quality people who share the same values as the firm. However, there are essentially two competing GHRM philosophies. The first philosophy says that GHRM stresses HR practices and human considerations in corporate sustainability. It advises aligning HR systems/ practices with green ideals and principles to increase environmental performance. GHRM also advises researchers, managers, and practitioners to integrate GSCM-GHRM for sustainable supply chains. If they want their sustainability initiatives to succeed, firms should enhance environmental performance, engage people to become involved, and give chances for participation (Jabbour & De Sousa Jabbour, 2016b; Renwick et al., 2013a). According to the Second School of Philosophy, combining HRM functions with environmental management improves environmental performance by changing employee attitudes and behaviour toward the environment (Khattak, 2019; Ottman, 2017). Now, the question arises: why is there a need for Green-HRM? As a consequence of the preceding analysis of the relevant research that was carried out, it is now evident that the main goal is environmental preservation, which will be accomplished by integrating green HR practices with more conventional HR procedures. Now that this has been shown conclusively, there is no longer any doubt that numerous reasons have developed to compel all organisations to integrate human resource management methods with the environment. Employee participation in environmental management (EM) may increase critical outcomes like resource efficiency, waste reduction, and pollution prevention (Renwick et al., 2013a). Improving environmental sustainability results via personnel selection, hiring, training, and assessment, as well as incentive programs for eco-friendly actions (Jabbour & De Sousa Jabbour, 2016b; A. Saeed et al., 2022; B. Bin Saeed et al., 2019; Zaid et al., 2018). Implementing green initiatives via GHRMs can enhance overall performance in several ways, including greater productivity and decreased costs resulting from more efficient resource use, including but not limited to water and energy (Ren et al., 2018). Management of human resources that has an emphasis on protecting the environment (or "green HRM") may help a hotel industry to enhance its environmental performance by fostering a culture of environmental stewardship among its employees (Arasli et al., 2020; Kim et al., 2019a). Businesses may become more environmentally friendly over time via waste reduction programs like these by cutting down on energy usage, switching to renewable energy sources, recycling old materials, and promoting alternative modes of transportation like public transportation and carpooling (Ahmad, 2015). Employee performance by giving them job-related skills and tools that foster a happy workplace that motivates workers to meet firm sustainability objectives (Renwick et al., 2013a).

Although the advantages of GHRM practices are acknowledged, their practical implementation often encounters several obstacles. An important obstacle is the insufficient awareness and comprehension among employees and management regarding the significance and advantages of GHRM. Gill Mandip (2012) states that numerous organisations face difficulties teaching their workers about the strategic importance of incorporating environmental sustainability into HR procedures. A lack of understanding of the topic can lead to resistance or indifference to "green" initiatives. In addition, resistance may be due to other causes. Workers can show resistance to new rules and changes in operation or working methods that appear disruptive or uncalled for. Renwick et al. (2013b) Stress the need to use good change management policies, which may involve communication, training, and allowing employees to participate in designing and implementing GHRM policies to address this challenge. The cost of implementing GHRM policies could be high, at least in the short run. According to the research by Jackson et al. (2011), the upfront costs associated with developing such training programs, green technologies, and sustainable infrastructure could be significant. Though these upfront costs may be subsequently balanced against future cost savings and efficiency gains, they may dissuade too many businesses in their initial financial struggles. Also, measuring the performance of GHRM programs presents yet another challenge. Many organisations lack the tools and metrics to measure and view it in human resource eco-friendly policy. Jabbour & Santos (2008) focus on the need for a proper measurement framework to capture the exact outcome of performance about organisational and environmental.

In order to overcome these difficulties, there are many ways that can help ensure the effective adoption of GHRM practices. The successful deployment of GHRM practices relies heavily on the backing of top management. The integration of environmental sustainability into the organisational culture and the allocation of essential resources can be effectively achieved through the commitment of senior executives (Daily & Huang, 2001). When senior leadership openly endorses environmentally friendly projects, it effectively communicates to all staff members the significance of these endeavours. Engaging employees in the process of developing and implementing GHRM practices helps increase their acceptance and decrease their opposition to change. Ahmad (2015) proposes that implementing participatory methods, such as establishing green teams or committees, can enhance the empowerment of employees and cultivate a feeling of ownership towards sustainability projects. Training and development programs are essential to gaining the relevant knowledge and skills required to effectively implement GHRM principles. 'An in-depth training programme should be implemented to sensitise the employees on matters of the environment and equip them with skills to include sustainable practices as part of their daily work activities' (Renwick et al., 2013b). Rewards and awards for eco-friendly behaviours could motivate employees to adopt sustainable activities. Offering financial incentives, recognition programs, and career development opportunities could all encourage employees to act in an environmentally responsible manner that supports enhanced organisational sustainability performance (Jackson et al., 2011). Two-way communication and a continuing education process will ensure that progress is maintained and GHRM projects succeed. Regular updates, workshops, and awareness campaigns will go a long way in sensitising employees on the sustainability goals of an organisation and their specific roles in realising the same (Daily & Huang, 2001). In the long run, implementation of continuous improvement practices can help firms improve and fine-tune GHRM practices with time. Regular evaluation and feedback procedures need to be established and maintained to ensure that GHRM initiatives remain efficient and connected with the changing sustainability goals of the organisation. There has to be flexibility in absorbing and implementing newer ideas as well as organisational challenges and benefits from implementing Green Human Resource Management strategies (Jabbour & Santos, 2008). Implementation of strategies which involve active assistance from the top-level executive, the involvement of the employees, training programs, incentives, and continuous improvements will help the organisation to overcome barriers such as ignorance, resistance to change, and financial constraints and smoothen the process of system integration. In dealing with the obstacles and the application of effective strategies, organisations can improve upon their ecological performance and contribute to the larger area of sustainability goals.

3.0 Research Gap

Bibliometric analysis has played a more significant role in research regarding Human Resource Management, such as a systematic approach to the study of academic environment. According to Smith & Bititci (2017), complex authorship patterns in HRM research reveal essential author and collaboration networks. The study by Kim et al. (2019b) intended to explore the global trends in HRM research, especially regional distribution and international collaboration. The research is based on previous studies because although we have gained much knowledge about the general field of HRM, there still needs to be more research conducted about Green HRM (Hoye et al., 2018; Pamela Jo Stewart, 2017). Bibliometric studies are required as they contain information related to assessing progression, patterns, and collaborative links in environmentally friendly human resources activities. This knowledge void justifies doing the present study with the title "Mapping the Terrain of Green-HRM: A Comprehensive Bibliometric Analysis Using Scopus Database." Using the extensive coverage of the Scopus database for existing Green HRM literature, it recognises this gap. The analysis is thus intended to give a comprehensive overview of the present state of research within Green HRM. The findings of the review would help in guiding further research and development towards sustainable HR practices both in academia and industry.

4.0 Methodology

The progression of GHRM research has been shown using a bibliometric analytic technique (Dolhey, 2019). Bibliometric analysis refers to a procedure in which statistical approaches highlight the publishing patterns and trends in a particular field of study (Bouyssou & Marchant, 2011; De Bakker et al., 2016). Bibliometric analysis allows the reader to learn from historical patterns throughout the topic, shed light on the specific subject's developments, and open the door for future study because this technique is novel and unique compared to traditional conceptual model construction (Valérie & Pierre, 2010).

4.1. Choice of the Database

This research is predicated on the screened papers listed in the Scopus database. Papers indexed in Scopus ensure credibility because of its more comprehensive coverage worldwide for quality journals. Article titles, abstracts, and keywords have been identified for bibliometric analysis on GHRM. We used "Green HRM" AND "Green Human Resource Management" OR "Green HRM Practices" OR "Sustainable HRM" AND "Environmental Sustainability" OR "Green Innovation" OR Environmental Performance" OR "Sustainable Performance" as a keyword to identify the documents on the Scopus database. A total of 357 documents consisting of 298 articles, 21 conference papers, 17 reviews, 14 book chapters, 2 books, 1 data study, 1 editorial, 1 conference paper, 1 letter, and 1 note were considered relevant from 2000 to 2022 and exported to an Excel file. Selected documents for the bibliometric analysis have been rigorously analysed.

4.2. Search Area

The focal point of this bibliometric study is solely on papers connected to environmentally responsible management of human resources. We ignored similar subjects, including management in leadership, strategy, change, innovation, sustainability, and knowledge. We only paid attention to research that specifically focused on the area of HR management that emphasised environmental responsibility. Studies that did not specifically address the "Green HRM" or "Green Human Resource Management" were also disregarded. For example, we omitted studies that used "Green" as a buzzword without identifying a Green HRM approach.

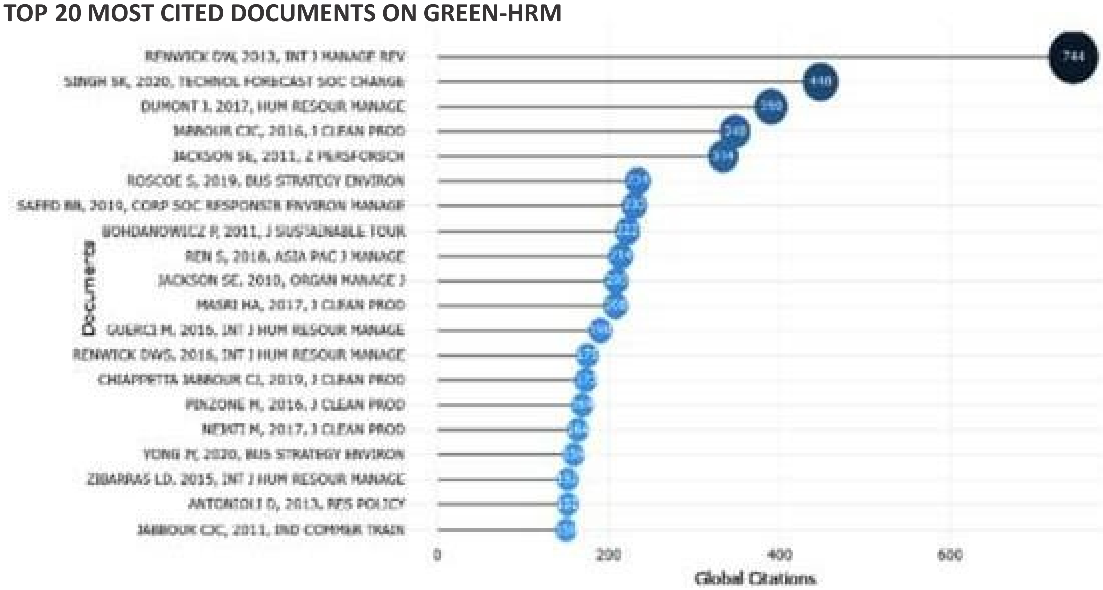
4.3. Measurement

For the measurement, Biblioshiny R packages and VOS Viewer 1.6.18 were used. The data is presented visually using VOS Viewer and bibliometric analysis methods, making it easy to understand for non-coders. Using this open-source software is simple. The automated workflow functionality of this program is helpful for networking and mapping jobs (Helena et al., 1919). It is possible to acquire cluster analysis, as well as co-authorship maps and nation analyses, journal visualisation network maps, and a great deal of other information, with the assistance of the Biblioshiny R packages and VOS Viewer software (Nerur et al., 2008).

5.0 Results

The concluding findings of this research endeavour have been given in the form of the goals outlined above.

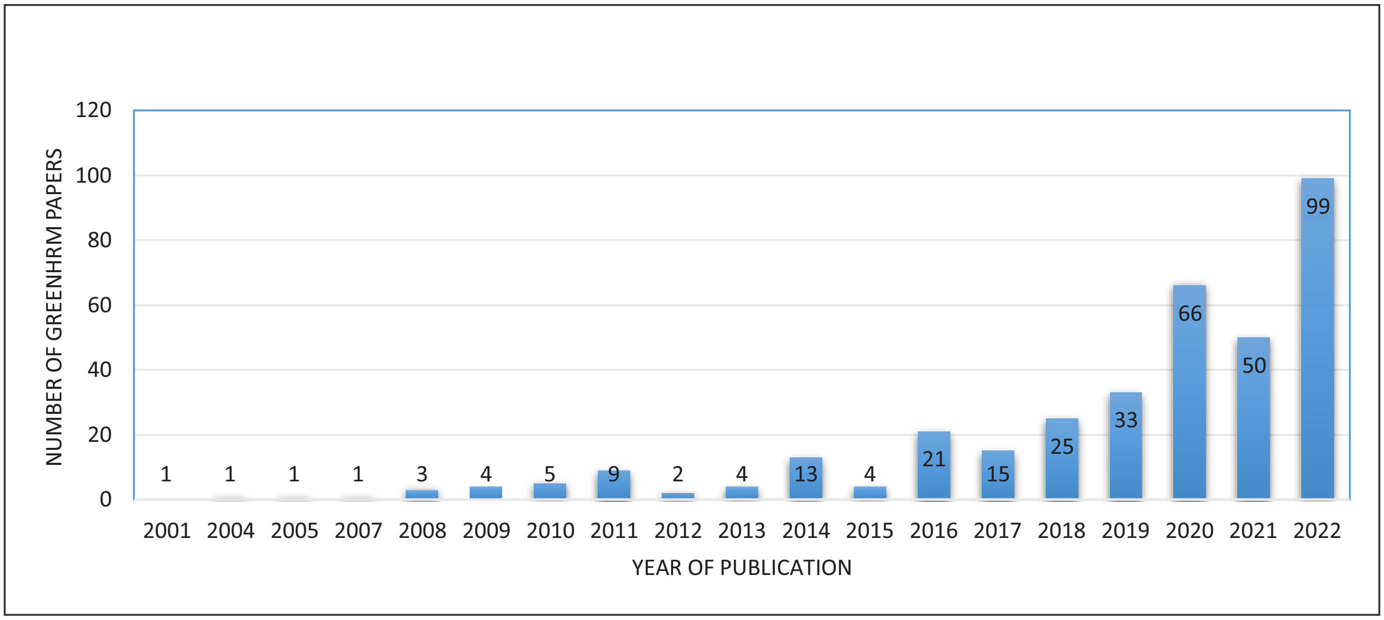
5.1. Figure 1: TOP 20 MOST CITED DOCUMENTS ON GREEN-HRM



Source: *Biblioshiny*

The pioneering authors in the area of GHRM are shown in Figure 1. These authors have received the most citations. According to the Scopus database, Renwick is now the most cited author. The primary contribution he has made to the sector above is linking the conventional HRM methods to eco-friendliness (Jackson et al., 2011; Renwick et al., 2013b; RENWICK et al., 2012). S.K. Singh, Dumont, and Jabbour are the most influential authors in GHRM after Renwick. To promote environmental sustainability, each of these authors has emphasised the importance of HRM practices that harmonise with the surrounding ecosystem (Dumont et al., 2017; Jabbour & De Sousa Jabbour, 2016a; Singh et al., 2020).

5.2. Figure 2: Yearly Publishing Pattern



Source: *Scopus database*

Figure 2 represents exciting information regarding the trend of yearly research paper publications in GHRM. As per the figure, it can be observed that in the initial time from 2001, there was only one study conducted in the field of GHRM, but after the period from 2008, it started increasing, and now it has gained too much importance in 2022, 2020, 2021, and 2019. Out of 357 papers, 298 papers have been published in these years. It shows concern for the environment. Moreover, this increasing pattern still shows that GHRM is in the developing stage, and the maturity phase has yet to come in the area of GHRM.

5.3. Table 1: TOP MOST JOURNALS

SERIAL NUMBER	JOURNAL NAME	DOCUMENTS	CITATIONS
1	Journal of Cleaner Production	17	1646
2	International Journal of Human Resource Management	12	1092
3	International Journal of Management Reviews	1	769
4	Corporate Social Responsibility and Environmental Management	6	575
5	Business Strategy and the Environment	4	514
6	Technological Forecasting and Social Change	1	477

7	Human Resource Management	3	447
8	International Journal of Manpower	16	418
9	Sustainability (Switzerland)	19	352
10	Journal of Sustainable Tourism	3	226
11	Asia Pacific Journal of Management	1	225
12	Organisation Management Journal	1	214
13	Industrial and Commercial Training	2	208
14	Benchmarking	4	207
15	Research Policy	1	155
16	Journal of Business Ethics	3	138
17	Resources, Conservation, and Recycling	1	133
18	Asia Pacific Journal of Human Resources	2	117
19	International Journal of Production Economics	1	108
20	Food Chemistry	1	99
21	Microbiology	1	97
22	Journal of Management Development	2	96
23	Global Business Review	1	94

This was the second purpose of our study, and Table 1 displays the journals that publish GHRM articles with the most significant citation impact factor. These leading GHRM papers publishing journals are responsible for publishing 103 GHRM-related documents, equivalent to 28 per cent of the total 357 GHRM-related articles. The general distribution of the research articles in these journals provides information on the academic influence of GHRM. The rankings of each journal, as determined by citation impact, are shown in Table 1. According to the widely trusted Scopus database, most papers on GHRM have been published in business, management, and accounting. The fields of environmental science, social sciences, and engineering follow this. Information about these topics may be found in various periodicals published patterns of GHRM papers. Apart from this, the Journal of Cleaner Production ranks higher among the same category of other journals than the number of citations. Its publication pattern and citation impact demonstrate that the critical viewpoint of GHRM is toward environmental conservation and sustainability through the effective use of natural resources.

5.2. Figure 2: Yearly Publishing Pattern

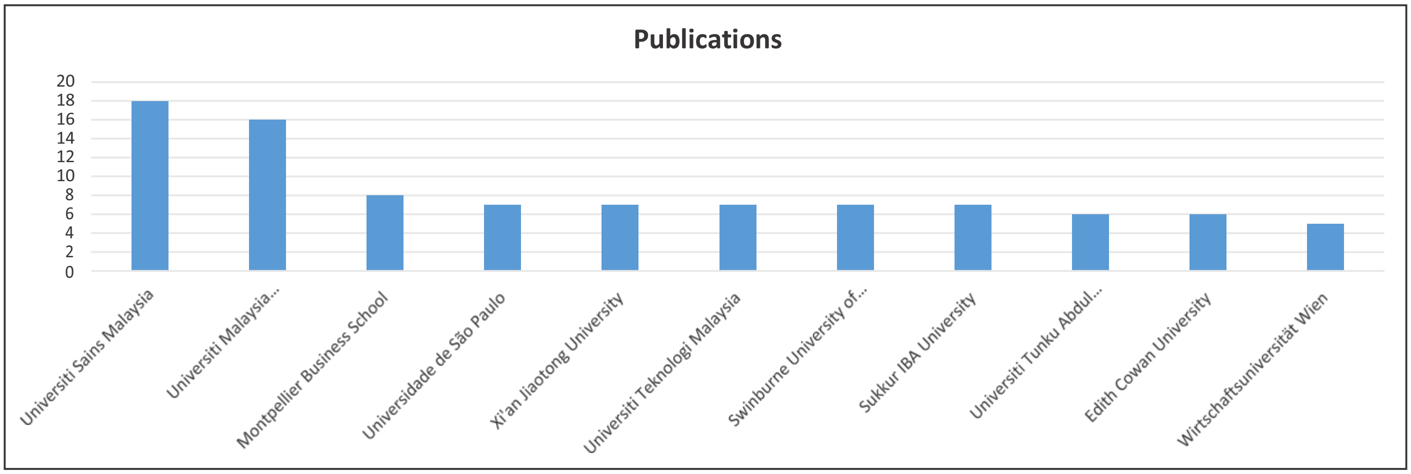
SR. NO.	KEYWORDS	NUMBER OF OCCURRENCES
1	Green HRM	72
2	Green Human Resource Management	71
3	Energy efficiency	36
4	Environmental Performance	35
5	Environmental Management	24
6	HRM	22

7	Human Resource Management	21
8	GHRM	16
9	Environmental Sustainability	15
10	Green HRM Practices	13
11	Green Innovation	12
12	Sustainable HRM	12
13	Eco-HR (GHRM)	11
14	Malaysia	11
15	Eco-Creativity	10

Source: *Authors Compilation*

Table 2 provides the data for several keywords identified as being used over three times in a spectrum of research articles in the Scopus database from 2000 to 2022. This study's findings provide empirical support regarding the number of times these words have been used within the literature on environmental human resource management and sustainable employment. The analysis has presented numerous research concerns and recurring themes identified by the researchers. This paper used VOS Viewer software to illustrate the proximity of keywords through their distance representation (Laengle et al., 2018). The shorter the gap between particular terms, the greater their association (Dolhey, 2019).

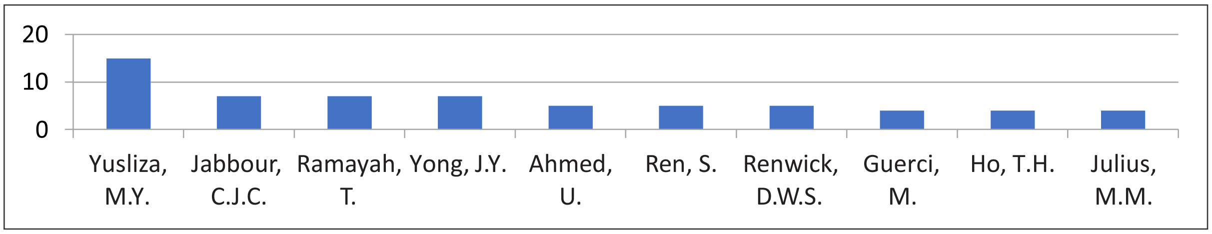
5.5. Figure 3: Top Universities in Publications on Green HRM



Source: *Scopus database*

Several prestigious academic institutions have published articles on Green-HRM, and they are shown in Figure 3. Only institutions with three or more publications were included in this analysis. Professor Yusoff, Yusliza Mohd, has written extensively on sustainable HRM, as seen by the many citations to her work in Figure 4. In this list, University Sains Malaysia stands at the top with an impressive 18 publications. After the University of Montpellier in France, University Malaysia Terengganu in Malaysia comes in as number two with sixteen papers. Each of the following academic organisations has published seven total papers: The following six publications have been published by researchers from the University of So Paulo in Brazil, Xi'an Jiaotong University in Shaanxi, China, University Technology Malaysia, Swinburne University of Technology in Australia, Sukkur IBA University in Pakistan, and two other universities: Edith Cowan University in Australia, and University Tunku Abdul Rahman in Malaysia and Wirtschafts University Wien, Austria with five papers.

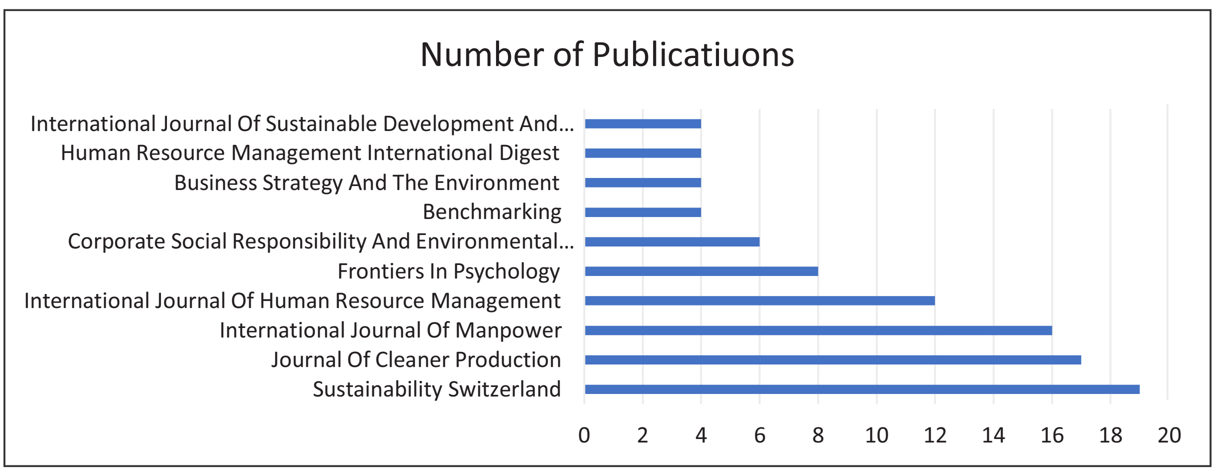
5.6. Figure 4: Most Prolific Authors



Source: *Scopus database*

Figure 4 provides information on the various authors who have contributed to the publication of more than three articles on GHRM. These authors have all played magnificent acts in this field. According to our research, the author Yusoff, Yusliza Mohd from the University Malaysia Terengganu in Terengganu, Malaysia, is the most well-known and influential person in the relevant subject. Sustainability, environmental management systems, eco-management, and audit schemes are the topics that most interest her in terms of study. The authors Ramayah, T. and Chiappetta Jabbour, and Charbel Jose from University Sains Malaysia in Minden, Malaysia, and Emlyon Business School in Ecully, France, are considered to be the second most influential people in the field of Green-HRM. Both of these institutions are located in Malaysia and France. Yong Jing Yi is the third influential author who has also written seven articles on the relevant subject. He is affiliated with Taylor's University Malaysia. With five different works to his name, Ahmed Umair of Arab Open University in Manama, Bahrain, stands as the fourth author who has had the most impact in the field. In addition, three authors have each published four papers on GHRM. These authors are Guerci, Marco (UniversitàdegliStudi Milano, Milan, Italy), Ho, Thu Hau (Northwest University, Xi'an, China), and Julius, Mercy Muthoni (Teachers Service Commission, Nairobi, Kenya) Shuang Ren (Queen's Management School, Belfast, United Kingdom) and Renwick, Douglas William Scott (Nottingham Trent University, Nottingham, United Kingdom) are the two authors who have published five papers on GHRM.

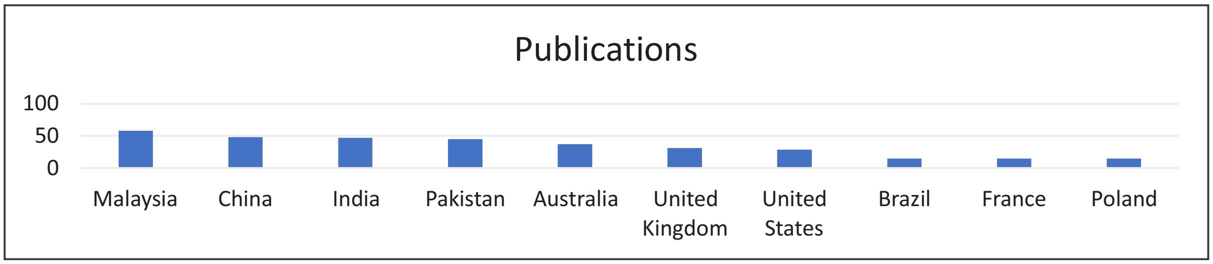
5.7. Figure 5: Top 10 Journals in Publication



Source: *Scopus database*

The information on the leading journals that have published articles on environmentally friendly human resource management is shown in Figure 5. During the years 2000 to 2022, the publishing companies MDPI's Sustainability Switzerland and Elsevier's Journal of Cleaner Production produced 19 and 17 research publications, respectively. In contrast, Elsevier's Journal of Cleaner Production, published by Elsevier, has received 1646 citations, while the Sustainability Swiss publication published by MDPI has received 352 citations, as seen in Table 1. Considering the large number of references received by this publication demonstrates its widespread appeal among academics. Additionally, the International Journal of Manpower, which is published by Emerald Publishing, has a total of 16 articles that have received a total of 418 citations. The International Journal of HRM follows this. Taylor & Francis is the publisher of this journal, which has a total of 12 articles that have received a total of 1092 citations. Frontiers in Psychology, published by Frontiers Media SA, has 8 articles, and the CSR Journal of EM, published by Wiley-Blackwell, has published 6 articles on Green-HRM. In addition, each of the following four journals have published four articles on green human resource management: Benchmarking, which Emerald Publishing publishes; Business Strategy and the Environment, which Wiley-Blackwell publishes; Human Resource Management International Digest, which Emerald Publishing publishes; and The International Information and Engineering Technology Association publishes a journal called International Journal of Sustainable Development and Planning.

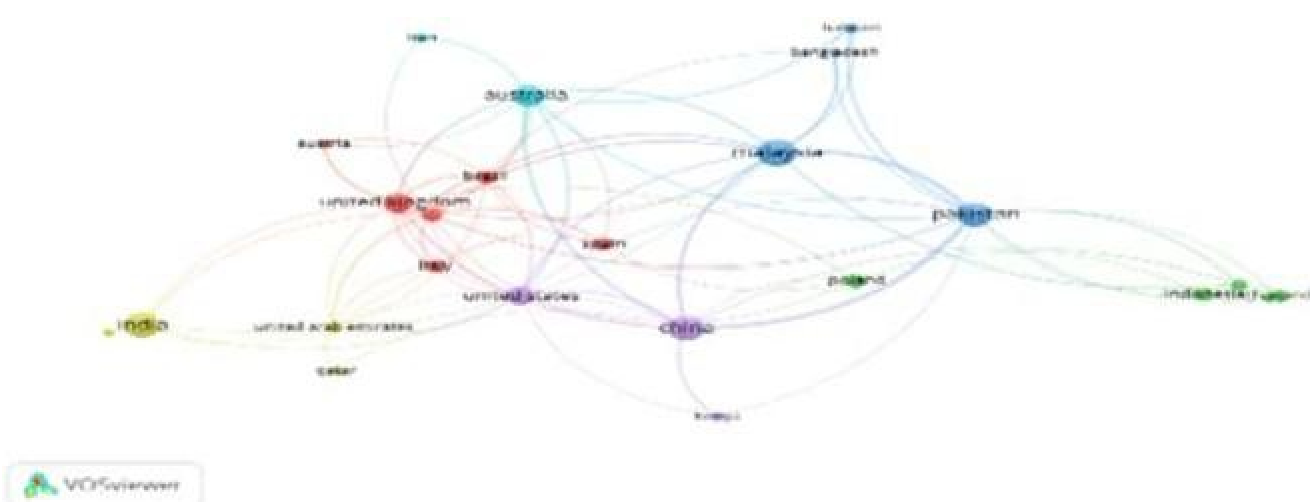
5.8. Figure 6: Top 10 Countries in Publication



Source: *Scopus database*

The information on publishing the 357 articles is shown in Figure 6, organised according to the authors' countries. The study of the number of publishing nations generated the most prominent countries based on the publication pattern with the authors' countries from 2000 to 2022. With 58 publications, Malaysia takes the top spot on the list, followed by China with 48 publications, India with 47, and Pakistan with 45. There were 37 articles published in Australia, 29 papers published in the United Kingdom, 31 papers published in the United States, and 15 papers published each in Brazil, France, and Poland. Our study shows that the top five nations have been responsible for publishing 65 per cent of GHRM publications.

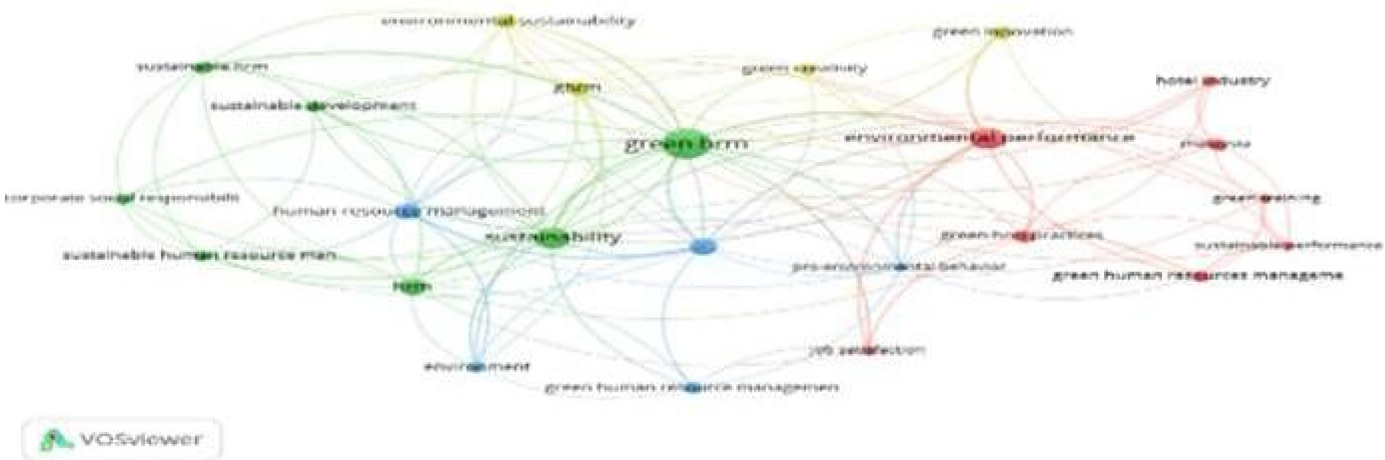
5.9. Figure 7: Co-authorship Country Collaboration Map



Source: *VOS Viewer*

The breakdown of co-authorship per nation is seen in Figure 7. This assessment aimed to understand better which nations have had a record number of international author collaborations among each other. In all, 75 nations were found in the collection of GHRM. According to the VOS Viewer software findings, out of 75 nations, only 24 were associated with one another regarding co-authorship. Six clusters were formed: cluster-1 (Australia, Brazil, France, Italy, Spain, United Kingdom); cluster-2 (Indonesia, Poland, Saudi Arabia, Taiwan, Thailand); cluster-3 (Bahrain, Bangladesh, Malaysia, Pakistan); cluster-4 (India, Qatar, Turkey, United Arab Emirates); cluster -5 (China, Kenya, United States); cluster-6 (Iran).

5.10. Figure 8: Keywords Occurrence Map



Source: *VOS Viewer*

In Figure 8, a map of the occurrence of keywords has been shown. This map showed how the keywords are related to one another and how they are associated with various lines. This keyword occurrence map illustrates how the lines of keywords in the data set are related.

6.0 Discussion and Conclusion

According to Scopus, a collection of scientific research, this bibliometric study illuminates the GHRM literature published between 2000 and 2022. To assess the publication trend and hot issues on GHRM, our study gives a detailed analysis of past studies. Consequently, this bibliometric study provides a way for academics interested in delving more into environmentally friendly personnel administration. The existing literature suggests that GHRM is still in its formative stages, and many studies still need to be done in this area. In addition, this research offers a wealth of information on previous studies, the current landscape, and prospective developments in this area, which may be beneficial when developing conceptual and theoretical frameworks. In addition, the yearly publishing breakthroughs in the field of environmentally aware organisational resources were brought to light by our investigation. These patterns or trends indicate that 2022, 2020, 2021, and 2019 were the most significant years for publishing papers. In addition, it identified the GHRM publications that were mentioned the most, as well as notable authors and prominent institutions that were actively engaged in GHRM research. In addition, this study included an analysis of the incidence of keywords, an analysis of co-authorship, and an inter-country network analysis map to bring about a holistic picture of all the research carried out about HR practices that minimise environmental impact. Our studies, by highlighting critical information from relevant publications, pave the way for academics interested in joining the subject of green human resource management. In addition, they provide information on prominent authors and institutions in this area. Finally, the keyword occurrence analysis network map and table display terms and phrases often used by scholars studying green HRM.

The most-cited research publication on green HRM found that GHRM strategies must be implemented effectively and to their full potential. As a result, this reduces businesses' ability to progress in improving environmental initiatives (Renwick et al., 2013c). In addition, Yusoff, Yusliza Mohd from the University Malaysia Terengganu in Terengganu, Malaysia, is the most prominent author in this field. However, the University Sains Malaysia is the most significant publication institution on GHRM. Malaysia has become a significant player in global co-authorship networks with the most published articles.

Furthermore, the paper publishing journals with the most significant number of papers were the Cleaner Production Journal by Elsevier and MDPI Sustainability (Switzerland). This research also emphasised the presence of terms such as 'green HRM,' 'green HR management," energy efficiency,' and 'assessment of the performance,' which featured more than 30 times in the 352 papers that focused on GHRM. In addition, this research splits the map of inter-country co-authorship analysis into six clusters, with Indonesia, Poland, Saudi Arabia, Taiwan, and Thailand emerging as the most robust clusters and Iran emerging as the cluster with the fewest authors.

Green recruiting, green resource effectiveness, green empowerment, environmental sustainability, and management are just a few of the hot themes that this research uncovered as needing to be connected with GHRM.

While research on environmentally responsible HR planning is spread throughout the business, management, and accounting sectors, GHRM primarily focuses on environmental preservation and sustainability. As a result, publications that concentrate on environmental protection, such as Cleaner Production Journal, Sustainability (Switzerland), Resources, Preservation of Resources, and Recycling, should have the most remarkable impact citations.

This bibliometric analysis reveals that the area of GHRM is young in the current era, and there is still a massive need for further research. This is because much research has been conducted in the industrial sector. However, just a few studies on GHRM exist in the service industries because of the sparse use of natural resources due to their low predominance in the manufacturing sector, which can be the reason for the small number of studies conducted in the service industries. More and more GHRM studies need to be tackled if the service industry is going to progress.

7.0 Limitations and Scope for Future Research

During the last several years, GHRM has gained meticulous expansion worldwide, which has resulted in a significant influence. In conclusion, GHRM is a subject in development and has excellent value for the business world and the academic community. This bibliometric study discovered that very few studies have been conducted in the service sector. On the other hand, an increasing number of studies have been centred on the manufacturing sector. Furthermore, it was discovered that there is a difference in the research on GHRM between developed and developing countries; as a result, the emphasis should be placed on cross-cultural and multicultural studies.

As it is common knowledge that the findings of any study are susceptible to several caveats, it follows that no research can be devoid of restrictions. This lays a path and a framework for future investigation into a particular field. The first limitation of this study is that it is solely based on the Scopus database. Although Scopus database is a widely trusted database, and it does consider high-quality journals from around the world, many other platforms also cover high-quality journal databases, like Web of Science, Google Scholar, and Springer; so, the researchers need to concentrate their efforts on these platforms as well to provide more recent knowledge to this area. This study does not take into account any of these other platforms. Second, while this research was conducted with a particular emphasis on environmentally friendly HR management, it is possible to extrapolate the findings to apply to other contexts.

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Resilient Bottom Line: Evaluating Financial Performance through Sustainable Practices in Healthcare

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Abstract

The purpose of this study is to determine the association between ESG and financial performance (FP) of the companies operating in healthcare sector. The sample for this study comprises 13 healthcare companies listed in Nifty 500 for a period of 9 years (2013-2021). Data has been collected through the Reuters Refinitiv database and CMIE Prowess. The findings of the study show the mixed outcomes. While the effect of ESG practices on the accounting performance was found insignificant, its effect on market performance was negatively significant. The results implies that the ESG benefits cannot occur in the short-run, they may need some time to materialize for the company and may get reflected in the company's future performance.

Keywords: *ESG, Environmental, Social, and Governance, Sustainability, Healthcare Industry, Financial performance, India*

1. Introduction

Businesses organize their sustainability initiatives based on three fundamental pillars: Environmental, Social, and Governance (ESG). The Environmental facet revolves around a company's ecological footprint and commitment to preserving the environment. Social considerations encompass how a company nurtures relationships with stakeholders and adds value to society. Governance is concerned with organizational policies that mirror management principles and practices, ensuring transparent and effective leadership. Sustainability has risen to prominence as a critical concern in recent years. The Global Risk Report 2022 from the World Economic Forum identified societal and environmental risks among the top 10 most pressing issues, presenting significant short, medium, and long-term threats (World Economic Forum, 2022). The global COVID-19 pandemic further underscored vulnerabilities in business operations, particularly in the social dimensions. Companies are scrutinized closely, as every action affects their reputation and market valuation. Embracing an ESG framework allows businesses to identify and mitigate environmental and social risks while exploring emerging opportunities for long-term value creation (Ernst & Young, 2021).

ESG initiatives in India have garnered significant attention across various sectors, particularly during the COVID-19 pandemic (Jain, 2021). The regulatory framework for ESG reporting has seen notable developments in the country. The Securities Exchange and Board of India (SEBI) mandated submitting a Business Responsibility Report (BRR) focusing on ESG aspects for the top 100 companies in 2012. This requirement was later extended to encompass the top 1000 companies (SEBI, 2019). In 2020, amidst the pandemic, SEBI introduced a new reporting format for ESG called the "Business Responsibility and Sustainability Report" (BRSR), which was set to replace the existing BRR format (MCA, 2020). According to a Care Edge (2023) report, ESG reporting by Indian corporates has witnessed significant growth, increasing by 160% since 2020.

The healthcare industry has emerged as one of India's most significant sectors, both in terms of financial revenue and employment opportunities. The healthcare domain in India is witnessing substantial expansion, drawing the interest of diverse investment opportunities for investors. The Government of India is actively implementing several initiatives to instill confidence among stakeholders in the healthcare sector. In the current budget, the government has increased overall healthcare expenditure from Rs. 79, 221 crores in 2023-24 to Rs. 90, 171 crores in 2024-25 (Healthcare radius, 2024). Healthcare systems contribute approximately 5% of total carbon emissions globally (KPMG, 2024). The substantial carbon emissions attributed to the healthcare sector stem largely from

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its extensive operations, which are running continuously and require substantial energy consumption. Moreover, healthcare establishments produce notable volumes of medical, pharmaceutical, and hazardous waste, improper handling of which can lead to environmental degradation.

This research aims to investigate how the ESG performance of healthcare companies influences their financial performance. To achieve this, we have utilized Thomson Reuters ESG scores and assessed their impact on both Return on Equity (ROE) and the firm's share price.

2. Literature Review

The existing body of literature on the relationship between ESG and financial performance is extensive, yet findings remain inconclusive. While some researchers have observed a positive correlation (Alsayegh et al., 2020; Mohammad & Wasiuzzaman, 2021), others have reported a negative association (Giuli & Kostovetsky, 2014; Hasan et al., 2021), or found the relationship to be insignificant (Servaes & Tamayo, 2013). Additionally, some studies have suggested a U-shaped relationship (Barnett & Salomon, 2012; Maqbool & Bakr, 2019). Several research studies have explored the link between corporate performance and social responsibility within the Indian context, but the outcomes are diverse (Hasan et al., 2021; Jha & Rangarajan, 2020). Hasan et al. (2021) investigated the relationship between ESG and financial performance within the healthcare sector, revealing a detrimental impact of ESG on the firm's financial performance. In their study, Agarwal et al. (2023) analyzed the relationship between ESG and financial performance in the healthcare sector, discovering a notable adverse correlation between ESG and financial performance as gauged by the market-to-book value ratio.

The Stakeholder Theory posits a strong link between ESG (Environmental, Social, and Governance) practices and Financial Performance (FP), advocating for companies to consider a broader array of interests beyond just shareholders. Improved ESG performance correlates with boosted employee morale, heightened productivity, and reduced regulatory costs (Freeman et al., 2010). Examining European firms, (Matos et al., 2020) found that those with superior ESG ratings tend to maintain more stable dividend payouts and profit sharing, all while preserving long-term growth potential. Moreover, companies integrating ESG factors into their strategies demonstrate lower stock volatility and achieve higher returns compared to competitors. The negative ESG-FP link can be attributed to the Shareholder Theory, which posits that ESG investments may undercut profitability (M. Friedman, 1962). (B. M. Friedman, 1970) further argues that executives may exploit resources meant for shareholders under the guise of socially responsible actions for personal gain. The insignificance of the ESG-FP relationship may stem from delays in realizing ESG benefits, which may emerge gradually over time (Behl et al., 2021; Sachin & Rajesh, 2021).

A significant portion of existing literature has delved into the relationship between ESG and financial performance on a global (Abdi et al., 2022) or within specific nations (Behl et al., 2021; Hichri & Ltifi, 2021). However, there is a growing need for research that narrows its focus to specific industries or selected sectors (Jain & Tripathi, 2023). In this context, the current investigation is centered on the healthcare sector. The study proposes following hypotheses concerning ESG scores and firm value. This research article explores financial performance through a dual lens, utilizing both accounting and marketing metrics as evaluative measures.

H1: ESG has a significant effect on the firm’s financial performance.

3. Research Methodology

This study aims to assess the impact of ESG practices on the financial performance of firms in the healthcare sector. The study's initial sample comprises healthcare companies listed in Nifty 500. The measurement and source of variables is mentioned in Table 1. Data for ESG indicators and financial variables has been collected from the Thomson Reuters Refinitiv Eikon database and Prowess respectively. Further, the study included only those companies for which both ESG data and financial variables were accessible. The final sample comprises that data for the 13 companies for a time period of 9 years (2013-2021), forming the unbalanced short panel data of 93 firm-year observations. As the Business Responsibility Report (BRR), which is based on ESG principles, was introduced in 2012 by the top 100 companies, the analysis encompasses data spanning from 2013 to 2021.

Key Variables

Dependent Variables			
Variables (Acronym)	**Measures**	**Source**	**Relevant Literature**
Return on Equity (ROE)	Net Income/ Total Assets	Prowess	(Albitar et al., 2020)
Share Price of the firm (SP)	Share price close as of the fiscal period end date	Prowess	(Qureshi et al., 2020)

Independent Variable			
ESG Score (ESG)	ESG Combined Score	Thomson Reuters	(Chams et al., 2021)
Control Variables			
Firm age (Age)	Logarithm of difference between date of incorporation and current year	Prowess	(Jha & Rangarajan, 2020)
Firm size (Size)	Logarithm of Total assets	Prowess	(Abdi et al., 2022)
Leverage	Total Debt/ Total Assets	Prowess	(Abdi et al., 2022)
Market Value to Book Value (MVBV)	Share's Market Value to Book Value	Prowess	(Kweh et al., 2017)

Table 1: Key Variables
Source: *Authors*

4.Regression Equation

$$Y_{it} = \beta_0 + \beta_1 \sum_{i=0}^{n} ESG_{it} + \beta_2 \sum_{i=0}^{n} Age_{it} + \beta_3 \sum_{i=0}^{n} Size_{it} + \beta_4 \sum_{i=0}^{n} Leverage_{it} + \beta_5 \sum_{i=0}^{n} MVBV_{it}\ \mu_{it} \quad (1)$$

Where;

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the parameters or coefficients of the explanatory variables.

Y_{it} = Financial Performance (FP) measured by ROE and SP.

ROE_{it} = Return on assets of firm i at time t;

SP_{it} = Share price of firm i at time t;

ESG_{it} = ESG score of firm i at time t;

Age_{it}= Firm age of firm i at time t;

$Size_{it}$ = Firm size of firm i at time t;

$Leverage_{it}$ = Leverage of firm i at time t;

$MVBV_{it}$ = Market value to book value of firm i at time t.

5.Results

5.1 Descriptive Statistics and Correlation Analysis

The descriptive statistics of all the variables are provided in Table 2. The mean and median value of ESG scores are found to be 44.2 and 42.2 respectively. There is a wide gap between the minimum and maximum value of ESG scores, which shows that few firms publish less information on ESG parameters than other firms.

Figure 1 illustrates the ESG trend analysis over the years. The assessment of ESG reveals an upward trend, signifying a positive trajectory in improving sustainability practices and reporting among Indian firms.

Variable	Mean	Median	S.D.	Min	Max
ESG	44.2	42.2	15.4	14.7	85.1
ROE	12.4	11.5	12.2	-36.9	39.3
SP	1215	795	1056	172.7	4516
Leverage	0.355	0.260	0.448	0.000	2.38
MVBV	4.99	4.42	2.98	0.440	19.2
Age	3.49	3.47	0.427	2.56	4.44
Size	11.8	11.9	0.607	10.6	13.0

Table 2: Descriptive Statistics
Source: *Authors*

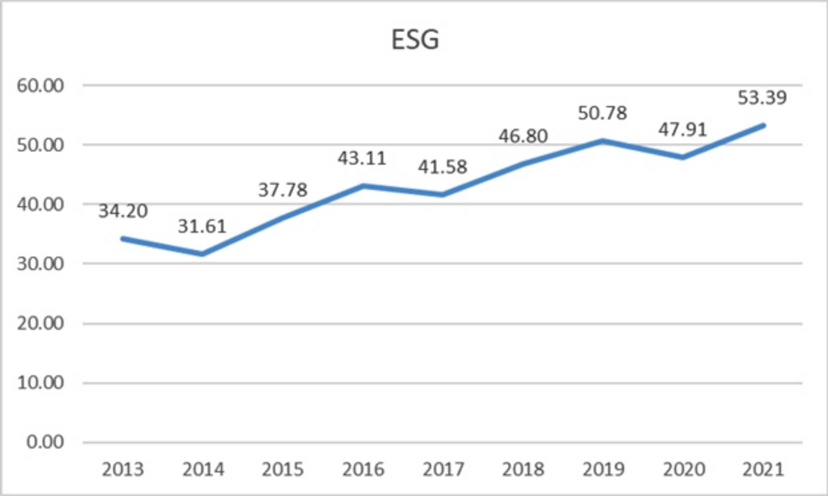

Figure 1: Trend of aggregate mean ESG from 2013-2021 for the Healthcare Sectors
Source: Authors

Table 3 displays the outcomes of the Pearson correlation matrix, showcasing the strength and direction of connections between the variables. Specifically, the SP exhibits a weak yet positive association with ESG, whereas ROE demonstrates a weak and negative relationship with ESG.

	ESG	SP	ROE	Age	Size	Leverage	MVBV
ESG	1						
SP	0.3197*	1					
ROE	-0.0496	0.2424*	1				
Age	0.3800*	0.0726	0.1069	1			
Size	0.2411*	0.0002	-0.0749	0.2793*	1		
Leverage	-0.3864*	-0.1223	-0.4667*	-0.4419*	-0.4475*	1	
MVBV	-0.2690*	0.3506*	0.1775	-0.3627*	-0.2155*	0.1466	1

Table 3: Correlation Matrix
Source: *Authors*

Note: Correlation coefficients with the '*' sign indicate a significant correlation at a 5% significance level.

5.2 Panel Data Regression Analysis

The aim of this study is to investigate the effect of the sustainability practices measured by ESG on the financial performance of healthcare companies. Table 4 and Table 5 presents the panel data regression models for the ESG and financial measures, i.e., ROE and SP, with firm age, firm size, leverage, and market value to book value as control variables. It comprises the results of the Ordinary Least Square method, fixed effect regression model, and random effect regression model.

We have employed the Hausman test and The Breusch-Pagan Lagrange Multiplier (BPLM) Test to determine the consistent and efficient method of parameter estimates. The BPLM test results reveal inconsistent parameter estimates obtained through OLS methods, given that both models have p-values below 0.05. Further, the Hausman test was utilized to determine the optimal estimation method between the fixed effect and random effect models. The p-value obtained from the Hausman test for both models falls below 0.05, suggesting that employing a fixed effect is the preferred estimation method for ensuring consistent and valid results.

5.2.1 Model 1

The findings reveal that ESG has a negative but insignificant effect on the ROE. Further, the results of the control variables were found to be significant for the firm age, leverage, and MVBV, while the size of the firm has an insignificant effect on the ROE of the firm. Additionally, with a Variance Inflation Factor (VIF) below 10, it is evident that the model is devoid of multicollinearity concerns.

Model 1			
Regression Model	**Pooled OLS**	**Fixed Effect Model**	**Random Effect Model**
IV/DV	**ROE**	**ROE**	**ROE**
Const.	93.8671*** (0.0004)	141.33***(0.0022)	89.9529** (0.0140)
ESG	−0.166610**(0.0297)	−0.0658105 (0.4930)	−0.124496 (0.1530)
Age	0.681361 (0.8136)	−53.6935*** (0.0010)	−3.85663 (0.4980)
Size	−6.1883*** (0.0017)	5.16391 (0.3282)	−5.00140 (0.1013)
Leverage	−19.0219*** (0.000)	−13.2840*** (0.0019)	−15.6046*** (0.000)
MVBV	0.676835* (0.0744)	1.00369*** (0.0092)	1.27514*** (0.0004)
R Square	0.391876	0.475579	0.314351
p-value	2.34e-08	5.35e-13	
Durbin-Watson	0.658997	1.123818	1.123818
BPLM Test	Chi-square = 12.6688		
	p-value = 0.000371805		
Hausman Test	Chi-square = 15.758		
	p-value =0.00757009		
Mean VIF	1.36		

Table 4: The bold figures represent the associations between dependent and independent variables (Model 1) of the Fixed effect model, which in accordance with our study, yields the most consistent and efficient parameter estimates.

Source: *Gretl*

Note: The numbers in parenthesis are p-values.

Significant at ***1%, **5% and *10% level of significance

5.2.2 Model 2

The outcome of the Model 2 shows that ESG has a significant but negative effect on the firm's share price. This negative impact shows that firms with superior ESG practices do not have better market performance than firms that have scored low on ESG parameters. Moreover, the control variables such as firm age, size, and MVBV significantly affect the firm's market performance, while leverage has an insignificant effect on the firm's share price. Furthermore, the model is free from multicollinearity problems, as evidenced by the VIF being less than 10.

Model 2			
Regression Model	**Pooled OLS**	**Fixed Effect Model**	**Random Effect Model**
IV/DV	**SP**	**SP**	**SP**
Const.	−2004.90*** (0.0040)	−18334.1*** (0.000)	−16041.4*** (0.000)
ESG	19.3256*** (0.000)	**−9.92814** (0.0453)**	−7.08549 (0.1456)
Age	191.55 (0.2743)	2558.47*** (0.0021)	1596.45*** (0.0024)
Size	500.588*** (0.0032)	861.664*** (0.0019)	937.298*** (0.000)
Leverage	21.2807*** (0.000)	−345.932 (0.1050)	−239.435 (0.2515)
MVBV	157.31*** (0.000)	203.492*** (0.000)	196.991*** (0.000)
R Square	0.704246	0.68676	0.0559623
p-value	1.31E-21	1.88E-29	
Durbin-Watson	1.066416	1.138304	1.138304
BPLM Test	Chi-square = 99.6589		
	p-value = 1.81037e-23		
Hausman Test	Chi-square = 11.8148		
	p-value = 0.0374148		
Mean VIF	1.36		

Table 5: The bold figures represent the associations between dependent and independent variables (Model 2) of the Fixed effect model, which in accordance with our study, yields the most consistent and efficient parameter estimates.

Source: *Gretl*

Note: The numbers in parenthesis are p-values.

Significant at ***1%, **5% and *10% level of significance

6. Discussion and Conclusion

The outcome of the panel data regression analysis indicates that the impact of ESG on the firm's accounting performance is statistically insignificant. However, a significant but negative effect was observed concerning market performance measured by the firm's share price. This implies that Indian companies excelling in Environmental, Social, and Governance (ESG) aspects do not necessarily exhibit robust financial performance compared to those scoring lower on ESG criteria. The study findings underscore that superior ESG performance does not guarantee immediate financial gains for the companies, aligning with various prior research (Abdi et al., 2022; Shahbaz et al., 2020). Hasan et al. (2021) explored this relationship across different Indian industries, reporting a non-significant and negative correlation for the primary material industry and a negative correlation for the energy and utility industry and healthcare industry. These results are in line with the classical shareholder theory (M. Friedman, 1962), suggesting that companies with enhanced sustainability performance do not necessarily outperform those with lower sustainability performance. The intricate dynamics between ESG and financial performance, as noted by Hasan et al. (2021), could contribute to these results. Another plausible explanation is that ESG benefits may not manifest in the short term, requiring time to materialize and reflect in a company's future performance (Behl et al., 2021; Sachin & Rajesh, 2021).

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Two Decades of Nexus Between Macro-economic Variables and The Exchange Rate of BRICS Countries

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Abstract

Objective of the study: This study investigates the relationship between Macroeconomic variables and exchange rates in BRICS countries over two decades (1999-2022).

Tools used: Utilizing advanced analytical techniques, including vector error correction model (VECM) and Autoregressive Distributed Lag (ARDL) Bound tests, we unravel the intricate dynamics at play.

Findings of the study: Our findings reveal a significant and sustained connection between these variables and exchange rates in Brazil, Russia, and South Africa, providing crucial insights for informed decision-making. Notably, India and China exhibit unique dynamics, emphasizing the diverse economic profiles within the Brazil, Russia, India, China, and South Africa (BRICS) consortium. This study underscores the importance of tailored policies that align with each nation's economic landscape.

Implications of the study: It serves as a beacon for stakeholders to navigate the complex terrain of global finance, offering a foundation for resilient strategies. The implications extend far beyond BRICS, influencing global investment strategies and policy-making.

Keywords: BRICS, Exchange Rate, Macro-economic variables, ARDL Bound Test, VECM, Granger Causality.

1. Introduction

The BRICS countries are projected to remain the main drivers of growth in the World Economy by 2030 (McKinley, 2018, Zhongxiu & Qingxin, 2020). The Emerging economies, collectively known as Brazil, Russia, India, China, and South Africa (BRICS), have grown as the most integrated and developed countries in trade and investment. Aggregately, these five countries cover 40 percent of the World's population and more than 25 percent of the World's land (Agtmael, 2012).

The BRICS countries, unaffected by the financial crisis, demonstrated stronger economic performance than developed nations and are seen as a driving force for global economic recovery. Their economic expansion is attributed to substantial inputs of factors, large populations, and abundant resources. Brazil and Russia benefit from significant mineral reserves. Brazil stands out as the most stable BRICS member, being a robust democracy without serious regional conflicts, unlike China, Russia, and India. China's economic strength lies in its cheap labor and low-cost resources, while Russia maintains economic power through its oil industry despite demographic challenges (Piper, 2015).

China has not only placed itself as a global economic player but politically also made notable progress. Emerging from the shadow of Maoist insularity, China faces significant regional rivals in the form of Japan (Möckli, 2007). On the other hand, South Africa was admitted to the BRICS based on being a regional leader, as it accounts for 41 percent of the Southern African Development Community's total trade and about 63 percent of SADC's GDP (Piper, 2015). It is worth noting that all the BRICS countries, except Brazil, show a very high investment rate.

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The quantum and direction of foreign trade and commerce are determined by the Exchange rate fluctuation or stability. This paper aims to identify significant Macroeconomic variables causing variation in the Exchange rates in the BRICS countries. BRICS is a particularly interesting set of countries to consider due to its rapidly growing share in global trade in the last two decades. There are various factors, such as the openness of an economy, the domestic and Foreign money supplies, Exchange rate regime, Levels of output, Income, Level of inflation, Rate of unemployment, Interest rates, Central bank independence, and unpredictable circumstances, which contributes to the fluctuation of an Exchange rate (Stancik, 2007; Andries et al. 2017; Alagidede & Ibrahim, 2017; Calderon & Kubota, 2018; Ha et al. 2020). The degree of the impact of each of these factors varies and depends on a particular country's economic condition. Literature based on Exchange rate fluctuations could be broadly categorized into studies related to the Exchange rate regimes, Exchange rate volatility, and the impact of various Macroeconomic variables.

As far as studies based on Indian Rupees are concerned, Bhanumurthy (2006) emphasized that in the short and medium run, the Exchange rate is influenced by Macro-variables such as speculation and Central bank intervention. Suthar (2008) identified Monetary policy intentions depicted by the bank rate of the RBI, the short-term and long-term domestic Interest differentials, Interest yield differentials, and the rate of change of Foreign Exchange reserves as the major factors affecting the Exchange rate fluctuations. Kumar (2010) inferred that a long-run relationship exists between productivity differential, Foreign assets, Terms of Trade, Trade openness, and Real Exchange rate in India. Another research conducted by CS Shylajan (2011) revealed a significant relationship between the rupee-dollar Exchange rate and Money Supply, Index of industrial production, and Interest rate. Damani and Vora (2018) studied the impact of bank rate, trade deficit, foreign inflows, oil and gold prices in the short term and during the crises on the exchange rate. The results of regression analysis hinted at a significant impact of the aforementioned factors on the exchange rate in the short run however during the crisis period the impact was minor.

Murari and Sharma (2013) Stated that Money Supply, Trade balance, Inflation, and Interest rates have a significant influence. Mirchandani (2013) has identified Interest rate, Inflation rate, and GDP Growth as the significant economic factors affecting the Exchange rate in India. Whereas Khera and Singh (2015) stated that Inflation Rate, Lending Interest Rate, Foreign Direct Investment (FDI), Gross Domestic Product (GDP), Growth Rate, and Current Account Deficit as the significant factors affecting the Exchange rate fluctuations in India.

Monica and Santhiyavalli (2017) concluded that the Balance of Payment – Current account, Foreign Exchange reserves, and GDP at factor cost are the most significant variables affecting the Exchange rate. Another study based on Indian Rupees by Venkatesan and Ponnamma (2017) stated that Inflation hurt the Foreign Exchange rate, and FDI has a long-term relation¬ship in affecting the fluctuations of the Indian rupee.

