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SUSTAINABLE BANKING IN THE DIGITAL AGE: LEVERAGING FINTECH AND DIGITAL MARKETING FOR TRANSFORMATIVE GROWTH

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Abstract

The digital transformation of banking is reshaping sustainability through the convergence of technological innovation and digital marketing alliance. This paper conceptualizes sustainable banking as an integration of economic viability, social responsibility, and environmental stewardship made attainable by technology and digital marketing. The objective is to analyze how this digital intervention and digital trade dimensions leverage sustainable banking outcomes. A blend of descriptive analysis, Factor Analysis and multiple regression were implemented for measuring the relationship between variables. primary data has been collected using questionnaire from 232 employees in Bengaluru's public, private, foreign, and cooperative banks. Findings demonstrate that both FinTech adoption and digital marketing effectiveness significantly boost sustainability outcomes of banks which results in transformative growth of the financial ecosystem.

Keywords: FinTech, Sustainable Banking, Triple Bottom Line, Digital Marketing, Global Trade

1. INTRODUCTION

The global financial system is witnessing a considerable transition at present, which is driven by the combination of sustainability and technology, the integration of digital marketing techniques and Financial Technology (FinTech) has altered the strategic architecture of contemporary banking, transitioning it from a profit-driven sector into an ecosystem with an agenda that achieves a balance between advancement and integrity (Hidayat ur Rehman & Hossain, 2024). Sustainability is a vital strategic consideration that governs how banks function, interact with one another, and participate in the global marketplace in this new paradigm (Yoganandham, 2024). The digital revolution, propelled by automation, data analytics, and artificial intelligence, has accelerated the pace of change, creating new opportunities to align economic growth with social equity and environmental preservation (Murali, Srinivasan, & Bopaiah, 2025).

Sustainable banking represents the cornerstone of this transformation, it extends beyond traditional financial intermediation to encompass a holistic commitment to economic viability, social inclusiveness, and environmental stewardship (Yoganandham, Revolutionizing Banking with reference to embracing digital innovation, artificial intelligence, blockchain, and sustainability-A comprehensive theoritical assessment.), (Cen & He, 2018). This redefinition of banking aligns closely with the Triple Bottom Line frameworks' principles, which emphasizes that enduring institutional success rests on the integration of profit (economic achievement), people (social commitment), and planet (environmental concern) (Starnawska, 2020). Banks, therefore, are no longer measured solely by their financial returns but by their contribution to societal progress and ecological balance (Ayodeji, et al., 2024).

Building upon this foundation, the Sustainable Innovation framework provides the necessary theoretical bridge between technological progress and sustainability outcomes, it asserts that innovation must not only enhance

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competitiveness but also generate enduring social and environmental value (Salampasis, 2025). Within this framework, sustainable banking emerges as an evolving concept where innovation is designed to serve both profit and purpose (Indrianti, Nurdin, & Perdhana, 2025). This multi-faceted approach of sustainable innovation, where communication and technology merge together to support inclusive sustainable financial growth, has been expressed as fintech and digital marketing (Sayari, et al., 2025).

Leveraging technological advancements like artificial intelligence, mobile banking, and blockchain has transformed how banks deliver services, handle risks, and serve underserved communities. As a result, FinTech plays an innovative and catalytic role in sustainable banking (Abbasov, 2022). FinTech-driven automation reduces operational inefficiencies and minimizes environmental costs by lowering paper usage, energy consumption, and carbon emissions (Kristiana, 2024). Furthermore, digital financial inclusion can be enabled through mobile payments and micro-lending platforms which has empowered marginalized communities, contributing to social equity and economic democratization (Barroso & Laborda, 2022). These innovations reflect the "profit" and "people" dimensions of the TBL framework while reinforcing environmental stewardship by promoting green finance mechanisms such as digital carbon tracking, sustainable credit scoring, and blockchain-enabled transparency in climate financing (Colombage, Nanayakkara, Barua, & Colombage, 2025).

