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ASSOCIATE BHARATIYA VIDYA BHAVAN, BENGALURU

Research Articles

Invited Article

Book Review

M P BIRLA INSTITUTE OF MANAGEMENT, Bengaluru

INFORMATICS
A Passage to Knowledge

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"Let Noble Thoughts Come To Us From Every Side"
-Rig Veda 1.89.1-

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Editorial: Bridging Ideas and Insights

In the dynamic and ever-evolving landscape of social science research, the need for intellectual platforms that blend scholarly rigor with real-world relevance has never been more urgent. DHĀRANA - International Journal of Business from MP Birla Institute of Management continues to stand tall as a beacon of interdisciplinary research, contributing thoughtfully to the ongoing discourse in business, management, and broader social sciences. As we move deeper into the third decade of the 21st century, Dhārāna plays a pivotal role in responding to the changing currents of social inquiry and academic engagement.

Contemporary social science research is undergoing a radical transformation. Traditional silos are dissolving, making way for hybrid approaches that address complex societal problems through integrated perspectives. This shift is characterized by a surge in research on sustainability, digital transformation, behavioural economics, inclusive governance, artificial intelligence in public policy, and the sociocultural impact of globalization. Journals like Dhārana have recognized the urgency to not only adapt to these trends but to be instrumental in shaping them. By publishing high-quality, peer-reviewed articles that examine emerging paradigms, Dhārana continues to serve as a crucible for critical thought and applied innovation. One of the defining features of Dhārana is its commitment to fostering a global academic conversation while anchoring itself in regional and local realities. Social science today cannot be constrained by geographical or disciplinary boundaries. Whether it's the study of entrepreneurial ecosystems in developing economies, the role of digital inclusion in rural education, or the psychological aftermath of post-pandemic work culture, Dhārana provides a space for researchers to explore, debate, and disseminate diverse ideas that cut across nations and sectors.

Another critical contribution of Dhārana lies in its focus on ethical research practices, methodological soundness, and inclusivity. With a strong emphasis on empirical research, theoretical advancements, and actionable insights, the journal consistently upholds the values of academic integrity and transparency. Moreover, by encouraging contributions from early-career scholars, practitioners, and interdisciplinary researchers, Dhārana democratizes knowledge production and empowers voices from various walks of life. As social scientists grapple with issues such as climate justice, data ethics, mental health, gender equity, and algorithmic bias, journals like Dhārana serve as both mirrors and maps. They reflect the world as it is, with all its intricacies and inequities, while also providing direction for what it could be. By aligning academic inquiry with societal needs, Dhārana exemplifies how research can inform practice, influence policy, and inspire change.

In addition, Dhārana is not just a journal, it is a movement towards meaningful scholarship. It stands at the intersection of tradition and transformation, offering a platform where intellectual curiosity meets practical relevance. As the contours of social science continue to expand and reshape, Dhārana remains committed to illuminating new pathways for researchers, educators, and policymakers alike. We invite scholars, practitioners, and thought leaders from across the globe to join us in this journey of questioning, understanding, and redefining the world through the lens of contemporary social science research.

From Chairman's Desk

As we turn another page in our academic journey, I am delighted to present this latest edition of Dharana, a journal that continues to embody our vision for rigorous thought, ethical inquiry, and purposeful business research. Each issue of Dharana is a reminder of the powerful synergy between scholarly exploration and practical relevance, a bridge that connects the world of ideas to the evolving challenges faced by industry, society, and policymakers.

In today's volatile global environment, business paradigms are being reshaped at an unprecedented pace. The rise of artificial intelligence, sustainability imperatives, digital disruption, and evolving consumer expectations are not just trends; they are transformative forces redefining the foundations of management and leadership. As we seek to make sense of these complexities, the role of research becomes more critical than ever. It is through inquiry, questioning, and evidence-based dialogue that we build resilient business models, ethical frameworks, and inclusive institutions.

This issue brings together a collection of research papers that reflect the richness and diversity of contemporary business thought. From empirical investigations in finance and marketing to theoretical explorations in human resource management and organizational behaviour, the contributions underscore the journal's interdisciplinary commitment. What binds these papers together is not only their academic rigor but also their aspiration to inform practice, influence policy, and inspire future research.

At MP Birla Institute of Management, we continue to nurture a research ecosystem that values depth over noise, insight over information, and reflection over rhetoric. Dharana is an extension of this ethos, a platform where emerging scholars and seasoned academics can engage in meaningful conversations. We also take pride in the journal's strong peer-review process, editorial independence, and a growing readership that spans continents.

I would like to extend my gratitude to the contributors, reviewers, and editorial team for their dedication and commitment. Each issue of Dharana is a collective effort, a tapestry woven from the intellectual curiosity, critical thinking, and scholarly perseverance of our community. As you browse through the pages of this edition, I invite you not just to read, but to reflect, critique, and build upon the ideas presented here. After all, knowledge thrives not in silos, but in shared discourse.

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Overcoming Traditional Constraints: Strategies for Fostering an Inclusive Entrepreneurial Ecosystem in Bangladesh

Emon Kalyan Chowdhury[1]* and S. Sathyanarayana[2]

Abstract

This paper analyses the impact of economic, socio-cultural, and institutional factors on entrepreneurial success in Bangladesh. Primary data from a structured survey with judgmental sampling, factor analysis, and regression models are used to examine these relationships. The findings show that a strong economic climate fosters entrepreneurship, but challenges such as limited access to financing and inadequate infrastructure hinder success. Socio-cultural factors, like traditional family structures and gender roles, significantly restrict women's participation. Institutional support, including policies and organisations, is crucial for success. The study highlights the need for targeted interventions to promote inclusive entrepreneurship. Policymakers should improve access to financing, reduce interest rates, and invest in infrastructure. Promoting gender equality and supportive policies is essential to enhance women's participation and guide entrepreneurs. Creating a conducive entrepreneurial ecosystem in Bangladesh can drive economic growth, reduce poverty, and empower marginalised groups, especially women.

Keywords: Bangladesh, Economic Factors, Entrepreneurship, Institutional Factors, Mindset. Socio-Cultural Factors

JEL Classification: L26, O17, O53, L38, M13, I38

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Introduction

Culture and tradition play a significant role in shaping the entrepreneurial mindset, influencing how individuals perceive and respond to business opportunities, challenges, and risks (Chowdhury, 2024). Previous studies have shown that values such as risk-taking, innovation, and resilience, along with cultural norms like social and business networking, can either facilitate or hinder entrepreneurial activities (Ilevbare *et al.*, 2022). Similarly, factors such as aversion to risk-taking, resistance to change, lack of support for innovation, and

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restrictive social norms can act as barriers to entrepreneurship (Adom and Anambane, 2020).

In developing nations, cultural values and traditions have been observed to foster or impede entrepreneurship. Guerrero *et al.* (2021) found that cultural values emphasising resilience, resourcefulness, and community support contribute to a conducive environment for entrepreneurship, leading to a vibrant entrepreneurial platform. On the contrary, cultural factors like discouraging risk-taking or favouring traditional employment over entrepreneurship can hinder entrepreneurial culture in other developing nations.

To address the gaps in understanding the influence of cultural and traditional factors on entrepreneurship, this study aims to provide a comprehensive analysis of the impact of economic, socio-cultural, and institutional factors on entrepreneurial success in Bangladesh. By examining how these factors shape the entrepreneurial landscape, this research seeks to contribute valuable insights to the field.

While Bangladesh has seen growth in entrepreneurial activities in recent years, driven by various economic, socio-cultural, and institutional factors (Rahman, Howlader & Nayak, 2022), it is essential to delve deeper into the specific dynamics at play. Economic factors, such as access to financing and infrastructure challenges, continue to impact entrepreneurial success in the country (Sarkar *et al.*, 2020). Socio-cultural factors, including traditional gender roles and religious practices, also influence the entrepreneurial mindset and opportunities available to different groups (Liñán *et al.*, 2022). Moreover, institutional factors, such as government policies and support organisations, play a crucial role in either hindering or enhancing entrepreneurial success (Urbano *et al.*, 2020).

By exploring these interrelated factors in the context of Bangladesh, this study aims to provide a nuanced understanding of the challenges and opportunities facing entrepreneurs in the country. Through a thorough analysis of the existing literature, identification of research gaps, and formulation of hypotheses, this research endeavours to contribute to the theoretical narrative on entrepreneurship in the specific context of Bangladesh.

Moving beyond merely contextualising the study within Bangladesh, this research aims to offer broader insights into how cultural values, traditions, and institutional frameworks shape entrepreneurial activities globally. By situating the study within a theoretical framework that transcends geographical boundaries, the findings of this research can contribute to the wider discourse on entrepreneurship and pave the way for future studies in the field.

This paper embarks on a journey to explore the intricate relationship between culture, tradition, and entrepreneurship, with a specific focus on Bangladesh as an empirical context. By analysing the impact of economic, socio-cultural, and institutional factors on entrepreneurial success in Bangladesh, this research aims to offer valuable insights for academia, policymakers, and practitioners in the field.

The subsequent sections of this paper delve deeper into the literature review, research design, findings, conclusions, and recommendations, culminating in a comprehensive analysis of the research objectives outlined in this introduction.

Literature Review

Entrepreneurial Beliefs and Attitudes

Traditional beliefs and attitudes have been acknowledged as influential factors in the success of businesses (Al-Mamary and Alshallaqi, 2022). Entrepreneurs' beliefs and attitudes towards their businesses can shape their actions, decisions, and outlook on success. The role of beliefs and attitudes, particularly the entrepreneurial mindset, in influencing entrepreneurial activities has been underscored (Al Issa, 2022). Entrepreneurs with a positive attitude towards risk-taking and a strong belief in their abilities may be more likely to pursue entrepreneurial activities. Conversely, limiting beliefs and fear of failure can hinder entrepreneurial pursuits. Therefore, understanding the significance of beliefs and attitudes is crucial for fostering entrepreneurial success (Chowdhury & Humaira, 2023).

Cultural Influence on Entrepreneurial Activities

The impact of cultural factors on entrepreneurial activities is undeniable. Cultural expectations and social norms shape the opportunities and challenges faced by entrepreneurs in diverse contexts, including Bangladesh (Rahman *et al.*, 2023). Cultural expectations may influence the types of business ventures considered acceptable, the resources available to entrepreneurs, and the level of societal support. Recognising the cultural context is vital for understanding and promoting entrepreneurship. Additionally, the influence of traditional family structures and religious practices on entrepreneurial activities and strategies has been highlighted (Mio *et al.*, 2020; Van Buren *et al.*, 2020). Understanding how culture shapes entrepreneurial endeavours is essential for entrepreneurs to navigate specific cultural contexts successfully.

Entrepreneurial Satisfaction and Well-being

Examining entrepreneurs' satisfaction with their business success provides insights into their well-being and continued growth. Cultural beliefs and expectations often influence entrepreneurs' perceptions of success and satisfaction with their achievements (Lindblom *et al.*, 2020). Factors such as material wealth, community well-being, and social impact can influence entrepreneurs' satisfaction levels. Understanding these factors is crucial for promoting entrepreneurs' well-being and sustained growth.

Impact of Family Structures and Gender Roles

Traditional family structures and gender roles play significant roles in shaping entrepreneurial opportunities and success. Familial obligations and gender expectations can present unique challenges for entrepreneurs, especially in societies where traditional roles are predominant (Aldrich *et al.*, 2021). Recognising and overcoming these barriers are essential for promoting gender equality and empowering entrepreneurs, particularly women.

Influence of Cultural Practices on Entrepreneurship

Cultural practices and traditions can either hinder or promote entrepreneurship based on their alignment with entrepreneurial values and practices. Understanding the dynamics between culture and entrepreneurship is essential for identifying barriers and opportunities for

entrepreneurs and developing strategies to leverage cultural practices in driving success and sustainability (Chowdhury *et al*., 2022; Azeem *et al*., 2021). Family networks and connections also play crucial roles in the entrepreneurial journey, providing access to resources, knowledge, and support (Kampouri *et al.,* 2017). Recognising and understanding these networks is vital for entrepreneurs seeking to thrive in their business endeavours.

Policy Implications and Stakeholder Roles

Policymakers and support organisations have essential roles in addressing challenges and creating opportunities for entrepreneurs (Veleva, 2021). Government policies and support programs can influence the entrepreneurial ecosystem by providing funding, mentorship, and regulatory frameworks. Collaboration between stakeholders, including policymakers, support organisations, and entrepreneurs, is crucial for fostering an enabling environment for entrepreneurial success.

While existing research provides insights into the influence of economic, socio-cultural, and institutional factors on entrepreneurship, there is a research gap in understanding these factors within the specific context of Bangladesh. Future research should focus on exploring the unique challenges and opportunities faced by entrepreneurs in Bangladesh, considering the country's cultural and institutional landscape. This research will contribute to a holistic understanding of entrepreneurship in Bangladesh and inform strategies to support and empower entrepreneurs in the region.

Conceptual Framework

This framework examines independent variables impacting entrepreneurship in Bangladesh, including economic, socio-cultural, and institutional factors. Economic factors like success rates and satisfaction drive entrepreneurship. Positive beliefs, cultural context, supportive family structures, and gender equality influence entrepreneurship development. Institutionally, favourable policies and support organisations promote entrepreneurship. The dependent variable is the entrepreneurial mindset, shaped by a combination of these factors. Favourable conditions enhance the mindset and entrepreneurship, while unfavourable conditions hinder development.

Independent Variables

Economic Factors

The success rate of business strategies is an important independent variable in understanding the development of entrepreneurship. If entrepreneurs consistently experience high success rates in their business endeavours, they are more likely to have increased confidence and motivation to pursue entrepreneurial activities (Baciu *et al*., 2020). This can contribute to the growth and development of entrepreneurship. Conversely, if entrepreneurs face constant failure and low success rates, it may discourage them from continuing their entrepreneurial ventures and hinder the development of entrepreneurship.

Satisfaction with business success is another economic factor that can impact the development of entrepreneurship. Entrepreneurs who are satisfied with their achievements are more likely to continue and expand their ventures. Their satisfaction can lead to further investment, job creation, and innovation, contributing to the growth of entrepreneurship in Bangladesh. However, if entrepreneurs are dissatisfied with their business success, it may result in

Figure 1. Factors Influencing Entrepreneurial Mindset.

reduced motivation and limited growth in the entrepreneurial sector. Thus, the first hypothesis is:

Hypothesis 1: Economic factors such as business strategies, satisfaction level with financial performance, and enhanced entrepreneurial success

Socio-Cultural Factors

Beliefs and attitudes towards entrepreneurship play a pivotal role in shaping the development of entrepreneurship. Positive beliefs and attitudes can enhance the perception of entrepreneurship as a desirable career option. If there is widespread positivity and support for entrepreneurship in society, individuals are more likely to consider it as a viable option and pursue entrepreneurial endeavours. Conversely, negative beliefs and attitudes can discourage individuals from exploring entrepreneurship, hindering its development.

The cultural context, including norms, values, and practices, in Bangladesh can have a significant impact on entrepreneurship. Different cultural perspectives towards risk-taking, innovation, and business ownership can either promote or hinder entrepreneurial activities. If the cultural context encourages risk-taking and innovation, it can create a conducive environment for entrepreneurship to flourish. However, if cultural practices discourage risk-taking or impose limitations on certain groups based on caste or religious practices, it can hinder entrepreneurial opportunities in the country (Akther and Nur, 2022).

Traditional family structures also play a crucial role in the development of entrepreneurship in Bangladesh. Supportive family structures can provide entrepreneurs with financial support, networks, and resources, thereby enhancing entrepreneurship. On the other hand, inhibitive family structures may discourage or limit entrepreneurial endeavours, hindering the growth of entrepreneurship in the country.

Gender roles and expectations are important socio-cultural factors that can impact entrepreneurship in Bangladesh. If there are gender disparities and restrictions that limit

female participation in entrepreneurship, it hampers the development of entrepreneurship. Promoting gender equality and providing equal opportunities for men and women can enhance entrepreneurship and contribute to its growth.

Religious and caste-based practices can also influence entrepreneurship in Bangladesh. Certain religious or caste groups may face barriers or discrimination that hinder their entrepreneurial opportunities. Overcoming these religious or caste-based practices and ensuring equal access to entrepreneurial opportunities can promote the development of entrepreneurship.

Cultural practices and traditions can have varying impacts on entrepreneurship. Cultural practices that value and encourage entrepreneurship can enhance its development, while practices that discourage risk-taking and innovation can hinder it. Understanding and leveraging cultural practices can have a positive impact on entrepreneurial success in Bangladesh.

Family networks and connections can be influential factors in the development of entrepreneurship. Strong family networks can provide entrepreneurs with resources, advice, and support, thereby enhancing entrepreneurship. Family networks can also serve as a valuable source of social capital, facilitating access to funding and business opportunities.

Decision-making processes within Bangladeshi society can impact entrepreneurship. If decision-making processes are centralised and restrictive, it can hinder entrepreneurial opportunities and the development of entrepreneurship. Creating a more decentralised and open decision-making environment can promote entrepreneurship.

The extent to which entrepreneurs in Bangladesh leverage cultural practices and traditions to enhance their entrepreneurial activities can impact their success. If entrepreneurs effectively leverage cultural practices, it can positively impact their entrepreneurial endeavours, leading to increased growth and development of entrepreneurship.

Restrictions on female entrepreneurs can significantly hinder the development of entrepreneurship in Bangladesh. It is essential to identify and address the specific limitations and challenges faced by female entrepreneurs to promote gender equality and create an inclusive business ecosystem.

The influence of customs on business operations is another socio-cultural factor that can impact entrepreneurship. If customs and traditions limit innovation, competition, or foreign partnerships, it can hinder the development of entrepreneurship. Creating an environment that fosters innovation, competition, and international collaboration can support the growth of entrepreneurship in Bangladesh. Therefore, this study sets the following second hypothesis:

Hypothesis 2: Socio-cultural factors positively influence entrepreneurial success

Institutional Factor

Policy and support organisations are vital institutional factors that can enhance the development of entrepreneurship. The presence of favourable policies and effective support organisations can provide resources, mentoring, and funding opportunities to

entrepreneurs. Well-designed policies and supportive organisations can create an enabling environment for entrepreneurship to thrive, leading to its growth and development (Urbano *et al.*, 2020). In this circumstance, we can develop the third hypothesis as below:

Hypothesis 3: Institutional factors accelerate entrepreneurial success

Dependent Variable

The dependent variable in this framework is the entrepreneurial mindset of individuals in Bangladesh. It measures their mindset and attitudes towards entrepreneurship. The combined impact of the independent variables mentioned above, such as economic factors, socio-cultural factors, and institutional factors, can enhance or hinder the entrepreneurial mindset. A positive entrepreneurial mindset can positively impact the development of entrepreneurship in the country, while a negative mindset can hinder it.

Research Design

The study aims to measure the role of institutional, socio-cultural and economic factors on the mindset of entrepreneurs in Bangladesh.

Data

This study employed the judgmental sampling technique to collect primary data through a well-structured survey questionnaire. Judgmental sampling was deemed appropriate in this study due to the specific needs and objectives of the research. A total of 172 responses were gathered from businesspeople, ensuring a diverse sample size from January to March 2024. By selecting respondents based on their expertise and knowledge in the field, judgmental sampling allowed for a more targeted and focused approach in gathering data, increasing the relevance and reliability of the findings.

The questionnaire was designed with multiple sections, with the first section focusing on gathering general information about the respondents. This initial section provided valuable demographic data, allowing for the assessment of the representativeness of the sample. The subsequent sections aimed to investigate the perceptions of the respondents towards the developed hypotheses. To measure these perceptions, Likert's five-point scale was implemented, with 1 (strongly disagree) to 5 (strongly agree). The use of Likert's scale has facilitated the quantification and comparison of responses, enabling the analysis and interpretation of the data effectively.

The survey responses were obtained through direct contact with the participants, ensuring the accuracy and reliability of the data. This approach minimised the potential for misinterpretation or miscommunication, as the researchers could clarify any uncertainties or ambiguities in real-time. Direct contact with the participants also allowed for the establishment of a rapport, potentially enhancing response rates and data quality.

Models

Factor Analysis

Factor analysis is a widely used statistical technique that aids in understanding the latent factors underlying a set of observed variables (Schreiber, 2021). In the realm of examining the mindset of entrepreneurs, factor analysis offers valuable insights into the underlying dimensions

or constructs associated with institutional, economic, and socio-cultural factors.

In this exploratory research, the Principal Axis Factoring (PAF) model was employed to extract the crucial factors due to its ability to handle complex data structures. An oblique rotation method, specifically the promax method, was chosen to account for the intercorrelation between variables. By selecting a determinant value of 0.30, we aimed to achieve a suitable balance between factor simplicity and interpretability.

The mathematical representation of factor analysis can be expressed as follows:

$$X = \Lambda F + \varepsilon \quad (1)$$

Where, X refers to the observed data matrix, Λ represents the factor loading matrix, which captures the associations between the observed variables and the underlying factors. F denotes the factor score matrix, representing the latent factor, while ε symbolises the error term.

Regression equation

To examine the impact of institutional, socio-cultural, and economic factors on the mindset of entrepreneurs, several regression models have been proposed. The equations (Equations 2 to 6) are designed to consider these variables and establish their significance:

$$EM = \alpha_1 + \beta_1 \mathrm{IF} + \varepsilon \quad (2)$$

$$EM = \alpha_1 + \beta_1 IF_1 + \beta_2 SCF_1 + \varepsilon \quad (3)$$

$$EM = \alpha_1 + \beta_1 IF_1 + \beta_2 SCF_1 + \beta_3 SCF_1 + \varepsilon \quad (4)$$

$$EM = \alpha_1 + \beta_1 IF_1 + \beta_2 SCF_1 + \beta_3 EF_1 + \beta_4 AgeF_1 + \varepsilon \quad (5)$$

$$EM = \alpha_1 + \beta_1 IF_1 + \beta_2 SCF_1 + \beta_3 EF_1 + \beta_4 Capital_1 + \varepsilon \quad (6)$$

In these equations, EM represents the mindset of the entrepreneurs, which includes their knowledge, awareness level, risk tolerance, and adaptability. This is the dependent variable. IF represents Institutional Factors, which encompass the policies and support provided by organisations. SCF denotes socio-cultural factors, including dimensions such as traditional family structures, religious practices, cultural diversity, family networks, restrictions on female entrepreneurs, beliefs and attitudes towards business, and decision-making processes within families. EF represents economic factors, which encompass the successful implementation of business strategies and the efficiency of business performance. These variables are considered independent variables. The age and capital of the business are included as control variables. The coefficients to indicate the impact of each variable on the mindset of entrepreneurs, while ε represents the error term.

Findings and Discussion

Figure 2 presents the demographic data, offering insights into the respondents' gender, age, and educational qualifications. The gender distribution reveals that 57.6% of respondents identify as male, while 42.4% identify as female. Turning to age groups, we observe distinct patterns. The largest cohort falls within the 36-45 age range, comprising 56 respondents (32.6% of the total). The second-largest group, aged 46-55, includes 50 participants (29.1% of the total). In contrast, the 18-25 age group has the fewest respondents, only 8 individuals (4.7% of the total).

The value obtained in Table 1 is above 0.744, indicating that there is an adequate number of questions and a strong correlation between the

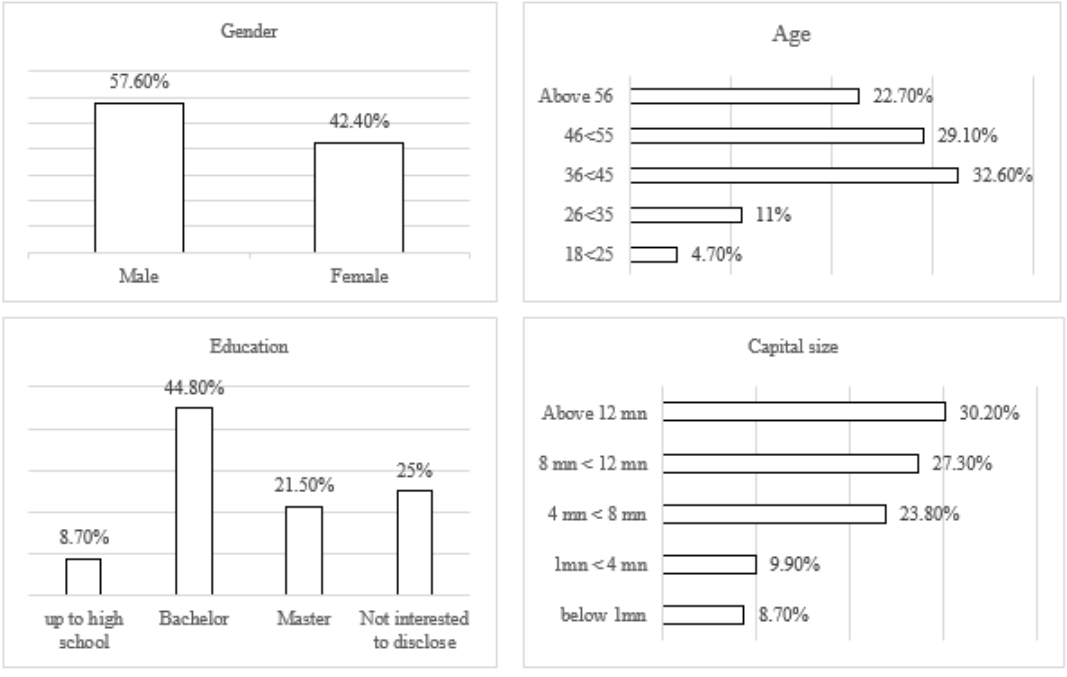

Figure 2. Participant Demographics.
Source: Desk Research

Table 1. Reliability Analysis

Cronbach's Alpha	No. of Items
0.744	16

Source: Desk Research

items (Chowdhury, 2024). This ensures that the data collected is dependable and can be used to draw meaningful conclusions.

Table 2 shows the correlation coefficients between different variables, namely, institutional factors, socio-cultural factors, economic factors, and entrepreneurial mindset. Starting with institutional factors, the correlation coefficient with entrepreneurial mindset is 0.374, indicating a positive and moderately strong relationship. This suggests that a favourable institutional environment, which includes supportive policies, regulations, and infrastructure, is associated with a higher likelihood of individuals developing an entrepreneurial mindset.

The correlation coefficient (0.659) of socio-cultural factors with entrepreneurial mindset indicates a positive and strong relationship. This implies that societal norms, cultural values, and social attitudes towards entrepreneurship play a significant role in shaping an individual's entrepreneurial mindset. For economic factors, the correlation coefficient with entrepreneurial mindset is 0.613, indicating a positive and strong relationship. This suggests that economic conditions have a direct impact on the development of an entrepreneurial mindset.

In Table 3, we examine the suitability of the data for factor analysis. The Kaiser-Meyer-Olkin

Table 2. Correlation Coefficient

	Institutional	Socio-cultural	Economic	Entrepreneurial mindset
Institutional	1			
Socio-Cultural	0.202**	1		
Economic	0.276**	0.589**	1	
Entrepreneurial Mindset	0.374**	0.659**	0.613**	1

** indicates correlation is significant at the 0.01 level (2-tailed)

Source: Desk Research

(KMO) measure of sampling adequacy yields a value of 0.635, indicating moderate adequacy. This score suggests that the observed variables (related to entrepreneurial mindset) exhibit some correlation. Bartlett's Test of Sphericity produces an approximate chi-square statistic of 754.361 with 16 degrees of freedom and a highly significant p-value. This result confirms that the variables are not independent and justifies proceeding with factor analysis.

Communalities exceeding 0.30 validate the explanatory strength of the variables (Bonsaksen *et al.*, 2019). After three iterations, the factor analysis produced Table 4, showcasing factor loading values for variables surpassing the 0.3 threshold.

In Table 5, we observe the variance explained by different factors in the factor analysis. The first factor accounts for 47.238% of the total variance, while the second factor explains an additional 26.640%. Together, these two factors contribute to a cumulative variance of 73.878%. Factors 3 to 6 do not specify extraction variance.

The pattern matrix in Table 6 shows the relationship between the different factors and the mindset of entrepreneurs in Bangladesh. Cultural practices and traditions (0.958) indicate that cultural practices and traditions in Bangladesh play a significant role in shaping the mindset of entrepreneurs. In Bangladesh, there is a cultural emphasis on family values, respect for seniors, and collective decision-making (Hamiduzzaman *et al.*, 2022). Policy and support

Table 3. KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.635
Bartlett's Test of Sphericity	Approx. Chi-Square	754.361
	Df	16
	Sig.	0.000

Source: Desk Research

Table 4. Communalities

	Initial	Extraction
Policy and support organisations	0.958	0.879
Cultural context	0.387	0.344
Family networks and connections	0.433	0.408
Cultural practices and traditions	0.959	0.921
Efficiency of business performance	0.376	0.525
Entrepreneurial knowledge and awareness	0.392	0.694

Extraction Method: Principal Axis Factoring.

Source: Desk Research

Table 5. Total Variance Explained

Total Variance Explained							
Factor	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings[a]**
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**
1	2.834	47.238	47.238	2.550	42.505	42.505	2.541
2	1.598	26.640	73.878	1.220	20.335	62.840	1.245
3	0.735	12.254	86.131				
4	0.467	7.786	93.917				
5	0.344	5.732	99.649				
6	0.021	0.351	100.000				

Extraction Method: Principal Axis Factoring.

[a] When factors are correlated, the sums of squared loadings cannot be added to obtain a total variance.

Table 6. Pattern Matrix[a]

	Factor	
	1	**2**
Cultural practices and traditions	0.958	
Policy and support organisations	0.937	
Entrepreneurial knowledge and awareness		0.833
Efficiency of business performance		0.724
Family networks and connections	0.638	
Cultural context	0.574	

Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalisation.