In case of Brazil Agenor, Hoffmaister and Medeiros (1997) and Harold and Adebayo (2017) stated that Interest rate shocks explain the fluctuations in the Brazilian Exchange rate. Since the initiation of economic reforms, Trade liberalization, and lifting trade restrictions on international trade a couple of decades ago, China has been one of the World's fastest-growing economies and has emerged as a significant economic and trade player (Morrison, 2006). Marquez and Schindler (2006) explains that appreciation in the Renminbi decreases Chinese Exports by half percent and Imports by 1/10th percent, whereas Ping (2011) stated that appreciation in the Renminbi hurts economic growth and employment. Baasankhuu (2013) studied the Chinese Yuan in relation to Inflation, Interest rates, Exports, and Imports and inferred that Interest rates and Inflation rates influence the Exchange rate of the Chinese Yuan. However, Jiang (2014) in general, concludes that long-run Exchange rate variation has a positive impact on Imports and Exports.

As far as other Asian countries are concerned, studies such as Saeed, Awan, and Sial, (2012), Farzana (2013), and Khan (2016) identified Government Debts, Foreign Exchange reserves, Imports, Exports, and Inflation as the major factors affecting the Exchange rate in Pakistan.

Studies related to South African Rand by Todani and Munyama (2005) and Hsing (2016) indicated that there exists a positive relationship between the Exchange rate and South African government bond yield, US real GDP, US stock prices, and South African Inflation rate. Mavee, Perrelli, and Schimmelpfennig (2016) and Mpofu (2016) identifies commodity price volatility, Trade openness, output volatility, Money Supply, Foreign Exchange reserves and global market volatility, and domestic political uncertainty to be the factors that lead to volatility in the South African Rand while Adebayo and Ngalawa (2017) identifies global shocks as a factor which influences the South African Rand.

The Macroeconomic variables causing variations in the exchange rate of the ASEAN countries is studied vastly (Lee-Lee & Hui-Boon, 2007; Abdoh, Yusuf, Zulkifli, Bulot, & Ibrahim, 2016). Whereas studies such as Shirodkar and Fernanades (2018) have analyzed the impact of the Exchange rate of BRICS countries. KoCenda (1998) and McKenzie (2002) have used the

TARCH Model to examine the volatility of the Exchange rate. Studies like Choudhry (2005) and Baum and Caglayan (2006) have examined the impact of Exports on the volatility of the Exchange rate. Sen et al. (2020) explore the long-term correlation between interest rates, price inflation, and foreign exchange rates in five regional developing market economies, i.e., Brazil, India, Turkey, South Africa, and Indonesia. The findings suggest a cointegration between interest and exchange rates in Brazil, India, and Turkey. In all sample countries, exchange rates and inflation rates tend to co-move in the long run.

Recent studies conducted by Salisu et al. (2021) investigate the predictable nature of exchange rates in each of the BRICS nations in relation to the price of oil worldwide. The results varied based on whether the sample economy is an importer (India, China, South Africa) or an exporter of oil (Brazil, Russia) country, as well as the extent of foreign interventions made by each country over time. It was concluded that Exchange rates tend to react more strongly to soaring oil prices than declining ones. Another study conducted for BRICS countries by Salisu, Cunado, and Gupta (2022) documented that the exchange rates are more susceptible to current Geopolitical risk data than to past data. In addition, it was found that the BRICS exchange rates are more prone to be significantly affected by Global geopolitical risk data than the country-specific. A study conducted for South Asian Countries by Qamruzzaman et al (2021) examined the relationship between FDI, financial innovation, and foreign exchange volatility. The study concluded a correlation between long-term financial innovation, FDI inflows, and exchange rate volatility. The study found that FDI inflows and financial innovation have negative long-term effects on exchange rate volatility, indicating that an increase in FDI inflows and financial innovation can reduce volatility in the foreign exchange market.
The review of the literature gives us glimpses of the extensive empirical and conceptual research directed toward identifying the forces causing fluctuations in the currency values and estimating the behavior of the Exchange rate. The present study will add to the existing literature in the following ways. Firstly, BRICS countries have been considered due to their rapidly growing share in global trade in the last two decades. Secondly, we have extensively chosen eight Macroeconomic variables for the longest spans of data, i.e., two decades, to evaluate their influence on the Exchange rates of the BRICS countries.

In the pursuit of comprehending the intricate dynamics of the BRICS economies, it becomes imperative to address two pivotal questions. Firstly, does the exchange rate of BRICS nations experience fluctuations in response to shifts in macroeconomic variables? Secondly, if indeed such a correlation exists, to what extent do these macroeconomic factors influence the exchange rates? This study embarks on a mission to dissect and analyze the impact of carefully selected macroeconomic variables on the exchange rates of BRICS countries.
The rest of the study is organized as follows: Section 2 presents the literature review, research model, and development of the hypotheses. Section 3 presents the methodology. The results and findings are shown in Section 4. Section 5 presents the study's discussion and conclusion.

Research Gaps and Research Questions

This research aims to clarify how macroeconomic variables affect exchange rates in the BRICS countries. Despite the significant influence of BRICS economies globally, we still do not fully understand how certain macroeconomic factors impact their exchange rates.

To address this gap, we focus on two main questions. First, do the exchange rates of BRICS nations change in response to shifts in macroeconomic variables? Second, if there is a correlation, how strong is the influence of these variables on the exchange rates?

This study examines how selected macroeconomic factors affect the exchange rates of BRICS countries. We analyze various key metrics, including GDP at factor cost, Consumer Price Index (as a measure of inflation), Money Supply (M3), Import-Export dynamics, Interest Rates, Foreign Direct Investment, Foreign Exchange Reserves, and the exchange rates themselves. By investigating these factors, we aim to understand the complex interactions that shape the economic environment of BRICS nations.

Objective of the study

To investigate the impact of Macroeconomic variables' on the Exchange rates of the BRICS countries.

Materials and methods

This study investigates eight important Macroeconomic variables' relationship and their influence on the Exchange rates of the BRICS countries. The sample period for the study extends from 1st January 1999 to 31st December 2022 based on quarterly data. Based on the literature review, we have chosen GDP at Factor cost, Consumer price index as a proxy of Inflation, Money Supply (M3), Import, Export, Foreign Exchange reserve, and Foreign Direct Investment as the Macro-economic factors to examine its impact on the Exchange rate of the BRICS countries. The data for all the Macro-economic variables as well as the Exchange rates of the respective countries, have been collected from the following sources:

Table 1: Macro-economic Variables, Period, Sources and Symbols of the Data

Sr. No.	Country	Macro-economic Variables	Period	Source	Symbol
1	Brazil	Exchange Rate	Q1 1999-Q4 2022	Fred Reserve	ER
		Gross Domestic Product	Q1 1999-Q4 2022	OECD	GDP
2	Russia	Inflation	Q1 1999-Q4 2022	Fred Reserve	CPI
		Money Supply	Q1 1999-Q4 2022	Fred Reserve	MS
		Export	Q1 1999-Q4 2022	OECD	EX
3	India	Import	Q1 1999-Q4 2022	OECD	IM
		Foreign Exchange Reserve	Q1 1999-Q4 2022	Bloomberg	FXR
4	China	Foreign Direct Investment	Q1 1999-Q4 2022	Fred Reserve	FDI
5	South Africa	Interest Rates	Q1 1999-Q4 2022	Fred Reserve	IR

To study the dynamic long-term relationship and short-run interactions among the variables under study, we employ the Autoregressive Distributed lag (ARDL) Cointegration technique as a VAR model of order p in Xt, where Xt is a column vector composed of the nine Variables:

$$X_t = (GDP_t, MS_t, ER_t, EX_t, FXR_t, IM_t, CPI_t, FDI_t, IR_t)$$

This approach has been developed by . It is superior to all other Cointegration methods because it is useful when the series are co-integrated at level, first, or second difference. Secondly, it is more efficient in the case of small sample data sizes, and lastly, by applying the ARDL model, we obtain Unbiased estimates of the long-run model (Harris & Sollis, 2003). The ARDL model in this study is expressed as follows:

$$\begin{aligned}\log(ER_t) = {} & \alpha + \beta_1 \log(GDP_{t-1}) + \beta_2 \log(MS_{t-1}) + \beta_3 \log(EX_{t-1}) \\ & + \beta_4 \log(FXR_{t-1}) + \beta_5 \log(IM_{t-1}) \\ & + \beta_6 \log(CPI_{t-1}) + \beta_7 \log(FDI_{t-1}) + \beta_8 \log(IR_{t-1}) + \varepsilon_t\end{aligned}$$

The Bound test is based on Joint F-statistic with non-standard asymptotic distribution with H0: No Cointegration. The first and foremost in the ARDL bound approach is to estimate the equation of five countries with the help of Ordinary Least Squares (OLS). This estimation is required to find out the long-run relationship among the variables under study by conducting F-test for the significance of the coefficient of the lagged levels of variables. Where H_0:b_1=b_2=b_3=b_4=b_5=b_6=b_7=b_8, against the alternative hypothesis where all coefficients are not significant. In the Estimated equation, two sets of values are determined (Pesaran et al., 2001). The first set of values assumed that the variables are co-integrated at order zero, and the second set is order one. If the F-statistics value exceeds the upper bound, it rejects the null hypothesis of no Cointegration and vice versa. If the F- statistic value falls between the lower and upper bound value, then the Cointegration test is inconclusive.

There may be a long-run equilibrium relationship between two or more variables, but in the short run, there could be disequilibrium. The nature of the relationship among Exchange rates, Exports, Imports, Inflation, GDP, Foreign Exchange Reserve, Money Supply, Foreign Direct Investment, and Interest Rates of all the BRICS countries in the short run can be investigated by implementing the Vector Error Correction Mechanism. A Vector Error Correction model is a restricted VAR with Cointegration restrictions built into the specification. Since all the variables were found to be non-integrated of the same order, we have used the ARDL Bound test approach of Cointegration for a long-term relationship. The error correction term of VECM specification signifies the rate at which it corrects its previous period disequilibrium or speed of adjustment to restore the long-run equilibrium relationship.

Table 2: Unit Root Test (Augmented Dickey-Fuller Test)

Variables	BRAZIL		RUSSIA		INDIA		CHINA		SOUTH AFRICA	
	ADF at level	ADF at First Difference	ADF at level	ADF at First Difference	ADF at level	ADF at First Difference	ADF at level	ADF at First Difference	ADF at level	ADF at First Difference
Exchange Rate	-1.7249 [0.4149]	-7.1699 [0.0000]	-0.1361 [0.9411]	-7.9871 [0.0000]	-0.3422 [0.9128]	-8.4803 [0.0000]	-1.1454 [0.6939]	-6.0656 [0.0000]	-0.8408 [0.8016]	-6.7393 [0.0000]
Export	-1.4614 [0.5479]	-7.6007 [0.0000]	-1.9245 [0.3196]	-5.0231 [0.0000]	-1.7833 [0.3861]	-7.3129 [0.0000]	-3.5783 [0.0080]	-	-1.6523 [0.4512]	-7.5547 [0.0000]
Foreign Direct Investment	-0.7540 [0.8261]	-9.1762 [0.0000]	-1.6359 [0.4596]	-14.5632 [0.0000]	-1.0082 [0.7469]	-9.0696 [0.0000]	-0.7066 [0.8380]	-8.9821 [0.0000]	-4.6891 [0.0000]	-
Foreign Exchange Reserve	-0.7206 [0.8483]	-12.0718 [0.0000]	-4.1472 [0.0000]	-	-2.5472 [0.1085]	-5.2090 [0.0000]	-2.6201 [0.0900]	-3.1976 [0.0230]	-0.9719 [0.7500]	-3.3028 [0.0181]
Gross Domestic Product	-3.8593 [0.0000]	-	-0.4542 [0.8935]	-8.8422 [0.0000]	-1.0671 [0.7251]	-3.0469 [0.0350]	-2.0717 [0.2566]	-8.2649 [0.0000]	-5.0507 [0.0000]	-
Import	-1.0523 [0.7307]	-6.9539 [0.0000]	-1.7896 [0.3830]	-4.8636 [0.0000]	-1.3995 [0.5785]	-8.6221 [0.0000]	-3.0294 [0.0365]	-6.2080 [0.0000]	-1.7611 [0.3970]	-9.0053 [0.0000]
Inflation Rate(CPI)	-1.3981 [0.5790]	-3.4806 [0.011]	-2.4159 [0.1409]	-10.6207 [0.0000]	-2.1839 [0.2138]	-15.3609 [0.0000]	-1.9578 [0.3040]	-6.4186 [0.0000]	-0.5318 [0.8784]	-4.1792 [0.0000]
Interest Rate	-2.4276 [0.1376]	-4.4438 [0.0000]	-2.8709 [0.0534]	-8.4968 [0.0000]	-2.0894 [0.2495]	-10.6466 [0.0000]	-3.0103 [0.0382]	-8.7221 [0.0000]	-1.8508 [0.3537]	-5.4232 [0.0000]
Money Supply(M3)	-3.7207 [0.0000]	-	-4.3427 [0.0000]	-	1.2113 [0.9980]	-5.9529 [0.0000]	-6.4239 [0.0000]	-	-3.9457 [0.0000]	-

Note: [ ] denote p-value

Results and analysis

To ascertain the stationarity of the data, we have applied ADF Test. If we proceed without ascertaining the stationarity of the data, then it could produce spurious results. Table 2 explains the stationarity of the time series data with the help of the ADF test.

In all the above cases, we rejected the null hypothesis at the level or the first difference as the p-value is more than 0.05%. The results of the ADF test indicate that the variables are not integrated in the same order. Therefore, we could proceed with the Bound test of Cointegration.

Table 3: Result of Bound Test Approach of Cointegration

Country	Level of Significance (α)	Critical Values		F-statistics
		Lower Bound I (0)	Upper Bound I (1)	
Brazil	10 percent	1.95	3.06	5.08
	5 percent	2.22	3.39	
	2.5 percent	2.48	3.70	
	1 percent	2.79	4.10	

Russia	10 percent	1.95	3.06	7.27
	5 percent	2.22	3.39	
	2.5 percent	2.48	3.70	
	1 percent	2.79	4.10	
India	10 percent	1.95	3.06	2.58
	5 percent	2.22	3.39	
	2.5 percent	2.48	3.70	
	1 percent	2.79	4.10	
China	10 percent	1.95	3.06	2.71
	5 percent	2.22	3.39	
	2.5 percent	2.48	3.70	
	1 percent	2.79	4.10	
South Africa	10 percent	1.95	3.06	5.64
	5 percent	2.22	3.39	
	2.5 percent	2.48	3.70	
	1 percent	2.79	4.10	

Table 4: Long-run Analysis Results (Error Correction Model Regression)

Country	ECT Coefficient	Std. Error	t-Statistic	P-value
Brazil	- 0.241	0.033	- 7.212	0.00
Russia	- 0.415	0.048	- 8.595	0.00
India	-	-	-	-
China	-	-	-	-
South Africa	- 0.083	0.010	-7.578	0.00

Table 3 presents the result of the ARDL Bound test approach. The model is determined to see the existence of a long-term relationship between the variables in the equation. We have used F-statistics and lower and upper bound values to determine the long-term relationship. It is observed that in Brazil, Russia, and South Africa, there is a long-term relationship between the Exchange rate and other Macro-economic variables as F-statistics values for Brazil (5.058), Russia (7.271) and South Africa (5.640) are greater than upper bound values, except for India and China.

The Error Correction Term (ECT) from Table 4 explains the speed of adjustment to restore the balance between the Exchange rate and the Macroeconomic variables. It explains how speedily or slowly the relationship comes back to equilibrium. The Error Correction Term coefficient must be negative and significant. As per Bannerjee et al. (1998), it has been further tested and said that if the ECT is highly significant and negative, it indicates a stable long-term relationship. The coefficients for Brazil (-0.241), Russia (-0.415), and South Africa (-0.063) suggest that Long term deviations in the Exchange rate are corrected by around 0.24 percent, 0.41 percent and 0.06 percent, respectively except for India and China.

Table 5: Result of VEC Granger Causality test

10	Independent Variable	Brazil	Russia	India	China	South Africa
		Chi-square (p-values)				
Exchange Rate	Imports	0.1429 (0.867)	1.4245 (0.247)	1.7745 (0.176)	3.3451 (0.040)**	1.4672 (0.237)
	Exports	0.1141 (0.892)	4.0655 (0.021) **	2.2736 (0.110)	2.9072 (0.061)*	1.3130 (0.275)
	Inflation	0.1541 (0.857)	0.9421 (0.394)	0.3878 (0.679)	1.0204 (0.365)	1.1886 (0.310)
	Interest rate	0.4206 (0.658)	9.3790 (0.000)***	2.5735 (0.083)*	0.3562 (0.701)	1.1886 (0.310)
	Money Supply (M3)	0.8524 (0.430)	0.8829 (0.417)	0.7266 (0.487)	0.1535 (0.857)	1.2495 (0.292)
	Foreign Direct Investment	0.7477 (0.477)	2.4584 (0.092)*	2.2952 (0.108)	1.4917 (0.231)	0.3808 (0.684)
	Gross Domestic Product	0.1534 (0.858)	5.9192 (0.004)***	3.8964 (0.024)**	1.3729 (0.259)	0.9262 (0.400)
	Foreign Exchange Reserve	0.8846 (0.417)	5.6320 (0.005)***	0.8749 (0.421)	3.8306 (0.026)**	1.0027 (0.371)

Note: * denotes 1% level of significance, **denotes 5% level of significance, and *** denotes 10% level of significance. Fig. in the ( ) denotes the t-stat. values

The Granger Causality test has been used to determine the impact of lagged Macroeconomic variables on the Exchange rate. In the above Table, 5 Exchange rates of each country has been treated as the dependent variable and other Macroeconomic variables as Independent Variables. The test result indicates that Export, Interest Rate, FDI, GDP, and Foreign Exchange Reserve have a causal impact on the Exchange Rate in Russia. There is a causal link flowing from Interest rate and GDP to India's Exchange rate. This result is in line with findings by Shastri and Shastri (2016) and Yildirim and Arifli (2021). In the case of China, Exports, Imports, and Foreign Exchange reserves are causing fluctuations in the Chinese Exchange rate. It could be further noted that no causality flows from Macroeconomic variables to the Exchange rate in South Africa and Brazil.

Conclusion

This study has ventured into the intricate web of economic relationships, shedding light on the critical macroeconomic determinants that have shaped the exchange rates of BRICS nations over the past two decades. Brazil, Russia, and South Africa emerge as noteworthy exemplars, exhibiting a robust long-term relationship between their macroeconomic variables and exchange rates. This can be attributed, in part, to the relatively stable economic policies and consistent performance of these economies. Brazil, for instance, has implemented prudent fiscal policies that have contributed to the resilience of its exchange rate. Similarly, Russia's diverse export base and prudent monetary policies have fortified its exchange rate stability. South Africa's strategic focus on monetary and fiscal stability has played a pivotal role in maintaining a steady exchange rate trajectory.

India and China, however, chart a unique course. Their nuanced relationship between macroeconomic variables and exchange rates hints at the intricate balancing act these nations undertake. India's diverse economic structure, combined with its robust service sector, has led to a more complex exchange rate dynamics. China's export-driven economy, heavily reliant on foreign exchange inflows, underscores the pivotal role that trade dynamics play in shaping its exchange rate. This highlights the need for tailored policies that reflect the idiosyncrasies of these economic powerhouses.

The VECM analysis reveals a notable feature: Brazil, Russia, and South Africa display a commendable capacity for equilibrium restoration following deviations in exchange rates. This resilience can be attributed to their proactive monetary and fiscal policies, which act as stabilizing forces in the face of external shocks. In contrast, India and China exhibit a more gradual adjustment process, reflecting the intricate interplay of factors unique to their economic structures.

The Granger causality test offers further clarity, unveiling specific drivers of exchange rate fluctuations. In Russia, for example, the influence of exports, interest rates, FDI, GDP, and foreign exchange reserves can be traced to the nation's export-driven economy and its monetary policy measures. This result is in line with studies by Fraz and Fatima (2016) and Yildirim and Ivrendi (2016). Similarly, in India, the causal impact of GDP and interest rates reflects the multifaceted nature of the Indian economy, which encompasses a wide array of industries and sectors.

This study has significant implications for policymakers, economists, investors, and businesses in BRICS countries. By understanding how key macroeconomic variables influence exchange rates, stakeholders can make more informed decisions. Central banks and governments can use these insights to formulate effective monetary and fiscal policies, while businesses involved in international trade can optimize their import-export strategies. Investors can make better investment decisions by understanding currency risks and opportunities. Additionally, the study provides a valuable foundation for further academic research, enhancing the global understanding of economic dynamics within the BRICS bloc.

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Table 1: Descriptive Statistics of Macro economic variables of BRICS countries from 01^{st} April 1999 to 31^{st} March 2022

Table 1.1: Descriptive Statistics of Macro economic variables of Brazil

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
Mean	0.02	0.88	25.35	12.01	27.41	7.34	25.36	4.23	4.59
Median	0.01	0.83	25.3	12.39	27.44	7.56	25.37	4.23	4.59
Maximum	0.3	1.42	26.42	12.83	28.19	8.51	26.36	4.8	4.74
Minimum	-0.34	0.45	23.98	10.44	26.33	0	24.17	3.58	4.36
Std. Dev.	0.11	0.27	0.61	0.89	0.59	1.35	0.61	0.35	0.1
Skewness	0.02	0.32	-0.44	-0.58	-0.29	-3.99	-0.15	-0.13	-0.32
Kurtosis	4.29	1.9	2.55	1.62	1.72	22.22	1.76	1.99	2.07
Jarque-Bera	5.57	5.43	3.3	10.81	6.56	1443.34	5.42	3.61	4.25

Source: Authors Computation

Table 1.2: Descriptive Statistics of Macro economic variables of Russia from 01^{st} April 1999 to 31^{st} March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
Mean	9.42	3.53	24.9	18.26	12.07	17.6	10.1	24.36	3.94
Median	9.53	3.41	25.08	21.21	12.68	14.51	10	24.6	4.04
Maximum	10.58	4.31	25.66	23.82	13.23	30.93	11.39	25.2	4.74
Minimum	4.93	3.16	23.5	4.42	8.86	13.9	8.77	22.93	2.72
Std. Dev.	0.85	0.32	0.64	6.33	1.22	6.57	0.84	0.72	0.57
Skewness	-2.37	1.25	-0.67	-0.96	-1.18	1.52	-0.01	-0.68	-0.39
Kurtosis	12.24	3.04	2.09	2.14	3.16	3.31	1.55	2.07	2.08
Jarque-Bera	341	19.65	8.26	13.95	17.63	29.47	6.66	8.66	4.59

Source: Authors Computation

Table 1.3: Descriptive Statistics of Macro economic variables of China from 01^{st} April 1999 to 31^{st} March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
Mean	24.64	3.94	24.33	17.36	12	30.34	10.52	28.81	4.12
Median	25.05	3.87	24.56	23.63	12.45	30.3	10.64	29.03	4.05
Maximum	25.61	4.28	25.23	27.06	12.9	31.51	11.44	30.12	4.77
Minimum	23.03	3.67	22.86	8.35	10.29	29.19	9.33	27.11	3.55
Std. Dev.	0.89	0.17	0.77	8.2	0.81	0.74	0.75	0.95	0.4
Skewness	-0.53	0.57	-0.55	-0.03	-0.92	-0.01	-0.22	-0.41	0.15
Kurtosis	1.67	1.87	1.78	1.03	2.42	1.61	1.43	1.7	1.51
Jarque-Bera	9.6	8.53	8.98	12.93	12.35	6.41	8.91	7.91	7.76

Source: Authors Computation

Table 1.4: Descriptive Statistics of Macro economic variables of South Africa from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
Mean	24.32	1.97	26.3	20.19	13.99	29.69	8.57	26.14	4.44
Median	24.41	1.93	26.56	23.33	14.48	29.78	8.74	26.4	4.44
Maximum	25.63	2.11	27.2	25.14	15.2	30.86	9.3	27.06	4.68
Minimum	22.65	1.81	24.55	9.96	11.9	28.39	7.67	24.45	4.24
Std. Dev.	0.94	0.12	0.83	6	1.16	0.75	0.54	0.8	0.15
Skewness	-0.2	0.1	-0.71	-0.91	-0.65	-0.2	-0.42	-0.72	0.05
Kurtosis	1.67	1.36	2.07	1.88	1.87	1.66	1.67	2.16	1.49
Jarque-Bera	6.38	9.1	9.66	15.15	9.94	6.55	8.19	9.19	7.59

Source: Authors Computation

Table 1.5: Descriptive Statistics of Macro economic variables of India from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
Mean	0.88	25.35	12.01	27.41	25.36	4.23	2.53	28.3	19.76
Median	0.83	25.3	12.39	27.44	25.37	4.23	2.55	28.35	22.42
Maximum	1.42	26.42	12.83	28.19	26.36	4.8	3.28	29.5	23.98
Minimum	0.45	23.98	10.44	26.33	24.17	3.58	1.44	26.79	9.15
Std. Dev.	0.27	0.61	0.89	0.59	0.61	0.35	0.37	0.84	5.56
Skewness	0.32	-0.44	-0.58	-0.29	-0.15	-0.13	-0.37	-0.19	-1.28
Kurtosis	1.9	2.55	1.62	1.72	1.76	1.99	2.84	1.67	2.7
Jarque-Bera	5.43	3.3	10.81	6.56	5.42	3.61	1.92	6.36	22.06

Source: Authors Computation

Table 2.1 :Correlation matrix of Macro economic variables of Brazil from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
ER	1	0.81	0.52	0.62	0.32	0.1	0.72	0.62	0.43
EXPORT	0.81	1	0.43	0.92	0.55	0.18	0.78	0.47	0.58
FOREX	0.52	0.43	1	0.62	0.4	0.82	0.35	0.58	0.57
GDP	0.62	0.62	0.62	1	0.6	0.6	0.25	0.61	0.45
IMPORT	0.32	0.55	0.4	0.6	1	0.24	0.65	0.42	0.55
INF	0.1	0.18	0.82	0.6	0.24	1	0.54	0.32	0.34
IR	0.72	0.78	0.35	0.25	0.65	0.54	1	0.22	0.26
MS	0.62	0.47	0.58	0.61	0.42	0.32	0.22	1	0.15
FDI	0.43	0.58	0.57	0.45	0.55	0.34	0.26	0.15	1

Source: Authors Computation

Table 2.2 :Correlation matrix of Macro economic variables of Russia from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
ER	1	0.72	0.43	0.53	0.23	0.01	0.63	0.53	0.34
EXPORT	0.72	1	0.34	0.83	0.46	0.09	0.69	0.38	0.49
FOREX	0.43	0.34	0.91	0.53	0.31	0.73	0.26	0.49	0.48
GDP	0.53	0.53	0.53	1	0.51	0.51	0.16	0.52	0.36
IMPORT	0.23	0.46	0.31	0.51	1	0.15	0.56	0.33	0.46
INF	0.01	0.09	0.73	0.51	0.15	1	0.45	0.23	0.25
IR	0.63	0.69	0.26	0.16	0.56	0.45	1	0.13	0.17
MS	0.53	0.38	0.49	0.52	0.33	0.23	0.13	1	0.06
FDI	0.34	0.49	0.48	0.36	0.46	0.25	0.17	0.06	1

Source: Authors Computation

Table 2.3 :Correlation matrix of Macro economic variables of India from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
ER	1	0.85	0.56	0.66	0.36	0.14	0.76	0.66	0.2
EXPORT	0.85	1	0.47	0.96	0.59	0.22	0.82	0.51	0.85
FOREX	0.56	0.47	1	0.66	0.44	0.86	0.39	0.62	0.56
GDP	0.66	0.66	0.66	1	0.64	0.64	0.29	0.65	0.66
IMPORT	0.36	0.59	0.44	0.64	1	0.28	0.69	0.46	0.36
INF	0.14	0.22	0.86	0.64	0.28	1	0.58	0.36	0.14
IR	0.76	0.82	0.39	0.29	0.69	0.58	1	0.26	0.76
MS	0.66	0.51	0.62	0.65	0.46	0.36	0.26	1	0.66
FDI	0.2	0.85	0.56	0.66	0.36	0.14	0.76	0.66	1

Source: Authors Computation

Table 2.4 :Correlation matrix of Macro economic variables of China from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
ER	1	0.79	0.5	0.6	0.3	0.08	0.7	0.6	0.35
EXPORT	0.79	1	0.41	0.9	0.53	0.16	0.76	0.45	0.79
FOREX	0.5	0.41	1	0.6	0.38	0.8	0.33	0.56	0.5
GDP	0.6	0.6	0.6	1	0.58	0.58	0.23	0.59	0.6
IMPORT	0.3	0.53	0.38	0.58	1	0.22	0.63	0.4	0.3
INF	0.08	0.16	0.8	0.58	0.22	1	0.52	0.3	0.08
IR	0.7	0.76	0.33	0.23	0.63	0.52	1	0.2	0.7

MS	0.6	0.45	0.56	0.59	0.4	0.3	0.2	1	0.6
FDI	0.35	0.79	0.5	0.6	0.3	0.08	0.7	0.6	1

Source: Authors Computation

Table 2.5 :Correlation matrix of Macro economic variables of South Africa from 01st April 1999 to 31st March 2022

	ER	EXPORT	FOREX	GDP	IMPORT	INF	IR	MS	FDI
ER	1	0.89	0.6	0.7	0.4	0.18	0.8	0.7	0.45
EXPORT	0.89	1	0.51	1	0.63	0.26	0.86	0.55	0.89
FOREX	0.6	0.51	1	0.7	0.48	0.9	0.43	0.66	0.6
GDP	0.7	0.7	0.7	1	0.68	0.68	0.33	0.69	0.7
IMPORT	0.4	0.63	0.48	0.68	1	0.32	0.73	0.5	0.4
INF	0.18	0.26	0.9	0.68	0.32	1	0.62	0.4	0.18
IR	0.8	0.86	0.43	0.33	0.73	0.62	1	0.3	0.8
MS	0.7	0.55	0.66	0.69	0.5	0.4	0.3	1	0.7
FDI	0.45	0.89	0.6	0.7	0.4	0.18	0.8	0.7	1

Source: Authors Computation

Blockchain Deployment in the Banking Sector: A Comprehensive Literature Review

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Abstract

Blockchain technology (BCT), a revolutionary innovation, is reshaping the global financial system. Despite being in its early stages, BCT has astounded the world by introducing a decentralized mechanism to replace traditional paper currency with digital assets. The literature on BCT within the financial industry, especially the banking sector, is experiencing significant growth. Numerous scholarly works have played a crucial role in advancing our current understanding of blockchain's role in banking. This document represents a comprehensive review of 96 research papers, aiming to offer an exhaustive assessment of related publications released online between 2017 to 2023. The article presents a succinct overview of the evolution of BCT, its impact, the challenges encountered in its implementation, and the constraints observed in its application within the banking sector. The research findings demonstrate that BCT has the potential to significantly enhance the banking sector by simplifying financial transactions, reducing costs, ensuring security, and enhancing transparency. BCT has emerged as a potent catalyst for the ongoing transformation of the banking industry. This study consolidates the insights of multiple authors into a single resource, facilitating a comprehensive understanding of the advantages and limitations of BCT within the banking sector. Additionally, it sheds light on the future research direction by examining the challenges the banking industry will likely confront as it embraces BCT.

Keywords: Blockchain Technology, Bibliometric Analysis, Banking Sector, Systematic Review, Bitcoin.

1. Introduction

Banking has undergone a considerable transformation (Wall, 2018; Gupta & Gupta, 2018) and digitization (Harshita, 2017; Park, et al., 2021); in recent years, modern banking has adopted a range of new technologies in response to rising consumer expectations, laws, economic shifts, and ongoing competition.[1] Blockchain has been dubbed a cornerstone of the fourth industrial revolution (Mushtaq and Haq, 2019) and has become a critical catalyst for banking sector growth (Khadka, 2020) by improving customers' banking experiences through reductions in transaction times from hours to seconds (Palihapitiya, 2020). It has also helped in achieving operational efficiency, simplicity, and transparency (Garg et al., 2020). As we enter the fourth industrial revolution, businesses across sectors and verticals are shifting to Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), big data, blockchain, and other modern innovations to streamline their operations (Hou et al., 2020; Chang et al., 2019). Artificial Intelligence (AI) is a multidisciplinary field of computer science that aims to develop intelligent systems capable of performing tasks that would typically require human intelligence. Machine Learning (ML) is a specialized area within the broader field of Artificial Intelligence (AI), which enables software applications to enhance their predictive abilities through learning from data and making accurate predictions without being explicitly programmed to do so. Blockchain is a e-form of database that employs cryptography to keep track of transactions (Patki and Sople, 2020). Blockchain is a secure data storage system that utilizes advanced cryptographic techniques to make it highly resistant to hacking or tampering (Chen, 2018; Nakamoto, 2008). To compromise a blockchain system, attackers would need to alter every block in the chain across all distributed copies, which is virtually impossible (Casino et al., 2019). As a technology, blockchain brings together numerous other technologies such as distributed data storage, consensus mechanisms, point-to-

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[1]IndianMoney.com 2021. Banking System in India: What You Need to Know? [online] Available at: <https://indianmoney.com/articles/banking-system-in-india-what-you-need-to-know> [Accessed 1 December 2021].

point transmission, and encryption methods (Palihapitiya, 2020). A blockchain is a decentralized peer-to-peer network that maintains a digital ledger of cryptocurrency transactions across multiple computers (Patki and Sople, 2020). The distributed architecture of a blockchain represents a departure from centralized records management systems (Bhatia et al., 2020), where records are maintained by a single entity. When it comes to information management, records managers need to carefully assess the record-keeping requirements before implementing BCT for business applications. Due to the immutable nature of blockchains, these considerations must be factored in from the outset (Bhatia et al., 2020). Blockchain has recently been utilized to provide privacy and security in peer-to-peer networks with topologies that are comparable to IoT networks (Dorri, et al., 2016). It is expected that blockchain will be used in a variety of Internet interactive systems (e.g., identity management, supply chain systems, IoT) (Casino, et al., 2019; Qi, et al., 2019). BCT is a powerful, low-cost network security solution and, as a result, significant emphasis has been placed on leveraging it to address network security difficulties and vulnerabilities and comprehend real-world security implications (Huang et al., 2021). It can record transactions in an immutable manner while also enabling independent verification and authentication of digital documents (Bhatia, et al., 2020; Vujičić, et al., 2018; Berdik, et al., 2021).

The banking industry has become an integral part of our daily lives, and the appeal of blockchain lies in its technique of validating and recording transactions. It relies on consensus among a peer-to-peer network of computers supported by complex algorithms rather than a financial institution or trustworthy third party (Khatri and Kaushik, 2021). Many people today, particularly in the financial industry, believe that blockchain offers a solution for safeguarding privacy, specifically in security aspects (Seybou Sakho et al., 2019). The banking industry recognizes the disruptive potential of blockchain to generate new revenue, boost process performance, and improve the end-user experience, while also increasing business operating risk (Reddy et al. 2020). Blockchain can remove intermediaries by automating, simplifying, and upgrading typical bank business operations, thereby boosting transaction traceability and transparency (Hassani et al., 2018). According to estimates (Fanning & Centers, 2016), financial institutions could save around $20 billion per year by using BCT to settle, administer, and cost cross-border payments. Over 90 central banks globally are actively exploring the potential of BCT, and around 80 percent of banks are planning to adopt distributed ledger technology. As a result, most banks are currently investigating various blockchain use cases, aiming to drive a significant transformation in the banking sector that could potentially challenge traditional banking practices (Shah & Jani, 2018). Different banks should execute and share a secure, distributed database of client information, which will aid in minimizing the cost, effort, and time involved in interbank transactions (Sharma, 2020).

Blockchain is a concept that is now gaining momentum within the banking industry (Guo, & Liang, 2016). As such, the significant development in the number of blockchain studies in the banking sector necessitates an examination of their contents and progress over time. To the best of our knowledge, no in-depth, comprehensive, and up-to-date review has yet been published that combines bibliometric analysis and a systematic review of the body of knowledge on the blockchain (Table 1). Hence, evaluating the application of BCT in the banking sector can be a valuable step in filling the gap identified in the literature, leading to a better understanding of the potential benefits and limitations of blockchain adoption.

Table 1: Main Features of the Previous and this Literature Review on Blockchain in the Banking Industry

Author's and years	Main topic	Aim of the review	Adoption of SLR Methodology	biblio-graphic analysis	Research questions	No. of articles	Interval time
Arjun, and Suprabha, (2020)	Innovation and Challenges of Blockchain in Banking: A Scientometric View	To investigate the impact of blockchain technologies on the banking sector.	Yes	Yes	yes	70	2008-2019
Dashkevich et al., (2020)	Blockchain Application for Central Banks: A Systematic Mapping Study	To study the use of BCT by central banks.	Yes	Yes	yes	72	2008-2020

Khatri and Kaushik, (2021)	Systematic literature review on blockchain adoption in banking	To conduct a thorough examination of blockchain adoption in banking to date and across geographical locations.	Yes	No	No	22	2015-2019
Saheb and Mamaghani, ni, (2021)	Exploring the barriers and organizational values of blockchain adoption in the banking industry	To Investigate a complete examination of blockchain's barriers and organizational principles in general by combining several qualitative research approaches.	Yes	No	Yes	35	2019-2020
Gan Q. et al. (2021)	A critical review of blockchain applications to banking and finance: a qualitative thematic analysis approach	The qualitative research looked into cutting-edge blockchain research and technology in the banking and financial industry.	Yes	Yes	Yes	76	2016-2020
Present study	Application of blockchain technology in	To study the application and impact of blockchain in	Yes	Yes	Yes	96	2017-2023

Given the dearth of review studies in the banking literature on the existing application of blockchain, we compare our work to various extant systematic literature reviews (SLRs) in the field in terms of the main topic, review goal, adoption of SLR methodology, bibliographic analysis, creation of research questions, number of publications and journals, and the period covered by the survey. Table 1 thus presents the reasons why another systematic review is required, as well as how this review differs from the others in terms of the factors involved. One of the most remarkable features of the contrasted systematic reviews is that some of them did not discuss the specific difficulties, impediments, and organizational values of blockchain in the banking industry. Some studies (Arjun and Suprabha, 2020; Saheb and Mamaghani, 2021) focused solely on the challenges of blockchain implementation in banking while others focused specifically on the adoption of blockchain in banking (Khatri and Kaushik 2021; Gan Q. et al. 2021), and Dashkevich et al. (2020) focused exclusively on central banks. Meanwhile, the present study thoroughly addresses a range of research questions, as set out in Table 2, thus making it a valuable resource for both academics and practitioners.

Table : Research Questions and Motivations

No.	Question	Motivation
RQ1	What are the trends of publication on blockchain applications in the banking industry w.r.t time, authors, journals, affiliated nations, and institutions?	It would help forecast the future Predictions by identifying annual publications, trends, top authors, journals, affiliated nations, and institutions in the application of blockchain in banking.
RQ2	What are the most impactful publications w.r.t no. of citations?	It would give researchers and practitioners a deeper comprehension of the most well-liked Blockchain articles, enabling them to combine cutting-edge studies to undertake research of the highest caliber.
RQ3	What are the applications of blockchain and its impact on the Indian banking sector?	By synthesizing the collected literature, it will aid in determining the possible application areas and impact of blockchain technology in the banking sector.
RQ4	What are the most frequently described challenges and solutions of incorporating blockchain technology in the banking sector?	The same problems that companies run into while trying to implement blockchain technology would be covered, along with solutions. .
RQ5	What are the research gaps that now exist and what future issues should be explored?	It would contribute to the advancement of blockchain research to uncover new findings.

We employed bibliometric and systematic review methodologies to explore the utilization of BCT in the banking sector, enabling us to empirically assess the extent of research activity and uncover the evolving directions of knowledge development in addressing pertinent research questions. Although the concept of blockchain was initially introduced in 2008, the banking industry saw its first academic study on the subject in 2017. Therefore, this study specifically focuses on blockchain-related research papers in the banking sector published between 2017 and 2023. To conduct our investigation, we selected the Web of Science (WoS) and Scopus databases as the primary sources, following the recommendation of Block and Fisch (2020). The decision was reached in light of WoS's status as the most comprehensive platform for scientific citation search and analysis worldwide, as emphasised by Korom (2019) and Bonilla (2015), as well as Scopus's vast and varied library of academic materials.

Six sections comprise the bibliometric and systematic review of BCT's application in the banking sector. After the introductory section (Section 1), this research study makes a significant contribution by systematically gathering, providing an overview, exploring the evolution, and explaining the functioning mechanism of BCT (Section 2). Section 3 outlines a comprehensive study plan, including the methodology section, which encompasses details on the database, keywords, and inclusion criteria. To address the research questions, a descriptive analysis is conducted using 96 relevant papers. This analysis also covers trends in publications over time, the journals in which they are published, the authors involved, their affiliated nations, and the institutions associated with the research (Section 4.1). Additionally, the study delves into the most influential publications, as measured by the number of citations (Section 4.2). The study thoroughly examines the application and impact of BCT (Section 4.3). It also sheds light on the existing challenges within the field (Section 4.4). It offers critical new insights while identifying future research areas about blockchain applications in the banking sector (Section 4.5). Lastly, this research study addresses managerial implications, providing valuable insights for academics, practitioners, and customers (Section 5) and conclusion (Section 6).

2. Overview of Blockchain and its Evolution in the Banking Industry

In 2008, the term "blockchain" was first coined by Satoshi Nakamoto as a means of facilitating peer-to-peer electronic cash transfers without the involvement of intermediaries such as banks or financial institutions. The first practical application of this concept was in the development of bitcoin (Nakamoto S., 2008). Bitcoin, a decentralized peer-to-peer digital money (Xu, M., et al. 2019) was the first blockchain-based cryptocurrency[2] and is now integrated with many other technologies and computing principles to develop new cryptocurrencies. Its evolution is outlined in Table 3. Blockchain has gained significant public attention and has a huge range of different applications (Treleaven, P., et al. 2017). Despite the polarizing nature of bitcoin, the BCT that underpins it has performed extremely well and offers a wide range of applications in both the financial and non-financial sectors (Crosby, m., et al. 2016; Lamport, 1998;

[2] "History of Blockchain – Javatpoint", 2022, www.javatpoint.com. (2022). Retrieved 29 April 2022

Yaga, D., et al. 2018). A blockchain consists of interconnected blocks of cryptocurrency, with each block containing a cryptographic hash of the preceding block, a timestamp, and transaction data, all secured through cryptography (Gupta, A., 2018). Each computer that joins the network is referred to as a node, and every node on the blockchain network has access to a complete copy of the blockchain. A distributed ledger is a decentralized network that uses many systems (nodes) to register, share, and synchronize transactions (kakavand, H., et al. 2017). As a result, it works similarly to a ledger system, where each data exchange is stored. This is also known as a triple entry (double-entry + cryptography) bookkeeping system (Sankaranarayanan, G., & Rajagopalan, K. K.,2020). The network's consensus process controls how user verifications are carried out. The proof-of-work (POW) consensus mechanism is a widely used tool in blockchains, including the bitcoin network. However, it has been scrutinized for its high energy consumption (O'dwyer & Malone, 2014). A blockchain is a decentralized ledger that stores data in the form of blocks, with each block comprising a collection of information (Khadka, R., 2020). Blockchain has emerged as a new paradigm in banking, attracting attention as cutting-edge technology that can shape the future (Yoo. S., 2017). Its deployment in major institutions worldwide demonstrates its potential to revolutionize banking practices (Patki & Sople, 2020). Although this new technology is still in its early stages (Khadka, R.,2020) and is yet to overcome various difficulties and limitations, major international banks and other financial behemoths have rushed to lay the groundwork and invest money in technological research and development (Chang, et al., 2020). Banks have already adopted know your customer (KYC) and smart contracts based on blockchain (Garg, et al., 2020; Gupta, & Gupta, 2018). The diagram presented below (Figure 1) provides a visual representation of the evolution of BCT within the banking sector, starting from 2016. It also highlights the recognition of blockchain's significance by Indian policymakers, incorporating insights from stakeholders on a global scale.

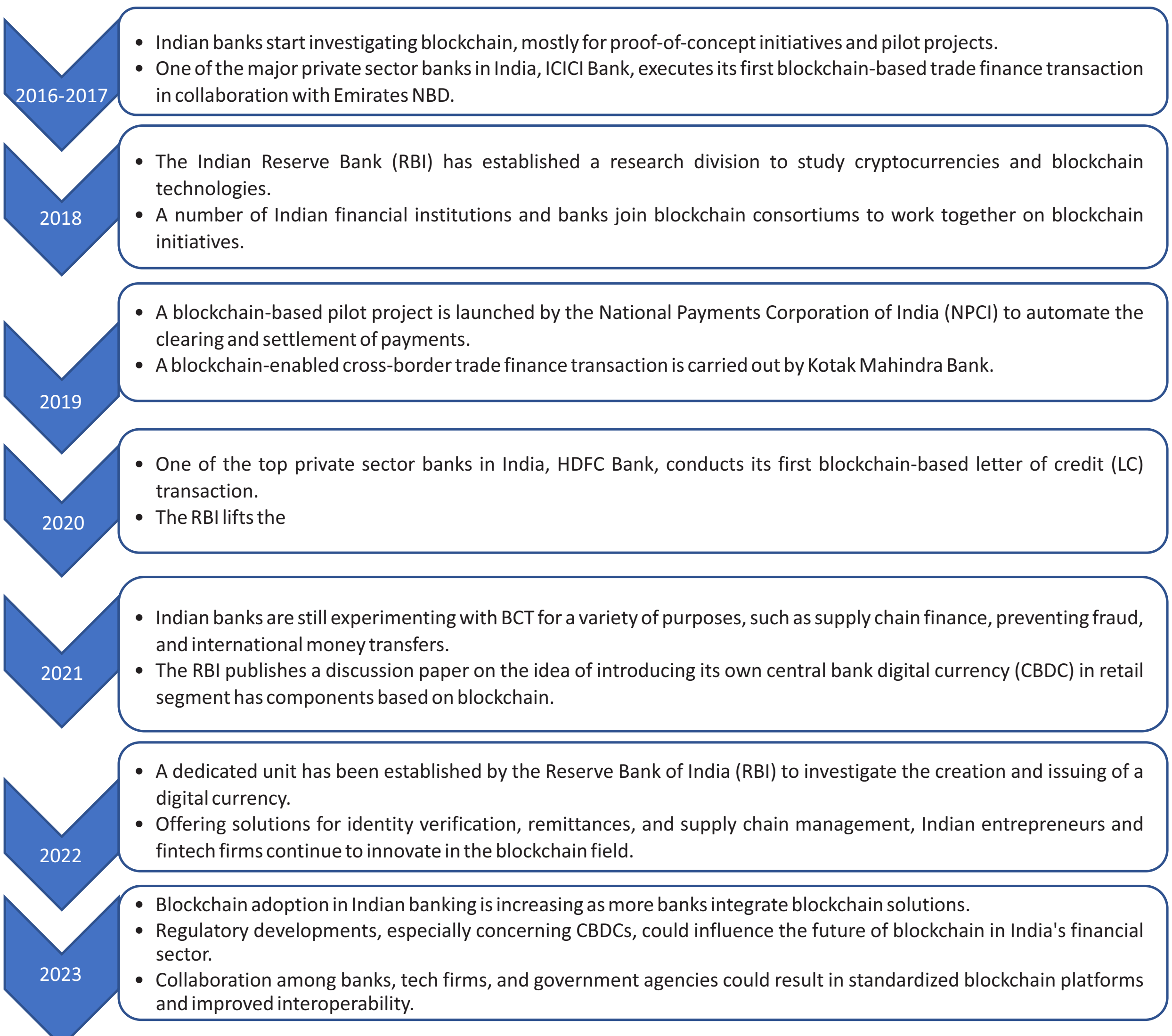

Figure1. Evolution of the Blockchain in Indian Banking Sector
Source: authors'

3. Research Methodology – Database, Keywords, and Inclusion Criteria

A bibliometric and systematic review of the literature is employed to characterize all the papers produced in a certain field of study in terms of productivity, number, quality, connection, and citations, as well as to analyze the intellectual progress within that field (Tepe, et al., 2021; Zupic, I., & Cater, T., 2015; Khatib et al., 2021; Fisch & Block, 2018). We compiled a sample of 96 peer-reviewed journal articles using the bibliometric method, which is a quantitative/statistical tool for analyzing the publishing trends of research articles and other scholarly documents (Randhawa et al., 2016; Knoll & Matthes, 2017; Paul & Mas, 2019). The PRISMA principles established by Moher, Liberati, Tetzla, and Altman were followed as these enable a higher level of accuracy in determining the sample database (Moher et al., 2009).

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was issued in 2009. It was created to assist systematic reviewers in reporting why the review was conducted in a transparent manner. The first stage in the PRISMA technique involved identifying articles on blockchain in banking (figure 2). A search for the terms (("Blockchain technology") AND ("Banking" OR "Banking Sector" OR "Banking Industry" OR "Banking System" OR "Bank" OR "Central Bank")) as a topic generated a total of 404 records from the databases interrogated. After removing data based on the English language, Document Types, and Publication Stage, there were only 320 articles remaining (Table 3).

Screening then led to the removal of 45 duplicates, thereby reducing the articles selected for further analysis to 275. Next, an analysis was conducted on the remaining papers to determine if they were relevant to the paper's goal. To do this, the titles, abstracts, and complete texts were read. Lastly, 96 articles were the subject of bibliometric analyses. Following this, the records were exported to the web-based interface for bibliometric analysis (Aria and Cuccurullo 2017) in the R Software Biblioshiny package to visualize the complicated structures for statistical analysis (Liu, et al.,2020; Glanzel, W. 2005; Rosado-Serrano et al., 2018), conduct a thorough and comprehensive examination of the knowledge amassed over time (Gilal et al., 2019), and provide information concerning the expansion of literature and flow of knowledge within a subject of academic study (Zupic, I., & Cater, T., 2015).

Table 3. Details of Document Collection Based on Search Criterion

	Web of Science	**Scopus**
Search Criteria	(("Blockchain technology") AND ("Banking" OR "Banking Sector" OR "Banking Industry" OR "Banking System" OR "Bank" OR "Central Bank"))	(("Blockchain technology") AND ("Banking" OR "Banking Sector" OR "Banking Industry" OR "Banking System" OR "Bank" OR "Central Bank"))
Number of documents	131	273
Selection Criteria	Languages: English. Document Types: Published Articles. Publication Stage: final	Languages: English. Document Types: Published Articles. Publication Stage: final
Number of documents	130	190
Data collected on 04/10/2023		

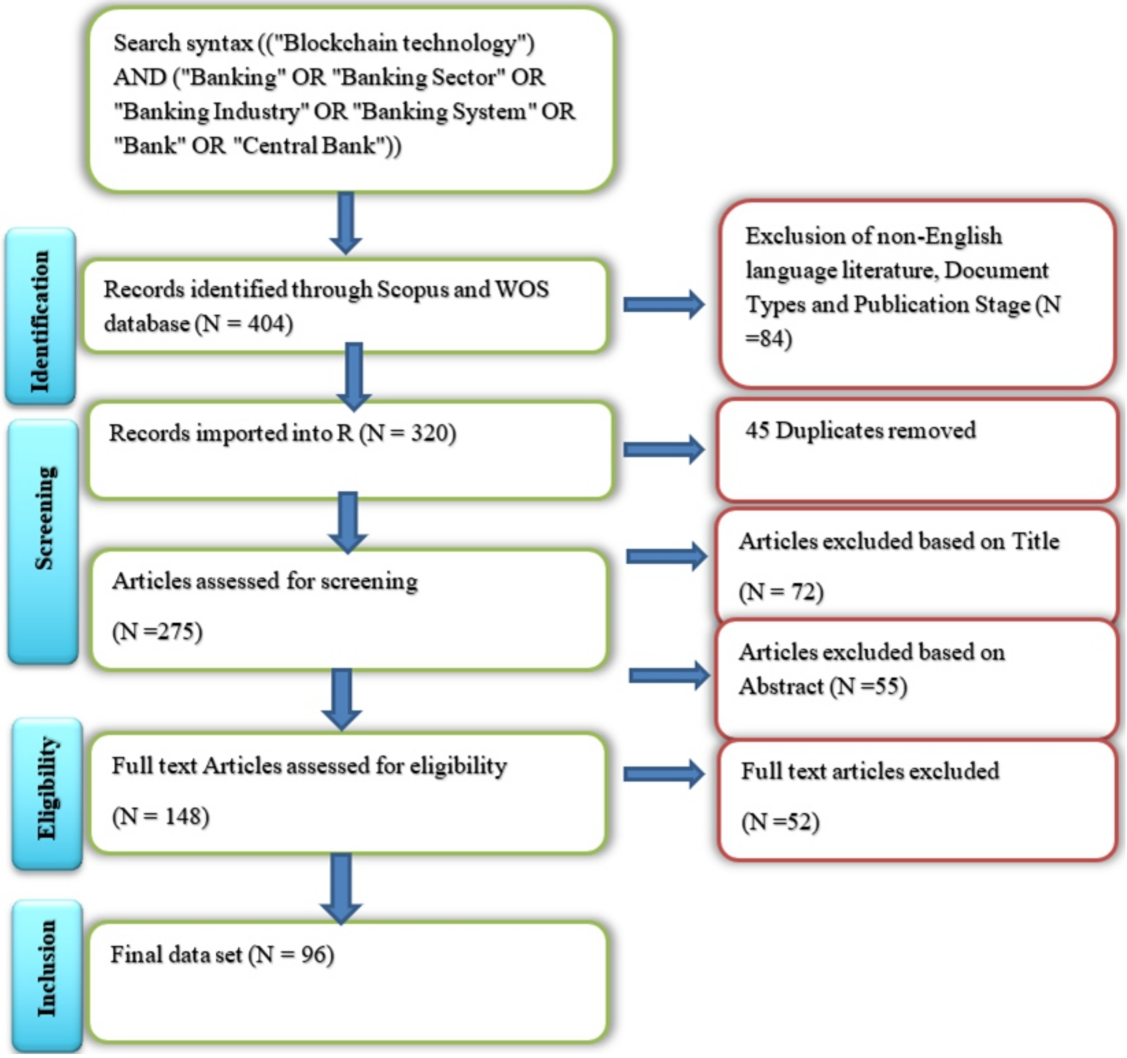

Figure 2. The PRISMA flow diagram showing the data retrieval process

4. Descriptive Analysis

The evaluation of bibliometric results commenced with a comprehensive analysis of key bibliometric metrics. This section provides an insightful exploration of the prevailing publication trends within blockchain applications in the banking sector, focusing on aspects such as time, notable authors, influential journals, affiliations, and associated nations. It effectively addresses the first research question (RQ1), as delineated in Table 2. The investigation encompassed a multifaceted assessment of the following dimensions: (1) annual publication patterns, (2) prominent authors, institutions, and countries, (3) leading journals, and (4) collaborative networks between countries. Additionally, various other pertinent topics were also encompassed within this comprehensive analysis.

4.1 Trends of publication on blockchain applications in the banking industry with respect to time, journals, authors, affiliated nations, and institutions

Figure 3 illustrates the annual growth in publications concerning blockchain within the banking sector, spanning from 2017 to 2023. The figure highlights a remarkable progression in the number of publications, commencing with a mere three articles in 2017 and surging to 24 in 2022, with a consistent upward trend that commenced in 2019.

Noteworthy is the period from 2019 to 2022, which accounts for a substantial 68.75 percent of the total publications (66 out of 96) in this specific domain. These statistics underscore a marked surge in recent years, signifying the increasing recognition of blockchain applications within the banking industry. An annual growth rate of 39.39% further highlights the significant dynamism in this field. This growth rate underscores that BCT remains in its nascent stages and is poised to disrupt the business landscape. Researchers are increasingly enthusiastic about unearthing its varied use cases and exploring the potential impacts of its adoption on the banking sector.

Based on a descriptive analysis of the fundamental data, as presented in Table 4, it is evident that the average number of citations per document stands at 11.03. Furthermore, there are a total of 17 single-authored texts in this dataset. These findings prompted the authors to direct their subsequent research focus towards the aspects of citations and author-related information.

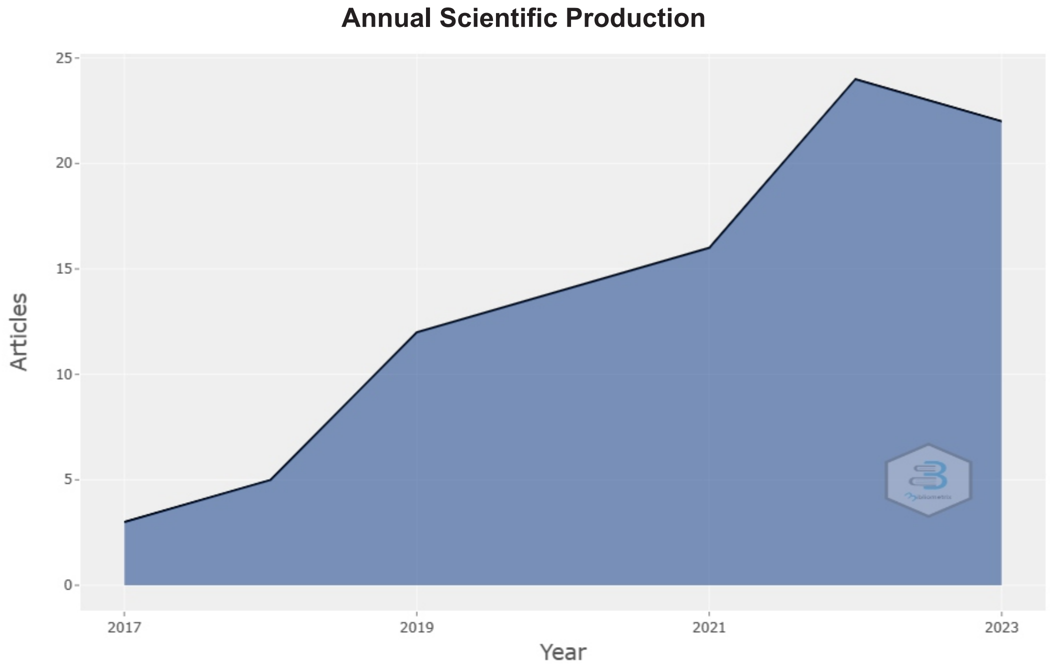

Figure 3. Annual Publication Trend From 2015-2021. Source: Authors' Elaboration Using Biblioshiny

Table 4: Basic Information on Published Papers and Their Characteristics

Data information	**Description**	**Frequency**
1. Timespan	Total time-period of articles	2017:2023
2. Sources (Journals, Books, etc)	The frequency distribution of all the sources	84
3. Documents	Total number of articles filtered from database	96
3.1 Average citations per documents		11.03
3.2 Average citations per year per doc		3.275
4. Document Contents		
4.1. Keywords plus (ID)	Total number of unique keywords in all the articles	141
4.2 Author's Keywords (DE)	Number of expressions/phrases that appear in the articles cited by the author	349
5. Authors		
5.1. Authors	Total number of authors	269
5.2. Authors Appearances	Frequency distribution of authors	289
5.3. Authors of single-authored documents	Total number of individual authors per article	17
5.4. Authors of multi-authored documents	Total number of authors of multi-authored documents	252

Source: *Authors' elaboration using Biblioshiny*

Table 5 provides an overview of the journals where the analyzed studies were published. Out of the 96 papers under scrutiny, they found their way into 84 unique journals. The top 15 journals, contributing to 27 papers in total, represented 28.12 percent of the corpus. Among these journals, "Financial Innovation" and "Journal of Advanced Research in Dynamical and Control Systems" led the way, each featuring 3 articles. Close behind were "IEEE Access," "International Journal of Business and Globalization," and "International Journal of Digital Accounting Research," with 2 articles each.

Table 5: Leading Journals Publishing on Blockchain in Banking

Sources	Articles	Impact Factor	H-Index
Financial Innovation	3	6.79	2
Journal of advanced research in dynamical and control systems	3	0.129	1
IEEE access	2	3.55	2
International journal of business and globalization	2	0.40	1
International journal of digital accounting research	2	2.14	1
International journal of electronic finance	2	0.179	1
International journal of supply chain management	2	4.725	1
Journal of financial economic policy	2	1.053	1
Journal of theoretical and applied information technology	2	0.195	1
Technological forecasting and social change	2	10.884	2
Advances in distributed computing and artificial intelligence journal	1	N/A	1
AJIL unbound	1	0.57	1
Amfiteatru economic	1	2.304	1
Behaviour & information technology	1	3.32	1
Bulletin of the atomic scientists	1	1.300	1

Source: *Authors' elaboration using Biblioshiny*

Our data indicates that 269 people have published papers on blockchain applications in the banking industry. These authors are affiliated with 145 institutions in 36 different countries. Table 6 lists the top contributors based on the number of publications and includes the top 15 authors who published papers on blockchain applications in banking research between 2017 and 2023. The top four authors in the list are Abdukaeva A (n=4), Elshin L (n=4), and Safiullin M (n=4).