In parallel, digital marketing has emerged as a vital social conduit that amplifies the visibility and credibility of sustainability initiatives in banking, it transcends its traditional promotional function by fostering ethical communication, customer engagement, and transparency (Hussain, Rehman, Rehman, & Khasawneh, 2025). Through digital storytelling, ESG-focused campaigns, and online awareness programs, banks communicate their commitment to responsible finance, thereby shaping consumer perceptions and encouraging sustainable behaviour (Sharma, Vasishta, & Singla, 2025). Digital marketing empowers financial institutions to build consumer confidence and loyalty while promoting green financial solutions like sustainability-linked financing or eco-savings accounts with the help of analytics and personalization. (Bouteraa, Raja Hisham, & Zainol, 2023). It strengthens the relational dimension of banking and fulfils the "people" component of the TBL by creating an informed, empowered, and ethically conscious consumer base (Melati, 2024).

The interplay among FinTech and digital marketing creates a synergistic ecosystem that reinforces sustainable banking practices, as FinTech provides the technological infrastructure that enables efficiency, inclusion, and transparency; digital marketing enhances awareness and trust by humanizing the sustainability agenda (Serdarušić, Pancić, & Zavišić, (2024).). When viewed collectively, these dimensions operationalize the TBL and Sustainable Innovation frameworks, translating theoretical ideals into practical mechanisms for change (Osman & Elamin, 2023). FinTech enhances operational sustainability and digital marketing fosters social legitimacy, together forming a dual model of transformation in modern banking.

In the current scenario the Indian banking industry is experiencing a digital renaissance characterized by neo-banking platforms, rapid FinTech adoption, and significant interaction with global financial systems, this integration is especially relevant and necessary in the Indian context (Silva, Leite, Guse, & Gollo, 2017). The Reserve Bank of India's Green Deposit Framework (2023) replicates that India's increasing commitment to sustainable and environmentally responsible finance is made apparent by SEBI's BRSR regulations and the creation of GIFT City as a global financial center (Cen & He, 2018). However, despite these developments, sustainability practices within the banking industry remain largely fragmented, many institutions pursue digital transformation and sustainability initiatives separately, without strategically aligning them to reinforce one another (Zaid, et al., 2025). Limited empirical research has explored how these technological adoption and digital marketing initiatives collectively contribute to sustainable banking outcomes within emerging markets like India, where the dual challenges of inclusion and environmental responsibility are most pressing (Munira, 2025).

Despite the expanding discourse on green finance and digital transformation, existing literature remains compartmentalized, often analyzing FinTech and digital marketing, in isolation rather than as interconnected determinants of sustainability. A lack of study exists in emerging markets where sustainability transitions and digital disruption are happening at the same time because the majority of research has been done in developed economies. Addressing this gap is both timely and crucial. The present study contributes to bridging this void by reimagining sustainable banking as a digitally enabled and innovation-driven, grounded in the principles of the Triple Bottom Line and Sustainable Innovation frameworks.

2. REVIEW OF LITERATURE

(Rahman, Kaium, Zahan, & Khan, 2024) conducted literature survey regarding Financial Technology and sustainable banking outcomes using TCCM (Theory–Context–Characteristics–Methodology) framework, aiming to

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synthesize global research trends on technology-enabled sustainability in finance. Drawing from 120 peer-reviewed studies, they identified that FinTech strengthens sustainable banking through enhanced operational efficiency, financial inclusion, and green innovation. Using a rigorous content analysis method, their study confirmed that FinTech applications improve transparency, resource efficiency, and carbon reduction. They concluded that FinTech is an essential enabler of sustainability by integrating economic, social, and environmental objectives.

(Garg & Kumar, 2024) examined the role of digitalization fuelled by fintech in achieving sustainable banking performance. Their objective was to explore how digital technologies improve profitability, inclusion, and environmental outcomes. They analyzed secondary banking data and conducted interviews with bank managers using empirical study. Findings revealed that digital adoption reduces operational costs, supports social inclusion through digital financial access, and minimizes ecological impact via paperless banking. The authors concluded that FinTech-driven sustainability enhances both institutional efficiency and ethical responsibility.

(Indrianti, Nurdin, & Perdhana, 2025) explores how digital trade and marketing transformation craft sustainability communication within financial institutions. Through a qualitative meta-synthesis of 75 research papers, they unearthed that digital trade integration enhances transparency in financial transactions and enhances sustainable brand credibility. Their findings emphasized that digital marketing strategies, such as online engagement and green campaigns, play a vital role in influencing consumer behavior toward sustainable banking practices. The study concluded that sustainability communication must accompany technological innovation to achieve genuine behavioral and systemic transformation.