[a] Rotation converged in 3 iterations.

organisations (0.937) suggest that the presence of supportive policies and encouragement of seniors in Bangladesh significantly impacts the mindset of entrepreneurs. The creation of the Bangladesh Small and Cottage Industries Corporation (BSCIC) and the Bangladesh Investment Development Authority (BIDA) has provided entrepreneurs with access to financing, technical support, and networking opportunities. These policy and support organisations have contributed to the growth of entrepreneurship and shaped the mindset of entrepreneurs by providing a supportive ecosystem (Mujeri *et al.*, 2021). Entrepreneurial knowledge and awareness (0.833) indicate that entrepreneurial knowledge and awareness have a significant influence on the mindset of entrepreneurs in Bangladesh. The availability of quality business education programs, training workshops, and mentorship opportunities has helped entrepreneurs acquire the necessary skills, knowledge, and awareness to succeed in their ventures (Bauman and Lucy, 2021). This factor plays a crucial role in shaping the mindset of entrepreneurs by providing them with the necessary tools and resources for success.

Efficiency of business performance (0.724) indicates that the efficiency of business

Table 7. Regression Estimates. Dependent Variable: Entrepreneurial Mindset

	Model 1	Model 2	Model 3	Model 4	Model 5
Institutional factors	0.281*** (5.27)	0.189*** (4.51)	0.152*** (3.77)	0.141*** (3.55)	0.146*** (3.97)
Socio-cultural factors		1.086*** (10.89)	0.792*** (6.91)	0.968*** (7.73)	1.313*** (9.65)
Economic factors			0.276*** (4.53)	0.232*** (3.79)	0.147* (2.46)
Age				-0.155** (-3.12)	
Capital					-0.287*** (-5.97)
Constant	2.725*** (16.35)	-0.778* (-2.25)	-0.560 (-1.69)	-0.431 (-1.32)	-0.890** (2.90)
N	172	172	172	172	172

t statistics in parentheses * p<0.05, ** p<0.01, *** p<0.001

performance has a moderate impact on the mindset of entrepreneurs in Bangladesh. Entrepreneurs who experience high levels of efficiency in their business operations are more likely to have a positive mindset and be motivated to pursue further growth opportunities. On the other hand, entrepreneurs who face challenges in achieving efficiency may have a negative mindset and be less motivated to take risks or innovate (Morris and Tucker, 2023).

Family networks and connections (0.638) imply that family networks and connections play a significant role in shaping the mindset of entrepreneurs in Bangladesh. Entrepreneurs who have strong family connections and networks are more likely to receive support, guidance, and resources from their family members. These connections can influence the mindset of entrepreneurs by providing them with a sense of security, access to capital, and opportunities for collaboration (Xu *et al.*, 2020).

Cultural context (0.574) suggests that Bangladesh has a moderate impact on the mindset of entrepreneurs. Cultural values such as collectivism, risk aversion, and social hierarchy can shape the mindset of entrepreneurs by influencing their decision-making processes, risk tolerance, and attitudes towards authority. The cultural context in Bangladesh can either encourage or discourage entrepreneurial behaviour based on the prevailing cultural norms and expectations.

The findings from Table 7 provide insights into the effects of institutional, socio-cultural, and economic factors on entrepreneurial mindset in Bangladesh (Polas *et al.*, 2022).

In terms of institutional factors, the government of Bangladesh has implemented various policies and initiatives to support entrepreneurship and innovation (Model 1-5). The establishment of the BSCIC is a notable example of institutional support that has created an enabling

environment for business growth (Chowdhury *et al*., 2021). This support has played a crucial role in fostering a positive entrepreneurial mindset among individuals looking to start their ventures, and we can accept the third hypothesis as true.

Socio-cultural factors also contribute significantly to the entrepreneurial mindset in Bangladesh. The country's rich cultural heritage and diverse social fabric create a vibrant entrepreneurial network (Model 2-5). Traditional family structures in Bangladesh often prioritise entrepreneurship as a means of economic empowerment and social mobility (Khan *et al*., 2022). Besides, the strong family networks and support systems present in the country offer aspiring entrepreneurs' access to capital, mentorship, and business connections thus the second hypothesis proved to be true.

The economic factors demonstrate the opportunities available for entrepreneurs in Bangladesh (Model 3-5). The country's significant economic growth, expanding consumer market, and rising middle class provide favourable conditions for identifying new market niches and launching innovative businesses (Alim *et al*., 2023). The success of e-commerce platforms like Daraz and Pathao is a testament to how entrepreneurs have leveraged economic growth to create thriving enterprises. Thus, the first hypothesis, "Economic factors such as business strategies, satisfaction level with financial performance, enhance the entrepreneurial success", has been proven true.

It is worth noting that the coefficient estimate for age suggests a negative impact on entrepreneurial mindset (Model 4). However, this does not mean that individuals of different age groups cannot become successful entrepreneurs in Bangladesh. Young entrepreneurs have demonstrated adaptability and a strong entrepreneurial mindset, while older entrepreneurs have shown how their accumulated wisdom and experience contribute to their entrepreneurial success (Cui *et al*., 2021).

Similarly, while the coefficient estimate for capital indicates a potential negative impact on entrepreneurial mindset (Model 5), it is important to differentiate between excessive capital and the necessary resources entrepreneurs require to start and grow their ventures. Access to sufficient capital is crucial for entrepreneurs to invest in their business, hire qualified employees, and explore growth opportunities (Teka, 2022). Entrepreneurs of 10 Minute School in Bangladesh have successfully scaled their startups and made a significant impact in the market by leveraging seed funding and investment capital.

Policy Implications

To foster a robust environment for entrepreneurship in Bangladesh, this plan outlines key policy recommendations for various stakeholders (Spillan & Rahman, 2023). The aim is to create a comprehensive system that supports business incubation, promotion, and long-term success.

Government entities can play a pivotal role by strengthening initiatives like Startup Bangladesh. Additionally, targeted financial incentives and tax benefits for women-led startups can empower female entrepreneurs. Grant programs and reduced-interest loans can provide crucial funding, while collaborations with universities and industry experts can lead to the development of practical training programs (Murati-Leka & Fetai, 2023). Introducing

entrepreneurship education and centres within universities equips aspiring business owners with valuable resources. The government can further stimulate entrepreneurship by facilitating partnerships between organisations like BIDA and private entities. These partnerships can offer mentorship, funding, and networking opportunities for entrepreneurs. Initiatives like the BIDA One Stop Service can streamline the process of obtaining guidance and support. Lastly, establishing incubation centres specifically for women entrepreneurs, potentially in collaboration with the Small and Medium Enterprise Foundation (Hajdari *et al.*, 2023), can provide targeted support for women in starting and growing their businesses.

Private organisations also have a significant responsibility in nurturing entrepreneurship. Grant programs and targeted investments in startups can provide the necessary capital for success. Establishing dedicated venture capital funds can further fuel the growth and innovation of promising ventures. Partnering with other organisations to create mentorship programs and business incubators offers valuable guidance and support to aspiring entrepreneurs, particularly women (Al Boinin, 2023). By organising networking events specifically for women entrepreneurs, private organisations can connect them with potential partners and investors. Hosting annual Entrepreneurship Summits fosters a vibrant space for startups to pitch their ideas and build valuable connections. Finally, private organisations can contribute to innovation by investing in research and development activities. Collaborations with universities and research institutions, through establishing innovation labs and funding research projects, can encourage the development of cutting-edge solutions in various sectors (Duxbury *et al.*, 2023)

Conclusion

This research paper has provided a comprehensive analysis of the influence of economic, socio-cultural, and institutional factors on entrepreneurial success in Bangladesh. The findings have revealed the critical role of these factors in shaping the mindset and outcomes of entrepreneurs in the country. The study has highlighted that a favourable economic climate, characterised by robust economic growth and expanding market opportunities, creates an enabling environment for entrepreneurs to launch and grow their businesses. However, challenges such as limited access to financing, high interest rates, and inadequate infrastructure continue to hinder entrepreneurial success. Policymakers and stakeholders need to address these challenges through targeted interventions, such as improving access to affordable financing, reducing interest rates, and investing in infrastructure development. Socio-cultural factors were found to exert a significant influence on the entrepreneurial mindset in Bangladesh. The country's cultural context, shaped by beliefs, attitudes, and religious practices, plays a crucial role in how entrepreneurs navigate business situations. Traditional family structures and gender roles often limit women's participation in entrepreneurship, leading to restricted access to resources and societal biases that undermine their entrepreneurial aspirations. Religious and caste-based practices can also impact business operations and decision-making processes. To promote inclusive entrepreneurship, it is necessary to address these socio-cultural barriers by promoting gender equality and challenging

discriminatory practices. Institutional factors, including policies and support organisations, have been identified as crucial in either hindering or enhancing entrepreneurial success. The government of Bangladesh has recognised the importance of entrepreneurship for economic growth and poverty reduction, leading to the implementation of various policies and initiatives to support entrepreneurs. Simplified business registration processes, tax incentives, and access to credit have been introduced to facilitate entrepreneurial activities. The emergence of support organisations, such as incubators, accelerators, and entrepreneurship training programs, has provided valuable resources and guidance to aspiring entrepreneurs. Continued investment in these institutional factors is essential to create a supportive ecosystem that nurtures and guides entrepreneurs throughout their journey. The empirical analysis, based on data collected through a well-structured survey questionnaire, has provided valuable insights into the relationship between economic, socio-cultural, and institutional factors and entrepreneurial mindset in Bangladesh. The findings highlight the need for continued policy support, educational initiatives, and collaboration among stakeholders to foster a conducive ecosystem for entrepreneurship in the country.

Limitations and Directions for Future Research

To further enhance the understanding of entrepreneurial success, it is recommended that future research in this field incorporate the long-term impact of different factors on the success of entrepreneurs. By closely monitoring the progress of entrepreneurs over an extended period, researchers can obtain profound insights into the specific elements that contribute to sustained success. It is suggested that future research adopt qualitative research methods, such as interviews and focus groups, to acquire a more nuanced understanding of the experiences, challenges, and strategies employed by entrepreneurs, specifically in the context of Bangladesh. These qualitative approaches will provide detailed insights and valuable perspectives, enabling a comprehensive exploration of the entrepreneurial ecosystem in Bangladesh. By embracing these recommendations, future research can bridge the gaps in current understanding, leading to a more holistic knowledge base on entrepreneurial success and its determinants in Bangladesh.

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Appendix

EM1	Entrepreneurial knowledge and awareness
EM2	Risk tolerance and adaptability
EF1	Successful implementations of business strategies
EF2	Efficiency of business performance
SCF1	Impact of traditional family structures
SCF2	Gender roles and expectations
SCF3	Religious and caste-based practices
SCF4	Cultural context
SCF5	Family networks and connections
SCF6	Restrictions on female entrepreneurs

SCF7	Belief and attitude
SCF8	Decision-making processes
SCF9	Leveraging cultural practices and traditions
SCF10	Influence of customs on business operations
SCF11	Cultural practices and traditions
IF1	Policy and support organizations

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Examining the Dynamics of Sensex and BRICS Stock Market: A Study on Interdependencies using VAR Framework

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Abstract

Aim: This study examines the long-run equilibrium relationship between the S&P BSE Sensex and BRICS stock markets using the Vector Autoregressive (VAR) framework. It also examines short-run relationships through causality models.

Methodology: To achieve the stated objectives, the researchers collected data from the Bloomberg database spanning January 2000 to September 2024. The collected data was tested for the existence of a unit root by running an ADF test, confirming the data's order of integration as I(1). Accordingly, the Vector Auto Regression framework was employed to examine the long-run relationship. Furthermore, to investigate the short-run relationship, Granger causality, IRF, and variance decomposition analysis were conducted.

Findings: Although the Johansen co-integration test results reveal a co-integrating vector, the error correction model reveals that Sensex does not share any long-run co-integration with BRICS stock markets and Sensex is largely driven by internal factors. However, short-run results indicate only MOEX and SSE significantly influence Sensex, while Variance Decomposition results demonstrate over ninety-five per cent variance of Sensex is driven by its internal factors, emphasising its limited dependence on BRICS stock markets.

Policy Implications: The results indicate that the policymakers should prioritise strengthening the stability of the domestic market to enhance resilience against global shocks. Moreover, fostering targeted collaboration with BRICS nations, specifically those with notable short-term influences such as MOEX and SSC, could assist in managing interdependencies very effectively.

Originality and Value: The current study offers original perspectives on the interlinkage between Sensex and BRICS stock markets, contributing to a deeper understanding of their dynamic long-run and short-run relationships. Furthermore, by applying advanced econometric tools like VAR, Granger causality, and IRF, it contributes to the existing literature on interconnectedness of BRICS stock markets and emphasises the relative independence of the Sensex.

Keywords: BRICS, Emerging Markets, Granger Causality, MOEX, Stock Market Integration, VAR Framework

JEL Classification Code: G10, G15, C32, F36

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Introduction

BRICS is an acronym for Brazil, Russia, India, China, and South Africa, formed from the first letters of these five powerful emerging economies of the world. BRICS epitomise an important force in the global economy, accounting for approximately 25 per cent of global GDP and 40 per cent of the global population, dazzling economic potential and demographic to cater to and bank upon (O'Neill, 2001; Wilson & Purushothaman, 2003). A study by Wilson & Purushothaman (2003) revealed that if the current path holds, the BRICS economy could become a significant player in the global economy. For instance, India's economy might overtake Japan's by 2032, while China's might exceed that of the US by 2041. Now, BRICS emerging as an important counterforce to the Western-dominated global financial market structures, aggressively working to reform global economic governance, including the creation of the New Development Bank (NDB), intended to fund infra-structure projects in developing nations (Cooper, 2016; Luna, 2020; Han & Papa, 2022). It also created the Contingent Reserve Agreement (CRA) to address the balance of payment crisis. In addition, the BRICS have even more aligned their policies on a wide range of burning issues such as education, agriculture, healthcare, and security (Han & Papa, 2022). Given their diverse economic fundamentals such as China's leadership in manufacturing, Russia's dominance defence exports, India's leadership in IT and IT enabled infrastructure to Brazil's agricultural exports the BRICS are strategically placed to complement each other, generating opportunities for greater trade and investment (Sharma, 2016; Stuenkel, 2020). However, the BRICS bloc faces major challenges, such as economic inequalities, geopolitical tensions, and sustainability issues, which emphasise the grave need for enhanced collaboration and strategic policy alignment within the trade bloc (Armijo 2007; Hopewell, 2015; Scholvin & Wigell, 2018). Addressing these challenges necessitates a unified framework that prioritises both economic and environmental objectives, nurturing resilience and inclusivity in a speedily changing scenario (Mielniczuk, 2013). As globalisation progresses, the BRICS trade bloc plays a vital role in driving economic growth and increasing the voices of developing and underdeveloped economies in the global arenas (Mielniczuk, 2013; Armijo & Roberts, 2014; Xing, 2019; Özekin & Sune, 2023; Rodriguez-Triocci, 2024).

Stock market integration denotes the process by which stock markets across the globe become more unified and interconnected, with security prices moving in response to shared global issues rather than being driven merely by local or regional specific factors. Many researchers concluded that the main driving force behind stock market integration is the advancement in information technology. These developments have not just driven stock markets towards risk diversification but also enhanced asset allocation

strategies and encouraged increased investment alternatives (Bekaert *et al.*, 2005, 2013; Arouri *et al.*, 2011). In addition, factors such as increased capital flow in the form of foreign direct investment and FIIs, liberalisation of financial markets (Saunders & Walter, 2002), which allow investors to diversify their portfolio across borders (Bekaert *et al.*, 2023). Additionally, examining stock market interlinkages among BRICS not only offers valuable insights into the economic synchronisation and likely to shed light on how major global financial events, such as policy announcements or shifts, economic crisis, affect the volatility and stability of the emerging markets (Singh *et al.*, 2022; Kaur *et al.*, 2023). As the BRICS economies deepen their financial collaboration, it is vital to investigate the extent of their stock market interconnectedness, predominantly in the context of cross-border trade, strategies for financial integration, and investment flow. In addition, BRICS markets have become very crucial economies due to their speedy growth, colossal population, and rise in contribution to global GDP, investment, etc., stressing the significance of studying their integration to understand the global stock market dynamics (Wilson & Purushothaman, 2003; Aizenman *et al.*, 2013). The integration of stock markets intensifies contagion risk, especially during financial crises, among BRICS economies, offering a valuable insight for understanding volatility transmission and market responses to such shocks (Bekaert & Harvey, 2000). Furthermore, understanding stock market integration within BRICS informs policy decisions intended at promoting economic resilience, such as mutual trade agreements, currency swaps, and promoting big financial institutions such as the BRICS Bank (NDB). These policy implications are likely to reduce dependency on highly organised Western financial systems and enhance regional cooperation (Chakrabarti & Sen, 2012; Gallagher, 2016; Stunkel, 2017). The dynamic linkage among BRICS markets offers stock market participants to diversify their portfolio and mitigate risk. Analysing BSE Sensex's relationship with other BRICS stock markets assists in understanding co-movement patterns and refining investment tactics (Mishra, 2012; Bekaert & Harvey, 2017; Maiti *et al.*, 2022; Sahoo & Kumar, 2022; Younis *et al.*, 2023). Moreover, advancements in information technology and its applications in the stock market, such as high-frequency trading and digital platforms, have augmented stock market interdependence, making it very essential to analyse these evolving dynamics (Arner *et al.*, 2015). Despite significant literature available on interlinkages of developed with emerging stock markets, research studies on BRICS stock market integration remain relatively unexplored. The majority of the studies aimed at individual market behaviours or spillover effects, overlooking interconnectedness and their implications for stock market stability (Bekaert & Harvey, 2017; Choudhary, 2018).

Finally, the reminder of the paper is organised as follows: part two discusses the literature review and raises the research questions, part three briefs out the research methodology employed for the study, part four aims on analysis of the collected data, and finally part five discusses the major findings with policy implications and draws conclusions.

Literature Review

A major chunk of the literature available on the stock market integration mainly focuses on the interlinkage of developed stock markets (Koch

& Koch, 1991; Masih & Masih, 1997; Francis & Leachman, 1998; Bracker *et al.*, 1999; Horvath & Petrovski, 2013; Lehkonen, 2015; Ma *et al.*, 2019; Marfatia, 2020) or interconnectedness of emerging markets with that of developed stock markets (Yang *et al.*, 2003; Mukherjee & Mishra, 2007; Awokuse *et al.*, 2009; Liu, 2013; He *et al.*, 2014; Al Nasser & Hajilee 2016; Zhang *et al.*, 2017; Patel, 2019). However, there is a relatively scarce number of empirical studies explicitly addressing the stock market interconnectedness within developing stock markets themselves, mainly among the BRICS nations. While previous studies primarily aimed at the integration of developed stock markets or emerging markets with developed stock markets, more recent literature has shifted attention to the dynamic interconnectedness within the BRICS market itself. Therefore, the stock market integration or interlinkage of BRICS markets has become a central point of empirical studies as these evolving economies seek to augment economic interlinkage and global competitiveness (Sharma *et al.*, 2011; Dasgupta, 2014; Singh & Singh, 2016; Ouattara 2017; Aggarwal & Raja, 2019; Gopane 2023; Singh *et al.*, 2022). The integration among BRICS markets not only fosters superior economic cooperation but is also likely to increase market efficiency and much-needed stability by providing diversified investment opportunities (Bekaert & Harvey, 2000). Studying developing stock markets, specifically the BRICS bloc, has gained momentum due to their increasing share in trade, investment flows, and share in global GDP (Wilson & Purushothaman, 2003). Furthermore, these economies, accounting for a significant share of global economic output and population play a very vital role in understanding dynamic market linkages, which are crucial for assessing financial stability, growth potential, and diversification of portfolios (O'Neill, 2001; Bekaert & Harvey, 2017; Choudhary *et al.*, 2020). Additionally, the interconnectedness of BRICS nations in the global financial system has deepened, making it a vital link to analyse their stock market interdependencies to better understand the transmission of global market shock waves, volatility spillover, and cross-border capital mobility (Bekaert & Harvey, 2000; Choudhary *et al.*, 2020). According to Stuenkel (2017), the BRICS economies' remarkable economic growth, demographics, and rising capital and financial markets have made them significant players in determining the future of cross-border trade and finance. The BRICS economies have arisen as key players in the global economy, with major contributions to global trade, GDP, and capital mobility (Wilson & Purushothaman, 2003). The BRICS nations have experienced extraordinary growth over the past few decades, mainly due to reforms, rapid industrialisation, and increasing consumer markets. In addition, BRICS nations jointly represent a large portion of the world's population and economic output, making their financial systems important to the international financial ecosystem (Aizenman *et al.*, 2013; Aizenman, 2015). The stock markets in BRICS nations, mainly those in China and India, have become important centres for global investment flows. According to Bekaert & Harvey (2000) and Stuenkel (2017), the increasing stock market interconnectedness of these emerging markets in the global arena has significantly increased their influence in global trade and investment, providing both opportunities and challenges for policymakers and investors.

The study of global stock market interlinkage has evolved from concentrating on developed stock markets to probing developing stock

markets like BRICS, mainly influenced by their swift growth, favourable economic policies, trade linkages, capital inflows, *etc*. (Arouri *et al.*, 2011). This paradigm shift emphasises the importance of understanding their changing role in global stability in financial markets. The financial crisis, such as the 1997 crisis of Asia and the 2005 sub-prime crisis, has further emphasised the importance of understanding stock market interconnectedness. These financial crises emphasised how shock waves creating in one part of the globe could cascade through interlinked global financial markets, affecting developed and developing markets alike (Bekaert & Harvey, 2000; Ng, 2000; Chancharoenchai & Dibooglu, 2006; Hwang *et al.*, 2011; Chiang *et al.*, 2013; Wang & Liu, 2016; Kao *et al.*, 2019). However, a few studies, for example, Xu & Hamori, 2012, Nikkinen *et al.*, 2013, Bergmann *et al.*, 2015, Mensi *et al.*, 2016, Kishor & Singh, 2017, Arora & Kalsie, 2018, have investigated how the BRICS nations' stock markets reacted to the global shock waves, emphasising the increasing co-movements of their markets with global market trends. In addition, the rapid stock market integration among BRICS nations has been shown to have important implications for risk management and financial market efficiency, emphasising the importance of this domain for more pronounced research (Ng, 2000). Recent empirical investigations emphasise the impact of macroeconomic variables, policy announcements (Dakhlaoui & Aloui, 2016; Mbangata & Kanayo, 2017; Yuan *et al.*, 2022; Gupta *et al.*, 2023), and geopolitical issues (Balcilar *et al.*, 2018; Zhang & Hamori, 2022; Feng *et al.*, 2023; Li *et al.*, 2024) on BRICS stock market integration, stressing both opportunities for collaboration and major challenges arising from structural differences. Most of these studies concluded that the growing attention on developing markets emphasises the major role of BRICS nations in reforming global market dynamics and shaping global financial integration (O'Neill, 2001). In a study by Wang and Wang (2024) investigated the interlinkage between BRICS economies, interest rate, investors sentiments, and cryptocurrencies, found a very strong information spillover during crisis period such as COVID-19. To explore the relationship, they employed a time-varying vector autoregression. They found a strong interconnectedness during highly uncertain periods like COVID-19, with minimal or virtually no impact on the US stock market. Several studies, for example, Bagchi (2017), Aggarwal and Raja (2019), Panda and Thiripalraju (2018), Qamruzzaman *et al.* (2021), Panda *et al.* (2021), Khan (2023), employed econometric tools such as ARCH, GARCH, DCC-MGARCH modelling framework to investigate the information spillover and its impact on BRICS markets. The findings from these studies confirmed that there was information spillover among the BRICS economies. These results emphasise the significant cross-market dependency, stressing the volatility policy framework to manage within the BRICS economies. Despite increasing stock market integration, major challenges continue. Differences in financial infrastructure, non-unified policy framework, extensive regulations, and external economic pressures continue to limit the accomplishment of BRICS stock market integration. Numerous studies have tried to investigate the integration of the BRICS stock market under Vector Autoregressive and Bayesian VAR models, yielding mixed results regarding the interlinkage among these economies. On one hand, Chittedi (2010), Sharma *et al.* (2013), Çakır and Kabundi (2013),

Dasgupta (2014), Singh and Singh (2016), and Singh *et al.* (2022) found an interconnectedness among the BRICS stock indices. These results confirm that shocks in one stock market are likely to affect others, supporting the proposed hypothesis of deeper interconnectedness within the BRICS bloc. However, other studies, such as Ouattara (2017), Konradsson & Porss (2019), and Malik and Sah (2023) using VAR models have contradicted the notion of stock market integration. They found only short-run evidence, and in the long run, they found significant structural differences.

Stuenkel (2017) emphasises the collective effort of BRICS economies on minimising excessive reliance on the U.S. dollar, and creating alternative platforms can create opportunities for deeper cooperation. Therefore, the connectedness of BRICS stock markets exhibits a very dynamic relationship of economic policies, geoeconomic interaction, and other global risk factors. While significant progress has been made, economic disparities and global uncertainties continue to guide the path of BRICS stock market integration.

Based on the above literature on BRICS stock market linkage, considering the VAR framework with a focus on both long and short-run relationships between BSE Sensex and BRICS economies, the following research questions have been raised to be addressed in the current study:

1. How do various global economic developments and policy shifts in BRICS nations influence the long-run equilibrium equation between the BSE Sensex and BRICS stock indices?
2. What role do regulatory structure and domestic policy framework in BRICS nations play in shaping short-run interconnectedness with the BSE Sensex?

The above two valid research questions cover both global economic events and policy regulations at regional levels that bind the financial integration of the Sensex with BRICS stock indices. Therefore, a deeper understanding of this interconnectedness is strategically very vital for policymakers, investors, and various major financial institutions (Wilson & Purushothaman, 2003; Stuenkel, 2017).

Research Design

The main scope of the current empirical study is to investigate the long-term relationship of Sensex with the BRICS stock market under VAR framework using indices such as Sensex (India) and SSE Index (China), MOEX (Russia), JSE-40 (South Africa), and Bovespa (Brazil) to capture the integration. Furthermore, to capture the short-run causal relationship of Sensex with BRICS stock indices by running short-run causality models. In addition to evaluating the policy implications of financial integration among the BRICS stock markets. To realise the stated objectives, the researcher collected data spanning from January 2000 to September 2024 from Bloomberg's financial database. To investigate the existence of unit root in the collected time series data, the Augmented Dicky-Fuller (ADF) test was run (Dickey & Fuller, 1979; Said & Dickey, 1984), which is widely used method to determine whether a time series is stationary or not (Kwiatkowski *et al.*, 1992). The general form of the ADF equation was as follows:

$$\Delta y_t = \alpha + \beta t + Y y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-1} + \varepsilon_t$$

where, y_t is the time series dataset under investigation, $\Delta y_{t=} y_t - y_{t-1}$ is the first difference of the series (to convert the data set into stationary), α is the constant term, βt is a deterministic trend component, γ is the coefficient of the lagged DV, $y_{t-1,}$ which tests for the existence of a unit root. is a sum of lagged differences of y_t, and ε_t is the error term. The H0: γ=0 (Which means the dataset is non-stationary). The results indicated that the data has a unit root at the level form, confirming the non-stationary nature of the dataset. Therefore, the dataset was first differenced to achieve stationarity as recommended by Nelson & Plosser (1982). Following the first differenced transformation, the time series data became stationary, making it suitable for further examinations by applying econometric models to explore the interlinkages of the BRICS stock markets.

The VAR model is strongly recommended for analysing the datasets that are integrated of order I (1), as it is expected to allow for the existence of both short-run (explained by lagged values) and long-run equilibrium relationships (Johansen & Juselius, 1991). While running the VAR model, the first step is determining the optimal lag length by using AIC, SIC, and HQ criteria (Heino & Anders, 2014). The following are the criterion equations in determining the optimal lag length in a VAR model that balances the trade-off between model fit and complexity:

Akaike Information Criterion (AIC)

$$AIC_{(p)} = -2\ln\ \ln\ (L) + 2p$$

L is the maximum likelihood; *p* is the number of parameters, including lags.

Schwarz Information Criterion (SIC) or Bayesian Information Criterion (BIC):

$$BIC_{(p)} = -2\ \ln\ \ln\ (L)\ + p\ \ln(N)$$

Where, N is the number of observations

Hannan-Quinn Criterion (HQ)

$$HQ_{(p)} = -2\ln\ \ln\ (L)\ + 2p\ \ln(\ln\ \ln\ (N)\ )$$

HQ is a middle point between AIC and BIC.

A smaller value indicates a better model.

The following is the general form of the VAR model.

$$Y_{(t)} = c + \sum_{(i=1)}^{p} A_i Y_{t-i} + \varepsilon_t$$

where, Y_t is a vector of *k* time series variables, C is the constant term, and Ai is A *k* x *k* matrix of coefficients for the *i*th lag. ε_t is the error term, and p is the lag order of the VAR model, signifying how many past observations are included (Stock & Watson, 2001).