Additionally, Table 6 lists the universities that will be most productive between 2017 and 2023 in terms of both the quantity and quality of publications. The most active institutions by the amount of work on blockchain are Alex Ekwueme Fed University (n=4), Hunan Normal University (n=4), and Hunan University (n=4), followed by International Islamic University Malaysia (n=4), PSG College Technology (n=4), and University of Bari Aldo Moro (n=4).

The top nations for authors who have written about blockchain applications in the banking industry are also shown in Table 6. India tops this list and therefore has the most articles on the subject (30), followed by the China (22), USA (16), Italy (7), and South Korea (6). A possible explanation for India's clear lead with a total of 30 publications could be that several corporations in the cross-border payments, supply chain financing, digital identification, trade finance, loyalty, and bill discounting sectors have experimented with using blockchain. A stock exchange, conglomerates, and various Indian banks feature among India's early blockchain adopters. Table 6 further illustrates how blockchain research is still in its infancy in several nations, including Egypt, Germany, and Hungary.

Table 6: Top Authors, Affiliations, and Countries Publishing on Blockchain in the Banking Sector

Authors	TP	Affiliations	TP	Country	TP
Abdukaeva A	4	Alex Ekwueme Fed University	4	India	30
Elshin L	4	Hunan Normal University	4	China	22
Safiullin M	4	Hunan University	4	USA	16
Li Y	3	International Islamic University Malaysia	4	Italy	7
Othman A	3	PSG College Technology	4	South Korea	6
Alhabshi S	2	University of Bari Aldo Moro	4	Estonia	5
Alhabshi S	2	AL Qasimia University	3	Nigeria	5
Kumar V	2	Chitkara University	3	Saudi Arabia	5
Luo J	2	Cyprus International University	3	UK	5
Sarfraz M	2	Eötvös Loránd University (ELTE)	3	France	4
Savushkin M	2	Helwan University	3	Malaysia	4
Wu Y	2	King Saud University	3	Romania	4
Abbasi A	1	National Taiwan University	3	Egypt	3
Abbasi G	1	Tallinn University of Technology	3	Germany	2
Abdeen M	1	University Utara Malaysia	3	Hungary	2

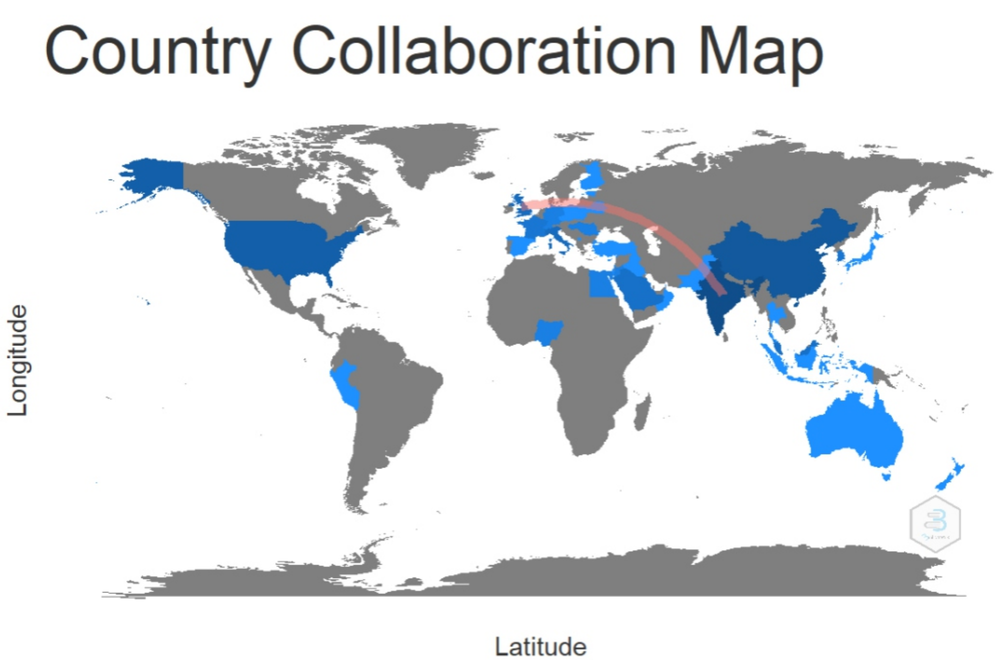

Figure 4. *Country Collaboration Map. Source: Authors' Elaboration Using Biblioshiny*

Global research collaborations are depicted in figure 4. On the map, countries engaging in research collaboration are indicated in blue. The pink bands connecting the countries represent the level of collaboration among authors. It is fascinating to see how the countries with the most blockchain publications have collaborated in this way. While the connections between countries such as the USA, China, France, and New Zealand have resulted in fundamental collaborations between nations that are sometimes very far apart and have failed to develop the subject, their joint efforts can nevertheless lead to market collaboration and policy sharing.

4.2 Most impactful publications with respect to number of citations

The most effective method for mapping a research paper's impact is to employ citation analysis (Tsay, 2009). An article with a high citation count is considered to have more influence on a certain subject than a study with a low citation count (Merigo et al., 2016). This section aims to provide answers to research question 2 (RQ2). Table 7 lists the most cited papers on blockchain in the banking industry. According to the total citations, (Kou et al., 2021) paper is highly cited with 181 citations. This is followed by (Dierksmeier & Seele, 2016) with 86 citations. (Z. Chen et al., 2017a) and (Cuccuru, 2017) are the third most highly cited paper with 74 citations each.

Table 7: The Most Cited Papers in Blockchain in the Banking Sector

Author(s) and year	Objective (Obj) & Methodology (M)	Findings	TC & (TC Per Year)
(Kou et al., 2021)	Obj-Identified the most important Fintech-based investment alternatives to improve the financial performance of European banks M- IT2 fuzzy DEMATEL and a comparative analysis is performed using the fuzzy VIKOR method, followed by a sensitivity analysis.	'Competitive advantage' stands out as the key factor in Fintech-based determinants, with 'payment and money transferring systems' as the top investment choice. European banks should prioritize these alternatives to attract customers, enhance receivable collection, and reduce costs.	181 (60.33)
(Dierksmeier & Seele, 2016)	Obj-Addressed the impact of BCT on the nature of financial transactions from a business ethics perspective. M-Review study	Cryptocurrencies disrupt finance, raise ethics concerns, enable illicit activities. Global regulation seeks balance but may limit independence. Evolving perception, Bitcoin crisis, uncertainty about future.	86 (14.33)
(Z. Chen et al., 2017a)	Obj-Analyzed the Industrial and Commercial Bank of China (ICBC) and Citibank. It analyzes the strategies, organizations, HR systems, and product innovations adopted by these two banks in response to the impact of FinTech. M-Adopted a comparative case study method	Described the difficulties encountered by the Chinese banking industry and proposes some feasible ways to upgrade. “Technology power” will become the core competitive concept for the financial institutions of the future.	74 (10.57)
(Cuccuru, 2017)	Obj- Discussed Bitcoin system and implementation of BCT with smart contracts M-Review study	BCT, with 'smart contracts,' streamlines digital transactions, but complexity limits adaptability. Hybrid approaches balance control, crucial for smart contract success. Finance leads private blockchain projects.	74 (10.57)
(Garg et al., 2021)	Obj-Assessed the perceived business benefits of implementing BCT in banking and identifies factors for measurement. M- EFA- SPSS 20, CFA, -AMOS 26.0. 291 people were interviewed for primary data.	Blockchain customization for banks cuts implementation costs, meeting needs like lower transaction costs, regulatory compliance, efficiency, security, and fast, transparent services for clients	61 (20.33)

(Huberman et al., 2021)	Obj-Created a model for Bitcoin's distinctive decentralized economic system , where independent miners operate the payment system with high reliability. M-Review study	Decentralization prevents monopoly pricing, ensuring competition and open entry maintain fair user fees. Users control priority and processing times through the transaction fee market.	37 (12.33)
(T. Chen et al., 2022)	Obj-Studies the application of fractional calculus system in the financial system of blockchain supply chain M-Conceptual study	A novel 3D blockchain supply chain finance model combining BCT and fractional calculus overcomes traditional model limitations, offering valuable insights for supply chain analysis and credit banking.	35 (8.75)
(Fauzi et al., 2020)	Obj-Explored cryptocurrency opportunities like technology security, low transaction costs, and high returns. It delved into legal aspects,	The paper asserts cryptocurrencies' permanence and underscores their future hinging on user and industry evaluation.	29 (7.25)
(Trivedi et al., 2021)	Obj- Focused on the usage of BCT in the financial and e -finance sectors. M-Systematic Literature Review	Blockchain has various unexplored application in finance sector and also there is a scope of improvement in technology. Also, the technology is unregulated, thus, it is still in its nascent stage and a lot is to be done in the field.	26 (8.66)
(Procházka, 2018)	Obj- suggested, compared, and assessed potential accounting models under IFRS. M- Review study	Fair value accounting is essential for users investing in cryptocurrencies. The paper discusses scenarios in which cryptocurrencies may be treated as currencies, despite not being fiat money according to financial regulators.	26 (4.33)

4.3 The applications of blockchain and its impact on the Indian banking sector

The declaration of ₹500 and ₹1000 notes as illegal tender in a matter of seconds on the eve of November 8, 2016, created significant disruption for people in India (Manda and Polisetty. 2018). Hence, it served as a significant catalyst for the country's transition to digitization (Harshita, 2017). Companies in India, notably financial institutions, are increasingly interested in using the technology by developing use cases and conducting pilot tests. According to this research, the most recent country trends show that India is in first place, with the most publications. Consequently, we addressed the application of blockchain and its impact on the Indian banking sector, which answers research question 3 (RQ3).

The world is beginning to change, and BCT is enabling this evolution. Almost every organization is racing to capitalize on the supposed benefits of the blockchain phenomenon, and many are attempting to develop private blockchain and cryptocurrency implementations. BCT can disrupt the $5 trillion banking industry by eliminating the need for intermediaries in core banking services such as settlement systems, payments, and clearance. According to Global Data,[3] in 2020 and beyond, the widespread adoption of BCT is expected to accelerate the growth of the Indian banking sector; for example, as part of their digital transformation efforts, several major banks are proactively investing in BCT. In the race to implement BCT, not even public sector banks are exempt. For example, SBI is experimenting with BCT for trade finance, reconciliation, and remittances (Garg, et al., 2020). The firm has already implemented KYC solutions and smart contracts, which are based on blockchain. Since its inception, it has been a member of the "Blockchain" consortium, focusing on new developments and implementing blockchain-based financial services. The

[3]India's banking sector to see increased use of blockchain technology in 2020 and beyond. Available at https://www.globaldata.com/indias-banking-sector-to-see-increased-use-of-blockchain-technology-in-2020-and-beyond-says-globaldata/#:~:text=With%20several%20leading%20banks%20proactively%20investing%20in%20blockchain,says%20GlobalData%2C%20a%20leading%20data%20and%20analytics%20company.

bank completed its first blockchain project, which enabled its members to share details on KYC, combating the financing of terrorism, and anti-money laundering (Gupta, & Gupta, 2018). The global financial and banking system, in particular, could stand to gain the most from the adoption of this innovative distributed ledger technology. By the end of 2013, the technology underlying blockchain and distributed ledger had attracted the attention of banks and start-ups.[4] Figure 5 shows that the banking and financial industry uses BCT more than other industries.

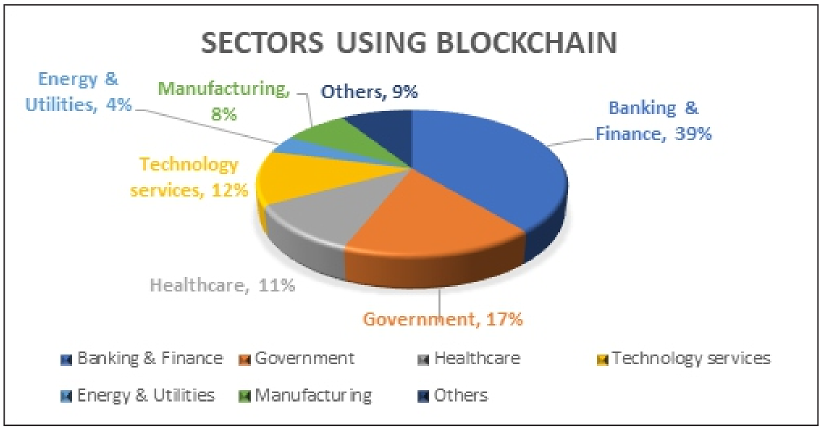

Figure 4. Sectors Using Blockchain

Blockchain is a new method for managing a database between multiple individuals that is based on numerical and economic principles free from any demand from a central authority (Sharma, D. 2020). Since 2008, it has become the most intriguing and demanding study topic. (Chang, et al., 2020) studied the critical challenges and ethical issues associated with BCT and discussed the growth of blockchain in the financial sector. Their study revealed that knowledge-hiding is the most serious problem and with the help of the theory of planned behavior it was suggested that "knowledge hiding was due to affective, cognitive, and behavioral evaluations." To address the existing barriers to blockchain adoption, experts have also provided several recommendations. (Schuetz & Venkatesh, 2019) reviewed the literature on financial inclusion, blockchain, and its adoption in India. According to their report, four obstacles must be overcome: geographical access, high costs, inadequate financial products and services, and financial illiteracy. To gain a better understanding of how blockchain-based innovations are being adopted in rural India, they devised a study agenda focused on the factors that influence adoption, as well as adoption trends and outcomes. Their paper contributed to the theory by identifying information gaps that needed to be filled for rural Indians to gain financial inclusion. (Manda & Polisetty, 2018) produced an overview of some of the ramifications of blockchain in India that had been explored up to that point in terms of adopting the technology, both within and outside the financial domain. Their study identified that blockchain is a potentially disruptive business technology that remains in its infancy. Indian companies, especially financial institutions, are increasingly interested in adopting the technology by developing use cases and conducting pilot tests. Aside from companies, however, governments and agencies must change their mindset to utilize BCT. Patki & Sople (2020) studied the application of BCT and the barriers to implementation it faces in the Indian banking sector. Their research examined how existing BCT assists banks in monitoring and controlling the banking process effectively and efficiently. Only India's leading banks and fintech companies were included in the study. In light of the study's findings, some Indian banks have already begun to use BCT and have seen some promising results. However, they are also experiencing some challenges in integrating and applying this new technology. Financial institutions in India are at different stages of introducing BCT. Gupta & Gupta (2018) provided an overview of BCT and its advantages, specifically focusing on its applications in the Indian banking sector. The paper explored various challenges and analyzed the global impact of BCT on the banking industry. The authors concluded that fintech companies and start-ups should closely collaborate with government agencies and regulators to ensure the legal and regulatory system supports blockchain applications. They also recommended that India embrace BCT, stating that the time is ripe for it. Polyviou, et al. (2019) outlined five everyday use cases in the financial sector where BCT is expected to have a significant impact: customer profile management, collaboration security, KYC, product personalization and insurance claims management, and credit risk scoring for SMEs in the financial services chain. The paper outlined how, according to blockchain enthusiasts, these applications are likely to become more popular in the financial sector over the next decade. In their study, Yli-huumo et al. (2016) examined BCT's current research,

[4] .Blockchain in banking: a measured approach. cognizant. Available at https://www.yumpu.com/en/document/read/56563192/o-blockchain-in-banking-a-measured-approach

challenges, and potential prospects from a technical standpoint by selecting 41 key papers from a scientific database. Their findings revealed that unlike other blockchain applications, the majority (80%) of the research focused on Bitcoin. While most existing studies have highlighted the advantages of BCT, many of its scalability challenges remain underexplored. In their study, Cocco et al. (2017) examined the opportunities and obstacles linked to using BCT in the banking sector. The researchers analyzed the actual performance of the Bitcoin system to gain insights into the blockchain's potential to improve the financial system while also identifying its primary limitations. Their findings suggested that addressing the weaknesses of the Bitcoin framework, and consequently, the BCT, could enhance the security and efficiency of managing the financial system.

The digitization of the banking sector has unquestionably brought many advantages to banks and customers (Barone, 2021). Banks that digitize will increase their revenues while also reducing costs, while on the other side, consumers using digital channels benefit from the convenience and flexibility they offer (Shah, & Jani, 2018, Shah, 2021). Different banks should create and share a safe database of client information to help reduce the time, cost, and effort involved in interbank transactions (Gupta, & Gupta, 2018). Fintech start-ups using cutting-edge technology and blockchain threaten banks with their lower-cost, more transparent, and faster services. One of the most fundamental advantages of blockchain is its immutable transaction background; as such, any completed transaction is irreversible (Iskandar, K. 2021), which will reduce the number of crimes against financial institutions. Other advantages of BCT in the banking industry include increased performance, increased security, faster transaction times, unchangeable records, and no third-party intervention, all of which reduce costs (Garg, et al., 2020). The use of blockchain in banking has changed the industry in various ways. Payments, fundraising, settlement systems, security monitoring, loan credit, and trade financing have all been impacted. In using blockchain, banks will also focus on other activities aside from monitoring payment transactions (Sankaranarayanan, & Rajagopalan, 2020). Blockchain leads to decentralization (Yaga et al., 2018); as a result, nobody keeps track of the ledger. It can also provide financial services such as payments with no third-party involvement. As such, blockchain has transformed the banking industry by eliminating the need for gatekeepers in the loan and credit industries. It has also made borrowing money safer and provided lower interest rates (Patki & Sople, 2020). Blockchain affects the settlement and clearing system, where a distributed ledger will reduce operational costs and allow for more real-time transactions between financial institutions (Khadka. R., 2020). Initial coin offerings (ICOs) have changed how people raise money. A new funding model allows unbundling access to capital from capital-raising resources and businesses. Public blockchains are used to store securities such as shares, stocks, and bonds. As a result, capital markets become more productive (Casino et al., 2019).

The preceding statements demonstrate that blockchain can be implemented in a variety of banking activities. Table 8 contains a summary of the literature review based on BCT application and its impact on the banking industry, while some of the major impacts of BCT on the banking industry are discussed in Table 9.

Table 8: Summary of Literature Review Based on Blockchain Technology Application and Impact on the Banking Industry

Author & Year	Objectives (Obj) & Method (M)	Findings
Yli-hummo, et al., 2016	Obj-To gain a technical understanding of current research issues, difficulties, and prospects in BCT. M- Systematic mapping study.	Most of the research in the field of blockchain is centered on identifying and remedying its privacy and security vulnerabilities. However, many of the proposed solutions lack concrete evidence of their effectiveness. Additionally, other scalability issues that are associated with blockchain, such as throughput and latency, have been relatively unexplored.
Guo, & Liang, 2016	Obj-The applicability of BCT and its prospects in China's banking sector were investigated and propose the urgent establishment of a “regulatory sandbox” and the development of industry standards. M- Conceptual study	Blockchain applications encourage the development of "multi-center, weakly intermediated" scenarios, which will improve banking efficiency.
MacDonald et al., 2016	Obj-The primary focus is on the economics of why banks operate as businesses and how technological progress influences transaction costs. M- Systematic review and theory building methods	Allows competitive banks to move banking transactions from centralized to decentralized markets.

Cocco, L., et al.,2017	Obj-Studied the obstacles and opportunities associated with using blockchain in the banking industry M- Conceptual study	The results reveal that the Bitcoin system's overall efficiency can only improve after it overcomes its two primary limitations: the limited number of transactions per block and the excessive processing power it now requires.
Gupta & Gupta, 2018	Obj-To give an overview of BCT and its advantages, and challenges, with a focus on its application in the Indian financial industry M- Conceptual study	Security, privacy, and scalability are some of the issues that must be addressed for blockchain to be commercially viable. Blockchain should be made more widely known through various training and seminars, as well as by incorporating it into educational institutions' curricula.
Manda & Polisetty, 2018	Obj-Gave an overview to look at some of the blockchain ramifications in India in terms of adopting the technology. Both within and outside the financial domain. M- Conceptual study	Apart from the Businesses that are using BCT, Governments, Regulators, and Agencies require a large-scale attitude shift to use the technology. Although progress is being made, large-scale industrial uses of the technology are not yet available in India.
Maguire & Chia, 2018	Obj-answered the question Could a viable KYC utility be built on the blockchain? M- Conceptual study	A blockchain KYC utility can reduce the time and expense associated with KYC processes while also delivering greater transparency to regulators and a better consumer experience.
Ikeda & Hamid, 2018	Obj-Reviewed the traditional BCT and suggest a revolutionary economic system in which such high-value-added commodities are exchanged without the use of money or a middleman. M- Conceptual study	Blockchain applications have immense potential to revolutionize our society and propel us towards a seamless system where most of the logistical delays and bureaucratic red tape can be eradicated. This novel peer-to-peer system allows individuals to engage in a new form of economic activity that combines elements of barter, sharing economy, and capitalism, leading us towards a frictionless economy.
Shah, T., & Jani, S., 2018	Obj-The paper's goal is to describe the architecture of blockchain, as well as how it works and what applications it has in the banking industry. M- Conceptual study	They concluded that regulators should get involved, interfere early, and shape innovation. This will enable people to comprehend technology, assess risk, and develop custom solutions to their specific problems.
Schuetz & Venkatesh, 2019	Obj-Studied the literature review on financial inclusion, blockchain, and its adoption in India and also analyzed the financial exclusion, how the four challenges of geographical access, inappropriate banking products, high cost, and financial illiteracy to be overcome M- Conceptual study	The findings suggest that BCT can connect rural Indians to local and global supply chains by addressing financial inclusion concerns.
Chang, et al., 2020	Obj-Studied the critical challenges and ethical issues associated with BCT and discussed the blockchain growth in the financial sector. M- Qualitative research- interview method Primary data was collected from 16 experts.	The study showed that knowledge-hiding is the most serious problem and with the help of TPB (theory of planned behavior) where it was suggested that "knowledge hiding was due to affective, cognitive, and Behavioral evaluations". To address the existing barriers to blockchain adoption, experts also provide several recommendations.

Garg, et al., 2020.	Obj-The objective of this research is to assess the alleged business advantages of using BCT in the banking industry. Establish criteria to quantify these benefits in the banking sector. M- EFA- SPSS 20, CFA, -AMOS 26.0. 291 people were interviewed for primary data.	Blockchain can be customized to meet the needs of a banking environment, lowering the cost of implementation. These requirements could include lowering transaction costs, meeting regulatory standards, improving efficiency and security, and providing clients with speedy and transparent services.
khadka, R., 2020.	Obj-Studied the Blockchain's impact on the banking system, as well as its obstacles and constraints. M- A literature review was conducted	Many banking sectors could benefit from BCT. It can enhance and transform cross-border payments, capital markets, trade finance, financial reporting, and compliance.
Palihapitiya T., 2020.	Obj-The study aimed to examine the influence of the Blockchain platform on the banking business. four consensus algorithms were discussed in this paper. M- Conceptual study	Payment clearing, Credit information systems, lending systems, smart contracts, auditing systems, digital verification, crowdsourcing, and Know Your Customer (KYC) in banking are all revolutionized by this technology.
Sharma, D., 2020	Obj-The main motive of the study is to investigate the impacts of blockchain on the banking industry via cryptocurrency. M- Conceptual study data from books, journals, newspapers, magazines, and online websites	The findings of the study demonstrate that the technology under investigation has already had a significant impact on the banking industry and that it is in the early stages of modifying several industries, with the possibility of them changing on their own in the next five to ten years.
Rajnak, V., Puschmann, T., 2020	Obj-To find out more about the impact of blockchain on banking business models. Derives model hypotheses with three generic value disciplines of banks “operational excellence”, “customer intimacy” and “product leadership” M- t test, PCA, and Regression analysis were applied. Primary data from 104 start-up companies and financial institutions.	The findings confirm the notion that BCT will have an impact on all three value disciplines in the future.
Patki & Sople, 2020	Obj-The deployment of BCT and its issues in the Indian banking sector were investigated. M- Interviews of executives through structured questionnaires. Generated primary data from top banks, Fintech companies, and banking consultants. secondary research,	Several Indian banks have started leveraging BCT and are experiencing its benefits. However, they are facing certain challenges in adapting and implementing this new technology. In the case of cross-border transactions involving different blockchain systems from different countries, legal and standardization issues must be thoroughly examined and addressed to ensure compatibility.

Table 9: Impact of Blockchain Technology on the Banking Industry

Use cases	From	To
Trade Finance	Drafting a letter of credit for making a cross-border payment, is a complicated process as it involves lots of paper formalities and is time-consuming (Gupta, A., & Gupta, S., 2018).	The importer, exporter, and their banks can share the information on the privately distributed ledger, and they can view the data related to their transactions and the actions worked on their system as well (Crosby et al., 2016; Shah & Jani, 2018).
Know Your Customer (KYC)	Many financial institutions' KYC processes are time-consuming, inefficient, and duplication of efforts, labor-intensive manual processes, and the possibility of error (Maguire & Chia, 2018).	BCT would eliminate this duplication of efforts (Xu, et al., 2019). It improves the efficiency of the operation and eliminates the need for repetitive tasks (Gupta, A., & Gupta, S.,2018). All the participants can view the transactions and the information. This way, once the information is processed, it can be accessed by the other banks (Chang et al., 2019).
Blockchain Technology in Capital Markets	Lack of control over the fair disclosure of financial information, long time to settle the accounts, manipulation of security prices, a large number of intermediaries, time-consuming process, high risk, and slow procedure (Yoo, 2017; Gupta, & Gupta, 2018).	99% of conventional three-day processes can be reduced to just ten minutes using blockchain (Ikeda & Hamid, 2018). According to a study conducted by Goldman Sachs investment bank, blockchain will save the stock market $6 billion per year (Khadka, R., 2020; Series, C.M. (n.d)).
Cross-border payments	The banking industry uses the SWIFT network . Visa-direct is another service that facilitates real-time cross-border transactions. However, it is a time-consuming and expensive procedure.	Money is transferred directly from one bank to another through blockchain, removing the need for two additional correspondent banks and minimizing transaction costs and time (Achanta, R., 2018; Qiu et al., 2019).
Monitoring of Consortium-Accounts	The borrower makes several transfers in transferring funds from one bank to another, the lender is unable to monitor the final use of funds.	Blockchain has the power to prevent such practices and the diversion of funds (It would result in a decrease in non-performing assets because banks will be able to monitor how funds are spent Every member of the group can have an eye on the movements of funds that enhance the control system.
Blockchain in Banking for Accounting and Auditing	Regularly preparing reports following the law takes time and effort.	Blockchain can automate reporting and save time and money. All the records are open and unchangeable when using blockchain. Smart contacts are a feature of this system that can automatically pay invoices

4.4 Challenges and solutions of blockchain technology in the banking sector

Although the future of blockchain in the banking sector appears bright, we must not overlook the reality that it faces numerous obstacles that render it particularly vulnerable. Usually, it takes time to develop new technology and for it to be fully embraced by the industry. Although many companies have come to rely on blockchain to solve many of the issues they face, various challenges remain. Hence, this section answers research question 4 (RQ4) and a synoptic view of the challenges and their solutions are presented in Table 10.

4.4.1 Scalability

Scalability problems have emerged as blockchain technologies have increased in popularity (Andoni et al., 2019). When Nakamoto first implemented blockchain, the maximum block size for data storage was 1 MB (Nakamoto, 2009). It typically takes 10 minutes to add a new block to the blockchain (Monrat et al., 2019). As a result, each block has only 1 MB of bandwidth, while the online capacity is limited to eight transactions per second (Zhang, et al., 2020). The average wait time for a transaction has increased to 29 minutes (Kaur & Gandhi, 2020). It is therefore evident that scalability is an issue for blockchain.

As the application of BCT increases, larger blockchain databases, as well as faster database access, are required (McKinlay, J., 2016). While scalability is a problem for all cryptocurrencies, Visa, as a conventional transaction provider, has already hit a peak of 10,547 transactions per second. [5]

4.4.2 Security

While blockchain is largely beneficial, it can pose risks to a business due to its set of security issues (Sengupta et al., 2020). Since everyone has access to the network's public keys, the blockchain system is subject to transactional privacy leakage (Zheng et al., 2018). Malicious actors can thus reverse transactions by acquiring majority control of a blockchain's hash rate and trigger double-spends (Kaur et al., 2021). In 2018, various well-known cryptocurrencies, such as verge, ZENCASH, and Ethereum classic, were subjected to 51% attacks, while in 2018, this blockchain protection problem resulted in a $20 million loss.[6] Thus, although BCT has provided unparalleled practicability and uniqueness in the capital market, regulators continue to grapple with the immaturity of its technology (Cong & He, 2019).

4.4.3 Privacy

Blockchain is a decentralized and digitized public ledger for use with all cryptocurrency transactions (Pilkington M, 2016). Unfortunately, its data security measures are not very powerful (Christidis and Devetsikiotis, 2016). Since all transactions and balance information are visible to the public, it is impossible to prevent the leakage of transactional information (Meiklejohn, et al., 2016). Since the data is freely available and everyone can access it, there are several issues with transaction privacy on the blockchain (Gupta, A., 2018). Private blockchains are much more stable; however, they have interoperability issues (Cheng et al., 2018).

4.4.4 Energy consumption

BCT consumes a significant amount of electricity (Gupta, A., 2018). It necessitates massive computational capacity far beyond that of the world's most powerful supercomputers (Ghosh & Das, 2020). In 2018, one bitcoin transaction used the same amount of energy as 80,000 Visa transactions. According to more recent data from Digiconomist,[7] a website "dedicated to exposing the unintended consequences of digital trends," a single bitcoin transaction consumes the same amount of energy as 453,000 Visa transactions.

4.4.5 Interoperability issues

Blockchain interoperability, as defined by Jabbar et al. (2021), is the capacity to view, share, and access data in blockchain networks without the need for a middleman or other authority. This is another difficulty for blockchain technology (Kuo et al., 2017). As more companies use blockchain, many will create systems with unique features that do not connect, while there is no uniform standard that enables them to do so. This lack of interoperability may render widespread adoption difficult for businesses and consumers alike (Biswas and Muthukkumarasamy, 2017), thus making it difficult to share data effectively (Kamel Boulos et al., 2018)

Table 10: Challenges and Solutions

Challenges	Solutions
Scalability	The Lightning Network is a blockchain network that adds a second layer to the main network to speed up transactions. Sharing is another compelling solution, which involves breaking subsets of nodes into smaller networks or "shards," with each shard being responsible for its own set of transactions.
Security	On the blockchain, self-sovereign identities will allow participants to capture and govern their data.
Privacy	In this scenario, a private or consortium blockchain could be advantageous, as participants would have limited access to the network, and personal information would remain confidential, as it should be.
Energy Consumption	Create blockchains that are more energy efficient such as the red belly blockchain
Interoperability Issues	Ark is a blockchain platform that boasts of its Smart Bridges architecture, which is designed to facilitate universal interoperability, cross-blockchain communication, and transfers. Cosmos is another example, which leverages the Inter Blockchain Communication (IBC) protocol to enable blockchain economies to communicate and exchange data seamlessly, beyond the limitations of siloed systems.

[5]Cryptocurrency Transaction Speeds: The Complete Review - The Daily Hodl. (2021). Retrieved 5 December 2021, from https://dailyhodl.com/2018/04/27/cryptocurrency-transaction-speeds-the-complete-review/

[6]LLC, L., 2021. Top 5 Blockchain Security Issues in 2019. [online] LIFARS, Your Cyber Resiliency Partner. Available at: <https://lifars.com/2019/12/top-5-blockchain-security-issues-in-2019/> [Accessed 8 December 2021].

[7]Digiconomist. 2021. Digiconomist - Exposing the Unintended Consequences of Digital Trends. [online] Available at: <https://digiconomist.net/> [Accessed 8 December 2021].

4.5 Research gaps that exist now and future directions that should be pursued

The current literature has investigated the notion of blockchain, its application, and its impact on the banking business to increase customer access to financing. This review contributes to a growing body of knowledge on blockchain by presenting scholarly work from 2017 to 2023 regarding various trends and themes. This section attempts to answer research question 5 (RQ5) and is dedicated to extending work in blockchain applications in banking.

The study reveals the existence of spatial specificity in terms of how the research has been based in both developed countries, such as the United Kingdom and the United States, and certain developing countries, such as China and India, according to the results of country-by-country analyses of citations. To advance the current body of information, future scholars may focus on examining the benefits of blockchain implementation in banking areas in the context of more developed countries. Further, we propose that future scholars research the discovery and empirical testing of organizational, non-technical, and environmental variables that may prevent or stimulate cross-industry blockchain implementation.

The content analysis identified another exciting area for future research: assessing user viewpoints on blockchain applications and their awareness of this technology. Greater research on blockchain applications in banking will provide consumers with more knowledge about the potential uses and applications of the technology, as consumer awareness has a significant impact on international economic markets and systems. To date, relatively little research has been undertaken in this field. However, as an innovative technology, blockchain is desirable in countries with a more rigid regulatory structure (Albayati et al., 2020). Hence, empirical research is needed to identify and investigate elements influencing user adoption and opposition to widespread blockchain implementation.

According to Gartner Senior Director Analyst Matthias Graf,[8] the hype around blockchain is characteristic of technologies in their early stages of development. However, corporate executives should nevertheless be wary of the disruptive potential of blockchain-based solutions as they will impact every function, not just IT. There is a risk of long-term disintermediation if human resource leaders fail to undertake adequate levels of scenario planning and experiment with the technology appropriately (Wiles, 2021). BCT has the potential to automate numerous procedures, which significantly reduces the need for manual verification, documentation, and intermediary involvement. The adoption of blockchain is associated with an overall increase in efficiency, which may lead to job displacement. Many individuals may need to learn new skills to keep up with the changing technology landscape. A research gap exists in exploring blockchain's effects on employment levels in the banking industry.

The questions listed below (Table 11) will assist in addressing the substantial problems faced by bank employees. As potential future directions, these would provide the blockchain literature with a new viewpoint on, among others, the country-specific impacts of the technology and the diverse tactics used by both developed and developing countries.

Table : Future Research Directions

Topic	Proposed research questions
Applications of blockchain in the banking sector for developed nations	What are the benefits of blockchain implementation in banking areas in the context of more developed countries? Is there any difference between the application of BCT in developed and developing countries? What are organizational, non-technical, and environmental variables that may prevent or stimulate cross-industry blockchain implementation?
Blockchain's impact on customers in the banking sector	What are the perceived benefits of putting blockchain into practice for consumers in the banking sector? How does the Blockchain affect consumers in developed and developing countries? What are the main obstacles customers face in embracing blockchain, and how can the same be overcome?
Impact of Blockchain on employment in the banking sector	Is there a link between BCT, job growth, and prospects of an increase in the salary structure of employees in the banking sector? What impact does a blockchain application in the banking industry have on employment in developing vs. developed countries? What is the country-specific impacts of a blockchain-based application on a bank's employment policy?

[8]Gartner. 2021. 5 Ways Blockchain Will Affect HR. [online] Available at: <https://www.gartner.com/smarterwithgartner/5-ways-blockchain-will-affect-hr> [Accessed 8 December 2021].

5. Managerial Implications

Our research benefits academicians, practitioners, and customers in various ways, and this study has multiple managerial implications. Initially, the research suggests that professionals, such bank executives in charge of technological advancements, can utilize our findings to gain a deeper understanding of the vast array of applications of blockchain in the banking industry. Second, in order to create plans and regulations that ease the shift from conventional to blockchain processes, stakeholders need to evaluate the advantages and disadvantages of blockchain. Therefore, marketing initiatives that highlight the benefits and uses of blockchain technology—such as its ability to save money and time, as well as its transparency, ease of use, and round-the-clock availability—may draw in customers and spur adoption. Regulatory agencies and critical stakeholders pushing for a transition to blockchain-based banking services must adopt regulations and standards that simplify regulatory document retrieval and streamline banking procedures such as transaction inspection, control, monitoring, and certification. The primary obstacles to blockchain adoption at the organizational level can be lessened and the necessary operational capabilities can be developed for the organization by offering specialized corporate training programmes and developing systems to enhance coordination and information sharing between service partners, businesses, and stakeholders. Managers should be aware of the additional problems and conflicts that can arise because of blockchain adoption and act to resolve issues that affect the long-term viability of banking services. As a result, executives must ensure that their digital transformation strategies account for the revolutionary potential of blockchain-based business models. Blockchain investments promise enhanced trust, traceability, transparency, and resource efficiency, which can help the banking industry to maintain its competitive advantage.

6. Conclusion

The primary aim of this research is to provide an exhaustive synthesis of the existing body of knowledge concerning the utilization of blockchain technology within the banking sector. The research findings unequivocally demonstrate a discernible shift within the banking industry, as it moves away from traditional security methods for financial assets and increasingly embraces advanced solutions. This transition is clearly exemplified by the industry's ongoing exploration of the myriad potential applications of blockchain technology, with several major banks proactively incorporating it into their digital transformation strategies. Notably, ICICI Bank, Yes Bank, AXIS Bank, and Kotak Mahindra Bank have emerged as trailblazers in India's adoption of blockchain technology, particularly in the domains of trade financing, both domestically and in overseas transactions. Research into BCT within the banking sector is advancing significantly, with India, China, the USA, and Italy emerging as the primary contributors. Notably, India leads the way in terms of the quantity of publications, closely followed by China and the USA. The period from 2019 to 2020 witnessed a remarkable surge in the number of publications, underscoring the escalating enthusiasm for BCT studies in the banking sector. Prominent journals that publish research on blockchain applications within the banking sector include "Financial Innovation," "Journal of Advanced Research in Dynamical and Control Systems," "IEEE Access," "International Journal of Business and Globalization," and "International Journal of Digital Accounting Research." The authors who have demonstrated the most prolific output in this field, with the highest number of publications, are Abdukaeva A, Elshin L, and Safiullin M. The leading institutions in this area are Alex Ekwueme Federal University, Hunan Normal University, and Hunan University. They are closely followed by the International Islamic University Malaysia, PSG College of Technology, and the University of Bari Aldo Moro.

Based on the research, the most influential studies are those conducted by Kou et al. (2021), which have garnered a remarkable 181 citations. Following closely are the studies by Dierksmeier and Seele (2016), with 86 citations, and those by Z. Chen et al. (2017a) and Cuccuru (2017), each receiving 74 citations.

According to the findings, BCT will have a sizable impact on the banking industry. Banks' adoption of BCT is being driven by numerous key benefits, notably that it promotes efficiency, improves security, generates immutable records, leads to faster transactions, removes the need for third-party involvement, and cuts costs. Scalability, security, privacy, and energy consumption are hurdles in blockchain adoption that will undoubtedly be overcome over time. Trade finance, KYC, capital markets, cross-border payments, consortium accounts, and accounting and auditing are six intriguing areas where blockchain is set to have a profound impact. BCT offers significant potential for cross-border payments since it employs encrypted distributed ledgers to enable real-time transaction verification without intermediaries' involvement. In trade finance, users can track items and assets using BCT in addition to their present location. Customer identities can be recorded, verified, and distributed using smart contracts inside a blockchain network of banks. In the capital market, BCT ensures trust and transparency for trading entities and reduces counter-party risk. Blockchain will automate numerous accounting and auditing operations within smart contracts, decreasing human error. Although this new technology remains in its infancy and faces numerous obstacles and restrictions, as is widely recognized, any new technology will always go through a hype phase. It takes much longer to overcome every obstacle and utilize the energy stored in the new technology to power the modern world.

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Data availability statement

The complete dataset supporting the findings presented in this article is included, and no further source data are needed.

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E-CRM Dynamics: Exploring the Pathways to Customer Loyalty via Moderated-Mediation Analysis

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Abstract

The study attempts to empirically analyze the association between E-CRM and customer loyalty (CL) using the moderated-mediation framework which incorporates customer experience (CE) as a mediator and customer trust (CT) as a moderator. It employs stimulus-organism-response (SOR) theory to link E-CRM and CL. Data was collected from 645 Indian bank customers. To evaluate the hypotheses, structural equation modeling (SEM) and the PROCESS Macro were employed. The results suggested that the link between E-CRM and CL was influenced by CE, with the mediating effect of CE varying across low and high levels of CT.

Keywords: E-CRM, customer trust, customer experience, customer loyalty, moderated-mediation.

Introduction

In recent decades, the banking industry has undergone reform due to the extensive development of information and communication technologies (ICTs) and the increasing use of the Internet (Shankar & Jebarajakirthy, 2019). Customers' quick adoption of technology followed by escalating internet usage and smartphone consumption, has caused banks to face significant challenges in several ways (Kumar & Mokha, 2022). Due to a variety of factors, including shifting consumer tastes and preferences, a turbulent business environment, a lack of attraction between customers and businesses, and others, banks are unable to grow their customer base, which causes them to lose both current and potential customers (Nurrohman et al., 2023). Customer loyalty is a challenge for service businesses (Khan et al., 2020). The similarity of banking products and services makes it difficult for customers to understand important differences (Damberg et al., 2022). Therefore, it is necessary to increase the loyal customer base. This can be done by spending time and effort on developing long-lasting customer relationships and giving their customers satisfying and good experiences (Fernandes & Pinto, 2019) which can, thus, increase their loyalty (Kumar et al., 2022). E-CRM is one such approach that has attracted a lot of interest over time, but it still needs to develop given the inevitable rise of digital transformation (Mokha & Kumar, 2022). E-CRM is the practice of establishing and sustaining long-lasting customer relationships online through the use of email, various electronic touchpoints, web browsers, etc (Kumar et al., 2022).

In today's technologically advanced environment, developing a long-term customer relationship has become the most challenging endeavor for organizations, particularly banks (Alam et al., 2021). Bank transactions are highly customer-oriented, thus banks must employ a variety of customer relations tactics in order to better comprehend their customers' needs (Hendriyani & Raharja, 2018). E-CRM initiatives are crucial, and it is a strategic step that encourages banks to adopt relational and loyalty strategies and increase their customer focus in order to improve financial outcomes and customer service quality (Kamath et al., 2019). E-CRM enables banks to track their customer relationships in real-time and offer the necessary information for all activities related to these relationships (Mokha & Kumar, 2021). E-CRM results in inherited long-term gains since it reduces the expense incurred by the banks in the process of hiring manpower (Al-Dmour et al., 2019), opening the opportunity for the internet to satisfy a large share of customers, therefore, building CL (Khanh et al., 2021; Kumar & Mokha, 2020). As a result, the banks sought to distinguish themselves by cultivating relationships with their customers (Rastgar et al., 2019).

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In the past, numerous studies have examined how E-CRM affects consumer behaviors like financial profitability, customer satisfaction, retention, loyalty, and more. Despite substantial research supporting the link between E-CRM and various customer behavior traits, significant research questions remain unanswered. One such question is the need to understand the mechanism through which E-CRM influences CL (Mokha & Kumar, 2023). The previous researchers found that several social, psychological, and contextual factors influence the association between E-CRM and CL including customer trust (CT) (Al-Dmour et al., 2019), customer satisfaction (Kumar & Mokha, 2022), relationship quality (Sokmen & Bas, 2019), etc. Despite the extensive use of E-CRM, prior research has highlighted a lack of studies investigating the link between E-CRM, CE, and CL simultaneously (Mokha & Kumar, 2022; Kumar & Mokha, 2021). This present study contributes to existing literature by exploring the mediating impact of CE between E-CRM and CL. CE is a critical aspect of consumer behavior and a core strategic goal for any service organization. Experiences create memories, which in turn influence the purchasing behavior decisions of the customers (Mokha & Kumar, 2022). Furthermore, CT is essential, serving as a crucial enabler for the seamless and ongoing exchange of interactions, especially within financial service markets (Paparoidamis et al., 2019).

This research seeks to address these gaps by offering a more nuanced and holistic perspective, unveiling how E-CRM, CE, CT interact to shape the loyalty landscape. Hence, this research delves deeper into exploring how the mediating impact of CE between E-CRM and CL changes across low and high levels of CT. The integrated analysis of these variables is crucial for a more thorough understanding of the complex dynamics at play, providing valuable insights for businesses seeking to optimize their E-CRM strategies for enhanced customer loyalty in the digital age.

Theoretical framework and hypotheses development

Stimulus Organism Response Theory

The SOR theory serves as a conceptual framework for understanding the intricate dynamics between external stimuli, the internal cognitive and emotional processes of an organism, and the subsequent behavioral responses. Originally proposed by Jacoby in 2002, this theory posits that various environmental cues act as stimuli, influencing the mental state of individuals and shaping their responses. Within the realm of e-commerce, the SOR theory has found widespread application, particularly in unraveling the complexities of consumer behavior (Kumar et al., 2022; Yadav and Rahman, 2018). The existing body of literature delves into the impact of environmental cues such as electronic word-of-mouth, convenience, customization, customer services, interactivity, and website attributes on individual responses within the e-commerce context (Kumar et al., 2022). Within the confines of this study, E-CRM is specifically designated as the stimulus. E-CRM, encompassing diverse strategies and tools utilized by businesses to oversee and analyze customer interactions across the customer lifecycle, undergoes cognitive and emotional assessments by customers based on their experiences. It is through this evaluation that customers form perceptions and feelings, ultimately influencing their loyalty to the e-commerce platform. The study posits that the interactions between E-CRM stimuli and CE plays a crucial role in influencing CL. By exploring cognitive as well as emotional dimensions of customers' evaluations of E-CRM, the study seeks to provide valuable insights into the complex mechanisms influencing CL in the dynamic and competitive landscape of e-commerce. Therefore, this theory corresponds to the broader application of the SOR theory, highlighting the intermediary role of the organism (CE) in connecting external stimuli (E-CRM) with behavioral responses (CL).

Hypotheses Development

E-CRM and CE

Within the banking industry, CE has demonstrated its significance as a crucial element for attaining enduring competitive advantages over competitors (Kumar et al., 2022). In contrast, customer relationships do not just exist; they evolve through time and experience. The feelings of attachment toward a service provider enhance as the relationship develops (Mokha & Kumar, 2022). As relational parties acquire experience, relationships evolve to deeper levels (Fernandes & Pinto, 2019). E-CRM aids banks in examining a comprehensive perspective of their customers, enabling an understanding of their behavioral patterns (Kumar & Mokha, 2020). With this information, the banks can provide unique experiences to their customers by addressing their customers with their names or trying to resolve their issues within a limited time frame (Mokha & Kumar, 2022). In consonance with Cajestan (2018), long-lasting customer relationships that leave customers with unforgettable experiences can be achieved with the right implementation and engagement in the relationship. Banks are exploring various avenues not just to acquire new customers but also to maintain existing ones, fostering a positive experience for their customer base (Chauhan et al., 2022). As a result, creating such experiences has become critical for long-term business performance. Nevertheless, there have been limited efforts to investigate the link existing between E-CRM and CE (Kumar et al., 2022; Kumar & Mokha, 2021; Mokha & Kumar, 2022). Therefore, it is essential to scrutinize the link between E-CRM and CE. Consequently, the first hypothesis is stated as:

H1: There exists a positive link between E-CRM and CE.

CE and CL

Customers are nowadays looking for products and services that provide memorable or favorable experiences, directed towards fantasies, fun, and feelings. Garg et al., (2014) postulated that customers want to have time-based interactions with their banks that allow interactions easily, rapidly, and personalized. These favorable memories arouse emotional and affective values in the minds of the customers (Chahal & Dutta, 2014) which ultimately instills a feeling of loyalty, thereby leading to positive word-of-mouth (Srivastava & Kaul, 2016). Thus, understanding and delivering a more personalized and one-to-one experience to sustain CL is increasingly important nowadays (Cajestan, 2018; Leva & Ziliani, 2018). In addition to this, Kumar et al., (2022) also opined that banks that focus on creating and maintaining stronger customer engagement and a durable CE can make their customers more satisfied and loyal to their products, service, or brand. When customers get a good experience with their banks, they stay loyal and recommend their banks to their friends or family, thus reducing the effect of switching behavior (Garzaro et al., 2021). Consequently, the extant literature ratifies the affirmative link between CE and CL (Cajestan, 2018; Garzaro et al., 2021; Kumar et al., 2022; Raina et al., 2019; Srivastava & Kaul, 2016). On this basis, the second hypothesis is stated as:

H2: There exists a positive link between CE and CL.

E-CRM and CL

CL is among the most significant objectives of activities of relationship marketing (Alam et al., 2021). Almost no banks can survive in the near future for a long if they have no loyal customers (Al-Shoura et al., 2017). Fostering customer loyalty stands as a primary objective of E-CRM, ensuring not only a stronger customer relationship but also the sustainability of CL, a critical factor in the banking sector (Kumar & Mokha, 2020). Utilizing E-CRM enables banks to gain a deeper understanding of their customers and cultivate a mutually beneficial relationship (Arjmand et al., 2023; Kumar et al., 2022). Al-Dmour et al., (2019) advocated that exceptional E-CRM services from banks contribute to an increase in customer loyalty. Previous research found a strong link between E-CRM and CL (Kumar & Mokha, 2020; Kumar et al., 2022; Mang'unyi et al., 2018; Rashwan et al., 2019). Based on this, the third hypothesis is stated as:

H3: There exists a positive link between E-CRM and CL.

Mediating role of CE

CE is a critical aspect of consumer behavior and a core strategic goal for any service organization. Experiences create memories, which in turn influence the purchasing behavior decisions of the customers (Kumar et al., 2022). E-CRM helps the banks monitor their customer connection on a real-time basis and provides all activities in this relationship with the necessary information in a 360-degree view. Klaus and Maklan (2013) opined that to enhance long-term customer relationships, it is significant to create memorable experiences in the customers' mindset toward any particular product, service, or brand which further enhances the loyal customer base as customers tend to become loyal as a result of their previous experiences. When banks offer exceptional experiences to their customers by providing them with personalized products/ services, the customers tend to become loyal to their banks (Kumar et al., 2022). Aligned with Mokha and Kumar (2022), customers are inclined to harbor a favorable disposition towards their banks when they anticipate each interaction to be noteworthy and memorable. Hence, based on the above discussion, the fourth hypothesis is framed:

H4: There exists a mediating effect of CE in the association between E-CRM and CL.

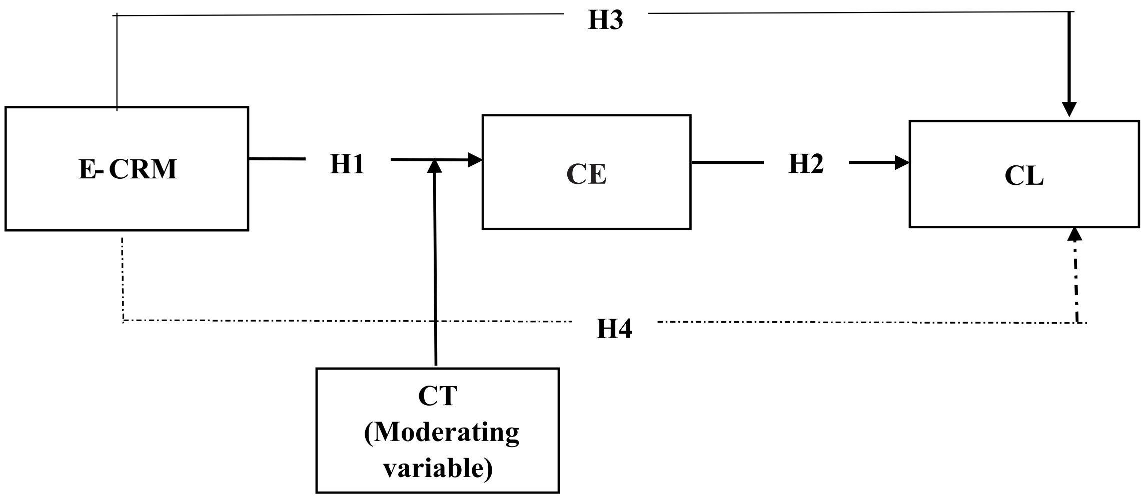
Moderating effect of CT

CT means the customers' perception that the service provider will meet their needs (Boonlertvanich, 2019). CT is widely recognized as essential for smooth ongoing interactions, particularly in financial services (Paparoidamis et al., 2019), serving as a precursor to lasting loyalty and strengthening the customer-business bond (Boonlertvanich, 2019). The literature suggests that CT has varying effects on customers' behavior and continuance intention in the financial sector (Alam et al., 2021; Hamakhan, 2020). Within the realm of E-CRM, customers lack direct face-to-face interactions with their bank officials. In this scenario, trust plays a pivotal role in diminishing customers' perceived risk. Those who trust their banks and service providers are more inclined to recommend them to others and engage in future repurchases compared to those lacking trust (Al-Dmour et al., 2019). When customers encounter positive and memorable service experiences, they appraise their banks positively and expect to use their services for a long time. Hence, the banks must engage their customers as it will inculcate a bond of trusteeship between the service provider and customer (Alam et al., 2021). Several academics conceptually highlight and acknowledge that consumers with a high level of engagement and interaction with their service providers are more likely to depict and perceive confidence and trusteeship (Al-Dmour et al., 2019; Kantsberger & Kunz, 2010). Furthermore, CT has a substantial impact both on CL and the dynamics of customer relationships within the banking sector. (Alrubaiee & Al-Nazer, 2010). Similarly, various studies have found that organizations may develop an effective association between CL and company success through CT or bonds (Boonlertvanich, 2019). Therefore, to improve the association between E-CRM and CL in the banking industry, we have included CT as a moderating variable, based on the prior arguments in the literature. Hence, the fifth hypothesis is formulated as:

H5: The mediating impact of E-CRM on CL is stronger for high levels of CT as compared to low levels of CT.

Based upon the theoretical framework and the proposed relationships, this study introduces a research model as depicted in Figure 1.

Figure 1. *Proposed research model*



Source: *Author's own*

Research Methodology

Data collection and process

To assess proposed hypotheses, an empirical investigation was conducted through a survey involving customers of Indian banks. The research was conducted among individuals who were actively engaging with their respective bank's E-CRM services. These customers were specifically chosen as the population under investigation, aiming to understand their experiences and perceptions within the context of E-CRM in the banking sector. The research sample encompassed 10 Indian banks, including the leading five public sector banks and the leading five private sector banks. These banks were selected because they were ranked among the top 10 banks on the basis of the market capitalization data (2021) which measures "what a bank is worth on the open market". We used purposive sampling technique as it is more often employed and acceptable in survey or fieldwork research (Bryman & Bell, 2015). Questionnaires were distributed to customers, and contact details were obtained through acquaintances, using numerous online platforms like WhatsApp, LinkedIn, Facebook, etc. The total responses returned were only 720 and only 645 (54.2% male) were found to be appropriate to test the hypotheses. For testing structural equation modelling (SEM), there should be at least 10 cases per indicator. In this study, there were 62 indicators, therefore, the sample size was more than adequate (Nunnally, 1978). Majorly, the respondents were young and in the age groups of less than 30 years (43.5%) and were graduated (42.6%).

Measurement development

To assess the study variables, established scales were employed with careful modifications based on the existing literature. For measuring E-CRM, a set of 19 items across 6 dimensions – "transactions security/privacy, customized products/services, alternative payment methods, problem-solving, online feedback, and frequently asked questions (FAQs)" – were borrowed from Abdulfattah (2012). Regarding CE, a set of 19 items distributed into 4 dimensions – "product experience, outcome focus, moments of truth, and peace of mind " – were borrowed from Klaus & Maklan (2013). For CL, a 24-item scale encompassing 3 dimensions – "attitudinal loyalty, behavioral loyalty and cognitive loyalty" – were borrowed from Jones and Taylor (2007) whereas to assess CT, four-items were borrowed from Lai et al., (2009). Before conducting the final study, pilot testing was done on 50 respondents and the scales were found to be satisfactory and reliable for further study.

Analysis and Results

Evaluation of Measurement Model

The measurement model underwent confirmatory factor analysis (CFA) using AMOS (v26) for validation. For this, both convergent and discriminant validity are needed to be established. Convergent validity is attained when Cronbach's alpha surpasses 0.70, composite reliability (CR) exceeds 0.70, and average extracted variance (AVE) is higher than 0.50 (Fornell & Larcker, 1981). Table I highlighted the findings of the convergent validity and revealed that CR and AVE values of all three scales i.e. E-CRM, CE, and CL were more than the required thresholds. Apart from this, factor loadings were also assessed and all were found to be more than 0.70 (Hair et al., 2010). After meeting the convergent validity, the next step was to achieve discriminant validity. For discriminant validity, it is essential that the the correlation values between constructs (non-diagonal values) should be lower than the diagonal values (represented as the square root of AVE). It was found in Table II that discriminant validity was also achieved. Thus, the proposed model has an adequate level of reliability and validity.

Table I. Results of the measurement model

Constructs	Factor loadings	CR	AVE
E-CRM:		0.87	0.52
Transaction security / privacy (TPS)	0.70		
Customized products / services (CPS)	0.73		
Alternative payment methods (APM)	0.70		
Problem solving (PS)	0.71		
Online feedback (OF)	0.74		
FAQs	0.75		
CE:		0.82	0.52
Peace experience (PE)	0.71		
Outcome focus (OF)	0.73		
Moments of Truth (MOT)	0.74		
Product of mind (POM)	0.70		
CL:		0.81	0.59
Attitudinal loyalty (AL)	0.88		
Behavioural Loyalty (BL)	0.71		
Cognitive Loyalty (CGL)	0.70		
CT		0.89	0.54

Source: *Author's compilation using AMOS.*

Table II Discriminant validity

	E-CRM	CE	CL	CT
E-CRM	0.71#			
CE	0.58	0.71#		
CL	0.44	0.56	0.74#	
CT	0.42	0.52	0.40	0.79

Source: *Author's compilation using AMOS.*
Note: #Square root of AVE

Direct effects

Hypotheses were examined (Table III) using structural equation modelling (SEM) in three phases: examining direct effects (H1-H3), mediating effect (H4), and moderated-mediation effect (H5). The model fitness of the structural model was found to be a measure of a good fit with the sample data (CMIN/df: 3.03; SRMR: 0.05; RMSEA: 0.05; TLI: 0.95; NFI: 0.93; CFI: 0.95). After this, the direct relationships between all the examined variables were ascertained (Table III). The findings indicated a favorable and significant link between E-CRM and CE (β= 0.58, p<0.01), confirming H**1**. Additionally, the favorable link between CE and CL (β=0.51, p<0.01), thereby supporting **H2**. Furthermore, the direct link between E-CRM and CL was favorable and significant (β= 0.22, p<0.01), thereby confirming H**3**.

Mediation results

The bootstrapping method, with 2000 resamples and a 95% confidence interval, was utilized to assess the mediating impact of CE in the link between E-CRM and CL. The results demonstrated a significantly positive indirect impact of CE on the connection between E-CRM and CL (β=0.30, p<0.01). Consequently, **H4** was supported (Table III). This affirmed that CE served as a mediator in the relationship between E-CRM and CL.

Moderated-mediation results

Finally, to evaluate whether the indirect impact of CE between E-CRM and CL differs across various levels of CT, a moderated-mediation analysis was conducted using 2000 bootstrap samples with a 95% confidence interval through the PROCESS macro. In Model 7, the conditional indirect effects of E-CRM on CL through CE were examined at high and low CT levels. The outcomes (Table III) indicated that the indirect effect of CE between E-CRM and CL varied significantly at high and low CT levels (β= 0.07, p<0.01). The indirect effect of CE between E-CRM and CL notably increases as CT increases from low to high levels, thus supporting **H5**.

Table III. Direct effects, indirect effect, and moderated mediation effect

Paths	Effects	SE	95% Confidence Interval		Results
			LLCI	ULCI	
Direct effects					
H1: E-CRM → CE	0.58**	0.04	0.51	0.68	Supported
H2: CE → CL	0.51**	0.05	0.35	0.55	Supported
H3: E-CRM → CL	0.22**	0.05	0.11	0.32	Supported
Indirect (mediating) effect					
H4: E-CRM → CE → CL	0.30**	0.04	0.20	0.35	Supported
Moderated Mediation effect					
H5: E-CRM → CE → CL (moderated by CT)	0.07**	0.02	0.04	0.11	Supported

Source: *Author's compilation using AMOS.*
Note: EQ= Educational qualification; CT= Customer trust
**p<0.01

Discussion and Conclusion

This study conducted a three-phase examination of hypotheses, and the results are discussed in this section. The initial phase centered on investigating the direct relationships among E-CRM, CE, and CL. In alignment with prior literature, the findings affirmed that E-CRM positively influences CL (Al-Shoura et al., 2017; Kumar et al., 2022; Mang'unyi et al., 2018; Mokha & Kumar, 2022; Rashwan et al., 2019; Kumar & Mokha, 2020). The implementation of E-CRM activities is crucial, and when E-CRM services are effectively employed, CL is enhanced, leading customers to be more inclined to advocate for their service providers among family and friends (Kumar et al., 2022).