(Yanti, Setyo, Indra, & sugiyono, 2025) conducted an empirical investigation on the strategic factors influencing sustainable banking performance in Southeast Asia, published in the Journal of Contemporary Leadership and Innovation. The study aimed to analyze how institutional capability, FinTech adoption, and trade openness contribute to sustainability outcomes. Using a survey of 320 bank executives and employing Structural Equation Modelling (SEM), Yanti found that FinTech adoption positively affects ESG performance, while global trade integration moderates this relationship, amplifying the impact of technology on sustainability. The study concluded that trade integration fosters global knowledge transfer and harmonization of green finance practices, thereby reinforcing the sustainability agenda.

(Zaid, et al., 2025) explores how digital technologies amplify the influence of green finance on sustainable banking. Using data from 152 Saudi bank employees, the study applies hierarchical regression with the PROCESS Macro to analyze moderating effects. Findings reveal that green finance positively influences sustainable performance, while FinTech adoption strengthens this relationship by improving transparency, accessibility, and efficiency in funding green initiatives. Furthermore, enhancing FinTech's moderating role by providing digital readiness, technological infrastructure, and organizational agility. Together, these factors create a synergistic model where technological innovation magnifies social and environmental outcomes of green finance.

The reviewed literature provides strong evidence that most prior studies examine these variables in isolation, focusing either on FinTech's technological role or on marketing communication, but rarely integrating them within a unified sustainability framework. This fragmentation limits understanding of how these dimensions interact synergistically to influence sustainable banking practices. The majority of empirical studies are concentrated in developed economies, while emerging markets like India, where rapid digital transformation coincides with sustainability transitions remain underexplored. The present study addresses these gaps by proposing and empirically validating an integrated framework that examines how FinTech and digital marketing collectively shape sustainable banking outcomes in the Indian context.

3. RESEARCH OBJECTIVES

1. To investigate how FinTech adoption boost sustainable banking outcomes by improving operational efficiency, financial inclusion, and environmental performance.
2. To examine how digital marketing helps the banking industry's stakeholders, ethical branding, and environmental consciousness.
3. To evaluate the interrelationship among technological advancements and digital marketing in achieving the multifaceted goals for sustainable banking under.
4. To propose strategic recommendations for banking institutions and policymakers on integrating FinTech and digital marketing to strengthen sustainable banking practices.

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4. RESEARCH METHODOLOGY

Using an exploratory research methodology, the study explores the combined impact of digital marketing strategies and FinTech adoption for collectively influencing the sustainability orientation of the banking sector, under the Triple Bottom Line (Profit–People–Planet) framework. The methodology ensures a comprehensive and reliable analysis by integrating both primary and secondary data.

4.1 Type of Research

The study adopts an empirical research design to uncover emerging relationships and underlying patterns between technological adoption, digital marketing and sustainability, while the descriptive aspect provides a systematic analysis of the perceptions of banking professionals. This blended approach ensures both depth and clarity in understanding the evolving role of digital transformation in promoting the Triple Bottom Line (Profit–People–Planet) objectives within the banking sector.

4.2 Data Collection Technique

A structured questionnaire method was employed for gathering primary data from banking employees who are working for Bengaluru's public, private, foreign, and cooperative banks. The study focused on how these employees perceived the use of FinTech and digital marketing strategies to encourage sustainable banking outcomes. The five-point Likert scale has been considered to gauge data recorded for the questionnaire, which was created based on verified constructs from earlier research and was in line with the TBL framework (Profit–People–Planet) and Sustainable Innovation frameworks. Prior to full-scale administration, a pilot test with 30 respondents was carried out to ensure the content authenticity, clarity, and dependability.

4.3 Sampling Design

The study adopts a purposive sampling design to collect data from employees working across different sectors of banks in Bengaluru, India's leading FinTech and innovation hub. The target population comprises banking professionals with direct or indirect involvement in digital transformation, FinTech adoption, marketing, or sustainability initiatives. The sample included managers, officers, and operational-level staff across various departments, enabling diverse insights into technology adoption and sustainability practices. The selected respondents were approached through both online and offline modes, ensuring accessibility and inclusivity.