The Johansen cointegration test is applied to determine the number of cointegrating vectors between a set of non-stationary datasets (Johansen, 1988). It is performed by applying the following equation:

$$\Delta Y_t = \prod Y_{t-1} + \sum_{(i=1)}^{(p-1)} \Gamma_i \Delta Y_{t-1} + \varepsilon_t$$

where, is the differenced series (T_t -Y_{t-1}), = α, where, α represents the adjustment speer to the long-run equilibrium, and is a cointegrating vector. is the short-run coefficient matrix. The rank of decides the number of cointegrating relationships. The test involves evaluating the eigenvalues of through two statistics (Johansen & Juselius, 1990):

Trace Statistic $= -T\Sigma_{(i=r+1)}^{k} ln?(1-\lambda_i)$

Table 1. Descriptive Statistics of the World's Major Indices

	Sensex	Moex	SSC	JSE40	BoVespa
Mean	24758.41	1622.393	2594.382	34503.03	60262.56
Std. Dev.	19369.15	951.4299	852.5693	19819.18	33967.8
Skewness	1.031248	0.34393	0.438676	0.246543	0.382107
Kurtosis	3.33548	2.547938	3.66167	1.938004	2.230277
JB Stats	54.03469	8.384204	14.94349	16.96572	14.55916
Prob.	0.00000	0.015114	0.000569	0.000207	0.000689

Source: Desk research

Table 2. ADF Test Results for Unit Root

Variable	Order of integration	Z(t) Value	pvalue
Sensex	1(1)	-16.30913*	0.0000
Moex	1(1)	-15.38029*	0.0000
SSE	1(1)	-15.84626*	0.0000
JSE 40	1(1)	-15.96577*	0.0000
Bovespa	1(1)	-16.38831*	0.0000

Note: 1%, 5%, and 10% critical values are -3.4546, -2.87212 and -2.57248, respectively

Source: Desk research

Trace statistics are expected to test the null hypothesis that there are at most r cointegrating vectors.

Max Eigenvalue Statistics $= -T \ln(1-\lambda_{r+1})$

This test is expected to test the null hypothesis that there are r cointegrating vectors against the alternative r +1. In this case λ_i are eigenvalues, and T is the number of observations.

If there is a cointegration, we are expected to run the Vector Error Correction Model to model the equilibrium relationship (Engle & Granger, 1987; Hamilton, 2020).

$$\Delta Y_t = \alpha(\beta' Y_{t-1}) + \sum_{(i=1)}^{(p-1)} \Gamma_i \Delta Y_{t-1} + \varepsilon_t$$

where, α is the adjustment coefficient, β is the cointegrating matrix, and Γ_{is} coefficient of the short-run relationship. Note that the VECM captures both the short and long run relationship (through $\alpha \beta' Y_{t-1}$).

The Toda-Yamamoto method is applied to test for Granger causality in the presence of a non-stationary dataset of the VAR framework (Toda & Yamamoto, 1995). The following equation is applied to determine the relationship:

$$Y_t = \sum_{t=1}^{p+d_{max}} A_i Y_{(t-i)} + \varepsilon_t$$

Y_t is the vector of the endogenous variable, Ai are the coefficient matrix and ε_t is the error component.

Impulse Response Function: This measures the response of a variable under study in a VAR framework to a one-time shock in another variable under study, while holding all other shocks constant (Sims, 1980). The equation is a derivative of the MA function in the VAR framework.

$$Y_t = u + \sum_{}^{\infty} \Psi\, u_{t-1}$$

where, $(\Psi_i^0) = \phi_1 \Psi_{i-1} + \phi_2 \Psi_{i-2} + \ldots \phi_p \Psi_{i-p}$ represents the impulse response coefficients recursively

Table 3. VAR Lag Selection Criteria

Lag	LogR	LR	FPE	AIC	SC	HQ
0	-13629.8	NA	6.56E+34	94.3582	94.42163	94.38362
1	-11485.9	4198.718	2.81E+28	79.69475	80.07535*	79.84725*
2	-11462.2	45.60421	2.84E+28	79.70372	80.40148	79.98331
3	-11435.6	50.30474	2.80E+28	79.69246	80.70739	80.09914
4	-11413.9	40.1991	2.87E+28	79.71547	81.04757	80.24924
5	-11385	52.64416	2.80E+28	79.68832	81.33757	80.34916
6	-11351	60.65935	2.63e+28*	79.62621*	81.59263	80.41415
7	-11336.1	26.0527	2.83E+28	79.69625	81.97983	80.61127
8	-11301.3	59.83200*	2.65E+28	79.628	82.22875	80.67011

Source: Desk research

Table 4. Johansen Cointegration Test among the BRICS Indices

R	Eigenvalue	Trace Statistics	Critical Value (5%)	Max-Eigen Statistic	Crit Value (5%)	Result
r = 0	0.107244	79.033*	69.819	33.011*	31.876	Co-integrated
r = 1	0.07866	46.022*	47.86	23.840*	27.584	

'r' =no of co-integrating vectors

** Statistically significant at the 5 per cent level*

Source: Desk research

calculated from the VAR, and is the structural shocks.

Forecast Error Variance Decomposition, popularly known as Variance decomposition, measures the proportion of a variable's forecast error variance accredited to shocks in each variable in the VAR system (Diebold, 1998). The h-step-ahead forecast error variance decomposition for variable j is:

$$VD_{j,h}(k) = \frac{\sum_{i=0}^{h-1} (\Psi i, jk)^2 \sigma_k^2}{\sum_{k=1}^{n} \sum_{i=0}^{h-1} (\Psi i, jk)^2 \sigma_k^2}$$

$\Psi_{i,jk}$ are the impulse coefficient of variable j to a shock in variable k, σ_k^2 is the variance of the shock, and h is the forecast horizon.

Data Analysis

Table 1 presents the descriptive statistics for the BRICS major indices. Among BRICS Indices, the Sensex has a mean Adj closing price of 24,758.41 with a standard deviation of 19,369.15, indicating large price swings. Skewness of 1.031 suggests rarer higher prices, and a kurtosis value of 3.34 indicates more extreme values than a standard normal distribution. A Jarque-Bera value of 54.03 ($p<0.001$) confirms the

Table 5. Estimating Long Run Equilibrium Relationship (Least Squares (Gauss-Newton/ Marquardt steps)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.015756	0.080136	12.67533	0.0000
C(2)	0.05473	0.411303	0.133064	0.8942
C(3)	-1.62982	0.802186	-2.03172	0.0432
C(4)	-0.00302	0.057146	-0.05288	0.9579
C(5)	0.012395	0.026381	0.469832	0.6389
C(6)	-0.17151	0.114966	-1.49183	0.1369
C(7)	0.807977	0.585147	1.38081	0.1685
C(8)	1.612752	1.146502	1.406671	0.1607
C(9)	-0.04541	0.077142	-0.5887	0.5566
C(10)	0.017099	0.040672	0.420404	0.6745
C(11)	0.237985	0.115723	2.056503	0.0407
C(12)	-1.15098	0.58236	-1.9764	0.0491
C(13)	1.441887	1.151	1.252725	0.2114
C(14)	0.054934	0.077213	0.711457	0.4774
C(15)	-0.06143	0.041727	-1.47207	0.1422
C(16)	-0.14925	0.115839	-1.28842	0.1987
C(17)	0.775794	0.593385	1.307405	0.1922
C(18)	0.340755	1.168257	0.291678	0.7708
C(19)	-0.1563	0.076778	-2.03578	0.0428
C(20)	0.040633	0.04072	0.997849	0.3193
C(21)	0.074344	0.083556	0.889748	0.3744
C(22)	-0.73174	0.420498	-1.74018	0.083
C(23)	-1.92894	0.825878	-2.33562	0.0203
C(24)	0.160401	0.056635	2.832179	0.005
C(25)	-0.00269	0.02664	-0.10086	0.9197
C(26)	317.4489	292.5899	1.084962	0.2789

Adjusted R-squared=0.2951, F-statistic=2371.947, Prob (F-statistic)=0.0000, Durbin-Watson stat=2.001356

Source: Desk research

non-normality with heavier tails. The Moex (Russian) average adj. the closing price was 1,622.39 with a lower volatility of 951.43. It has a slight positive skewness with 0.344, and a kurtosis value of 2.55 indicates a near-normal distribution with fewer extremes. The Jarque-Bera test score 8.38 (<0.05) indicates a minor violation of normality. The Chinese premier

index SSC has an average Adj, closing price of 2,594.38 with moderate volatility of 852.57, with a slightly positively skewed 0.439, and a kurtosis of 3.66, indicating more frequent extreme values. The Jarque-Bera value 14.94 ($p<0.01$) confirms non-normality of the distribution. The JSE-40 average price was 34,503.03, with a very high standard deviation of 19,819.18. Skewness of 0.247 indicates slightly right-skewed, and low kurtosis of 1.94 suggests fewer extreme values. The Jarque-Bera value=16.97 ($p<0.01$) confirms non-normality of the data set. The Bovespa has an average Adj. closing price of 60,262.56 with a high volatility of 33,967.8, indicating large price swings. Distribution is slight positive skewness of 0.382, and kurtosis of 2.23, suggesting fewer extreme values. The Jarque-Bera value 14.56 ($p<0.01$) confirms non-normality of the distribution (Jarque & Bera, 1980).

The Augmented Dicky-Fuller test was used to investigate the presence of a unit root in the collected dataset, determining whether the data series was stationary (Dickey & Fuller, 1979). At the level, unit roots were found in all indices; the table above shows the first-differenced values. After first differencing the data set, the Z(t) value for Sensex was 16.31, well above the critical values at the 1%, 5%, and 10% levels, indicating that the series is free from unit roots (Enders, 2008). Similarly, for Moex (Russian index) Z(t) value was 15.38 was well above the critical values, suggesting the series is stationary after the first difference. For SSE, the index shows a Z(t) value of 15.85, again well above the critical values, confirming it is now free from unit roots. JSE 40 index, the Z(t) value was 15.97, well above the critical values at the 1%, 5%, and 10%, indicating that the series is free from unit roots, and finally, the Bovespa index has a Z(t) value was 16.38 was well above the critical values, indicating no unit root in the differenced series. Each index was tested for stationarity with an intercept, trend, and none, ensuring comprehensive results across different model specifications.

Since the time series variables are integrated of order 1(1), it is appropriate to investigate the cointegration (a long run equilibrium relationship among the variables) among them within a Vector Autoregression framework (VAR). To identify the cointegrating vector(s), a Johansen cointegration test is recommended by Johansen (1988); Johansen & Juselius (1990). Furthermore, the VAR model's performance and drawing inference from the results are highly sensitive to lag selection because choosing an incorrect lag length can lead to biased estimates (Lütkepohl, 2005). In addition, selecting too few lags can omit relevant information, resulting in autocorrelated residuals, while too many lags may overfit the model, increasing estimation errors in parameters and reducing the predictive ability of the model (Enders, 2008). Thus, information criteria such as the AIC, SCI, and HQC are widely recommended for determining optimal lag length selection (Enders, 2008; Hamilton, 2010)

Selecting too few lags can omit relevant information, resulting in autocorrelated residuals, while too many lags may overfit the model, increasing parameter estimation errors and reducing predictive power (Enders, 2008). Thus, information criteria such as the Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ) are widely recommended for determining optimal lag length, balancing model fit with parsimony (Hamilton, 2010). These considerations make lag selection a critical component in

the VAR framework for capturing accurate interdependencies among variables.

Lag selection in VAR models relies on several recommended criteria to determine the optimal lag length that balances model fit and parsimony. The following are the key criteria generally recommended: (i) Akaike Information Criteria (Akaike, 1974), Schwarz Criterion (SC) (Schwarz, 1978), and Hannan-Quinn Criterion (HQ) generally recommended for larger datasets (Hannan & Quinn, 1979). It is evident from the above table that the optimal lag selection for the present study was lag 6 as per AIC and FPE. However, HQ and SC recommend lag 1. There is a contradiction among the various criteria in lag selection. This is quite common in VAR modelling because each criterion balances model fit and complexity differently, leading to diverse recommendations. According to Enders (2008), AIC and FPE are more likely to select higher lags to optimise predictive ability, therefore, we are going ahead with AIC and FPE criteria.

The Johansen cointegration test was conducted among the BRICS indices to determine if there exists a long-run equilibrium relationship among them. This test covers two prominent statistics: Trace statistic and the Max-Eigen statistic, each evaluated against their respective critical values as follows:

At r=0, the trace statistic is 79.033, which is greater than the critical value 69.819, and the Max-Eigen statistic is 33.011, surpassing the critical value of 31.876. Since both values are statistically significant at the 5% level, this indicates the rejection of the null hypothesis, suggesting the presence of at least one cointegrating vector among the BRICS indices. At r=1, the trace statistic is 46.022, which is less than the critical value 47.86, and the Max-Eigen statistic is 23.84, which is also below its critical value of 27.584, indicating that we fail to reject the null hypothesis at this level. The test results imply that there is no evidence for more than one cointegrating relationship.

Based on the results, we concluded that there exists a single cointegrating vector among the BRICS indices, meaning that these indices share a stable relationship. However, it does not by itself provide the dynamics of the long-run or short-run relationships among the indices. Therefore, the Vector Error Correction Model (VECM) is employed to investigate the long-run and short-run relationships among the indices.

The VECM results revealed that the coefficient for the first lag (β=1.015, t=12.68) was significant, the second lag (β=-0.1715, t=-1.49) was not significant, the third lag (β=0.2379, t=2.056) was significant, lag four (β=-0.149, t=1.288) was not significant, and lag five (β=0.0743, t=0.8897) was not significant. The VECM results indicate that Sensex's current value is influenced by its first and third lags, subsequent lags have mixed impacts and lower statistical significance. The SSC's only third lag (β=-1.15, t=1.9764) has a significant impact on Sensex value (possibly due to interdependence between Asian markets), other lags have very little or weaker statistical explanatory power. The VECM results suggest that the immediate past MOEX (-1) (β=-1.6298, t=2.031) and the five-period lag MOEX (-5) (β=-1.9289, t=2.3356) of MOEX exert a significant negative influence on Sensex. This implies that certain immediate and delayed adjustments in the MOEX market conditions have a significant impact on the Indian stock market, possibly due to global economic factors. The other lags of MOEX (-2), (-3), and (-4) show no statistical impact on Sensex. The JSE-40 lag four

(β=-0.1563, t=2.03578) and lag 5 (β=0.1604, t=2.8322) appear to have statistically significant effects on Sensex, with JSE-40 (-4) contributing a negative and JSE-40 (-5) contributing a positive impact on Sensex. However, the first three lags of JSE-40 show either weak or no statistically significant impact on Sensex. However, none of the lags of Bovespa show a statistically significant impact on Sensex based on the t-statistics. The coefficients, although varied, are too small, and the t-values do not exceed the threshold for statistical significance for every lag, suggesting no meaningful relationship.

The Sensex coefficient for C (1) is 1.016, which is positive and statistically significant (β=1.016, t=12.675, p=0.000). The positive sign indicates that Sensex tends to persist at its previous level, implying a non-mean-reverting behaviour. This indicates that the Indian stock market index, Sensex, is not cointegrated with the other BRICS members. If the variables are cointegrated, the coefficient reflects the adjustment mechanism that confirms the variables move back toward their long-term equilibrium relationship after experiencing short-term fluctuations (Engle & Granger, 1987; Pesaran & Shin, 1995; Maddala, 1998). The Past value of the MOEX index (β=-1.6298, t=-2.0317, p=0.0432) has a negative impact on the Sensex. The third lag of Sensex (-3) positively influences the current value (β=0.237985, t=2.056503, p=0.0407). Similarly, past values of SSC (-3) (β=-1.151, t=-1.9764, p=0.0428) have a negative effect on Sensex. The fourth lag of JSE-40 (-4) also negatively impacts Sensex (β=-0.1563, t=-2.0358, p=0.0428). The fifth lag of MOEX (-5) also negatively impacts Sensex (β=-1.9289, t=-2.3356, p=0.0203), and the fifth lag of JSE-40 (-5) positively impacts Sensex (β=0.1604, t=2.832, p=0.005). Therefore, the results confirm that Sensex's current value is significantly influenced by the third lag, while other BRICS indices also contribute as independent variables in the model.

Table 6. Wald Test Results

Test Statistics	Value	df	P
F	133.107	(24, 266)	0.0000
Chi-Sq	3194.568	24	0.0000

Source: Desk research

Table 7. VAR Granger Causality/ Block Exogeneity Wald Test

Excluded	Chi-Sq	df	P
SSE	6.905	2	0.0317
MOEX	6.676	2	0.0355
JSE	1.465	2	0.4807
Bovespa	0.470	2	0.7904
All	14.133	8	0.0784

Source: Desk research

The Wald test results show a significant model effect, $F(24, 266) = 133.107$, $p<0.001$, indicating that the model is statistically significant. The $\chi^2(24) = 3194.57$, $p<0.001$, further confirms the overall significance of the model. The test results indicate that the model, including all the variables and their lags, is highly significant in explaining the change in Sensex. The rejection of the null hypothesis reinforces the relevance of the included independent variables and their lags (Wald, 1943; Wooldridge, 2010).

Diagnostic Checking

A diagnostic check was made by running the various residual tests. First was a correlogram of Q-statistics (Ljung-Box test) to capture whether the VAR model has adequately captured the autocorrelation structure of the

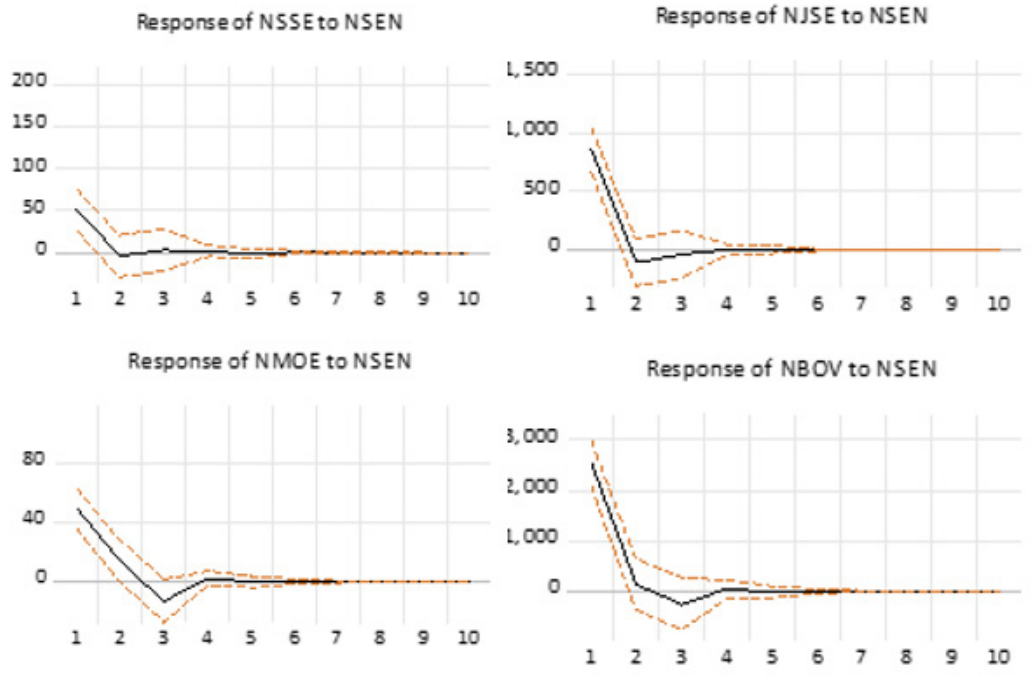

Figure 1. Impulse Response Function.
Source: Desk research

data. The p value for the proposed model is greater than 0.05, indicating that there was no significant autocorrelation in the residuals at the tested lags (Ljung & Box, 1978; Enders, 2008). For the second test, the correlogram of squared residuals, the pvalues are greater than 0.05, indicating that there was no significant evidence of heteroscedasticity in the residuals at the tested lags (Engle, 1982; Brooks, 2019). For the third residual test, the Jarque-Bera test stats was 116.023 with a p-value of 0.000 (<0.001) signifies that the residuals deviate significantly from normality, suggesting the presence of non-normality in the model's errors (Jarque-Bera, 1980; Brooks, 2019). In order to investigate the existence of serial correlation in the data set, the researchers have employed the Breusch-Godfrey Serial Correlation LM test. The F (2, 264) = 0.9548, p= 0.2203 (>0.05) and the Obs*R-squared=0.4941, p=0.2143 (>0.05) both fail to reject the null hypothesis, suggesting that the model residuals do not exhibit autocorrelations (Breusch, 1978; Godfrey, 1978). Finally, the ARCH test was conducted to investigate the existence of homoskedasticity of the time series data. The ARCH F (1,289)=0.64905, p=0.5267 and Obst*R-squared=0.27518, p=0.5108 (>0.05) both fail to reject the null hypothesis. This suggests that the variance of the residuals is homoscedasticity, supporting the assumptions of constant variance across observations (Engle, 1982). In the residual diagnostic checks, all tests indicated satisfactory results, except for

Table 8. Variance Decomposition of Sensex

Period	S.E.	NSEN	NSSE	NMOE	NJSE	NBOV
1	1395.73	100.0000	0.0000	0.0000	0.0000	0.0000
2	1410.62	97.9357	0.0038	2.0136	0.0000	0.0469
3	1431.58	95.4833	1.8617	2.1281	0.3042	0.2227
4	1432.13	95.4517	1.8618	2.1269	0.3370	0.2225
5	1432.72	95.3734	1.8738	2.1768	0.3369	0.2391
6	1432.77	95.3665	1.8768	2.1779	0.3376	0.2411
7	1432.81	95.3623	1.8780	2.1795	0.3383	0.2419
8	1432.81	95.3616	1.8782	2.1798	0.3383	0.2421
9	1432.81	95.3613	1.8782	2.1800	0.3383	0.2421
10	1432.82	95.3613	1.8782	2.1800	0.3383	0.2422

Source: Desk research

the normality of the residuals, which showed a significant deviation from normality.

In the next phase, the short-run causal dynamics within the VAR framework, tools such as Granger causality, Impulse response function, and variance decomposition offer meaningful insights to the short-run relationship. The lag selection criteria record the lowest values for AIC, FPE, and HQE, for lag 1, indicating it as the optimal lag for this model. These criteria aim to balance goodness of fit and model complexity, favouring simpler models when performance is comparable.

Granger causality tests help determine if past values of one variable significantly predict another, identifying short-run directional relationships without establishing a long-run equilibrium (Granger, 1969; Sims, 1980). SSE χ^2=6.905, p=0.0317 (<0.05) and MOEX χ^2=6.676, p=0.0355 (<0.05) display statistically significant causality on the dependent variable (BSE Sensex), indicating that their past values have predictive power for movements in Sensex. This suggests short-run causal linkages, indicating that changes in these markets influence Sensex dynamics. However, JSE-40 χ^2=1.465, p=0.4807 (>0.05) and Bovespa χ^2=0470, p=0.7904 (>0.05) do not significantly Granger-cause Sensex, indicating their past values lack predictive power for Sensex. These results suggest a weaker short-run causal relationship between these variables and the Sensex. The combined effect of all the predictors is marginally non-significant χ^2 = 14.133, p=0.0784 (>0.05), signifying that while individual markets like SSE, MOEX have a causal relationship, the collective contribution of all variables together does not strongly predict Sensex. The findings seem to agree with the literature on financial cointegration and interdependence in global equity markets (Granger, 1969; Sims, 1980). Non-significance of others like NJSE and Bovespa suggest regional variations in influence (Bekaert & Harvey, 1995; Eun & Shim, 1989), possibly due to differing market structure or economic conditions (Chen *et al.*, 1986; Forbes & Ribbon, 2002; Brooks & Del Negro, 2004).

The impulse response function analysis reveals that shocks from different stock markets have varying durations of influence on the Sensex. Specifically, a shock from the SSE to the Sensex lasts for 9 days, the JSE-40 to the Sensex for 6 days, the MOEX for 7 days, and the Bovespa for approximately 7.5 days. These results suggest that the Sensex experiences short-run responses to external market shocks, with the SSE having the most prolonged influence. The above results exhibit the complex interlinkage of global stock markets and the varying extent to which shocks from different regions can affect emerging markets like India. These findings seem to agree with the earlier research studies (Bekaert & Harvey, 1995; Eun & Shim, 1989; Forbes & Ribbon, 2002)

The variance decomposition results of Sensex reveal that it explains most of its variance, consistently accounting for around 95.36% to 97.94%, that is, starting at 100% in period 1 and stabilising at 95.36% by period 10. The Russian MOEX exerts the most external shock 2.18%, followed by SSE 1.88%, while South African Index JSE-40 accounts for 0.34%, and Brazil's Bovespa accounts for -0.24% have negligible impact on the volatility of Sensex, indicating a low degree of interdependence between Sensex and the BRICS nations in the short to medium term. Particularly, the spillover influence of BRICS markets such as NJSE40 and Bovespa remains consistently low (about 0.34% and 0.24%, respectively) across the study periods, which suggests limited spillover effects from these markets on the Sensex during this time. This analysis confirms that the Sensex is driven by its internal dynamics, which limits the impact from BRIC markets. These results may indicate a relatively low level of market integration or weaker financial linkages between the Sensex and BRICS stock markets during the period under review. These findings align with the earlier studies that suggest emerging market indices like the Sensex can often exhibit stronger self-driven volatility compared to Western higher-integrated stock markets (Forbes & Rigobon, 2002; Sharma *et al.*, 2011; Singh *et al.*, 2022).

Diagnostic Checking

After investigating short-run VAR models, it is vital to investigate diagnostic checks to ensure the model's robustness. The first test conducted was VAR Residual Portmanteau Tests for Autocorrelations. The results revealed, the values of Q-Stat (33.665) and Adj Q-Stat (33.99) with p=0.115 and 0.108, respectively, suggest that there was no significant autocorrelation at the 5% level. These results indicate that the error terms are not serially correlated (Kilian & Lutkepohl, 2017). The second test conducted was the VAR residual serial correlation LM Test to investigate the presence of autocorrelation in the errors at different lags. For lag 1, the LRE stats=8.42, p=0.1452, indicating no autocorrelation, while for lag 2, the LRE stats=9.32, p=0.2341, and at lag 3, the LRE stats=31.36, p=0.1772 indicate no significant autocorrelation in the data set. The third diagnostic check conducted was the VAR residual heteroskedasticity test, which reveals non-significant heteroskedasticity in the residuals. The joint test has a Chi-square statistic of 21.34 (df=300), p=0.3542, indicating no evidence of heteroskedasticity in the dataset. At the individual level, most variables do not exhibit significant Chi-square statistics with a pvalue above 0.05, confirming the absence of heteroskedasticity in both their levels and interactions. Finally, the VAR residual normality test indicates a clear rejection of the null

hypothesis that the residuals are multivariate normal. For individual components, both skewness and kurtosis exhibit significant Chi-square statistics with p value well below 0.05, suggesting deviation from normality. The joint tests for skewness, kurtosis and the combined Jarque-Bera statistic further confirm the overall non-normality of the residuals, with all p values being 0.000.

Discussion and Conclusion

The current study examines the stock market indices (Sensex, MOEX, JSE-40, SSE, and Bovespa) interlinkages among the BRICS nations, using data spanning from January 2000 to September 2024. The analysis employed a vector autoregressive framework, as we found a unit root at the level. The study findings offer significant insight into the dynamic interrelationships between the Indian stock market (BSE Sensex) and the BRICS stock indices. The Johansen cointegration test results indicate the existence of a single cointegrating vector among the BRICS stock market indices, suggesting a long-run equilibrium model. This suggests that the stock markets of BRICS nations share common underlying trends, due to global economic conditions or shared macroeconomic factors. However, the coefficient of the error term or error correction term indicates a non-mean-reverting behaviour for the BSE Sensex, indicating that deviations from the equilibrium do not strongly adjust back in the long run. The findings also show that Sensex operates largely independently, driven primarily by its internal dynamics. Our findings seem to agree with the findings of Sharma *et al.* (2011); Tripathi & Sethi (2012) in their study found no evidence of cointegration among the markets, indicating that BRICS countries do not share a common stochastic trend. The limited long-run relationship may reflect structural differences in economic environment, market regulations, and investor behaviour across BRICS nations. Furthermore, Forbes & Rigobon (2002); Singh *et al.* (2022) emphasise that emerging markets, such as the BSE Sensex, often display weaker synchronisation with global stock markets compared to other developed stock markets. They also concluded that while BRICS markets may share certain common influences, the unique dynamics of each economy are the chief drivers of their long-run trends. However, in the short run, the MOEX shows a significant negative impact on Sensex at immediate past values (lag -1) and five period lag values (-5), suggesting that short-term adjustments in the Russian stock market affects Sensex negatively. This could be due to global economic factors or geopolitical influences. Similarly, the third lag of SSE exerts a significant negative effect on Sensex, emphasising the influence of the SSE on Indian premier index. On the other hand, the JSE-40 index exhibits a mixed bag of short-run impacts, with significant positive and negative coefficients at lags -5 and -4, respectively. The lack of significant effect from Brazilian index Bovespa exhibits a weaker linkage between the Indian premier indexes. The Granger's test reveals that the MOEX and SSE indices Granger-cause Sensex, indicating the predictive power of past values of SSE and MOEX on Sensex. On the other hand, indices like JSE-40 and Bovespa did not exhibit significant short run causality with Sensex, signifying limited direct influence. The findings revealed that BSE Sensex is more sensitive to certain BRICS indices, exhibiting the economic and financial interdependencies designed by trade, investment, and geopolitical factors. In addition, the Indian stock market is generally influenced by globally dominant

markets such as MOEX and SSE than by the relatively less interconnected markets within BRICS. The Impulse Response Function (IRF) further supports these findings, displaying varying lengths of shocks from BRICS indices on Sensex. SSE shocks persist for 9 days, MOEX for 7 days, JSE-40 for 6 days, and Bovespa for 7 days. These results confirm the limited short-run spillover effects from BRICS indices on Sensex and Sensex adjust very quickly to external influences but do not retain their effects long term. The variance decomposition results demonstrate that Sensex is mainly influenced by its own internal factors, consistently explaining over 95% to 97.94% of its variance. External shocks from MOEX (approximately 2.18%) and SSE (1.88%) have some influence. However, the impact of JSE-40 (0.34%) and Bovespa (-0.24%) is negligible. These findings highlight a low level of market integration between Sensex and BRICS stock indices, signifying that the Indian stock market functions with relative independence.