The findings further revealed a favorable influence of E-CRM on CE, aligning with the assertion of Kumar et al. (2022). Banks that use E-CRM can gain a 360-degree perspective of their consumers, allowing them to better understand their purchase intentions and behavioral responses (Mokha & Kumar, 2022). This signifies that the banks with the help of information stored in their E-CRM systems can provide personalized interactions to their customers by resolving their customers' problems quickly and also ensuring that no problem is being left unanswered. Such support and interactions will in turn lead to a positive CE. Thus, E-CRM positively leads to CE. Furthermore, the results depicted a favorable connection between CE and CL, consistent with previous studies (Cajestan, 2018; Leva & Ziliani, 2018; Kamath et al., 2019; Kumar & Mokha, 2021; Klaus & Maklan, 2013; Mokha & Kumar, 2022). Favorable and memorable experiences create a feeling of loyalty in the minds of the customers. Also, customers tend to become loyal as a result of their previous experiences (Klaus & Maklan, 2013).

The second phase of the hypothesis pertains to the mediating impact of CE on the association between E-CRM and CL. E-CRM enhances CE which further leads to CL. If the customer perceives that their banks provide them with an ideal banking experience while using E-CRM services, they tend to become loyal to their bank and recommend them to others. A customer who has a good experience is more likely to be a repeat customer who will not only be loyal to his/her service provider but will also provide positive feedback to others (Makudza, 2020).

The third phase of the hypothesis focuses on the moderating influence of CT on the link between E-CRM and CL through CE. The results indicate that CT positively and significantly moderates the indirect effects of E-CRM on CL via CE. This implies that highly engaged customers in E-CRM services anticipate more positive experiences and a heightened level of CT regarding their personal information and financial transactions. A positive experience builds trust over time, fostering a lasting connection with customers. This emphasizes the notion that customers should derive enjoyment from banking rather than merely engaging in banking activities (Mokha & Kumar, 2022). When customers perceive that E-CRM services meet these expectations, their CT strengthens, ultimately enhancing loyalty to their banks. The more the CT their banks, the more likely their future financial relationships with the bank would be sustained (Kabadayi, 2016). As a result, a regular customer who has a high level of trust in the bank while using E-CRM services may quickly transform into a loyal customer as compared to a lower level of trust. Therefore, banks possessing elevated levels of consumer trust can reinforce the connection between E-CRM and CL through CE, marking a unique contribution of this study within this framework.

Theoretical implications

The present study carries notable theoretical implications. Primarily, despite existing research on the connection between E-CRM and CL, there is a scarcity of studies investigating the essential mechanism needed to enhance CL. Previous efforts linking E-CRM and CL CE are limited (Mokha & Kumar, 2022; Kumar et al., 2022). Consequently, this study adds to the existing body of literature by integrating E-CRM, CE, and CL within a unified framework.

Second, the research adds to the current body of literature on CT. The previous works revealed that CT has varying effects on customers' behavior and continuance intention in the service sector (Alam et al., 2021; Hamakhan, 2020). Within E-CRM, customers lack direct face-to-face interactions with their bank officials; hence, trust becomes instrumental in mitigating customers' perceived risk in this context. When customers encounter positive and memorable service experiences, they appraise their banks positively and expect to use their services for a long time. However, there is hardly any study that investigated the moderating impact of CT on the indirect impact of E-CRM on CL.

Third, to assess the impact of E-CRM on CL, this study devised an extensive moderated-mediation model. The integration of a moderated-mediation model for augmenting CL through E-CRM via CE represents an unexplored aspect in current literature. This study articulated that the impac of E-CRM on CL is mediated by CE, and this mediation effect is further moderated by CT in E-CRM services.

Fourth, this study used the SOR theory as a theoretical foundation to assess the link among E-CRM, CE, and CL. The research asserts that the interactions between E-CRM stimuli and CE significantly influence CL. By delving into the cognitive and emotional dimensions of customers' assessments of E-CRM, the study seeks to offer valuable insights into the complex processes that propel customer loyalty in the dynamic and competitive realm of e-commerce.

Fifth, it is worth noting that this research was conducted in India. In recent decades, India has witnessed substantial growth in e-banking, boasting the world's second-largest internet user base, following China. In the Indian context, however, there is limited research on E-CRM (Kumar et al., 2022; Kumar & Mokha, 2021). Therefore, in addressing the identified research gaps, the findings are noteworthy and make a substantial contribution to the literature concerning E-CRM and consumer behavior within the banking industry.

Practical Implications

To enhance customers' comprehension and satisfaction, financial institutions should establish a bidirectional communication channel, wherein addressing customers' needs is undertaken with meticulous care. In this context, bank management must be diligent in soliciting and responding to customer feedback, incorporating their suggestions to augment CL. This proactive engagement enables banks to offer personalized products, enhance transaction security and privacy, and promptly resolve customer queries or issues. By systematically capturing and understanding customer behaviors, banks can cultivate a positive environment and favorable experiences, thereby fortifying their relationships and fostering customer loyalty.

Customer trust, confidence, and regulatory concerns serve as impediments to the widespread adoption of E-CRM services. Customers often exhibit hesitancy in utilizing the Internet for transactions due to these factors. Therefore, it is imperative for banks to actively cultivate trust and confidence among customers as an integral element in the quest to enhance CL. Given the inherent risks associated with the exchange of personal information and financial transactions, banks must undertake substantial efforts to instill a sense of trust and confidence among their customers. This involves implementing measures and strategies that enhance security and privacy, ensuring customers feel confident and secure in their financial interactions.

Consequently, in the pursuit of robust customer relationships, bank managers must possess a comprehensive understanding of customer-centric E-CRM features before formulating a proactive E-CRM strategy. The banking industry is urged to intensify its focus on investing in relationship-centric activities, specifically E-CRM initiatives. By creating positive and memorable customer experiences, banks can establish enduring connections, thereby instigating a sense of loyalty among their customer base. This strategic approach ensures the development of a strong bond between the banking industry and its customers.

Limitations and Future Scope of Research

This study comes with several limitations. Firstly, it focused exclusively on the banking industry; future investigations could explore other industries such as airlines, education, hospitality, tourism, etc. Secondly, the study was conducted in Delhi/NCR, India, providing an opportunity for future studies in different states or countries. Lastly, additional variables like customer satisfaction, retention, and service quality could be incorporated into the proposed research model to further explore the direct and indirect relationships between E-CRM and CL.

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Decoding Privacy: Analysing Young Adults' Evaluation of Perceived Benefits and Risks in Personalised Digital Marketing

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Abstract

The present study investigates the dynamics of young adults' perspectives on personalized digital marketing by quantifying and assessing their perceived benefits and risks. Using convenience sampling, data from 202 respondents residing in Imphal districts of Manipur, was collected through a structured questionnaire distributed via Google Forms. Statistical tools such as KMO-Bartlett's test, Cronbach Alpha's Reliability Test, Factor analysis using Principal Component Analysis, Standard Deviation and Mean, were employed using SPSS software. Findings revealed significant positive associations, indicating that higher security concerns are linked to lower e-commerce readiness and increased online risk perception. Further, E-commerce readiness is positively correlated with online risk perception and website trust, highlighting the relationship between e-commerce readiness, risk perceptions, and trust in online platforms. Limitations include the regional focus and the use of cross-sectional data. Future researches can go for longitudinal studies, exploration of emerging technologies, and intervention studies to enhance digital literacy and privacy awareness.

Keywords: Privacy Trade-offs, Personalised digital marketing, young adults, decision making process, online engagement.

1. Introduction

The digital era has provided young adults various social networking sites (SNSs), which has become fully embedded in their daily lives. The widespread popularity of SNSs among adolescents has captured the attention of advertisers, providing them with a significant platform for their commercial activities. Within these platforms, young adults regularly encounter personalized digital advertising tailored to their unique characteristics and behaviors (Zarouali et al.,2018). As social networking sites become an everyday part of young adults' lives, personalized ads tailored to their traits and behaviours thrive. Yet, a study reveals that many young adults may not possess a complete awareness of brand communications circulating within social networking environments (Lawlor et al., 2016). In the past few years, the significant increase in internet utilization for information retrieval, online shopping, and service acquisition has sparked discussions and disagreements regarding potential challenges to privacy. While some polls/ surveys have revealed that internet user's strongly value privacy, yet there is an increasing trend of online shopping especially among young adults. This anomaly as pointed by economists and professionals reveals that consumers' actual behaviour may be different from their privacy preferences.

In the present era, online shopping and e-commerce have become pervasive, which has been woven into the fabric of daily life as individuals across the globe grow accustomed to procuring products and services through digital platforms. As of the beginning of 2024, India recorded 751.5 million internet users, reflecting a 52.4 percent internet penetration rate, according to reports from Digital 2024 India. Concurrently, data gathered from leading social media platforms' digital marketing planning tools indicated that there were 383.0 million users aged 18 and above engaging with social media in India at the same period, constituting 38.1 percent of the total population within that age group. Additionally, the evolution of e-commerce has significantly transformed the Indian shopping landscape, particularly with the exponential growth of the internet and online infrastructure. The shifting consumer behaviour, influenced by the pandemic, coupled with the expanding presence of the organized sector in retail markets, has laid a strong foundation for the establishment of e-commerce in the country. With a population exceeding 1.4 billion and a rapidly growing economy, the number of online shoppers in India is anticipated to surge to 427 million by 2027. Consequently, the thriving e-commerce industry is projected to

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surpass a value of 350 billion U.S. dollars by the year 2030 (Statista, 2023). However, this thriving e-commerce and the exponential use of online platforms for various purposes in the daily life comes with its own set of challenges, particularly concerning the balance between managing one' s online identity and compromising online privacy. The immense volume of personal information shared on social networking and e-commerce sites heightens the risks associated with the unsafe utilization of private data (Ahn et al., 2014; Taneja et al., 2014). Despite the growing attention towards privacy concerns, the majority of research in this domain are predominantly focused at Western countries. In the South East Asian context, particularly in India, there remains a gap in our understanding of the dynamics between online users, their privacy perceptions, and the evolving landscape of digital commerce. This study aims to address this gap by delving into the perspectives of Indian users with special reference to the young adult population of a north east state, viz., Manipur, shedding light on their experiences and concerns regarding online privacy in the realm of e-commerce. Investigating online privacy in the area of e-commerce in India reveals significant concerns about data privacy violations by e-commerce companies. Several instances have been reported where companies like Flipkart, Amazon, and Paytm were accused of misusing users' personal information without consent (Pratikh, 2023; Panjiar & Jain, 2022). These violations pose risks such as identity theft, financial fraud, and reputation damage. E-commerce platforms have a legal responsibility to protect users' data and prevent unauthorized access or misuse. Privacy concerns, if unaddressed, have the potential to erode consumer trust, hinder the growth of the e-commerce sector, and pose challenges to the overall sustainability of digital commerce. Therefore, a comprehensive exploration of the online privacy landscape, particularly in the unique socio-cultural context of India, can offer valuable insights into fostering a secure and resilient digital marketplace.

The following section is divided into the following sections. Section 2 presents the theoretical background and literature review. Section 3 describes in detail the objectives and hypothesis of the study along with research methodology. The next section presents the data analysis and discussion. Section 5 discusses the implications, the next section 6 presents the limitations, section 7 future research directions and the last section 8 conclusion.

2. Theoretical Background and Literature Review-

The theory of Planned Behaviour (Ajzen, 1988) has been the most referred theoretical framework by Management Information systems academicians for exploring behavioral intention and performance. The present study aligns with existing literature, focusing on the Theory of Planned Behaviour models' core elements—beliefs and behavioural intention. Following a similar approach to previous research, such as that of McKnight et al. (2002) and Dinev & Hart (2006), we concentrate on understanding the beliefs influencing the intention to share personal information for online transactions which enables digital marketing. Understanding the intention is a crucial aspect in deciphering users' decision-making processes and enhancing the effectiveness of strategies in the realm of digital marketing. According to Laufer & Wolfe (1977), an essential factor influencing the disclosure of personal information is a calculus of behaviour that takes into account situational constraints, such as institutional norms, anticipated benefits, and unforeseen consequences related to computerized data banks. They argued that a critical element of this behavioural calculus is the inherent difficulty individuals face in predicting the nature of what needs to be managed. This underscores the significance of personal beliefs in influencing behavioural intentions. In alignment with Laufer & Wolfe's (1977) perspectives, Culnan & Armstrong (1999) asserted that, particularly in the context of purchasing products and services, the decision-making processes individuals undergo before divulging personal information for transaction completion are influenced by a privacy calculus. To elaborate, consumers exhibit a greater willingness to disclose personal information when they are well-informed about the vendor's information practices and when they perceive the business as fair to them. Culnan & Bies (2003) asserted that individuals are inclined to share personal information when they perceive that the overall benefits of disclosure are either balanced by or exceed the evaluated risks associated with disclosing such information. They characterized this phenomenon as a privacy calculus, drawing a parallel to a cost-benefit analysis. Additionally, they contended that a positive net outcome would make individuals more amenable to accepting the compromise in privacy that comes with disclosing personal information, as long as the associated benefits entail an acceptable level of risk (Culnan & Bies ,2003).

Intention

Intention, a fundamental concept in psychology and behavioural studies, is commonly understood as the willingness or readiness to embrace motivational factors that influence behaviour. It signifies an individuals' mental state of being prepared to engage in a particular action or behaviour. This mental state of intention is crucial as it serves as a precursor to actual behaviour, indicating the individuals' level of determination and commitment towards performing the desired action. Past studies by Yulihasri et al. (2011) and Vijayasarathy (2004) has shed light on the significant correlation between one's intention to engage in a behaviour and the subsequent actual performance of that behaviour. These studies have consistently shown that the stronger an individual's intention is to carry out a specific behaviour, the more likely they are to actually perform it. This relationship between intention and behaviour has been supported by both theoretical frameworks and empirical evidence, emphasizing the importance of understanding and measuring behavioural intention in predicting actual behavioural outcomes. In various fields such as marketing, information technology, psychology, behavioural intentional is often utilised as a reliable proxy for actual behaviour outcomes in research studies. By substituting actual behaviour with behavioural intention, researchers are able to effectively study and predict individuals' actions and decisions in various contexts.

Digital transactions

E-Commerce's continuous growth is intricately tied to the pivotal factors of trust and privacy, which play significant roles in shaping online transactions (Liu et al. (2005). Trust, a fundamental element in e-commerce success, serves to mitigate perceived risks and foster positive consumer experiences. The concept of digital trust encompasses various aspects such as security, privacy, transparency, and accountability. However, concerns surrounding trust and privacy in e-commerce pose potential challenges and significant concerns for both organizations and individual consumers. The term "consumers' intention to transact" pertains to the behavioural inclination to participate in online transactions, involving the purchase of products or services from online retailers (Kahttab et al., 2012). Pavlou & Chai (2002) contended that the adoption of e-commerce is contingent upon consumers' behavioural intention to actively participate in the acquisition of products and services through online platforms. A study by Wen et al. (2011) demonstrated a strong correlation between concerns about online shopping and factors such as trust, privacy, security and risk.

Risk

Risk, defined as the potential for loss, is a subjective concept often linked to uncertainties arising from a seller's opportunistic behaviour, posing potential losses for consumers (Chiles& McMackin, 1996). In traditional transactions, risk is alleviated through brand familiarity and sales assurances. However, as information technology facilitates transactions, privacy risks associated with personal information disclosure become more pronounced. Privacy notices have been identified as crucial assurances, especially when dealing with unfamiliar online vendors (Milne & Culnan ,2004). While many e-commerce studies include risk as a precursor to transaction intentions, few consider the loss of personal information. Studies such as (Jarvenpaa et a., 2000; Palvou, 2003; Palvou & Gefen, 2004) suggest that perceived privacy risk might outweigh economic risk in dissuading individuals from engaging in e-commerce transactions. This study assesses privacy risk, considering the perceived risk of opportunistic behaviour related to obtaining personal information. Sources of such behaviour include third-party marketing firms, financial institutions, and government agencies. The reluctance to disclose personal information in the online environment is driven by concerns about unintended use and inadequate protection, reflecting the fear of suffering consequences due to opportunistic behaviour. This hesitancy aligns with expectancy theory, emphasizing individuals' motivation to minimize negative outcomes in high-risk situation.

Privacy Concerns

The heightened use of information technology has raised four key ethical concerns, known as privacy, accuracy, property, and accessibility (Mason, 1986). Privacy, a vital aspect, is defined in various ways, including "the right to let alone" and the ability to control information extent (Deng et al., 2010). Information privacy, a subset of privacy, is crucial in today's information-rich environment (Stewart & Segars, 2002). The Concern for Information Privacy (CFIP) model, introduced by Mason (1986), identifies privacy as the most significant concern. Smith, Millberg, & Burke (1996) developed a CFIP model with dimensions like collection, unauthorized secondary use, improper access, and errors. Antecedents of CFIP, categorized into individual, social-relational, organizational, task environmental, macro-environmental, and information contingencies, highlight the significant role of individual factors (Li, 2011). Studies by Mohamed & Ahmad (2012) and Awwal (2012) applied the APCO macro model, examining information privacy concerns considering factors like self-efficacy, perceived severity and vulnerability, response efficacy, reward, gender, and age. This study contributes by exploring the influence of individual factors, specifically age and gender, on CFIP among university students, aiming to deepen our understanding of privacy concerns and their impact on behaviour regarding personal information collection.

3.1. Objectives of the study

1. To quantify and assess young adults' perceived benefits and risks associated with personalised digital marketing.
2. To identify the primary factors influencing young adult's decision-making processes in evaluating privacy trade-offs in personalised marketing.
3. To examine the behavioural outcomes of young adults' privacy-related decisions and their impact on online engagement and privacy-enhancing practices.

3.2. Hypothesis of the study

H01: There is no significant correlation between young adults' privacy-related decisions and their online engagement and privacy-enhancing practices.

3.3. Research Methodology

Research Design

The present study adopts an empirical, cross-sectional research design, signifying a methodological approach grounded in direct observation and data collection at a single point in time.

Sources of data

The research utilized both primary and secondary data sources. Primary data collection involved administering a questionnaire through Google Forms. Secondary data was obtained from diverse research articles and websites, contributing to the literature review aspect of the study.

Method of Data collection

A systematically designed questionnaire, as recommended by Cooper & Schindler (2016), was utilised to ensure a standardised method for efficient data collection and comparability across respondents. The questionnaire used were adapted from Smith et al. (1996); Bellman et al. (2004) and Dinev & Hart (2006) which was then modified to suit the objectives of the study. Prior to full-scale implementation, the questionnaire underwent a pilot testing phase with a small subset of participants. This phase aimed to identify any ambiguities, refine question wordings, and improve overall clarity. After incorporating these enhancements, the finalised questionnaire was then distributed through Google link form to respondents through email and WhatsApp.

Data analysis approach

SPSS software Version 21 was utilized to analyse the collected data, employing descriptive statistics such as mean, standard deviation, frequency, and percentages. The analysis also involved assessing the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and conducting Bartlett's Test of Sphericity. Further, the data underwent a Reliability test using Cronbach's Alpha. Principal Component Analysis (PCA) was applied for factor analysis to extract components from the study. Finally, Correlations analysis was employed to examine relationships within the data.

Sampling Design

Sample Size and Sampling Technique

The study focuses on the population of Manipur, particularly emphasizing on the residents of Imphal East and Imphal West districts. The sample size for this research comprised 202 respondents. Convenience sampling was employed to collect the required data from the above respondents.

Rationale of the study

The study explores the increasing prevalence of personalized digital marketing and its impact on young adults in Manipur, specifically focusing on Imphal East and Imphal West districts. With the sample size of 202 respondents, the research aims to explain how young adults evaluate the perceived benefits and risks associated with personalised digital marketing. In this digital era, where individuals are consistently exposed to tailored marketing content, understanding the privacy concerns and preferences of this demographic is crucial. The findings are expected to provide insights for marketers, policymakers, and digital platforms, contributing to the development of responsible and user-friendly marketing practices in the evolving landscape of digital communication and advertising.

4. Data Analysis and Discussion

Table 1: Demographic profile of the respondents

Particulars		Number	Percent
Gender	Male	94	46.5
	Female	102	50.5
	Prefer not to say	6	3.0
Age	18-21 years	15	7.4
	22-25 years	35	17.3
	26-29 years	44	21.8
	30-33 years	38	18.8
	34-37 years	35	17.3
	38-40 years	35	17.3
Residence	Rural	110	54.5
	Urban	92	45.5
Education Qualification	10th Pass	2	1.0
	12th Pass	2	1.0
	Graduate	77	38.1
	Post Graduate	121	59.9
Employment Status	Employed	28	13.9
	Not Employed	174	86.1
Income Level	No Income	81	40.0
	Below 10,000	68	33.7
	10,000 to 20,000	22	10.9
	20,000 to 30,000	11	5.4
	30,000 to 40,000	8	4.0
	40,000 to 50,000	4	2.0
	Above 50,000	8	4.0
Total		202	100.0

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

The table above exhibits the demographic profile of the respondents of the study. Among the 202 respondents, 94 were male and 102 were female, 6 preferred not to disclose their gender. The age distribution indicates a varied representation, with the majority falling within the 26-29 years age group (21.8%), followed closely by the 30-33 years and 34-37 years categories, both at 18.8% and 17.3%, respectively. The residence distribution shows somewhat similar balance between rural (54.5%) and urban (45.5%) respondents. Educational qualifications reveal a well-educated group, with 38.1% being graduates and a significant majority of 59.9% holding postgraduate degrees. Employment status shows that 86.1% of the respondents are not employed, while 13.9% are employed. In terms of income levels, the highest proportion (40.0%) falls under the category of no income, followed by 33.7% with incomes below 10,000.

Table 2. Frequency of Internet Usage in a day

Hours in a day	Frequency	Percent
Less than 1 hour	8	4.0
1 hour- 2 hours	26	12.9
2 hours-3 hours	56	27.7
3 hours-4 hours	33	16.3
4 hours-5 hours	32	15.8
Above 5 hours	47	23.3
Total	202	100.0

Source: Authors, Data Proceeds, 2024 (Primary Data)

Table 2 provides a comprehensive overview of the frequency of internet usage among the respondents, categorizing them based on the hours spent online per day. The majority of participants, 27.7%, reported spending 2 to 3 hours daily on the internet, followed closely by those who allocated 1 to 2 hours (12.9%). Notably, 23.3% of respondents indicated internet usage exceeding 5 hours daily, suggesting a significant portion of the sample is highly engaged with online activities. On the lower end, 4% of participants reported using the internet for less than 1 hour daily.

Table 3. Frequency Distribution of Interaction with digital advertisements online

Interaction with digital advertisements online	Frequency	Percent
Frequently	82	40.6
Occasionally	55	27.2
Rarely	60	29.7
Never	5	2.5
Total	202	100.0

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

Table 3 illustrates the frequency distribution of respondents' interactions with digital advertisements online. Majority of participants, constituting 40.6%, reported frequent engagement with digital ads. An additional 27.2% indicated occasional interactions, while 29.7% stated that they rarely engage with digital advertisements. A smaller proportion, 2.5%, claimed to never interact with online ads.

Table 4: Mean and Standard Deviation

Items	Mean	SD
WS1	3.50	2.253
WS2	3.84	2.364
WS3	3.93	2.336
WS4	3.40	2.197
WS5	3.76	2.295
WS6	4.31	2.198
WS7	4.66	2.120
WS8	3.92	2.332
WS9	3.62	2.326
WS10	3.38	2.261
WS11	3.37	2.315
WS12	4.26	2.220
WS13	4.24	2.162
WS14	4.444	2.162
WS15	4.46	2.163
WS16	3.44	2.080
WS17	3.32	2.063
WS18	3.14	1.899
WS19	3.44	2.049
WS20	3.58	2.150
WS21	3.59	2.150
WS22	3.50	2.138
WS23	3.58	2.098
WS24	3.63	2.117
WS25	3.51	2.110
WS26	3.41	2.136
WS27	3.31	2.159
WS28	3.44	1.820
WS29	3.333	1.813
WS30	3.29	1.677
WS31	3.05	1.757
WS32	3.35	1.847
WS33	3.60	1.963

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

The table above demonstrates the complexity of young adults' attitudes towards personalised digital marketing, highlighting both areas of concern and instances where conveniences and perceived benefits outweigh privacy considerations. The statements in the table are coded as WS 1 to 33 in alignment with the questionnaire (refer to Appendix 1). Regarding concerns about personal information sharing, respondents express a moderate level of concern (mean scores ranging from 3.40 to 3.93) regarding the frequency with which websites request personal information and the perceived volume of data collected. The higher standard deviations (ranging from 2.197 to 2.336) indicate some variability in responses, suggesting that individual attitudes towards these aspects may vary. Regarding emphasis on security measures, statements related to the necessity of protecting databases from illegal access and the responsibility of websites to prevent hacking received higher mean scores (ranging from 3.76 to 4.66). This suggests a strong consensus among respondents on the importance of strong security measures in safeguarding personal information. In relations to accuracy and use of personal information, participants express a moderate level of agreement (mean scores ranging from 3.38 to 4.31) with statements emphasizing the need for accuracy in personal information stored by websites. Additionally, the willingness of respondents to authorise the use of their data for specific purposes receives high mean scores (ranging from 4.24 to 4.46). Concerning willingness to share information, statements probing respondents' willingness to share accurate and identifiable information for online transactions receive moderately positive mean scores (ranging from 3.14 to 3.44). While individuals may be open to certain transactions, the variability in responses (reflected in standard deviations) suggest differing comfort levels with sharing information for specific activities. Concerns about potential risks, including the sale of online transaction records without consent and the misuse of personal information, are expressed at a moderate level (mean scores ranging from 3.50 to 3.59). Interestingly, respondents exhibit a relatively high level of trust in internet websites, perceiving them as safe and reliable environments for information exchange and business transactions. Mean scores for these statements range from 3.29 to 3.44, with lower standard deviations suggesting a more consistent positive perception among participants. In relations to balancing privacy concerns with internet usage, the last three statements reveal a relationship between respondent's privacy concerns and internet usage habits. While concerns are expressed (mean scores ranging from 3.05 to 3.60), indicating a level of caution, respondents also acknowledge that personal interest often overrides privacy concerns (mean scores ranging from 3.29 to 3.60).

Table 5. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.877
	Approx. Chi-Square	3160.418
Bartlett's Test of Sphericity	Df	528
	Sig.	.000

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

Table 5 reveals a high Kaiser-Meyer-Olkin (KMO) measure of sample adequacy, indicating a value of 0.877. The results suggests that the data used for the analysis is suitable for factor analysis, since the sampling adequacy is above the recommended threshold of 0.6. Further, Barlett's Test of Sphericity yielded a statistically significant result, with an approximate chi-square of 3160.418, 528 degrees of freedom, and a significance level of 0.000. This indicates that there is a significant relationship among the variables.

Table 6. Cronbach's Reliability Statistics

Cronbach's Alpha	N of Items
.928	33

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

Table 6 demonstrates the Cronbach's reliability statistics of 33 items. The reliability statistics reveal a robust internal consistency among the items included in the scale, as evidenced by a high Cronbach's alpha coefficient of 0.928. This coefficient, ranging from 0 to 1, indicates the extent to which the items in the scale are correlated, with higher values suggesting greater reliability. With a value of 0.928, the scale demonstrates a high level of homogeneity among its 33 items, indicating that they collectively measure a consistent and cohesive construct.

Table 7. Factor Loadings

Items	Security Concerns	E-Commerce Readiness	Online Risk Perception	Website Trust	Interest Driven Privacy
(WS3)	.503				
(WS5)	.619				
(WS6)	.705				
(WS7)	.616				
(WS12)	.681				
(WS13)	.765				
(WS14)	.786				
(WS15)	.822				
(WS20)		.700			
(WS21)		.758			
(WS22)		.707			
(WS23)		.635			
(WS24)		.714			
(WS25)		.639			
(WS26)		.689			
(WS27)		.630			
(WS28)			.541		
(WS29)			.610		
(WS30)			.717		
(WS31)			.667		
(WS32)			.634		
(WS33)			.602		
(WS1)				.581	
(WS9)				.535	
(WS10)				.700	
(WS11)				.721	
(WS18)					.742
(WS19)					.615

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

Table 7 indicates the factor loadings for each item under the identified components, highlighting on the strength of their relationship with the respective factors. Out of 33 items from the questionnaire, 5 items were excluded. The exclude items had factor loadings below 0.5. In the "Security Concerns" component, items such as WS5 (.619), WS6 (.705), and WS15 (.822) exhibit high loadings, indicating a strong association with concerns about personal information security. The 'E-Commerce Readiness' component is characterized by high loadings from items like WS18 (.742), reflecting a willingness to engage in e-commerce transactions requiring credit card information. 'Online Risk Perception' is influenced by items such as WS21 (.758) and WS24 (.714), indicating concerns about potential misuse and disclosure of personal information online. The 'Website Trust' component is defined by substantial loadings from items like WS30 (.717), implying confidence in the competence of internet websites to handle user information. Lastly, the 'Interest-Driven Privacy' component is represented by items such as WS31 (.667) and WS32 (.634), suggesting that users may prioritize personal interests over privacy concerns when seeking information or services online.

Table 8. Correlation Analysis

		Security Concerns	ECommerce Readiness	Online Risk Perception	Website Trust	Interest Driven Privacy
SecurityConcerns	Pearson Correlation	1	.414**	.339**	.588**	.364**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	202	202	202	202	202
ECommerce Readiness	Pearson Correlation	.414**	1	.541**	.414**	.470**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	202	202	202	202	202
OnlineRiskPerception	Pearson Correlation	.339**	.541**	1	.350**	.355**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	202	202	202	202	202
WebsiteTrust	Pearson Correlation	.588**	.414**	.350**	1	.354**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	202	202	202	202	202
InterestDrivenPrivacy	Pearson Correlation	.364**	.470**	.355**	.354**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	202	202	202	202	202
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: *Authors, Data Proceeds, 2024 (Primary Data)*

Table 8 presents the correlation analysis examining the relationships between Security Concerns, E-Commerce Readiness, Online Risk Perception, Website Trust, and Interest-Driven Privacy. The Pearson correlation coefficients reveal the strength and direction of associations between these variables. Starting with Security Concerns, there is a statistically significant positive correlation with E-Commerce Readiness ($r = 0.414$, $p < 0.01$), indicating that individuals with higher security concerns tend to have lower readiness for engaging in E-Commerce activities. Similarly, Security Concerns exhibit a positive correlation with Online Risk Perception ($r = 0.339$, $p < 0.01$), suggesting that those with heightened security concerns also perceive higher risks associated with online activities. Moving to E-Commerce Readiness, it shows a strong positive correlation with Online Risk Perception ($r = 0.541$, $p < 0.01$) and a moderate positive correlation with Website Trust ($r = 0.414$, $p < 0.01$). This implies that individuals who are more ready for E-Commerce tend to perceive online risks more acutely and trust websites more. Online Risk Perception exhibits a positive correlation with Website Trust ($r = 0.350$, $p < 0.01$), indicating that as individuals perceive higher risks in online activities, they also tend to place greater trust in websites. Website Trust, in turn, shows a robust positive correlation with Interest-Driven Privacy ($r = 0.354$, $p < 0.01$), suggesting that those who trust websites more are also more likely to have a heightened interest in privacy. Interest-Driven Privacy, as a variable, is positively correlated with Security Concerns ($r = 0.364$, $p < 0.01$) and E-Commerce Readiness ($r = 0.470$, $p < 0.01$). This implies that individuals with a stronger interest in privacy are more likely to have higher security concerns and greater readiness for E-Commerce activities.

5. Implications of the study

The implications of the present study carry significant implications for various stakeholders, including marketers, policymakers, and digital platforms. By studying the young adults' perceptions of personalized digital marketing in Manipur, the research reveals insights that can inform strategic decision-making. Marketers will benefit if they incorporate these findings into their approach, shaping strategies that delicately balance personalized content with a profound understanding of users' privacy concerns. This user-centric model not only enhances engagement but also fosters a more positive relationship between brands and consumers. On the policy front, the study provides a foundation for framing regulations that align with the identified components such as 'Security Concerns,' 'E-Commerce Readiness,' 'Online Risk Perception,' 'Website Trust,' and 'Interest-Driven Privacy.' Policymakers can use these insights to develop guidelines that safeguard user privacy while accommodating the evolving dynamics of digital marketing. For digital platforms, the implications extend to user experience enhancement. By aligning with the identified components, platforms can create interfaces and functionalities that resonate with the preferences of young adults. Prioritizing user privacy and building trust can elevate the overall online experience, potentially setting a benchmark for responsible digital engagements. Moreover, the study's broader relevance lies in contributing to the ongoing discourse on responsible and ethical digital marketing practices. The insights gained from Manipur's young adult population can potentially serve as a model for other regions, guiding industry practices toward greater transparency, user-centricity, and trustworthiness.

6. Limitations of the study

This study is subject to some limitations that needs considerations. Firstly, the use of convenience sampling may introduce selection bias, as participants may not be fully representative of the broader population of young adults in Manipur. The cross-sectional research design, while suitable for capturing a momentary snapshot of attitudes, prevents the establishment of causal relationships over time (Sekaran & Bougie, 2013). Additionally, the reliance on self-reported data through questionnaires opens the possibility of social desirability bias, as participants may be inclined to present responses that align with societal expectations rather than their genuine perspectives.

7. Future Research Directions

Future research in the area of young adults' perceptions of personalized digital marketing can take several directions to deepen our understanding of this dynamic landscape. Longitudinal studies would provide insights into the temporal evolution of attitudes and behaviours, (Sekaran & Bougie, 2013) offering a more comprehensive view of how privacy concerns and engagement patterns change over time. Qualitative research methods, such as interviews and focus groups, could shed deeper insights into the motivations shaping individual perspectives. Exploring the impact of emerging technologies like artificial intelligence on personalized marketing perceptions is essential in the recent industry trends. Additionally, intervention studies could assess the effectiveness of educational campaigns in influencing digital literacy and privacy awareness.

8. Conclusion

The present study has provided valuable insights into young adults' perceptions of personalized digital marketing in Manipur. The findings highlight the balance between privacy concerns and the convenience and benefits associated with personalised online content. The study's identification of key factors such as 'Security Concerns,' 'E-Commerce Readiness,' 'Online Risk Perception,' 'Website Trust,' and 'Interest-Driven Privacy' contributes to the understanding of the factors at play in this digital landscape. The high Cronbach's alpha coefficient indicates a strong internal consistency among the scale items, enhancing the reliability of the measurement instrument. However, the study has its limitations, including the use of convenience sampling and the cross-sectional design, which impact the generalizability and ability to establish causation. Despite these limitations, the implications of the study are far-reaching, providing guidance for marketers, policymakers, and digital platforms to navigate through the digital marketing area by being responsible and enforcing user-centric digital marketing practices. As the digital marketing continues to evolve, these insights can inform future research endeavours and contribute to the development of ethical and effective strategies in personalized digital marketing.

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No.	Statements	SD	D	SWD	N	SWA	A	SA
1.	It usually bothers me when some websites ask me for personal information. (WS1)							
2.	When Web sites ask me for personal information, I sometimes think twice before providing it. (WS2)							
3.	It bothers me to give personal information to so many Web sites. (WS3)							
4.	I'm concerned that Web sites are collecting too much personal information about me. (WS4)							
5.	Web sites should devote more time and effort to preventing illegal access to personal information. (WS5)							
6.	Databases that contain personal information should be protected from illegal access— no matter how much it costs. (WS6)							
7.	Web sites and other companies should take more steps to make sure that hackers cannot access the personal information in their computers. (WS7)							
8.	All the information received on Web sites should be double-checked for accuracy—no matter how much these costs. (WS8)							
9.	Web sites should take more steps to make sure that the personal information in their files is accurate. (WS9)							
10.	Web sites should have better procedures to correct errors in personal information. (WS10)							
11.	Web sites should devote more time and effort to verifying the accuracy of the personal information in their databases. (WS11)							
12.	Web sites should not use personal information for any purpose unless it has been authorized by the individuals who provide the information. (WS12)							
13.	When people give personal information to a site for some reason the site should never use the information for any other reason. (WS13)							
14.	Web sites should never sell the personal information they have collected to other Web sites. (WS14)							
15.	Web sites should never share personal information with other Web sites or companies unless it has been authorized by the individuals who provided the information. (WS15)							
16.	I am willing to purchase goods (e.g., books or CDs) or services (e.g., airline tickets or hotel reservations) from websites that require me to submit accurate and identifiable information (i.e., credit card information). (WS16)							
17.	I am willing to retrieve information from websites that require me to submit accurate and identifiable registration information, possibly including credit card information (e.g., using sites that provide personalized stock quotes, insurance rates, or loan rates; or using sexual or gambling websites). (WS17)							

No.	Statements	SD	D	SWD	N	SWA	A	SA
18.	I am willing to conduct sales transactions at e-commerce sites that require me to provide credit card information (e.g., using sites for purchasing goods or software). (WS18)							
19.	I am willing to retrieve highly personal and password-protected financial information (e.g., using websites that allow me to access my bank account or my credit card account). (WS19)							
20.	There is a risk that records of my online transactions could be sold to third parties without my consent. (WS20)							
21.	There is a risk that the personal information I submit online could be misused for unauthorized purposes. (WS21)							
22.	There is a risk that my personal information might be disclosed to unknown individuals or companies without my knowledge or consent. (WS22)							
23.	There is a risk that my personal information could be made available to government agencies without my explicit consent. (WS23)							
24.	I am concerned that the information I submit on the Internet could be misused. (WS24)							
25.	I am concerned that a person can find private information about me on the Internet. (WS25)							
26.	I am concerned about submitting information on the Internet, because of what others might do with it. (WS26)							
27.	I am concerned about submitting information on the Internet, because it could be used in a way I did not foresee. (WS27)							
28.	Internet websites are safe environments in which to exchange information with others. (WS28)							
29.	Internet websites are reliable environments in which to conduct business transactions. (WS29)							
30.	Internet websites handle personal information submitted by users in a competent fashion. (WS30)							
31.	I find that personal interest in the information that I want to obtain from the Internet overrides my concerns of possible risk or vulnerability that I may have regarding my privacy. (WS31)							
32.	The greater my interest to obtain a certain information or service from the Internet, the more I tend to suppress my privacy concerns. (WS32)							
33.	In general, my need to obtain certain information or services from the Internet is greater than my concern about privacy. (WS33)							

Crafting a Customer-Centric Experience Framework for Enhancing Digital Payment Journeys

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Abstract

In the era of digitalization, the rise of digital payment systems has transformed the landscape of financial transactions, prompting a need to comprehensively understand and optimize customer experiences (CX) within this domain. However, there is a scarcity of studies available on customer experience within the realm of digital payments. To address this shortfall, our study aims to develop a conceptual model based on comprehensive review of existing academic literature on fintech, digital payments, consumer behavior and customer experience to enhance the understanding in this sphere. The study adopts the Stimulus-Organism-Response (S-O-R) model as a theoretical framework to unveil the multifaceted dynamics of CX within the domain of digital payments. The implications derived from this framework facilitates digital payment service providers in devising strategies to enhance customer experience, promote customer satisfaction, facilitate adoption, prevent intention to switch and cultivate long-lasting customer engagement amidst the evolving landscape of digital payments.

Keywords: digital payments, customer experience, SOR framework, customer engagement, fintech

1. Introduction

With the recent technological advancement, fintech services that combine information technologies with existing financial services are rapidly growing. Fintech, a portmanteau of finance and technology, integrates information technology within the financial services sector. This fintech industry is expanding globally, fueled by advancements in fourth-industrial revolution technologies such as big data, artificial intelligence (AI), blockchain, the internet-of-things (IoT), near-field communications, mobile wallets and others (Lim et al., 2018 & Yoon & Lim, 2021). The widespread adoption of the Internet and mobile phones has significantly contributed to the growth of digital payments (Sahi et al., 2021). The emergence of digital payments has revolutionized the way financial transactions are conducted. Serving as a catalyst for change, digital payments have significantly influenced various aspects of our daily lives, society, businesses, and the economy on a large scale. The global COVID-19 pandemic has further spurred this shift, driving a notable surge in consumer spending behavior through digital payments (Abdullah & Khan, 2021).

In the Indian context, the digital payment transaction volume has increased from 2,071 crores in FY 2017-18 to 13,462 crores in FY 2022-23 at a CAGR of 45 per cent (Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), DIGIDHAN Portal & Press Information Bureau). According to the Indian Payments Handbook 2023-2028, the Unified Payment Interface (UPI) emerged as the most utilized platform for digital transactions in FY 2022-2023, constituting over 75% of retail digital payments in India. In the realm of smart cards, credit card transaction volumes exhibited a year-over-year increase of 30% in FY 2022-2023 compared to FY 2021-2022, while debit card transaction volumes witnessed a year-over-year decline of 13% during the same period (https://www.pwc.in). The payment industry is witnessing a surge in digital payment service providers, enhancing payments with personalization, speed, simplicity, security, and seamlessness. These providers have attracted millions of digital consumers by offering cash-back rewards and discounts (Abdullah & Khan 2021). Thus, amidst a plethora of digital payment service providers vying for customer

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attention, it is crucial to understand the customer experience in digital payments. The success of a novel product or service hinges upon consumer experience, given that present-day consumers are increasingly concerned with what a company offers and how it delivers its offerings (Sachdeva and Goel 2015). As a result, companies in the twenty-first century have shifted their focus from a service-based economy to an experience-based economy (Kim et al.., 2011). Subsequently, customer experience has emerged as a critical metric supporting organizational performance. Following commodities, goods, and services, experiences serve as the fourth economic offering for businesses (Pine and Gilmore, 1998).

2. Customer Experience

Customer satisfaction levels are primarily influenced by their positive or negative experiences. These experiences play a crucial role in the customer's decision-making process regarding purchasing and using a specific product or service (Garg et al.., 2014). In light of today's advanced technology, increasingly sophisticated and demanding consumers, and a highly competitive business landscape, businesses must move beyond goods and services to craft memorable customer-centric experiences. This shift is imperative because each customer's experience is unique and individualized (Gilmore and Pine, 2002).

Customer experience (CX) is a dynamic terminology influenced by the products or services offered by businesses, the evolving environment, shifts in consumption practices, and the varying levels of interactions between businesses and consumers (Barbu et al, 2021, Hoyer et al, 2020). It is a set of cognitive, emotional, social, physical, and sensory responses of the customer subsequent to interaction with a company, its brands, services and/or products (Rose et al. (2012) and Lemon & Verhoef, (2016)). Cognitive experiences show how customers think, emotional experiences share how they feel, social experiences describe their interactions with others, physical experiences involve touching products or things, and sensory experiences are about what they sense with their senses (Ameen et al., 2021). Experiences may be characterized by customers' feelings and beliefs regarding what happens when engaging in an activity. When customers make a purchase, they have an experience that may be good or bad, resulting in feelings of pleasure and sentiment toward the firm. If the customer is satisfied, they are more likely to make another purchase, leading to a tangential benefit (Karim et al, 2022). However, CX is considered a strategic process to achieve differentiation and sustainable competitive advantage, foster customer satisfaction, build customer loyalty, enhance purchasing intention, and promote positive word-of-mouth communication (Rawson et al., 2013).

Customer Experience (CX) has become the predominant marketing concept, acknowledged by both practitioners and academics and universally recognized as crucial for enhancing overall business performance (Harvard Business Review [HBR] Analytic Services, 2017). Gentile et al (2007), reflected that CX plays a pivotal role in shaping customer preferences, which in turn influence their purchase decisions. Morgan-Thomas and Veloutsou, (2013) highlighted the importance of delivering a distinctive brand experience within a digital landscape due to the extensive and dynamic flow of information on digital platforms. Meanwhile, Bapat (2021) identified four key disciplines—information technology, marketing, finance, and services—that influence the experience of digital financial services. Barbu et al. (2021) revealed advancements such as digitalization, e-commerce, mobile application marketing, and social media marketing have significantly impacted the dynamics of customer experience. Windasari et al, (2022) opined that it is crucial to create an appealing and user-friendly digital banking interface to enhance the ease-of-use experience for customers. It was further suggested to implement other factors such as rewards, unique features, and positive word-of-mouth to create positive customer experiences. However, Barari et al. (2019) concluded that when a company encounters issues during the online shopping journey of the customer, such as procedural deficiencies or unsatisfactory outcomes, it creates a disconnect between the customer's expected cognitive and emotional goals and the real experience of the online purchase. This mismatch contributes to the erosion of customer experience, triggering a negative reaction from the customer. The discussion raises many queries. What factors contribute to customer experience? How to measure customer experience? What are the consequences of customer experience?

This study endeavors to address a significant research gap by constructing a conceptual model to evaluate the CX of the users of digital payment systems. To achieve this objective, the paper is structured into four main sections. Firstly, a comprehensive review of prior literature in this field is presented. Second section discusses the model adopted for assessing CX. Third section, delves into formulation of a conceptual model encompassing the various antecedents and outcome of CX. Fourth and the last section presents the summary, discussion and conclusion and provides the direction for future research.

3. Literature Review

Several studies have explored customer experience within the domain of digital banking. Garg et al (2014) in his study reported "convenience" to be the vital factor of CX in banking sector, which is followed by other highly significant factors such as customer interaction with employees, speed, servicescape, core services, online functional elements, presence of other customers, value addition, service process and online aesthetics. In a study by Mbama and Ezepue (2018), it was confirmed that perceived value, functional quality, service quality, employee-customer engagement, perceived risk, and perceived usability positively affect CX in digital banking sphere. Further it was noted that there exists a significant relationship between CX in digital banking, customer satisfaction, and customer loyalty, which subsequently impacts the financial performance of banks. Windasari et al (2022) reported Economic value, perceived ease of use, social influence, firm reputation, features, and rewards significantly influence the intention to use digital banking services among young adults. Nguyen et al (2022) opined that components such as outcome focus, peace of mind, moment of truth and product experience are important indicators of CX with Digital Banking. Further it was also revealed that before Covid-19, CX with Digital Banking positively influenced banks' financial performance through increased customer satisfaction. However, the intermediary factors of word-of-mouth (WoM) and trust did not exhibit significant impacts during this period. Conversely, during the lockdown, only word-of-mouth (WoM) demonstrated a positive influence on banks' financial performance.

Customer experience (CX) was also studied in the field of m-payment services. Tripathi et al (2022) in their study reported, CX in the context of M-payment can be captured by multifarious dimensions such as a practical/operational dimension, emotional dimension, or social dimension, and they found out a positive and significant relationship between Utilitarian Value and Customer Advocacy, Hedonic Value and Customer Advocacy as well as with Customer experience. The third facet of value, Social Value, has no significant association either with Customer Advocacy or with Customer experience indicating that users are not much concerned with how the usage influences their social image in the context of M-payment services. Whereas in the study conducted by Eren (2022), it was outlined that information quality, system quality, perceived transaction speed, and optimism played significant roles in shaping the customer experience of Quick Response (QR) code mobile payment (m-payment). However, factors such as service quality and perceived risk associated with QR code m-payment did not affect the CX.

Customer experience (CX) was further explored in Fintech sphere. In a study by Barbu et al (2021) it was reported that, perceived value, customer support, assurance, speed and perceived firm innovativeness are positively related to CX in fintech. In turn, CX is positively associated with the loyalty intentions of the customer. Mutambik (2023) reported that ease of use, perceived value, quality of support, reliability, perceived risk and ability to innovate affect the CX in fintech. Further, CX in fintech is positively associated with loyalty intentions. Karim et al (2022) revealed that Fintech services, CX, and customer attitude significantly impacted customer-loyalty intention in the hospitality sector. Additionally, they found that CX and customer attitude mediated the relationship between Fintech services and customer loyalty intention in the hospitality sector. The research study undertaken by Bapat (2021) revealed that the digital functional element positively affects the digital financial services experience. It was also observed that lifestyle mediated between perceived ease of use and timeliness with digital financial services experience. Further, the study found that familiarity moderates the relationship between the digital financial element and digital financial services experience.

Furthermore, several studies have been conducted on CX across various other domains. These were in the area of online shopping and restaurant customer experience. Cankül et al (2024) in their study discovered a statistically significant relationship between gastronomic experience and restaurant image, as well as between gastronomic experience and customer perceived value. Molinillo et al (2020) found out that affective experience and cognitive experience dimensions positively impact the satisfaction and trust that users have in mobile shopping applications, which in turn has a positive effect on loyalty felt towards the retailer. While Roy et al. (2024) delineated that trust in service providers acts as a mediator between customer equity drivers (value equity, brand equity, relationship equity) and the quality of customer experience in the context of social robots. Petersson et al (2023) found that human-like features such as emojis, willingness to assist, and polite communication style contribute to a positive customer experience with banking chatbots. Abdelkader (2023) highlights the significance of several moderating factors—Familiarity and Comfort with Technology, Business Type, Age, and Education Level—on the correlation between customer experience with ChatGPT and overall satisfaction with digital marketing. However, Gender does not appear to play a significant role in this relationship. Ameen et al. (2021) demonstrated that trust acts as a mediator between AI-enabled customer shopping experiences and various factors, including personalization, perceived sacrifice, and AI-enabled service quality. Additionally, perceived sacrifice mediates the connections between AI-enabled shopping customer experience and personalization as well as AI-service quality.

In the context of online shopping, Bilgihan et al. (2016) highlighted several antecedents of a cohesive online shopping customer experience, such as the ease of locating the website/app, ease of use, perceived usefulness, hedonic and utilitarian features, perceived enjoyment, personalization, social interactions, and multi-device compatibility. Furthermore, they found that compelling online shopping customer experiences lead to outcomes like brand engagement, positive word of mouth (WOM), and repeat purchases. Thomas & Veloutsou (2013) outlined the positive influences of trust and perceived usefulness on online brand experience. They further suggested that positive experiences lead to satisfaction and behavioral intentions, ultimately fostering the formation of online brand relationships.

The extensive literature review in the context of CX focused on digital banking, fintech, m-payment services, online shopping and the like. It was observed that, these studies employed several adoption theories for new technology, including Davis's Technology Acceptance Model (TAM, 1989), Fishbein and Ajzen's Theory of Reasoned Action (TRA, 1975), Ajzen's Theory of Planned Behavior (TPB, 1985), Rogers' Diffusion of Innovation (DOI, 1962), and the Unified Theory of Acceptance (UTAUT and UTAUT 2) proposed by Venkatesh, Morris, Davis, and Davis (2003) and further refined by Venkatesh, Thong, and Xu (2012). However, these adoption frameworks cannot be directly applicable to study customer experience (CX) due to its incomplete coverage of the entire customer journey, including their rational, emotional, sensory, physical, and spiritual experiences as a result of their interactions with a company or product. A variety of stimuli can elicit diverse experiences, influencing financial decision-making, as highlighted by Windasari et al. (2022). Hence, there is a need for further exploration of additional factors, especially through context-specific exploratory studies within the domain of digital payments. Despite the surge of digital payments in India and an increasing customer base, academic research in the context of CX in digital payments systems remains unexplored yet. Hence, this study addresses a significant research gap by framing a conceptual model to explore both the antecedents and outcome of CX in the realm of the field of digital payments.

4. Research Methodology

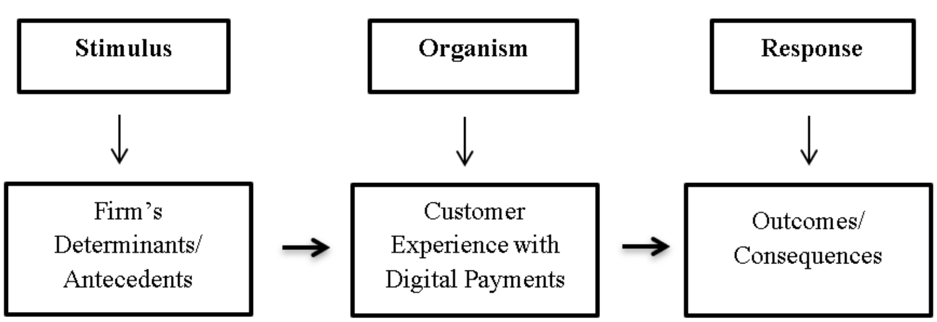
The Stimulus-Organism-Response (S-O-R) Model

Having examined previous literature and taking into account the context of our research, we have identified the most appropriate Stimulus-Organism-Response (S-O-R) model that serves as our theoretical base to study CX. This model enables us to encompass various digital payment-specific factors and comprehensively assess their impact on users' organismic states and subsequent responses.

The Stimulus-Organism-Response (S-O-R) model measures the customer experience across various domains. The Stimulus-Organism-Response (S-O-R) framework proposed by Mehrabian and Russell (1974) is recognized as one of the most prominent models in environmental psychology. It delineates a process wherein an external environmental factor (stimulus) influences the internal state of consumers (organism), subsequently eliciting approach or avoidance behavior (response) by the customer (Chopdar & Balakrishnan, 2020).The "stimulus" component refers to the influence that triggers the individual's response. Fintech companies offer financial services based on technology they develop and configure their services and employ marketing-related stimuli to captivate and engage customers (Barbu et al, 2021). The “organism” refers to the customers’ affective and cognitive conditions, consisting of the internal processes triggered by the stimuli (Kamboj et al, 2018). These processes contribute to shaping the CXs within the "organism". This experience is formed by the customer's assessment of the stimuli offered by various companies, brands, and/or products. CX is inherently subjective, as it evolves within a unique context for each individual, influenced by sociocultural factors, customer knowledge, expectations, and proficiency in utilizing fintech applications. The "response" manifests as the outcome of customers' experiences with fintech companies (Rose et al, 2012 and Barbu et al, 2021).

The S-O-R Model can be associated with the concept of the customer journey. Customer journey is defined as the interactions between the customer and the company across the prepurchase, purchase and post purchases stages (Lemon & Verhoef, 2016; Følstad & Kvale, 2017). During the pre-purchase stage, customers become acquainted with the company and engage with the stimuli provided by the company. The interaction between the customer and the stimuli makes the “organism” to produce the customer experience along the customer journey. Beginning from the purchase stage, "responses" accumulate as a consequence of customer experience, encompassing acquisition, trust, commitment, word-of-mouth referrals, and intentions for loyalty (Barbu et al, 2021).

***Figure 1:** Determinants and consequences of customer experience (CX) in digital payments*



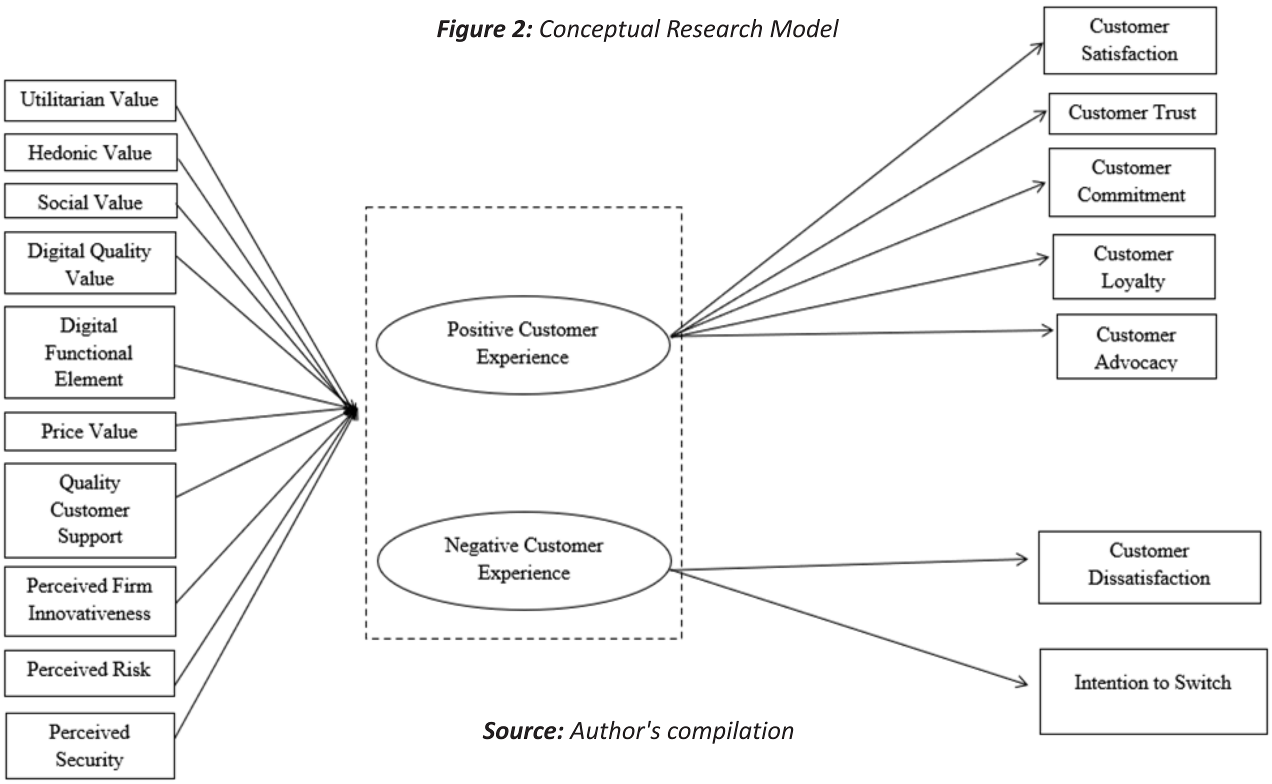
***Source:** Adapted from Becker & Jaakkola, 2020, p.638*

Aligned with the S-O-R paradigm, this study aims to recognize diverse marketing-related attributes acting as stimuli and assess their influence on customer experience within the realm of digital payments. The resulting response variable in the model encompasses consumers' satisfying experiences, which foster trust, loyalty, commitment, and advocacy, and/or dissatisfying experiences, which prompt switching behavior.

5. Conceptual Research Model and Hypotheses Development

Figure 2 presents the conceptual framework of customer experience (CX) in the context of digital payments. We adopt the established S–O–R or input–response–output framework for our research study. Our model is composed of three types of variables, which are discussed below: antecedent variables, customer experience component variables, and outcome variables. Ten antecedent variables, supported within the literature, are formative upon components of customer experience (CX), which in turn lead to positive or negative outcome behavior. Below we delve into the discussion of the conceptual model, including supporting hypothesis sourced from the existing knowledge base in CX literature.

***Figure 2:** Conceptual Research Model*



***Source:** Author's compilation*

5.1 Antecedent Variables

Ten antecedent variables are proposed that independently influence the customer experience in the domain of digital payments supported by literature from the fields of consumer behavior and CX. These antecedent variables are as follows:

(i) Utilitarian Value (UV) : In the realm of digital payments, transactions are facilitated via online platforms or mobile applications. This virtual delivery mechanism underscores the significance of user experience in terms of convenience and app usability, thereby shaping the UV *(Addis & Holbrook, 2001)*. Additionally, users enjoy time and location benefits, further enhancing the overall UV *(Heinonen, 2004)*. Accordingly, the following hypothesis is proposed.

Hypothesis 1 (H_1): Utilitarian Value (UV) is positively associated with CX.

(ii) Hedonic Value (HV): for customers can be understood as having control over the entire service process and deriving enjoyment from the experience *(Tripathi et al, 2021)*. "Hedonic intake" encompasses various facets of consumer behavior that prioritize pleasure or indulgence, often targeting different sensory experiences such as taste, smell, touch, and sight. These sensory stimuli serve as triggers for emotional arousal and enjoyment *(Strahilevitz & Myers, 1998)*. Consequently, following hypothesis is suggested.

Hypothesis 2 (H_2): Hedonic Value (HV) is positively associated with CX.

(iii) Social Value (SV): The social component involves consumers' sense of belonging to, and being accepted by, an exclusive social group through the use of a specific digital payment service *(Reyes-Menendez, 2021)*. Thereby, the following hypothesis is developed.

Hypothesis 3 (H_3): Social Value (SV) is positively associated with CX.

(iv) Digital Quality Value (DQV): Digital product or service quality encompasses a company's capability to incorporate each product or a service with a distinct identity or feature for consumer recognition. Facilitation of digital payments can occur by connecting an individual's bank account to a digital wallet or through QR code payments. Digital payments are increasingly valuable for generating audit trails and authenticating individuals. Furnishing accurate information is pivotal for electronic payment acceptance *(Bapat et al, 2021)*. Accordingly, the following hypothesis is proposed.