For obtaining trustworthy and robust results, Robert F. Devellis and Joseph F. Hair recommend a sample size of 5 to 10 respondents per each considered observed variable. A minimum of 100 respondents (20 X 5) are essential to meet the minimum threshold for this study, which includes 20 observed variables. 232 respondents were selected for attaining the reliability and validity for the factor analysis as well as to provide adequate power for statistical testing. This sample size provides a solid foundation for discovering underlying factor structures and assures adequate representation for generalizing the results.

4.4 Data Analysis Technique

Explored relationship among FinTech adoption, digital marketing strategies, and sustainable banking outcomes, by analysing the gathered data through quantitative statistical methods. Used exploratory factor analysis (EFA) to find underlying constructs and ensured dimensional validity using descriptive statistics for describing respondent profiles and variable trends. The internal consistency of the measuring scales was verified through construct validity checks and reliability testing using Cronbach's alpha. Multiple regression undertaken to look at the direct correlations between the variables considered.

5. ANALYSIS

5.1 Hypothetical Model

Figure 1 replicates the hypothetical model which serves as a basis for testing the underlying relationship between dependent and independent variable. A basis for empirical validation through regression analysis is provided by the arrows, which illustrate the anticipated casual pathways.

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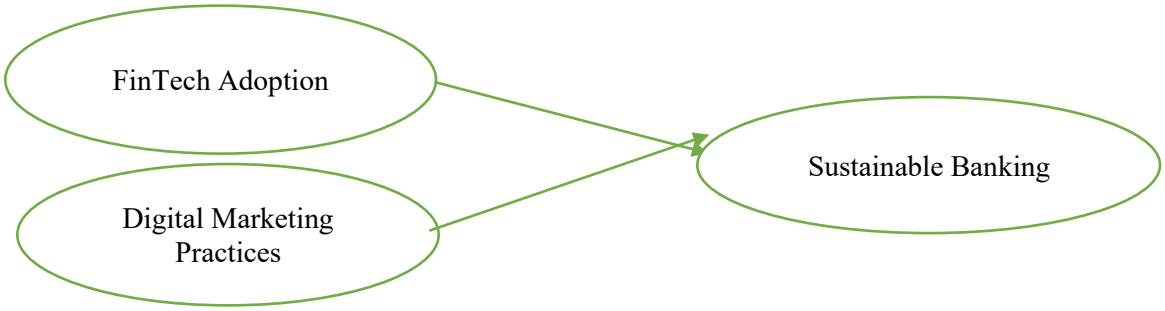
Figure 1: Hypothetical Model



(Source: Constructed by author)

5.2 Hypotheses

H_1: There is a significant relationship between FinTech adoption and sustainable banking.
H_2: There is a significant relationship between Digital marketing practices and sustainable banking.

5.3 Demographic details of the respondents

Identifying the respondents' demographics provides important background information to evaluate the results. It ensures that the survey includes a range of viewpoints from employees across different sectors of banking.

Table 1: "Respondents' demographic details"

"Demographic characteristics"		**"Frequency"**	**"Percentage"**
Gender	Male	157	67.7
	Female	75	32.3
Age group (Years)	18 - 24	36	15.5
	25 – 34	73	31.5
	35 and above	123	53.0
Level of Education	Till Under Graduation	134	57.8
	Post Graduation	98	42.2
Type of the Bank	Public Sector Bank	80	34.5
	Private Sector Bank	74	31.9
	Foreign Bank	26	11.2
	Cooperative Bank	52	22.4
Experience in the Banking Sector (Years)	0 – 3	28	12.1
	4 – 6	43	18.5

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	7 - 9	95	41.0
	More than 9	66	28.4

(Source: Constructed by author)

The above table 1 represents the employee's demographic data. A total of 232 respondents were considered, out of which 67.7% are males and 32.3% are females. among them, 15.5% belongs to 18-24 years age category, 31.5% belong to age category of 25-34 years, and 53.0% belong to 35 years and above. Among the respondents 57.8% of the employees completed the education level till under graduation, and 42.2% had completed post graduation. 34.5% are belongs to employees of public sector bank, 31.9% of the respondents are of private sector bank employees, 11.2% are employees of foreign banks and remaining 22.4% are belongs cooperative bank employees. 12.1% of the respondents have experience of 0-3 years, 18.5% have 4-6 years of experience, 41.0% have 7-9 years of experience, and remaining 28.4% have experience of 9 years above.

