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Impact of Digital Banking on Customer Experience and Satisfaction

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Abstract

The study's main objective was to comprehend the users' experience and satisfaction regarding the four pillars of digital banking, i.e., Omnichannel, smart, modular, and open banking solutions. This cross-sectional study is based on a survey sample of 594 customers of India conducted using a mixed-method approach, combining descriptive and exploratory research designs. A theoretical framework was developed to understand user experience and satisfaction; five models were identified to analyze the relationships between variables through a multi-regression test. Female users prefer Tech-enabled banking technologies to male users. Users between 19 and 30 years and customers without any occupation exhibit the highest inclination towards Omnichannel, smart, modular, and open banking compared to those with varying age and occupation brackets. Models 1 to 5 revealed positive user experiences with Omnichannel, smart and modular banking and all results were found statistically significant ($p < 0.001$). The study's novelty is recognizing gender and age-specific adoption styles in digital banking. The study developed a new theoretical framework that provides actionable insights for enhancing user satisfaction across digital banking pillars. It also presents fresh views for stakeholders and contributes to advancing research in virtual banking technology, empowering professionals with practical implications for their work.

Keywords: Digital Banking, Digital Platforms, Modular Banking, Omnichannel Banking, Open Banking, Smart Banking.

Introduction

The Digital India campaign of the Government of India empowered bank customers to perform banking transactions as "Faceless, paperless, and cashless", helping India to become a learning economy and society empowered by technology. Digital banking in India emerged in the late 1990s, with ICICI Bank being the first to offer services in 1999. Banks began offering a wider range of online products. The word "Digital Banking" might be sufficient to describe the state of banking today; it also plays a significant role in cashless transactions. Digital banking is driven by developed IT technologies, integrated smartphones, tablets, and PCs, and extended 24/7 banking services at the fingertips (1). Digital banking channels offer convenience, safety, and availability for customers. The Banking 4.0 digital banking platform aims to offer consumers a superior and personalized banking experience while empowering banks to become more competitive, inventive, and adaptable in the quickly changing digital market. Clever digital platforms power these enhanced experiences, and the shift to a digital-first strategy has completely transformed the game. The four pillars of this framework—Omnichannel, smart, modular, and open banking—support it as a digital-first platform. With the platform's APIs, third-party service providers may access consumer data and create new financial products and services, enabling banks to stay competitive across several platforms, including mobile, web, chatbots, and social media. Digital transformation in the banking sector focuses on improving customer experience, streamlining operations, and creating innovative business models (2). Successful strategies involve technology, value creation, structural change, and financial aspects. These changes present both threats and opportunities for banks and financial institutions. Demographic factors, such as time and internet access, influence the adoption of innovative technology. Friends, family and usage of