Hypothesis 4 (H_4): Digital Quality Value (DQV) is positively associated with CX.

(v) Digital Functional Element (DFE): The functionality of an online brand significantly influences the experiential outcome *(Flavian et al., 2009)*. These elements primarily deal with the usability and interactivity aspects of the digital payment platform, which greatly impact the online user experience (*Constantinides, 2004)*. Consequently, following hypothesis is suggested.

Hypothesis 5 (H_5): Digital Functional Element (DFE) is positively associated with CX.

(vi) Perceived value (PV): is defined as the trade-off between the costs and benefits associated with performing a particular behavior *(Dootson et al., 2016)*. PV can be comprehended by connecting the quality and price of a service *(Fornell et al, 1996)*. PV quantifies the customer's benefit in monetary terms *(Agarwal & Teas, 2001)*. The higher the PV, the more relevant the CX *(Mbama & Ezepue, 2018)*. Financial savings are frequently highlighted as one of the primary benefits offered by companies in the fintech sector *(Gomber et al, 2018)*. Digital payment service providers can provide services at low prices because of their efficient cost structure, which relies on innovation and technological progress *(Agarwal, 2020).* Thereby, the following hypothesis is developed.

Hypothesis 6 (H_6): Price value (PV) is positively associated with CX.

(vii) Quality Customer Support (QCS): Customer support plays a crucial role in providing assistance to customers when they encounter issues with products or services *(Parasuraman et al, 2005),* thus being also responsible for relevant CX. Customer support is essential for fostering reassurance and trust in digital payment services, especially in the face of potential problems like financial loss, privacy concerns, and monetary considerations. Customer support plays a crucial role in maintaining positive CX and building long-term relationships *(Barbu et al, 2021).* Accordingly, the following hypothesis is proposed.

Hypothesis 7 (H_7): Quality Customer Support (QCS) is positively associated with CX.

(viii) Perceived Firm Innovativeness (PFI): refers to how customers view a company's capacity to introduce new products and create unique experiences *(Kunz et al, 2011)*. In the realm of digital payments, innovation is frequently regarded as a fundamental element. *(Berman et al, 2021)*. A company perceived by customers as innovative typically receives higher ratings for its products or services, experiences greater consumer engagement, and often cultivates customer loyalty *(Henard & Dacin, 2010)*. The creation of innovative products or services enhances the CX *(Shams et al, 2015)*. Fintech companies are acknowledged for their innovative capabilities, leveraging technology to craft personalized services, thereby enhancing the CX *(Imerman & Fabozzi, 2020)*. Consequently, following hypothesis is suggested.

Hypothesis 8 (H_8): Perceived Firm Innovativeness (PFI) is positively associated with CX.

(ix) Perceived Risk (PR): In the domain of digital payments, risk is commonly perceived as an individual's assessment of the likelihood of experiencing loss, whether it occurs during or after a transaction. However, risk is a more intricate concept than mere individual perception *(Mutambik,2023)*. According to *Ryu (2018),* risk in fintech is not a singular dimension but it is multidimensional, comprising four key components: financial, security, legal, and operational. Financial risk pertains to the potential for monetary loss during transactions; legal risk involves concerns regarding terms and conditions; security risk relates to privacy breaches and misuse of personal data; and operational risk encompasses the possibility of system failures and network issues.

Collectively, these various facets of risk have been shown not only to hinder the acquisition of new users *(Lee, 2009)*, but also to influence the CX and, in the long run, brand loyalty *(Alalwan et al 2018)*. Thereby, the following hypothesis is developed.

Hypothesis 9 (H_9): Perceived Risk (PR) is positively associated with CX.

(x) Perceived Security (PS): Customers' perceptions of the system's capability to conduct transactions securely are manifested in their perceived security in digital payments *(Lee at al, 2017)*. Growing concerns about using digital payments have been fueled by reports of financial crimes associated with such transactions, making the use of digital payments seem volatile *(Najib & Fahma, 2020).* Security, a paramount concern for digital customers, encompasses aspects such as authentication, confidentiality, privacy protection, and data integrity. High security risks can significantly impede the ease of conducting digital transactions *(Suh & Han, 2003)*. Consequently, implementing robust security controls becomes essential for the smooth operation of digital payments. Customers' perceptions of the security of the transaction system on a digital payment platform can have either a positive or negative impact on their overall experience with digital payments. Accordingly, the following hypothesis is proposed.

Hypothesis 10 (H_{10}): Perceived Security (PS) is positively associated with CX.

5.2 Customer Experience components

The customer experience (CX) arises from a series of interactions between a customer and a product or a service, a company, or elements of its organization, eliciting a response *[Meyer and Schwager (2007), Verhoef et al., (2009)]*. The advancement of information and communication technologies has led to the emergence of digital brands. Consequently, these brands can provide digital experiences to customers *[Ha & Perks (2005); Morgan-Thomas and Veloutsou, (2013)*]. *Morgan-Thomas and Veloutsou (2013)* defined online brand experience as "an individual's internal subjective response to the contact with the online brand". Experience is generated through interactions with the organization and its offerings across various touchpoints *(Gentile et al., 2007)*. In digital payments, these touchpoints encompass websites, mobile applications, point-of-sale transactions for credit and debit cards, QR codes, and more. The two customer experience components considered for this study are positive customer experience and/or negative customer experience (CX). Positive CX is achieved when consumers perceive their interactions with a brand to be memorable, special, enjoyable, or worthwhile. It can offer values to both firms and customers, such as enhanced customer satisfaction, loyalty to organizations' offerings, positive word-of-mouth/referrals, improved retention and reduced complaints, all of which can improve profitability *(Mbama et al, 2017)*. However, when a company fails to meet the expectations of its customers, this is called a negative customer experience. This negative CX can lead to negative consequences such as dissatisfaction and intention to switch.

5.3 Outcome Variables

Positive Customer Experience

Following are the outcomes associated with positive customer experience in the realm of digital payments considered for this study:

(i) Customer Satisfaction: refers to the sentiment a consumer holds regarding a specific service or product following its use *(Zouari & Abdelhedi, 2021)*. *Egala et al (2021)* defined customer satisfaction as the attainment of elevated levels of customer fulfillment concerning the product or service. When customers experience satisfaction, it boosts business performance, thereby fostering business prosperity *(Al-Khalaf & Choe, 2020)*. Therefore, it is regarded as one of the primary strategic objectives to which every organization should devote special attention *(Dabholkar et al., 1996)*. *Chang and Chen (2009)* suggest that satisfaction with electronic services may arise from the expression of emotions triggered by the characteristics of the service. This influences customers' continual utilization of digital financial services *(Wang et al., 2019)*. Ensuring the satisfaction of customers is consistently the primary focus of any thriving business.*(Khatoon et al, 2020).*

Hypothesis 11 (H_{11}): Customer Satisfaction *is positively associated with CX.*

(ii) Customer Trust: Trust represents consumers' confidence in payment transactions being executed as anticipated. Establishing trust relies on the quality of information: credibility, clarity, salience, memorability, and visibility. Users' perceived institutional trust significantly impacts their behaviors *(Ma et al, 2023)*. As per *Wu et al. (2018)*, trust can be understood as a belief, confidence, sentiment, or expectation regarding buyer intention or probable behavior. Therefore, trust is a crucial factor in deciding whether to continue utilizing a particular service. Accordingly, the following hypothesis is proposed.

Hypothesis 12 (H_{12}): Customer Trust is positively associated with CX.

(iii) Customer Commitment: Commitment can be described as "an enduring determination to sustain a valued relationship" *(Moorman et al., 1992)*. Consumers exhibiting high levels of dedication, having established strong bonds with a company, tend to value strong connections between themselves and the brand *(Escalas and Bettman, 2003)* and view brands as integral part of their lives *(Fournier, 1998)*. Commitment stands as one of the pivotal factors in fostering enduring relationships within a marketplace. In the realm of digital applications, marketers aim to encourage repeat transactions and explore new patterns of usage, thereby securing long-term relationships *(Bapat et al, 2022)*. Indeed, commitment to a favorable brand or product is established when the consumer demonstrates a positive intention, thereby engaging in transactions within the framework of a digital application (*Wu, 2011)*. Consequently, following hypothesis is suggested.

Hypothesis 13 (H_{13}): Customer Commitment is positively associated with CX.

(iv) Customer Loyalty: refers to the level of unwavering commitment a customer demonstrates towards a business or service, as reflected in their attitudes and behaviors, even when alternative options are available from other sources (*Fornell, 1992)*. Customers who consistently make repeat purchases or utilize the same services are valuable to established companies. Their repeated patronage enhances the average customer value, highlighting the importance of fostering customer loyalty. *[Jenneboer et al (2022); Brandtzaeg & Folstad (2017)]*. Customer loyalty is crucial because retaining existing customers is generally less expensive than acquiring new ones (*Herrmann et al,2007).* A company can establish a loyal relationship with a customer by providing a quality product or service. Loyal customers are known to dedicate more time and often become brand ambassadors, spreading positive word-of-mouth about the retailer's products or services *(Tiwari, 2023).* Thereby, the following hypothesis is developed.

Hypothesis 14 (H_{14}): Customer Loyalty is positively associated with CX.

(v) Customer Advocacy: focuses on garnering strong recommendations in customer communications. In the ever-evolving market landscape, customer advocacy is increasingly indispensable for the firm's sustainability. Recommendations from current customers regarding the product or service are considered among the most reliable and trustworthy sources of information for prospective customers and also significantly impact a firm's revenues. Customer advocates go beyond being mere repeat buyers; they serve as the pillar of the company's brand, representing those who invest the most, fetch new customers, and vocally champion the brand. Customer advocacy program is crafted to enhance credibility and showcase dedication to customers, resulting in the formation of a low-cost trusted unpaid army of customer advocates. This, in turn, drives sales growth and boosts the firm's profitability *(Tripathi et al, 2021)*. Accordingly, the following hypothesis is proposed.

Hypothesis 15 (H_{15}): Customer Advocacy (CA) *is positively associated with CX.*

Negative customer experience

Following are the outcomes associated with negative customer experience in the domain of digital payments considered for this study:

(I) Customer Dissatisfaction: refers to the feelings experienced when expectations or desires are not fulfilled as anticipated *(Yoon and Lim, 2021)*. Dissatisfaction represents a detrimental outcome that drives users away from the current service provider *(Fang & Tang, 2017)*. Dissatisfaction in the context of digital payments pertains to followers' reduced confidence in the navigation structure, information provided, speed, reliability, assurance, empathy, and responsiveness of the digital payment platform.

Hypothesis 16 (H_{16}): Customer Dissatisfaction *is negatively associated with CX.*

(ii) Customers' intention to switch: Switching behavior denotes the act of consumers opting for an alternative provider over their current one. Typically, it emerges from dissatisfaction with the existing product or service, coupled with the perception of substitutes offering greater advantages.*(Hsieh et al, 2012)*

Hypothesis 17 (H_{17}): Customers' Intention to switch *is negatively associated with CX.*

6. Conclusion

The The rise of digital payments has caused significant disruption in the financial services sector, particularly in emerging economies. The fact that digital payments are delivered through virtual platforms, creates a distinct customer experience. Thus, assessing the factors influencing customers' experience in the context of digital payments and evaluating the resulting outcomes have become essential. This study provides a conceptual research model based on the S-O-R framework to assess customer experience in the context of digital payments. Building upon the preceding exploration of the proposed research model components, a predicted interrelationship between them is highly anticipated. This interrelationship is expected to serve as a core system for enriching the understanding of customer experience in the domain of digital payments. However, empirical research in this domain is yet to be explored. The expectation is to validate the previously proposed hypotheses positively and affirm the relevance of the research model. Future research could be an empirical one, harnessing the insights derived from the S-O-R model which can empower digital payment service providers, design customer-centric solutions, optimize user experiences, and drive sustainable growth in the digital payments ecosystem. As technology continues to reshape the way we conduct financial transactions, a deep understanding of customer experience facilitated by frameworks such as S-O-R will be indispensable for navigating the complexities and seizing opportunities in this dynamic digital payment landscape.

Declaration of Conflict of Interest

The authors declare that, there is no conflict of interest.

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P2P Lending Research: A Bibliometric Exploration of Emerging Patterns

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Abstract

P2P Lending Platform is a virtual market that is used to connect trusted borrowers searching for unsecured business and personal loans with lenders looking to increase returns from their lending funds as compared to other investment avenues. Peer-to-peer lending is a procedure of financing that doesn't involve any intermediary banking services, and it is like a debt.

The objective of the present research is to do the bibliometric analysis of peer-to-peer lending literature that was the part of Dimension database from banking, finance, and investment perspectives. The data for this research was obtained from the Dimensions Database in January 2023 and a total of 355 research papers have been analysed. The results show an upward trend in publications in 'P2P Lending'. Lin and Mingfeng were found to be the most influential researchers, and have been cited most frequently. With a citation count of 2414, the United States is the most frequently cited authors country in research publications related to P2P lending. Most of the research in 'P2P Lending' was found to have been published in the disciplines of Economics and Applied Economics.

KEYWORDS: Bibliometric Analysis, Citation Count, Co-authorship, NBFC, P2P lending.

Introduction

P2P lending is like an online way for people to lend money to each other. Instead of going through a bank, individuals can directly borrow money from other people. It's all done through websites that connect lenders and borrowers. (Rajeshwari, 2019)

In recent years, P2P lending has become very popular in China. It is considered to be a big and new idea in the world of everyday banking.

In 2005, a special way for people to borrow and lend money started in the United Kingdom. It's called P2P lending, and the first platform was Zopa. In China, similar online platforms began in 2006, and since then, many more have been created. Right now, the biggest P2P lending platform is Lending Club, with around $4.6 billion in transactions. At first, P2P lending was seen as a risky, but potentially profitable way for people to invest their money. The government has since created more supportive policies for P2P lending. Over the years, the number of P2P lending platforms and the amount of money being borrowed and lent have been steadily going up.

P2P lending works like this: there are people who need to borrow money (borrowers) and people who want to lend money (lenders). They connect through the internet on platforms like Zopa or Lending Club. Borrowers share information about themselves and their finances, and lenders decide if they want to lend money to them based on their assessment of risk.

P2P lending has become popular because it makes it easier for people to borrow and lend money without involving banks or other traditional financial institutions. Websites like www.Indialends.com, www.i2ifunding.com, and FinTech Early Salary let individuals get loans or invest money through P2P lending.

Faircent is a lending platform in Gurugram, India. It was started by Nitin Gupta, Rajat Gandhi, and Vinay Mathews in 2013. Faircent helps people who need money borrow directly from those who want to lend, without any middlemen. This way, both borrowers and lenders can get better interest rates.

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In today's world, if someone needs money, they can use something called peer-to-peer lending (P2P Lending). This means they can borrow money directly from another person without dealing with the strict rules of regular banks. Traditional banks have a lot of rules about how much money you need, what you have to give them as security, high-interest rates, complicated paperwork, and lots of documents that take a long time to fill out. But with online P2P lending, you can skip all that. These lending platforms have huge markets in the USA, China, UK, Germany, Singapore, and Indonesia. In India, they started in 2012, and in 2017, the Reserve Bank of India (RBI) made rules about how they should work.

In the past few years, a lot of researchers from around the world have been looking into P2P lending. They are studying it to find solutions for problems in related areas. Countries like the USA and China have done many studies on P2P lending.

Before, many studies looked at numbers and information about P2P lending. In a study by Ariza-Garzon et al. (2021), they found important research and trends in P2P lending using a method called bibliometric analysis. However, in this study, they were only using information from the WoS database. Another study by Martínez- climent et. al. (2018) also looked at a similar topic, but they focused on crowdfunding and its financial returns using the WoS database. They found that, when you consider the money side of things, P2P lending seems more interesting to study than crowdfunding with equity-based loans. This conclusion is based on the number of research papers published in this area.

A group of researchers, led by Himmatul Kholidah and others in 2022, studied a similar topic. They wanted to conduct a bibliometric analysis of P2P lending literature from an economic and business viewpoint. This means they looked at articles about P2P lending in journals that are recognized by Scopus. This research is unique because it's the first time someone has used VOSviewer for a bibliometric analysis of P2P lending literature as per the researcher. They mainly looked at the authors, countries, organizations, and keywords that were most popular in the literature.

Now, this study is a bit different. This study gathered information from journals listed in the Dimension Database.

Literature Review

Funk (2011) talked about the P2P lending market. They looked at what makes P2P lending work and studied the determinants of P2P. They also focused on the differences between the financial and demographic characteristics of the borrower. The study found that online P2P lending has become more important in the world recently.

Pushpa BV and Phani Satish's (2016) research article tried to look at how P2P lending or marketplace lending works and what's happening with it in Indian financial market. This study also describes the P2P lending model in India.
According to Iyer et al., (2016) study, one good thing about P2P platforms is that they have a lot of credit information. This helps lenders decide if someone is good at repaying loans or not. It also affects how much interest they charge.

Another study by Bachmann et. al. (2011), has looked at online P2P lending. They looked at some articles published until 2010. Their focus was on how things like age and other personal details influence P2P loans.

Peer-to-peer lending is like a win-win situation. It gives people who lend money better profits, and it makes it easier for people who need money to get it at lower costs. This is especially helpful for those who might find it hard to get a loan from a traditional bank. According to experts like Milne & Parboteeah (2016) and Wardrop et al. (2016), this kind of lending can do better than conventional lending in the retail sector.

Numerous studies have explored the possibility of P2P lending as a substitute for conventional financing, as demonstrated by Liu et al. (2022) and others.

According to Eugenia (2018), the expenses associated with operation and maintenance were minimal since the complete management of P2P entities was conducted online.

Further Kittu & Satya Prakash (2019), stated that if P2P (Peer-to-Peer) starts using new and advanced technologies like blockchain early on, it will have a long-lasting advantage.

Shivangi's (2019) research in India showed that P2P (peer-to-peer) advancement started with I-LEND creating a tech-based credit market in 2012. After that, more than 30 companies joined this industry.

Khatri's (2019) study pointed out that the online lending business was expected to grow a lot, around 51.5% every year from 2016 to 2022. This info came from reports by Research and Markets. However, there were some problems that lenders, borrowers, and platform operators needed to handle.

The main aim of the present study is to conduct a thorough methodological analysis of the literature on P2P lending, focusing on the perspectives of banking, finance, and investment, and contribute valuable insights to the existing body of literature. The study will focus specifically on the structural aspects of P2P lending literature in these fields.

The significance of this study lies in its potential to identify current research trends and publications in the global P2P lending landscape. To achieve this, the study will use the Dimension Database, covering the period from 2012 to the present.

While there have been various bibliometric analyses of peer-to-peer lending, most have concentrated on specific regions or countries. As a result, there is a dearth of comprehensive bibliometric studies that cover the global landscape of P2P lending research. Furthermore, although some studies have examined citation patterns and research trends in P2P lending, very few have looked at co-citation patterns and rational structure of the field, which could provide valuable insights into relationships and knowledge flow among researchers and research topics in the domain.

Considering that no research has been conducted using the Dimension database, while other studies have mainly relied on Scopus and Web Science databases, a bibliometric analysis that combines both citations and comprehensively examines the global landscape of P2P lending research, thereby filling this research gap.

Research Objectives

The objective of this study is to examine the research patterns in the P2P lending domain throughout the years. Specifically, this study aims to achieve the following research objectives:

1. Investigate the top 10 P2P lending startups in India.
2. Analyze the publication trends in the P2P lending domain over time
3. Identify the primary journals that publish research on P2P lending.
4. Determine the most influential researchers in a particular P2P lending field based on citation count.
5. Identify the top author countries and organizations whose research on P2P lending is most frequently cited.

Research Methodology

To accomplish the research objectives, this study employed a quantitative research approach and the bibliometric review method. The data analyzed in this study consists of 355 research articles published between 2012 and January 20, 2023, and was sourced from the Dimension database. Bibliometric analysis is a widely utilized approach to examining the origins of any research topic (Li, C., Wu, K., & Wu, J. 2017), and this study utilized various tools such as publication trends and citation network analysis.

For data analysis, this study utilized VOSviewer software, which provides a map to examine the relatedness of items based on the distance between them. The software was used to analyze the collected data and generate visual representations of citation network analysis.

Table 1: Design of research study.

DATA SCREENING	**STEP-1**	Identification of P2P lending literature based on banking, finance, and investment perspective indexed in Dimension Database
	STEP-2	Search papers by looking for the article title and abstract using the keywords "Peer to Peer Lending."
	STEP-3	Subject area selection based on “Banking, Finance and Investment” and “Economics, Applied Economics, and Accounting”
	STEP-4	Select a publication document “all types publication”, publication stage “Final”, source type “Journal”, language “English” and publication period from “2012 to 20 Jan 2023”
RESULT ANALYSIS	**STEP-5**	The number of articles identified in the Dimension Database based on above mentioned specific criteria was 355 documents results

Source: *Author's elaboration*

Findings & Discussion

The research findings, concerning the five research objectives discussed above, are presented below.

Top 10 P2p Lending Startups In India

A recent report by Boston Consulting Group (BCG) says that Fintech, which is about using technology in finance, has been growing a lot. The part of it that involves lending money online is predicted to become a $1 trillion industry in the next five years. The government is working to make India more digital, and as more people use the internet, it will create a big market for this growing industry.

Top 10 P2P lending startups in India:

- Faircent: This is a Gurugram-based P2P lending platform, founded by Nitin Gupta, Rajat Gandhi, and Vinay Mathews in 2013.
- Lendingkart: Is an Ahmedabad based fin tech startup founded by Harshvardhan Lunia and Mukul Sachan in 2014.
- Finzy: This is a Bengaluru-based P2P lending startup founded by Abhinandan Sangam, Amit More, Vishwas Dixit and ApoorvGowde in 2016.
- i2i Funding: Is a Noida-based fintech startup founded by Abhinav Johary, Manisha Bansal, Neha Aggarwal, Raghavendra Pratap Singh, and Vaibhav Pandey in 2015.
- i-Lend: Is a Hyderabad-based P2P-NBFC platform founded by Mukesh Kothari, Niti Gupta, and VVSSB in 2012.
- LenDenClub: Is a Mumbai-based P2P lending startup founded by Bhavin Patel and Dipesh Karki in 2015.
- PaisaDukan (BigWin Infotech): Is a Mumbai based P2P lending startup founded by Rajiv Ranjan in 2018.
- RupeeCircle: Is a Mumbai-based fintech startup founded by Ajit Kumar, Abhishek Gandhi, Ashish Mehta, and Piyush Saurabh in January 2018.
- Monexo: Is a Mumbai-based P2P NBFC founded by M. Sundar, Mukesh Bubna, and Sonal Bengani in 2014.
- Cashkumar: Is a Bengaluru-based fintech startup founded by Dhiren Makhija, Kannana Kandappan and Yogesh Joshi in 2012

The new companies will make it easy for people to borrow money without it costing too much. They will also help people who lend money to make good profits by cutting out middlemen. As more and more people in India use the internet, we expect more of these financial technology startups to take advantage of this opportunity. This will make a bigger market for the growing industry in the country.

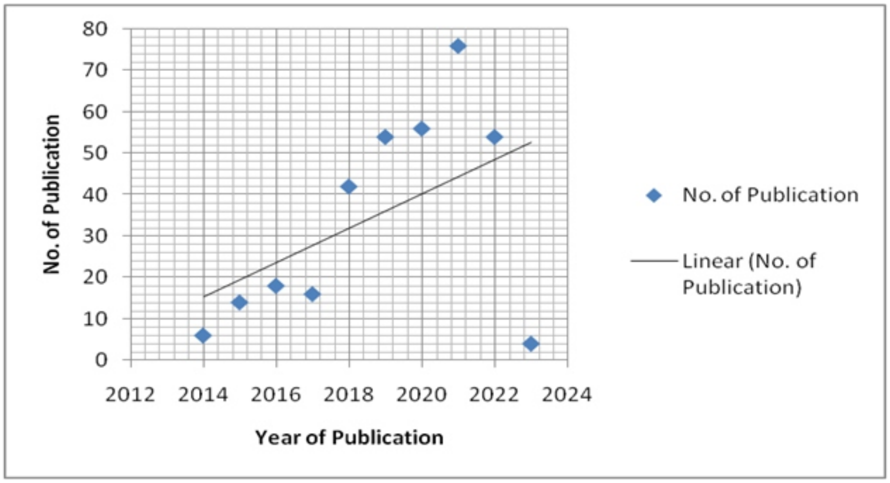
Publication trends in the domain of P2P Lending with respect to time.

Peer-to-peer lending, which means people lending money to each other online, is a fresh idea in research. More and more studies have been done about it in recent years. The first online peer-to-peer lending platform that got noticed was "Zopa" in 2006. But in 2007, "Prosper.com" made its platform's data available to the public, and this increased the number of research studies on the topic. From 2006 to the end of 2010, there were about 43 research papers written about it (Bachmann, et al., 2011). Based on table 2 it seems that there is an upward trend in P2P research. The number of publications increased from 6 in 2014 to 76 in 2021, showing significant growth over time.

Table 2: Publication trends in the domain of P2P Lending with respect to time.

Year	No. of Publication
2014	6
2015	14
2016	18
2017	16
2018	42
2019	54
2020	56
2021	76
2022	54
2023	4

Source: *Authors' elaboration based on Dimension Database*



Source: *Authors' elaboration based on Dimension Database*

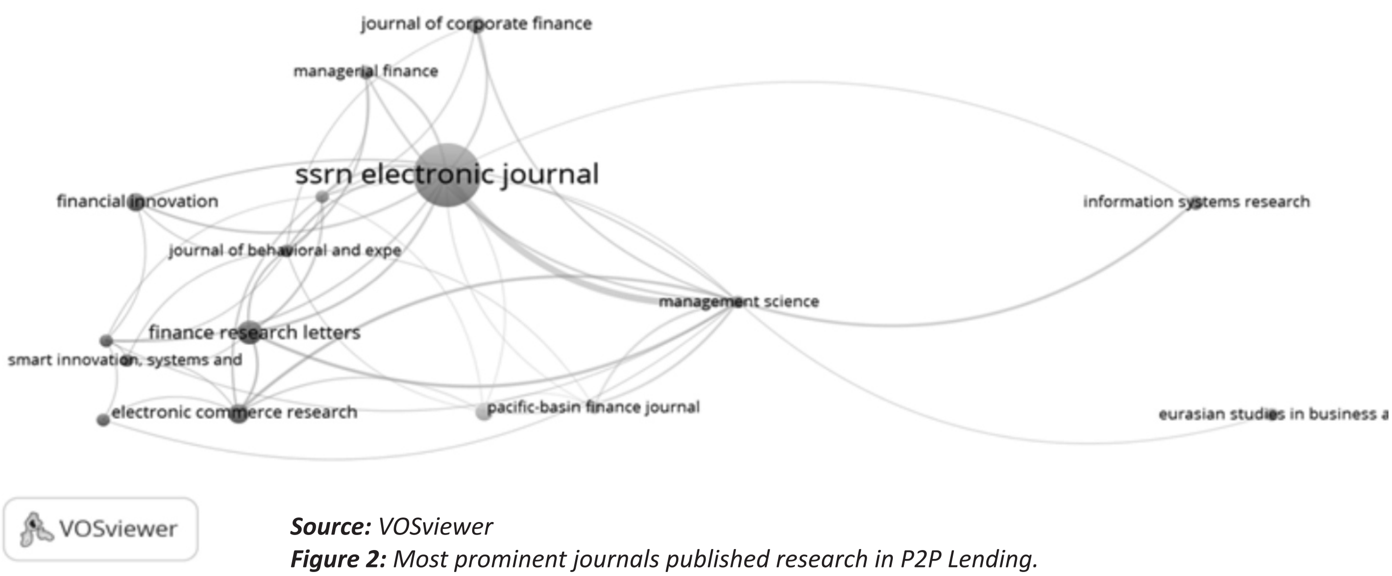
The most prominent journals published research in P2P Lending

Table 3 and Figure 2 show that the bulk of research in 'P2P Lending' has been published in the SSRN Electronic Journal with 73 documents and it was followed by Finance Research Letters with 10 documents. Look at Figure 2 below, it's about important journals that share research about P2P Lending. It also shows the collaboration network between journals in publishing P2P lending research. The size of the circle cluster shows the number of papers published by authors in the journal. The biggest circle cluster in the center represents SSRN Electronic Journal, which is the top journal with the most P2P lending publications.

Table 3: Most prominent journals that published research in P2P Lending.

Sr. No.	SOURCE	DOCUMENTS
1	SSRN Electronic Journal	73
2	Finance Research Letters	10
3	Electronic Commerce Research	7
4	Financial Innovation	6
5	Emerging Markets Finance And Trade	5
6	Journal Of Corporate Finance	5
7	Information Systems Research	4
8	Managerial Finance	4
9	Eurasian Studies In Business And Economics	3
10	Expert Systems With Applications	3
11	Journal Of Banking & Finance	3
12	Journal Of Behavioral And Experimental Finance	3
13	Lecture Notes In Networks And Systems	3
14	Management Science	3
15	Pacific-Basin Finance Journal	3
16	Smart Innovation, Systems And Technologies	3
	Total	**138**

Source: *Authors' elaboration based on Dimension Database*



Source: *VOSviewer*

Figure 2: *Most prominent journals published research in P2P Lending.*

The most prominently cited authors in the field of P2P Lending in the domain based on Citation Count

Using a tool called VOSviewer to study citations, it was discovered that Lin, Mingfeng's work got 926 citations (shown in Table 4 and Figure 3) and has a total link strength of 39. This means that Lin, Mingfeng's research on P2P lending is highly recognized and frequently referenced by other researchers in the same field.

Table 4: Most influential researchers in the field of P2P Lending in the domain based on Citation Count

Sr. No.	Author	Documents	Citations	total link strength
1	Lin, Mingfeng	6	926	39
2	Wei, Zaiyan	6	175	15
3	Gonzalez, Laura	9	146	10
4	Byanjankar, Ajay	4	93	5
5	Liao, Li	6	68	9
6	Wang, Zhengwei	5	57	8
7	Yang, Jun	4	27	3
8	Wang, Bo	4	27	8
9	Sohn, So Young	5	24	2
10	Wang, Yan	5	10	4
11	Nigmonov, Asror	4	8	10
12	Ni, Xuelei Sherry	4	7	3

Source: *Authors' elaboration based on Dimension Database.*

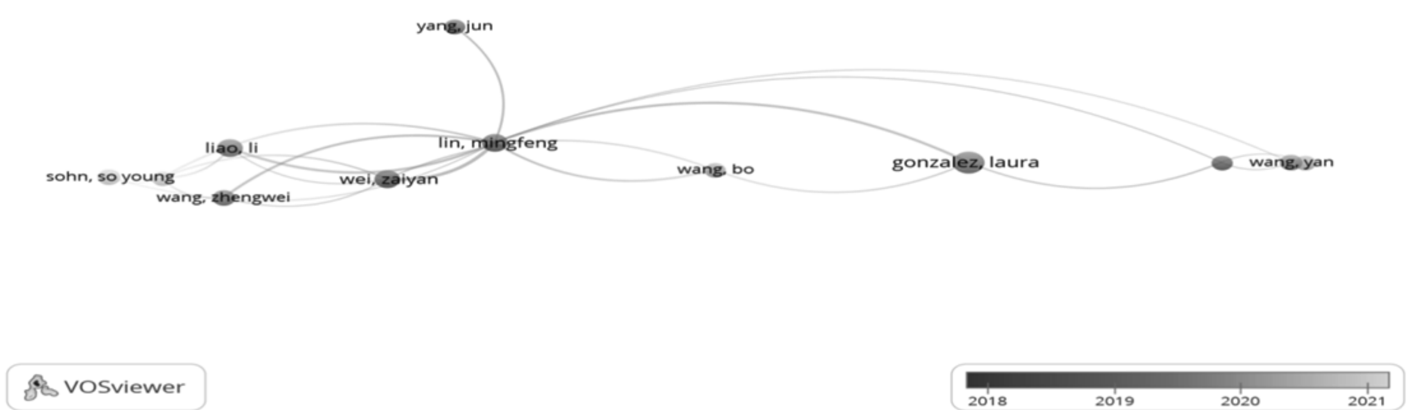


Figure 3: *Most prominently cited authors in the field of P2P Lending in the domain based on Citation Count*

Most Influential Research Papers in P2P Lending as per Citation Analysis

Citation analysis is like checking how important a research paper is by counting how many times other papers mention it (Waltman & Van Eck, 2012)

When we talk about the "citation count," we mean the number of times people refer to a specific paper over time. If lots of papers mention it, we think that paper is really important. Citation analysis is a great way to figure out how much impact a research paper has (Tsay, 2009).

To identify the most influential research papers on P2P Lending, the data was analyzed through VOSviewer software. Table 5 shows the list of the top 20 research papers on P2P Lending which are cited most frequently from 2012 to till date. As per citation count, Lin (2013) is on the top of the list with 752 citations followed by Duarte (2012) with 642 citations and Bruton (2015) with 492 citations. Figure 4 below is related to the influential research paper on P2P Lending. It shows a citation network on P2P Lending made with the help of VOSviewer. It also shows the collaboration network between authors in the field of P2P lending research studies. The size of the circle cluster represents the number of times the paper was cited by the other researcher. Figure 4 below clearly indicates Lin (2013) as the top author with respect to citations.

Table 5: Top 20 research papers on 'P2P Lending' based on citation count, during the period 2012–2023, retrieved from Dimension database.

Sr. No.	Research Paper	Citations
1	Lin (2013)	752
2	Duarte (2012)	642
3	Bruton (2015)	492
4	Michels (2012)	209
5	Dorfleitner (2016)	193
6	Wei (2017)	148
7	Morse (2015b)	121
8	Gonzalez (2014)	87
9	Byanjankar (2015)	84
10	Wang (2020a)	70
11	Martínez-Climent (2018)	65
12	Mild (2015)	63
13	Bussmann (2020)	63
14	Butler (2017)	62
15	Bastani (2019)	57
16	Balyuk (2016)	55
17	Xu (2018)	52
18	Chen (2020)	48
19	Bollaert (2021)	47
20	Caldieraro (2018)	47

Source: *Authors' elaboration based on Dimension Database*

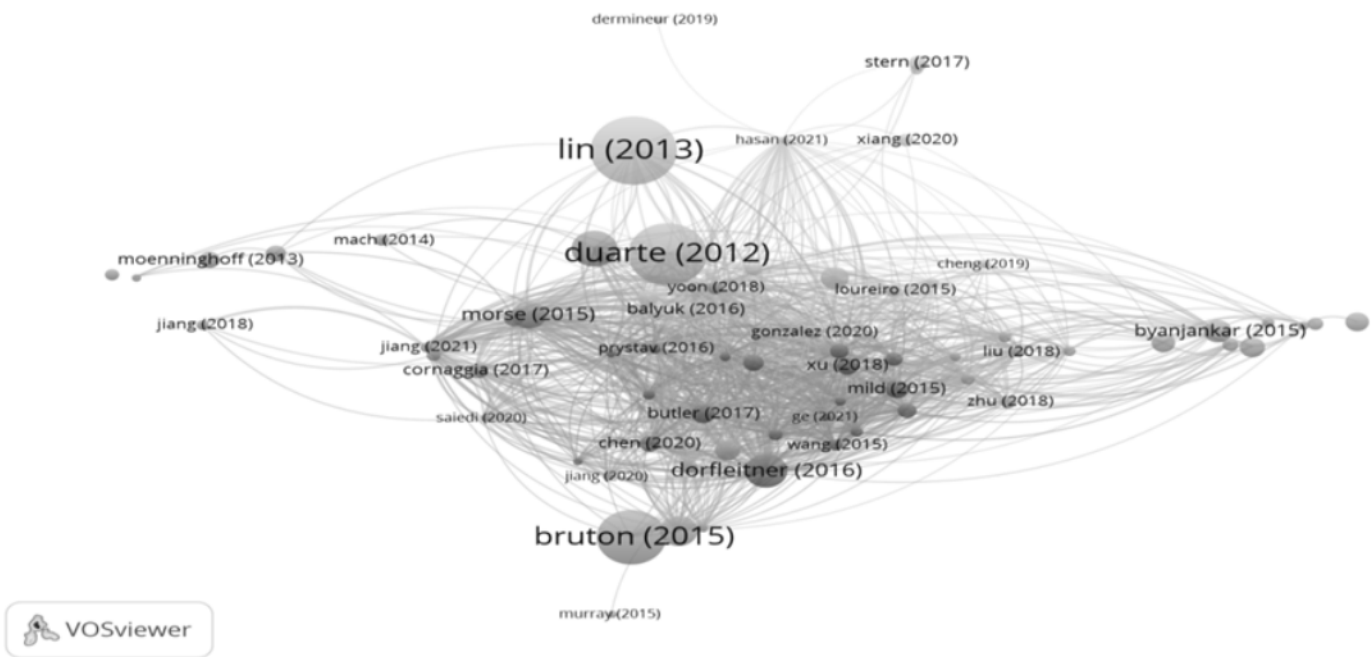


Figure 4: *Citation network on P2P Lending made using VOSviewer software*

Authors Country and Organisation in the field of 'P2P Lending' which is mostly cited by the researcher

Looking at Table 6, it was found that most of the researchers cited the work from the United States (which had 2414 citation counts in 67 documents). After that, China was cited 765 times in 86 documents, and the United Kingdom was cited 694 times in 28 documents.

Figure 5 below is related to the authors' countries in P2P Lending. It also illustrates the collaboration network between authors' countries in the field of P2P lending research studies. The size of the circle cluster represents the number of documents published by authors' countries in the area of P2P lending. Additionally, it demonstrates the citation network on P2P Lending created with the help of VOSviewer. Figure 5 below clearly indicates that the United States is the leading country of authors in terms of citations."

Table 6: Top 10 Authors Countries whose research study was highly cited

Sr. No.	Country	Documents	Citations
1	United States	67	2414
2	China	86	765
3	United Kingdom	28	694
4	Germany	11	297
5	Italy	6	91
6	South Korea	11	64
7	Ireland	3	55
8	Japan	4	52
9	Australia	11	50
10	France	3	50

Source: *Authors' elaboration based on Dimension Database*

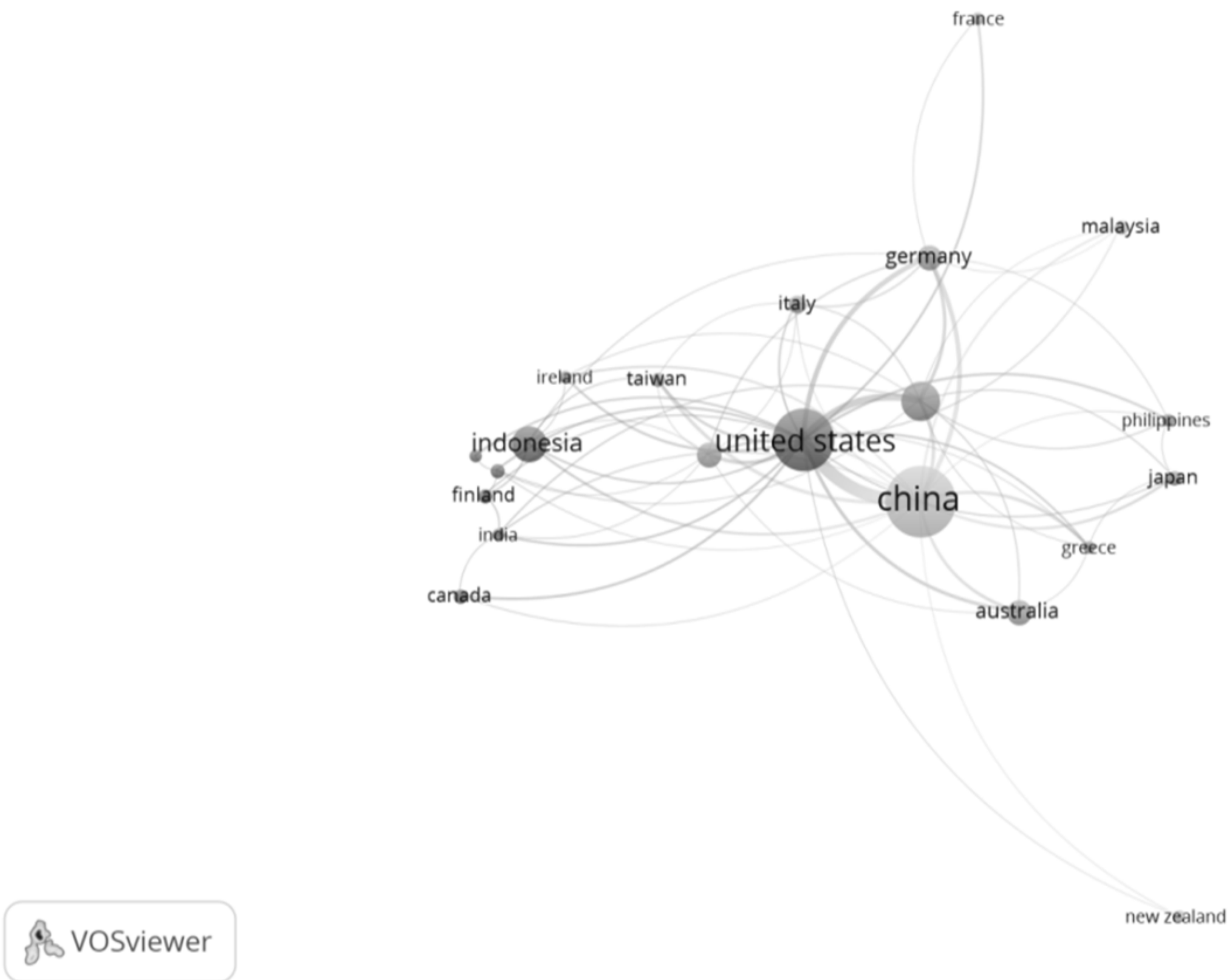


Figure: 5 *Authors Countries highly cited in this field*

According to Table 7, University of Arizona research documents received the highest number of citations, totaling 910 across 4 documents. Following closely are Purdue University West Lafayette, with 175 citations across 6 documents, and Pennsylvania State University, with 142 citations across 4 documents

Figure 6 below is related to the author's organizations on P2P lending. It also shows the collaboration network between authors' organizations in the field of P2P lending research studies. The size of the circle cluster represents the number of documents published by author organizations in the area of P2P lending. It also shows the citation network on P2P Lending made with the help of VOSviewer. Figure 7 below clearly indicates the University of Arizona is the top author's organization concerning citations.

Table 6: Top 15 Organizations mostly cited by the researcher in this field

Sr. No.	Organization	Documents	Citations
1	University Of Arizona	4	910
2	Purdue University West Lafayette	6	175
3	Pennsylvania State University	4	142
4	Southwestern University Of Finance And Economics	7	128
5	Fordham University	4	127
6	Renmin University Of China	8	85
7	The University Of Texas At Dallas	3	81
8	Chinese University Of Hong Kong	5	80
9	Tsinghua University	9	70
10	Peking University	11	66
11	Zhejiang University Of Finance And Economics	3	63
12	Jinan University	6	62
13	University Of Cambridge	3	62
14	University Of Washington	4	62
15	Shandong University	5	41

Source: *Authors' elaboration based on Dimension Database*

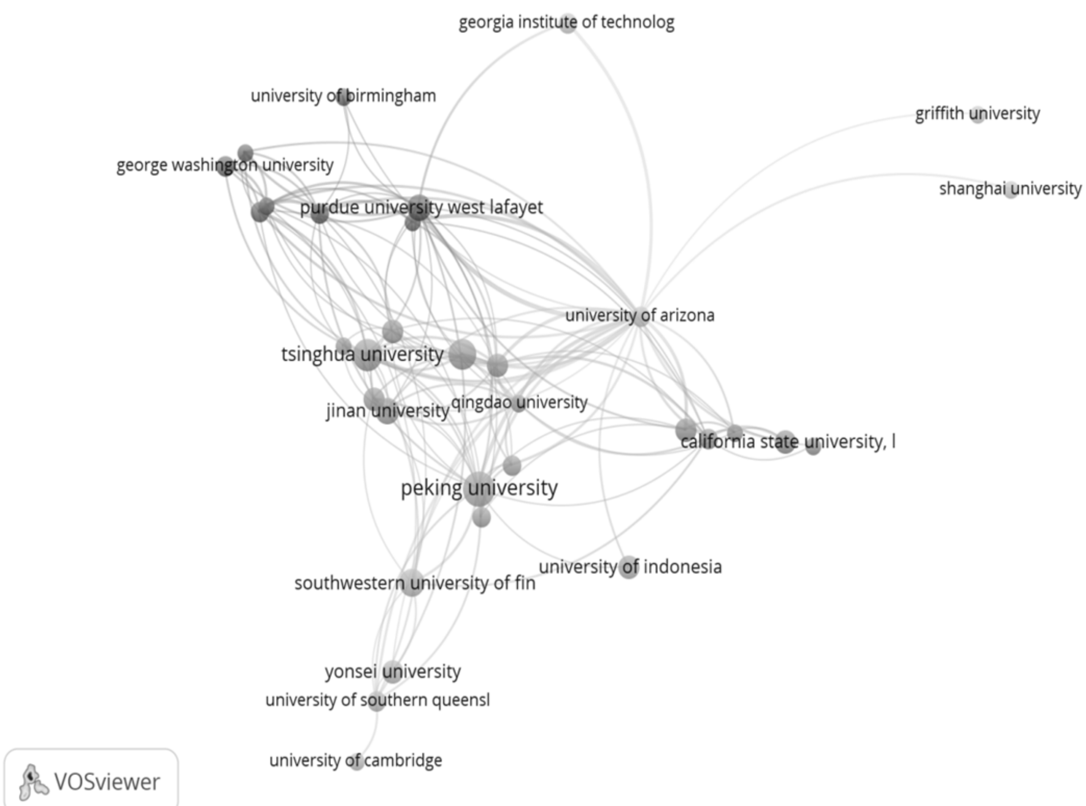


Figure 6: *Author's Organisation, which is mostly cited by researchers in this field*

Conclusion, Limitation, and Future Scope

The study field of 'P2P Lending' holds immense importance for financial Institutions and academia. This study has tried to throw some light on the bibliometric analysis of 'P2P Lending' between 2012 and 20 Jan. 2023 by using data from the Dimensions database. This study provides a comprehensive overview of 'P2P Lending' by determining the top 10 P2P Lending platforms, publication trends, top journals, top authors, top countries, and top organizations based on citation count. In this study researcher used only the Dimensions database which is a limitation of the study. For future studies, researchers can consider other databases like Scopus and Web of Science with different period for bibliometric analysis.

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Exploring the Use of Digital Payment Apps Among Amritsar Residents

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**Dr. Ishu Chadda

Abstract

The rise of e-commerce has fuelled global interest in integrating technology into financial transactions. In response, the Indian government launched the "Digital India Campaign" to promote a cashless society. This initiative has led to the adoption of various digital payment methods, including debit cards, credit cards, electronic wallets, and bank transfers via Internet banking apps like PhonePe, Paytm, and Google Pay. The ubiquity of smartphones and mobile payment technology has further simplified online transactions. Consequently, digital payment systems have become increasingly essential for everyday financial activities. To understand the adoption of these systems in India, this study investigates the use of digital payment methods among citizens of Amritsar. A specifically designed questionnaire was distributed through a Google Form, and data was collected from 100 respondents. The findings reveal a growing trend of daily usage of digital payment apps, with Paytm, PhonePe, and Google Pay emerging as the most popular choices in Amritsar.

1. Introduction

The rise of e-commerce has fuelled global interest in integrating technology into financial transactions. This trend prompted the Indian government to launch the "Digital India Campaign," aiming to promote a cashless society, characterized by minimal reliance on physical currency (Kumari & Khanna, 2017). Digital transactions in India utilize various methods, including debit cards, credit cards, electronic wallets, and bank transfers via e-banking platforms like PhonePe, Paytm, and Google Pay. The Indian banking industry actively promotes digital payments as a key strategy in transforming India into a digital nation. While PayPal pioneered online money transfer in 1998, it's important to focus on India's specific digital payment landscape. Paytm, Tez (now Google Pay), and BHIM emerged in 2015, following the entry of Samsung Pay and the enhanced services offered by Android Pay in 2017 (Mallesha & Godugu, 2021).

The ubiquity of smartphones, mobile payments, and other technologies has significantly simplified online transactions. While digital payment systems have become increasingly popular, it's important to acknowledge that not everyone has access to or feels comfortable using them. India has witnessed a surge in the development and adoption of various cashless payment methods, aiming to achieve a more digital economy. Notably, in 2021, India surpassed China and the US in terms of digital payment volume. This shift signifies India's transformation from a cash-reliant economy to a digitally empowered one. The COVID-19 pandemic further accelerated the growth of India's digital payment market. Over the past few years, platforms like Paytm, PhonePe, and Google Pay have successfully integrated into B2B and B2C transactions, solidifying the country's payment infrastructure (Financial Express, 2021). This growth coincides with the significant expansion of mobile network infrastructure, particularly the widespread adoption of 3G and 4G services in both urban and rural areas. This rapid improvement in internet connectivity underscores India's ongoing "Digital Revolution" (Reserve Bank of India, 2020).

The Indian government's "Digital India Campaign" has been a significant driver in the adoption of cashless transactions, particularly evident in the phenomenal growth of the Unified Payments Interface (UPI). According to the National Payments Corporation of India (NPCI) 2024, UPI transactions reached a staggering ₹125.95 trillion by the end of 2022, reflecting a remarkable 175% year-on-year (YoY) growth. Notably, this value constituted nearly 86% of India's GDP in FY22, highlighting UPI's widespread use in everyday financial activities. This impressive growth trajectory continues. As of the end of 2023, the total transaction volume on UPI stands at a significant 83.75 billion, showcasing its sustained dominance in the digital payments

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landscape as revealed in figure 1. Looking ahead, the Reserve Bank of India (2022) recently announced the expansion of its Central Bank Digital Currency (CBDC) pilot program on April 5, 2024. This expansion involves distribution through non-bank payment system operators in addition to more banks. Encompassing retail and wholesale segments, the pilot program aims to explore a wider range of use cases for the CBDC.

This research paper investigates the popularity of digital payment systems among citizens in Amritsar. A specifically designed questionnaire was distributed through a Google Form, and data was collected from 100 respondents using snowball sampling. The study aims to:

- Assess customer awareness of digital payment applications.
- Evaluate customer preferences and usage patterns for these apps.
- Analyze customer feedback and opinions on digital payment applications.

Review of Literature

The widespread adoption of digital payment applications can be attributed to their convenience and accessibility, as highlighted by Dahlberg (2007) who emphasized how these mechanisms simplify transactions. Studies have explored user preferences towards various mobile wallets. Shin (2009) found that M-wallet users valued security, privacy, and trust, while non-users expressed concerns about its complexity. This highlights the importance of user experience in digital payment app adoption. Kumar (2017) explored the functionalities offered by mobile payment applications, such as online bill payments, shopping, and other online transactions. These features, as identified by Praiseve and John (2018), contribute to consumer acceptance and adaptation of digital payment apps.

Customers prefer digital payment apps due to their security, convenience, and time-saving benefits (Singh & Rana, 2017). Ease of use appears to be a key factor influencing user choice, with Paytm and Google Pay emerging as popular options due to their user-friendly design (Franciska & Sahayaselvi, 2017). Studies have also found a positive correlation between customer satisfaction and mobile wallet usage (Singh et al., 2017). Incentives offered by service providers, including discounts, cash back, and faster transactions, further enhance customer satisfaction with digital payment apps (Khan & Jain, 2018). As a result, Indian consumers increasingly favor apps like Paytm, PhonePe, and Google Pay (Gupta, Yadav, & Gupta, 2020).
A study by Singh and Singh (2024) in Amritsar, India, supports the idea that digital financial tools can improve financial inclusion for underprivileged populations. Their research found that the urban poor are increasingly using digital wallets like Google Pay, PhonePe, and Paytm for online transactions, bill payments, and mobile recharges. This trend aligns with the goals of the JAM trinity (Jan Dhan - bank accounts, Aadhaar - unique ID system, Mobile - mobile phone connectivity) program, which aims to create the infrastructure for delivering financial services and government benefits efficiently. These findings suggest that combining accessible digital payment options with government initiatives like JAM has the potential to empower the urban poor by making it easier for them to access financial services and government aid.

Database And Methodology

This study relies on primary data collected through a structured questionnaire. It was designed and administered online through Google Forms. Using snowball sampling, a sample of 100 respondents from Amritsar was recruited between February 15th and 28th, 2024. The questionnaire gathered information on respondents' socio-economic backgrounds and their knowledge of various digital payment methods. Data analysis utilized a combination of descriptive statistics (simple percentages) to understand the distribution of responses, and inferential statistics (t-tests, Cohen's D, and ANOVA) to explore potential relationships between variables.

Ethical Approval:

This study adhered to ethical research principles. Informed consent was obtained from all respondents through a statement within the Google Form explaining the study's aims, implications, and how their data would be handled confidentially and anonymously. To ensure data quality and avoid duplication, measures were taken to limit participation to one response per person. No financial compensation or rewards were offered to participants.

Results and Findings

This study investigates the popularity of digital payment applications in Amritsar. The findings are presented across three key sections:

Socio-economic profile of the sample customers: This section explores the demographic characteristics of the survey respondents to understand potential user groups for digital payments.

Awareness about Digital Payments Apps: This section examines the respondents' level of awareness and knowledge regarding various digital payment applications, including Google Pay.

Preferences and opinions using Digital Payments Apps: This section analyzes user preferences for digital payment applications, focusing on the reasons for choosing or not choosing digital payment applications.

Table 1: Socio-Economic Profile of the Respondents

Demographic Details	Percent
Gender	
Male	65
Female	45
Age-Groups	
15-25	46
25-40	40
40 and above	14
Marital Status	
Married	13
Unmarried	87
Living Arrangements	
Joint	44
Nuclear	56
Qualification	
12^{th} or Equivalent	11
Bachelor's Degree	51
Masters's Degree	38
Profession	
Student with a part-time job	44
Salaried Job	16
Self-Employed/Business	14
Unemployed	26
Monthly Income	
Less than Rs. 20000	74
Rs. 20000- Rs.30000	13
Rs. 30000-Rs.40000	3
Rs.40000 and above	4

Source: *Computed from Primary Data*

Table 1 explains the Demographic Breakdown of Respondents.
Gender: The majority of respondents were male (65%), with the remaining 45% being female.

Age: The study population skewed younger, with 46% falling between 15-25 years old, followed by 40% in the 25-40 age group, and the remaining 14% above 40.

Marital Status: The majority (87%) of respondents were unmarried.

Living Arrangements: Over half (56%) of the respondents lived in nuclear families, while the remaining 44% lived in joint family structures.

Educational Qualification: A significant portion (51%) of the respondents held a Bachelor's degree, followed by 38% with a Master's degree, and 11% with a 12th-grade diploma or equivalent qualification.

Occupation: The largest group (44%) of respondents were students with part-time jobs. Salaried jobs accounted for 16%, followed by self-employed/business owners (14%), and unemployed individuals (26%).

Monthly Income: The majority of respondents (74%) had a monthly income below Rs. 20,000. The remaining income brackets saw a decreasing percentage, with 13% earning between Rs. 20,000- Rs.30,000, 3% between Rs. 30,000- Rs.40,000, and only 4% earned above Rs.40,000.

Table 2: Awareness of Digital Apps

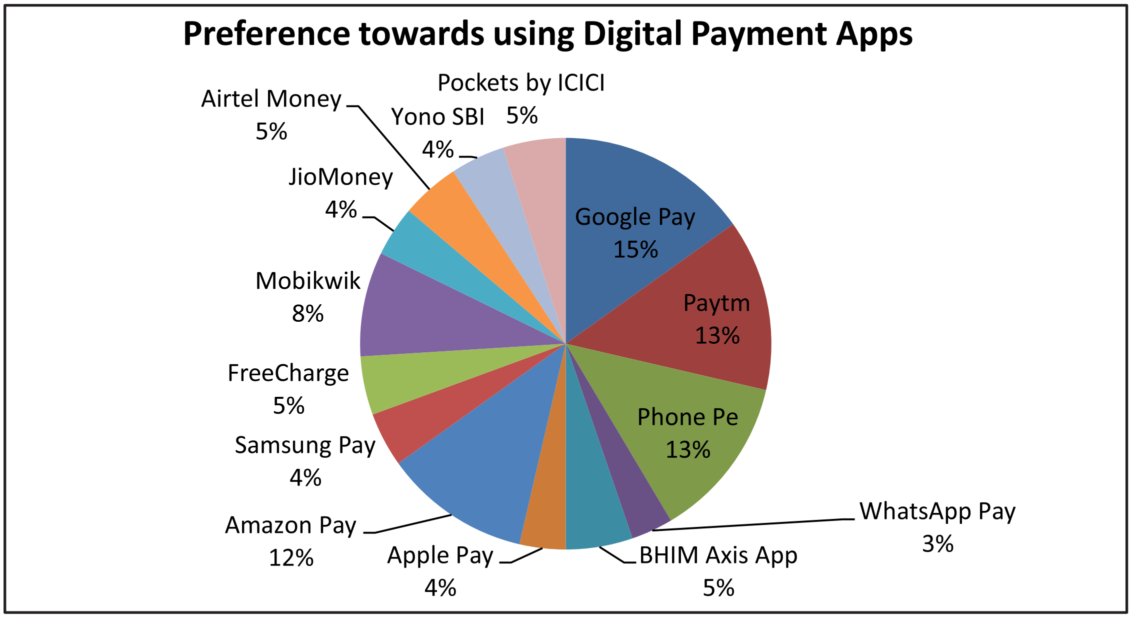
Status	Percent
Fully Aware	50
Partially Aware	37
Not Aware	13

Source: *Computed from Primary Data*

The survey results indicate a positive level of awareness regarding digital payment applications among the respondents in Amritsar. As shown in Table 2, half of the respondents (50%) reported being fully aware of these apps. An additional 37% indicated partial awareness, suggesting some familiarity with digital payment options. However, a minority (13%) remained unaware of digital payment applications altogether.

The pie chart depicts the digital payment app preferences among respondents in Amritsar. Google Pay emerges as the most popular choice, with a significant majority of respondents (46%) reporting its use. Following Google Pay are Paytm Digital (41%), PhonePe (39%), and Mobikwik (25%), which collectively account for the remaining 64% of users. The chart highlights Google Pay's dominance in the digital payments landscape of Amritsar, while also indicating the presence of other established players in the market. Google Pay is highly suggested and preferred because, in contrast to other apps, it makes payments digitally directly from the customers' accounts. The user-friendliness of this software, according to users, is higher. The rise of Mobikwik and Paytm has accelerated since demonetization, according to Mallesha and Godugu (2021).

Figure 1: *Preference towards using Digital Payment Apps*



Source: *Computed from Primary Data*

Poongodi, Jayanti & Ramya (2021) investigated why individuals prefer Google Pay and what factors influence its utilization. Google Pay, one such method, provides an easy and secure way to send money instantaneously. The study discovered strong associations between age, education, occupation, length and frequency of Google Pay use, platform awareness, and overall usage level. Google Pay enables user-to-user transactions that are both convenient and cost-effective. This eliminates transaction fees, facilitating smaller transactions.

Table 3: Usage of Digital Payment Apps

Status	Percent
Yes	84
No	16

Source: *Computed from Primary Data*

The survey results in Table 3 reveal that a significant portion (84%) of the respondents in Amritsar reported using digital payment applications. This indicates a growing acceptance and integration of these technologies in everyday financial transactions. However, a noteworthy minority (16%) still do not utilize digital payment apps. During the COVID-19 pandemic, digital payment apps like Google Pay, Paytm, and Mobikwik gained popularity. These easy-to-use apps provide convenient, rapid, and transparent cashless transactions. Despite occasional technical hiccups, users value the security, convenience, and transparency that they provide. However, a small percentage of the population is still cautious due to a lack of bank accounts, security concerns, or limited access to smartphones. The study highlights the importance of addressing these concerns and encouraging non-users to accept digital payments (Goplani, Sabhani & Gupta 2021).

Table 4: Frequency of using Digital Payment Apps

Frequency of Usage	Percent
Daily	4
Weekly	51
Monthly	23
Quarterly	22

Source: *Computed from Primary Data*

Examining the frequency of digital payment app usage among those who reported using them (n=84) reveals interesting patterns in Table 4. Weekly usage emerged as the most common pattern, accounting for 51% of respondents. This suggests a regular integration of digital payments into everyday financial activities. A significant portion (23%) utilizes these apps monthly, while another 22% relies on them quarterly. These findings indicate varying frequencies of digital payment app usage within the adopting population.