5.4 Factor Analysis

To uncover the core elements impacting sustainable banking practices, an exploratory factor analysis was carried out. After confirming that the collected data met all primary requirements which are necessary to conduct the exploratory factor analysis using preliminary suitability tests like KMO and Bartlett's tests, the underlying factors were identified using Principal Component Analysis (PCA). Components which are having eigenvalues more than 1 are retained, as represented through the Scree plot and the Kaiser criterion. The factor structure was made more interpretable by applying Varimax rotation.

Table 2: "KMO and Bartlett's Test"

Kaiser-Meyner-Olkin Measure of Sampling Adequacy		**.963**
Bartlett's Test of Sphericity	Approx. Chi-Square	6717.673
	Df	190
	Sig.	.000

(Source: Output from Factor Analysis)

The table 2 represents, the Kaiser-Meyer-Olkin, a measure for Sampling Adequacy bearing the value 0.963, denotes an outstanding level of data suitability for executing factor analysis. This suggests that underlying causes account for a significant amount of the dataset's volatility. The Bartlett's Test of Sphericity was significant (χ^2 = 6717.673, df = 190, $p < 0.001$), confirming that identity matrix is not correlation matrix and it is adequate for underlying factor extraction. Since the correlations between the variables are appropriately robust, these findings collectively support the suitability of dataset for exploratory factor analysis.

Table 3: "Variance Explained by the Variables in Total"

"Component"	**"Initial Eigen values"**			**"Rotation Sums of Squared Loadings"**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	**14.528**	72.641	72.641	8.991	**44.954**	44.954
2	**1.410**	7.051	79.691	6.947	**34.739**	**79.691**
3	.936	4.680	84.371			
4	.666	3.331	87.702			

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5	.562	2.809	90.512			
6	.256	1.282	91.793			
7	.175	.874	92.668			
8	.165	.827	93.495			
9	.153	.766	94.261			
10	.143	.717	94.978			
11	.140	.700	95.678			
12	.132	.660	96.337			
13	.120	.600	96.938			
14	.119	.593	97.530			
15	.101	.506	98.036			
16	.098	.492	98.529			
17	.094	.469	98.997			
18	.081	.405	99.403			
19	.075	.377	99.780			
20	.044	.220	100.000			

(Source: Output of Factor Analysis)

Table 3 shows the two components which are extracted, through Principal Component Analysis with eigenvalues of more than 1. These components explain a sum of 79.691% of the variance. After rotation of the factors under the study, 44.954% of the variance is represented by Component-1, and component-2 represents 34.739% of the variance of the, bringing an interpretable structure for the variables extracted. The remaining components contribute minimally, hence not extracted as factors.

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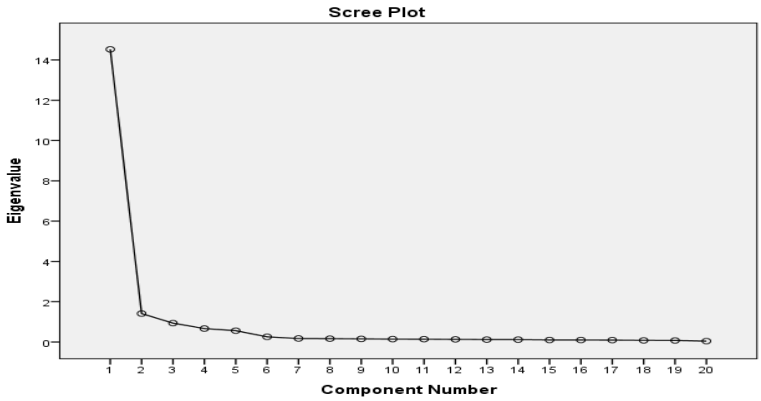
Figure 2: "Scree plot"



(Source: Extracted from Factor Analysis)

The figure 2, Scree plot visualises eigenvalues of the PCA-extracted components. It is evident from the presence of a distinct "elbow" at the third component that the data can be largely represented by the first two components alone. These components, with eigenvalues greater than "1", account for approximately 79.691% of the total variance. Components beyond the second have eigenvalues below "1" and contribute minimal variance, and thus, were excluded from further analysis. This result is consistent with the Kaiser criterion for component retention.