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the Internet increase awareness of M-banking among clients. The platform uses data analytics, cloud computing, and artificial intelligence (AI) to offer customized offers, recommendations, and services. Additionally, it ensures the confidentiality and privacy of customer information and transactions (3). Under the Open Banking paradigm, banks use APIs to share client data with other vendors, enabling third-party providers to develop innovative goods and services that meet clients' unique requirements. The Open Banking model enables external providers to access financial records through technology and legal advancements in the financial services industry (4). A Modular Bank is a bank 4.0 modular architecture model that offers new strategic opportunities for universal banks by creating new products by orchestrating these different services. The fusion covers physical and digital distribution channels, including call centres, brick-and-mortar storefronts, social media, email, chatbots, and voice assistants; giving customers a streamlined and uniform experience is called an omnichannel experience. With technological breakthroughs like rapid payments, blockchain, and artificial intelligence, omnichannel deployment is essential for the banking sector (5). IoT-based Smart Banking System helps banks offer user-friendly value-added services and customized products, fostering a win-win situation for customers (6). They can access vital financial information, increase engagement, and prevent unresponsiveness through push notifications in real-time and event-based notifications; it has reduced customers' stress and ambiguity in managing their finances proactively. Digital banking technology offers enhanced security features, including biometric identification, multi-factor authentication, and immediate login alerts for secure financial access. The Banking-as-a-Platform (BaaP) digital platform strategy provides a reference model and discusses its advantages and disadvantages for entrepreneurs, policymakers, banks, and FinTech firms (7). Mishra and Rajwani addressed technology bringing ease in the banking environment and giving better insights for customer understanding (8). Jiang and Taskin developed and tested a modified theoretical model based on the Unified theory of acceptance and use of technology (UTAUT) to analyze how customers respond to digital banking products or services in New Zealand from a behavior intention perspective (9). Diener and Špaček perceived obstacles to digital transformation in both the private and commercial banking sectors from a managerial point of view (10). The liberalization of Indian economic policy (1991) emphasized that improving banking infrastructure is urgently needed to provide banking services of international standards. Resultantly, the Research Bank of India initiated the payment system in the global financial system to be at par in terms of efficiency, safety, and speedy delivery, which includes cashless transactions (11). The RBI made the payment system more affordable for users and motivated Banks to integrate ICT and digital technologies (11). In this scenario of digital interventions in the banking system, new possibilities and facilities are being implemented, such as Omnichannel, Smart, Modular, and Open Banking technologies in India. The study endeavored to assess Omnichannel, Smart, Modular, and Open Banking services/technologies in India regarding user experience and satisfaction, which seems more pertinent in this scenario. The research is based on a simple question: "How do Omnichannel, smart, modular and open banking solutions impact customer satisfaction in Indian banking?"

Open Banking

A new idea called "open banking" gives financial service providers from the outside, free access to banks (12). Open banking refers to "APIs, " which contain information on customer banking, transactions, and other financial data made available to a third party to foster greater consumer choice, competition, and innovation (13). Open banking enables clients to share financial information with fintechs and improves screening and product offerings (14). Open banking in Ukrainian banking environments was found as a potential application (15), and the level of bank readiness in Indonesia for implementing Open API in open banking was assessed and found useful (16).

Omnichannel Banking

The Omnichannel strategy enables banks to collect customer data across multiple channels, providing a seamless, integrated customer experience and competitive advantage. Omnichannel banking supports customer interactions and identifies theoretical and managerial implications for

customer experiences (17). The Omnichannel customers observed the standard of customer experience in Indian banks and, based on elements influencing customer impressions, developed a model to enhance the Omnichannel customer experience in banking (18). The Omnichannel banking strategy engages customers, offers customized products, provides personalized services to retain tech-savvy customers, and focuses on the conceptual underpinnings of Omnichannel marketing and tactics for success in the digital era (19). An Omnichannel banking methodology built on BIAN concepts that optimize client experience, retention rates, service quality, and profitability through integrated channel interactions, and Omnichannel adoption mediates the relationship between technology and marketing strategy (20).

Smart Banking

Despite technological advancements, digital banking faces limitations such as poor infrastructure, remote access, and low internet connectivity. The impact of smart mobile banking services (SMBS) on senior clients' intention to utilize banking applications was investigated, and it was found that SMBS features such as convenience, security, trust, and ease of use influence senior clients' adoption (21). One study examined resistance to smart banking across various income groups and explored obstacles (22). Relationships between smart banking traits (convenience, security, convergence, and economy), user features (familiarity and innovativeness), perceived utility, trust, contentment, and intention to continue (23).

Modular Banking

Modular banks transition from conventional to modular architecture (24). BaaS provides modular banking financial services through regulated infrastructure and API-driven platforms. Banking-as-a-Service (BaaS) results from this progress, where FinTechs can swiftly integrate these use cases through APIs (25). The modular branch banking parameters have several characteristics (26), and banks could innovate quickly according to customer needs with a modular architecture (27).

Customer Experiences

The impact of CMM on banking sector loyalty (virtual, physical, and service interactions) (28), has revealed a positive correlation between client loyalty and customer experience management, influencing loyalty behaviour and building trust. Kassab and Laplante presented five trust concerns necessary for open banking to succeed globally and improve customer choice and experience (29). The mediating role of customer trust and engagement in experience excellence and customer loyalty was investigated (30). The impact of the Internet of Everything explained relationships between perceived usefulness, perceived ease of use, subjective norms, perceived risks, trust and attitudes that influence mobile banking behaviour, revealing attitudes, perceived utility, subjective norms, and responsiveness influencing usage (31).