Table 5: Number of times using Digital Payment Apps by Respondents

Status	Percent
Only Once	5
2-5 times	33
5-10 times	45
More than 10 times	17

Source: *Computed from Primary Data*

Further analysis revealed that among the 84 respondents who reported using digital payment applications, the largest portion (45%) uses them 5-10 times, indicating a moderate level of engagement. A significant number (33%) use them 2-5 times, suggesting a developing habit. Additionally, 17% reported using them more than 10 times, highlighting a group of frequent users who have likely integrated digital payments into their core financial activities.

Table 6: Purpose of using Digital Payment Apps

Types of Digital Payment Apps	Percent
Online Shopping	24
Bank Transfer	16
Travel Services	8
Mobile Recharges	13
Payment of Electricity Bills	18
Payment of Insurance Premium	6
Others	15

Source: *Computed from Primary Data*

Table 6 sheds light on the varied purposes for which respondents in Amritsar utilize digital payment applications. Online shopping emerged as the most common purpose, with 24% of respondents reporting its use for such transactions. This highlights the growing integration of digital payments within the e-commerce landscape. Following closely behind was using the apps for bill payments, particularly electricity bills (18%). Bank transfers (16%) and other miscellaneous uses (15%) were also significant purposes identified by the respondents. These "other" uses might encompass sending gifts, paying for food deliveries, or other everyday transactions. Mobile recharges (13%) and travel services (8%) constituted a smaller portion of the reported uses. Interestingly, only 6% of respondents used digital apps for insurance premium payments, suggesting potential areas for further growth and user education. The use of digital payment apps has boomed in areas such as commerce, bill payments, and ticketing. Government initiatives such as demonetization and Digital India accelerated this rise. Encouraging non-users would be crucial in reaching the objectives of the Digital India programme (Goplani, Sabhani & Gupta 2021).

Table 7: Opinion Regarding Digital Payment Apps

Age	Digital Apps become an alternative to traditional payment methods	Digital Apps will replace traditional payment methods	Digital Apps will support traditional payment methods	Digital Apps are not necessary	Total
15-25	23	7	7	13	50
25-40	22	3	3	6	34
40 and above	7	4	2	3	16
Total	52	14	12	22	100

Source: *Computed from Primary Data*

Table 7 explores user opinions on how digital payment applications are influencing traditional payment methods in Amritsar. A significant portion of the respondents (52%) viewed digital apps as emerging alternatives to conventional payment methods. This sentiment suggests a growing acceptance and potential shift in payment preferences. Interestingly, 14% of the respondents believed digital apps would entirely replace traditional methods, indicating a perception of potential dominance by digital payments in the future. However, a combined 24% (12% + 12%) felt that digital apps would either coexist with or simply support traditional methods, highlighting a nuanced understanding of the evolving payments landscape. Notably, a minority (22%) considered digital apps unnecessary altogether.

Table 8: t-test Results

Media Type	N	Means	Standard Deviation	95% CI	t-statistic	Df
Traditional	100	2.63	0.71	(2.55, 2.71)	1.97	99
On-Line	100	1.68	0.57	(1.62, 1.75)		

Source: *Computed from Primary Data*

The t-test was used in the current paper to ascertain the respondents' preferences. To compare traditional payment methods against digital payment methods, a t-test was used. There was a statistically significant difference, according to the analysis. At the 0.05 level of significance, t (100) = 1.97, p = 0.000, digital payment methods were chosen over traditional payment channels among the two payment methods. An analysis of the user preference data revealed a statistically significant difference ($p < 0.05$) between the mean scores (M) assigned to online and traditional payment methods. Respondents exhibited a clear preference for online payment methods (M = 1.68) compared to traditional methods (M = 2.63). This finding suggests a potential shift towards the adoption of digital transactions among the study population in Amritsar. Further, this research paper employed Cohen's d. It is to assess the magnitude of the difference between preference scores for traditional and online payment methods.

Cohen's d = (M1 - M2) / (pooled standard deviation)

Pooled Standard Deviation represents the overall variability considering both groups. There are different ways to calculate the pooled standard deviation, but a common approach is using the following formula:

$$\textbf{Pooled SD} = \sqrt{\frac{(SD_1{}^2 + SD_2{}^2}{2}}$$

By employing the above-mentioned formulae An effect size analysis using Cohen's d revealed a large effect (d = 1.47). This indicates a substantial difference in preference scores between traditional and online payment methods. This finding aligns with the statistically significant t-test result, further corroborating the notion that respondents in Amritsar exhibit a significantly stronger preference for online payment methods compared to traditional ones.

A one-way analysis of variance (ANOVA) was conducted to explore potential differences in user preferences among various digital payment applications (Table 9). The results revealed a statistically significant difference ($F(5,345) = 101.197$, p = 0.000) in preference levels, indicating that respondents in Amritsar exhibit varying preferences for different digital payment apps.

Table 9: ANOVA Results

Types of Digital Payment Apps	SS	Df	MS	F	P
Between Groups	467.092	5	90.34	101.197	0.000
Within Groups	878.082	345	0.892		
Total	**1345.174**	**350**			

Source: *Computed from Primary Data*

Since 2020, there has been an emphasis on fundamental and rapid digitization reforms, as the COVID-19 pandemic highlighted the importance of digital payment methods. To transform India into a digitally enabled economy, government capacity-building and digital literacy projects were implemented (Gupta and Asha 2020). With demonetization, there has been a significant increase in the number of digital apps. The use of these digital apps has increased as a result of the COVID-19 pandemic and now encompasses payments for recharges, electricity bills, and other expenses like groceries.

Rambani (2023) highlights the growing concern about digital bribes being facilitated through these very apps and but it's imperative to address corresponding security anxieties. This emphasizes the need for stricter regulations and user awareness campaigns to ensure the ethical and secure use of digital payments. Fortunately, these applications employ robust security measures like Multi-Factor Authentication (MFA) and data encryption to safeguard user information.

Conclusion

This study employed a quantitative approach, surveying 100 respondents in Amritsar to explore the motivations for utilizing digital payment applications (DPAs) and user preferences regarding traditional versus online payment methods. The findings offer valuable insights into the evolving landscape of digital payments within the city. Online shopping emerged as the primary purpose for DPA utilization, highlighting their integration with e-commerce platforms. A significant and continuous rise was observed in the adoption of DPAs for online transactions, with Google Pay, PhonePe, and Paytm being the most popular choices. A substantial portion of the respondents perceived DPAs as viable alternatives to conventional payment methods, suggesting a growing acceptance of this technology. Employing a t-test, the study revealed a statistically significant preference for digital payment methods over traditional ones. Additionally, ANOVA results indicated statistically significant variations in preference levels amongst different DPAs. Collectively, these findings suggest a burgeoning preference for digital payment methods within Amritsar. Users are increasingly integrating these applications into their financial activities for diverse purposes, potentially leading to a gradual shift away from traditional payment methods. User education plays a complementary role in fortifying the digital payments ecosystem. Emphasizing the creation of strong passwords and PINs, vigilance against phishing scams, and responsible app downloads from official sources are all paramount. By fostering user awareness of these implemented security features and promoting safe practices, we can collectively enhance the security posture of digital transactions in Amritsar.

Limitations and Future Scope of Study: This study was limited to a sample population in Amritsar. The findings may not be generalizable to the entire population or other geographical regions. Future research endeavors could explore the implementation of targeted marketing and promotional campaigns to raise awareness among non-users. Additionally, investigating the potential impact of reward programs and discount offerings on user adoption rates would be a valuable avenue for further investigation.

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Intention to Pay Premium Price for Green Products: A Young Consumers' Perspective

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Abstract

The study seeks to measure the young, educated consumer's intention to pay a premium price for green products and establish the relationship between the intention and different contributing factors to make young consumers' intention for green products in the fast-moving consumer good (FMCG) sector. A sample of 384 respondents was collected from developing nation i.e., India by using a self-structured questionnaire. The convenience sampling method was used, and analysis has done with the help of factor analysis and hierarchical regression analysis through SPSS 22. The findings reveal that young consumers are concerned for the environment and ready to pay a premium price for green products. Additionally, the most influencing factor to make favorable purchasing intention is the reference group followed by environmental concern, government concern, health concern, and green knowledge. The study is different from others as it seeks to measure the young, educated consumers' intention and readiness to pay a premium price for green products and sustainability. The model is rational and logical and having the involvement of young consumers' intention, paves the way to achieve a green and clean India. To get the best results, the marketers must ensure the theoretical and practical knowledge of Demographics variables and Green Innovation (Reference Group, Environmental Concern, Health Concern, Green Concern, and Green Knowledge) variables of the model and its careful applications while formulating marketing-mix strategies. Being exploratory, the study is based on educated youngster only and the small sample couldn't be generalized the whole population of developing nation i.e., India. However, it paves the way for the measurement and validation of the model in the future.

Keywords: Young Consumer, Intention, Green Products, Environment, Premium Price

Introduction

In recent past years, the global market has become eco-conscious with environmental-friendly buying habits of the consumer. At present, environmental concerns is the major issue for marketers for accomplishing the requirement of consumers (Pino, Peluso, & Guido, 2012). As the concerns related to the environment, most of the people realized that buying habits have a direct influence on ecological problems. Environmental or ecological problems are severe today in the mind of consumers which they are also accepted and business does not act responsibly towards the environmental issues as it is required (D'Souza, Taghian, Lamb, & Peretiatkos, 2006) however, we should acknowledge that some of them have altered their perspectives in order to accommodate the new demands for safe environment and have finished to all the efforts which transform corporate cultures to be more ecologically concern and to adjust current products to be more environment friendly(Street, Wt, El, & Font, 2010). Therefore, Indian consumers are also conscious about environment and sustainability.

Sustainability has attracted a lot of interest from academics and professionals alike. These substantial sustainable business concerns related to environmental protection have focused on the demand of consumers and the buying habits (Moser, 2015). Therefore, some of the researchers initiate to explore that a small number of consumers have increased the buying habits and purchase intention of green products (Mendleson, Jay, & Polonsky, 2006). The inclination to buy and pay more for environmentally friendly goods and services has been revealed by the significant number of consumers who have

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demonstrated increasing awareness about the environment and demand of green products (Manaktola & Jauhari, 2007).

Studies also explore that a consumer is ready to pay extra amount for green products. Guagnano (2001) highlighted that the consideration of Willingness to Pay (WTP) for green products and stated that consumers' behaviour is based on self-interest. The study is based on consumers' experiences with environmentally friendly products and makes use of the Swartz model of altruism to clarify consumers' WTP for recycled products. This model suggested the environment role in upbringing of the society and attribute for the responsibility of unselfish behaviour happens when individuals are aware of the pessimistic importance of social preventive substance against better environmental action (Han, Yu, & Kim, 2019). Loureiro, Hine, Loureiro, & Hine (2015) suggested that eco-certification plays a very important role in WTP for products as the female respondents are more likely to prefer eco-labeled Apples followed by children with strong environmental and food safety concerns which are significant to pay a premium price (Giannelloni, 1998)(Robinot & Giannelloni, 2010).

Keeping in view the environmental threat, the present study explores whether the young consumers are eager to pay a more price for green products that could be beneficial to the marketers to formulate strategies for green marketing practices (Koenig-Lewis, Palmer, Dermody, & Urbye, 2014). In this regard intention to pay a premium price for green products is a dependent variable whereas, demographics variables and green innovation variables (environment concern, health concern, reference group, government concern, and green knowledge) are independent. The term "green innovation" was coined, and it refers to a branch of sustainable theory that focuses on how well innovations perform in terms of the environment (Albort-Morant, Leal-Millán, & Cepeda-Carrión, 2016)(Baeshen, Soomro, & Bhutto, 2021). Further, the cause-effect relationship between each factor and the purchase intention of consumers has been analyzed.

Following the review of literature, we discovered that diverse research utilized distinct variables. (Leszczyńska, 2015)(Laroche, Bank, Molson, Bergeron, & Barbaro-Forleo, 2001). However, none have assessed both demographic and green innovation concerns among young, educated consumers' intention and green concerns in the perspective of developing nation. As a result, we determined the necessity for and carried out a quantitative study that included variables that were neglected which include the demographics, environmental concern, health concern, reference group and green knowledge of young consumers' intentions.

This study is the first of its sort, as to the best of our knowledge. Prior studies that used a descriptive research method to establish the relationship between the demographics and green innovation characteristics among young consumers are not available to us. This study aims to provide renewed perspective on the shifting mindset of Indian customers for researchers, marketers, and practitioners using peer reviewed. Employing a descriptive research design in a developing nation, the study aims to close a knowledge gap while offering new insights on environmental concerns and customers' ready to pay extra for green products. Information was gathered from young educated Indian consumers.

The findings of this study can aid academicians, policymakers, entrepreneurs, and others in the fast-moving consumer goods (FMCG) sector in understanding the relationship between the demographics and green innovation aspects while assessing the intention to pay a premium price for green products. This should in turn support the promotion of environmental issues in the FMCG industry. This study is significant because it advances our understanding of demographic trends and the concerns of young, educated customers in developing economies regarding green innovation. The study is organized as follows. The literature on demographics and consumers' green intention, and green intention and its determinants are presented in Section 2. Conceptual framework and objectives for Section 3. Our study research methodology and data analysis methods are described in Section 4, and the findings and analysis are reported in Sections 5 and 6. Lastly, the conclusion, the limitations, the managerial implications for policy, and the future direction of the study is highlighted.

Review of Literature and Hypotheses Development

Demographics and Consumers' Green Intention

The conceptual connection among the green marketing, environmental justice, and industrial ecology where, Oyewole (2001) this suggests that customers understand the need of environmental justice and are prepared to accept the related expenses. However, it appears that partial or hazy estimation of socio-demographic qualities for portioning and focusing on naturally cognizant customers. "The pursuit of equal justice without discrimination based on race, ethnicity, and/or socioeconomic status regarding both the enforcement of existing environmental laws and regulations and the reformation of public health policy" is the definition given for the phrase "environmental justice."(Chavis, 1993, p. 3). Numerous consumer products and service companies are essentially or entirely dependent on demographics". Since socio-demographic factors, in contrast to gauge the other division, are even more easily accessible and can be applied to division issues (Myers, 1996). As a result, the obvious lack of socio-demographics for profiling green consumers is of enormous administrative concern: if such qualities truly have no task to carry out, advertisers are compelled to go to elective and, perpetually, more perplexing segmentation and focus on approaches, whereas, Laroche, Bank, Molson, Bergeron, &

Barbaro-Forleo (2001) contented that most of the consumers who were ready to pay more for green products were married female, those have at least one child living with her at home. The demographic profile of the respondent did not significantly differ across eco-friendly intentions (Han, Hsu, Lee, & Sheu ,2011). Dimara, Manganari, & Skuras (2015) opined that the consumers' willingness to participate in towel reuse hotel practices and examine the consumers' willingness & financial support for towel reuse practices. According to the study, using the model will enable unbiased evaluation of the typical consumer's willingness to pay as well as an approximation of the welfare impacts brought on by the adoption of green practices in the hotel sector. Leszczyńska (2015) assesses the interrelations between willingness and individual values, and the perceived benefits of green products. Thakur & Sweta Gupta(2012) Additionally, those who have a positive attitude and desire for green products are willing to purchase green products. Han et al., (2011); Taghian & Lamb(2006) customers' eco-friendly decision-making processes and seek the relationship among attitude toward green behavior and hotel visit intention of gender effects found significant. Yildirim(2014) so far green products as well as the price of the product are good for companies' welfare and better for the environment at the acceptable level where consumers will be ready to purchase more green products. Lin & Ho(2008) The readiness of logistics service providers to adopt green practices is said to be significantly influenced by six factors, including government support, environmental uncertainty, organizational encouragement, and the quality of human resources. Biswas(2015); Oyewole(2001) this implies that consumers recognize environmental justice and are willing to accept the associated costs. Bento & Filho(2014) the idea that taking environmental protection measures might give businesses a competitive edge in the war for consumers may well explain why companies engage in green marketing and other forms of corporate social responsibility.

H_{01a} Gender significantly affects the intention of young consumers to pay a premium price for green products.

H_{01b} Age significantly affects the intention of young consumers to pay a premium price for green products.

H_{01c} Education qualification significantly affects the intention of young consumers to pay a premium price for green products.

H_{01d} Family monthly income significantly affects the intention of young consumers to pay a premium price for green products.

H_{01e} Marital status significantly affects the intention of young consumers to pay a premium price for green products.

Green Intention and its Determinants

Many factors contribute to the favorable intention for green purchases. Yazdanifard & Mercy (2011) suggested that a significant impact of environment through green marketing which is a protecting tool for safety of the future generation. Laroche, Bank, Molson, Bergeron, & Barbaro-Forleo(2001) contented that environmental and ecological consciousness are willing to pay more for environmentally friendly products. A study by Han, Hsu, Lee, & Sheu(2011) identified the customers' intention to pay the extra price for making the eco-friendly environment in the hotels for lodging and services. Sharma(2011) focused on changing consumer behavior towards the usage of green products and explored that consumers are increasingly sensitive to the need to switch to green products and services. Pickett-Baker & Ozaki(2008) also reveals that there is a correlation between consumers' confidence in the performance of green products & pro-environmental beliefs in general. Kang, Stein, Heo,s & Lee (2012) US hotel guests with higher degrees of environmental concerns declare a higher willingness to pay a premium for the hotel's green initiatives. Mohd Suki & Akila Mohamad Azizan, (2013) recognized that the consumers' attitudes and behavior psychologically influenced on environmental issues and problem. understand the four Malaysians' environmental knowledge categories that encapsulate the environmental issues: fundamental environmental knowledge, knowledge of local natural issues, knowledge of recyclable items, and knowledge of climate-related concepts. These categories are useful for motivating customers to consider their social responsibility as humans toward the environment. Das (2002) examined the role of government that how they focus on the environmental problem and often tends to focus on its most tangible features like air, water, and food. The study concludes that the government should take initiatives to preferentially buy products with "eco-mark" products. Gupta (2014) It was mentioned that businesses have become more competitive by identifying green consumers' purchase intents and incorporating eco-friendly measures into their operations. As per (5) the well-being and awareness are noteworthy indicators of green purchase intention among Malaysian purchasers. It is because shoppers accepted that eco-friendly products are useful for a more advantageous way of life and help save the climate. Be that as it may, another investigation discovered wellbeing cognizance to be the least significant in anticipating mentality towards organic products in contrast with sanitation and moral conc.erns (Michaelidou and Hassan, 2008).

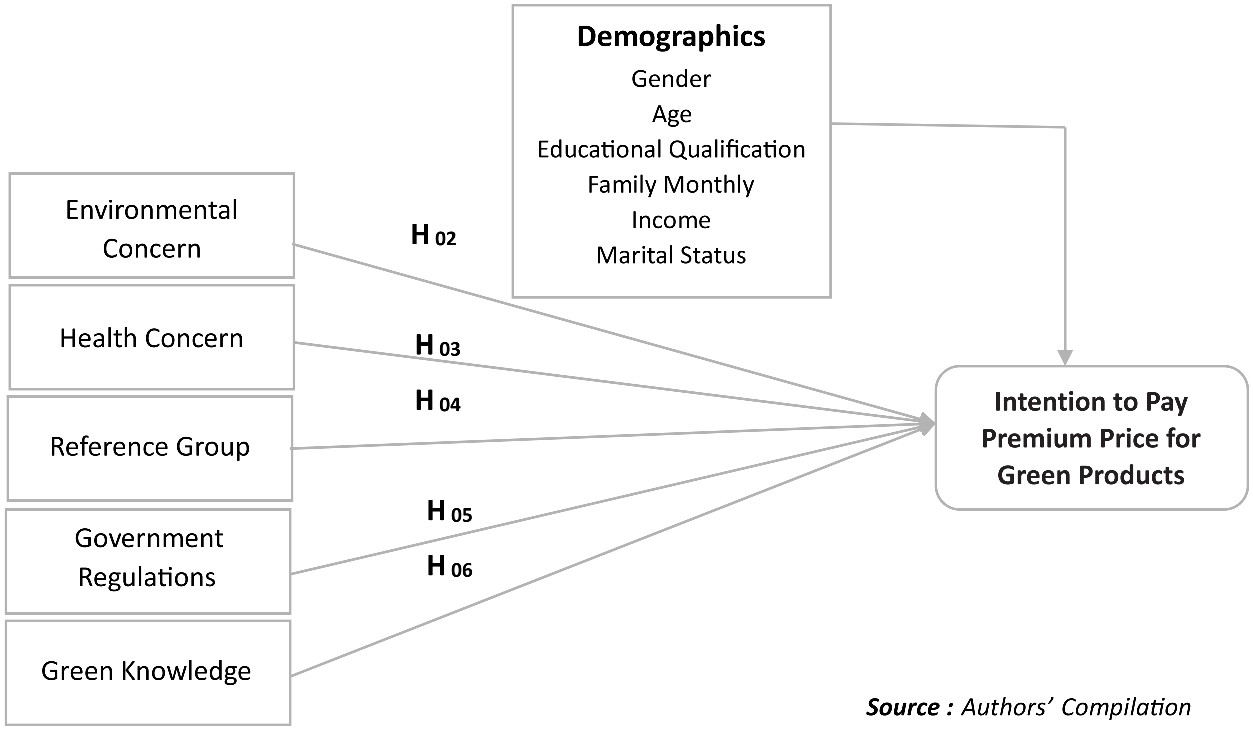
H_{02} Environmental Concerns significantly affect the intention of young consumers to pay a premium price for green products.

H_{03} Health Concerns significantly affect the intention of young consumers to pay a premium price for green products.

H_{04} Reference Group significantly affects the intention of young consumers to pay a premium price for green products.

H_{05} Government Regulations significantly affect the intention of young consumers to pay a premium price for green products.

H_{06} Green Knowledge significantly affects the intention of young consumers to pay a premium price for green products.



***Source :** Authors' Compilation*

Objectives of the Study

1. To examine the relationship between demographics and intention to pay a premium price for green products.
2. To determine the relationship between green innovation and the intention to pay a premium price for green products.

Research Methodology

The hypotheses have been tested of young, educated consumers' intention to pay more price for green products and conceptual model has been validated quantitatively, by statistical approach. In the present study the exploratory factor analysis (EFA) has been preferred for exploring the different green innovation factors of purchase intention, that it is best suited in analyzing. Whereas hierarchical regression analysis has been used to estimate the measures of the proposed model and to prove the proposed hypotheses that are to decipher purchase intention. Furthermore, establishing a relationship between the independent variables and dependent variable has been used in the study. A unique method of multiple linear regression analysis is the fundamental idea behind hierarchical linear regression. In this case, additional variables are methodically added to the model in discrete steps known as "blocks." In this regard measuring the relationship between the variables of demographics and purchase intention of green products were identified the overall effect of the model of intention to pay premium price Lankau, M. J., & Scandura, T. A. (2002) and Park, N., Kee, K.F., & Valenzuela, S. (2009) (Blunch, 2017; Griffin., 2012).

Questionnaire Development

The questionnaire is segregated into two sections, section A reveals the demographic profile of consumers, whereas section B contains thirty-three items related to different dimensions of green innovation and intention to pay a premium price for green products in the form of a five-point Likert scale, where (1) represents 'strongly disagree' and (5) represents 'strongly agree'. All the measuring items were taken from the various studies mentioned below in the table with little modification of wordings to make it clearer and more understandable for consumers in the Indian context. The construct of Environmental concern (6 items) was adopted from (Han et al., 2011; Kang et al., 2012; Laroche et al., 2001; Sharma, 2011; Taghian & Lamb, 2006), Health Concern (4 items) were adopted from(Han et al., 2011; Taghian & Lamb, 2006), Reference group (5 items) were adopted from Mohd Suki & Akila Mohamad Azizan, (2013), Government regulation (5 items) were adopted from Das (2002), Green Knowledge (3 items) were adopted from Das (2002), and Intention to pay premium price (4 items) were adopted from (Laroche et al., 2001).

Table 1: Questionnaire Items and their Adopted Sources

Variables	Measuring Items	Source of Adoption
Environmental Concern		Kang, Stein, Heo,s & Lee (2012) Han et al., (2011); Taghian & Lamb (2006)
EC_1	I feel that now a day's consumers become more sensitive to environmental protection.	
EC_3	I feel that now a day's consumers have more inclination toward green products.	
EC_9	I feel that the purchase of green products will increase environmental sustainability.	
EC_10	I buy products made from recycled materials to save resources and energy.	
EC_19	I do not buy products that harm the environment.	
EC_2	I feel that the companies enjoying a green image will have a competitive advantage.	
Health Concern		Han et al., (2011); Taghian & Lamb (2006)
HC_ 6	I feel that the present competitive environment forced the firm to change its marketing activities.	
HC_7	I feel that now a day's people have become more health conscious.	
HC_ 13	I feel that green products are made of natural ingredients which are good for health.	
HC_15	I feel that green products are more beneficial to our health.	
Reference Group		Mohd Suki & Akila Mohamad Azizan, (2013)
RG_17	If someone looking to purchase FMCG products, I will suggest to him/her green products.	
RG_18	Word of mouth would play an effective role in making use of green products.	
RG_21	I often urge my friends to use products that are being advertised as green.	
RG_23	I ensure that the government provides financial support for developing green marketing practices.	
RG_29	It is acceptable to pay more for products that are produced, processed, and packaged in an environmentally friendly way.	
Government Regulations		Das (2002)
GR_12	I feel that a green product does not have any side effects.	
GR_25	I feel that the government set strong environmental regulations for the FMCG industry.	
GR_27	I feel that the responsibility of the government is more to protect the environment.	
GR_31	I would be willing to spend an extra amount to buy environmentally friendly products.	
GR_26	I feel that government has to educate people and run many campaigns regarding green practices.	
Green Knowledge		Haron, S.A., L. Paim and N. Yahaya, (2005)
GK_ 8	I feel recycled products can lead to bad results.	
GK_ 4	I feel that using a recycled product would cause me to worry.	
GK_ 16	I feel that most of the people in my reference group are using green products.	
Intention to Pay Premium Price		Laroche, Bank, Molson, Bergeron, & Barbaro-Forleo (2001)
ITPP_28	I feel that green products are more valuable than their price.	
ITPP_14	I feel the price is secondary in comparison to health.	
ITPP_11	I feel that green products are better than traditional products.	
ITPP_22	I feel that the government should improve energy efficiencies or tax reduction on renewable energy.	
ITPP_31	I would be willing to spend an extra amount to buy environmentally friendly products.	

Sampling & Data

To attain the laid objectives, information was collected from 384 young educated consumers residing in developing nation i.e., India (Han et al., 2011; Kang et al., 2012; Laroche et al., 2001; Sharma, 2011; Taghian & Lamb, 2006). Convenience sampling, picks and drop methods, mail and online sources were used for data collection. A pilot survey among fifty respondents was carried out for scale validation of all items and every statement was evaluated for validity and reliability using the Cronbach's Alpha technique (Duffett, 2015). As per the suggestions during a pilot survey, a few adaptations were made to the questionnaire. A total of 600 hundred questionnaires were distributed among young consumers, out of the 430 returns i.e., around 72% approximately which is a very high rate of responses. Further, a total of 384 questionnaires were used for analysis, after eliminating the incomplete responses and excessive outliers. The sample size has suggested that there should be 10 cases per dimension/item required as a statistical estimate (Hair et al., 2013); (Kline, 2011). Thus, a minimum of 260 were required as the study has 26 items. Therefore, 384 samples are justified for the research as the study contains 26 items.

Reliability and Validity Testing

Cronbach's Alpha outcome demonstrates that each item's total coefficient correlations are more than 0.4 for each individual statement value between 0.926 to 0.616 across all items. The overall positive outcome thus demonstrates the consistency of the claims in the structured questionnaire. The exploratory factor analysis did, however, identify the five latent variables of retrieved utterances related to the goal of green products. Each factor's given value exceeded 1 and each item's factor loading exceeded 0.4. Additionally, the results demonstrate that the discriminant validity was achieved because the association between any two viewpoints was smaller than the Cronbach's Alpha estimation of any one perspective(Gaski & Nevin, 2006; Han et al., 2011; Laroche et al., 2001) (Table1).

Table 2: Reliability and Validity

Factors	Variables	Items-total Correlation Coefficient	Factor Loading	Cronbach's Alpha
Intention To Pay Premium Price	I feel that green products are more valuable than their price.	.796	0.803	.837
	I would be willing to spend an extra amount to buy environmentally friendly products.	.800	0.792	
	I feel the price is secondary in comparison to health.	.806	0.777	
	I feel that green products are better than traditional products.	.808	0.770	
	I feel that the government should improve energy efficiencies or tax reduction on renewable energy.	.813	0.753	
Reference Group	I ensure that the government provides financial support for developing green marketing practices.	.874	0.876	.918
	Word of mouth would play an effective role in making use of green products.	.877	0.864	
	If someone looking to purchase FMCG product s, I will suggest to him/her green products.	.815	0.809	
	It is acceptable to pay more for products that are produced, processed, and packaged in an environmentally friendly way.	.776	0.775	
	I often urge my friends to use products that are being advertised as green.	.769	0.760	

Environmental Concern	I feel that the purchase of green products will increase environmental sustainability.	.823	0.881	.869
	I do not buy products that harm the environment.	.827	0.863	
	I feel that now a day's consumers have more inclination toward green products.	.856	0.858	
	I buy products made from recycled materials to save resources and energy.	.827	0.858	
	I feel that now a day's consumers become more sensitive to environmental protection.	.618	0.616	
	I feel that the companies enjoying a green image will have a competitive advantage.	.413	0.420	
Health Concern	I feel that green products are more beneficial to our health.	.765	0.863	.837
	I feel that the present competitive environment forced the firm to change its marketing activities.	.790 .	0.822	
	I feel that green products are made of natural ingredients which are good for health.	.792	0.823	
	I feel that now a day's people have become more health conscious.	.824	0.763	
Government Regulations	I feel that the government set strong environmental regulations for the FMCG industry.	.736	0.925	.803
	I feel that the government has to educate people and run many campaigns regarding green practices.	.363	0.927	
	I feel that the responsibility of the go vernment is more to protect the environment.	.762	0.929	
	I feel that a green product does not have any side effects.	.683	0.904	
	I would be willing to spend an extra amount to buy environmentally friendly products.	.437	0.871	
Green Knowledge	I feel recycled products can lead to bad results.	.728	0.852	.811
	I feel that using a recycled product would cause me to worry.	.720	0.849	
	I feel that most of the people in my reference group are using green products.	.774	0.820	

It can be verified from the above table 2 that the commonality value in respect of constructs and sub-constructs of the items is more than the threshold limit of 0.5 and hence, all the major constructs and variables under purchase intention of young consumers' toward green products are a good fit and also shows that the data of all constructs and variables in the current study must pass the test of normalcy, as the values of Skewness and Kurtosis are within the ranges of +1 and -1, respectively. Consequently, everything is usually distributed see (Annexure).

Young Consumer's Demographic Characteristics

The valid responses of respondents were as follows, in data there was, 276 were male (71.9%) remaining 108 were female (28.1%). Most of the respondents, 308, very young groups belong to 18-21 years old age followed by 22-25 years and 26-30 years old respectively. Similarly, education-wise well qualified young consumers pursuing post-graduation had the majority were 224 postgraduates (58.3%) followed by 75 Ph.D. scholars

(19.5%) and 49 graduates (12.8%). The family monthly income of respondents in Indian rupees a group belongs to 75001-100000 had majority followed by 50001-75000 and above 100000 consequently. Marital status wise 282 unmarried consumers (73.4%) followed by 97 married (25.3%) and the rest 5 others status (1.3%) respectively table shown in annexure.

Results & Discussion

To determine the relationship between the variables influencing consumers' desire to purchase and willingness to pay a premium price for environmentally friendly products, hierarchical regressions are employed. Consumers' purchase intention is taken as a dependent variable and green innovation & demographics as independent variables. The study reveals that nearly 90 percent of young consumers are attentive of the green products from the television followed by newspaper and reference groups etc. However, young consumers were spending nearly 63 percent more on green products. The increasing awareness of young consumers for the betterment of environmental concerns and safety concerns are also influenced by the government campaign organized by the ministry of environment simultaneously. Although young consumers are more dedicated and willing to pay a premium price for green products, even though these independent variables are found to be insignificant (gender, age, marital status, education qualification, and family monthly income). The result shows that demographic (gender) is found significant except other demographic variables it enables that doesn't affect willingness to purchase green products by young consumers. Moreover, the female consumers are more concern instead of male consumer who ready to pay a more price for green products, it is shown in the equation as well as in coefficient table 4 (Han, Yu, & Kim, 2019) (Giannelloni, 1998)(Robinot & Giannelloni, 2010). According to Manaktola &Jauhari, 2007; Mendleson & Polonsky, 1995; Vandermerwe & Oliff, 1990 said that many customers are becoming more concern about green environment and try to be opted green technology in their businesses for producing goods, which shows that majority of the consumers to buy and ready to pay extra for eco-friendly goods and services. Generally, multiple linear regressions with two levels in which the demographics variable in model 1 and green innovation variables in model 2 will be used to conduct the research.

$$\Upsilon 1 = \alpha+\beta 1X1+ \beta 2X2+\beta 3X3+\beta 4X4+\beta 5X4X1+\varepsilon$$

$$Y= a + bX$$

$$Y= 0.66 + (2.4 *0) = 0.66 \text{ (Male)}$$

$$Y= 0.66+ (2.4 *1) = 3.06 \text{ (Female)}$$

Table 3: Pearson Correlations

	ITPP	G	Age	Educational Qualification	Family Monthly Income	Marital Status
ITPP	1.000	.106	-.010	.014	-.017	-.019
G	.106	1.000	-.176	-.101	-.098	-.013
Age	-.010	-.176	1.000	.278	.232	.410
Educational Qualification	.014	-.101	.278	1.000	.304	.108
Family Monthly Income	-.017	-.098	.232	.304	1.000	.020
Marital Status	-.019	-.013	.410	.108	.020	1.000

Note: -Correlation is significant at the level of 0.01 (double-tail). _Correlation is significant at the level of 0.05 (double-tail).

Table 4: Regression coefficient of demographic variables

	Adjusted R Square	Model
Gender	.009	.110
Age	.006	.017
Educational Qualification	.004	.029
Family Monthly Income	.002	-.019
Marital Status	.000	-.027
F value		2.061

P < 0.1, _P < 0.05, __P < 0.01, ___P < 0.001

However, green innovation variables like reference group, environmental concern, government concern, health concern, and green knowledge are significantly affected by a willingness to pay a premium price for green products. Moreover, the most significant factor which affects the purchase of green products is the reference group followed by environmental concern, government concern, health concern, and green knowledge shown in table 6. Therefore, the hierarchical regression model indicators and Pearson correlations met and came close to the antecedents standard (Han et al., 2011; Laroche et al., 2001; Taghian & Lamb, 2006). Additionally, every factor loading that is connected to the latent constructs of the variables in the current study is assessed at or above 0.40 and explores the substantial influence, demonstrating the efficacy and validity of each intentional claim(Amir & Dhyani, 2018)(Kang et al., 2012 Amir & Dhyani., 2018), (Amir & Dhyani, 2019).

Table 5: Pearson Correlations

	WT_PP	R_G	E_C	H_C	G_C	G_K
WT_PP	1.000	.432	.264	.013	.371	-.032
R_G	.432	1.000	.000	.000	.000	.000
E_C	.264	.000	1.000	.000	.000	.000
H_C	.013	.000	.000	1.000	.000	.000
G_C	.371	.000	.000	.000	1.000	.000
G_K	-.032	.000	.000	.000	.000	1.000

Note: -Correlation is significant at the level of 0.01 (double-tail). _Correlation is significant at the level of 0.05 (double-tail).

Table 6: Regression coefficient of green innovation variables

	Adjusted R Square	Model
Reference Group	.185	.432
Environment Concern	.253	.264
Health Concern	.251	.013
Government Concern	.388	.371
Green Knowledge	.388	-.032
F value		2.130

P < 0.1, _P < 0.05, __P < 0.01, ___P < 0.001.

The relationship model and goodness of fit indices model were analyzed with the help of a hierarchical regression analysis model to measure and recognized the overall effect of the demographics and green innovation model on consumers' purchase intention to pay a premium price for green products. The results found that the perfect standard met by the general model and its importance subsequently, the exhibition of the model is acceptable and significant shown in table 7.

Table 7: Results of Innovation Variables on Consumers' Intention to Pay Premium Price for Green Products

Path Analyses of Observed Variables	Standardized Coefficients	F Value	P
ITPP <--- Reference Group	.432	87.869	.000b
ITPP <--- Environment Concern	.264	65.812	.000c
ITPP <--- Health Concern	.013	43.797	.000d
ITPP <--- Government Concern	.371	61.831	.000e
ITPP <--- Green Knowledge	-.032	49.542	.000f
Source: Authors Compiled			

Source: *Authors Compiled*

Note: Intention to Pay Premium Price (ITPP)

Theoretical Implications

Consumers' intention toward green products has been largely researched since last few years and it was observed that consumers' intention toward green products has a direct influence to purchase the green product and is willing to pay a premium price. Additionally, intention toward green products has also been deemed to be an efficient measure of willingness to pay more for environmental concerns (Pino et al., 2012). The concern of consumers from traditional products to green products has been shown the concern for the environment and ecological problems.

The move from conventional to green methods has always piqued the interest of academics and marketers; this was evident at the COP21 summit held in Paris in November 2015. Hence, Indian consumers are also conscious of environment ("Greendex," 2012). From both academic and marketer's practitioners' perspectives, because it offers a thorough explanation of how sustainability issues—especially those related to environmental protection—intersect with consumer demand and purchasing behavior in the business world, the hierarchy-of-effect model has attracted a lot of interest. (Moser, 2015).

Although there is a recognized theoretical framework, little research has been done on the implications of consumers' readiness to pay more for green products. Consequently, this study attempted to look for the young consumer's intention to pay a premium price for green products within the framework of the proposed model. Moreover, the relationship between the intention for green products in the FMCG sector and different contributing factors to making young consumers' perseverance. The result reveals that young consumers are concerned for the environment and ecological problems and are ready to pay a premium price for green products. Demographically, the female respondents are high concerned about the ecosystem and ready to pay more for green products supported (Giannelloni, 1998)(Robinot & Giannelloni, 2010). Furthermore, the green innovation variables have a significant contribution toward green products. The most significant contributing factors which affect young educated consumers' purchase of green products are reference groups followed by environmental concerns, government concerns health concerns, and green knowledge supported (Han et al., 2011; Laroche et al., 2001; Taghian & Lamb, 2006). The model suggests that it enhances gradually more challenging to achieve the objectives of marketers of young consumers' intention to pay a premium price for green products. A more positive number of consumers had shown more interest towards environmental concern and purchasing predictions about green products betterment of society as well (Manaktola & Jauhari, 2007). Particularly about young customers, this study has made a substantial contribution to the field of purchase intention studies and theory development. Reveals that young consumers' intentions regarding environmental issues and green products' importance influenced Indian youngsters.

Practical Implications

This study has highlighted various factors of green innovation and demographics which shows that consumers' intention for green products could be influenced by the marketers and academicians. Marketers have built a pro-environmental image of the young customer demographic that is eager to pay more on green, environmentally friendly items. Green products given exposure will be more likely to sell in greater numbers, especially to the young female consumers' who represent the majority of the market segment and are willing to pay a premium price for green products Laroche, Bank, Molson, Bergeron, & Barbaro-Forleo (2001).

The study demonstrated that 90 percent of young consumers are aware of green products from television followed by newspaper and reference groups. This shows that a significant market segment has a high positive intention of young consumers' regarding the environmental concern and is influenced to purchase eco-friendly products. Demonstrating the win-win scenarios for producers, distributors, and young consumers of ecologically companionable products. According to the outcome of the study, the demographic profile of the young consumers who are ready to pay a premium price for green products is that they are well-qualified unmarried females of very young age and having a substantial family income followed by males. However, the green innovation factors taken into study reveal that the most significant contributing factor to favorable intention to pay more for the green product is the reference group followed by environmental concern, a government concern, health concern, and green knowledge. The study provides empirical results that could help marketers to gain insight into the intention of young consumers to purchase green products in the FMCG sector. The FMCG companies that produced green products should take note that young consumers positively perceived eco-friendly products from the green innovation perspective.

Conclusion

The foremost contribution of the present study was to investigate the young consumers' intention who are eager to pay for green products. Although, to explore the influencing factors among the green innovation factors and the successive argument of the inferences for the marketers. The finding reveals that the demographic profile of the customers is significant especially young unmarried female consumers‟ are ready to pay a more price for green products supported by Laroche, Bergeror & Forleo (2001), Han, Hsu & Soo Lee (2009). Further, the green innovation factor which includes environment concern, reference group, a government concern, health concern & green knowledge is positively significant. The young consumers were influenced and preferred to buy green products for spending more on eco-friendly concerns Laroche, Bergeror & Forleo (2001). It shows that the present study is exploratory; further research in this area, which is becoming more and more important theoretically and practically, can be sparked by the findings. The rise in government concern over natural weakening and their campaign to raise awareness of it through social media, the recent invasion of eco-friendly products into the market, and the inclusion of environmental issues in our political and educational systems all indicate the need for additional studies on customers who care about the environment.

Managerial Implications

The study found that a substantial number of young consumers are ready to pay a premium price for green and eco-friendly products is fair enough to warrant marketers‟ attention. Nearly, 60% of young consumers were ready to pay a premium price for green products which are also indicated by Laroche, Bergeror& Forleo (2001). This shows a substantial segmentation of the market for producers and distributors of ecologically companionable products by highlighting the environmental benefits and sustainability features of their offerings in marketing campaigns. The marketers also focus on developing innovative green products to meet the increasing demand. According to Laroche, Bergeror& Forleo (2001) aim of the marketers may positively identifiable the targeted audience and promoted a new line of ecological crackers that were created from natural ingredients, wrapped in recycled materials. Majority of young customers are still around that might be persuaded to join the willing group. There seems to be an opportunity for marketers to successfully develop various methods and use various appeals to persuade some of the unwilling to join the segment of the willing. Thus, the marketers should consider them while formulating marketing mix strategies like pricing and value perceptions. The marketers can set the strategic price of green products which can enhance consumers, perception of value. Similarly, proper education and the managers should effectively communicate the sustainable initiatives, certifications, and eco-friendly practices employed by their company. Further, distribution techniques, corporate social responsibly initiatives positively influence consumers' intention to pay more for green products.

Limitations and Future Research

The present study has been limited to some extent that the first restriction is about the study area which is only confined to developing nation i.e., India. Whereas, the sample size of the study is too small because of time constraints so, the finding should be applied with prudence prior to simplifying the result of the study. Keeping in mind with this limitation by the researcher, that future research might be extending the number of respondents, other developing nation in Asia and outside the Asian countries situated in different parts of the world to evaluate perfectly and reliable results. Another research limitation is that no green product was used in the FMCG segments; instead, replies were provided in several FMCG segment categories, which may have been assumed by the respondent. Several researchers can use different approach on the dissimilar aspects of eco-friendly environment products from a diverse perspective that drives the consumers' purchase intention. The marketers can make use of the present study focusing on the whole aspect of FMCG segments which can be driven by eco-friendly or green product buying decisions.

Annexure: II

Validity Measures

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Normality: Skewness	Normality: Kurtosis
SC_1	384	1	5	3.74	1.186	1.406	-.915	-.039
SC_2	384	1	5	3.66	1.079	1.164	-.811	.076
SC_3	384	1	5	3.46	1.193	1.424	-.542	-.720
SC_4	384	1	5	2.81	1.128	1.272	.292	-.840
SC_5	384	1	5	3.60	1.101	1.212	-.784	.147
SC_6	384	1	5	3.33	1.192	1.421	-.455	-.811
SC_7	384	1	5	3.25	1.161	1.347	-.277	-.876
SC_8	384	1	5	2.63	1.176	1.383	.417	-.855

SC_9	384	1	5	3.48	1.147	1.316	-.494	-.717
SC_10	384	1	5	3.38	1.245	1.551	-.471	-.908
SC_11	384	1	5	3.74	.967	.936	-.862	.773
SC_12	384	1	5	3.87	1.043	1.088	-.839	.133
SC_13	384	1	5	3.42	1.149	1.320	-.555	-.651
SC_14	384	1	5	3.81	1.109	1.230	-.865	.076
SC_15	384	1	5	3.48	1.133	1.284	-.634	-.444
SC_16	384	1	5	2.65	1.189	1.415	.432	-.808
SC_17	384	1	5	3.36	1.075	1.155	-.513	-.305
SC_18	384	1	5	3.47	.996	.991	-.550	-.005
SC_19	384	1	5	3.56	1.038	1.077	-.590	-.157
SC_20	384	1	5	3.45	1.188	1.412	-.493	-.784
SC_21	384	1	5	3.32	1.059	1.122	-.575	-.253
SC_22	384	1	5	3.91	.981	.962	-.962	.466
SC_23	384	1	5	3.40	1.022	1.045	-.512	-.129
SC_24	384	1	5	3.38	1.063	1.129	-.517	-.311
SC_25	384	1	5	3.97	.988	.976	-.983	.629
SC_26	384	1	5	4.04	1.094	1.197	-1.220	.905
SC_27	384	1	5	3.92	1.003	1.007	-.949	.449
SC_28	384	1	5	3.78	1.027	1.055	-.810	.223
SC_29	384	1	5	3.37	1.057	1.117	-.522	-.244
SC_31	384	1	5	3.65	.993	.987	-.818	.483
SC_33	384	1	5	3.28	1.125	1.266	-.460	-.517
Valid N (listwise)	384							

Annexure: III

Statistics				
	N		Mean	Std. Deviation
	Valid	Missing		
Gender	384	0	1.28	.450
Age	384	0	1.23	.496
Educational Qualification	384	0	2.85	.882
Family Monthly Income	384	0	3.38	1.181
Marital Status	384	0	1.28	.477
Are you aware of green products?	384	0	1.10	.302
How you became aware of ‘Green Products’.	384	0	2.48	1.505

I feel that now a day's consumers become more sensitive toward environmental protection.	384	0	3.74	1.186
I feel that the companies enjoying a green image will have a competitive advantage.	384	0	3.66	1.079
I feel that now a day's consumers have more inclination toward green products.	384	0	3.46	1.193
I feel that using a recycled product would cause me to worry.	384	0	2.81	1.128
I feel that green marketing organizations are more ethically and socially responsible.	384	0	3.60	1.101
I feel that the present competitive environment forced the firm to change its marketing activities.	384	0	3.33	1.192
I feel that purchase of green products will increase environmental sustainability.	384	0	3.25	1.161
I feel recycled products can lead to bad results.	384	0	2.63	1.176
I feel that now a day's people have become more health conscious.	384	0	3.48	1.147
I buy products made from recycled materials to save resources and energy.	384	0	3.38	1.245
I feel that green products are better than traditional products.	384	0	3.74	.967
I feel that green product does not have any side effects.	384	0	3.87	1.043
I f eel that green products are made of natural ingredients which are good for health.	384	0	3.42	1.149
I feel the price is secondary in comparison to health.	384	0	3.81	1.109
I feel that green products are more beneficial for our health.	384	0	3.48	1.133
I feel that most of the people in my reference group are using green products.	384	0	2.65	1.189
If someone looking to purchase FMCG products, I will suggest to him/her green products.	384	0	3.36	1.075
Word of mouth would play an effective role in making use of green products.	384	0	3.47	.996
I use green products or in some way recommend them to others also.	384	0	3.56	1.038
I do not buy products that harm the environment.	384	0	3.45	1.188
I often urge my friends to use products that are being advertised as green.	384	0	3.32	1.059
I feel that government should improve energy efficiencies or tax reduction on renewable energy.	384	0	3.91	.981

I ensure that government provides financial support for developing green marketing practices.	384	0	3.40	1.022
I feel that government encourages companies to promote green products.	384	0	3.38	1.063
I feel that the government set strong environmental regulations for the FMCG industry.	384	0	3.97	.988
I feel that government has to educate people and run many campaigns regarding green practices.	384	0	4.04	1.094
I feel that the responsibility of the government is more to protect the environment.	384	0	3.92	1.003
I feel that green products are more valu able than their price.	384	0	3.78	1.027
It is acceptable to pay more for products that are produced, processed, and packaged in an environmentally friendly way.	384	0	3.37	1.057
I would accept paying more taxes to an environmental cleanup program.	384	0	3.42	1.081
I would be willing to spend an extra amount to buy environmentally friendly products.	384	0	3.65	.993
I am ready to pay a premium price for a green or eco-friendly product.	384	0	3.49	1.126
I feel that consumers are less price centric on green products.	384	0	3.28	1.125
Have you ever purchased any green products?	384	0	1.34	.476
Do you pay more for green products?	384	0	1.40	.491

Annexure: IV

Excluded Variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Age	.009[b]	.175	.861	.009	.969	1.032	.969
	Educational Qualification	.025[b]	.488	.626	.025	.990	1.010	.990
	Family Monthly Income	-.007[b]	-.132	.895	-.007	.990	1.010	.990
	Marital Status	-.018[b]	-.344	.731	-.018	1.000	1.000	1.000
2	Educational Qualification	.024[c]	.457	.648	.023	.920	1.087	.901
	Family Monthly Income	-.009[c]	-.175	.861	-.009	.943	1.061	.923
	Marital Status	-.026[c]	-.457	.648	-.023	.828	1.207	.803
3	Family Monthly Income	-.016[d]	-.300	.764	-.015	.882	1.134	.860
	Marital Status	-.026[d]	-.455	.650	-.023	.828	1.207	.755
4	Marital Status	-.027[e]	-.481	.631	-.025	.823	1.216	.732

a. Dependent Variable: ITPP
b. Predictors in the Model: (Constant), G
c. Predictors in the Model: (Constant), G, Age
d. Predictors in the Model: (Constant), G, Age, Educational Qualification
e. Predictors in the Model: (Constant), G, Age, Educational Qualification, Family Monthly Income

Annexure: V

Excluded Variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	E_C	.264[b]	5.980	.000	.293	1.000	1.000	1.000
	H_C	.013[b]	.276	.783	.014	1.000	1.000	1.000
	G_C	.371[b]	8.824	.000	.412	1.000	1.000	1.000
	G_K	-.032[b]	-.688	.492	-.035	1.000	1.000	1.000
2	H_C	.013[c]	.288	.773	.015	1.000	1.000	1.000
	G_C	.371[c]	9.306	.000	.431	1.000	1.000	1.000
	G_K	-.032[c]	-.718	.473	-.037	1.000	1.000	1.000
3	G_C	.371[d]	9.295	.000	.431	1.000	1.000	1.000
	G_K	-.032[d]	-.717	.474	-.037	1.000	1.000	1.000
4	G_K	-.032[e]	-.794	.428	-.041	1.000	1.000	1.000
a. Dependent Variable: ITPP								
b. Predictors in the Model: (Constant), R_G								
c. Predictors in the Model: (Constant), R_G, E_C								
d. Predictors in the Model: (Constant), R_G, E_C, H_C								
e. Predictors in the Model: (Constant), R_G, E_C, H_C, G_C								

Annexure: VI

Coefficient Correlations

Model			R_G	E_C	H_C	G_C	G_K
1	Correlations	R_G	1.000				
	Covariances	R_G	.002				
2	Correlations	R_G	1.000	.000			
		E_C	.000	1.000			
	Covariances	R_G	.002	.000			
		E_C	.000	.002			
3	Correlations	R_G	1.000	.000	.000		
		E_C	.000	1.000	.000		
		H_C	.000	.000	1.000		

	Covariances	R_G	.002	.000	.000		
		E_C	.000	.002	.000		
		H_C	.000	.000	.002		
4	Correlations	R_G	1.000	.000	.000	.000	
		E_C	.000	1.000	.000	.000	
		H_C	.000	.000	1.000	.000	
		G_C	.000	.000	.000	1.000	
	Covariances	R_G	.002	.000	.000	.000	
		E_C	.000	.002	.000	.000	
		H_C	.000	.000	.002	.000	
		G_C	.000	.000	.000	.002	
5	Correlations	R_G	1.000	.000	.000	.000	.000
		E_C	.000	1.000	.000	.000	.000
		H_C	.000	.000	1.000	.000	.000
		G_C	.000	.000	.000	1.000	.000
		G_K	.000	.000	.000	.000	1.000
	Covariances	R_G	.002	.000	.000	.000	.000
		E_C	.000	.002	.000	.000	.000
		H_C	.000	.000	.002	.000	.000
		G_C	.000	.000	.000	.002	.000
		G_K	.000	.000	.000	.000	.002

a. Dependent Variable: ITPP

Annexure: VII

Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	R_G	E_C	H_C	G_C	G_K
1	1	1.000	1.000	1.00	.00				
	2	1.000	1.000	.00	1.00				
2	1	1.000	1.000	.50	.50	.00			
	2	1.000	1.000	.00	.00	1.00			
	3	1.000	1.000	.50	.50	.00			
3	1	1.000	1.000	.50	.01	.49	.00		
	2	1.000	1.000	.50	.01	.49	.00		
	3	1.000	1.000	.00	.00	.00	1.00		
	4	1.000	1.000	.00	.99	.01	.00		

4	1	1.000	1.000	.00	.44	.36	.20	.00	
	2	1.000	1.000	.00	.27	.00	.73	.00	
	3	1.000	1.000	.00	.00	.00	.00	1.00	
	4	1.000	1.000	1.00	.00	.00	.00	.00	
	5	1.000	1.000	.00	.29	.64	.07	.00	
5	1	1.000	1.000	.00	.03	.00	.94	.03	.00
	2	1.000	1.000	.29	.02	.00	.02	.67	.00
	3	1.000	1.000	.00	.00	.00	.00	.00	1.00
	4	1.000	1.000	.00	.45	.52	.02	.01	.00
	5	1.000	1.000	.71	.01	.00	.01	.27	.00
	6	1.000	1.000	.00	.50	.48	.01	.01	.00
a. Dependent Variable: ITPP									

Annexure: VIII

Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-2.1856551	1.5039722	0E-7	.62919659	384
Residual	-4.06837034	2.16704845	0E-8	.77724620	384
Std. Predicted Value	-3.474	2.390	.000	1.000	384
Std. Residual	-5.200	2.770	.000	.993	384
a. Dependent Variable: ITPP					

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The Impact of Behavioral Biases, Social Media Influence and Parental Influence on Investment Decision of Generation Z Investor in Ahmedabad City using SmartPLS

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Abstract

Purpose: - *The aim of the research paper is to study the influence of behavioral biases, social media influence and parental influence on investment decision of generation Z investor who are staying Ahmedabad City. Herding Behaviors, Overconfidence bias, Conservatism Bias, Representativeness Bias are included behavioral biases in this research*

Design/Methodology/Approach: *A survey questionnaire was circulated to the Generation Z (age group 18- 25) investor who are investing in Stock or mutual fund or both. Convenience sampling was used to select the investors from Ahmedabad city. Overall, 110 questionnaires were distributed, out of which 98 responses were taken for the study, remaining were disqualified as the investor was not investing in stock or mutual fund or both and the response rate 89%. The data was analyzed using Excel and SmartPLS 4.0 and Hypothesis were tested by bootstrapping in PLS-SEM.*

Result/Finding: - *This study reveals that there is a substantial influence of conservatism bias and social media influence on investment decision of investor and there is no significant impact of Herding Behavior, overconfidence bias, Representativeness bias, Parental Influence on investment decision of Generation Z investor residing in Ahmedabad.*

Limitations – *the time taken for the study is limitation in this research, random sampling technique for data collection for primary study was adopted involving only individuals from city of Ahmedabad from Generation Z investor age group between 18-25. Supplement of this study can gather the data on broader scale to re-verify the projected model.*

Keywords: - Herding Behaviors, Overconfidence bias, Conservatism Bias, Representativeness Bias, social media influence, parental influence, Investment decision

Introduction

Behavioral biases are the branch of finance that investigates the psychological factor on investment decision of Investor. Investment decision taken by investor can be either rational or irrational based on their knowledge, judgments and ability of individual investor. For perfect portfolio, investment investor must have to make rational decision. Traditionally financial theory assumes that individual is rational and always makes decision with the aim of maximizing the utility. But there is a strong influence of emotions, mood and cognitive bias on investor due to that they fail to be as a rational investor while taking investment decisions. Several research have proven that there is the effect of psychology on investment decision of investor. And behavioral finance describes why individual do not behave rationally while taking investment decision. These biases are deeply rooted in psychology of human which influence their attitude, perception, and their action in various aspect of investment decision making process. Understanding this bias is crucial for individual investor, as they impact the outcome and contribution to their both successful and failure of the investment. These biases hinder the objective of investment making of an individual.

Earlier investment theory suggests that investor take rational decision on maximizing return while limiting their risk. However,

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recent theories challenge this suggestion and assumption as human mind does not always think rationally and neither Market always perform efficiently as the psychological factor such as fear, greediness, emotion among the individual can influence the investment decision of investor. So behavioral finance is the field of study with suggest that investment decision is influenced by emotional and psychological factor to a great extent. According to (Nga, Leong Ken Yien, & , 2013) researcher studies influence of personality traits and demographics on financial investment decision making among Gen Y for the study, researcher have collected data from 314 undergraduates students of business school, and finding of the study was openness to experience, Conscientiousness and agreeableness have positive influence on risk aversion and cognitive bias and socially responsible investing and gender has no significant impact on financial decision making of investor.

Literature Review

Conservatism Bias

Conservatism Bias influence the investor due to existing beliefs regarding investment. This is due to stereotype mindset regarding investment decision. This bias can lead individuals to maintain their current beliefs or opinions which leads to irrational decision of investor. According to previous study by (Rahim, Shah, & Alamzeb , 2019) has published impact on conservatism bias on investor's investment decision making of Pakistan stock exchange investor that is from Islamabad stock exchange Karachi Stock exchange and Lahore stock exchange and study reveals conservatism bias has positive impact on decision making regarding investment of Pakistan stock exchange investor. And (Giri & Adhikari, 2023) conservatism bias and overconfidence influence the decision of investor in Nepali share market, for this research 335 data have been collected and it was analyzed using SPSS and CB-SEM. the outcome of the study is the conservatism bias has significant impact on investment decision of investor.

H1: There is significant impact of Conservatism Bias on decision of Generation Z investor regarding investment

Herding Behavior

Herd behavior in investment decision making refers to tendency of investor to follow the crowd rather than making rational decision based on their own analysis of available information. In other words, herd bias the investor follows the work of other which means if one investor makes any investment decision then other investor also invest in the same investment Avenue without with no due diligence and making their own strategy. The influence of people around the investor in taking investment decision is the main reason of herd behavior.

(Shekhar & Prasad R.A, 2015) Investigated the influence of herding behavior on Indian professional investor and retailers its impact on financial capital market (stock market price volatility). Investor receives information from difference such as experts, investment guru, and stockbroker without implementing their own investment strategy. (Sajid Mohy Ul Din, Mehmood, Shahzad, Ahmad, Davidyants, & Abu-Rumman, 2021) Reported impact of herd behavior for Islamic financial product, data was collected from 410 respondents, the study validates Self attribution, availability of information has positive impact on herding For Islamic financial product, According to (Altaf & Jan, 2023) they have studied investing behavior of millions driven by generational bias. They have collected data from 516 millennial investor reveals that socially responsible investing, herding, fear of missing out, overconfidence has positive impact on the investment intention as there, P value is 0.039, 0.017, 0.05, 0.018 respectively and disposition has no significant impact on investment intention as the value is 0.619

H2: There is significant impact of Herding behavior on decision of Generation Z investor regarding investment

Overconfidence

Overconfidence bias involves an individual investor's excessive confidence in their knowledge, own abilities to take decision or judgments which often leads investor to overestimate their accuracy and take risk too lightly. When it comes to take investment decision, investor many a times believe they have superior availability of information or analytical skills leads them to take wrong decision many a times.(Malik, Muhammad , & Muhammad)conducted research to study impact of overconfidence bias on investment decision, for this research, researcher have collected data from 283 respondents and study reveals that overconfident bias has a positive relation with investment decision. According to (Hadzimustafa & Nermine) this research paper focus on to analyses the investment decision making process based on overconfidence bias and it shows that it has significant impact on decision of investor. Men and women both are found overconfident, but degree of overconfidence varies among them. (BICH, Dat , NGUYEN , NGUYEN, & NGUYEN , 2023) Studied on the influence of behavioral factor on stock investment decision of Vietnam's generation Z investor, The researcher have taken into consideration herd behavior, fear of missing out (FOMO), overconfidence, framing, representativeness and risk attitude as factor influencing investment decision.in the study, 558 responses were collected from generation Z Securities investor in Vietnam. The study was carried on using structural equation model and study reveal that overconfidence, representativeness, fear of missing out, risk attitude has a significant positive influence on decision making of investor on other hand herd behavior and framing has no significant impact on investment decision

H3: There is “significant “impact “of “Overconfidence Bias “on decision of Generation Z investor regarding investment

Parental Influence

The impact of family and parental influence on investment decisions can be significant, as the family values, dynamics and financial situations often play an important role in shaping an individual investor's approach to investing. (Sentosa & Gosal, 2023) aims to determine the impact of parental financial behaviour, herding behavior and financial literacy on investment behavior of Gen Z and researchers have Collected data from 364 respondent for “the study, for the analysis the data (PLS - SEM) and the study shows that parents financial behaviour have positive impact on financial literacy but does not impact directly on investor's investment behavior of Gen Z and hurting behavior as positive impact on investor behavior of Gen Z

H4: There is significant impact of Parental Influence on decision of Generation Z investor regarding investment

Representativeness Bias.