Table 4: "Rotated Component Matrix"

SL. NO.	"Statements"	"Factor Loading"	"Factor Reliability"
	FinTech Adoption		**0.970**
01	Digital payment platforms like mobile banking, UPI, and instant transfer systems have enhanced transaction speed.	0.841	
02	Automation and AI applications have significantly improved accuracy and productivity in daily banking operations.	0.835	
03	Digital lending tools and alternative credit scoring have increased access to finance for underserved customers.	0.814	
04	Blockchain or distributed ledger technologies are improving transparency and reduce fraud.	0.807	
05	Digital processes have reduced paperwork and minimized environmental impact.	0.789	
06	FinTech partnerships have enhanced innovation and service delivery in our bank.	0.784	
07	Predictive analytics helps banks to improve credit risk management.	0.784	
08	The adoption of real-time data systems has improved decision-making and responsiveness.	0.759	

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09	FinTech initiatives have helped reduce operational costs and improve profitability.	0.743	
10	FinTech adoption has strengthened our bank's competitive position in the market.	0.732	
	Digital Marketing Practices		**0.968**
01	Digital channels (social media, email, and mobile applications) are used to communicate sustainability and ESG initiatives.	0.887	
02	Digital marketing campaigns promote green or sustainability-linked financial products.	0.866	
03	Online campaigns effectively build customer trust in our bank's sustainability claims.	0.857	
04	Data analytics is used to personalize messages and engage customers on sustainability issues.	0.854	
05	Banks can provide clear and transparent sustainability information on its digital platforms.	0.791	
06	Digital branding strategies highlight the bank's ethical and socially responsible image.	0.752	
07	Digital marketing emphasizes inclusive finance and equitable growth.	0.649	
08	Continuous evaluation is undertaken to gauge the outcomes of digital sustainability initiatives.	0.644	
09	Digital marketing tools are used to educate customers about environmental and green finance initiatives.	0.627	
10	Customer engagement through digital sustainability campaigns has improved brand loyalty.	0.624	

(Source: Output of Factor Analysis and Reliability Statistics)

The table 4 reflects 20 manifest variables in the form of statements, which are analysed through factor analysis. The results reflect the extraction of 2 latent or unobserved variables i.e., "FinTech Adoption" and "Digital Marketing Practices", as the factors driving sustainable banking which results in transformative growth. Loadings of the factor for every observed variable shows the correlation with the corresponding unobserved variable which is associated with. Internal consistency of the observable variables listed under each factor is measured by the Cronbach's alpha for each latent variable, to ensure factor reliability.

The first latent variable, FinTech Adoption, represents the role of digital technology in advancing sustainable banking practices. It demonstrates a strong reliability coefficient of 0.970, indicating high internal consistency. The factor loadings of its manifest variables confirm that these indicators effectively capture the influence of FinTech adoption on sustainability in banking. Key dimensions include operational efficiency, automation, financial inclusion, transparency and compliance, paperless transformation, collaboration and innovation, risk management, data-driven decision-making, cost efficiency, and strategic impact. The second latent variable, Digital Marketing Practices, reflects how digital marketing initiatives contribute to the enhancement of sustainable banking practices. It exhibits a high reliability coefficient of 0.968, affirming the robustness of the construct. The associated factor loadings suggest that these indicators accurately measure the impact of digital marketing on sustainability outcomes in banking, encompassing aspects such as sustainability communication, green product promotion, customer trust, personalization, transparency, ethical branding, social inclusion, performance measurement, environmental awareness, and customer engagement and loyalty.

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Table 5: "Reliability Statistics for all the Variables"

Cronbach's Alpha	No. of Variables
0.980	20

(Source: Result of Reliability Statistics)

Table 5 outlines a reliability value of 0.980 for 20 manifest variables was obtained when Cronbach's Alpha was used to evaluate the scale. this indicates excellent internal consistency, confirming the reliability of the instrument for examining the fintech adoption and digital marketing practices on transformative growth in the banking sector through sustainable banking practices.

5.5 Regression Analysis

Employed multiple regression to investigate the influence of independent variables on the dependent variable. The analysis incorporated diagnostic tests to ensure the reliability of the model, including checks for multicollinearity, normality, and linearity. The overall model's explanatory power was evaluated using the coefficient of determination (R^2), while the relative importance of each independent variable was assessed through standardized coefficients (Beta values) and their statistical significance (p-values).