The study confirms that while there exists a long-term equilibrium relationship among the BRICS premier indices, the Indian stock market is chiefly self-driven, with limited interdependence on other BRICS stock markets. Furthermore, the study confirms a relatively low degree of market integration among BRICS, exhibiting regional economic structure and trade interdependence. Policymakers and investors should consider the limited spillover effects and dominance of internal market dynamics when framing strategies. Future research could possibly explore sectoral linkages and the role of macroeconomic factors in determining these relationships, further enhancing our understanding of financial integration in the BRICS context. Policymakers, on the other hand, must identify the potential vulnerabilities to external shocks, particularly from significant global players like Russia and China, and formulate strategies to increase market resilience by framing robust fiscal and monetary policies. Trade conflict and diversification of supply chains have reduced Chinese dominance over Indian markets. The current study presents evidence that contradicts the assumptions of a long-term equilibrium relationship among BRICS stock markets, stressing India's relatively self-driven internal dynamics. This suggests the need for further research into the effects of policy interventions, external shocks, and the emerging role of technological advancements and post-pandemic financial trends in determining market interdependence.

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Leveraging Digital Marketing Strategies for Personal Branding in India's Linguistically Diverse Market: A Strategic and Empirical Analysis

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Abstract

This study explores the integrative impact of digital marketing tools such as Social Media Usage, Search Engine Optimisation (SEO), Content Marketing Quality, and Consumer Engagement on Personal Brand Influence within India's culturally and linguistically diverse digital market. Using a robust mixed-method approach, data were collected from 260 Indian professionals, entrepreneurs, and students through structured surveys and comprehensively analysed using descriptive statistics, correlation, and regression analyses. Results indicate that Consumer Engagement and Content Marketing Quality have the strongest positive influence on personal branding outcomes, emphasising the necessity for interactive, authentic, and culturally adaptive communication strategies. Furthermore, the study identifies significant gaps in current SEO practices and highlights India's distinct preference for vernacular content. These findings underscore the strategic importance of integrating culturally tailored digital marketing approaches to effectively leverage India's rapidly growing digital market. This research contributes to scholarly literature by providing nuanced insights and actionable strategies for professionals seeking to enhance personal brand visibility, credibility, and influence in culturally diverse markets.

Keywords: Brand Influence, Consumer Engagement, Content Marketing, Cultural Diversity, Digital Marketing, Personal Branding, SEO, Social Media Usage, Vernacular Content

JEL Classification: M31, M37, D83, L82

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Introduction

In the contemporary digital age, personal branding has transitioned from a supplementary practice to a critical strategic imperative for professionals, entrepreneurs, and influencers globally. Leveraging digital marketing tools such as social media, Search Engine Optimisation

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(SEO), and content marketing has empowered individuals to effectively articulate their value propositions, establish authority, and build trust among diverse audiences (Edelman, 2023; Labrecque, Markos, & Milne, 2011). Digital marketing's integration into personal branding activities is widely recognised as instrumental in enhancing visibility, credibility, and professional opportunities within today's hyper-connected and competitive marketplace (Gartner, 2023; McKinsey & Company, 2023).

Despite the global acknowledgement of digital marketing's transformative potential, significant gaps persist in understanding its cumulative effectiveness within culturally diverse and linguistically nuanced markets, such as India. India's digital landscape is notably complex, characterised by rapid internet penetration, significant linguistic diversity, and distinct consumer behaviours (Google-KPMG, 2023; Hootsuite, 2023). Projected to surpass 900 million internet users by 2025, India presents immense potential for leveraging digital marketing in personal branding. However, harnessing this potential necessitates strategies uniquely adapted to local contexts and cultural sensitivities (Internet and Mobile Association of India [IAMAI], 2023).

Despite clear evidence demonstrating the benefits of structured personal branding, a significant gap persists between acknowledgement and practical implementation among Indian professionals. LinkedIn India Insights (2023) indicate that professionally optimised profiles attract approximately 27 times more inquiries and 12 times more views, yet less than 40% of Indian professionals consistently engage in personal branding activities. This indicates a critical gap between perceived importance and strategic application, highlighting the need for culturally adaptive strategies tailored specifically to India's nuanced consumer preferences and digital behaviours.

One of the most prominent challenges in the Indian market is the necessity to accommodate its substantial linguistic and cultural diversity. Research indicates that approximately 70% of Indian digital consumers prefer vernacular or regional-language content, emphasising the strategic necessity of localised digital marketing approaches (Google-KPMG, 2023). The demand for culturally relevant and personalised content underscores the pivotal role content quality and consumer engagement play in the successful execution of personal branding initiatives (Statista, 2023).

Additionally, SEO has emerged as a crucial yet underutilised strategy in the Indian context, where localised, vernacular-specific SEO strategies are essential. With global studies highlighting that approximately 75% of users do not venture beyond the first page of search results, the role of SEO in enhancing online discoverability and credibility becomes indispensable (Chaffey, 2023). However, despite global acknowledgement, the application of these strategic insights within India's culturally diverse digital landscape remains notably limited, warranting further investigation.

The current scholarly discourse predominantly explores digital marketing tools such as social media, SEO, and content marketing independently, often from a Western-centric perspective, with limited emphasis on their combined impact within culturally diverse markets like India (Google-KPMG, 2023; LinkedIn India Insights, 2023). Given the unique cultural, socioeconomic, and digital complexities inherent to the Indian market, this

research aims to bridge these identified gaps by examining the collective impact of social media usage, seo implementation, content marketing quality, and consumer engagement on personal brand influence.

Thus, this study aims to systematically address these gaps by examining how the integrated application of digital marketing strategies influences personal branding outcomes within India's culturally diverse digital ecosystem. Employing a robust mixed-method approach, the research provides a nuanced exploration of the effectiveness of digital strategies, underpinned by theoretical frameworks such as the Technology Acceptance Model (TAM), Social Exchange Theory (SET), Information Foraging Theory, Resource-Based View (RBV), Relationship Marketing Theory, and Impression Management Theory. This comprehensive theoretical integration offers a structured and holistic examination of the complexities associated with personal branding within India's distinct market conditions.

Consequently, this research significantly contributes to the existing body of knowledge by providing evidence-based insights and actionable guidelines for professionals, entrepreneurs, and marketers. Specifically, it emphasises the importance of culturally adaptive, strategically targeted, and linguistically nuanced digital marketing approaches, ultimately shaping a comprehensive roadmap for effective personal branding practices in India's rapidly evolving digital landscape.

Literature Review

Personal branding has gained strategic prominence in the contemporary digital marketplace, driven primarily by the proliferation and integration of digital marketing strategies such as social media usage, SEO, content marketing quality, and consumer engagement (Labrecque *et al.*, 2011; Edelman, 2023). This literature review critically explores these core variables through theoretical lenses, empirical validations, and contextual insights within India's diverse and digitally expanding market landscape.

Social Media Usage

Theoretical Foundation: The Technology Acceptance Model (TAM) and Social Exchange Theory (SET) provide essential theoretical underpinnings for the use of social media in personal branding. TAM emphasises user acceptance of digital platforms based on perceived usefulness and ease of use, thereby explaining their widespread adoption for branding purposes (Davis, Bagozzi, & Warshaw, 1989). Complementarily, Social Exchange Theory highlights reciprocal interactions on social media, fostering relationships through mutual content exchanges that build trust, engagement, and community loyalty (Cropanzano *et al.*, 2017).

Empirical Evidence and Contextual Insights: Empirical studies reveal social media's powerful role in enhancing personal brand influence by fostering audience engagement, visibility, and expertise (Kaplan & Haenlein, 2010). Platforms like LinkedIn notably illustrate this relationship, where strategically branded profiles achieve significantly higher visibility, garnering up to 27 times more inquiries than non-branded counterparts (LinkedIn India Insights, 2023). Further, Indian social media users predominantly engage through localised and vernacular content, with over 75% following influencers who adopt culturally resonant

communication strategies, underscoring the necessity of culturally adapted content approaches (Statista, 2023; Hootsuite, 2023).

Practical Implications: Recent studies confirm that targeted, culturally adapted social media strategies significantly boost engagement rates by upwards of 40%, particularly emphasising interactive, regular postings and vernacular adaptation (Google-KPMG, 2023; Statista, 2023).

SEO Implementation

Theoretical Foundation: SEO strategies rest firmly upon the Information Foraging Theory, proposing that internet users prioritise accessibility, rapidly selecting search results that appear prominently and effortlessly accessible (Pirolli & Card, 1999). Consequently, optimising digital content for top search engine rankings directly influences discoverability and perceived credibility, essential to effective personal branding.

Empirical Evidence and Contextual Insights: Globally, optimised SEO practices critically enhance visibility, as 75% of search engine users seldom navigate beyond initial search result pages (Chaffey, 2023). However, the Indian market uniquely demands SEO strategies localised to regional languages, significantly impacting engagement. Brands adopting vernacular-specific keyword strategies experience approximately a 45% increase in engagement, suggesting robust opportunities within India's linguistic diversity (Google-KPMG, 2023).

Practical Implications: Empirical validations further demonstrate optimised SEO implementation leading to approximately a 37% increase in website traffic, affirming its substantial role in strengthening personal brand visibility and credibility within culturally diverse contexts.

Content Marketing Quality

Theoretical Foundation: The Resource-Based View (RBV) framework highlights content quality as an essential resource, enabling differentiation, value creation, and sustained competitive advantage in personal branding (Barney, 1991). High-quality content, characterised by authenticity, storytelling, and visual engagement, facilitates emotional connections and bolsters consumer trust, crucial for long-term brand loyalty (Pulizzi, 2012).

Empirical Evidence and Contextual Insights: Globally, Edelman's Trust Barometer (2023) illustrates that approximately 67% of consumers demonstrate enhanced trust and affinity towards brands consistently delivering authentic, high-quality, and informative content. Specifically, in India, preference for video-centric and vernacular-specific content necessitates content strategies tailored explicitly to regional cultural narratives, leading to a 40% increase in trust and engagement (Google-KPMG, 2023).

Practical Implications: Visual storytelling strategies effectively improve audience retention by 55%, further substantiating the strategic imperative for high-quality, visually rich content in personal branding endeavours (Statista, 2023).

Consumer Engagement

Theoretical Foundation: Consumer engagement derives significantly from Relationship Marketing Theory, emphasising

sustained interactions founded on trust, authenticity, and commitment as cornerstones of consumer loyalty and advocacy (Morgan & Hunt, 1994). Thus, high-quality interactive engagements, such as real-time dialogues, personalised communication, and responsive feedback mechanisms, are essential to shaping personal brand perceptions and enhancing brand influence.

Empirical Evidence and Contextual Insights: Empirical studies indicate that high consumer engagement levels substantially amplify brand credibility, visibility, and loyalty. Engaged audiences, actively participating via social interactions, are statistically 50% more likely to exhibit brand advocacy and loyalty (Brodie *et al.*, 2011). Moreover, Edelman (2023) highlights that around 64% of Indian consumers prioritise authenticity and prompt brand responsiveness, reinforcing the significance of engagement-focused strategies within India's diverse marketplace.

Practical Implications: Highly engaging content significantly increases the probability of brand visibility, with posts achieving robust engagement metrics being three times more likely to appear prominently within user feeds, driving sustained consumer interaction and trust (Chaffey, 2023).

Personal Brand Influence: Integrative Perspectives

Theoretical Foundation: Impression Management Theory complements Relationship Marketing Theory by explaining individuals' strategic behaviours in curating digital personas aligned with desired audience perceptions, further reinforcing sustained consumer relationships built upon trust and authenticity (Goffman, 1959).

Empirical Evidence: Consistent empirical evidence underscores personal brand influence as contingent upon strategic integration of digital marketing tools, directly enhancing consumer trust, credibility, and professional opportunities. Labrecque *et al.* (2011) further illustrate that strategically optimised digital content significantly enhances professional credibility, fostering substantial audience trust.

Research Gap

Despite substantial individual exploration of digital marketing tools such as social media, SEO, content marketing, and consumer engagement, an evident research void exists concerning their integrated and cumulative impacts, specifically within culturally and linguistically diverse markets such as India. Predominantly, existing literature has approached these tools from a predominantly Western-centric perspective, often overlooking the intricate interplay among cultural sensitivities, regional preferences, and socioeconomic diversity uniquely characterising the Indian context (Google-KPMG, 2023).

Specifically, the following notable gaps persist:

1. Limited empirical integration and validation of vernacular content strategies within digital personal branding literature.

2. Insufficient exploration into the interconnected, cumulative impacts of digital marketing strategies on personal brand influence, particularly within culturally nuanced markets such as India.

3. Sparse consideration of consumer behaviour

linguistic, and socioeconomic factors within emerging markets.

This study directly addresses these critical research gaps by systematically exploring the integrative roles of social media usage, SEO implementation, content marketing quality, and consumer engagement in shaping personal brand influence within India's culturally and digitally evolving marketplace.

Research Design

Research Methodology

This study employs a mixed-method approach incorporating descriptive and exploratory research designs to capture comprehensive insights into digital marketing strategies and personal branding dynamics. The descriptive aspect quantitatively evaluates relationships among key variables, while the exploratory dimension qualitatively investigates cultural and contextual nuances specific to India's digital marketplace.

Statement of the Problem

In the contemporary digital landscape, personal branding has emerged as a strategic imperative rather than a supplementary activity, essential for enhancing professional visibility, credibility, and sustained influence (Labrecque, Markos, & Milne, 2011; Gartner, 2023). While digital marketing strategies, including social media, SEO, and content marketing, have demonstrated effectiveness in global markets, their collective and localised implementation remains inadequately examined in culturally complex and linguistically diverse contexts such as India (McKinsey & Company, 2023).

India, with a rapidly expanding digital ecosystem projected to exceed 900 million internet users by 2025, presents a multifaceted digital marketing environment (IAMAI, 2023). However, effectively navigating this market demands tailored strategies responsive to unique linguistic, cultural, and consumer engagement dynamics. Specifically, the limited empirical investigation into how interconnected digital marketing tools influence personal branding outcomes within this culturally heterogeneous context represents a significant research gap. This study addresses these critical gaps by systematically evaluating the collective influence of social media usage, SEO implementation, content marketing quality, and consumer engagement on personal brand influence, aiming to provide practical insights for professionals and entrepreneurs navigating India's diverse digital landscape.

Objectives of the Study

The following objectives guide this research:

1. To examine the impact of social media usage on personal brand influence among Indian digital audiences.
2. To evaluate how SEO implementation contributes to the visibility and credibility of personal brands in the Indian digital landscape.
3. To assess the role of content marketing quality in shaping audience trust and engagement, thereby enhancing personal branding outcomes.
4. To analyse the influence of consumer engagement on the effectiveness and success of personal branding strategies in culturally diverse Indian markets.

5. To determine the relative contribution of each digital marketing strategy—social media, SEO, content quality, and engagement—to the overall influence of personal branding.

Scope of the Study

This research focuses explicitly on the strategic role of digital marketing tools in shaping personal brand influence within India's culturally diverse, rapidly digitising market. The study systematically examines four core independent variables—social media usage, SEO implementation, content marketing quality, and consumer engagement—in relation to the dependent variable, personal brand influence.

Geographically, the scope is confined to India, selected due to its unique digital landscape characterised by significant linguistic diversity and distinct consumer behaviours. Demographically, the target respondents include professionals, entrepreneurs, and students across diverse age groups (18–45+), industries, and geographical locations (metropolitan, urban, semi-urban), actively involved in personal branding efforts.

Methodologically, a robust mixed-method research design is adopted, combining quantitative data from structured online surveys with qualitative insights drawn from authoritative industry reports and scholarly literature. Statistical methods, including descriptive analysis, correlation, and regression analyses, ensure a thorough exploration and empirical validation of relationships, thus providing actionable insights for strategically enhancing personal branding practices in India's competitive digital ecosystem.

Data Collection Method

Primary Data is collected through an online, structured survey developed using Google Forms. Survey items include Likert-scale questions, multiple-choice options, and open-ended qualitative questions to gain nuanced insights into respondents' perceptions and behaviours regarding personal branding.

Secondary Data is extensively derived from high-quality, peer-reviewed journals (indexed by Scopus, Web of Science, ABDC), authoritative industry reports (McKinsey & Company, Deloitte, Gartner), and relevant publications (World Economic Forum, IAMAI reports) to reinforce empirical findings and theoretical perspectives.

Sampling Design

Sampling technique: A Stratified random sampling technique is applied to ensure diverse representation across age groups, professions, and geographic locations within India, increasing the generalizability and validity of results (Bryman, 2016).

Sample Size: Included 260 respondents consisting of professionals, entrepreneurs, and students actively engaging in personal branding activities within India's digital sphere.

Demographic Breakdown: Respondents in the age group of 18–45 plus years were considered from Metropolitan regions, including urban and semi-urban areas across India. The occupation of respondents includes diverse representation from professional, entrepreneurial, and student populations.

Plan of Analysis

Quantitative data were rigorously analysed using SPSS, adopting descriptive statistics (means, standard deviations, frequencies) to summarise respondent characteristics and responses. Reliability testing was conducted using Cronbach's Alpha (acceptable threshold: $\alpha > 0.7$), ensuring internal consistency of survey instruments (Hair *et al.*, 2018). Correlation analysis identified the strength and direction of relationships among social media usage, SEO Implementation, content marketing quality, consumer engagement, and personal brand influence. Multiple regression analysis was further applied to statistically ascertain the predictive strength and significance of independent variables on personal brand influence.

Statistical Tools Employed

1. Reliability Testing (Cronbach's Alpha) to validate instrument consistency.
2. Descriptive Statistics for demographic profiling and preliminary insights.
3. Correlation Analysis to examine relationships between variables.
4. Regression Analysis to determine the relative impact of independent variables.

Hypotheses Formulated for Empirical Validation

The following hypotheses underpin the statistical testing framework:

H1: Social media usage positively influences personal brand influence among Indian digital audiences.

H2: Effective SEO implementation significantly enhances personal brand visibility and credibility within the Indian context.

H3: Content marketing quality has a direct and substantial impact on audience trust and engagement, enhancing personal brand influence.

H4: Consumer engagement exhibits a strong positive correlation with personal brand influence, serving as a key predictor of personal branding success.

Data Analysis

Descriptive Statistics and Reliability Analysis

The descriptive statistics and Cronbach's Alpha values (Figure 1) confirm high internal consistency and a robust central tendency across all independent variables. With mean values exceeding 3.80 and reliability coefficients (α) above the 0.80 benchmark (Hair *et al.*, 2018), the dataset demonstrates strong psychometric validity.

Notably, Consumer Engagement recorded the highest mean ($M = 4.15$, $SD = 0.70$), suggesting its dominant role in shaping personal brand outcomes. This finding corroborates the assertions of Brodie *et al.* (2011) and Edelman (2023), who emphasise engagement as critical for trust, loyalty, and influence.

Correlation Analysis

The correlation matrix results (Figure 2) indicate statistically significant and positive relationships among all study variables. The strongest association was found between consumer

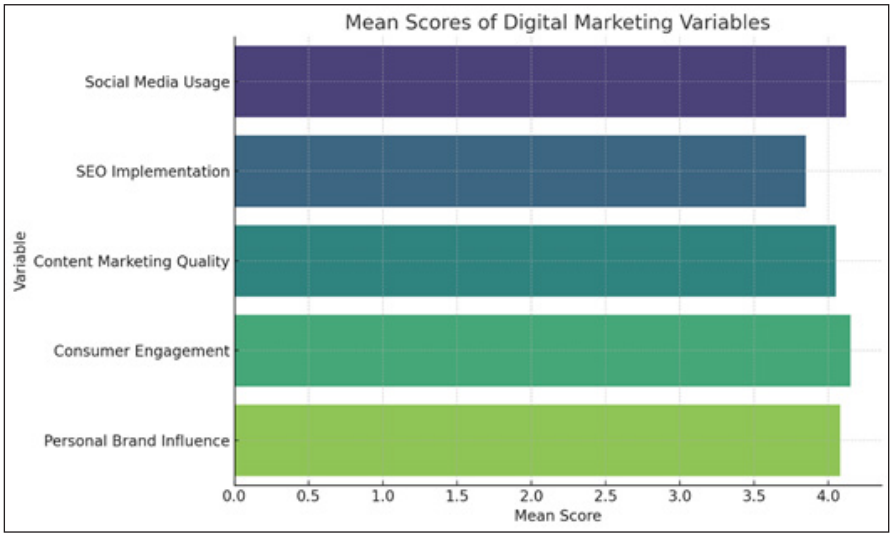

Figure 1. Mean Scores of Digital Marketing Variables.
Source: Desk Research

engagement and personal brand influence ($p < 0.01$), followed by content marketing quality ($r = 0.78$), both of which emphasise consumer-centric branding mechanisms.

These results highlight that interactive communication and high-quality, culturally resonant content are instrumental in personal branding, particularly within India's diverse market. This validates existing theories, including Relationship Marketing Theory and supports findings by Gartner (2023) and Statista (2023).

Multiple Regression Analysis

Regression results (Figure 3) reveal that the combined model explains 62% of the variance in Personal Brand Influence (Adjusted $R^2 = 0.62$), indicating strong explanatory power.

These findings confirm the acceptance of all four hypotheses (H1–H4), as each independent

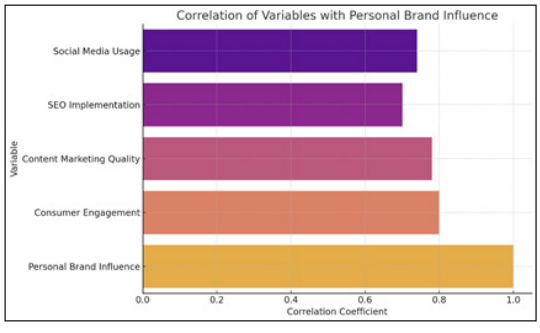

Figure 2. Correlation of Variables with Personal Brand Influence.
Source: Desk Research

variable exerts a statistically significant positive effect on the dependent variable.

Hypothesis Validation Summary

The validated model underlines consumer engagement as the most impactful strategy, followed closely by content marketing quality, underscoring the need for interaction-rich and culturally adaptive branding approaches. The

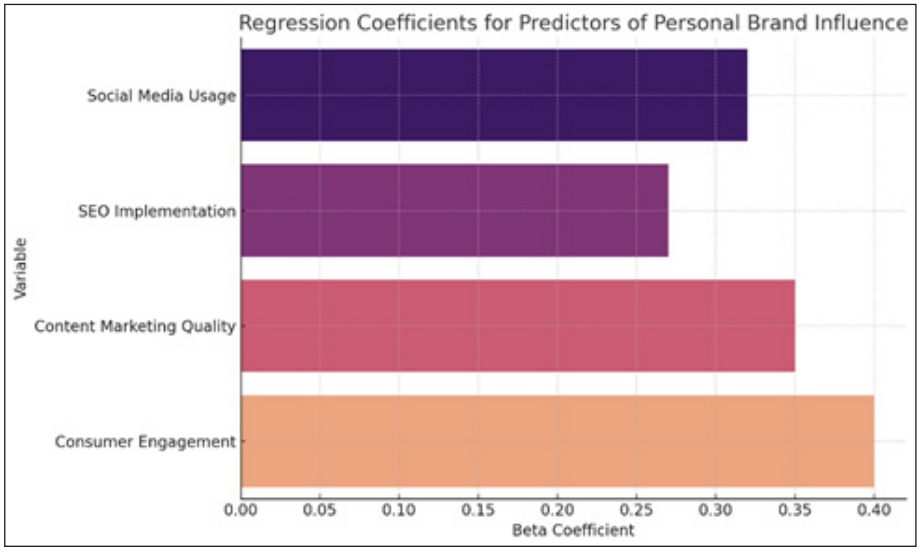

Figure 3. Regression Coefficients for Predictors of Personal Brand Influence.
Source: Desk Research

Table 1. Table showing β and p-values of Predictors

Predictor	Beta (β)	p-value	Interpretation
Consumer Engagement	0.40	< 0.001	Strongest predictor, confirming the value of interaction
Content Marketing Quality	0.35	< 0.001	High influence via authentic, quality content
Social Media Usage	0.32	< 0.001	Important, but less than content and engagement
SEO Implementation	0.27	< 0.001	Statistically significant, especially for discoverability

Source: Desk Research

results validate the positive influence of digital marketing elements (social media, SEO, content marketing, engagement) on aspects of personal branding.

Comparative Strategic Analysis

To evaluate the relative impact of digital strategies, the study performed a comparative effectiveness analysis based on perceived engagement and effectiveness scores

The hierarchy reinforces the strategic importance of engagement-first and content-driven branding models over visibility-centric approaches alone.

Discussion

The findings of this study affirm the theoretical frameworks grounding personal branding within the digital marketing paradigm. The

strongest predictor, Consumer Engagement, echoes the tenets of Relationship Marketing Theory (Morgan & Hunt, 1994) and Impression Management Theory (Goffman, 1959), asserting that interactive and reciprocal brand-consumer relationships are vital in the digital era. This aligns with Brodie *et al.* (2011), who argue that engagement drives trust and advocacy, forming the foundation for sustained personal brand influence.

The significant impact of content marketing quality supports the Resource-Based View (RBV) (Barney, 1991), positioning authentic, consistent content as a strategic asset that enhances differentiation and audience trust. In the Indian context, where over 70% of digital users prefer vernacular content (Google-KPMG, 2023), the role of localised storytelling is even more pronounced, aligning with Edelman's (2023) findings on the rise of trust in culturally resonant narratives.

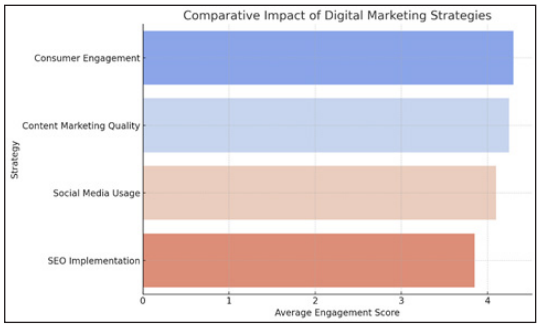

Figure 4. Comparative Impact of Digital Marketing Strategies.
Source: Desk Research

While Social Media Usage and SEO Implementation also show positive effects, their impact is comparatively modest. These findings imply that visibility tools (social and search) serve as enablers rather than drivers of personal brand success. This resonates with the Information Foraging Theory (Pirolli & Card, 1999), where discoverability matters, but what audiences find (content and engagement) is even more critical to influence (Chaffey, 2023; McKinsey & Company, 2023).

Notably, the model's high explanatory power (Adjusted $R^2 = 0.62$) indicates robust predictive strength, comparable to similar digital branding studies (Kaplan & Haenlein, 2010; Labrecque *et al.*, 2011). The statistically significant β values across all predictors underscore that a holistic digital strategy, rather than isolated tools,

Table 2. Table showing the Hypothesis Validation Summary

Hypothesis	**Statement**	β Coefficient	**Result**
H1	Social Media Usage → Personal Brand Influence	0.001	Accepted
H2	SEO Implementation → Personal Brand Visibility & Credibility	0.001	Accepted
H3	Content Marketing Quality → Audience Trust & Engagement	0.001	Accepted
H4	Consumer Engagement → Personal Brand Influence	0.001	Accepted (Strongest Impact)

Source: Desk Research

Table 3. Table showing the Impact Score between Variables

Strategy	Avg. Engagement Score	Effectiveness Rank	Perceived Impact
Consumer Engagement	4.30	1	Very High
Content Marketing Quality	4.25	2	High
Social Media Usage	4.10	3	High
SEO Implementation	3.85	4	Moderate

Source: Desk Research

is central to building influence in culturally diverse markets like India.

Managerial Implications

The study's findings present actionable insights for digital marketing professionals, personal brand strategists, and content creators targeting India's heterogeneous digital landscape:

1. **Prioritise Interactive Platforms and Real-time Engagement:** Managers must design engagement-first strategies, leveraging features like live sessions, comment prompts, and polls across Instagram, LinkedIn, and YouTube. Real-time responsiveness builds perceived authenticity and fosters brand loyalty (Edelman, 2023; Brodie *et al.*, 2011).

2. **Invest in High-Quality, Vernacular Content Production:** Brand builders should focus on producing regionally adapted content. Video-based storytelling in local languages can increase engagement by over 40% (Google-KPMG, 2023; Statista, 2023). Hiring regional influencers or creators can also bridge cultural gaps.

3. **Reinforce SEO with Localised Keywords:** Although SEO shows lower direct influence, its role in discoverability is undeniable. Marketers must optimise content using regional search terms and include schema markup to improve visibility among India's multi-lingual digital consumers (Chaffey, 2023).

4. **Integrate social media with Value-Driven Campaigns:** Instead of volume-based posting, marketers should focus on purpose-driven content strategies aligned with audience aspirations and emotional triggers (Pulizzi, 2012; Edelman, 2023).

Strategic Recommendations

To translate the findings into a roadmap for effective personal brand growth in the Indian market, the following strategic recommendations are proposed:

1. Develop an Integrated Branding Framework

Organisations and individuals should build comprehensive digital marketing plans that blend social media, SEO, content marketing, and engagement into a synergistic model. Fragmented approaches may lead to superficial influence without depth or sustainability (McKinsey & Company, 2023).

2. Localise Brand Narratives through Cultural Adaptation

Brand narratives must be constructed around cultural empathy and regional relevance. Using localised storytelling aligned with festivals,

values, and idioms enhances relatability and emotional attachment (Google-KPMG, 2023; Statista, 2023).

3. Leverage Data-Driven Personalisation

Advanced analytics and AI tools should be employed to tailor content, format, and delivery timing to user preferences. Personalised content drives 80% higher consumer engagement and is pivotal in shaping brand perception (PwC, 2023; Gartner, 2023).

4. Promote Transparent, Two-Way Communication

Brands must encourage and act upon user-generated content, feedback loops, and community interactions. This transparency enhances credibility and accelerates trust-building, key attributes of effective personal branding (Edelman, 2023; Brodie *et al.*, 2011).