Representativeness Bias had impact on investment decision by leading them to rely on stereotypes and mental shortcut and inaccurate judgments affecting the overall performance of an investment portfolio (Irshad, Badshah, & Hakam, 2016) reported in their research paper on effect of representativeness bias in investment decision of investor where data is collected from 120 respondent of Islamabad stock exchange. And result shows that investor is affected by representativeness bias Islamabad stock exchange. (Kurniana, Manurung, & Sembel, 2023) Published an article on representativeness bias and availability bias on decision making of gen Z and data was collected from age range of 17 to 35 years of age and data is collected from 120 investor, millennial examine that representativeness has a positive impact on millennial generation Z investor in Indonesia

H5: There is significant impact Representativeness Bias on investment decision of Generation Z investor

Social media influence

Social media platforms have become an important part of our daily lives, affecting in various aspects of our behavior which include decision-making of investment as well. The growth of social media has impacted the financial industry mainly investment decisions. The ability to connect with a wider network has enabled investors to gather information, the ease of availability to information and learn from their peers and make informed investment decision has impacted on investment decisions of generation Z investor. (Tandon & Jain, 2022) Published impact of social media among young adults, while taking investing decision. Researchers have collected data from 101 respondents who are investing in different investment avenues. The study found that young adults' uses social media frequently and they take decision considering social media hence social media has positive impact on investment decisions. (Quetua, Clarizze , Katipuna, Jr. Etrata, & Velasco, 2023) This study aims to research the purchasing behaviour of investment asset and factor influencing investment intention among generation, Y and Z investor Cohort for the study. Researcher have used convenient sampling technique for data collection and collected 148 responses from the respondent comprise of gen Y and gen Z investor and data was analyzed using PLS – SEM. Study reveals “that financial “literacy has a significant relationship with purchasing behavior of both generation Y and generation Z investor and it can be concluded that Investment bias, consumer behaviour, risk, tolerance, Marketing or promotional activity has no significant impact on investment purchase behavior of Gen Y and Gen Z investor.

H6: There is significant impact of Social Media Influence on decision of Generation Z investor regarding investment

Research Methodology

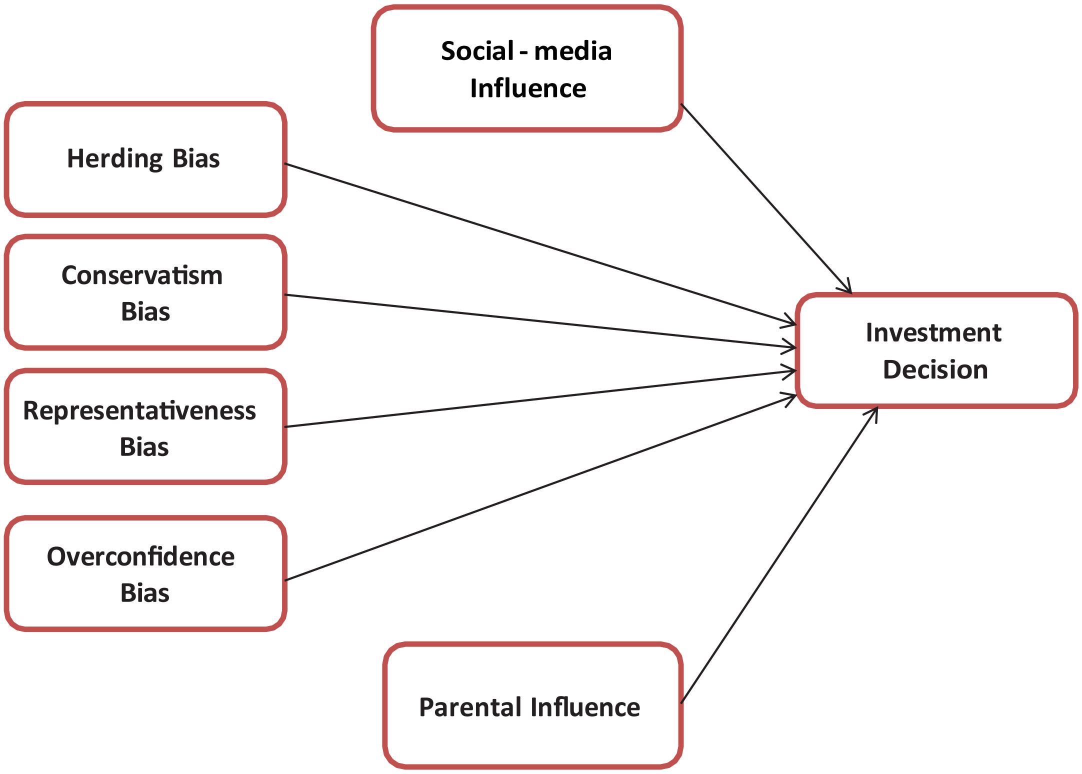
Research Objective

- To study impact of behavioral bias on decision of Generation Z investor in city of Ahmedabad regarding investment
- To study influence of social media on decision of Generation Z investor in city of Ahmedabad regarding investment
- To study the effect of Parental Influence on decision of Generation Z investor in city of Ahmedabad

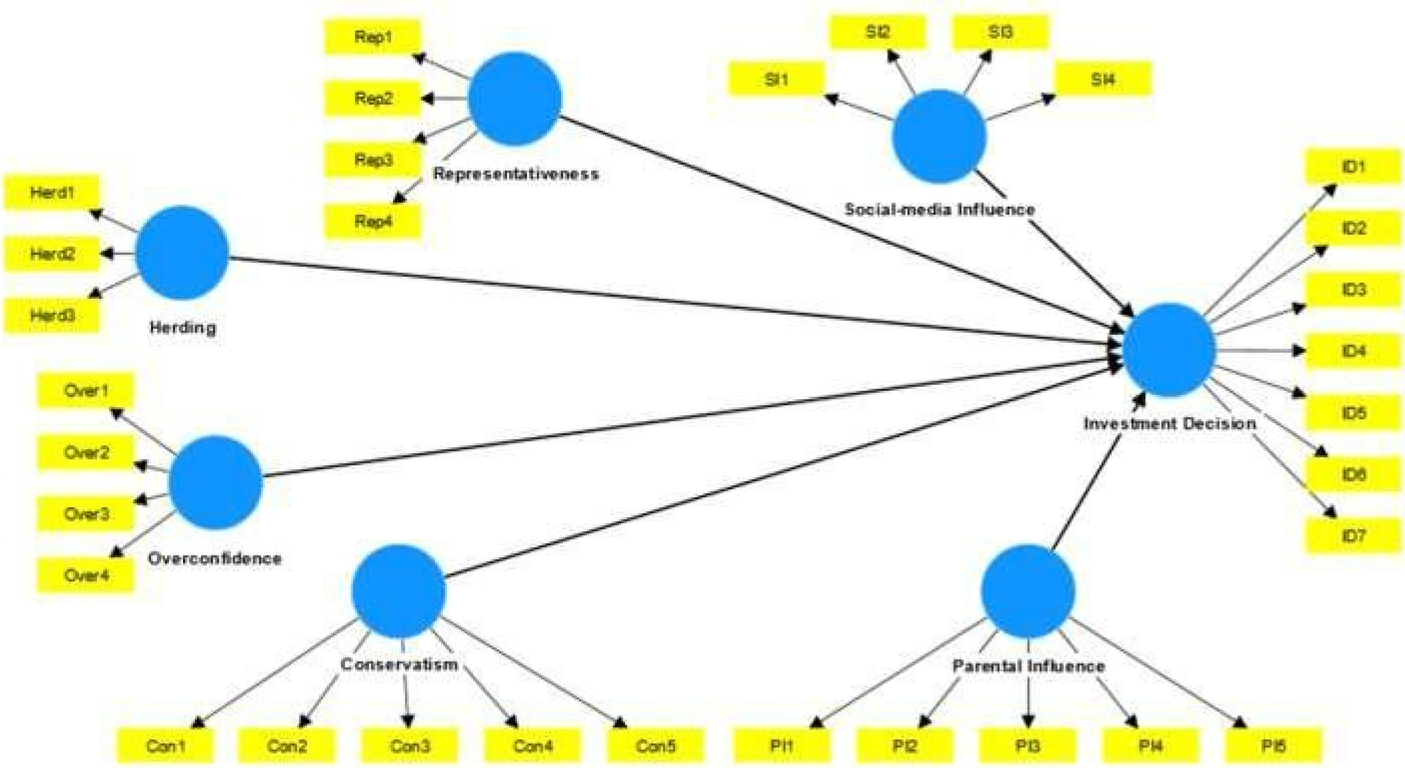
Data - The data for the research is collected using online mode i.e. (Google form). Questionnaire were distributed to 110 out of which 98 responses were taken for the study, remaining were disqualified as the investor was not investing in stock or mutual fund or both and investor of age group between 18-25 and the response rate 89%. Sampling technique is non-probability and convenience sampling

Source of data - All data and information for this research are gathered from primary sources via questionnaires and secondary data was collected from research paper, book, website, etc. For primary data, the questionnaires consist of two sections where the first is for investor's demographic and the second section is related to behavioral factor, Parental Influence, Social media Influence. The data was analyzed using Excel and SmartPLS 4.0 and Hypothesis were tested by bootstrapping in PLS-SEM

Conceptual Framework



Analysis of Data



Measurement model

The consistency and reliability of the construct in the study is assessed the measurement model. The assessment criteria start with the factor loading followed by establishing the construct reliability of the construct. Reflective- Reflective measurement model is measured based on two types of validity that is convergent validity and discriminant validity. Convergent validity is the degree to which each indicator of specific construct converges a high proportion of variance which can be measured Using factor loading, internal consistency reliability, indicator reliability, AVE average variance extracted. Additionally, discriminant validity refers to the indicator that should load more intensely on their own construct than on another construct in the model. Discriminant validity uses different method to examine this study which includes(F&L) fornell and larcker criterion and (HTMT) heterotrait- monotrait ratio

Reflective Measurement model is evaluated- Evaluation Criteria

1. **Indicator reliability**
2. **Internal Consistency reliability**
3. **Convergent Reliability**
4. **Discriminant Reliability**

Factor loading

Factor loading means to the extent at which each of the item in the study is correlated with the underlying factor. Factor loading can range from -1.0 to +1.0. None of the item in the has factor loading less than recommended value than 0.50. Hence none of the item was removed. Construct. The below table represents factor loading of each single statement (latent variable) of each given construct in the study which is more than standard range i.e. more than 0.708 (Hair, Hult, Christian, & Marko, 2017).

Table 1- factor loading

	Conservatism	Herding	Investment Decision	Overconfident	Parental Influence	Representativeness	Social-media Influence
Con1	0.885						
Con2	0.926						
Con3	0.896						
Con4	0.902						
Con5	0.704						
Herd1		0.894					
Herd2		0.865					
Herd3		0.988					
ID1			0.883				
ID2			0.92				
ID3			0.925				
ID4			0.936				
ID5			0.941				
ID6			0.918				
ID7			0.929				
Over1				0.891			
Over2				0.901			
Over3				0.89			
Over4				0.817			
PI1					0.961		
PI2					0.911		
PI3					0.882		
PI4					0.927		
PI5					0.904		

Rep1						0.906	
Rep2						0.88	
Rep3						0.867	
Rep4						0.925	
SI1							0.789
SI2							0.797
SI3							0.844
SI4							0.827

Internal consistency Reliability and validity

Convergent Validity

Table 2- Convergent Validity

Construct	Type	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Conservatism	Reflective	0.914	0.928	0.937	0.751
Herding	Reflective	0.928	2.211	0.941	0.841
Investment Decision	Dependent	0.97	0.971	0.975	0.85
Overconfidence	Reflective	0.899	0.912	0.929	0.766
Parental Influence	Reflective	0.955	1.243	0.964	0.842
Representativeness	Reflective	0.917	0.924	0.941	0.801
Social-media Influence	Reflective	0.831	0.835	0.887	0.663

Cronbach's Alpha and composite reliability (Rho_a) assist as tools for evaluating the internal reliability of a measurement model. Cronbach's Alpha working to gauge the internal consistency of an entire construct, examining whether the formulated scale statements are unbiased, easily comprehensible, and neutral. The factor loadings, AVE and CR (Rho_a, Rho_c) of the reflective-reflective constructs are shown in the table 2. According to (Hair, Hult, Christian, & Marko, 2017) the loadings which is lower than 0.708 can be kept when the AVE result has achieved 0.5. Furthermore, all of the four constructs have to meet the minimum cut-off value. where all average variance extracted AVE should be greater than 0.5 and all Composite reliability have greater than 0.7. constructs which shown in Table 2 have been meet the reliability and the convergent validity requirement

Discriminant Validity

After assessing convergent validity, the discriminant validity of the reflective- reflective model have to be evaluated. When looking for the Fornell and Lacker Criterion (Table 4) and HTMT (table 3), all of the constructs were satisfactory when it comes to discriminant validity. For assessing discriminant validity for Reflective-Reflective Higher order construct HTMT ration was assessed, Statistic of that was less than 0.85 and forenell and larckar criteria diagonal element was assessed

Table 3- HTMT

	Conservatism	Herding	Investment decision	Overconfidence	Parental Influence	Representativeness	Social-media Influence
Conservatism							
Herding	0.365						
Investment decision	0.476	0.059					
Overconfidence	0.585	0.218	0.444				
Parental Influence	0.243	0.058	0.095	0.056			
Representativeness	0.267	0.159	0.425	0.566	0.036		
Social-media Influence	0.472	0.209	0.601	0.397	0.079	0.433	

Table 4- Fornell-larcker criterion

	Conservatism	Herding	Investment decision	Overconfidence	Parental Influence	Representativeness	Social-media Influence
Conservatism	**0.866**						
Herding	0.323	**0.917**					
Investment decision	0.455	0.072	**0.922**				
Overconfidence	0.533	0.169	0.42	**0.875**			
Parental Influence	0.22	0.053	0.11	0.031	**0.917**		
Representativeness	0.252	0.16	0.404	0.509	0.009	**0.895**	
Social-media Influence	0.416	0.186	0.543	0.351	0.035	0.3820	**0.815**

Structural Model

The structural path model is used for hypothesis testing in the study. A structural model comprises of specifying structural relationships between endogenous variable and exogenous variable. In structural path model R^2 has to be assessed for measuring the variance and F^2 is used to assess the effect of exogenous construct to endogenous latent variable

Coefficient of Determination (R^2)

R^2 of the model means coefficient of determination which is useful to measure the variance directed by each dependent variable and R^2 can be used to determine how predictive it is. The predictive value is also called as R^2 and R^2 has a range from 0 to 1, higher numbers suggesting better prediction. The R^2 values of 0.75, 0.50, and 0.19 are considered substantial, moderate, and weak respectively. As per (Hair, Hult, Christian, & Marko, 2017). The R^2 value is 0.413 in the study which means there is moderate variation in endogenous variable i.e. investment decision in the study.

Discussion

Table 5- Hypothesis Testing

Hypothesis	Relationship	Original	Mean	(STDEV)	t-value	P values	F Square	Decision
H1	Conservatism -> Investment Decision	0.236	0.244	0.101	2.335	0.02	0.054	Accepted
H2	Herding -> Investment Decision	-0.119	-0.127	0.102	1.169	0.242	0.021	Rejected
H3	Overconfidence -> Investment Decision	0.096	0.115	0.138	0.695	0.487	0.009	Rejected
H4	Parental Influence -> Investment Decision	0.047	0.039	0.116	0.402	0.688	0.003	Rejected
H5	Representative-ness -> Investment Decision	0.176	0.158	0.138	1.273	0.203	0.036	Rejected
H6	Social-media Influence -> Investment Decision	0.364	0.361	0.105	3.455	0.001	0.168	Accepted

The major goal of this study the impact of Behavioral biases, social media and parental influence on decision of generation Z investor in Ahmedabad City.

The Relationship between Conservatism Bias and Investment Decision on Generation Z Investor

Conservatism bias and overconfidence influence the investment decision of investor in Nepali share market. the outcome of the study is the conservatism bias has significant impact on investment decision of investor.

The Relationship between Herding Behavior and Investment Decision on Generation Z Investor

According to the result of hypothesis testing in this research, there is no impact of herding Behavior on investment decision of Generation Z investor in Ahmedabad City (H2: Beta= -0.127, P value of 0.242(<0.05)). As a result, Hypothesis is confirmed. The study shows that there is no effect of herding behaviour on investment decision as the f value is 0.0021 as per (Hair, Hult, Christian, & Marko, 2017) the effect size f^2 allows assessing an" exogenous construct to endogenous latent variable, value of f^2 is 0.02,0.15,0.35 indicates small, moderate, large effect respectively. The reference to the above hypothesis (Adiputra, Bangun, & Rivaldy, 2023) The study show that herding behaviour variable has no significant effect on investment decision of investor. This result indicates that investor of Indonesia stock exchange tends to receive information and perform good analysis to choose stock. Investor take rational decision because they are not influenced by other investor and do not follow the noise which occurs in the market. (prasetyo, Sumiati, &

Ratnawati, 2023) this study shows that herding behavior has no impact on investment decision on generation Z investor of kediri city and finding suggest that investor avoid formation of Market bubbles and avoid irrational investment decision rather generation z investor use fundamental analysis and companies financial report to make rational decision. (Bakar & Chui , 2016) the study shows that herding behavior has no significant impact on investment decision making of invested age group between 18-60 years of klang valley and pahang in Malaysian stock market

The relationship between Overconfidence Bias on investment decision of Generation Z investor

In this research, there is no impact of over confidence Bias on investment decision of Generation Z investor in Ahmedabad city result shows that (H3 Beta=0.115, P value is 0.487(<0.05). Hence the hypothesis H3 is rejected. The study shows that there is no effect of over Confidence bias on investment decision as the f value is 0.009 as per (Hair, Hult, Christian, & Marko, 2017) the effect size f^2 allows assessing an exogenous construct to endogenous latent variable, value of f^2 is 0.02,0.15,0.35 indicates small, moderate, large effect respectively. The above result is supported by (prasetyo, Sumiati, & Ratnawati, 2023) it shows that overconfidence bias does not have any positive effect on investment decision of investor the overconfidence buyers in investing does not influence investment decision made by generation Z investor who have good financial literacy and good level of education So they are not influenced by such biases. (Ahmad & shah, 2020) the study has confirmed that overconfidence bias is significantly negatively associated with investment decision making of investor.

The relationship between Parental influence on investment decision of Generation Z investor

Based on the research finding, it has been determined that there no significant impact of parental influence while taking investment decision in generation Z investor as (H4 Beta=0.039, P value is 0.688 (<0.05)). Hence the hypothesis H4 is rejected. The study shows that there is no effect of parental influence on investment decision as the f value is 0.003 and as per(Hair, Hult, Christian, & Marko, 2017) the effect size f^2 allows" assessing an exogenous construct "to endogenous latent variable, value of f^2 is 0.02,0.15,0.35 indicates small, moderate, large effect respectively. Nonetheless, there was not much pervious study that supported the result from this study. (Mahalakshmi & Anuradha, 2018) According to the study, influence of family or parents has indirect impact on investment decision. The decision-making behavior of me dependent in the family will differ from me without dependent. Hence Family influence has a moderating influence on investment decision making process

The relationship between representativeness biases on investment decision of Generation Z investor.

The research analysis shows that there no significant impact of Representativeness Bias while taking investment decision in generation Z investor as (H5 Beta=0.158, P value is 0.203(<0.05)). Hence the hypothesis H5 is rejected. The study shows that there is no consequence of representativeness Bias on investment decision as the f value is 0.036 and as per (Hair, Hult, Christian, & Marko, 2017) the effect size f^2 allows assessing an exogenous construct to endogenous 'latent variable, value of f^2 is 0.02,0.15,0.35 indicates small, moderate, large effect respectively. The finding of this study is consistent with the finding of (Fitri & Cahyaningdyah, 2021) that representativeness biases no significant impact on decision making of investor, representativeness bias in financial behavior leads investor to irrational decision. Investors take Investment decision very fast without in-depth analysis and they rely on past experience (Ganavi & Shakila, 2024) study shows that represent representative bias as no impact on individual decision making of investor which implies that sometimes we will tend to make wrong prediction based on what they believe

The relationship between social media on investment decision of Generation Z investor.

According to the hypothesis testing in this research that there is significant impact of social media while taking investment decision in generation Z investor as beta=0.361, P value is 0.001(<0.05). Hence the hypothesis H6 is accepted. The study shows that there is moderate impact of social media on investment' decision of generation Z investor in Ahmedabad city as f value is 0.168 and as per (Hair, Hult, Christian, & Marko, 2017) the effect size f^2 allows 'assessing an exogenous construct to endogenous latent variable, value of f^2 is 0.02, 0.15, 0.35 indicates small, moderate, large effect respectively. Furthermore, the result of the study is supported by (Tandon & Jain, 2022) Published impact of social media among young adults, while taking investing decision. Researchers have collected data from 101 respondents who are investing in different investment avenues. The study found that young adults' uses social media frequently and they take considering social media hence social media has positive impact on investment decisions.

Conclusion

Practical/Managerial Implication

The Aim of this research paper is to study the impact of behavioral Biases, social media influence and parental influence on investment decision of generation Z investor in city of Ahmedabad. This study used four behavioral biases which are overconfidence Conservatism, Herding behavior and representativeness. From the practical opinion, the end result of the study was showing that over confidence, Herding behavior, representativeness and parental influence have no significant influence on investment decision of investor while conservatism bias and social media influence have a significant" impact on "investment decision. This means that, for the individual investors of Generation Z who are investing in mutual fund or equity, or both may have advantage straight away from the finding, they can use these finding as a reference of while deciding their investment portfolio. So that investor may avoid some unnecessary loss in their future investment and help those in taking rational decision rather relying on social media.

The findings of this research would help financial institutions, social media influencer, future researcher and policymakers to frame investment strategies in diversifying their portfolio. Another way the finding will help from this could be for training purpose of investors and educate them regarding the same. Further this study will also help "regulatory authorities in order to "develop such kind of "policies to avoid -those behavioral biases

Limitation of the study is the time taken for the study is of 2 months is limitation in this research, random sampling technique for data collection was implemented only individual investor from city of Ahmedabad from Generation Z of age group between 18-25. Further studies" can collect the data on" wider scale to re-verify the "proposed model. In this study is only two type of investment instrument, namely stocks and mutual fund, so it does not yet describe the overall behavior of investors in other investment instruments. The sample size in the study is the limitation as it is limited to Ahmedabad city only.

Recommendation for future studies

There are some of the references for future research which can be recommended to make enhance and improvement in the future research study. This study "was examining the "relationship between some of the "dimensions of behavioral bias and the investment decision in Ahmedabad city.

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Exploring the Role of Corporate Reputation and Capability as Intermediaries in The Relationship Between Corporate Social Responsibility and Consumer Buying Behaviour

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Abstract

Objective: *The influence of Corporate Social Responsibility (CSR) on customer buying choices is substantial. Modern consumers increasingly prefer businesses engaged in ethical practices and contributing positively to society. Companies that actively participate in CSR programs often enjoy a favorable brand reputation, increased customer loyalty, and a competitive advantage.*

Purpose: *This concise research endeavor seeks to examine the function of business reputation as a mediator and organizational capability in the connection between CSR and consumer purchasing behavior. The research employs the causal stages technique to assess mediation.*

Results: *The study reveals that corporate reputation and corporate ability do not serve as mediators, meaning they do not have an indirect influence, between consumer purchasing behavior and corporate social responsibility. Nevertheless, Corporate Social Responsibility (CSR) has a direct and substantial impact on customer buying behavior.*

Key words: Corporate Social Responsibility - Corporate reputation - Corporate ability – Consumer buying behaviour - mediating variables.

Corporate Social Responsibility

According to Vats and Mittal (2021)[1], companies who engage in corporate social responsibility are perceived as being more socially and ecologically aware. They also tend to make beneficial contributions to the local communities surrounding their facilities. Visser's (2009)[2] research underscores the growing interest and importance of exploring Corporate Social Responsibility (CSR) in emerging nations, offering a significant opportunity to advance CSR studies that have been surprisingly overlooked in research. MigleSontaite-Petkevicience (2012)[3] found that CSR is increasingly becoming a pivotal factor shaping the public's perception of companies. The impact of CSR on a company's reputation is intricately tied to its categorization into areas such as human responsibility, environmental responsibility, and product responsibility.In their article "CSR Themes, Opportunities, and Challenges" (Crane &Glozer (2016)[4], the authors emphasize that effective communication with stakeholders is vital for the successful planning, implementation, and impact of CSR initiatives. This focus has led to an increasing amount of written works on the communication of corporate social responsibility (CSR).

Premlata and A. Agarwal (2013)[5] delve into the implication of CSR for firms, questioning the reasons for advocating the promotion of economic growth. They posit that CSR is indispensable because companies have a responsibility to support their communities, particularly in rural areas.The Friedman model (1962–1973)[6], developed between 1962 and 1973, highlights the notion that it is both the social and moral responsibility of a businessman to fulfill their duties. The sole obligation of a businessman is to his shareholders and investors. Corporate Social Responsibility: Transforming the concept of development According to Michael Blowfield (2005)[7], CSR can have advantages in some situations. However, it is important to recognize its limitations in order to prevent economic interests

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from taking precedence over the development goals while engaging with developing nations.

CSR and the Reputation of a company

Corporate Social Responsibility (CSR) and company reputation are intricately intertwined, exerting a substantial influence on each other. Engaging in CSR projects has the potential to develop a company's standing, while a positive reputation can amplify the perceived value of CSR initiatives. By adeptly managing CSR and reputation, organizations can build trust, attract stakeholders, and contribute meaningfully to long-term sustainable prosperity. The perceived CSR and business reputation are closely linked, requiring a certain level of credibility for CSR projects to be effective. Customers may be skeptical of initiatives accepted by companies with corporate image matters((Liebl, 2011)[8]. Therefore, firm reputation stands as a valuable and challenging-to-replicate intangible asset (Rodríguez, 2002)[9], significantly impacting customer purchase intentions (Pirsch et al., 2007[10]; Aksak et al., 2016[11]) and corporate reputation (Park et al., 2014)[12]. Corporate reputation heavily relies on stakeholder groups' opinions of an organization's CSR. Specifically, it is determined by how well the organization's CSR programs and outcomes align with stakeholders' social and environmental values and expectations. In this specific context, Corporate Social Responsibility (CSR) possesses the ability to effect these insights, thus contributing to the maximization of the financial benefits linked to a company's reputation (Unerman, 2008)[13]. Empirical analysis supports a positive correlation between CSR and company reputation. According to Husted & Allen (2007)[14], raising awareness among consumers and stakeholder groups about the significance of social responsibility of corporate (CSR) may have a beneficial impact on the organization's image.

According to Bayoud& Kavanagh (2012)[15], CSR reporting improves business reputation and financial performance. It also has the potential to attract international investment and increase consumer satisfaction and staff loyalty. Research conducted by Husted & Allen (2007) clearly shows that a strong business reputation has a considerable capacity to generate value and is challenging to duplicate. Corporate reputation is a crucial competitive advantage in marketplaces where it is challenging to distinguish products from one another. Melo& Galan (2011)[16], assert that the utilization of CSR enhances this competitive advantage.

Brammer and Millington (2005)[17] found a direct correlation among corporate social responsibility and an organization's reputation. According to Roberts (2003)[18], a positive image enhances the perceived worth of an organization and influences its behavior and statements. Likewise, a negative reputation diminishes the worth of an organization's products and services, serving as indicators that provoke more disdain. According to Whooley (2005)[19], the importance of reputation is not something that can be considered trivial or insignificant. Proper utilization of reputation may bolster the profitability and long-term viability of an organization.

CSR and Corporate capability:

CSR and corporate capability are closely linked and can significantly impact each other. Companies can enhance their corporate capabilities by integrating CSR into their business plans and operations. CSR activities have the potential to positively influence various aspects of a company's performance, including reputation, stakeholder relationships, risk management, innovation, talent acquisition, and financial position.The affiliation with an organization refers to the perception or belief associated with the organization, including its reputation, information about the organization's history, and attitudes and evaluations towards the organization (Brown and Dacin, 1997)[20]. Therefore, an organization's capacity is determined by society's expectations of the organization, which are influenced by its actions, as well as the level of trust and distrust towards the institution. The link between consumers and firms may be categorized into two components: CSR and corporate ability (Berens, 2004)[21]. This implies that customers' perception of organizations has an impact on their appraisal of products. Hence, both corporate competence and CSR impact the assessment of a firm in addition to its goods. Research indicates that corporate ability significantly influences the reputation of firms and their corporate social responsibility. Additionally, CSR has a strong impact on the adoption of endorsed strategy and a unified branding plan (Berens et al., 2005)[22].

Corporate ability refers to the proficiency of a firm in creating and delivering products and services, as described by Brown. In this research, CSR and corporate ability are treated as distinct concepts and measured individually. This allows for a thorough analysis of the individual impacts of each set and a comparison between the influence of social factors (CSR) and economic variables (CA). This is done despite Deng (2012) suggestion to combine CSR and corporate ability into a single construct. Deng argues that a company can obligate both social responsibility and produce high-quality inexpensive products, and that the resources of a firm should be used to support its social responsibility behavior.

Investing in CSR, or corporate social responsibility, enhances the new product development process and boosts production competence. Hence, people anticipate that the firm's new product would possess superior quality. Green and Peloza (2014)[24] identify customers' expectations as one of the two primary factors that significantly influence the outcome of a CSR investment. As a result of the higher standards for quality, buyers now experience less satisfaction from the firm's new product.

Corporate ability encompasses proficiency in generating highly inventive products/services and providing high-quality commodities. The corporate abilities and CSR of a firm have a significant impact on consumers' impressions of its products. (Lii, J.K.R.; Stutts, M.A.; Patterson, L. 1991)[25]. Sen and Bhattacharya (2001)[26] found that prioritizing CSR above corporate capabilities negatively affected customers' buying intentions.

Positive corporate culture is likely to promote better employee affiliation with a central organization for at least two reasons. Positive corporate reputation (CR) generates external admiration, respect, and status, which are appealing to workers and foster the development of organizational identification (OID). Prior research has shown that factors indicating a company's capacity, such as consistent financial success, innovation, and the production of high-quality products, are highly indicative of how external evaluators perceive the company (Lange, Lee& Dai, 2011; Rindova et al., 2005; Walker, 2010)[27].

CSR and Consumer purchasing behaviour:

Corporate Social Responsibility (CSR) can significantly influence customer purchasing decisions. There is a growing trend among consumers to favour corporations that uphold ethical practices and actively contribute to societal well-being. Businesses engaged in CSR programs often enjoy a positive brand reputation, increased customer loyalty, and a competitive advantage. Consumers are keen to pay further for products associated with CSR, and positive word-of-mouth can also drive sales. CSR needs a substantial and positive impact on purchasing decisions, fostering a favorable brand image among consumers, ultimately influencing their buying choices (Widiyantoro & Sumantri, 2017)[28].

According to Sugi&Khuzaini (2017)[29], Lachram & Sharif (2020)[30] and Fatmawati & Soliha (2017)[31], there is clear evidence that corporate social responsibility has a major impact on buying decisions.

Mohr, Webb, and Harris (2001)[32] discovered that customers' purchasing behavior is influenced by their understanding of a company's CSR initiatives pertaining to environmental or social concerns. Consumers exhibit a greater sense of social responsibility and are more drawn to companies that actively engage in corporate social responsibility (CSR) initiatives. According to Sen and Bhattacharya (2001)[33] study, the way customers respond to CSR has a direct impact on their propensity to buy items from the company.

Mediation Effect:

A mediating variable acts as a channel through which the influence of an independent variable affects a dependent variable (MacKinnon DP et.al, 2007)[34]. The widely employed method for assessing mediation is the fundamentalphases approach, defined in the seminal works of Baron & Kenny (1986)[35] and Judd & Kenny (1981)[36].Their strategy for establishing mediation involves four phases. First and foremost, it is crucial to notice a substantial correlation between the variable that is independent and the dependent variable. Furthermore, it is essential to show a strong association between the variable that is independent and the putative mediating variable. Furthermore, it is crucial for the mediating variable to have a strong correlation with the variable that is dependent when both the variable that is independent and mediating variable are examined as predictors of the dependent variable in question. Moreover, the magnitude of the coefficient connecting the variable that is independent to the dependent variable must exceed the magnitude of the coefficient connecting the independent variables to the dependent variables in the model of regression where both the independent variables and the mediating variable predict the variable that is dependent. The current study has utilized a causal stages approach to evaluate mediation.

Objectives

This short term research paper intended to analyse the mediate effect of corporate reputation and corporate ability in between CSR and Consumer Purchase behaviour. With this primary purpose, the following objectives constructed.

To know the indicators reflect the corporate responsibility, corporate ability, CSR and consumer purchase behaviour.

To analyse the correlation among the four variables entered in the path model.

To analyse the possible mediation effect of corporate reputation and corporate ability

Hypothesis

This research paper proposed the following alternative hypothesis based on the objective of the research proposed earlier.

Ha1: Company reputation serves as an intermediary between consumer buyingbehavior and company social responsibility.

Ha2: Corporate capability serves as an intermediary between consumer buying behavior and CSR

Methodology

This is an exploratory study with an objective to know the mediate effect of corporate reputation and corporate ability in between CSR and consumer purchase behaviour. The researcher adapt a simple random sampling to choose 120 sample respondents. The sample respondents are residential at Tiruchycity. Selecting an adequate sample from a larger population using simple random sampling is well-established and reliable (Jiang Y, Wu,G& Jiang L 2023)[37]. Its simplicity, openness, and impartiality and generalizability justify its usage in manuscripts. Simple random sampling minimizes selection bias by randomly picking population members or pieces (Mujere, N 2016)[38]. This strategy is useful for homogenous populations and when researchers want to draw reliable population-wide conclusions from a controllable sample. Simple random selection improves the study's external validity, boosting confidence in its generalizability (Rubin D B & Schenker N 1986)[39].

The questionnaire was consisting with two parts. Part one included with four demographic profile questions measured with nominal and ratio. The second part of the questionnaire related to core area of this research consisting fourteen questions measured with five point Likert's scale (1 as Not at all, 2 as Slightly, 3 as Moderately, 4 as Very and 5 as Extremely). At the end questionnaire issued were return back. The computerised analysis was done with a help of statistical software SPSS 20 and AMOS. The primary information gathered via the structure questionnaire. 116 of the 120 given questionnaires were returned. This analytical study incorporates the four factors such as CSR, Corporate Repuation, Corporate ability and Consumer purchasing behaviour. The CSR factor consist with four commonly accepted corporate social responsibility indicators. The CSR factor consider as a exogenous factor in the path model. The second factor named as Consumer purchasing behaviour consist with four indicators which reflects the consumers minimum expected CSR in their purchasing products. This consumer purchasing behaviour factor consider as endogenous factor. The remaining two factors such as corporate ability and Corporate reputation consider as a mediators in the path analysis comprises with three indicators in the each factor.

Table 2. Distribution of sample respondents based on personal demographic factor

Gender	**Female**				**Male**					
	Count		Row N %		Count		Row N %			
	33		28.4%		83		71.6%			
Age	**20-30**		**31-40**		**41-50**		**Above 50**		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
	37	31.9%	43	37.1%	21	18.1%	15	12.9%	116	100.0%
Education	**Graduates**		**Professional**		**Diploma**		**Others**			
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %		
	37	31.9%	43	37.1%	21	18.1%	15	12.9%		
Occupation	**Salary class- Public Sector**		**Salary Class – Private sector**		**Self Employed**		**Others**			
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %		
	54	46.6%	34	29.3%	28	24.1%	0	0.0%		

The demographic makeup presents a gender distribution with males comprising the majority at 71.6%, while females represent 28.4%. Within the age spectrum, individuals aged 20 to 30 constitute 31.9%, indicating a sizable proportion of young adults. The subsequent age brackets display a progressive trend: 31-40 years at 37.1%, 41-50 years at 18.1%, and those above 50 years at 12.9%, signifying a diverse range of age groups. Educational attainment reveals 31.9% as graduates, 37.1% as professionals, 18.1% holding diplomas, and 12.9% falling into other categories. Economic engagement is characterized by a distribution across sectors, with 48.6% of the workforce in the public sector, 29.3% in the private sector, and 24.1% self-employed. This multifaceted overview underscores a dynamic composition, reflecting both gender and age diversity, educational achievements, and occupational engagement patterns.

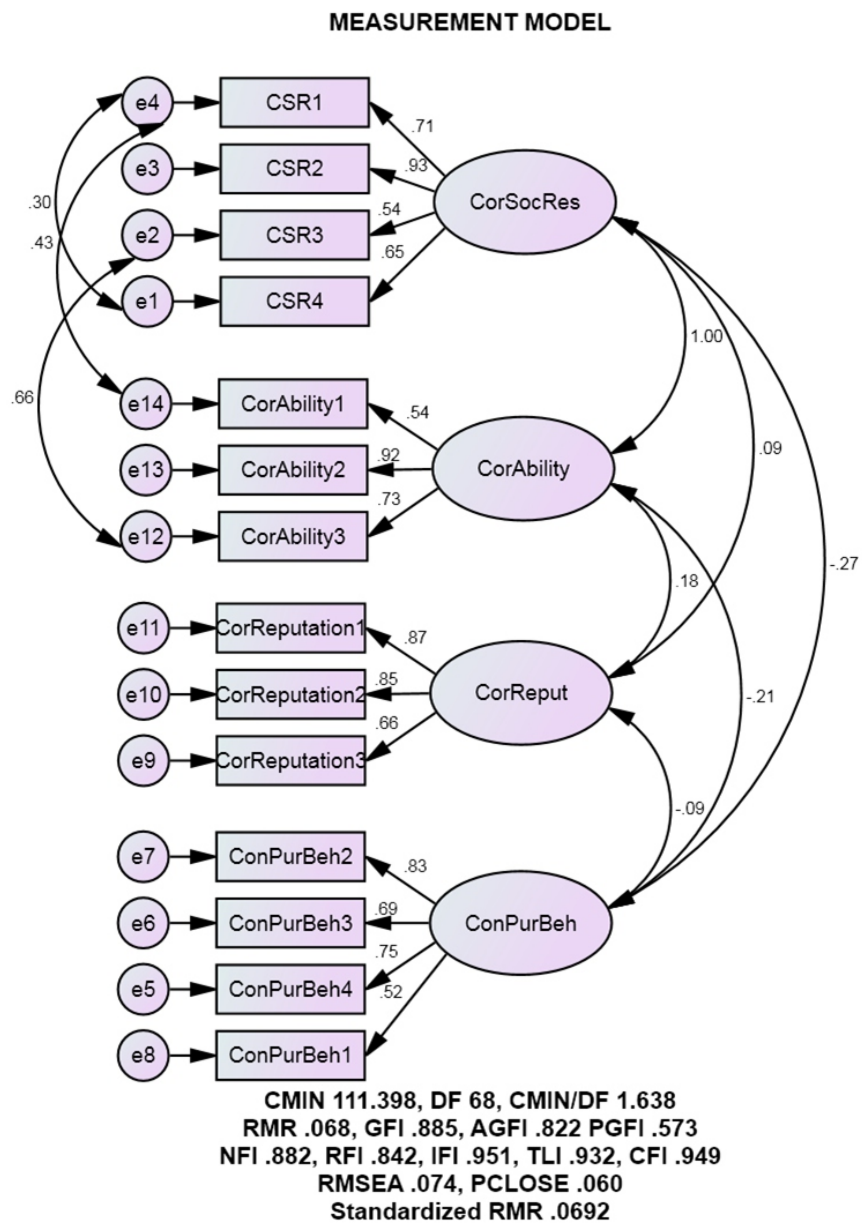
Table 2. Frequency distribution shows the respondents opinion over the measured indicators

CSR Indicators		Not at all	Slightly	Moderately	Very	Extremely
CSR1-A business that is dedicated to environmental sustainability.	Count	0	19	40	34	23
	Row N %	0.0%	16.4%	34.5%	29.3%	19.8%
CSR2-An organisation that practises ethical business.	Count	0	23	39	30	24
	Row N %	0.0%	19.8%	33.6%	25.9%	20.7%
CSR3-Company engages in charitable giving and community involvement.	Count	0	6	51	30	29
	Row N %	0.0%	5.2%	44.0%	25.9%	25.0%
CSR4-Business focuses on stakeholder engagement.	Count	1	17	42	25	31
	Row N %	0.9%	14.7%	36.2%	21.6%	26.7%
CorReputation1 - Do you believe the business has a stellar reputation?	Count	0	24	46	27	19
	Row N %	0.0%	20.7%	39.7%	23.3%	16.4%
CorReputation2 - Do you believe the business is widely recognised to the general population?	Count	0	38	34	28	16
	Row N %	0.0%	32.8%	29.3%	24.1%	13.8%
CorReputation3 - Are you familiar with the goods that businesses offer to customers?	Count	1	6	54	23	32
	Row N %	0.9%	5.2%	46.6%	19.8%	27.6%
CorAbility1-The company's product has a pleasing appearance.	Count	0	26	45	20	25
	Row N %	0.0%	22.4%	38.8%	17.2%	21.6%
CorAbility2-The business continuously looks for novel concepts	Count	1	28	36	24	27
	Row N %	0.9%	24.1%	31.0%	20.7%	23.3%
CorAbility3-The business offers customers high-quality, innovative goods and services	Count	0	5	48	27	36
	Row N %	0.0%	4.3%	41.4%	23.3%	31.0%
ConPurBeh1-Verify the Products of Companies Known for Being Socially Responsive.	Count	1	29	53	19	14
	Row N %	0.9%	25.0%	45.7%	16.4%	12.1%
ConPurBeh2-My top option was the firm that engages in CSR.	Count	0	36	42	19	19
	Row N %	0.0%	31.0%	36.2%	16.4%	16.4%
ConPurBeh3-It matters a lot to me whether the businesses I support have a reputation for doing ethically.	Count	0	6	57	26	27
	Row N %	0.0%	5.2%	49.1%	22.4%	23.3%
ConPurBeh4-I wouldn't purchase anything created using child labour.	Count	2	23	47	17	27
	Row N %	1.7%	19.8%	40.5%	14.7%	23.3%

The survey results reflect a diverse range of sentiments among respondents concerning various aspects of corporate values and practices on CSR. Notably, 34.5% of respondents show a moderate level of acceptance towards the concept of "A business that is dedicated to environmental sustainability," indicating a significant recognition of the importance of eco-friendly initiatives. Similarly, 44.0% of respondents moderately accept the notion of a "Company participates in charitable giving and community involvement," suggesting a prevailing appreciation for companies that actively contribute to the betterment of their communities. Additionally, 26.7% of respondents express an extremely high level of acceptance for a "Business focuses on stakeholder engagement," underscoring the growing significance of involving stakeholders in shaping business strategies. The data also reveals that 46.6% of respondents moderately accept the idea of businesses offering familiar goods to customers, indicating the importance of brand recognition and familiarity. Moreover, 31.0% of respondents highly value "The business offers customers high-quality, innovative goods and services," reflecting the enduring importance of product excellence. Interestingly, for 31.0% of respondents, their top preference is a firm that engages in CSR, highlighting the growing role of ethical considerations in shaping consumer preferences.

Data Analysis – I Measurement model

Fig.1 Measurement model



Model Fit: The provided model seems to have a reasonably good fit to the data. Chi-Square: The model's chi-square statistic (111.398) suggests a decent fit, considering the degrees of freedom (68). Ratio (CMIN/DF) The chi-square to degrees of freedom ratio (1.638) is within an acceptable range, indicating reasonable fit. The root mean square residual (RMR) and standardized RMR values (0.068 and 0.0692) are relatively low, suggesting good model fit. Goodness of Fit Indices: Various indices (GFI, AGFI, PGFI, NFI, RFI, IFI, TLI, CFI) show that the model fits well, with values close to 1 in most cases. RMSEA: The root mean square error of approximation (RMSEA) value (0.077) indicates a reasonable fit. Overall, based on the provided fit indices, the model appears to be a reasonable representation of the data. However, it's important to consider these values in the framework of the research question and the specific goals of the analysis.

Table 3.Covariances and correlation between the three latent factors

Correlation between		Covariance's	S.E.	t value	Correlation	Sig.
Corporate Social Responsibility	Consumer Purchase Behaviour	-.151	.066	-2.286	-.269	.022*
	Corporate Reputation	.039	.046	.837	.090	.403
	Corporate Ability	.465	.092	5.084	.997	***
Consumer Purchase Behaviour	Corporate Reputation	-.047	.058	-.811	-.090	.417
	Corporate Ability	-.116	.063	-1.831	-.208	.067
Corporate Reputation	Corporate Ability	.076	.047	1.609	.178	.108

* Significant at 0.05 level, *** Significant at 0.001 level.

The relationship between CSR and Consumer Purchase Behavior reveals a noteworthy negative correlation, as indicated by a statistically significant t-value at the 0.05 level ($p < 0.05$). The evidence suggests that close is a substantial basis for this correlation, with a probability of obtaining a critical ratio as large as 2.286 in absolute value being 0.022. In simpler terms, the covariance between CSR and Consumer Purchase Behavior significantly deviates from zero at the 0.05 level, with an estimated correlation of -.269.

Conversely, a robust positive correlation is observed between CSR and Corporate Ability. The high t-value, coupled with a significance level below 0.001, underscores the highly statistically significant nature of this correlation. The probability of achieving a critical ratio as substantial as 5.084 in absolute value is less than 0.001, indicating a significant departure of the covariance between CSR and Corporate Ability from zero. The estimated correlation between the two stands at .997.

While a positive correlation (.090) exists between CSR and Corporate Reputation, the associated t-value is relatively low, and the significance level exceeds 0.05. Consequently, this correlation is not deemed statistically significant. Similarly, a negative correlation (-.047) is identified between Consumer Purchase Behavior and Corporate Reputation, with a t-value of -.811 and a significance level above 0.05, indicating its lack of statistical significance. The estimated correlation between Consumer Purchase Behavior and Corporate Reputation is -.090.

A negative correlation (-.208) is observed between Consumer Purchase Behavior and Corporate Ability, with a probability of obtaining a critical ratio as large as 1.831 in absolute value being 0.067. Despite a moderately good t-value of -.1.831, the significance level surpasses 0.05, rendering this correlation statistically insignificant. In contrast, a positive correlation (.178) is noted between Corporate Ability and Corporate Reputation. However, the t-value is relatively low (1.609), and the significance level exceeds 0.05, indicating that this correlation lacks statistical significance. The estimated correlation between Corporate Reputation and Corporate Ability is .178.

Data Analysis – II Structural model

Fig.2. Mediate effect of corporate reputation

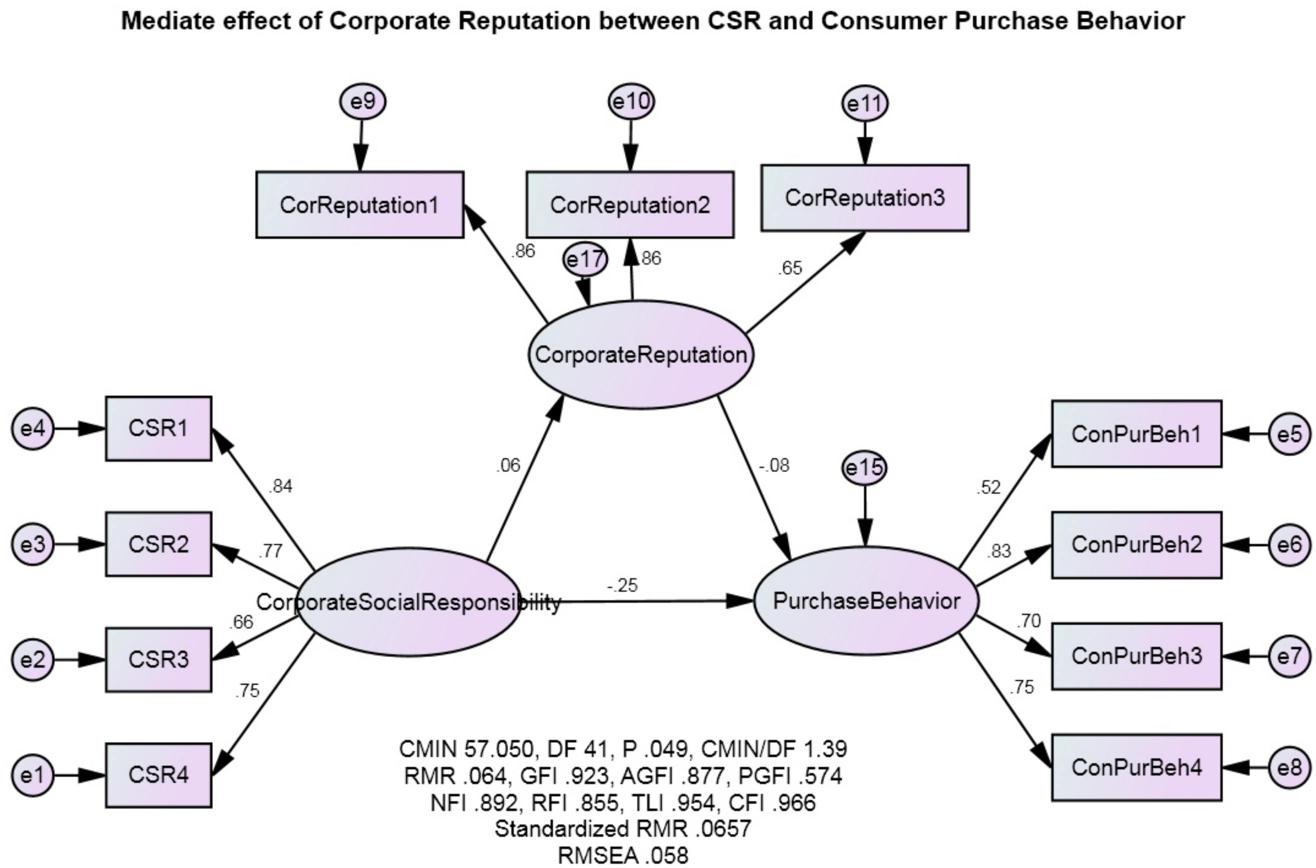


Table 5. Standardized Estimate: CSR-CR-CPB

Latent Variables	Estimate	S.E.	C.R.	Standardized Estimate	P	Result
CSR on Corporate Reputation	.069	.123	.556	.060	.578	Not Significant
Corporate Reputation on Purchase Behaviour	-.075	.104	-.715	-.077	.475	Not Significant
CSR On Purchase Behaviour	-.270	.123	-2.207	-.246	.027	Significant

This table shows estimates, standard errors, critical ratios (C.R.), standardized estimates, and p-values for the relationships between latent variables in the study. The following interpretation were brought:

1. The analysis indicates a positive correlation (0.069) between Corporate Social Responsibility (CSR) and Corporate Reputation, implying that CSR has a favorable impact on a company's reputation. Nevertheless, the estimate lacks statistical significance, as evidenced by the p-value (0.578) exceeding the conventional significance threshold of 0.05. This suggests that the observed correlation may have been a result of random chance.
2. The estimated value of -0.075 indicates a negative correlation between Corporate Reputation and Purchase Behaviour. However, like the prior association, the estimate lacks statistical significance (p-value = 0.475), suggesting

that the observed link may be attributed to chance fluctuations.

3. CSR on Purchase Behaviour: The negative estimate (-0.270) indicates a negative relationship between CSR and Purchase Behaviour. In this case, the estimate is statistically significant (p-value = 0.027), suggesting that the observed relationship is questionable to have occurred by casual. A standardized estimate of -0.246 indicates that the strength of this relationship, though negative, is of moderate magnitude.

Hypothesis Testing

Ha1: Corporate reputation acts as a mediator between consumer buying behaviour and CSR

The direct impact of CSR on Corporate Reputation is 0.06, but it is not statistically significant. Similarly, the direct influence of Reputation of Corporate on Consumer Purchase Behavior is -0.08, and it is also not statistically significant. Thus the calculated total indirect effect was to be (.06 x -.077) -0.00462. Both indirect path are insignificant; The direct effect of CSR on Consumer Purchase Behaviour = -.246 (Significant negatively).

The standardized indirect influence of CSR on Purchase Behavior, mediated by Corporate Reputation, is -0.005. This occurs as Corporate Social Responsibility indirectly affects Purchase Behavior by influencing Corporate Reputation. Research indicates that nearby is a negative correlation between an increase in CSR by 1 standard deviation and a drop in Purchase Behaviour by -0.00462 standard deviations. The data from the table indicates a significant and direct detrimental influence of corporate social responsibility on consumer buying behavior. The regression weight for Corporate Social Responsibility in predicting Purchase Behaviour (direct effect) is statistically substantial at the 0.05 level. An increase of 1 standard deviation in CSR leads to a decrease of 0.246 standard deviations in Purchase Behaviour. There is evidence that company reputation does not serve as an intermediary between consumer purchasing behavior and CSR.

Fig.2. Mediate effect of corporate ability

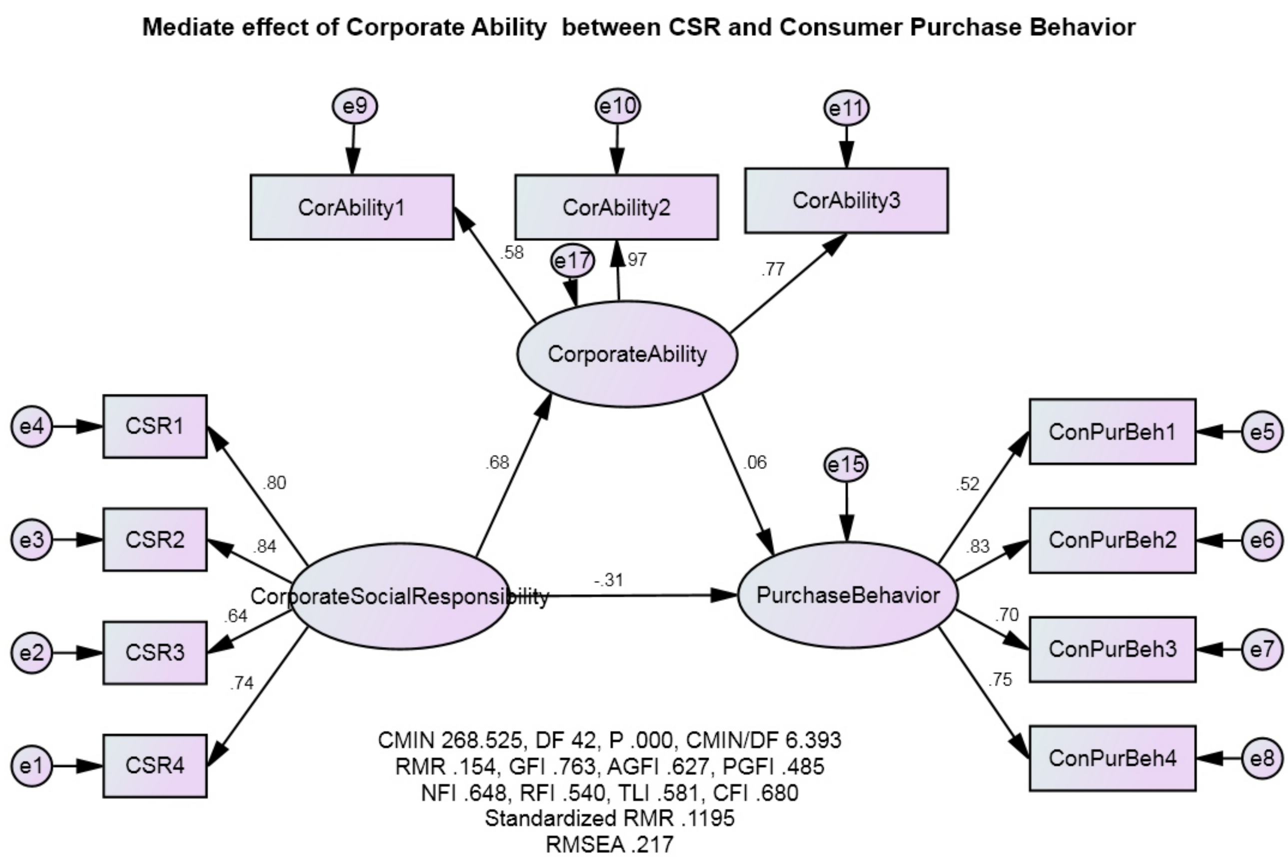


Table 5. Standardized Estimate: CSR-Corporate Ability-CPB

	Estimate	S.E.	C.R.	Standardized Estimate	P	Result
CSR on Corporate Ability	1.064	.147	7.254	.675	***	Significant
Corporate Ability on buying Behaviour	.041	.097	.426	.065	.670	Not Significant
CSR on buying Behaviour	-.309	.162	-1.908	-.307	.056	Not Significant

The direct consequence of CSR on Corporate Ability = .675 (significant); The direct effect of Corporate Ability on Consumer buying behaviour = .065 (not significant); Thus the calculated total indirect effect was to be (.675 x .065) 0.0438. Both indirect path are insignificant; The direct outcome of CSR on Consumer Purchase Behaviour = -.307 (Not Significant).

The table presents estimates, standard errors, critical ratios (C.R.), standardized estimates, and p-values for the associations between latent variables in the research. The following interpretations were presented.

1. There appears to be a strongly positive correlation between Corporate Social Responsibility and Corporate Ability. This infers that there is a direct relationship between the rise in CSR and the development in Corporate Ability. The association has aacceptable levle of statistical significance ($p < 0.001$), suggesting that the likelihood of this outcome occurring by chance is quite low.
2. Relationship between Corporate Ability and buying Behaviour: There appears to be a positive but modest correlation between Corporate Ability and Purchase Behaviour. Nevertheless, the association lacks statistical significance ($p > 0.05$), indicating that any observed impact might be attributed to random chance.
3. There appears to be an adverse connection between CSR and Purchase Behaviour.This indicates that there is a tendency for Purchase Behaviour to drop as Corporate Social Responsibility grows. However, it is vital to note that this link is only marginally statistically significant ($p = 0.056$), suggesting that further data or study may be required to form a definitive conclusion.

Ha2: Corporate ability acts as a mediator between consumer buying behaviour and CSR.

The standardized indirect effect of CSR on buyiing Behaviour, mediated by Corporate ability, is 0.0438. Specifically, the increase in CSR, which is influenced by corporate ability, has an indirect impact on buying Behaviour. When CSR increases by 1 standard deviation, buying Behaviour increases by 0.0438 standard deviations.This statement pertains to the potential effect of CSR on buying Behavior, considering any additional influences.The regression weight for Corporate Social Responsibility in predicting consumer buying Behaviour is not significant at the 0.05 level. There is a negative correlation between an increase in CSR by 1 standard deviation and a diminution in consumer buyingBehaviour by 0.307 standard deviations. Corporate capability does not serve as an intermediary between consumer purchasing behavior and CSR.

Findings:

1. The demographic makeup presents a gender distribution with males comprising the majority at 71.6%, while females represent 28.4%. Within the age spectrum, individuals aged 20 to 30 constitute 31.9%, indicating a sizable proportion of young adults.
2. Educational attainment reveals 31.9% as graduates, 37.1% as professionals, 18.1% holding diplomas, and 12.9% falling into other categories. Economic engagement is characterized by a distribution across sectors, with 48.6% of the workforce in the public sector, 29.3% in the private sector,
3. Notably, 34.5% of respondents show a moderate level of acceptance towards the concept of "A business that is devoted to environmental sustainability," indicating a significant recognition of the importance of eco-friendly initiatives.
4. 44.0% of respondents moderately accept the notion of a "Company involves in charitable giving and community involvement," suggesting a prevailing appreciation for companies that actively contribute to the betterment of their communities.
5. The data also reveals that 46.6% of respondents moderately accept the idea of businesses offering familiar goods to customers, indicating the importance of brand recognition and familiarity.
6. It is found that 31.0% of respondents, their top preference is a firm that engages in CSR, highlighting the growing role of ethical considerations in shaping consumer preferences.
7. There is a negative relationbetween CSR and Consumer Purchase Behaviour.