Statistically the regression equation is expressed as bellow

$Ý = \alpha + \beta 1 X 1 + \beta 2 X 2 + ei$

Where,

Ý = Sustainable Banking

α = Constant

X 1 = FinTech Adoption

X 2 = Digital Marketing Practices

β 1 & β 2 = Regression coefficients of Two Factors

Table 6: "Model Summary"

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.912[a]	.832	.831	.3017

a. Predictors: (Constant), FinTech Adoption, Digital Marketing Practices

(Source: Output of Regression Analysis)

Table 6 portrays the model of the regression demonstrating a strong predictive relationship between the independent variables i.e., FinTech adoption, digital marketing practices, and the dependent variable, sustainable banking. Adoption of financial technology and digital marketing practices greatly help to boosting sustainable banking practices which results in transformative growth of the financial sector of the economy, as indicated by the very strong positive connection (R-value: 0.912). The model demonstrates strong explanatory power, as evidenced by the R^2 value of 0.832, which indicates that 83.2% of the variation in sustainable banking practices is explained. Due to the addition of predictors, the model's robustness is further confirmed by the corrected R^2 of 0.831, which shows low overestimation. Furthermore, with a standard error of only 0.3017, it is clear that the data points that were actually measured are in excellent agreement with the regression line. The results underscore the critical role of technological adoption and digital marketing initiatives in achieving sustainable banking.

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Table 7: "Coefficients"

Coefficients[a]

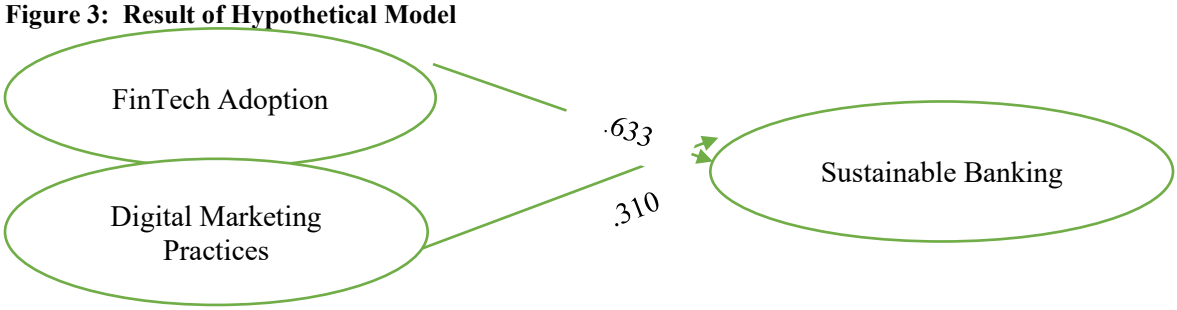
"Model"		"Unstandardized Coefficients"		"Standardized Coefficients"	"t"	"Sig."
		"B"	"Std. Error"	"Beta"		
1	"(Constant)"	.063	.091		.689	.491
	Digital_Marketing_Practices	.316	.054	.310	5.901	.000
	FinTech_Adoption	.649	.054	.633	12.046	.000

a. Dependent Variable: Sustainable_Banking

(Source: Output of Regression Analysis)

Table 7 showing regression coefficients shed light on how digital marketing practices and fintech adoption, as independent variables, affected sustainable banking, the dependent variable. For digital marketing practices, the unstandardized coefficient (B = 0.316) connotes that for each one-unit raise in this variable, sustainable banking improves by 0.316 units, keeping other factors constant. Its standardised coefficient (Beta = 0.316, $p < 0.001$) confirms its significant positive impact. Similarly, fintech adoption has as unstandardized coefficient (B = 0.649), indicating a 0.649-unit increase in fintech adoption per one-unit increase in user experience. It's standardized coefficient (Beta = 0.649, $p < 0.001$) also highlights a robust and statistically significant impact. The predictor digital marketing practices have a t-value of 5.901 and another predictor fintech adoption have a high t-value of 12.046, both predictors have very low p-values ($p < 0.001$), demonstrating their critical role in explaining sustainable banking.