Conclusion

This research contributes significant empirical and strategic value by demonstrating the integrated impact of digital marketing tools, social media usage, SEO implementation, content marketing quality, and consumer engagement on personal brand influence within India's culturally diverse digital ecosystem. The results indicate that while visibility-oriented tools are foundational, it is engagement and authentic content that truly drive influence.

The study bridges a vital research gap by empirically validating the cumulative influence of digital tools in a linguistically complex emerging economy. Practically, it equips professionals and marketers with a culturally adaptive framework to navigate India's digital audience. The implications extend to broader markets with similar diversity challenges, paving the way for future research in multilingual content optimisation, cross-cultural branding, and AI-driven personalisation.

In closing, this research underscores that strategic integration, cultural sensitivity, and authentic engagement are not optional; they are imperative for sustained personal brand growth in today's digital-first, trust-deficient world.

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Online Purchase Behaviour among Software Professionals in Bangalore

G. Mahesh[1]

Abstract

The rise of internet shopping has been remarkable, with significant players in the industry experiencing exponential growth, indicating substantial untapped potential for e-commerce. This trend, especially prominent among younger generations like Gen Y & Z, underscores the unparalleled convenience offered by online shopping, prompting increased focus from retailers. This study aimed to explore the relationship between various independent variables, including cultural, social, personal, psychological, and marketing mix factors, and consumer behaviour in the online market, specifically targeting individuals aged 18 to 34. Out of 480 distributed questionnaires, 200 responses were collected and subjected to descriptive and inferential statistical analyses to unveil consumer decision-making patterns. Although the overall association between the independent variables and consumer behaviour was found to be weak, a closer examination revealed strong correlations between social factors, physical elements, marketing mix components, and consumer buying behaviour. These insights provide valuable knowledge of consumer decision-making rules, which can aid producers and retailers in understanding consumer behaviour and enhancing consumer satisfaction.

Keywords: Consumers, Decision Making, Exponential Growth, Marketing Mix, Online Shopping
JEL Classification: M31, L81, D12
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Introduction

Understanding consumer behaviour is paramount for companies to achieve commercial success. The relationship between consumer behaviour and marketing strategy is crucial, as the effectiveness of marketing strategies hinges on managers' comprehension of consumer behaviour, especially during economic downturns. Consumer buying decisions serve as indicators of how well a company's marketing strategy aligns with market demand, highlighting the centrality of the consumer in the marketing process.

The study of customer behaviour revolves around consumer buying behaviour, where customers assume three distinct roles: user, payer, and buyer. Despite efforts, consumer behaviour remains challenging to predict, even for seasoned experts in the field. It encompasses various psychological processes, including

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recognising needs, seeking solutions, making purchase decisions (such as choosing a product, brand, and location), interpreting information, devising plans, and executing them (for instance, through comparison shopping or making actual purchases).

Consumer behaviour research delves into the decision-making process of buyers, both at the individual and collective levels. It examines various individual consumer characteristics, such as demographics and behavioural variables, to comprehend people's desires. This research facilitates enhanced understanding and prediction not only of what consumers purchase but also of their motives and purchasing patterns.

A key assumption in contemporary consumer behaviour research is that individuals often buy products based on their perceived subjective value rather than solely on their primary functions. While the basic functions of products remain important, their contemporary role transcends mere utility. Consumers frequently evaluate products not only based on their core attributes but also factors like their real product qualities and extended product benefits. The extended product encompasses intangible elements such as brand image, customer service, and post-sale support, which contribute to a desired perceived advantage for the consumer.

In essence, modern marketers prioritise understanding consumers and their responses before delving into the fundamental characteristics of consumer behaviour. The study of consumer behaviour aids in identifying who the customers are, what they desire, and how they utilise and respond to products. Surveys on consumer behaviour play a crucial role in meticulously examining customer preferences.

Factors Influencing Consumer Behaviour

The stimulus-response model, also known as the black box model, provides a well-established framework for understanding buyer behaviour. This model illustrates how stimuli, consumer characteristics, decision processes, and consumer responses interact. Stimuli can be categorised as interpersonal (between people) or intrapersonal (within people). The black box model is akin to the black box theory of behaviourism, focusing on the relationship between stimuli and consumer responses rather than the internal processes of the consumer.

Marketing stimuli are intentionally designed and created by firms, while environmental stimuli arise from social factors influenced by the economic, political, and cultural circumstances of a society. Within the buyer's black box lie the buyer's characteristics and decision-making processes, which ultimately shape the buyer's response to stimuli (Sandhusen, 2000).

In the depicted model, marketing and other stimuli enter the customer's "black box," generating specific responses. Marketing management's objective is to uncover the processes occurring within the customer's mind—the black box. The buyer's characteristics shape how they perceive stimuli, while the decision-making process dictates their buying behaviour. Understanding buyer behaviour begins with examining the factors influencing the buyer's characteristics within the black box model.

Numerous factors impact a consumer's purchasing decisions and buying behaviour,

which literature categorises and structures in various ways. Despite these variations, consumer behaviour is generally shaped by factors classified into five groups: cultural, social, physical, personal, and the marketing mix.

These factors are identified to understand their effects on consumer behaviour and aid marketers in selecting consumer targeting strategies. They are utilised to segment the market and target specific consumer groups effectively. This paper aims to explore the influences of factors measured in a survey on purchasing behaviour.

Research indicates that customers typically undergo a five-stage decision-making process when making a purchase, although in routine purchases, some stages may be omitted or reversed. The buying process commences with need recognition, where the buyer identifies a problem or need or responds to a marketing stimulus. Subsequently, the consumer evaluates how much information is necessary to make the decision. If the need is urgent and a suitable product or service is readily available, a purchase decision is likely to be made immediately. Otherwise, the consumer initiates the information search process.

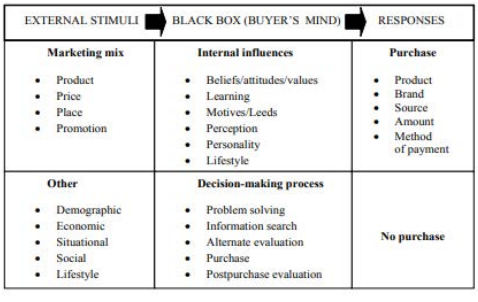

Figure 1. The Black Box Model of Consumer Behaviour

Source: The Black Box Model of Consumer Behaviour. (Keegan *et al.,* 1992)

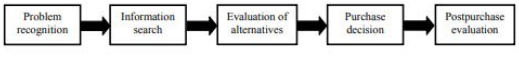

Figure 2. Consumer Decision-Making Process.

Source: Adapted from Kotler, P., & Keller, K. L. (2016). *Marketing Management* (15th ed.). Pearson Education

During the information search phase, consumers gather information from various sources, including personal (family, friends), commercial (advertising, retailers, packaging), and public (newspapers, magazines, radio, television, Internet) sources. The relevance and influence of each information source may vary depending on the product and the consumer. Notably, marketers wield significant control over the information provided to consumers and its presentation, impacting consumers' decision-making process. (Kivetz & Simonson, 2000)

Limited decision making involves a blend of extensive and routine purchase decisions. Consumers in this category generally have a clear idea of the type of product they need, but are deliberating between different brands. For instance, when purchasing clothing, a customer seeking a new pair of jeans may explore various brands to find the best fit. While engaging in limited decision making, consumers may seek advice from friends, but typically spend a moderate amount of time gathering information and considering options. This process is less exhaustive and time-consuming compared to higher-priced items.

Extended decision making represents the most intricate buying behaviour, occurring when purchasing unfamiliar, expensive, or infrequently bought products such as computers,

televisions, cars, or houses. Consumers invest considerable amounts of time researching numerous options, consulting trusted sources like friends, family, and sales professionals, and scouring reviews and ratings online and in consumer magazines. Those involved in extended decision making usually take more time to reach a final purchase decision and extensively research their choices. Many may also experience cognitive dissonance. Extended decision making is commonly employed for high-involvement products.

Routine response behaviour is observed when consumers purchase frequently bought, low-cost items that require minimal effort in terms of search and decision-making, such as milk, eggs, bread, or socks. Consumers spend little time deliberating on whether to purchase these items and often do not consult reviews or seek opinions from friends before making routine purchases. However, when it comes to "ethical" products, consumers tend to become more engaged, leading to a more thorough search for information. These products are usually smaller purchases and fall within the lower end of the price range.

When buying such items, consumers may have a preference for a particular brand but are familiar with multiple brands within the product category and consider several options acceptable. Generally, low-involvement products are purchased almost automatically (Zander & Hamm, 2011).

Literature Review

Ajzen (1991) and Orapin (2009) argued that external factors like perceived social pressure can impact one's behaviour. Previous studies on subjective norms have examined various contexts, including family Takaful schemes (Husin & Rahman, 2013), intentions to work in older age (Lu, 2012), consumption of infused soft drinks (David *et al.,* 2012), telepresence systems (Park, 2013), participation in online communities (Zhou, 2011), and online shopping (Al-Maghrabi *et al.,* 2011; Limayem *et al.,* 2000; Jamil & Mat, 2011; Orapin, 2009). Most of these studies focused on university students as respondents (David *et al.*, 2012; Orapin, 2009; Zhou, 2011), while others included the general public, including professionals (Al Maghrabi *et al.*, 2011; Husin & Rahman, 2013; Limayem *et al.*, 2000; Lu, 2012; Jamil & Mat, 2011; Park, 2013).

There's a lack of a direct significant relationship found between subjective norms and consumer behaviour, as Ajzen (1991) showed that personal considerations often overshadow the influence of subjective norms. Many studies indicate that subjective norms primarily affect purchase intentions rather than actual buying behaviour (Choo, Chung & Pysarchik, 2004; Limayem *et al.*, 2000; Jamil & Mat, 2011; Zhou, 2011). For instance, Jamil and Mat (2011) found that subjective norms significantly influence online purchase intentions but have a minor effect on actual online purchases, suggesting that factors like family, friends, and media have limited influence on internet shopping habits.

Subjective norms are considered the second most influential factor after perceived behavioural control in influencing online shopping intentions (Orapin, 2009). He *et al.* (2008) suggested that third-party recommendations (subjective norms) significantly impact consumer purchase intentions.

Overall, studies suggest that subjective norms have a direct and significant influence on

Table 1. Table showing a Comparison between Types of Behaviour

	Routine response behaviour	**Limited decision making**	**Extended decision making**
Level of involvement	low	low	High
Product cost	low	low to moderate	High
Brand preference	More than one is acceptable, although one may be preferred	several	varies, usually many
Search effort	little	little to moderate	Extensive
Time spent	short	short to medium	long

Table 2. Table showing Factors Affecting Consumer Behaviour

Major factor	**Sub-factors**	**Description**
Cultural	Culture	Factors refer to the set of basic values, wants and behaviours learned by a member of society from the family and other important institutions.
	Sub-culture	Each culture contains smaller subcultures. Sub-culture includes nationalities, religions, racial groups and geographic regions
	Social class	Society's relatively permanent and ordered divisions, the members of which share similar values, interests and behaviours. Social class can be determined by a combination of occupation, income, education, wealth and other variables
	Groups	Group refers to 2 or more individuals who interact to accomplish individual or mutual goals. A person's behaviour is influenced by many small groups or reference groups. These groups involve family, religious groups, friends circles, neighbours, etc.
Social	Family Members	It can strongly influence a buyer's behaviour. Marketers are interested in the roles and influences of the husband, wife and children on the purchase of different products and services.
	Roles and status	The person's position in each group can be defined in terms of both role & status. Each role carries a status that is conferred by society
	Age and life cycle	Stage People change their purchases over their lifetimes. Marketers define their target markets in terms of family life-cycle stage and develop appropriate plans and products for each stage.
Personal	Occupation	A person's occupation affects the goods and services bought
	Economic situation	A person's economic situation affects product choice. Marketers of income-sensitive goods should monitor trends in personal income, savings and interest rates
	Motivation	When a consumer recognises that they have a need, the inner drive to fulfil the need is called motivation. A motivated person is ready to act.
Psychological	Perception	It is the process by which people select, organise and interpret information to form a meaningful picture of the world

	Learning	When people act, they learn. Learning can be described as changes in an individual's behaviour arising from experience
Marketing mix	Product	It is a tangible good or an intangible service that is mass-produced or manufactured on a large scale with a specific volume of units.
	Price	The price is the amount a customer pays for the product
	Promotion	It represents all of the communications that a marketer may use in the marketplace. Promotion has four distinct elements: advertising, public relations, personal selling and sales promotion.
	Place	A way of getting the product to the consumer, and/or how easily accessible it is to consumers.

purchase intentions for online shopping (Leeraphong & Mardjo, 2013; Jamil & Mat, 2011). These conclusions are particularly relevant to Malaysians, given their cultural preferences and resistance to change (Harn *et al.*, 2006; Jamil & Mat, 2011).

Perceived usefulness refers to how consumers perceive the value and effectiveness of an online website for their shopping needs. This perception is based on whether the website enhances their task performance and adds value to their shopping experience. Factors contributing to perceived usefulness include technological features like advanced search engines and personalised services provided by the service provider. Websites must provide comprehensive information and high-quality product descriptions to assist customers in making well-informed decisions.

Research on perceived usefulness has predominantly focused on developing countries like China, Malaysia, Vietnam, and Iran, with fewer studies conducted in developed countries such as Taiwan and South Korea.

Intentions, as suggested by Ajzen (1991), serve as indicators of individuals' willingness to engage in certain behaviours, including online shopping. Lack of intention to purchase online has been identified as a major obstacle in the advancement of electronic commerce. The Theory of Planned Behaviour (TPB) applied to Thai consumers suggests that purchase intention is influenced by perceived behavioural control and subjective norms, reflecting attitudes from their social circles. These factors subsequently influence consumers' behaviour toward online shopping and may lead to actual purchasing actions.

While intention is a significant predictor of online shopping behaviour, it's essential to recognise that purchase intention doesn't always translate into actual purchases. Perceived ease of use and usefulness, as outlined in the Technology Acceptance Model (TAM), play pivotal roles in shaping online shoppers' decisions once behavioural intentions are formed.

Understanding customers' purchasing behaviour is vital for online websites to establish and maintain positive relationships with their clientele. Some researchers have suggested that purchase intention can positively influence actual online purchases, emphasising the importance of further investigation into this relationship. Limayem *et al.* (2000) highlighted the need to explore intention further, suggesting that behaviour might naturally follow once intention is established.

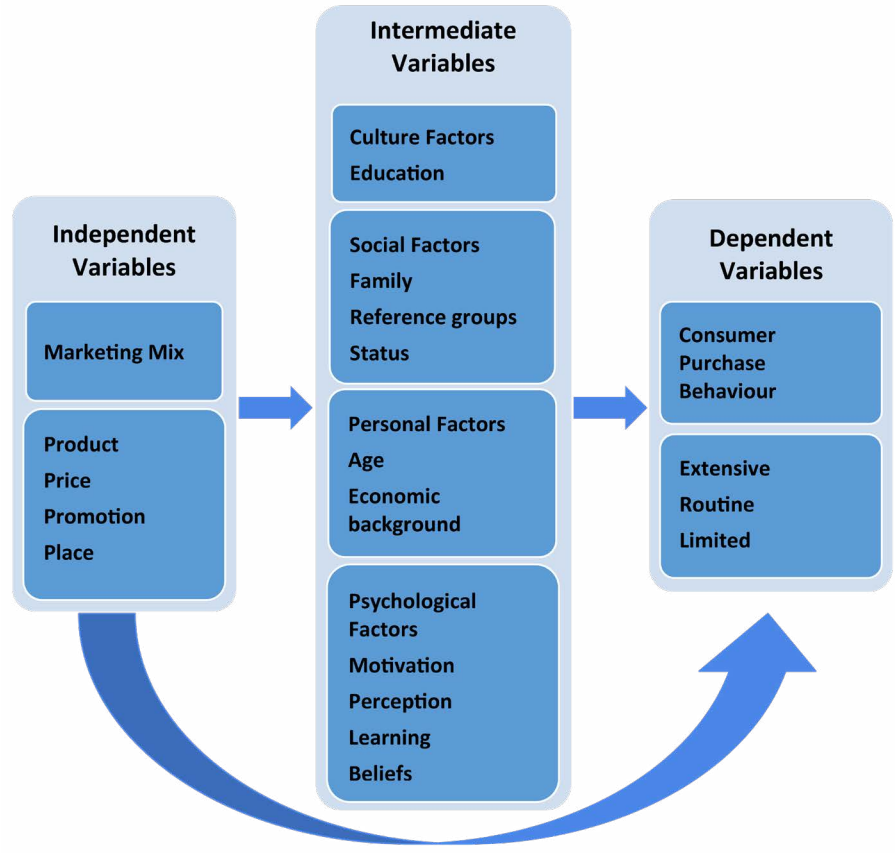

Figure 3. Conceptual Framework.
Source: Adapted from consumer behaviour models (e.g., Kotler & Keller, 2016; Schiffman & Kanuk, 2010)

Research Design

Objectives of the Study

1. To study the factors that affect online consumer behaviour patterns of Indian consumers.

2. To understand the purchase intentions of online consumers towards electric appliances.

Research Methodology

Descriptive and exploratory research were used, and survey instruments such as questionnaires and interviews were used to collect the data from the respondents, and simple random sampling techniques were adopted with a sample size of 200 responses. The responses were recorded using a five-point Likert scale ranging from 1 to 5. One indicates definitely disagree, to five indicates definitely agree.

The survey aimed to gather insights into how various factors affect consumer behaviour in online purchases. Following a thorough literature review, the authors constructed a research model to examine and dissect the decision-making processes of Indian consumers in the online marketplace. The graphical

representation of this research model can be expressed mathematically, as outlined below.

Factor Impact on Consumer Behaviour = A + B1 Cultural + B2 Social + B3 Personal + B4 Psychological + B5 Product + B6 Price + B7 Promotion + B8 Place + e

H1: Cultural factors have a strong relationship with consumer behaviour.

H2: Social factors have a strong relationship with consumer behaviour.

H3: Personal factors have a strong relationship with consumer behaviour.

H4: Psychological factors have a strong relationship with consumer behaviour.

H5: The product factor has a strong relationship with consumer behaviour.

H6: The price factor has a strong relationship with consumer behaviour.

H7: The promotion factor has a strong relationship with consumer behaviour.

H8: The place factor has a strong relationship with consumer behaviour

Table 3. Table showing Reliability Statistics

Variables	Cronbach's Alpha
Cultural factors	0.84
Social factors	0.81
Personal factors	0.79
Psychological factors	0.75
Product	0.95
Price	0.83
Promotion	0.7
Place	0.87
Routine response behaviour	0.93
Limited decision making	0.88
Extensive decision making	0.76

Source: Desk Research

Table 4. Table showing Regression Coefficient

Hypothesis & relationship	Coefficients (Unstandardized)		Coefficients (Standardised)	t-value	p-value	Remarks H1
	B	Std. error	Beta			
H1 cultural factors → behaviour	-0.086	0.043	-0.136	-1.926	0.058	Not Supported
H2 social factors→ behaviour	0.191	0.042	0.322	4.423	0.000	Supported
H3 personal factors→ behaviour	-0.066	0.031	-0.123	-1.738	0.085	Not Supported
H4 psychological factors→ behaviour	0.321	0.042	0.434	6.754	0.000	Supported
H5 product→ behaviour	0.182	0.046	0.268	3.607	0.000	Supported
H6 price→ behaviour	0.142	0.033	0.293	2.955	0.000	Supported
H7 promotion→ behaviour	0.165	0.044	0.269	3.872	0.000	Supported
H8 place→ behaviour	0.132	0.043	0.234	4.675	0.000	Supported

Source: Desk Research

Instrument and Study Sample

The data utilised for analysing the factors influencing consumers' decision-making processes in purchasing were gathered through a marketing survey employing a questionnaire. The authors opted for this tool due to its numerous advantages. The standardised nature of the questionnaire ensures consistency across respondents, minimising errors that may arise from interviewer bias. Moreover, it guarantees confidentiality, enabling respondents to provide honest answers without fear of judgment. Additionally, questionnaires facilitate quick and efficient data collection from a large pool of consumers. However, crafting a questionnaire demands meticulous attention to ensure clarity and relevance, as the quality of collected data hinges on the questionnaire's efficacy.

The questionnaire was structured into three segments: demographic information, factors impacting consumers and behaviour, and brand loyalty. The latter two sections employed a 5-point Likert scale for respondents to rate their agreement. The survey, conducted in Bengaluru city, garnered 200 responses, of which 176 were deemed acceptable after data validation. Analysis was conducted using the Statistical Package for Social Sciences (SPSS) version. 21.

Data Analysis and Interpretation

Demographics

Participants volunteered to complete the questionnaire, with 36% reporting annual income exceeding 1 million rupees, 43% earning between 500,000 and 999,000 rupees annually, and 21% earning less than 499,000 rupees per annum. Regarding gender distribution, 56% identified as male, and 44% as female. Age-wise, 6.0% were aged 18-24, 28.5% were 25-34, 34.0% were 35-44, 21.5% were 45-54, and 10% were over 55 years old. In terms of education, the majority (58.8%) had higher education qualifications, while 21.6% had secondary education, 12.6% intermediate education, 5.0% primary education, and only 2.0% had no formal education.

Conclusion and Directions for Future Research

This research significantly contributes to the comprehension of consumer purchasing behaviour in the online market. While the overall relationship between the independent and dependent variables was found to be weak, a closer examination revealed strong associations between social factors, physical elements, and marketing mix components with the buying habits of Indian consumers. These insights unveil underlying decision-making patterns among consumers.

Furthermore, our analysis has unveiled several promising avenues for future research. The focal point of forthcoming studies will be to establish methodological frameworks for analysing consumer behaviour through Multi-Agent Based Simulation (MABS) and conduct simulation tests using this developed methodology. We aim to construct a computer simulation model that will offer a deeper understanding of consumer behaviour, particularly in the online market.

This simulation model will employ a multi-agent approach to intricately map out the dynamics of the online marketplace.

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Impact of Organic Farming on Sustainable Agriculture Development – A Study on Mandya District

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Abstract

The study examines socio-economic aspects affecting organic agricultural adoption in Mandya, Karnataka, India. Using standardised questionnaires, 50 organic farms were surveyed about demographics, adoption, implementation, and economic outcomes. Percentage analysis and regression modelling are used to determine regional organic farming acceptance and economic viability factors. Organic agricultural implementation is examined in terms of certification, marketing channels, input access, government backing, and technical expertise. The methodology includes quantitative economic indicator analysis and farmers' ecological benefit perceptions. Two hypotheses are examined using regression analysis to evaluate whether socio-economic factors or organic farming techniques better predict practitioner economic success. The findings benefit agricultural extension services, policymakers, and farmers contemplating organic approaches. The report also makes evidence-based recommendations for developing a sustainable agricultural ecosystem in southern Karnataka and other Indian agroecological zones.

Keywords: Biodiversity, Climate Change, Greenhouse Gas Emissions, Organic Farming, Sustainable Agriculture

JEL Classification: Q01, Q12, Q15, Q57, O13, R58

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Introduction

Organic farming has gained popularity due to its sustainability compared to chemical-dependent agriculture. It focuses on ecological balance, conserving biodiversity, and soil fertility, avoiding the use of fertilisers and pesticides. (Reganold & Wachter, 2016). Organic farming improves soil structure and health through crop rotation, green manure, and compost applications, ensuring long-term productivity with minimal chemical intervention. Organic farming limits greenhouse gas emissions and enhances biodiversity, consuming less energy and polluting less than conventional systems. It also contributes to improved livelihoods in rural economies,

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particularly in India, providing small farmers with premium prices and better market opportunities, leading to increased income levels and food security. (Lotter, 2003) However, drawbacks include lower initial yields, lack of knowledge, and certification difficulties. These barriers may restrict its scaling up unless addressed through policy support and training programs. Organic agriculture aligns with sustainable development, promoting responsible exploitation of natural resources, good environmental practices, and long-lasting agriculture (Singh *et al.*, 2010). This study examines the role of organic farming in promoting sustainable environmental, social, and economic outcomes in agriculture and identifies specific transformations occurring at the grassroots level in different agricultural communities. (Scialabba & Müller-Lindenlauf, 2010).

Theoretical Background of the Study

Introduction to Agriculture and Sustainable World

Agriculture, a vital part of human life, has been industrialised, leading to environmental damage like soil erosion and water pollution. Sustainability in agriculture aims to balance ecological systems by reducing non-renewable inputs, preserving soil fertility, and promoting biodiversity. Activities like rotating crops and composting contribute to soil structure and carbon capture. The principle of it is as shown below,

1. **Optimal Use of Resources**: Prioritising natural resources (*e.g.*, solar energy, organic manure) over synthetic inputs.
2. **Ecosystem Conservation**: Preserving pollinators, soil organisms, and natural habitats to ensure ecological resilience.

Social Justice

Ensuring fair remuneration, secure working conditions, and equal access to markets for farmers.

Economic Sustainability

Balancing profitability with reduced environmental impacts through innovations like precision farming.

Emergence of Organic Farming

Organic farming is a sustainable approach to agriculture that uses closed-loop systems to avoid synthetic chemicals, enriching soil with compost and crop diversity, reducing chemical runoff, and increasing biodiversity. It contributes to reducing agriculture's carbon footprint and food security by addressing challenges like low yields and high labour costs. Sustainable agriculture balances present food needs with future ones, addressing productivity, environmental care, and social justice. Organic farming is an evolution of ancient practices and modern innovations, addressing ecological and socio-economic challenges. It has roots dating back to the 12th millennium when humans transitioned from hunting and gathering to cultivation. Advancements in crop rotation, fertile soil, and pest management practices have laid the foundation for organic farming principles.

Description of Organic Farming during the 20th Century

Albert Howard, Rudolf Steiner, and Eve Balfour were pioneers in the early 20th century, promoting soil health and composting (Heckman, 2006). J.I. Rodale introduced organic farming to the US (O'Sullivan, 2015), while Rachel Carson raised public support for

alternatives (Paull, 2007). The development of organic farming faced resistance from chemical companies and governments, but gained momentum with industry associations and consumer demand. Post-1990, legal frameworks like EU Regulation 2092/91 and USDA Organic standardised practices led to global growth in organic acres and retail sales.

Heritage and Challenges

Organic farming, initially scepticism, has evolved into a sustainable agriculture method, reducing synthetic inputs, promoting biodiversity, soil health, and climate resilience, despite challenges like higher labour costs and knowledge gaps.

Environmental Benefits

Organic farming offers numerous environmental benefits, addressing ecological issues like soil degradation, water pollution, and biodiversity loss associated with conventional practices like synthetic chemicals, monoculture farming, and mechanised methods, which harmonise with natural processes.

Soil Health and Fertility

Organic farming improves soil health by using natural alternatives like compost and manure, enhancing soil fertility and structure. Practices like crop rotation, green manure, and reduced tillage increase organic matter, improving soil quality, water repellency, and microbe diversity, enabling better withstand ability in erosion, flooding, and drought conditions.

Pollution and Chemical Runoff Decrease

Organic farming reduces environmental pollution by reducing the use of synthetic pesticides and fertilisers. By adopting natural pest management techniques and biological controls like beneficial insects, crop rotations, and companion planting, organic farmlands contribute less to water body pollution and reduce pesticide exposure risks.

Conservation of Biodiversity

Organic farming promotes biodiversity by creating complex ecosystems, reducing species diversity due to monoculture farming systems. It involves intercropping, agroforestry, and maintaining natural habitats, ensuring ecosystem health and improving resilience to pests and diseases.

Reduction in Greenhouse Gas Emissions

Organic farming has a lower carbon footprints than conventional agriculture, as synthetic fertilisers and organic carbon inputs contribute to greenhouse gas emissions.

Socio-Economic Impacts

Organic farming offers socio-economic benefits, particularly for smallholder farmers, by reducing production costs, enhancing profitability, and preserving soil fertility. It also promotes economic resilience, especially in rural areas, as agricultural livelihoods are the backbone of the community. Organic farming also provides social benefits, providing local employment, fostering cooperation, and improving farmworker health. As these practices spread, they support local economies, reduce dependence on external agricultural implements, and strengthen sustainable food systems.

Need for the study

Agriculture in organic form poses considerable potential contrasts to conventional agriculture, becoming a development model with

significant potential impact on environmental sustainability, human health, and rural economic viability. However, a thorough assessment of its multidimensional impacts remains limited. This study aims to fill crucial research gaps by synthesising existing evidence regarding the contribution of organic farming to sustainable agricultural development. There has been a plethora of studies that have explored specific aspects of organic systems; this review uniquely integrates findings from the environmental, economic, and social realms to afford a holistic evaluation. The study also establishes knowledge gaps on the yield gap, climate resilience, and scaling barriers, which ought to inform agricultural policy. As global food systems are facing innumerable challenges from climate change, resource depletion, and population expansion, this all-encompassing analysis of organic farming's strengths and weaknesses will be crucial for working towards evidence-based mechanisms that seek an equilibrium of high productivity with sustainability in the long run.

Literature Review

This section provides the various works on organic farming carried out by various research scholars.

The Rise of Organic Agriculture in Global Food Systems

Organic farming has grown significantly globally, with the total area under organic management increasing from 11 million hectares in 1999 to over 74.9 million hectares by 2023. This growth is driven by consumer demand for healthier, environmentally friendly foods and increased policy support. Organic agriculture is defined by its principles of health, ecology, fairness, and care, aligning with the Sustainable Development Goals. This review synthesises current research findings to assess organic farming's contributions to agricultural sustainability.