8. A robust positive correlation is evident between CSR and Corporate Ability, supported by a high t-value and a corresponding significance level, highlighting the highly statistically significant nature of this correlation.
9. While a positive correlation (.090) exists between CSR and Corporate Reputation, the associated t-value is relatively low, and the significance level surpasses 0.05, indicating the lack of statistical significance in this correlation.
10. A negative correlation (-.208) is identified between consumer purchase behavior and Corporate Ability. Although the probability of obtaining a critical ratio as large as 1.831 in absolute value is .067, the moderately good t-value of (-.1.831) and a significance level above 0.05 indicate that this correlation is insignificant.
11. A positive correlation (.178) is detected between Corporate Ability and Corporate Reputation. However, the relatively low t-value (1.609) and a significance level higher than 0.05 suggest that this correlation lacks statistical significance.
12. The analysis reveals that Corporate Reputation does not act as a mediator (indirect effect) between consumer purchasing behavior and CSR. However, Corporate Social Responsibility's direct effect on Purchase Behavior is significantly different from zero at 0.05 level. Specifically, when CSR increases by 1 standard deviation, Purchase Behavior decreases by 0.246 standard deviations.
13. The findings specify that corporate ability does not act as a mediator (indirect effect) between consumer purchasing behavior and CSR. It is revealed that CSR, increasing by 1 standard deviation, results in Purchase Behavior going up by 0.044 standard deviations, with a mediating effect of corporate ability. Significantly, the statistical analysis indicates that the direct effects of CSR on consumer purchase behavior are not statistically significant.

Conclusion

In summary, the exploration of correlations among CSR, Consumer buyingBehavior, Corporate Ability, and Corporate Reputation has yielded valuable insights. Notably, a negative correlation has been observed between CSR and Consumer buyingbehaviour, suggesting a potential impact of CSR on consumer's choices..

On the other hand, a robust positive correlation was observed between CSR and Corporate capability, suggesting a strong connection between a CSR initiatives and its overall abilities. However, the positive correlation between CSR and Reputationof Corporate, although existent, lacked statistical significance due to a relatively low t-value and a significance level exceeding 0.05. Further, the analysis revealed a negative correlation between consumer purchase behavior and Corporate Ability, though this correlation did not attain statistical significance. Similarly, the positive relation between Corporate capability and Corporate Reputation, while observed, lacked statistical significance based on a low t-value and a significance level higher than 0.05. Additionally, the role of Corporate Reputation as a mediator amongst CSR and Consumer buying behavior was dismissed, as the direct result of CSR on Purchase Behavior proved to be statistically significant. Conversely, the findings indicated that corporate ability did not act as a mediator among CSR and consumer purchasing behavior, with the direct impact of CSR on purchase behavior remaining statistically insignificant.

In summary, while certain correlations highlight potential connections, careful consideration of statistically significance is essential. The intricate relationships among CSR, Consumer Purchase Behavior, Corporate Ability, and Corporate Reputation warrant further exploration and nuanced understanding within the broader context of corporate dynamics and consumer choices.

Managerial Implication

Managers should recognize that strong CSR efforts may not immediately boost consumer buying behavior. Instead, they should balance CSR initiatives with targeted consumer engagement strategies. The favorable correlation between CSR and Corporate Ability implies that incorporating social responsibility into overall corporate strengths can provide a competitive advantage. However, the non-significant link among CSR and Reputation ofCorporate implies that companies need additional efforts to enhance their overall brand image. The complex interactions among Consumer Purchase Behavior, Corporate Ability, and Corporate Reputation indicate a need for nuanced strategies, emphasizing the importance of context-specific decision-making for sustainable business practices.

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From Crisis Management to Opportunity: Harnessing Organisational Resilience in the Pharmaceutical Industry of Himachal Pradesh

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Abstract

Researchers and scholars of various scientific communities around the globe focus on organizational resilience in managing crises to mitigate the impact of crises, speeding up the process of crisis aftermath, and fostering sustainable development. Secondary data was utilized to frame the structured questionnaires, and it was distributed to the 500 respondents working in pharmaceutical industries with online and offline modes, yielding 483 valid responses. The six pharmaceutical industries were chosen randomly, and sample sizes were chosen conveniently. ANOVA was performed to analyze the data with the help of SPSS 27. The literature review shows minimal information regarding organisational resilience and crisis management for the pharmaceutical sector in Himachal Pradesh. It is concluded from the analysis that age and marital status have significant effects on organisational resilience. Gender, working experience, and educational qualifications do not significantly impact organisational resilience. This study provides substantial insights from various perspectives that are helpful to practitioners and academics.

Keywords: Organisational Resilience, Crisis Management, Pharmaceutical Industry, ANOVA, Demographics.

1. Introduction

Organizational crises can differ in intentionality and predictability, affecting how they are handled and managed (Chewning et al., 2013). Nevertheless, it is essential to understand that disasters can present opportunities for business development, such as creating new business ties (Burnard et al., 2018). Managing crises makes leaders address questions regarding how companies may capitalize on the uncertainty of the market, support the concept of sustainable development, and gain a competitive edge (Ouedraogo & Boyer, 2012). Mafabi et al. (2013) pointed out that organisational resilience is influenced mainly by organisational cultures that value innovation and openness. Employees might be encouraged to express their real-time perceptions of the company's potential issues in such an environment. Employees can only develop their resilience in an environment where resilient organizational behavior is actively supported (Teixeira & Werther, 2013). Pharmaceutical companies are subjected to scrutiny during a crisis more than companies in other sectors (Schaetz & Lindgren, 2012).

Due to its expanding international operations in the healthcare sector, the pharmaceutical business is particularly vulnerable to crises (Schaetz & Lindgren, 2012). What must be done and the best way to do it must be clear for the firm to fight any crisis (Niemuth, 2021). The economic crisis may make getting medications harder (Rashidian et al., 2015). The pharmaceutical industry in India is already facing numerous difficulties on multiple fronts (Festa et al., 2022). Innovation plays a part in the pharmaceutical business's effectiveness despite being a highly regulated industry (De Lucia, 2021). Research on crisis management is still fragmented (Bundy et al., 2017). There are still unanswered questions regarding the causes of resilience (Khan et al., 2019). Crisis management becomes an essential need for 21st-century business (Vašíčková, 2020). The vulnerability of healthcare systems is being given significant attention in the wake of the viral outbreak.

According to Duchek et al. (2020), an organization's "capacity to foresee possible hazards, deal with negative situations well, and

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adjust to shifting circumstances" is what is meant by "organizational resilience." A crisis may appear to be more or less a permanent feature of our environment (Rais, 2007). Crisis management refers to integrating an organization's activities in "identifying and evaluating" early warning signals of a crisis (Ulubeyli and Kazaza, 2015; Paraskevas, 2006; Mitroff and Alpaslan, 2003). The complexity and multifaceted nature of organisational resilience have been clearly shown by Linnenluecke and Griffiths (2010). Learning is a fundamental and integral component of organisational resilience (Boin and van Eeten, 2013). A more profound comprehension of the insights of industries would facilitate the application of “resilience and organizational” learning in chaotic conditions, as well as the realization of crisis management strategies (Altinay & Arici, 2021; Ghaderi et al., 2022; Postavaru et al., 2021). Four categories of organizational resilience techniques were established by Hillmann and Guenther (2021): "organizational change capacity, organizational flexibility, organizational buffering, and organizational adaptive ability."

Himachal Pradesh, a northern Indian state, is a leading cluster in the pharmaceutical industry, with a highly trained labor force and supportive working conditions, contributing significantly to the economy and society (IBEF,2015). Himachal Pradesh's pharmaceutical industry faces regulatory challenges, health crises, and supply chain limitations. Organisational resilience is crucial in managing these crises, as it helps organizations navigate strategic risks and effectively manage crises. Responding to “natural disasters, cyberattacks, epidemics, and emergencies” can determine an organization's capacity to overcome obstacles and uphold its reputation (Wut et al., 2021). The foundations of organisational resilience include “anticipation, improvisation, business model innovation, networking, and anticipation” (Zott and Amit 2010; Rerup 2001; Jung 2017).

Pharmaceutical businesses face unprecedented uncertainty due to “severe pandemics, natural disasters, and global terrorism”. These challenges necessitate swift, adaptable reactions, decision-making, and resilience, requiring organizations to “adapt, withstand setbacks, and remain resilient” amidst these challenges. COVID-19 has impacted the pharma organization significantly, emphasizing a firm “structure, flexibility, and resilience” in promoting survival. Previous research has concentrated on analyzing organizational and crisis management separately for diverse industries. Additionally, few studies mix organizational management with crisis management, particularly in the pharmaceutical industry. No prior studies have analysed the interrelationship between “crisis management and organisational resilience” in the Himachal Pradesh pharmaceutical industry.

2. Review of Literature

2.1 Organisational Resilience

Over the past few years, the concept of resilience in theory and practice has constantly fluctuated. Organizational resilience procedures aim to improve the understanding of the situation, reduce the organization's susceptibility to some situations, such as systemic risk, and regain effectiveness upon disruption (Bhamra et al., 2011; Yang et al., 2021). An organization must be able to cope with an unpredictable and disruptive event to be called resilient (Williams et al., 2017; Hall et al., 2011). There are several ways the literature defines the term organizational resilience (Hillmann & Guenther, 2020). The stability of an organization in dealing with disruption is anchored on the organization's approach to “crisis management”, which focuses on “prevention, assessment, reaction, and rehabilitation” (Evans & Elphick, 2005). Crisis management is, therefore, a cross-functional activity cutting across all aspects of an organization's operations and is central to strategic management (Gundel, 2005). Academic studies on healthcare system resilience primarily focus on acute shocks, while chronic shocks, lasting longer, pose unique challenges to the system's resilience (Barasa et al., 2018).

These match the resilience-related elements discovered by Ponomarov and Holcomb (2009). These make up the elements of "readiness and preparedness," "adaptation and response," and "recovery or adjustment." According to Hillmann and Guenther (2020), the capability-based approach to organisational resilience posits that a company's capacity to weather a crisis is mainly based on its acquired competencies. Hall et al. (2011) defined the “organisational resilience” as - "a set of procedures within an organization that allows it to react to circumstances effectively." According to Williams et al. (2017), businesses' resilience and established protocols allow them to perform better during times of crisis. At the organisational level, resilience capabilities must be multifaceted (Hillmann & Guenther, 2020). Organizational resilience capability is defined by Hall and Beck (2005) and Hall et al. (2011) as a distinct combination of behavioral, environmental, and cognitive components that work together to create resilience in times of crisis. These components become organisational resilience skills when turned into actions during a crisis. Understanding what businesses do and which companies do better than others amid crises brought on by unforeseen and disruptive occurrences is made more accessible by the capability-based approach to organisational resilience (Duchek, 2020).

Braes and Brooks (2011) discussed how an organization can build resilience. McManus et al. (2008) defined the characteristics of organizational resilience as “situational awareness, keystone vulnerability management, and adaptive ability.” Negativity is inevitable; thus, an organization needs resilience to achieve its “strategic direction, growth, and existence”. According to the literature, the capacity to adapt is the most significant determinant of an organization's longevity (Dogrusoz et al., 2022; Seville et al., 2008). Organizations encounter threats and uncertainties in the “economic, social, and natural environment”, which pushes them into competition and manage risks (Lampel et al., 2014; Hall et al., 2011). Meyers & Holusha (2018) pointed out that change could happen faster during a crisis. When an organization can mobilize and coordinate core applications and processes with its people's support, it can develop resistance and manage change and crisis effectively, as found by Lengnick et al. (2011) and Shin et al. (2012).

2.2 Crisis Management

An organizational crisis is "an occurrence that managers and stakeholders find particularly noteworthy, surprising, and possibly disruptive" (Bundy et al., 2016). A crisis can bring uncertainty and disruption and jeopardize an organization's long-term viability and survival (James et al., 2011). A crisis management system comprises policies, procedures, actions for assessment, prevention, containment, and response to risks and emergencies. The aim is to reduce impact and foster fast recovery (Frandsen and Johansen, 2017). Researchers have been looking into how companies may reduce the effects of a crisis like this and recover from it (Bundy & Pfarrer, 2015; Kahn et al., 2013). To deal with adversity, organizations employ internal mechanisms, including organizational reactions, relational and technical systems coordination, and external initiatives to coordinate social connections among organizations (Bundy & Pfarrer, 2015). Leaders who perceive crisis circumstances as opportunities and react swiftly to them can significantly impact the resolution of such events (James et al., 2011; Brockner & James, 2008). According to Brockner and James (2008), leaders who possess learning-oriented, promotion- or prevention-focused mindsets and feel that opportunities may be achieved are more likely to recognize them during times of crisis. When faced with uncertain and perilous crises, leaders generally rely on the implicit knowledge gained from experience when making decisions (Sayegh et al., 2004). This type of tacit knowledge is directly related to the intuition of leaders (Sayegh et al., 2004). Patton (2003) highlighted the intuition that decision-makers have developed through training and experience, which helps them to react quickly in emergencies. Regarding a leader's communication abilities, managers who consistently create internal communication channels and show staff compassion in times of crisis can significantly improve organizational performance (Frandsen & Johansen, 2011; Mazzei et al., 2012).

Contemporary enterprises are continuously experiencing crises, proving the importance of effectively managing crises for developing strategies to reduce losses and adjusting the current processes when an environmental disaster occurs (Salamzadeh et al., 2023). It's unclear precisely what organizational skills a company has developed and which ones its management might need to assist and coordinate for the recovery (Duchek, 2020; Conz & Magnani, 2019; Williams et al., 2017; Linnenluecke, 2017; Bundy & Pfarrer, 2015; Vegt et al., 2015). Recovering from a crisis depends on leaders' evaluations and modifications regarding supporting organizational capacities created and intricately woven into processes, practices, and systems (Schulman, 2004). It is a given fact that every crisis is different and calls for another plan and standards. It could be established that many disasters have similar intervention and preparation features that could be used to develop crisis management plans. According to Gregory (2005), a crisis is a dynamic situation with little opportunity, uncertainty, and time. According to Prewitt et al. (2011), a crisis is a set of events with far-reaching consequences, limited choices, time factors, and few options. In addition, developing and establishing a universally applicable concept for crisis management is challenging because there are practically unlimited possible crises (Penrose, 2000).

Crisis management aims to avoid or reduce the magnitude of a negative outcome concerning the business, the sector, and its associates (Coombs, 2012). Crisis management is a systematically planned and organized proactive process with pre-, post-, and during-crisis phases intended to prevent or reduce the damage done to an organization and its stakeholders (Coombs, 2010; Simola, 2014). Thus, if a business recognizes the signs of a crisis, it can avoid catastrophes and learn to continue to exist with the lowest possible levels of loss (Ma & Zhang, 2022; Sahin et al., 2015). Fleming (2021), Sahin et al. (2015), and Mitroff & Pearson (1993) observed that the some of the many activities in crisis management include: "forecasting, safeguarding and becoming ready, identification and management of property, healing, and education." Self-generated information based on Hazaa et al. (2021), Barasa et al. (2018), and Teixeira & Werther (2013) reveal that "information technology, planning, social media, knowledge, leadership, and governance" are some of the elements that affect the crisis management.

The healthcare system must be assessed in light of the potential dangers connected with threat expansion when confronted with a unique circumstance or threat (Marome & Shaw, 2021). To determine how the associated risk impacts the healthcare system, all data are benchmarked against the system performance KPIs. Therefore, the evidence collected during the investigation defines the criticality of the hazard. The system permits some resilience management procedures even if it identifies no criticality (Lauriola et al., 2021; Hunte et al., 2020; Ager et al., 2015). Decision-makers in the healthcare systems have a lot of work, which they can only perform by referring to past results and understanding that each business has its own needs and peculiarities. Because every system has different goals, constraints, known risks, regional issues, and governing conventions, customized solutions are required to manage crises in each system. Decision-makers with the necessary authority must highlight and prioritise distinctive attributes to adapt and respond to changing conditions (Hunte et al., 2020; Therrien et al., 2017).

2.3 Research Gaps

As identified by Khan et al. (2019), there are still questions concerning the sources of resilience. The literature on resilience and crisis management has not been synthesized properly (Williams et al., 2017). In particular, research is scarce, especially when building and understanding business resilience (Martín, 2018). The models and frameworks used currently to address crisis management have a very narrow perspective when defining crises and do not consider that crises can have multiple dimensions (Buhagiar & Anand, 2023). Liu et al. (2021) pointed out that limited literature focuses on organizational resilience factors. Crisis management research has not reached a point where it can provide academics with a precise determination of crucial results of the literature, identification of the remaining gaps, and determination of the right course of action because the literature is still fragmented in terms of crisis antecedents, outcomes, and management (Bundy et al., 2017).

3 Objectives

- To examine gender-based differences for organisational resilience.
- To measure age's impact on organizational resilience.
- To assess the relationship between work experience levels and organisational resilience.
- To examine the significance of the phenomenon of marital status in the formation of organisational resilience.
- To investigate the relationship between educational qualifications and organisational resilience.

4 Methodology

Primary data from employees working in the six pharmaceutical industries were collected, and they were chosen randomly from the list of sectors in Himachal Pradesh. The structured questionnaire is used online and offline to collect the data from employees of 6 industries with the help of convenience sampling. The secondary data is used to frame the questionnaire. The study sample size of 500 was taken, and 483 valid responses were received. ANOVA on SPSS 27 software was used to fulfill the objective and to test the null hypothesis. A 5-point Linkert scale was deployed in this research to measure organizational resilience.

5 Results and Discussions

5.3 Organisational Resilience and Gender

To check the impact of gender on organisational resilience, the following null hypothesis was framed:

H_0: There is no significant difference in organisational resilience amongst respondents of different genders.

Table 1 reveals the descriptive related to gender. The results state that for male respondents, M = 3.3977 and SD = .88328; for female respondents, M = 3.3523 and SD = .84315; whereas for other respondents, M = 3.000 and SD = .0000.

Table 1, Descriptive related to different genders of respondents

	N	Mean	Std. Deviation	Std. Error
Male	248	3.3977	.88328	.06620
Female	168	3.3523	.84315	.08268
Others	67	3.0000	.00000	.00000
Total	483	3.3783	.86498	.05133

ANOVA was applied to study the difference in organisational resilience amongst respondents concerning the different genders of the respondents. Computed values of ANOVA state that for organisational resilience F = .282 and the degree of freedom = 482, the significance value is .755, which is >.05 (illustrated in Table 2). Hence, it can be concluded that the variance among respondents of different genders is insignificant for "organisational resilience".

Table 2, Results of ANOVA for Organizational Resilience across different genders

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.423	2	.212	.282	.755
Within Groups	211.317	480	.752		
Total	211.740	482			

5.4Organisational Resilience and Age

To check the impact of gender on organisational resilience, the following null hypothesis was framed:

H0: There is no significant difference in organisational resilience amongst respondents of different age categories.

Table 3 presents the descriptive related to respondents of different "age categories". The results indicate that for respondents who are in the age category between 18-25 years, M = 3.4009 and SD = .89661; for respondents of age category 26-35 years, M = 3.1539 and SD = .94063, whereas for respondents who are in the age group of 36-45 years of age M =

3.4078 and SD = .79098; for respondents belonging to the age category of 46 – 55 years M = 3.8682 and SD = .56038 and those are who are more than 55 years of age M = 3.8737 and SD = .23493.

Table 3: Descriptives related to different age categories of respondents

	N	Mean	Std. Deviation	Std. Error
18-25 years	95	3.4009	.89661	.11121
26-35 years	136	3.1539	.94063	.09136
36-45 years	102	3.4078	.79098	.09322
46 – 55 years	52	3.8682	.56038	.11947
Above 55 years	49	3.8737	.23493	.05390
Total	483	3.3783	.86498	.05133

Table 4 presents the results of the ANOVA test, which was used to compare the range of organizational resilience across the age differences of the respondents. These include the null hypothesis, which posits that all data collected from different groups are derived from populations with equal means and is tested by the p-value. Computed values indicate that for organisational resilience F = 5.462 and the degree of freedom = 482, the significance value is 0.000, which is <.05. Hence, the variance among respondents of different age groups is significant for organisational resilience.

Table 4, Results of ANOVA for organisational resilience across different age categories

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.377	4	3.844	5.462	.000
Within Groups	196.363	478	.704		
Total	211.740	482			

5.5 Organisational Resilience and Work Experience

To check the impact of work experience on organisational resilience, the following null hypothesis was framed:

H0: There is no significant difference in organisational resilience amongst the respondents with a level of working experience.

Descriptive values in Table 5 present those respondents with less than one year of experience M = 3.3115 and SD = .88770; for respondents who have 1-5 years of experience, M = 3.2009 and SD = .93331; for respondents having experience of 5 -10 years M = 3.4804 and SD = .86300; whereas for respondents who have more than ten years of experience M = 4.3700 and SD = .88525.

Table 5, Descriptive related to the experience of respondents

	N	Mean	Std. Deviation	Std. Error
Less than one year	56	3.3115	.88770	.08464
1-5 years	165	3.2009	.93331	.12255
5-10 years	114	3.4804	.86300	.08949
Ten years and above	148	4.3700	.88525	.13256
Total	483	3.3510	.89301	.05517

As per the results of ANOVA for organisational resilience F = 1.717 and the degree of freedom = 482, the significance value is .164, which is >.05, illustrated in Table 6. Hence, the variance among respondents with different working experiences is insignificant for organisational resilience.

Table 6, Results of ANOVA

ANOVA					
OR Mean					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	4.075	4	1.358	1.717	.164
Within Groups	204.062	478	.791		
Total	208.137	482			

5.6 Organisational Resilience and Marital Status

To check the impact of work experience on organisational resilience, the following null hypothesis was framed:

H0: There is no significant difference in organisational resilience amongst respondents with different marital statuses.

Descriptive statistics in Table 7 present that the mean value for married respondents is 3.4662; for unmarried respondents, M = 3.2041; and for divorced respondents, M = 3.6733. The standard deviation for married respondents is 0.80956, for unmarried respondents is 0.94350, and for divorced respondents, the standard deviation is .73178. Hence, as per the results, the organisational resilience of respondents with different marital statuses is almost similar.

Table 7, Descriptive related to marital status of respondents

	N	**Mean**	**Std. Deviation**	**Std. Error**
Married	178	3.4662	.80956	.06068
Unmarried	100	3.2041	.94350	.09435
Divorced	6	3.6733	.73148	.29863
Total	284	3.3783	.86498	.05133

The results of the ANOVA that was conducted to test the hypothesis that there is a difference in investment decisions among respondents with different marital statuses are presented in Table 8. The null hypothesis, which means all groups are equal, is tested by a p-value that reflects the probability of data coming from populations with equal means. Computed values indicate that for investment decision F = 3.350 and the degree of freedom = 482, the significance value is 0.036, which is <.05. Hence, it can be stated that the variance among respondents of different marital statuses is significant for organizational resilience.

Table 8, Results of ANOVA for organisational resilience across different marital status

ANOVA					
OR_Mean					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	4.931	2	2.466	3.350	.036
Within Groups	206.809	480	.736		
Total	211.740	482			

5.7 Organisational Resilience and Educational Qualification

To check the impact of work experience on organisational resilience, the following null hypothesis was framed:

H0: There is no significant difference in organisational resilience among respondents with different educational qualifications.

Table 9 presents the descriptive related to respondents with different educational qualifications. It indicates that for respondents who have intermediate qualifications, M = 3.4644 and SD = .67720; for respondents who have graduated, M = 3.4398 and SD = .84244; for postgraduate respondents, M = 3.1905 and SD = .96625; whereas for respondents who have doctorate M = 3.7275 and SD = 1.05351.

Table 9, Descriptive related to respondents with different educational qualifications

	N	Mean	Std. Deviation	Std. Error
Intermediate	79	3.4644	.67720	.10844
Graduate	198	3.4398	.84244	.06660
Post Graduate	121	3.1905	.96625	.10803
Ph.D.	44	3.7275	1.05351	.52676
Others	41	3.8000	1.02121	.62532
Total	483	3.3783	.86498	.05133

Table 10 below shows the results of an ANOVA used to compare the respondents in terms of their educational backgrounds to identify their level of organizational resilience. The null hypothesis, having it that all the given data belong to populations that share equal means, is tested by the p-value. Computed values indicate that for organisational resilience F = 1.474 and the degree of freedom = 482, the significance value is 0.210, which is >.05. Hence, the variance among respondents with different educational qualifications is insignificant for organisational resilience.

Table 10, Results of ANOVA for organisational resilience across respondents with different educational qualifications

ANOVA					
OR_Mean					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.381	3	1.095	1.474	.210
Within Groups	207.359	479	.743		
Total	211.740	482			

6 Discussion

This research aimed to establish how organisational resilience is associated with specific demographic variables, such as "gender, age, work experience, marital status, and level of education". The study provides essential implications concerning how these factors may affect organizational resilience in the workforce. The study further showed no statistically significant difference in organizational resilience based on gender (F = 0. 282, p = 0. 755). This implies that gender might not be a factor that should disqualify anyone from contributing to organisational resilience. Organizations may benefit more from other measures that can be implemented to improve resilience rather than gender objectives.

There was a difference in the perceived organizational resilience based on age (F = 5. 462, p = 0. 000). However, the current study revealed that the older employees with age 55 years and above had the highest mean resilience scores (M = 3. 8737, SD = 0. 23493), while the younger employees of 26-35 years had the lowest mean resilience scores (M = 3. 1539, SD = 0. 94063). This research implies that age and experience may positively impact organizational resilience. It can be helpful to look at the strengths of older employees as it relates to mentoring the organization and positions that demand flexibility and the ability to cope with pressure. While there was no significant relationship between the number of years in the workplace and resilience (F = 1. 717, p = 0. 164), there was a slight tendency towards improving resilience with the increase in the number of years in the workplace. Out of all the variables, the experience of more than ten years in employment showed the highest mean resilience of 4. 3700 with a standard deviation of 0. 88525. Although this trend is not very conclusive, it points to the fact that having long-term employees can be of significant value regarding organizational robustness.

Based on marital status, the study established a high level of variation in organizational resilience (F = 3. 350, p = 0. 036). In this study, the divorced respondents had the highest mean resilience score (M= 3. 6733, SD= 0. 73148), followed by the married and the unmarried respondents. Such a study direction suggests that aspects of personal life experiences may play a role in moderating workplace resilience. There was no evidence of a difference in organizational resilience by education level, F = 1. 474, p = 0. 210. Nevertheless, the results of the descriptive statistics indicated some changes, where the highest mean resilience was recorded for the Ph. D. holders (M = 3. 7275, SD = 1. 05351). This indicates that although one may receive some form of education, this may be formal education, which may not necessarily indicate resilience.

7 Conclusion

The research aimed to assess the factors influencing organisational resilience within the pharmaceutical industry in Himachal Pradesh. Valuable insights were gained through collecting and analyzing primary data from employees across six randomly selected pharmaceutical companies, along with supplementary secondary data. The study, conducted using ANOVA on SPSS 27 software, revealed several key findings. Firstly, it was found that gender did not significantly influence organisational resilience among the respondents. However, age groups emerged as a significant factor, indicating that different age cohorts may perceive and respond to organisational challenges differently, thus affecting resilience levels. On the other hand, the working experience was not found to significantly impact organizational resilience, suggesting that resilience might not necessarily correlate with tenure in the industry.

Marital status emerged as a significant factor affecting organisational resilience, implying that personal life circumstances could affect how individuals contribute to organisational resilience. Interestingly, educational qualifications were found to have an insignificant effect on organizational resilience, suggesting that the level of education attained may not directly impact an individual's resilience within the organizational context. These findings underscore the multifaceted nature of organisational resilience, influenced by various demographic factors. By understanding these influences, pharmaceutical companies in Himachal Pradesh can better tailor their strategies to enhance resilience and navigate challenges effectively in an ever-changing industry landscape.

Further research could investigate how these demographic factors interact with organisational resilience, enabling more targeted interventions and strategies for sustainable organisational success. Research on organizational resilience in the pharmaceutical industry of Himachal Pradesh could help develop targeted interventions and approaches for sustainable success. Longitudinal studies could track resilience evolution, particularly in response to specific crises. Comparative analyses across different industries could identify sector-specific factors influencing resilience. Qualitative methods like "interviews or focus groups" could provide deeper insights. Examining organizational culture, leadership styles, and technology adoption could also offer practical implications. Developing comprehensive resilience metrics tailored to the industry and exploring stakeholder perspectives could provide a holistic understanding of organizational resilience.

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The Role of Management Information Systems in Telecommunication Companies: A Comparative Analysis Between India and Iraq

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Abstract

Purpose of the Study: In order to better understand the function of MIS in the Indian and Iraqi telecommunications industries, this research will compare and contrast the two countries. It takes a look at these two economically and socially distinct nations to see how MIS helps with things like digital transformation, customer management, and operational efficiency.

Research Methodology: With 200 participants distributed equally between Iraq and India, a mixed-method approach was used, integrating in-depth interviews with a standardised questionnaire. Factor analysis and demographic profiling were used to examine the collected data in order to shed light on the relative functions of MIS.

Findings: Improved decision-making, operational efficiency, and CRM are all outcomes of MIS in India, thanks to cutting-edge tech like AI and ML. At the same time, MIS is vital to the rehabilitation of Iraqi infrastructure and the distribution of resources. Iraq is concentrating on cutting costs and expanding their network, while India is concentrating on gaining a competitive edge, according to the report.

Social Implications: MIS improves digital access, particularly in underserved areas, thus bridging the digital divide. In India, it promotes economic growth and social inclusion, while in Iraq, it supports public administration and the reconstruction of communication infrastructure.

Novelty: The study contributes to the understanding of how socio-economic contexts influence the implementation and impact of MIS in different regions.

Keywords: Management Information Systems (MIS), Telecommunication Sector, Operational efficiency, Digital Transformation, Network Infrastructure

1. Introduction

Communication, data transfer, and internet access are made possible in today's digitally transformed world by the telecommunications industry. Adopting new technology, such as MIS (Management Information Systems), becomes more crucial as this business evolves. The overarching goal of management information systems (MIS) is to improve analysis, control, decision-making, and coordination across different levels of an organisation by centralising and processing and disseminating relevant data. Operations, customer relationship management, resource allocation, and financial monitoring may all be more efficiently overseen with the use of a Management Information System in a telecoms company. India and Iraq are two countries with very different socioeconomic situations and levels of technical development; this research compares and contrasts their telecoms sectors' adoption of Management Information Systems.

1.1 Background of MIS in Telecommunications:

Data is essential to the telecom sector. Companies in the telecommunications industry produce vast amounts of data

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that must be efficiently managed. This data includes information on customers, billing, network operations, marketing, and the monitoring of service performance in real-time (Neogy, 2015). Telecommunications companies may improve their performance and service delivery with the help of Management Information Systems (MIS), which are designed to handle complex data environments. The widespread use of mobile phones and the increasing availability of affordable internet services have driven the telecommunications industry in India to rapid growth. The Iraqi telecom industry, on the other hand, is rebuilding after years of fighting and is putting its energy into updating its infrastructure and information systems to keep up with the growing demand for connection. That is according to Demir (2019a). For such companies, MIS is of the utmost importance. With the help of management information systems (MIS), businesses are able to optimise their day-to-day operations and get strategic insights that might influence their decisions in the future. Implementing these technologies is crucial for financial planning, supply chain management, and customer relationship management (CRM). By facilitating faster decision-making and enhancing operational efficiency, Management Information Systems (MIS) provide a competitive advantage in the very competitive Indian telecom industry(Aydin & Özer, 2005; Riyadh et al., 2021).

1.2 The Role of MIS in Indian Telecommunication Companies:

With a rapidly expanding population of internet users and millions of customers, India's telecom industry is one of the biggest in the world. Given the vast operations and the need to manage considerable numbers of client data, billing records, and network infrastructure, Management Information Systems play an essential role in this industry. Management information systems are used by Indian telecom companies to monitor customer service platforms, simplify network operations, and increase data analytics competency. These companies include BhartiAirtel, Reliance Jio, and Vodafone Idea(Kim et al., 2004).Particularly in outlying areas where infrastructure is still being built, these technologies make it possible to continuously monitor network performance, which is crucial for keeping connection unbroken. When it comes to management information systems (MIS), customer relationship management (CRM) stands out in India's telecom industry. By combining CRM with MIS, businesses may better manage their contacts with current and potential consumers, streamline operations, and increase profits. To proactively gauge customer satisfaction and resolve service-related issues, BhartiAirtel, for instance, uses advanced CRM systems. In addition, predictive analytics relies heavily on MIS, which helps businesses anticipate their customers' wants and requirements, which in turn allows for better tailored service and lowers customer turnover (AZEEZ, 2020).

Establishing extensive information systems to guarantee adherence to compliance, reporting, and auditing standards is mandated by the regulatory framework in India, which is supervised by the Telecom Regulatory Authority of India (TRAI). By standardising reporting processes and checking data for correctness before submitting it to government agencies, the Management Information System (MIS) makes businesses easier to comply with regulatory requirements (Mundy & Owen, 2013).

1.3 The Role of MIS in Iraqi Telecommunication Companies:

As a result of the country's unique social and political climate, Iraq's telecom sector faces unique obstacles. The country's infrastructure, especially its communication networks, has taken a major hit throughout the protracted war. The modernisation of operations and the improvement of service delivery have been greatly facilitated by Management Information Systems throughout the sector's rehabilitation phase(Falih & Al, 2022). Iraqi telecommunications providers including Zain Iraq, Asiacell, and Korek Telecom have poured a lot of money into MIS to streamline operations, keep tabs on client data, and make the most of available resources. One of the primary functions of MIS in Iraqi telecom businesses is network management. Management Information Systems are crucial for these businesses as they attempt to rebuild their telecommunications infrastructure and include new technologies like 4G and fibre optic networks. In order to keep service disruptions to a minimum, the Management Information System (MIS) makes it easier to monitor network performance, pinpoint when repair is required, and better allocate resources(Kumar et al., 2024; Nur Pratama et al., 2023)In areas where communication infrastructure is lacking, the integration of MIS into customer service has proved crucial in raising service standards. The importance of Management Information Systems has been brought to light by the progress made by the Iraqi government in e-government programs and the increasing use of mobile services for public administration. Telecommunications providers can meet the growing demand for digital services with the help of these technologies, which make it easier to handle massive amounts of data generated by public and private sector exchanges(Pankaj et al., 2023; Zahid et al., 2019).

Management Information Systems (MIS) are crucial in the telecommunications industries of both Iraq and India, but the two countries' methods vary because of their unique operating environments. Staying competitive in a crowded market, optimising customer service, and managing large-scale operations are the main focusses in India. Telecom firms in India use cutting-edge MIS technologies, such as AI and ML, to automate decision-making and improve predictive analytics(Du & Chen, 2018; Lai, 2004).

MIS is helping the Iraqi government's attempts to increase internet access, particularly in rural areas, and improving operational efficiency in the country's telecommunications sector, which is now rebuilding its infrastructure. But there are obstacles that Iraqi telecom businesses must overcome, such as a lack of capital, an absence of qualified IT workers, and the need to continually upgrade their equipment((Nigam et al., 2012; MIGRATION, 2019).Despite these hurdles, MIS is crucial in improving customer service and network coverage, positioning it as a critical driver of Iraq's digital transformation and economic growth(Ali Wehaib, 2023).

The telecoms industries of Iraq and India both rely heavily on management information systems (MIS), but to different degrees. Management information systems in India help with a lot of things, such improving customer service, running more processes, and using data analytics to stay ahead of the competition. When it comes to e-government efforts, network management, and infrastructure rehabilitation in Iraq, Management Information Systems are crucial. Management Information Systems are beneficial in both countries, regardless of their socioeconomic situations, and they play an essential role in regulating complex data-centric operations.

2 Review of Literature

Management Information Systems (MIS) are essential for enhancing operational efficiency, enabling data analytics, and improving customer service in telecommunication companies across the globe(Madani et al., 2024). Countries such as India and Iraq, each with unique socio-economic contexts, utilize Management Information Systems to tackle challenges within their telecommunication sectors(Kumar et al., 2023; Riyadh et al., 2021) However, they do so in different manners. India, characterized by its advanced telecommunication infrastructure, employs Management Information Systems to sustain a competitive edge in a crowded marketplace. Conversely, with its telecommunication sector in the reconstruction process, Iraq depends on Management Information Systems to enhance network coverage and ensure operational reliability(Bilal, 2024). This literature review integrates research concerning the roles and impacts of Management Information Systems in these two nations, providing a comparative analysis of their implementations.

2. 1 Role of MIS in Indian Telecommunication Companies

Due to its enormous size and rapid technical advancement, India's telecom sector stands out as one of the world's most active. The significance of Management Information Systems in India is paramount for managing extensive operational data, enhancing customer service, and enabling companies to sustain their competitive edge in a crowded marketplace(Demir, 2019b; Turban et al., 2008).Cline & Guynes, (2001) indicates that India's swift embrace of Information Technology (IT), particularly Management Information Systems (MIS), has greatly enhanced the nation's telecom firms' capabilities, enabling advanced data analysis and optimized decision-making processes. For better predictive analytics and more efficient decision-making, Indian telecom businesses have used advanced management information system technologies like machine learning and artificial intelligence. As a result, businesses have been able to gain an edge in the market by improving operational efficiency and providing more personalised customer care(Ali et al., 2023; Kumar et al., 2023; Pankaj et al., 2023).Dhupar, (2023), major Indian telecommunications companies such as Bharti Airtel and Reliance Jio are implementing AI-driven chatbots and automated systems for customer support, leading to decreased costs and enhanced customer satisfaction.

The implementation of Management Information Systems has further empowered Indian telecommunication companies to manage the substantial volumes of data produced by millions of customers. Advanced data analytics tools integrated into MIS systems enable organizations to derive insights for informed business decisions by analyzing customer behaviour and market trends(Hosen et al., 2024). Data-driven methodologies have demonstrated their significance in effectively managing customer retention and acquisition.

2.2 Role of MIS in Iraqi Telecommunication Companies

In contrast to India, Iraq's telecommunication sector remains in a developmental stage, with Management Information Systems employed to reconstruct and modernize the industry. Iraqi telecommunication companies encounter distinct challenges, such as constrained financial resources, continuous infrastructure development, and a shortage of qualified IT professionals(Abd et al., 2019).However, MIS is significantly contributing to the enhancement of operational efficiency and the extension of network services in areas that are currently underserved. The primary emphasis of MIS within Iraq's telecommunications sector is on ensuring operational efficiency and reliability, particularly when facing infrastructure challenges(Reyath & Kamarul, 2019). Management Information Systems assist communication companies in optimizing their internal operations, minimizing operational expenses, and guaranteeing the consistent reliability of network services, even in the face of persistent infrastructural challenges. Shwedeh et al., (2023) observes that MIS has played a vital role in expanding telecom networks into rural regions, aiding government initiatives such as the National Telecommunications Commission's endeavour to enhance internet accessibility nationwide. The Management Information Systems in Iraq significantly contribute to government-led initiatives to modernize the nation's telecommunication infrastructure. Through the facilitation of effective resource allocation and project management, MIS plays a crucial role in guaranteeing the success of initiatives focused on expanding broadband and mobile network services(Sharify & Al-Dallal, 2022).E-government initiatives, crucial to Iraq's digital transformation, heavily rely on a robust Management Information System to underpin the nation's digital infrastructure(Samuel, 2013).

2.3 MIS Implementation in India and Iraq

A significant distinction in the implementation of Management Information Systems between India and Iraq is the scale involved. India is recognized as a telecommunications hub and utilizes management information systems to effectively oversee extensive operations and a substantial customer base. Conversely, Iraq's emphasis is more concentrated, seeking to enhance operational efficiency and network reliability within a sector that continues to expand (Celiku, 2018).India's telecommunication industry is leading the way in integrating advanced technologies such as AI, ML, and Big Data analytics within their MIS frameworks. This has enabled Indian companies to enhance and tailor customer services (Kumar et al., 2023, 2024; Mach-Król & Hadasik, 2023; Pankaj et al., 2023).Conversely, Iraq is engaged in developing its fundamental infrastructure, with the main aim of Management Information Systems being to enhance the reliability and reach of network services, particularly in underserved areas(Mariam Zahedi, 1997). India confronts challenges related to sustaining competitiveness in a saturated market. Iraq's telecom sector grapples with more fundamental issues, including constrained financial resources and a shortage of skilled IT professionals (Jan et al., 2005). The identified limitations significantly influence the degree to which sophisticated MIS technologies may be implemented within Iraq's telecommunications sector.

A notable distinction lies in the government's involvement in fostering the adoption of Management Information Systems (MIS). The government in Iraq actively facilitates the expansion of telecommunications, especially in rural regions. Conversely, the private sector in India demonstrates a greater degree of autonomy, as companies independently implement advanced Management Information Systems to enhance business performance (Ranganathan & Kannabiran, 2004).

There are clear benefits for both Iraq and India when MIS is integrated into their respective telecommunications sectors. According to Mata et al. (1995), Management Information Systems are vital for India to maintain its competitiveness in the global marketplace, promote economic growth, and enable the delivery of digital services to a large population. When it comes to digital transformation—crucial for rebuilding Iraq's economy and infrastructure—Management Information Systems are indispensable in the country.East et al., (2014)emphasizes that as Iraq advances in modernizing its telecommunications sector, the significance of Management Information Systems will increasingly be vital in fostering the nation's sustained economic growth. Regardless of the variations in execution, both India and Iraq exemplify the fundamental significance of Management Information Systems within the telecommunications sector. India employs Management Information Systems to oversee extensive operations, enhance customer service, and sustain its competitive edge(Bloom et al., 2013). In contrast, Iraq concentrates on utilizing these systems to reconstruct its infrastructure and broaden network accessibility in areas that lack service. The function of MIS in both nations underscores its capacity for flexibility and adaptability in meeting the distinct requirements of varied socio-economic environments. As both nations progress, Management Information Systems will continue to serve as a fundamental element of their telecommunications sectors, enhancing operational efficiency, customer satisfaction, and economic growth.

3 Research Methodology

The research utilizes a systematic data-gathering approach to obtain the required data for analysis. Primary data is acquired through interviews with the target group to extract comprehensive insights from participants. The interviews constitute the basis of the primary data collection, ensuring the collection of comprehensive and pertinent information. Subsequently, the data is methodically collated and structured utilizing a standardized questionnaire, as Beef (1999) advised, to guarantee uniformity and dependability in all responses.

The empirical data included responses from 200 individuals, evenly divided into 100 participants from India and 100 from Iraq. The data is examined to evaluate the research objectives, providing significant insights into the comparison analysis. Utilizing this empirical data is essential for assessing the outcomes and ensuring the results are accurate and consistent with the study's objectives. The research achieves a more comprehensive grasp of the issue by integrating qualitative insights from interviews with quantitative data from the standardized questionnaire. This systematic and organized technique ensures the results are valid and reliable and can substantiate the overarching study conclusions with precision and depth.

Table 1 presents demographic and employment data from a combined sample of 200 individuals, equally divided between India and Iraq. Males dominate the sample at 86.5%, while females represent only 13.5%. Most participants are aged between 30-35 (34.5%) and 35-40 (31.5%), with only 6.5% being over 45. Regarding education, 44% hold a master's degree, with a slightly higher percentage in India (48%) than in Iraq (40%). Job roles are reasonably balanced, with 47% in managerial positions and 53% in non-managerial roles. Experience levels show that 36.5% have 6-10 years of experience, followed by 30% with 0-5 and 11-15 years of experience, while only 3.5% have over 15 years. Employment status indicates that 57% hold permanent positions, and 43% are temporary. The data highlights a male-dominated, middle-aged workforce with significant experience, largely holding permanent employment and a relatively balanced distribution of managerial roles between the two countries.

Table 1: Demographic profile of respondents

S. No.	Items	India	Iraq	Total (India+Iraq)	
		Number	Number	Number	Percentage (%)
	Gender				
1	Male	84	89	173	86.5
2	Female	16	11	27	13.5
	Age group				
3	25-30	21	17	38	19
4	30-35	33	36	69	34.5
5	35-40	30	33	63	31.5
6	40-45	9	8	17	8.5
7	More than 45	7	6	13	6.5
	Total	100	100	200	100
	Education (Having Master's degree)				
8	Yes	48	40	88	44
9	No	52	60	112	56
	Designation				
10	Managerial	49	45	94	47
11	Non-Managerial	51	55	106	53
	Experience				
12	0-5 Yrs	31	29	60	30
13	6-10 Yrs	37	36	73	36.5
14	11-15 Yrs	28	32	60	30
15	More than 15	4	3	7	3.5
	Type of Employment				
16	Permanent	59	55	114	57
15	Temporary	41	45	86	43

Source: *Authors' Development*

Table 2: KMO measure of sampling adequacy

KMO and Bartlett's Test		Job Satisfaction among Employees
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.947
Bartlett's Test of Sphericity	Approx. Chi-Square	5004.279
	df	300
	Sig.	.000

Source: *Primary Survey, Significance level: *p≤0.05, **p≤0.005*

Table 3: Factors Analysis for INDIA Sample

Rotated Component Matrix* (INDIA)					
		Component			
Factors	**Variables**	**F-1**	**F-2**	**F-3**	**F-4**
Efficiency & Decision-Making Support	Does the MIS aid in the efficient and timely making of decisions?	0.72			
	Can the MIS system aid in making prompt judgements that lead to market dominance?	0.675			
	Is the company making sure that all departments can quickly access company data via MIS?	0.652			
	When it comes to auditing, is MIS useful?	0.576			
	Does MIS still work to boost turnover compared to last year?	0.545			
	Can the MIS system adapt quickly enough to the changing business climate?	0.498			
	Has the use of MIS helped employees hone their analytical abilities?	0.4			
	Is it feasible for MIS to effectively deploy the telecom industry application over a big population?	0.638			
Cost Reduction & Resource Optimization	Is there a correlation between MIS and a drop in operating costs?		0.847		
	Is HR spending cut down by the MIS?		0.815		
	How effective is the MIS in reducing material waste?		0.782		
	Is it accurate to say that MIS makes it easier to reach the customer?		0.570		
Innovation & Product Improvement	Is MIS useful for the company's ongoing development and innovation?			0.825	
	Is MIS helping to boost product quality?			0.766	
	In order to become an inventor, does MIS help?			0.585	
	Is it possible to achieve competitive settings with excellent MIS?			0.544	
Productivity & Internal Communication	Is there an uptick in productivity after using MIS?				0.825
	Does MIS contribute to the enhancement of product production?				0.658
	Can we say that internal communication is sped up by using a management information system?				0.630

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.
Source: *Primary survey*

Table 4: Factors Analysis for IRAQ Sample

Rotated Component Matrix* (IRAQ)					
		Component			
Factors	**Variables**	**F-1**	**F-2**	**F-3**	**F-4**
Operational Efficiency & Cost Reduction	Q7: Is HR spending cut down by the MIS?	0.802			
	Q8: Does MIS help in the increase of production of products?	0.786			
	Q9: Does MIS reduce the operational cost of the organization?	0.741			
	Q11: Is the MIS helpful in the control of wastage of items?	0.714			
	Can MIS efficiently implement the telecom sector application among a large population?	0.713			
	Is it true that after the arrival of MIS, it provides easy access to the customer?	0.691			
	Is there a direct relation between MIS and the profitability of the organization?	0.650			
	Does MIS remain helpful in increasing the turnover as compared to the previous year?	0.638			
Innovation & Competitive Advantage	Q15: Does MIS help to become an innovator?		0.788		
	Q14: Is the MIS system suitable enough to keep pace with the dynamic business environment?		0.722		
	Q21: Does good MIS help play a role in achieving competitive environments?		0.678		
	Is the product quality being improved by using MIS?		0.582		
	Q18: Is MIS helpful in the continuous growth and innovation of the organization?		0.540		
Decision Making & Communication Enhancement	Q.3 Does Management Information System speed up the internal communication?			0.764	
	Q10: Is the MIS helpful in making decisions timely and efficient			0.759	
	Q20: Does the organization ensure that there is rapid information flow across all departments through MIS?			0.758	
	Q16: Does the MIS system help make decisions timely to become a market leader?			0.641	
Human Resources & Skills Development	Q17: Have staff members improved their analytical skills after the usage of MIS?				0.726
	Q6: Is MIS helpful for the scope of audit activities?				0.713
	Q4: Does the performance of the staff become improved after using MIS?				0.642
	Q22: Does MIS help telecom sector accessibility to common people?				0.568

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.
Source: *Primary survey*

With 300 degrees of freedom and a significance threshold of 0.05, the chi-square statistic for the Role of Management Information Systems in Telecommunication Companies is 5000.279, as shown in Table 2. The results show that the factors under study are highly correlated with one another. In addition, the data is suitable for factor analysis, as shown by the Kaiser-Meyer-Olkin (KMO) statistic, which has a significant value of 0.947. The robustness of the results is supported by the statistical significance ($p<0.05$), which confirms that the dataset is suitable for further analysis and interpretation.

Table 5: Total Variance Explained (TVE), India's Data

Total Variance Explained									
Factors	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**RotationSums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
Efficiency & Decision Making Support	11.245	44.979	44.979	11.245	44.979	44.979	6.418	25.671	25.671
Cost Reduction & Resource Optimization	2.302	9.208	54.187	2.302	9.208	54.187	4.267	17.066	42.737
Innovation & Product Improvement	1.349	5.394	59.581	1.349	5.394	59.581	2.855	11.42	54.157
Productivity & Internal Communication	1.136	4.543	64.124	1.136	4.543	64.124	2.492	9.967	64.124

Source : *Primary survey, Extraction Method: Principal Component Analysis.*

In order to better understand the dataset's variance, eigenvalues analysed using factor analysis provide more informative results, as shown in Table 5. Values greater than one indicate a high level of explanatory power, whereas eigenvalues quantify the extent to which each component contributes to the overall variance. The importance of MIS in the telecom business is validated by the fact that all four components of this study have eigenvalues greater than 1. With an eigenvalue of 11.245, the first component, "Efficiency & Decision-Making Support," accounts for 25.67% of the total variance. The eigenvalue of the second component, "Cost Reduction & Resource Optimisation," is 2.302, and it accounts for 17.06% of the total variance. With an eigenvalue of 1.349, the third component, "Innovation & Product Improvement," explains 11.42% of the overall variance. The eigenvalue of the fourth component, "Productivity & Internal Communication," is 1.136, and it accounts for 4.543% of the total variance. All four components collectively provide information on the underlying features that explain the structure of the data; they account for 64.12% of the overall variance.

Table 6 demonstrates that the eigenvalue analysis through factor analysis provides significant insights into the importance of the observed factors in explaining the variance within the dataset. Eigenvalues indicate how much each factor contributes to the overall variance, with values exceeding one signifying significant explanatory capacity. Each of the four factors in this analysis show eigenvalues over 1, so affirming their significance in explaining the variability within the dataset.

The first factor, "Operational Efficiency & Cost Reduction," possesses an eigenvalue of 4.322 and significantly contributes to the data variability, representing 18.79% of the overall variance. The second component, "Innovation & Competitive Advantage," controls 11.089 percent of the total variation with an eigenvalue of 2.551. Thirdly, 7.213% of the variance is explained by the component "Decision Making & Communication Enhancement," which has an eigenvalue of 1.659. The fourth factor, "Human Resources & Skills Development," possesses an eigenvalue of 1.235 and constitutes 5.368% of the variance. All of these parts work together to highlight the key features that show how the data is structured. When taken together, these four variables explain 62.38 percent of the overall variation.

Table 6: Total Variance Explained (TVE), IRAQ's Data

Total Variance Explained						
Factors	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Operational Efficiency & Cost Reduction	6.916	40.685	40.685	3.153	18.546	18.546
Innovation & Competitive Advantage	1.541	9.064	49.748	2.707	15.924	34.47
Decision Making & Communication Enhancement	1.134	6.669	56.417	2.695	15.852	50.322
Human Resources & Skills Development	1.014	5.963	62.38	2.05	12.058	62.38

Source : *Primary survey, Extraction Method: Principal Component Analysis.*

The comparative analysis of the factor analysis from Table 5 (India) and Table 6 (Iraq) underscores the distinct ways Management Information Systems (MIS) contribute to the telecommunications industries in these two regions. While both countries' analyses identify four significant factors, their specific names and the proportion of variance explained highlight different priorities and challenges faced by each country's telecommunications sector. This suggests a nuanced role of MIS in shaping the operational strategies and decision-making processes in these countries.

In India, the first factor is Efficiency & Decision-Making Support, explaining 25.67% of the total variance. This factor's dominance highlights MIS's critical role in enhancing efficiency and strategic decision-making in India's telecommunications industry. It suggests that organizations in this sector heavily rely on MIS to streamline operations and support data-driven decisions that impact their overall performance and competitiveness. In contrast, Iraq emphasizes Operational Efficiency & Cost Reduction as its first factor, which explains 18.79% of the total variance. This shows that while efficiency remains important, cost-cutting measures are prioritized. The emphasis on cost reduction reflects a strategic focus on maintaining profitability and minimizing operational expenses in the telecommunications industry.

The second factor in India, Cost Reduction & Resource Optimization, explains 17.06% of the total variance. This reveals that cost reduction is still an essential priority for India's telecommunications companies, but it is coupled with a focus on optimizing the use of resources. Resource optimization can include efficient allocation of manpower, technological resources, and infrastructure to maximize output with minimal waste. In contrast, the second factor in Iraq, Innovation & Competitive Advantage, explains 11.089% of the variance. This highlights that innovation and staying competitive in the rapidly evolving telecommunications market are key priorities. The focus here is more on leveraging MIS to drive innovation, develop new products, and enhance service delivery, which, in turn, fosters competitive advantage. Moving to the third factor, India's Innovation & Product Improvement explains 11.42% of the variance, reflecting the country's recognition of the importance of MIS in driving innovation and improving product offerings. MIS is utilized to streamline processes that lead to innovation, whether in product design, service delivery, or customer engagement. In Iraq, the third factor is Decision Making & Communication Enhancement, which accounts for 7.213% of the total variance. This indicates that in Iraq, MIS is more integral to improving internal decision-making processes and enhancing communication, perhaps emphasizing collaboration and information sharing within the organization.

Finally, the fourth factor in India, Productivity & Internal Communication, explains 4.543% of the variance, showing that MIS is crucial in boosting internal productivity and facilitating communication across different departments. This factor highlights that MIS is seen as a tool for ensuring that internal workflows are smooth and that communication barriers are minimized, which is essential in a large and complex industry like telecommunications. By contrast, the fourth factor in Iraq, Human Resources & Skills Development, explains 5.368% of the total variance. This reflects a different focus, where MIS supports human capital development. This could involve using MIS to manage training programs, track employee performance, and ensure that skills development is aligned with the organization's needs.

The total variance explained by the four factors in India is 64.12%, compared to 62.38% in Iraq. This indicates that MIS has a slightly broader scope of influence in India's telecommunications industry, perhaps reflecting the greater complexity of the sector or the more diverse ways MIS is applied. In contrast, Iraq emphasizes innovation and human resource development, which suggests a forward-looking approach to adapting to new market demands and developing internal capabilities. This comparative analysis shows how regional priorities shape the role of MIS in the telecommunications industry and provides insight into the strategic focus of each country.

Conclusion and Discussion

The study emphasizes the essential function of Management Information Systems (MIS) within the telecommunications industries of India and Iraq, although in markedly distinct socio-economic and operational contexts. In India, Management Information Systems (MIS) is a mechanism for overseeing extensive activities, enhancing decision-making, and sustaining a competitive advantage in a saturated market(Owusu, 2024; Pankaj et al., 2023). Indian telecommunications firms utilize sophisticated Management Information Systems technology, including artificial intelligence and machine learning, to improve predictive analytics, optimize resource distribution, and refine operational processes. The Indian telecommunications industry employs Management Information Systems (MIS) for customer relationship management (CRM), predictive analytics, and regulatory compliance. The advanced application of MIS facilitates the rapid expansion of India's telecom business, propelled by millions of consumers and intricate network requirements(Sehgal et al., 2016).

On the other hand, Iraq's telecommunications sector remains in a reconstruction phase after experiencing periods of conflict. In this context, MIS is crucial for reconstructing infrastructure, enhancing operational efficiency, and facilitating governmental e-governance activities. Iraqi telecommunications firms prioritize the utilization of Management Information Systems to improve network efficiency, manage customer data, and allocate resources effectively within a demanding context characterized by constrained financial resources and a scarcity of proficient IT personnel. Notwithstanding these limitations, MIS is essential for facilitating the expansion of telecommunications access in Iraq, particularly in underserved rural regions, and for advancing its comprehensive digital transformation initiatives(Kumar et al., 2023; Yousif, 2024) In comparison, although both nations prioritize operational efficiency, India's utilization of Management Information Systems (MIS) is more sophisticated, concentrating on strategic decision-making, customer management, and the application of technology to sustain competitiveness. In Iraq, MIS serves predominantly as a mechanism for infrastructural rehabilitation and operational dependability within an emerging market. Notwithstanding their divergent focal points, both nations acknowledge the significance of MIS in promoting growth and enhancing efficiency within their telecommunications sectors.

The comparative examination of India and Iraq illustrates the divergent applications of Management Information Systems (MIS) influenced by each nation's developmental stage and industrial requirements. In India, a nation characterized by a competitive and technologically sophisticated telecommunications sector, Management Information Systems (MIS) are employed to improve operational efficiency and augment decision-making processes, enhance customer happiness, and ensure regulatory compliance(Lee et al., 2012). The report indicates that India's telecom firms, such as Bharti Airtel and Reliance Jio, utilize Management Information Systems (MIS) to amalgamate Customer Relationship Management (CRM) systems with predictive analytics, hence delivering tailored customer experiences and minimizing churn rates.

Iraq's telecommunications sector use Management Information Systems mostly to improve fundamental operational efficiency and restore its infrastructure(Jabbouri et al., 2016). MIS assists firms like as Zain Iraq and Asiacell in optimizing network performance, monitoring upcoming technologies like 4G, and efficiently allocating resources to reduce service interruptions. The application of MIS corresponds with Iraq's socio-political issues and the persistent requirement for telecommunications infrastructure upgrading, emphasizing MIS's potential as a crucial catalyst for economic recovery and digital transformation(Emberti Gialloreti et al., 2020; Kumar et al., 2023, 2024). The function of MIS in advancing Iraq's government-led projects, such as e-governance, demonstrates the system's capacity to enhance wider public administration operations. A notable distinction exists in how each country implements management information systems (MIS). Indian telecommunications firms exhibit greater autonomy, utilizing new technology and tools such as artificial intelligence to maintain competitiveness. This differs from Iraq, where the government is more proactive in enhancing telecommunications services, especially in rural regions. This indicates that Iraq's telecommunications sector relies on public sector measures to guarantee extensive connectivity.

The results indicate that Management Information Systems (MIS) in India account for 64.12% of the total variance in telecommunications operations, whereas in Iraq, this figure is 62.38%. This minor distinction highlights how India's numerous and intricate telecom operations fully utilize MIS, unlike Iraq, which concentrates on basic operational enhancements. Both nations illustrate that Management Information Systems (MIS) are essential for handling substantial data volumes, augmenting customer service, and refining decision-making processes, regardless of the industry's maturity level.

The function of Management Information Systems in telecommunications is essential for both developed and emerging markets. In India, it promotes innovation, competitive advantage, and operational efficiency; in Iraq, it is essential for reconstructing infrastructure, enhancing network reliability, and broadening telecommunications services. Future research may examine the enduring effects of Management Information Systems on customer satisfaction and operational efficiency within these sectors as they develop.

Social Implications

Findings from this study highlight the far-reaching societal effects of MIS in the Indian and Iraqi telecom sectors. Through the optimisation of operations and the facilitation of data-driven decision-making, MIS improves connectivity in India, particularly in rural and remote places. Economic growth, social inclusion, and a narrowing of the digital gap are all aided by more widely available telecommunications services. Higher quality of life is the result of easier access to healthcare, education, and government services. Significant social effects result from the role of Management Information Systems (MIS) in restoring Iraq's telecommunications infrastructure. This is especially true when it comes to providing communication services to neglected regions. By strengthening e-governance and public administration, MIS helps Iraq's digital transition, which in turn improves service delivery to citizens and increases transparency. Better communication between previously isolated communities is another way that improved access to reliable telecoms networks strengthens social cohesiveness. As a result, MIS plays an essential role in promoting societal growth and stability in both nations.

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