Figure 3: Result of Hypothetical Model



6. FINDINGS OF THE STUDY

The investigation through observed data unveiled a robust and statistically significant impact of both FinTech adoption, digital marketing practices on sustainable banking outcomes. The regression model attained the R-value of 0.912 and an R^2 of 0.832, exhibiting that 83.2% of variance in sustainable banking is jointly explained by FinTech adoption and digital marketing practices. The standardized coefficients demonstrates that FinTech adoption ($\beta = 0.633$, $p < 0.001$) exerts a stronger positive influence on sustainable banking than digital marketing practices ($\beta = 0.310$, $p < 0.001$). These results denote that technology-driven initiatives namely automation, AI, digital lending, and paperless operations contribute substantially to operational efficiency, financial inclusion, and environmental sustainability embodying the "profit" and "planet" dimensions of the Triple Bottom Line. Meanwhile, digital marketing initiatives enhance the "people" dimension by promoting sustainability awareness, ethical branding, and customer trust through transparent and ESG-focused communication.

The factor analysis results validated two latent constructs i.e., FinTech Adoption and Digital Marketing Practices with high reliability scores (Cronbach's $\alpha = 0.980$), confirming the robustness of the measurement model. Both constructs demonstrated excellent internal consistency and strong factor loadings, indicating that the questionnaire effectively captured the constructs' multidimensional nature. The findings underscore that the convergence of financial technology and digital marketing nurtures transformative and sustainable banking by aligning innovation with social and environmental responsibility. The study establishes that FinTech adoption acts as a technological catalyst, while digital marketing functions as a social amplifier of sustainability in banking, together shaping a synergistic model that stimulates transformative growth, ethical performance, and long-term institutional

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resilience.

7. SUGGESTIONS: CHARTING A PATH FORWARD

The study underscores that FinTech adoption and digital marketing practices serve as critical enablers of sustainable banking by fostering operational efficiency, transparency, and stakeholder engagement. Banks should strategically integrate FinTech-driven innovations within their sustainability frameworks to augment green finance initiatives and fine-tune resource utilization. Swapping toward paperless initiatives can substantially trim environmental footprints while elevating cost efficiency and operational agility. Furthermore, digital marketing must be repositioned as a catalyst for sustainability communication where banks use online platforms and data-driven campaigns to promote ESG initiatives, ethical branding, and customer trust. Such initiatives can reinforce the people, planet, and profit dimensions of the Triple Bottom Line, fostering the culture of responsible innovation within the banking ecosystem.

8. CONCLUSION

The study concludes that the integration of FinTech and digital marketing in banking sector is the transformative pathway toward attaining sustainable banking in the digital age. Drawing upon the Triple Bottom Line (TBL) and Sustainable Innovation frameworks, the findings reveal that FinTech adoption enhances operational efficiency, financial inclusion, and environmental performance, while digital marketing amplifies sustainability communication, ethical branding, and stakeholder engagement. Together, these digital drivers redefine banking from a profit-centered model to one grounded in inclusivity, responsibility, and environmental stewardship. The strong explanatory power of the regression model underscores the synergistic influence of technology and communication in promoting sustainability-oriented growth.

9.LIMITATIONS & SCOPE FOR FURTHER RESEARCH

The study's geographical limit on a specific banking community in Bangalore may limit how widely the results can be used in other local or regional contexts. Even though the study had considered data validation and reliability testing before statistical analysis, findings is mainly based on the perceptual data from self-reported responses, which may be influenced by the respondents' biases. Causal findings between variables can be further deliberated by appending other variables which impact on the sustainable banking practices. Subsequent studies can be considered to widen the scope by employing longitudinal or cross-country comparative designs to assess how FinTech-driven sustainability evolves over time and across regulatory environments. Integrating, mediating and moderating variables such as green innovation capability, digital literacy, or ESG orientation may further enrich the model. Future studies could apply advanced analytical approaches like structural equation modelling (SEM) to uncover the relationship.

10. STATEMENTS & DECLARATIONS:

Use of AI Statement

The authors declare that they have not used generative artificial intelligence, specifically ChatGPT in the writing of this manuscript and/or in the creation of images, graphics, tables, or their corresponding captions

Conflict of Interest and Declarations:

Authorship contribution statement: Sowmya N: Carrying the Experimental work, Data curation and writing the original manuscript and original draft. Nirmala K: Supervision and review of manuscript.

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