Soil Health and Fertility: Building the Foundation of Sustainable Agriculture

Organic farming has been shown to significantly improve soil health, with long-term comparative studies showing significant improvements in physical, chemical, and biological properties. Organically managed soils contain 20-40% more microbial biomass, 30-40% more earthworms, and 90% greater microbial activity compared to conventional systems (Fließbach *et al.*, 2007). This enhances soil ecosystem functioning and resilience. Soil Organic Matter (SOM) typically increases under organic management due to greater inputs of organic amendments and more diverse crop rotations. Organic farms maintain 3.5% higher soil organic carbon concentrations and 12.8% higher carbon stocks compared to conventional farms, providing dual benefits for soil fertility and climate change mitigation (Lori *et al.*, 2017).

Nutrient cycling in organic systems relies on biological processes rather than synthetic inputs, creating qualitative differences in nutrient availability patterns. Organic systems retain nitrogen more efficiently within the soil-plant system, reducing nitrogen leaching by up to 64% compared to conventional systems (Drinkwater *et al.*, 1998). Soil physical properties also improve under organic management, with increased aggregate stability, water infiltration rates, and water holding capacity. These improvements are particularly significant in climate change adaptation, as enhanced water retention can buffer against drought conditions and reduce erosion risk during intense rainfall events.

Biodiversity Conservation: Supporting Ecosystem Services in Agricultural Landscapes

Organic farming has been shown to have a significant positive impact on biodiversity conservation, with an average 30% increase in species richness compared to conventional operations (Bengtsson *et al.*, 2005). This is particularly significant for pollinators and predatory insects, which provide essential ecosystem services like pollination and natural pest control. The benefits of organic farming are attributed to the absence of synthetic pesticides, diverse crop rotations, and management practices like reduced tillage intensity and mixed farming (Hole *et al.*, 2005). The landscape context also plays a significant role in biodiversity outcomes, with organic farming's benefits most pronounced in homogeneous, intensively farmed landscapes. Soil biodiversity also shows significant responses to organic management, with microbial biomass and enzyme activities being 59% and 30% higher in organic systems. This enhanced biodiversity not only supports agricultural productivity but also improves pollination, natural pest control, and soil fertility (Crowder *et al.*, 2010).

Water Quality and Resource Management: Reducing Agricultural Pollution

Organic farming systems offer significant water quality protection by prohibiting synthetic pesticides and limiting soluble fertilisers, reducing agricultural pollutants entering ground and surface waters. Nitrogen leaching rates are 31% lower in organic systems compared to conventional agriculture, and nitrate leaching reductions range from 40-64%. Organic-approved pest management substances, such as copper-based fungicides, have lower water quality impacts than synthetic alternatives due to reduced persistence and lower application rates. Water use efficiency in organic systems varies depending on regional context and management specifics. In arid regions, improved soil structure and higher organic matter content can enhance water retention capacity by 20-40%, reducing irrigation requirements during dry periods (Gomiero *et al.*, 2011). The relationship between organic farming and water resource management becomes increasingly important in the context of climate change, with more frequent droughts anticipated in many agricultural regions. Watershed-level studies show potential landscape-scale benefits of organic agriculture for water quality, particularly when strategically implemented in high-leaching risk zones.

Climate Change Mitigation and Adaptation: Organic Farming's Carbon Footprint

Organic farming has the potential to contribute to climate change mitigation through various pathways, including increased soil carbon sequestration and reduced greenhouse gas emissions. Organic farms sequester an average of 3.5 metric tons of CO_2-equivalent per hectare per year more through soil carbon storage, with the greatest gains observed in arid regions. However, organic systems may produce higher emissions of certain gases under certain conditions, such as nitrous oxide and methane (Grandy, 2006). Life Cycle Assessments (LCAs) reveal system- and product-specific patterns, with organic products generally having lower carbon footprints per unit area but not necessarily per unit product due to the yield gap. Organic systems also have climate adaptation capacity, with enhanced soil

organic matter, improved water retention, and greater biodiversity, conferring greater resilience to extreme weather events. Research by Lotter *et al.* (2003) shows that organic corn and soybean systems have 28-33% higher yields during drought years due to better water retention and greater resilience to flooding in organic systems with well-developed soil structure (Gomiero *et al.*, 2011).

Productivity and Yield Comparisons: Addressing the Yield Gap

Organic agriculture's productivity comparison is a contentious issue, with studies showing that organic yields are generally 25% lower than conventional yields. However, this difference varies by crop type and management context (De Ponti *et al.*, 2012). Diversification practices like multi-cropping and crop rotations can help overcome the yield gap. Long-term systems trials show that organic systems can achieve 80% of conventional yields while using less fertiliser and energy. Theoretical modelling suggests that the current yield gap could narrow significantly with further research and innovation. Organic agriculture could potentially feed the global population without expanding agricultural land area, but only if combined with strategies to reduce food waste and shift dietary patterns. The yield gap discussion should be contextualised within broader sustainability goals (Reganold & Wachter, 2016).

Economic Viability: Farm Profitability and Market Development

Organic farming offers economic sustainability through improved farm profitability, market stability, and economic resilience. Despite lower yields, organic farms often achieve equal or greater profitability compared to conventional operations (Crowder & Reganold, 2015). A meta-analysis found that organic agriculture is 22-35% more profitable than conventional agriculture, with a benefit/cost ratio 20-24% higher. Price premiums are the primary economic driver offsetting lower yields, with average premiums varying across regions. Organic production costs show different patterns than conventional agriculture, with higher expenses for labour, organic inputs, and certification. The global market for organic food has grown significantly, but market infrastructure limitations create barriers for farmers transitioning to organic production. Organic farms typically implement more diverse crop rotations, resulting in more stable incomes and less vulnerability to input price volatility (Delbridge *et al.*, 2017).

Social Dimensions: Health, Employment, and Rural Development

Organic farming has significant social sustainability impacts, including improved human health, employment opportunities, and rural community development. It reduces the occupational hazard of pesticide poisoning, as organic farming eliminates synthetic pesticide use. Employment effects are positive but context-dependent, with organic farms employing 15% more workers per hectare than conventional operations (Boedeker *et al.*, 2020). Consumer health impacts are ongoing, with organic food containing higher antioxidant concentrations and lower levels of cadmium and pesticide residues (Finley *et al.*, 2018). Organic farming also fosters social capital development in rural areas through direct marketing, agritourism, and value-added processing (Jansen, 2000). The educational aspect of organic farming extends to consumers, with farm visits and direct marketing creating opportunities for public

engagement (Baudry *et al.*, 2018). However, equity considerations in organic agriculture remain complex, with participatory guarantee systems and group certification models emerging to address challenges (Beuchelt & Zeller, 2011).

Organic agriculture policy support has evolved significantly over the past few decades, with key mechanisms such as financial incentives, maintenance payments, and market development support being effective in promoting organic transitions. Europe has the most supportive policies, with the EU aiming to convert 25% of agricultural land to organic by 2030. The economic rationale for public support of organic agriculture is partly due to its provision of public goods and positive externalities, such as enhanced ecosystem services and rural employment. However, tensions between original organic principles and regulatory minimums have emerged, leading to the participatory guarantee systems movement. Research and extension policies tailored to organic systems remain underdeveloped in most regions, with less than 1% of published agricultural research specifically addressed (Lockeretz & Anderson, 1993).

Research Design

The study uses a quantitative research approach to evaluate the impact of organic farming on sustainable agriculture development, using a descriptive survey design to analyse farmers' experiences, production methods, economic outcomes, and environmental impacts in the study area.

Statement of the Problem

Even though the harm to the environment and side effects of using chemicals in farming have become more widely known, organic methods are still not widely used in agricultural areas specific to the Mandya region. Farmers encounter issues relating to declining soil fertility, heavy dependence on rain due to lack of irrigation facilities, fewer types of crops and rising input prices. All these factors impact the continuous and sustainable success of agriculture. The claim that organic farming is environmentally friendly and efficient lacks empirical evidence specific to the Mandya region. This study aims to find out if organic farming helps the local economy, protects the environment and boosts the lives of farmers in Mandya and what challenges or drivers affect people's ability to adopt it.

Objectives of the Study

(i) To analyse the socio-economic profile of organic farmers in the Mandya district.

(ii) To identify determinants influencing their adoption of organic farming practices.

(iii) To measure the economic viability of organic farming by comparing production cost, yield pattern, and income generation with those of conventional farming in the area under study.

(iv) To identify the major challenges and constraints faced by organic farmers in Mandya district in terms of production, certification, and market access.

(v) To study the relationship between different characteristics of farmers and farms with the economic success of organic farming enterprises using regression modelling.

Study Area

The research was conducted in Mandya district, Karnataka, due to its significant organic farming activities and diverse agro-ecological conditions. The district, known for its canal irrigation systems and cultivation of crops like rice, sugarcane, and vegetables, is an ideal location to study various aspects of organic agriculture implementation.

Sampling Procedure

The study used a purposive sampling technique to select 50 farmers in Mandya district who have been practising organic farming for at least three years, ensuring substantial experience and a sample size based on research objectives, available resources, and statistical requirements.

Data Collection

The study used a structured questionnaire to gather information on farmers' socio-economic characteristics, organic farming practices, production inputs, yields, marketing channels, income, challenges, and perceived benefits of organic farming. Field assistants were available for clarification, and questionnaires were completed and reviewed. Secondary data was sourced from government reports, Karnataka State Department of Agriculture, local agricultural extension offices, organic certification bodies, and published literature to complement the primary data.

The collected data was analysed using both descriptive and inferential statistical techniques.

Descriptive Statistical Analysis

Percentage analysis was employed to examine the distribution of respondents across various categories, including demographic characteristics, farm size, types of organic crops grown, certification status, marketing channels utilised, and perceived benefits of organic farming. Results are presented using frequency tables, charts, and graphs to facilitate easy interpretation and comparison.

Regression Analysis

The regression analysis revealed that factors such as farm size, education, farming experience, access to credit, and market access significantly impact the productivity and profitability of organic farming systems.

Independent Variables (IVs)

Age, education level, farming experience, and land holding size.

Dependent Variable (DV)

Economic success of organic farming operations (measurable through: "Organic farming has improved the overall economic viability of my farm operation", and "Percentage premium price received").

Hypotheses of the Study

H1: There is a significant relationship between farmers' socio-economic characteristics (age, education, farm size, and farming experience) and the economic success of their organic farming operations.

H2: Organic farming practices significantly improve the economic viability of agricultural operations compared to conventional farming methods in the Mandya district.

Data Analysis

From Table 1, we can analyse that

(i) Middle-aged farmers participate more in organic farming, potentially due to experience and sustainable practices, while younger and elderly farmers participate less, indicating age-specific hurdles.

(ii) Organic farmers in Mandya district have moderate literacy, with secondary education being the majority, which may limit their access to organic agricultural information.

(iii) Organic farmers typically have 11-20 years of experience, with a lower percentage under 5 years, suggesting perceived hazards may deter adoption.

(iv) Marginal farmers benefit most out of organic farming practices compared to landholders

(v) Mandya's traditional agricultural profile includes rice as the dominant crop, while diversification into vegetables reflects market demand for organic produce in high-value crops.

(vi) Organic farmers have a local market orientation, limiting integration with specialised value chains, with producer organisations acting as intermediaries and export market access being limited.

(vii) The majority of the farmers lack specialised credit facilities for organic farming, limiting investment in infrastructure due to reliance on general agricultural loans or difficulties accessing tailored finance.

(viii) Organic farming practices lead to cost reduction due to decreased dependency on chemical inputs. However, some may experience increased costs during transition years.

(ix) Most organic farmers in Mandya have modest price premiums, suggesting limited market differentiation or consumer willingness to pay for organic products in accessible markets.

The analysis of regression results for organic farmers in Mandya (Table 2) reveals that the amount of variation in economic success explained by the chosen characteristics (age, education, farming experience and landholding

Table 1. Demographic and Other Categorical Responses of the Respondents

Age	41-50 years	21%
Education	Secondary (6-10 standard)	19%
Farming Experience	11-15 years	34%
Land holding	1-2 hectare	46%
Crop type	Rice	74%
Marketing channel	Direct sales	74%
Authentication	Organic farming certification	36%
Access to credit	Short-term loan (Crop loan- unsecured)	38%
Economy	Lower production cost	38%
Price premium	Modest price premium	34%

Source: Desk Research

size) is quite low. Overall, less than 3% of the change in economic performance is connected to the independent variables included, as indicated by R-squared.

Statistical analysis in Tables 3 and 4 indicates that the selected socio-economic variables are not linked to economic success. The F-statistic at 1.4441 indicates the goodness of fit of the model. However, the significance value of 0.241 indicates no significant impact of socio-economic variables on the economic success of organic farming.

Table 2. Regression Statistics

Regression Statistics	
Multiple R	0.17
R Square	0.0289
Adjusted R Square	0.0089
Standard Error	0.519
Observations	50

Source: Desk Research

Discussion and Conclusion

The analysis makes it clear that we need policies to foster an excellent environment for organic farming. If the market is better linked, services could be improved, access to certification is made easier, and credit facilities are established, people will be more likely to take up and succeed with new technologies. Structural reforms can streamline the support mechanisms provided to farmers adopting organic farming. The change would play a big role in reaching the main objectives for sustainable farming in India.

The study reveals obstacles and potential in organic farming in the Mandya district. The majority of the farmers considered as sample respondents for the study practice organic farming. They have a secondary education as their background. The land distribution is similar to broader agricultural patterns, with small and marginal farmers making up 64% of practitioners. Only 38% of select respondents have an official organic farming certification.

Table 3. ANOVA

	df	SS	MS	F	Significance F
Regression	4	0.7781	0.1945	1.4441	0.241
Residual	45	6.0689	0.1349		
Total	49	6.847			

Source: Desk Research

Table 4. Coefficient Statistics

	Coefficients	Standard Error	t Stat	p value	Lower 95%	Upper 95%
Intercept	1.5541	0.2037	7.6275	0.0000	1.1497	1.9585
Age	-0.1199	0.1006	-1.1919	0.2362	-0.3197	0.0798
Education level	0.0635	0.0546	1.1629	0.2477	-0.0449	0.1719
Farming experience	0.045	0.0600	0.7500	0.4560	-0.0760	0.1660
Land holding size	0.08	0.0700	1.1429	0.2580	-0.0610	0.2210

Source: Desk Research

Technical constraints include input accessibility and pest management facilities. They have limited exposure to market opportunities. The majority depend on unsecured short-term agricultural loans and lack access to institutional loans. Despite these hurdles, farmers claim increased soil quality, biodiversity, cost reductions, and economic viability as advantages of organic farming. Government support is low, suggesting improving institutional support, market growth, and access to organic inputs could improve the adoption rates.

The success of organic farming is not primarily determined by socio-economic factors but by the comprehensive application of organic practices. The study suggests holistic policy interventions to create an enabling ecosystem for organic farming, such as strengthening market linkages, enhancing extension services, and developing specialised credit facilities.

Since socio-economic factors only partly explain economic success among organic farmers. Future studies can include factors such as the use of organic products, training and policy support from the government, water conservation techniques, membership in cooperative societies, *etc*. In addition, researchers can adopt focus group interview methods and case studies that can help understand the qualitative factors that shape success that cannot be measured with numbers. Furthermore, dividing farmers into small and large groups or new and experienced organic farming participants could uncover information that is not present when all farmers are analysed as a single group. This method enables us to customise support services for each type of farmer.

In addition, time-series research can help us monitor the long-term economic changes caused by organic agriculture. With the current cross-sectional information, it is not possible to account for seasonal or yearly differences in income, yield or access to the market. The government must concentrate on making the market, storage systems, certification and training better for organic farmers. Programs for farmers that teach them about recent organic farming technologies and sustainability would be beneficial too. Researchers can apply logistic regression, path analysis or structural equation modelling to obtain better analysis.

The challenges in organic farming are closing the yield gap that can be improved by breeding programs, enhanced biological pest management strategies, and precision organic technologies. Climate change adaptation is another challenge, with research focusing on developing drought-resistant systems and climate-adaptive crop varieties. Ensuring equitable access to organic markets globally is another challenge, with producers in developing regions often facing barriers. Participatory guarantee systems and digital technologies can help build local organic markets while minimising certification costs. Integrating traditional agricultural knowledge with modern organic science can enhance productivity and cultural relevance in developing regions (Scialabba & Müller-Lindenlauf, 2010). Technology adoption in organic agriculture presents trade-offs between efficiency and adherence to core principles, with debates surrounding new breeding techniques like CRISPR gene editing. (Baars, 2011)

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The Implementation of Blockchain Technology in the Banking Sector: Opportunities, Challenges, and Future Prospects

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Abstract

Blockchain technology has emerged as a transformative force across industries, with the banking sector at the forefront of its practical application. The present study explores the implementation of blockchain technology in the banking sector, emphasising its capacity to enhance operational efficiency and reduce transaction costs. The token system, a key component of blockchain, streamlines transactions, enabling faster payments at lower costs, thereby enhancing customer satisfaction. With its extensive application in cryptocurrency support, blockchain technology is transforming the economy. Furthermore, its integration simplifies the loan application process, making it more efficient for applicants. Despite its potential, widespread adoption is hindered by challenges such as regulatory uncertainty, scalability issues, interoperability concerns, and resistance to organisational change. The analysis concludes that while blockchain technology is not a panacea, its strategic implementation can offer competitive advantages and greater transparency in banking operations.

Keywords: Banking Sector, Blockchain, Cryptocurrency, Private Blockchain, Public Blockchain
JEL Classification: G21, E58, E42
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Introduction

The banking sector globally has taken significant steps towards digitalisation. The implementation of blockchain technology in the banking sector enables faster and more transparent communication with users. Blockchain is an advanced database technology that provides transparency in data sharing within business networks (Abu-Elezz *et al*., 2020). This rapidly

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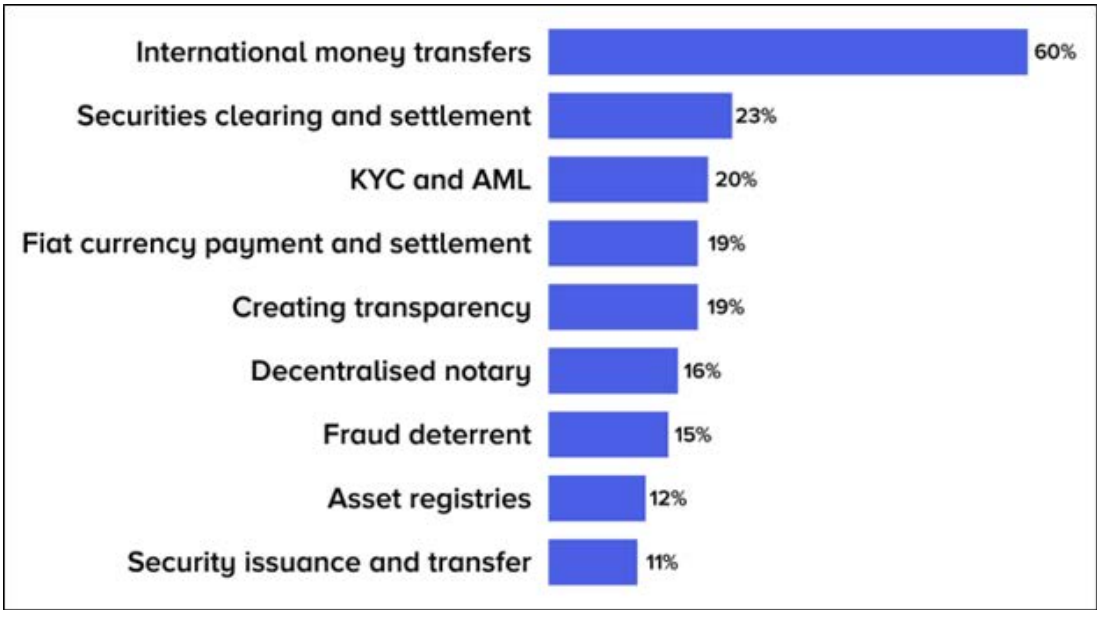

Figure 1. Top Applications of Blockchain in the Banking Sector.
Source: Shuvo (2023)

growing technology primarily records and facilitates the efficient transfer of stored assets. There are four main types of blockchain technologies: public, hybrid, private, and consortium.

Blockchain technology has the potential to revolutionise the banking sector by securely distinguishing between digital data and unique assets. The use of tokens facilitates smooth transactions, increasing the flow of transactions within the banking sector (Ali *et al.*, 2021). By tracking ownership of assets such as stocks, commodities, and debts, blockchain technology ensures secure and efficient transactions. The elimination of intermediaries through blockchain reduces transaction processing time and minimises the risk of fraudulent activities. The introduction of cryptocurrencies like Bitcoin has made transactions more accessible, eliminating extra fees and enabling real-time processing (Alsharari, 2021). By introducing a token system, blockchain technology reduces transaction costs and streamlines processes, transforming the banking sector's transaction landscape.

Figure 1 highlights the top applications of blockchain technology in the banking sector. Initially, blockchain was primarily used for security, insurance, and transactions. Its benefits are particularly evident in international money transfers, where it reduces transaction costs and eliminates intermediaries, thereby increasing transaction speed (Andoni *et al.*, 2019). By integrating blockchain, banks can mitigate risks associated with asset management and multiple transactions, enhancing overall efficiency and security.

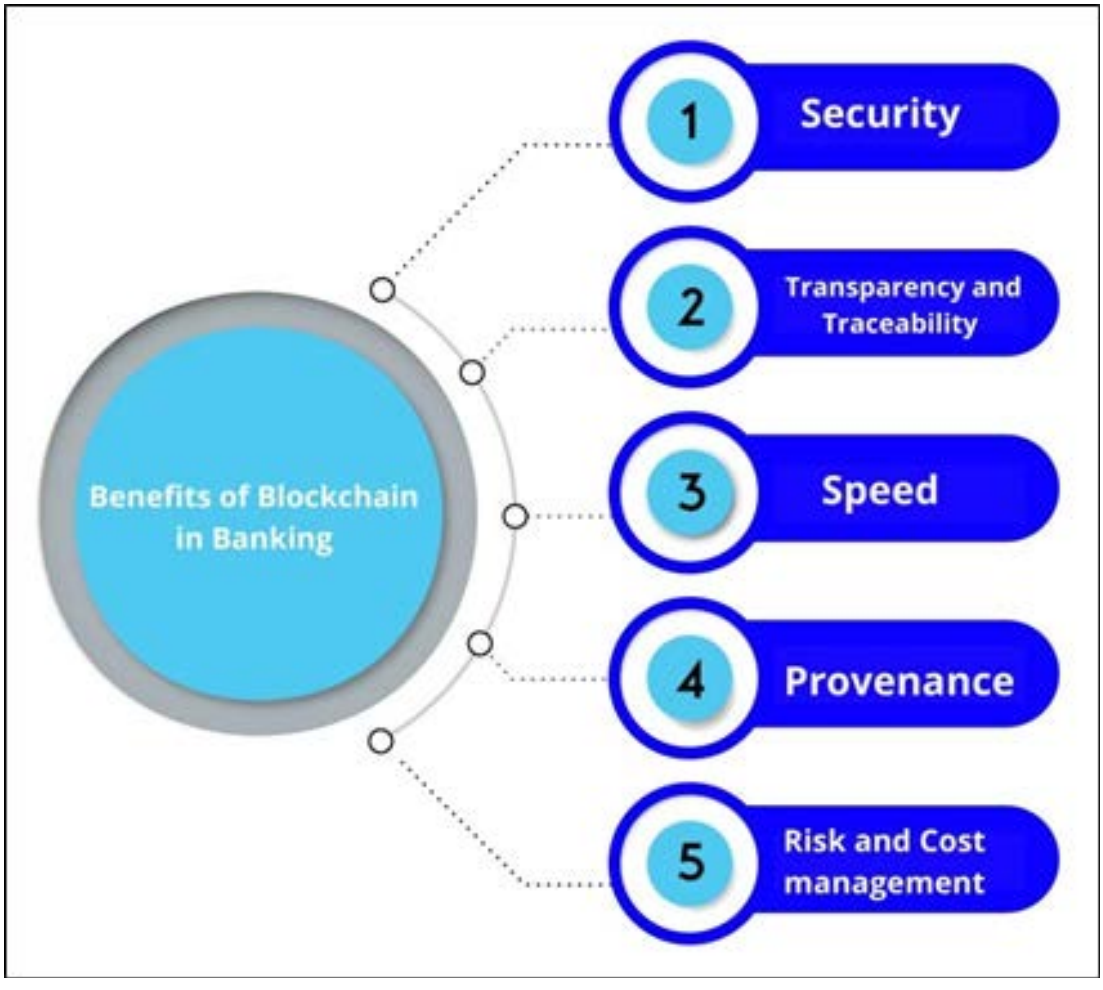

Figure 2. Benefits of Blockchain in the Banking Sector.
Source: Nagar (2025)

Literature Review

Role of Blockchain in the Banking Sector

Blockchain technology is revolutionising the banking sector by streamlining transactions and enhancing transparency. As illustrated in figure 2, blockchain reduces the need for intermediaries, increases efficiency and trust in financial transactions (Bhutta *et al.*, 2021). Its impact is far-reaching, influencing various banking aspects such as trade finance, fundraising, loans and credits, and settlement and clearance systems. The benefits of blockchain in these areas are significant, offering improved security, speed and reduced costs.

The implementation of blockchain technology in banking enhances customer satisfaction by facilitating faster payments and reducing

transaction costs. Even with high-quality offers and services, banks can further improve efficiency by leveraging blockchain, which eliminates intermediaries and ensures secure transactions (Cole *et al.*, 2019). Blockchain plays a crucial role in trade finance, connecting transaction activities with international commerce. By operating on a digital platform, blockchain enables the banking sector to stay ahead in terms of technological advancement. Additionally, blockchain can potentially simplify fundraising processes, which can be challenging through traditional venture capital routes.

The traditional fundraising process involves multiple steps, leading to delays and complexity (Dutta *et al.*, 2020). Blockchain technology streamlines this process by leveraging digital platforms, thereby accelerating fundraising. In loan applications, blockchain eliminates intermediaries and reduces the need for extensive documentation, making the process more efficient. By enabling direct transactions between banks and customers, blockchain provides a transparent and trackable record of customer interactions. This technology has the potential to transform the banking sector globally.

Advantages of Implementing Blockchain Technology in the Banking Sector

Blockchain technology has the potential to revolutionise the banking sector by introducing innovative processes and eliminating intermediaries (Guo & Yu, 2022). By streamlining transactions, blockchain accelerates processing times and enhances customer satisfaction. Public blockchains, in particular, enable secure and transparent transactions, facilitating access to assets for multiple parties. This technology also supports cryptocurrencies like Bitcoin and Ethereum (Janssen *et al.*, 2020). The use of cryptocurrencies can significantly reduce transaction costs. However, a lack of clear government regulations poses a challenge to the widespread adoption of cryptocurrencies in the banking sector.

Problems in Implementing Blockchain Technology in the Banking Sector

The integration of blockchain technology in the banking sector has the potential to drive significant advancements. However, its adoption also presents several challenges (Javaid *et al.*, 2021). One key issue is determining a fixed budget for blockchain implementation, as costs can vary widely depending on the scope and complexity of the project. The global nature of blockchain adoption further complicates

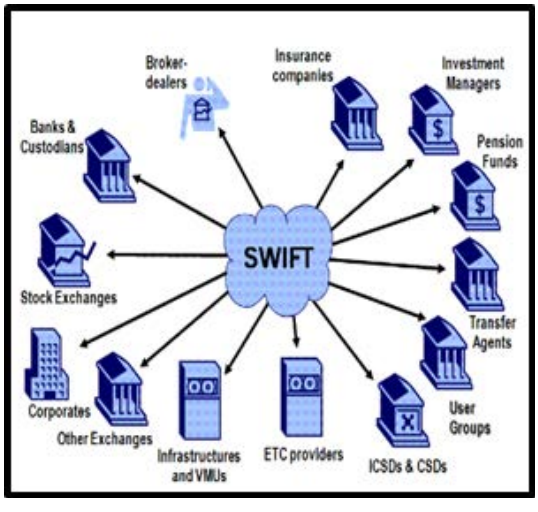

Figure 3. Disruptions in the Banking Sector by Blockchain.
Source: CB Insights (2018)

budget planning. It causes disruptions in the banking sector as illustrated in Figure 3. Despite these challenges, blockchain technology can streamline transaction procedures, making loan applications faster and more efficient for customers.

While blockchain technology can enhance efficiency in banking, it also introduces new security challenges. The decentralised nature of blockchain can increase vulnerability to fraudulent activities, private key attacks, and other security threats (Lim *et al*., 2021). Although traditional banking methods have strict regulations, blockchain's unique characteristics require innovative security solutions to mitigate these risks.

Strategies to Overcome the Problems in Implementing Blockchain Technology in the Banking Sector

To successfully implement blockchain technology in the banking sector, it's essential to establish a strong foundation (Lin *et al*., 2020). This includes allocating a suitable budget and minimising costs during the initial phase. Given the critical importance of security in banking, blockchain systems must prioritise robust security measures that align with existing banking standards. By doing so, blockchain can enhance transaction efficiency and provide a secure experience for customers.

Research Design

Objectives

The primary focus of integrating blockchain in the banking sector is to facilitate rapid transactions by eliminating intermediaries and reducing transaction costs. The primary focus of the paper is to understand the role of blockchain technology in the banking sector and challenges associated with the same. The study identifies the following objectives to be explored in detail.

The objectives of the study are as follows:

1. To understand the role of the blockchain in the banking sector.
2. To analyse the advantages of implementing blockchain technology in the banking sector.
3. To identify the issues and challenges in implementing blockchain technology in the banking sector.
4. To develop strategies to overcome the problems in implementing blockchain technology in the banking sector.

Methodology

This study is descriptive and examines the impact of blockchain technology on the banking sector. The study uses secondary data sources, existing research papers, articles, and journals to explore theoretical approaches and analyse their practical implications in the banking sector.