Customer Satisfaction

Customer satisfaction in digital bank applications using ecosystem, company image, promotion, perceived usefulness, and system use, emphasizing ecosystem investigation for better customer satisfaction and business growth (32). A study about PT Bank Central Asia in Cikarang revealed that e-satisfaction and e-trust were moderated by digital banking usage, with electronic trust having no considerable influence (33). The impact of brand image, service quality, and trust on customer satisfaction and loyalty in Islamic banks (34). The banking industry adapts to dynamic technological changes for customer satisfaction (35).

Summary of the Literature Review and Research Gap

A thorough literature review found two research gaps: evidence-based and theoretical. Many studies have separately focused on omnichannel, smart, modular, and open banking. So, there is a need to examine omnichannel, smart, modular, and open banking together to assess the effectiveness of digital banking technology in enhancing users' experiences and satisfaction. The theoretical gap in understanding how digital banking technology catalyzes the enhancement of customer experiences and satisfaction involves a lack of comprehensive frameworks or models that integrate diverse factors influencing user satisfaction in the digital banking context. Five hypothetical models were developed to fill the theoretical gap in understanding how technology-enabled omnichannel, smart, modular, and open banking solutions enhance customer satisfaction and experiences.

Methodology

The research employs a descriptive pragmatic paradigm (36). Information was gathered from an unidentified demographic through Google Forms and disseminated by email, WhatsApp, and other online platforms. The combined approach analyses and explores the user experience using India's omnichannel, smart, modular and open banking technology through empirical and systematic investigations.

The Difference between the Proposed Method and the Existing Method

The proposed technique drastically differs from existing strategies in several aspects. The proposed technique introduces a new theoretical framework to investigate user experience studies in digital banking; unlike current techniques, frequent models utilize demographic concerns. It emphasizes demographic preferences, highlighting that female users aged 19 to 30 are more interested in various digital banking solutions, which existing approaches often overlook. Using multiple regression analysis in the proposed method allows for identifying significant predictors of user satisfaction and preferences, contrasting with traditional qualitative analyses that could miss the element's statistical importance. The method recognizes the impact of gender and age on adoption styles, enabling the development of focused techniques to enhance consumer satisfaction and engagement. Overall, the proposed method provides a more nuanced and data-driven understanding of the user's experience in digital banking. A mixed-method approach is employed, which includes descriptive and exploratory research designs. In this study, 594 users from India were surveyed to investigate their experience with omnichannel, smart, modular, and open banking across gender, age, occupation, frequency of use, and satisfaction. During 2023–24, the study employed convenience-based sampling to gather responses from users who used omnichannel smart, modular and open banking in India, spanning various demographics. This study proposes a conceptual framework for understanding user experience with digital banking technologies using models 1 to 5.

Measures

The questionnaire was developed based on previous studies. It evaluates users' experiences with various banking technologies using 36 statements: omnichannel banking (OMC1-OMC6), smart banking (SB1-SB6), modular banking (MB1-MB6), and open banking (OB1-OB6) Figure 1 illustrates the relationship between user's digital experiences in omni-channel, smart, modular and open banking technologies and various demographic and behavioral factors such as gender, age Occupation, Satisfaction and frequency to use. The six models explore how these banking technologies impact specific user characteristics.

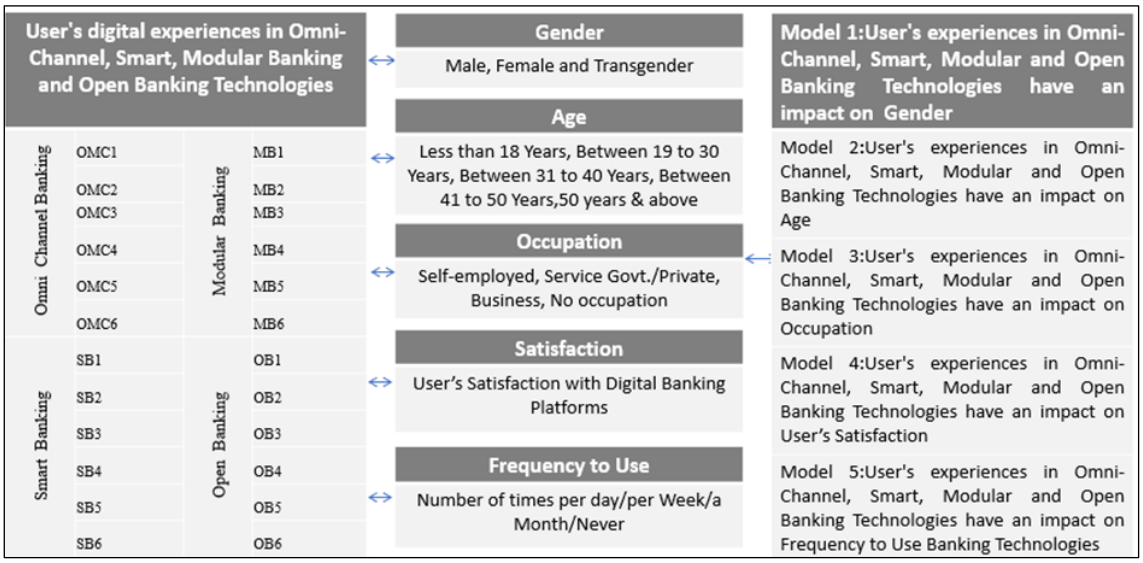

Figure 1: A Conceptual Framework to Test the Significance of the Research Model

The validation test examined the bivariate correlations for all the questionnaire items, confirming a correlation within the acceptable limits of each item below 0.05, thus confirming

their validity. Construct validity was therefore supported for OMC1-OMC6, SB1-SB6, MB1-MB6, and OB1-OB6, as the variance extracted was greater than squared correlations. Reliability for the 57 items was measured through Cronbach's alpha, which equated to 0.934, an excellent figure demonstrating high internal consistency. The normality of the data was measured using Shapiro-Wilk and Kolmogorov-Smirnov tests in SPSS, which showed that p-values less than 0.05 indicated a skewed distribution of the sample data.

Results

The data were analyzed using demographics, such as gender, age and occupation. Hypothesis testing examined the differences in user experiences with Omnichannel, smart, modular, and open banking technology across gender, age, occupation, satisfaction, and frequency of use.

Table 1: Descriptive Statistics

Gender	Frequency	Percentage
Male	273	46
Female	321	54
Age	Frequency	Percentage
Less than 18 Years	3	0.5
Between 19-30 Years	510	85.9
Between 31-40 Years	24	4
Between 41-50 Years	27	4.5
50 and above	30	5.1
Occupation	Frequency	Percentage
Self-employed	54	9.1
Service Govt./Private	96	16.2
Business	51	8.6
No occupation	393	66.2

Demographic Profile

The demographic assessment, as shown in Table 1, shows approximately a female majority of 54%, with equal representation of both genders. Most respondents are young people between 19-30 (85.9%), with the other age groups being poorly represented. Most (66.2%) are non-occupied, which may be attributed to their student status, while the remaining are in the government/private sectors (16.2%), self-employed (9.1%) or in business management (8.6%). Given the youthful yet diverse nature of the sample, the current research results will predominantly reflect the attitudes, beliefs and behaviours of young adults, which is especially important for the present study.

Table 2: Likelihood of Using Digital Banking Platforms

Sl. No.	Statements	Mean	Std. Deviation
1	Convenience and accessibility	3.182	1.371
2	Greater transparency and control over Financial transactions	3.232	1.302
3	Personalized financial insights and tools	3.162	1.258
4	Customizable branding	2.899	1.236
5	Alerts and push notifications	3.101	1.215
6	Effective Security and fraud detection measures	3.162	1.294

Table 2 presents mean scores for the likelihood of using digital banking platforms. Greater transparency and control over Financial transactions have the highest mean score (3.232), followed by Convenience and accessibility (3.182), Personalized financial insights and tools and Effective Security and fraud detection measures share a mean score of (3.162), Alerts and push notifications follow with 3.101. Customizable branding (2.899) has the lowest mean score.