This research design provides insights into the current state of implementation and use of blockchain technology in the banking sector and provides insights into the future trends in the extensive use of blockchain technology in banking products and services. The study employs a deductive approach, examining key variables and their implications (Morkunas *et al*., 2019).

Discussion

Impact of Blockchain Technology in the Banking Sector

Blockchain technology benefits both private and public sectors, particularly in transaction methods. In the banking sector, blockchain implementation accelerates transaction processing, surpassing traditional methods. Public blockchain transactions are decentralised and accessible to multiple users, promoting transparency (Sedlmeir *et al.*, 2020). In contrast, private blockchain transactions are restricted to specific users, managed by network administrators, and offer higher efficiency and scalability.

Utilisation of Blockchain Technology in Multiple Fields of the Banking Sector

Traditional banking methods involve multiple stages, making transactions cumbersome. Blockchain technology eliminates intermediaries, streamlining transactions and reducing costs (Cole *et al.*, 2019). By automating processes, blockchain minimises errors associated with manual data tracking, ensuring more accurate and efficient transactions.

The banking sector's shift towards digitalisation has led to the adoption of blockchain technology, enabling faster and more transparent communication with users (Ali *et al.*, 2021). By eliminating intermediaries, blockchain reduces transaction costs. This technology has become increasingly accessible to customers, although its integration can disrupt traditional banking processes. Blockchain also minimises errors and improves customer tracking (Sedlmeir *et al.*, 2020). However, a significant challenge to blockchain adoption in banking is the lack of understanding of its potential benefits and limitations.

Blockchain technology is increasingly being adopted in the banking sector due to its potential to support cryptocurrencies and revolutionise the economy. By eliminating intermediaries, blockchain facilitates smooth cash flow and reduces costs (Xiong *et al.*, 2020). To successfully integrate blockchain, banks must educate their organisations about the technology and develop familiarity with its capabilities. Effective collaboration between blockchain and banking can drive economic growth. However, understanding the specific needs of banks remains a challenge in the global adoption of blockchain technology.

Conclusion

Blockchain technology in the banking operations defines a paradigm shift in how financial institutions operate, offering the promise of greater transparency, enhanced security, faster transactions and reduced operational costs. The integration of blockchain technology in the banking sector accelerates transaction processing, enhancing customer satisfaction and driving global adoption. By replacing traditional methods, blockchain increases productivity, reduces errors, and promotes transparency, allowing banks to efficiently track customer transactions and maintain accurate records. However, regulatory ambiguity, data privacy, and scalability issues continue to slow progress in adoption and implementation. The long-term potential of blockchain is substantial. Future research should focus on systemic risk, the use of blockchain in financial inclusion, etc.

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CBDC Adoption: A Case Study with reference to China

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Abstract

The Reserve Bank of India's (RBI) digital rupee program marks a significant step toward modernising monetary policy tools, increasing financial inclusion, and decreasing reliance on physical currency. This comparative case study analysis of China's e-CNY offers valuable insights into India's digital rupee adoption within the framework of government schemes. This paper examines the integration of government schemes such as Jan Dhan Yojana, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), and Direct Benefit Transfer (DBT) to promote Central Bank Digital Currency (CBDC) adoption. Using the grounded theories like Technology Acceptance Model (TAM), Prospect theory, Trust Theory, and Innovation Diffusion Theory (IDT) as theoretical foundations, this paper has derived a deductive model. The research critically examines the behavioural, infrastructure, and factors influencing CBDC deployment and has proposed a conceptual model in studying the role of government schemes in CBDC adoption. A comparative analysis and case examination of China's e-CNY provides cross-national insights and emphasises Challenges in Government-led CBDC Promotion and technological readiness for successful CBDC implementation in India. Policy recommendations are offered to guide the effective CBDC adoption in India.

Keywords: CBDC, CBDC Adoption, Central Bank Digital Currency, Digital India, Financial Inclusion, Government Schemes

JEL Classification: E42, E58, O33, G28, G21

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Introduction

Digital Rupee, or e-rupee, is India's CBDC. It is the digital form of India's physical currency, the Rupee, issued by the RBI in digital format. The Digital Rupee offers features similar to physical cash, such as convenience of use, guaranteed by the RBI. The Digital Rupee (e-Rupee) ensures instant and hassle-free transactions, offering simplicity and speed. It reduces the time and cost associated with cross-border payments. By minimising cash handling and transportation, CBDC can potentially cut expenses and lower security risks. Additionally, CBDC functions both online and offline, further boosting financial inclusion. India's digital ecosystem has grown for various reasons, including the government's push for digitisation, internet and

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smartphone usage, and the rise of e-commerce. Government schemes have enabled significant growth in CBDC adoption in countries like China and others. In India, these initiatives help Indian banks expand their operations rapidly, but the adoption of CBDC, or the e-rupee, for retail use progresses at a slower pace. CBDC adoption enables financial inclusion and digital literacy are be facilitated on a large scale. Through several programs, including Start-up India, Make in India, and Digital India, the Indian government has aggressively encouraged digital technologies. These programs seek to boost the adoption of digital technology across various industries, including healthcare, education, and agriculture, while fostering an atmosphere supporting start-ups' growth. The expansion of the digital ecosystem has also been significantly aided by India's rising internet and smartphone penetration rates. The digital equivalent of government-backed fiat money is called Central Bank Digital Currency (CBDC). India's digital rupee which will be supported by the RBI, the country's central bank.

India's Unique Landscape

Phases & Rollout of the CBDC: India launched the pilot of its digital rupee in December 2022. According to the RBI, CBDCs can be categorised into Wholesale, or CBDC-W, for the banking and financial institutions; Retail, or CBDC-R, for the people at large. The former has been in operation in places at large for some time. The former has already operated in interbank operations and government securities. Collaborating banks provide consumers with the retail versions of digital wallets, which offer the possibility of P2P (Peer-to-Peer) and P2M (Peer-to-Merchant) transactions. The projects have objectives such as an expanded financial system and economic digitisation.

Literature Review

Kahneman and Tversky's (1979) Prospect Theory suggests that people assess profits and losses asymmetrically. When faced with uncertainty, people tend to be risk-averse because they are more sensitive to possible losses than to comparable rewards. This theory helps in deducting sensitivity to data control loss, perceived security and privacy risks, willingness to adopt CBDCs and confidence in regulatory frameworks as research variables. It explains new paradigms of financial interaction, such as government-controlled digital currencies and decreased transaction anonymity brought about by the shift from UPI (Unified Payments Interface) to CBDCs. The paradigm provides a framework of understanding risk aversion in financial decision-making is provided by this seminal research, which describes how people evaluate possible benefits and losses differently. This theory provides insights, particularly in understanding the hesitation people experience when adopting new financial technologies. Privacy concerns, trust aspects are deducted to understand how security, privacy perceived and financial risk are key factors in resistance toward innovations like CBDCs or digital payment systems.

Hansen (2014) opined that, according to trust theory, innovations can be accepted and successful if people have faith in the institutions, processes, and governing authorities. Trust can be effective (based on emotional ties) or cognitive (based on logical assessment). Furthermore, arguments suggest that decision-making is disproportionately influenced by

perceived losses, which is particularly relevant to public reluctance towards adopting CBDCs.

Charness and Rabin (2002) offered a thorough framework for institutional trust, which is essential for embracing innovations such as CBDCs. Mayer *et al.* (1995) examined trust through its three key components: ability, integrity, and benevolence are crucial factors in technology adoption, which is directly relevant to understanding public trust in CBDCs adoption in India.

Gefen *et al.* (2003) explored the relationship between control and trust, highlighting how trust is influenced by perceptions of oversight and governance. This framework can be applied to strike a balance between the public's confidence in the RBI and the regulatory supervision of CBDCs.

Das and Teng (1998) provide theoretical depth for analysing public confidence in digital systems and highlight fundamental insights into the significance of trust in societal interactions. Trust as a social mechanism, risk and confidence dynamics factors enable researchers to study the public adoption of CBDCs.

Luhmann (2018) and Roger (2003) Innovation Diffusion Theory (IDT) explains the pattern and speed at which information about innovations reaches the population. The theory outlines five key components, like Innovation characteristics, Relative advantage, Compatibility, Complexity, Trialability, Observability, Adopter Categories, Communication Channels and Social Systems. Adopter categories help to identify who is likely to adopt CBDC and when. Communication channels indicate how information about the CBDC is shared and how people can be informed and persuaded. Lastly, social systems explain where the adoption of CBDC may be fast or slow and why these variations happen.

Roger (2003) and Wani and Ali (2015) suggest that the information about innovations is diffused or spread through certain channels to people. These Communication channels through which innovation is communicated can greatly influence people's interest in the innovation and their response to it, leading to different adopter categories: early adopters, early majority adopters, late majority adopters and laggards. (Roger, 2003). This theory implies that communication channels through which people learn about the central bank digital currency play a vital role in people's interest in CBDC adoption or usage. Positive messaging that addresses concerns about security, transparency and usability and misinformation or lack of clear communications contributes to scepticism.

Davis (1989) The Technology Acceptance Model (TAM) suggested two important elements: Perceived Usefulness (PU): the conviction that using technology takes little effort. These elements have an impact on Behavioural Intention to Use (BIU) and Attitude Toward Use (ATU), both of which are indicators of actual technology adoption. (Davis, 1989) In the context of CBDC adoption, this theory suggests a person who perceives technology or innovation as easy to use. Easy to learn, time-saving and valuable, will be more likely to accept and use the technology. The implications of this theory for CBDC are that the central bank digital currency needs to undertake effective marketing or campaigns to create a positive perception about the ease of use and usefulness of the Digital Rupee among the population.

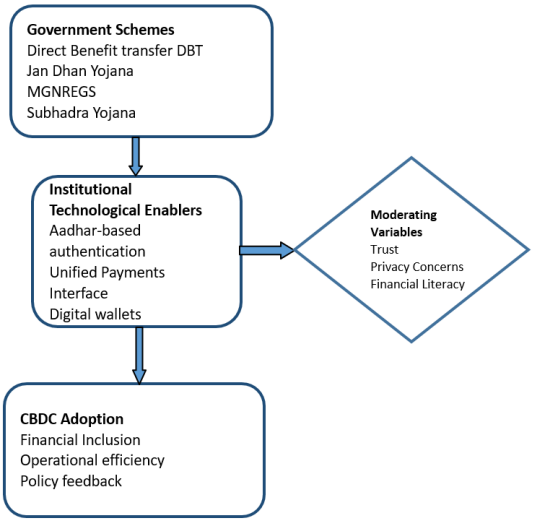

Figure 1. Conceptual Framework.
Source: Information collated by the author

Research Design

Figure 1 represents a conceptual framework illustrating how institutional enablers and government schemes such as Direct Benefit Transfers (DBT), Jan Dhan Yojana, MGNREGS, and Subhadra Yojana help unbanked populations into to formal economy, enabling broader outreach of digital financial platforms to influence the adoption of CBDC. The Digital rupee, framed as a function of financial inclusion, operational efficiency, and policy feedback loops, is expected to promote faster settlements and reduce physical cash (Bank for International Settlements, 2020). This relationship is moderated by individual-level factors such as financial literacy, privacy concerns, and trust. This model facilitates the development and dissemination of institutional technological enablers, such as Aadhaar-based authentication systems, UPI, and digital wallets. They represent the infrastructural readiness for CBDC roll-out and act as mediators between policy and adoption (Rao & Ghosh, 2022). Furthermore, technical infrastructures lay the foundation for scalable and CBDC adoption. The final node is conceptualised as an outcome shaped by both institutional setup and citizens' readiness to engage. Trust in digital finance and the central bank is very important. Previous research showed that higher trust correlates positively with willingness to use digital currency. However, when CBDCs are perceived as surveillance-prone, individuals may hesitate to adopt them. (Borgonovi & Pokropek, 2023) Moreover, financial literacy will better enable able to evaluate the benefits and challenges of CBDC, and it also moderates the influence of digital infrastructure on user behaviour.

Research Question

How government schemes are effectively integrated with CBDC to accelerate adoption in India?

Problem Statement

The successful adoption of the Digital Rupee can transform India's financial ecosystem, navigating social change and providing new routes for economic participation both domestically and globally. In spite of the potential benefits, CBDCs face significant challenges. To increase the use of the digital rupee, the Reserve Bank of India is exploring government schemes as a means to promote the digital rupee. The role of government incentives and schemes in the adoption of CBDC is a topic that needs to be researched.

Research Objectives

To examine how existing government schemes support and magnify the CBDC adoption.

To determine the antecedents which drive financial inclusion in terms of CBDC and major issues and challenges faced by policymakers.
To offer the policy implications based on the current qualitative study.

Research Methodology

This research is quantitative. The study is based on data obtained from secondary sources. The information is collated from various published sources like the Ministry of Finance, the government of India, the RBI, journals, e-newspapers, research papers, government policies, case studies, fintech industry reports, websites, *etc*. One of the strategic measures implemented under China's Digital Yuan (e-CNY) initiative involves the use of government schemes and incentives as a key mechanism to drive the adoption of central bank digital currency (CBDC). By integrating e-CNY into public services and welfare disbursements, China has effectively leveraged state-led financial inclusion to encourage widespread usage. This paper involves a case study analysis of China's adoption strategies and provides valuable insights into potential pathways, challenges, and approaches for other countries exploring CBDCs, particularly India. Through a comparative case study methodology, two key strategic directions emerge for India: First, leveraging government programs to facilitate the adoption of its CBDC; and second, addressing context-specific challenges through robust policy design, inclusive stakeholder engagement, and enhanced technological infrastructure.

Digital Yuan (e-CNY) in China: Case Analysis
A case study on International markets like China, where digital currency has gained prominence, pilot studies were conducted, which were tied to lotteries and subsidies. Citizens received free digital yuan to spend, creating grassroots engagement.

The e-CNY, China's digital currency, is similar to digital cash issued and monitored by the Chinese central bank. It works like physical money, can be used for payments, deposits, and tracking the actual balance. However, every transaction was digitally recorded and retrieved when required.

The monetary framework has two levels:

(i) Big Bank- Few commercial banks in China can convert cash or deposits into e-CNY
(ii) The central Bank, the People's Bank of China, regulates and monitors the money supply and ensures easy transactions.

China's digital currency network operates under three layers.

(i) The digital yuan is guaranteed by the PBOC (People's Bank of China).
(ii) Two databases: the PBOC database, managed by the Chinese central bank of all monetary transactions, and another managed by lower-tier banks.
(iii) Three Centres-they reside with PBOC, include identity verification, tracking digital wallets and transactions, and analysing financial data of users (Lee *et al.*, 2021).

The Chinese government claims that, unlike paper currency, digital yuan (e-CNY) transactions are monitored. However, user privacy is ensured. The primary purpose of this monitoring is to prevent money laundering and tax evasion.

The major reasons for the digital yuan (e-CNY) in China are made possible by two profound reasons.

First, on the domestic front, the digital yuan (e-CNY) simplifies financial transactions while also enabling the Chinese central bank to monitor and prevent illegal activities and financial fraud and strengthens regulatory omissions.

Secondly, on the international front, China wanted to have a strong financial position in international finance and to reduce its dependence on the US dollar-denominated financial system. Further, digital yuan is fully controlled by the PBOC (People's Bank of China), transactions are private to the general public but monitored by the Chinese government. Governments worldwide face a trade-off between security and privacy as countries move toward cashless transactions.

China's Digital YUAN (e-CNY) and Government Incentives

The following points highlight China's Digital Yuan (e-CNY) with government incentives regarding adoption, economic impact and regulatory frameworks.

China Government Incentives to Leverage CBDC Adoption

China's e-CNY is the largest CBDC pilot globally regarding the amount of currency in circulation and the number of users. Various government incentives were implemented, like public transportation, retirement benefits, school tuition, and tax payments. It also used promotional discounts to encourage the use of e-CNY.

Improved Financial Inclusion

The e-CNY has improved access to digital payments in remote rural areas of China, enabling offline payments through digital wallets. The digital Yuan offers many benefits, including transparency, reduced transaction costs, and increased financial inclusion.

Monetary Policy and Economic Control

The People's Bank of China (PBOC) Digital Yuan has increased the capacity of monetary policy of China. PBOC's implementation of the digital Yuan was able to address economic fluctuations and adjust the money supply or interest rates.

Privacy and Data Governance

The Digital Yuan allows privacy between everyday users and businesses. However, the government maintains oversight to track larger transactions for security reasons in a system known as "controlled anonymity".

Competition with UPI and other Digital Payments

The e-CNY allows users to connect numerous bank accounts. It offers to pay using QR codes, like Alipay and WeChat Pay. However, e-CNY offers a new feature called tap-to-pay that allows customers to make and receive payments without a phone signal.

Cross-Border Trade and Internationalisation

The Digital Yuan extends beyond financial transactions; it serves as a foundational pillar in reshaping global finance by driving the de-dollarisation trend, reinforcing financial

sovereignty, and challenging the dominance of the US dollar in International trade.

Lessons Learned from China's Digital Yuan (E-CNY) and Government Incentives: Insights for India's CBDC Adoption

The suitability of CBDCs as a tool for improved financial inclusion must be carefully assessed on a country-specific basis. In India, with its diverse demographics, widespread use of smartphones as a customisable interface for various phone types, and expansion of rural Point of Sale (POS) infrastructure, has laid a strong foundation for digital payments. However, technical infrastructure, such as data centres, servers, and network capacity, if limited, can impact the scalability and performance of CBDC systems and create vulnerabilities to cyberattacks. Financial inclusion is still viewed with speculation.

India's CBDC needs a privacy framework to ensure that citizens' financial data is protected while allowing them to maintain control over their personal information. There won't be a digital footprint because the digital currency will transfer directly between wallets. As a result, the entire procedure becomes anonymous. To enhance user privacy while maintaining security, India's digital rupee should adopt General Data Protection Regulation (GDPR) best practices used in Europe.

The Reserve Bank of India (RBI) is working on integrating UPI QR codes with CBDC wallets. This interoperability allows users to scan any UPI QR Code for transactions. Indian banks have introduced incentives such as cashback and reward points to encourage businesses and individuals to adopt the digital rupee. CBDC adoption leads to direct bilateral trade agreements with BRICS, ASEAN and Gulf countries and reduced dependence on third-party currencies. Businesses and governments aim to reduce foreign exchange costs. And also India is strengthening its financial sovereignty in global trade.

Challenges for CBDC Implementation in India

The RBI is focusing on government schemes to facilitate CBDC adoption, improve efficiency, promote financial inclusion, and reduce operating costs. The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), DBT, Pradhan Mantri Jan Dhan Yojana (PMJDY), and Subhadra Yojana for the successful adoption of CBDC in India (Table 1). To assess the operational performance, certain parameters have to be considered, like infrastructure integration, financial literacy implications, and alignment of these with digital payment mechanisms.

Subhadra Yojana scheme is the first government initiative to utilise CBDC under this scheme, Rs. 10000 is annually deposited into beneficiaries' bank accounts without intermediaries. The digital rupee can be spent using UPI QR codes, transferred to bank accounts, or withdrawn as cash. High transaction volumes help the banks identify user issues and address them quickly. Providing women with safe access to money through user-friendly digital wallets.

Connect DBT and CBDC wallets with real-time payments and Aadhaar. Using Aadhaar-based identity verification, link DBT straight to CBDC accounts. Use quick, safe payment methods (such as UPI) or use digital wallets to ensure payments are made right away. To distribute

CBDC using Jan Dhan accounts and mobile wallets. Use basic mobile wallet apps and Jan Dhan bank accounts to send and store CBDC. This will make it easier to receive and use digital currency, especially for those without smartphones or prior digital experience.

In certain MGNREGS districts with enough infrastructure, pilot CBDC in rural areas where MGNREGS runs and where banking and a strong mobile network are available, begin small-scale CBDC payments trials. This will elevate the effectiveness of CBDC in wage programs in rural areas.

Table 1. Comparative Analysis of Government Schemes

Sl.No	Parameter	DBT	Jan Dhan Yojana	MGNREGS	Subhadra Yojana
1	**Primary Objective**	Transfer welfasre subsidies directly to beneficiaries	Financial inclusion via zero-balance accounts	Employment guarantee with wage payments	Proposed scheme (e.g. for women's cash benefit scheme)
2	**Target Population**	Low-income, rural, and urban poor	Unbanked individuals, especially rural poor	Rural labor force	Women, particularly from lower-income households
3	**Digital Infrastructure Integration**	High – uses Aadhaar-linked bank accounts and digital modes	High – foundational layer for digital payments	Medium – increasingly digitized wage disbursement	Potential – depending on execution via DBT or digital wallets
4	**Financial Literacy Impact**	Medium – limited to transactional interaction	High – foundation for digital transactions	Low – focused on employment more than financial tools	Potential – if integrated with digital literacy drives
5	**Banking Penetration**	Strong – Aadhaar-linked accounts are widely used	Very Strong – enabled approximately 50 crore accounts	Moderate – bank access may be limited in remote areas	Variable – depends on rollout design
6	**CBDC Adoption Potential**	Very High – existing digital transaction rails compatible with CBDC	Very High – acts as foundational layer for wallet/account integration	Medium – may face challenges due to lower digital literacy and infrastructure	Moderate to High – if used as CBDC transfer mechanism for women's welfare

Source: Information collated from various sources by the author

Policy Implications

Integrated Infrastructure Development

To facilitate the distribution and payment of subsidies, digital wallets must be integrated with the current government infrastructure, including Jan Dhan accounts, Aadhar verification, and UPI QR codes, for the successful implementation of CBDC.

Targeted Scheme Pilots

Implementing pilot CBDC programs in districts with high MGNREGS usage and sufficient infrastructure confirms the efficiency of salary distribution and improved financial inclusion in rural areas.

Digital Literacy Campaigns

To build user trust, particularly among low-income and rural groups, literacy programs are essential. These initiatives should include training people how to use wallets safely and safeguard their privacy must be included with schemes.

Trust and Data Governance

To strike a balance between user privacy and government monitoring, a framework of "controlled anonymity," similar to China's Model, must be established along with strong GDPR-aligned data standards to ensure data security and compliance.

Cross-Sector Incentives

Given China's e-CNTs' success in areas like taxation, education, and transportation, India could expand CBDC's applicability to public services, promoting regular use.

Monetary Sovereignty and Trade

India's monetary sovereignty could be strengthened, and its reliance on foreign currencies may be reduced by the integration with the BRICS, ASEAN, and Gulf nations.

Conclusion

The transition from physical currency to digital currency, with the introduction of CBDC, signifies a paradigm shift in India's financial infrastructure, specifically, and its economic systems, more broadly. India's digital rupee is a game-changing initiative, backed by strong government support, a digital ecosystem, and a policy commitment to financial inclusion. However, a balanced approach is required due to the Complexities of user behaviour, infrastructure constraints, and privacy considerations. Government programs are a key means of disseminating CBDCs, and when combined with Aadhar, mobile wallets, and Jan Dhan accounts, they can establish a financial system that is inclusive, safe, and easily accessible. China's e-CNY offers important lessons about how incentives, trust, and interoperability may boost adoption. In order to mainstream CBDCs in India's economy going ahead, a user-informed and trust-centric implementation approach supported by robust policy alignment and digital resilience is essential.

Directions for Future Research

Future Research on CBDC should investigate different groups of people (Urban vs rural, young vs elderly) to examine trust and privacy aspects through qualitative methods. Comparative analysis studies of countries already implementing CBDC can provide insights and lessons for India's CBDC adoption. Studies should examine the long-term impact

of the economic policies, and there is a need to explore how CBDC could be used for international trade. Furthermore, research can also be conducted on the privacy and cybersecurity aspects associated with CBDC implementation.

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Personal Data Protection in Business: Legal and Operational Challenges

M.G. Kodandaram

Introduction

In the digital age, businesses must prioritise personal data protection to comply with the Digital Personal Data Protection (DPDP) Act, 2023, while mitigating risks related to security breaches, legal compliance, and operational disruptions. Neglecting data protection can lead to severe penalties, reputational damage, and erosion of consumer trust.

Personal data security is a pressing concern as businesses face cyber threats. Implementing strong security measures -encryption, multi-factor authentication, and real-time monitoring - is essential to prevent unauthorized access. Additionally, optimising data collection and secure storage reduces liability and cyber risks. Adopting data minimisation and robust storage protocols helps prevent unnecessary exposure.

Legal compliance is another challenge, as the DPDP Act mandates explicit consent, lawful processing, and transparent privacy policies. Non-compliance can result in regulatory scrutiny and huge financial penalties. Businesses must also ensure clear, multilingual policies and proactive compliance strategies.

Beyond regulations, consumer trust hinges on ethical data handling. Transparent policies and empowering users with control over their data develop credibility. Moreover, operational resilience requires investment in cybersecurity, incident response plans, and recovery strategies. By prioritising compliance, risk mitigation, and consumer trust, businesses can steer across the complexities of personal data protection while maintaining efficiency.

In today's digital era, protecting personal data has become a major legal and operational challenge for businesses, governments, social utilities and societies. Personal information is a basic asset in the modern economy, driving targeted advertising, customised services, and data-driven decision-making in all business environments. However, mishandling of personal data can lead to serious repercussions, such as privacy breaches and cybercrimes, ultimately causing harm to innocent individuals. Stolen personal information is frequently abused for phishing attacks, fraud, and corporate espionage. The rising frequency of personal data breaches exposes millions to identity theft, financial fraud, and reputational harm.

Weak and Inadequate data management practices often lead to unauthorised access, data theft, and exploitation of sensitive personal information. Once leaked, sensitive data can end up on the dark web, fuelling illicit activities and reinforcing the need for strict data protection

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measures. As digital economies grow, the demand for robust security infrastructure, comprehensive legal frameworks, and regulatory oversight intensifies. To mitigate personal data security concerns, nations worldwide are implementing exclusive laws that govern personal data collection, storage, and usage. Regulations like the General Data Protection Regulation (GDPR) in Europe establish standardised approaches to data privacy, ensuring accountability among individuals and businesses.

Indian Law for Personal Data Protection

A major milestone in India's data protection terrain is the Digital Personal Data Protection Act, 2023 (hereinafter 'DPDP Act' or 'the Act' for brevity), which received presidential approval on August 11, 2023[1]. This legislation aims to create a structured regulatory framework for handling digital personal data, safeguarding individual rights while enabling responsible data use by businesses. It enforces explicit consent for data collection, promotes data minimisation, and holds data fiduciaries accountable for protecting sensitive information. Non-compliance can result in substantial penalties, ensuring adherence to data protection standards.

As a further step to implement the DPDP Act, the Ministry of electronics has notified draft DPDP Rules 2025 on January 3, 2025[2], inviting public feedback before finalisation. These rules are expected to refine compliance mechanisms, addressing aspects such as data localisation, grievance redressal, and mandatory reporting of data breaches. As global economies become increasingly data-driven, the DPDP Act establishes a foundation for responsible data governance and cybersecurity measures. Businesses must prioritise investments in secure data storage, advanced cybersecurity solutions, and employee training programs to minimise risks. Without effective data protection policies, Business organisations not only face financial and legal repercussions but also risk losing consumer trust, which is essential for long-term success in the present cyber society.

Businesses also must ensure compliance with the Information Technology Act, 2000 (IT Act), which provides the basic legal framework for secure and reliable electronic, digital, and online transactions while aiming to reduce cyber-crimes in India and protect digital data, including personal information. This legislation outlines the responsibilities of businesses that manage digital data, ensuring they implement necessary safeguards to prevent unauthorised access, data breaches, and misuse of personal information.

In addition to the IT Act, the DPDP Act[3] has been introduced as a standalone law to regulate the processing of personal data in a diligent manner with an objective to protect the privacy rights of the citizens. The DPDP Act mandates strict compliance from Data Fiduciaries that includes all business and non-business entities dealing with digital personal information of individuals. Under this law, businesses are

[1]https://www.meity.gov.in/static/uploads/2024/06/2bf1f0e9f04e6fb4f8fef35e82c42aa5.pdf (visited on 26.02.2025)

[2]https://innovateindia.mygov.in/dpdp-rules-2025/ (visited on 26.02.2025)

[3]A Detailed Analysis of DPDP Act,2023 -refer https://fdppi.in/library/2024/DPDP%20Act%20part%201%20overview%20FDPPI_MGK.pdf (visited on 26.02.2025)

required to implement robust personal data protection mechanisms, obtain explicit user consent for data collection, ensure secure storage and processing, and uphold individuals' rights concerning their personal data.

Furthermore, the DPDP Act imposes stringent obligations on organisations to safeguard sensitive data and report breaches promptly to an authority namely 'the Data Protection Board of India', which is going to be formed on implementation of this act. Non-compliance can result in severe penalties on the fiduciaries, reinforcing the need for businesses to adopt strong data governance policies, cybersecurity measures, and transparent data-handling practices. By aligning with both the IT Act and the DPDP Act, businesses can ensure regulatory compliance, enhance consumer trust, and mitigate risks associated with data breaches and cyber threats.

This article provides an overview of India's Personal Data Protection law and the mandatory compliance requirements for business fiduciaries. It also examines the operational challenges of managing personal data and outlines essential steps for businesses to achieve compliance with the DPDP Act while steering the evolving regulatory landscape.

Personal Data Defined

The Act includes several key definitions that clarify its scope and application. The term "data" refers to representations of information, including facts, concepts, opinions, or instructions, conveyed in a manner suitable for human understanding, transmission, interpretation, or automated processing[4]. "Personal data" is defined as any information related to an identifiable individual, while "digital personal data" specifically refers to such information in digital form[5]. Notably, non-personal data - data without person identifiers - is not covered under this law.

The DPDP Act governs the management of digital personal data within India's jurisdiction. It applies to personal data that is collected in digital form or converted into digital format after being initially gathered in a non-digital medium. Additionally, the Act extends its applicability to the processing of digital personal data outside India if such processing pertains to goods or services offered to individuals within India[6]. The provisions of this law will come into effect on dates notified by the Central Government, with different provisions potentially being implemented at separate times.

Rights of Data Principal

The Act identifies the "Data Principal[7]" as the individual to whom personal data pertains. Also referred to as 'data subjects' in other data protection laws, the 'data Principal' is the person whose personal information is processed by a data Fiduciary. If the Principal is a child (anyone under the age of eighteen), their parents or legal guardians assume responsibility, and for individuals with disabilities, their lawful guardian acts on their behalf.

[4]Sec 2(h) of DPDP Act, 2023
[5]Sec 2(t) and Sec 2(n) ibid
[6]Sec 3 ibid
[7]Sec 2(j) ibid

However, the Act excludes certain scenarios from its scope, such as personal data managed by individuals for domestic or personal use and data that has been intentionally made public by the principal or disclosed under applicable Indian laws.

The DPDP Act grants several rights to data principals, empowering individuals to have better control over their personal data. One of the key rights is the Right to Access, which allows data principals to obtain a summary of their personal data being processed. They can also seek details of all data fiduciaries and processors who have access to their data, ensuring awareness of how their information is being utilised. Further, they hold the Right to Correction, enabling them to request rectifications, updates, or completions of any inaccurate or incomplete personal data held by data fiduciaries. Further strengthening their autonomy, data principals have the Right to Erasure, permitting them to request the deletion of their personal data when it is no longer necessary for legal or business purposes. However, if the retention of data is essential for specific obligations, the data fiduciary may continue to hold it.

In scenarios where individuals may be unable to exercise their rights due to death, mental incapacity, or physical infirmity, the Right to Nominate allows them to designate someone to act on their behalf. Additionally, the Right to Revoke Consent ensures that individuals can withdraw their consent for data processing at any time. These rights collectively empower data principals, reinforcing their autonomy over personal information while ensuring that data fiduciaries remain accountable and transparent in their practices.

To ensure that individuals can seek recourse in case of disputes or grievances, the Act also provides the Right to Grievance Redressal. Data fiduciaries are mandated to establish accessible mechanisms for resolving complaints, and if grievances remain unresolved, data principals can escalate their concerns to the Data Protection Board.

Data Fiduciary and Significant Data Fiduciary

A 'Data Fiduciary[8]' is any individual, organisation, or entity that determines the purpose and means of processing personal data, either independently or in collaboration with others, known as processors. This definition mandates that all entities - whether commercial, governmental, or otherwise - must collect personal data from individuals (Principals) in a legally regulated manner. Any personal data obtained must be stored and processed strictly for the designated purposes outlined by law. A fundamental and indispensable requirement in this process is obtaining the individual's informed and fair consent before collecting personal data. Fiduciaries are authorised to collect, store, and process personal data only if their activities comply with the Act. Processing must serve a lawful purpose or fall under legitimate uses as defined by the Act.

A Significant Data Fiduciary[9] (SDF) is a notified subcategory of Data Fiduciaries that handle high volumes of personal data or process sensitive data that poses greater risks to individual rights

[8]Sec 2(i) ibid
[9]Sec 2(z) ibid

and freedoms. Such notified SDFs are required to appoint a Data Protection Officer (DPO), who acts as the central point of contact for regulatory authorities and data principals. The appointed officer must serve as a representative of the Fiduciary, operate within India, and report to the governing body. Responsibilities of SDOs include conducting regular Data Protection Impact Assessments, mitigating risks to data rights, and implementing measures in accordance with the Act.

Obligations of Data Fiduciaries

Under the Act, data fiduciaries are entrusted with the responsibility of handling personal data in a manner that upholds privacy, security, and accountability. Their duties are designed to ensure that data processing is conducted ethically, legally, and with the utmost regard for the rights of data principals.

One of the fundamental principles under the DPDP Act is data minimisation, which mandates that data fiduciaries collect only the necessary personal data required for a specific purpose. Once the data is no longer needed or if the data principal withdraws consent, fiduciaries must ensure its deletion, including erasing it from processors' systems. Purpose limitation is another crucial duty, ensuring that personal data is only used for the purpose for which consent was obtained. However, certain exceptions allow data fiduciaries to process personal data without explicit consent, such as when data is voluntarily provided without objection, for legal compliance, governmental functions, maintaining public order, handling medical emergencies, and safeguarding national security. These provisions allow flexibility while maintaining strict compliance with personal data protection norms.

Transparency in data processing is upheld through privacy notices, which must be clear, accessible, and available in English as well as all languages listed in the Eighth Schedule of the Indian Constitution. These notices must provide details about the categories of data collected, the specific purpose of collection, the process of exercising consumer rights, the revocation of consent, and the mechanism for filing complaints with the Data Protection Board. Businesses must also ensure that their contact information is easily accessible for data principals to seek clarifications regarding data processing. The DPDP Act stipulates that data fiduciaries cannot process personal data without obtaining prior consent unless for legitimate use or exempted under the Act. When processing the personal data of children (individuals under 18 years) or persons with disabilities, verifiable consent from parents or legal guardians must be obtained.

Data fiduciaries also have a duty to ensure accuracy and completeness of personal data, particularly when the data is likely to be used for decision-making that affects data principals or when sharing data with another fiduciary. This prevents misinformation and ensures that data principals are not adversely impacted by erroneous data handling.

To safeguard personal data, robust security measures must be implemented at both technical and organisational levels. These include encryption, obfuscation, masking, access controls, and regular monitoring of access logs to detect unauthorised activity. Other security measures involve ensuring data backup to maintain continuity in case of

data loss. Data fiduciaries must also include provisions in contracts with data processors to maintain compliance with the DPDP Act. Other obligations of fiduciary under the Act include complying with government restrictions on cross-border data transfers, maintaining contractual relationships with data processors to enforce compliance, and ensuring timely delivery of consumer requests.

Establishing effective grievance redressal mechanisms is another critical duty. Data fiduciaries must provide clear procedures for data principals to exercise their rights and appoint a dedicated employee / DPO to handle grievances. Consumer requests must be addressed within a reasonable timeframe.

Companies operating in India or catering to Indian consumers must reassess their data policies and operations to remain compliant with the DPDP Act. In the regime of DPDP Act, all organisations may have to undergo significant transformations in processes, technology, and corporate policies to align with the Act, which may involve huge cost to the organisation. Beyond avoiding substantial penalties[10], which may go up to 250 crores, adherence to the Act enhances customer trust, strengthens market credibility, and ensures long-term business sustainability.

Formation of Board

In pursuance of the Act, the central government will establish the Data Protection Board (DPB) of India. The main functions of the Board include: (i) monitoring compliance and imposing penalties, (ii) directing data fiduciaries to take necessary measures in the event of a data breach, and (iii) hearing grievances made by affected persons. In case of data breaches, fiduciaries have an obligation to promptly report incidents to the DPB as well as to affected individuals i.e. Principals. Timely reporting ensures that necessary remedial actions can be taken to abate potential harm.

Compliance Requirements under DPDP Act

The DPDP Act lays down strict compliance requirements for fiduciary organisations, with the aim of safeguarding citizens' privacy while enabling a responsible data economy. Some of the essential compliance requirements are as follows:

1. **Consent-Based Data Processing:** One of the core principles of the DPDP Act, is the requirement for explicit, informed consent from individuals before their personal data is collected or processed. Gone are the days of vague or hidden consent mechanisms; businesses must now adopt clear and transparent methods to acquire consent from users. The Act mandates that principals must be fully aware of what their data is being used for, who will access it, and how long it will be retained. Organisations must offer an opt-in mechanism where individuals voluntarily agree to the processing of their data. Furthermore, principals must have the option to withdraw their consent at any time, ensuring that they maintain control over their personal information. This compliance requirement is important as it empowers individuals to make informed

[10]Sec 33(1) read with schedule ibid

decisions about their data, reducing the risks of unauthorised data usage.

2. **Data Minimisation Principle:** Another essential compliance requirement under the Act is the principle of data minimisation. Businesses must ensure that they collect only the personal data that is necessary for the specific purpose they intend to fulfil. This is a direct response to the growing concerns about over-collection and misuse of personal information. Once the data is no longer needed, it must be securely deleted or anonymised under intimation to the principal. This ensures that organisations do not hold onto unnecessary or outdated information, thereby reducing the risk of data breaches or misuse.

3. **User Rights and Grievance Redressal:** Users must be provided with an easy and accessible means to view the data an organisation holds about them, correct inaccuracies, and request the deletion of unnecessary or obsolete data. In addition to these rights, businesses must establish a robust grievance redressal mechanism. This means that users who feel their data rights have been violated can lodge complaints, and organisations are obligated to address these grievances in a timely and effective manner. This system ensures that individuals have avenues for recourse if they believe their data privacy is being compromised.

4. **Data Breach Reporting:** Organisations must be proactive in identifying and addressing data breaches under the DPDP Act. If a breach occurs, businesses are required to report it to the Data Protection Board of India without undue delay. The Act stipulates that organisations must notify affected individuals about the breach if it is likely to result in significant harm. By mandating prompt reporting, the DPDP Act aims to overcome the damage caused by data breaches and ensure that appropriate corrective actions are taken swiftly. Failure to comply with these breach notification obligations can result in hefty fines and reputational damage.

5. **Accountability and Governance:** Under the DPDP Act, organisations are required to implement strong accountability and governance structures to ensure ongoing compliance with data protection principles. This includes the appointment of a nodal persons and in case of SDFs a DPO responsible for overseeing data protection measures within the organisation. The DPO ensures that the company's practices align with the DPDP Act's requirements, conducts regular audits, and liaises with the Data Protection Board of India when necessary. Further, organisations must establish internal compliance frameworks, including policies and procedures for data processing, training programs for staff, and mechanisms for monitoring compliance. This internal governance framework with due diligence as a policy, serves as a safeguard to ensure that the organisation maintains high standards of data protection across all operations.

6. **Children's Data Protection:** Recognising the vulnerability of minors in the digital age, the Act includes specific provisions for the protection of children's data. Companies must implement stricter safeguards when processing the personal data of minors, which includes obtaining explicit parental consent before collecting or processing such data. Organisations must also be transparent

about their practices regarding children's data and provide mechanisms for parents or guardians to access, correct, and delete their child's data if necessary.

Overcoming Operational Challenges in Handling Personal Data

Responsible management of personal data is not only a legal obligation under the DPDP Act but also a critical business necessity. To address operational challenges in data protection in an effective manner, businesses must focus on the following basic requirements.

1. **Strengthening Data Security:** Businesses are prime targets for cyberattacks such as hacking, ransomware, and phishing. Security breaches expose sensitive customer information, leading to financial losses, reputational damage, and erosion of consumer confidence. To counter these threats, organisations should implement encryption, multi-factor authentication, firewalls, and continuous monitoring to prevent unauthorised access.

2. **Optimising Data Collection and Storage:** Excessive data collection increases liability without corresponding benefits. Implementing data minimisation strategies ensures only essential information is gathered, reducing exposure to risks. Secure storage, reinforced by proper classification and encryption, is crucial to protecting data from cyber threats.

3. **Updating Privacy Policies:** Privacy policies must comply with current legal frameworks and be easily understandable. Regular reviews and updates should clearly define data collection practices, usage, and individuals' rights. Ensuring accessibility in multiple languages, as required by the DPDP Act, promotes inclusivity and compliance.

4. **Addressing Legal Consequences:** Non-compliance with the DPDP Act can lead to heavy penalties, regulatory scrutiny, and legal disputes. Businesses must obtain explicit user consent, process data lawfully, and implement protective measures. Regular audits, policy updates, and employee training are essential to maintaining compliance.

5. **Preserving Consumer Trust:** Mishandling personal data weakens consumer relationships, diminishing loyalty and market competitiveness. Data breaches and unethical practices cause long-term reputational harm. Transparent policies, clear communication of security measures, and enhanced user control over personal data help promote trust.

6. **Mitigating Operational Disruptions:** Data breaches and regulatory failures can cause system downtime, compliance enforcement actions, and workflow inefficiencies. Organisations may be subjected to mandatory audits or additional safeguards, straining resources. Investing in cybersecurity, incident response plans, and recovery mechanisms strengthens operational resilience.

7. **Preventing Data Misuse and Identity Theft:** Unauthorised access to personal data enables identity theft, financial fraud, and phishing scams. Criminals exploit stolen information for malicious purposes, exposing businesses to legal and financial liabilities. Strong access

controls, data minimisation, and secure authentication are essential in mitigating these risks.

8. **Conducting Data Protection Impact Assessments (DPIAs):** Evaluating the risks associated with data processing - especially when adopting new technologies or handling sensitive information - helps identify vulnerabilities and implement safeguards. DPIAs play a crucial role in preventing breaches and ensuring compliance.

9. **Enhancing Employee Awareness and Preventing Insider Threats:** Human error is a leading cause of data breaches, whether through phishing scams, weak passwords, or improper data handling. Additionally, insider threats pose significant risks. Comprehensive training programs, strict access controls, and multi-factor authentication help mitigate these challenges, reinforcing security and compliance.

10. **Managing Third-Party Vendors:** Organisations frequently rely on third parties for data processing, making compliance across the data supply chain essential. Strong contractual agreements and periodic audits ensure adherence to regulatory standards, minimising external risks.

11. **Seeking Legal and Compliance Expertise:** Navigating complex data protection laws requires expert legal guidance. Staying informed on regulatory changes and proactively implementing compliance measures reduces risks and legal repercussions.

12. **Balancing Security and Business Efficiency:** While robust data protection is necessary, excessive restrictions can hinder operations. A risk-based approach prioritising sensitive data protection while ensuring seamless processes is key. Embedding privacy-by-design principles enables compliance without compromising efficiency.

By implementing these strategies, and by continuously improving the personal data protection measures, businesses can effectively address data protection challenges, ensuring regulatory compliance while maintaining consumer trust and operational agility.

Essential Steps to Achieve DPDP Act Compliance

As organisations handle vast amounts of personal data from consumers (principals), vendors, and employees, they must navigate a complex landscape of legal obligations and operational challenges to ensure effective data protection. Compliance with the DPDP Act requires a structured and proactive approach. Below is a comprehensive guide outlining the essential steps organisations must take to achieve compliance:

1. **Obtain Valid Consent:** Ensure that explicit and informed consent is obtained from data principals before processing their personal data.

2. **Provide Transparent Privacy Notices:** Accompany consent requests with clear privacy notices in English and all languages listed in the Eighth Schedule of the Indian Constitution, ensuring accessibility for diverse stakeholders.

3. **Limit Data Collection:** Collect only the data necessary for the specified purpose, minimising excess data accumulation.

4. **Implement Robust Security Measures:** Enforce stringent security protocols, including encryption, access controls, and incident response mechanisms to prevent data breaches.

5. **Secure Special Category Data:** Obtain verifiable consent for processing the data of children and individuals with disabilities, adhering to heightened protection standards.

6. **Ensure Timely Data Deletion:** Establish mechanisms for data deletion once the processing purpose is fulfilled, consent is revoked, or upon request by the data principal.

7. **Facilitate Data Principal Rights:** Develop efficient processes to respond promptly to requests for data access, correction, portability, or erasure.

8. **Protect Children's Data:** Prohibit behavioural monitoring, targeted advertising, and tracking of children to comply with child data protection laws.

9. **Maintain Data Accuracy:** Implement validation procedures to ensure data accuracy and consistency, preventing errors that could negatively impact data principals.

10. **Conduct Audits and Risk Assessments:** If classified as a SDF, conduct periodic audits and DPIAs to mitigate potential risks.

11. **Comply with Cross-Border Data Transfer Regulations:** Ensure adherence to government regulations concerning data transfers to restricted countries.

12. **Establish Strong Data Processor Agreements:** Enter into legally binding contracts with data processors to enforce compliance and accountability.

13. **Implement Data Breach Notification Protocols:** Report all data breaches to the Data Protection Board (DPB) and notify affected individuals, regardless of severity or volume.

14. **Appoint a Data Protection Officer (DPO):** Designate a responsible officer to oversee compliance efforts, handle grievances, and liaise with regulatory authorities. Document data processing activities, consent records, and risk assessments to demonstrate compliance during audits or regulatory inquiries.

15. **Train Employees on Data Protection:** Conduct regular training sessions to ensure employees understand data protection principles and their responsibilities under the DPDP Act.

16. **Integrate Privacy-by-Design Principles:** Embed data protection considerations into business processes, products, and services from the outset.

As India strengthens its data protection framework, businesses must proactively develop comprehensive compliance strategies. While adherence to the DPDP Act presents operational challenges, organisations that prioritise data security, regulatory alignment, and consumer trust can mitigate risks and gain a competitive edge.

By promoting a culture of responsible data management, businesses not only meet legal obligations but also enhance their reputation and ensure sustainable growth in an increasingly data-driven economy. Implementing robust security measures, ensuring alignment with global data protection standards, and integrating privacy-conscious practices into operations will enable businesses to safeguard personal data while maintaining operational efficiency and public trust in a connected world.

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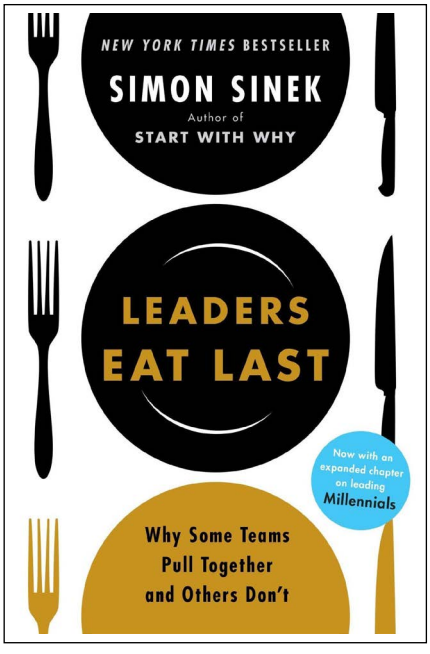
Book Review
Leaders Eat Last (With a New Chapter): Why Some Teams Pull Together and Others Don't

Published by: Penguin Publishing Group; Author: Simon Sinek

-Reviewer: S. Sathyanarayana

Simon Sinek's Leaders Eat Last explores the dynamics of leadership, teamwork, and corporate culture, emphasizing the importance of creating an environment where employees feel valued and safe. The book is an insightful extension of his earlier work, Start with Why, delving deeper into the biological and psychological aspects of leadership, particularly through the lens of trust and cooperation.



Strengths of the Book

One of the book's biggest strengths is its ability to connect leadership principles with biology and human psychology. Sinek effectively explains how the brain's chemistry particularly the role of hormones such as dopamine, serotonin, oxytocin, and cortisol impacts motivation, teamwork, and leadership. His argument that a leader's primary role is to create a "Circle of Safety" resonates strongly in today's corporate environment, where stress and disengagement are prevalent issues.

Another commendable aspect of Leaders Eat Last is its reliance on real-world examples. Sinek draws from military leadership, corporate case studies, and neuroscience to illustrate how great leaders foster environments that encourage collaboration and loyalty. His reference to the U.S. Marine Corps and their practice of ensuring that junior officers eat before their superiors exemplifies how leadership should be based on service rather than authority. By highlighting companies like

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Barry-Wehmiller, which prioritizes employee well-being over short-term profits, he underscores the importance of trust and stability in fostering high-performance teams.

The book also emphasizes long-term thinking in leadership. Sinek criticizes the short-sightedness of modern corporate culture, where quarterly profits often take precedence over employee well-being and organizational sustainability. His advocacy for purpose-driven leadership aligns well with contemporary discussions on ethical business practices and corporate social responsibility. He stresses that successful leaders inspire rather than manipulate, creating a shared vision that promotes loyalty and productivity.

Sinek's storytelling is another compelling aspect of the book. He presents engaging narratives and case studies that make the theoretical aspects of leadership more relatable. The inclusion of personal anecdotes, military experiences, and corporate success stories makes his arguments persuasive and easy to understand. His engaging writing style ensures that even readers unfamiliar with leadership literature can grasp complex ideas without difficulty.

Despite its strengths, Leaders Eat Last is not without its shortcomings. One notable issue is its repetitive nature. Sinek reiterates key points multiple times throughout the book, which, while reinforcing the message, can feel redundant for readers who grasp the concepts early on. A more concise approach would have made the book more engaging and impactful.

Additionally, while Sinek provides numerous anecdotes, some critics argue that his evidence is largely anecdotal rather than empirical. While storytelling is an effective tool for communication, the lack of extensive quantitative research weakens the book's credibility as a business or leadership manual. A more data-driven approach, with statistical backing and case studies that include both successes and failures, could have strengthened his arguments. Though his leadership principles align well with existing research in organizational behaviour and psychology, a stronger integration of academic sources would have made his claims more robust.

Another point of critique is that the book's idealistic tone may not always align with the realities of corporate leadership. While Sinek's call for selfless leadership is inspiring, implementing such practices in profit-driven organizations can be challenging. Many companies operate in highly competitive environments where leaders may not always have the luxury of prioritizing employee welfare over financial outcomes. The book sometimes overlooks the challenges of balancing ethical leadership with the pressures of delivering financial returns to shareholders. Additionally, Sinek tends to present an overly simplified dichotomy between good and bad leadership, which does not fully capture the nuances and complexities of corporate decision-making.

Overall, Leaders Eat Last is an inspiring and thought-provoking book that successfully highlights the importance of trust, empathy, and long-term thinking in leadership. While it could benefit from a more empirical approach and a less repetitive structure, its core message remains powerful and relevant. Sinek's advocacy for servant leadership is a much-needed reminder that great leadership is not about authority, but about responsibility and care for others.

For aspiring leaders and corporate professionals looking to foster a more inclusive and engaged workplace, this book serves as an invaluable resource. It provides a compelling argument for leaders to create environments of safety and trust, where employees are motivated not by fear but by a shared sense of purpose. Though its implementation may vary depending on industry and organizational constraints, the fundamental principles Sinek advocates empathy, service, and long-term vision remain essential for any leader aiming to build a sustainable and high-performing organization.

In conclusion, while Leaders Eat Last may not provide a fool proof formula for leadership success, it certainly offers valuable insights into the kind of leadership that promotes genuine engagement and long-term business success. Whether one is an experienced executive, an emerging leader, or simply someone interested in leadership theory, this book presents valuable lessons that can inspire meaningful change in how organizations are led.

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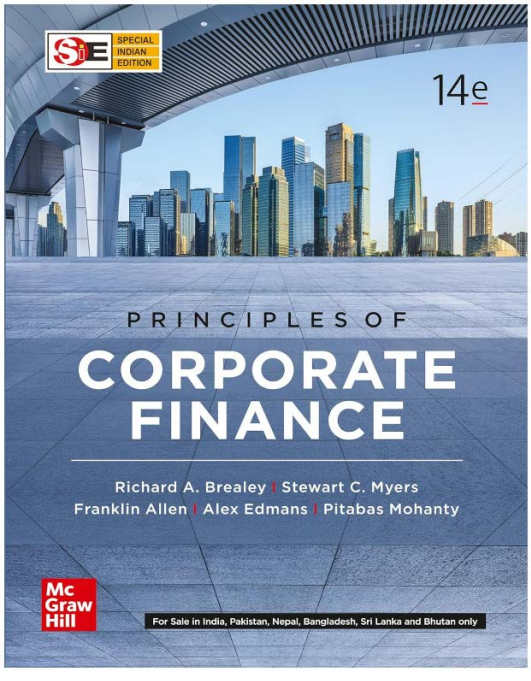
Book Review
Principles of Corporate Finance
(14th Edition, ISBN-13: 978-9355325839)

Published by: McGraw-Hill Education; Author: Richard A. Brealey and Stewart C. Myers

Reviewer: Pallavi. R

Principles of Corporate Finance by Richard A. Brealey and Stewart C. Myers is widely regarded as one of the most authoritative textbooks in the field of corporate finance. Now in its multiple editions, the book provides a comprehensive framework for understanding financial principles and decision-making processes in the corporate world. The authors, both distinguished scholars in finance, offer a well-balanced blend of theory and practical applications, making the book suitable for both students and professionals. Published by McGraw-Hill Education, the book is known for its rigorous approach, covering essential topics such as capital budgeting, risk management, financial markets, and corporate valuation.



One of the major strengths of this book is its structured approach to corporate finance, beginning with fundamental concepts before gradually progressing to more advanced topics. The authors introduce core financial principles with clarity, ensuring that readers without a strong financial background can still grasp the key concepts. Topics such as the time value of money, financial statement analysis, and risk-return trade-off are well-explained with real-world examples, making theoretical concepts more relatable. Furthermore, the book integrates financial modelling and valuation techniques, which are crucial for decision-making in both academia and the corporate

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sector. Brealey and Myers also incorporate discussions on financial markets, providing insights into how stock markets, bond markets, and derivatives play a role in corporate financial strategies.

Another significant strength of the book is its emphasis on empirical research and data-driven analysis. Unlike many finance textbooks that rely heavily on theoretical models, Principles of Corporate Finance uses historical financial data, case studies, and real-life corporate decisions to illustrate its points. This empirical approach helps bridge the gap between finance theory and practice. Additionally, the book includes problem sets and exercises that reinforce learning, making it an excellent resource for students preparing for exams or professionals looking to enhance their analytical skills. The use of global financial examples makes the book relevant beyond any single market, adding to its credibility as an international finance resource.

Despite its strengths, the book is not without its criticisms. One common concern is its extensive length, which may be overwhelming for beginners or those looking for a more concise overview of corporate finance. Some readers have found certain sections highly technical, particularly those involving advanced mathematical models and financial derivatives, making it challenging for individuals without a strong quantitative background. While the book provides thorough explanations, some concepts might still require supplementary readings or instructor guidance to fully grasp. Moreover, although the book is frequently updated to reflect changes in financial regulations and global markets, some editions may not be as current as fast-evolving financial technologies and innovations demand.

Another limitation of the book is that while it excels in covering traditional corporate finance principles, it sometimes lacks depth in newer areas such as fintech, behavioral finance, and sustainable finance. Given the rapid evolution of financial markets and corporate decision-making frameworks, future editions could benefit from incorporating more discussions on emerging trends like cryptocurrency, digital assets, and ESG (Environmental, Social, and Governance) investing.

Overall, Principles of Corporate Finance remains a cornerstone textbook in financial education and corporate decision-making. It is an invaluable resource for finance students, MBA candidates, and practitioners looking for a solid foundation in corporate finance. The book's balance between theory and real-world application makes it an essential reading for anyone interested in understanding how corporations make financial decisions. However, readers who prefer a more concise or less technical approach may find it challenging, and those looking for insights into newer financial trends may need to supplement their learning with additional resources. Despite these minor limitations, Brealey and Myers' work continues to set the standard in corporate finance education, making it a must-read for anyone serious about mastering the subject.

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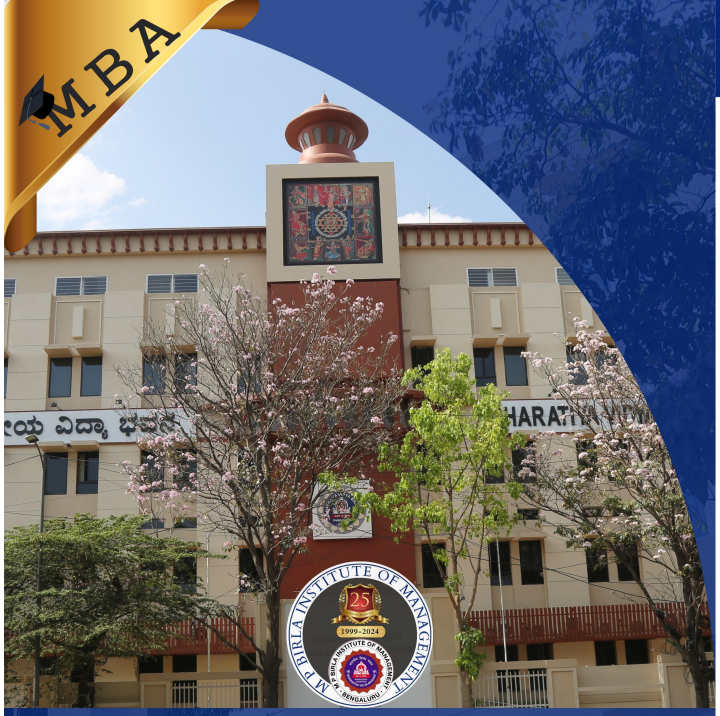

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M P Birla Institute of Management-An initiative of Bharaitya Vidya Bhavan which enjoys an enviable track record as a proponent of education with Indian Culture and Values in the area of higher management education. M.P. Birla Institute of Management in Bangalore stands as a distinguished Management Institute, commemorating 25 years of delivering exceptional education. Offering a comprehensive two-year full-time MBA Program affiliated with Bengaluru City University, MPBIM has shown remarkable growth since its establishment in 1999 under the guidance of Sri. Madhav Prasad Birla and Smt. Priyamvada Devi Birla. Starting with a modest enrollment of 30 students, the institute now boasts an impressive cohort of 360 students. Many alumni of MPBIM hold key positions in leading corporate entities and industries, reflecting the institution's success in nurturing talent. Er. N Ramanuja, Chairman and Former Chairman and Managing Director of HMT Ltd., a prominent public sector company, MPBIM has rightfully earned a reputation as one of the most sought-after postgraduate management institutions in Karnataka. In addition to shaping innovative, efficient managers for the industry, the institute prioritizes instilling core human values, emphasizing Nobility, Righteousness, and Excellence in its students. Recognized as a NAAC accredited institution, MPBIM benefits from an esteemed faculty comprising accomplished academicians and industry veterans who bring a wealth of experience to the classroom. Ranked 21st in the Silicon India All India Ranking of Non-IIM B Schools, MPBIM continues to uphold its commitment to providing a top-tier management education experience.