Hypothesis Testing and Model Development

Testing the hypotheses below precedes the model development to validate the proposed relation within the data.

Hypotheses

H1: The user experience with omnichannel, smart, modular, and open banking technology significantly impacts gender. **H2:** The user experience with omnichannel, smart, modular, and open banking technology significantly impacts age. **H3:** The user experience with omnichannel, smart, modular, and open banking technology significantly impacts occupation. **H4:** The user experience with omnichannel, smart, modular, and open banking technology significantly impacts customer satisfaction. **H5:** The frequency of banking technology use significantly impacts users' experience with omnichannel, smart, modular, and open banking technology.

Model testing through multiple regression analysis

Multiple regression analyses of the relationships between the independent and dependent variables were performed. Models 1 to 5 evaluate the hypotheses (H1-H5). Models 1-5 regressed gender, age, occupation, satisfaction, and frequency of use of digital banking technology on 24 independent variables (Figure 1).

H1: The user experience with omnichannel, smart, modular, and open banking technology significantly impacts gender.

Table 3: Model 1 - Summary of Multi-Regression Analysis between Omnichannel, Smart, Modular and Open Banking Technologies and Gender

Regression Weights	R2, R, F	Beta Coefficient	t-value	p-value	Result and Analysis
Omnichannel-Gender	R2 =0.884	0.338	4.741	0.000	F (528.081) =0.000, p<0.001<=0.05 Hypothesis supported
Smart Banking-Gender	R=0.782	0.001	0.021	0.991	F (528.081) =0.991, p>0.001>=0.05 Hypothesis not supported
Modular Banking-Gender	F=528.081	.531	6.883	0.000	F (528.081) =0.000, p<0.001<=0.05 Hypothesis Supported
Open Banking-Gender		0.027	-1.263	0.733	F (528.081) =0.733, p>0.001>=0.05 Hypothesis not supported

The table 3 presents the result of Model 1, a multi-regression analysis examining the impact of user's experience in omnichannel, smart, modular and open banking technologies with gender on table. The table includes regression weights, R^2, R ,F-values, beta coefficient, t-values and p-values to determine the significance of each relationship. The finding reveals Omnichannel banking was found to have a positive and significant association with gender; the R^2 is 0.884, the beta coefficient is 0.338, and the value of 0.000 indicates that gender plays an important role in how users experience banking. On the other hand, smart banking does not significantly impact gender, as shown by the beta coefficient of 0.001 and p-value of 0.991, which does not support the hypothesis. Modular banking, conversely, has a significant impact on gender, showing an R2 of 0.531 and a p-value of 0.000, affirming that gender impacts the user experience with banking. Finally, open banking does not show any possibility of significance with a beta of 0.027 and a p-value of 0.733.

H2: The user experience with omnichannel, smart, modular, and open banking technology significantly impacts age.

Table 4: Model 2 - Summary of Multi-Regression Analysis between Omnichannel, Smart, Modularand Open Banking Technologies and Age

Regression Weights	R2, R, F	Beta Coefficient	t value	p-value	Result and Analysis
Omnichannel-Age	R2 =0.877	0.168	2.288	0.022	F(491.358)=0.022,p<0.001<=0.05 Hypothesis supported
Smart Banking Age		0.251	3.486	0.001	F(491.358)=0.001,p<0.001<=0.05Hypothesis Supported
Modular Banking Age	R=0.769	0.421	5.308	0.000	F (491.358) =0.000, p<0.001<=0.05 Hypothesis Supported
Open Banking Age	F=491.358	0.053	0.648	0.517	F (491.358) =0.517, p>0.001>=0.05 Hypothesis not supported

The table 4 summarizes the result of Model 2, a multi-regression analysis exploring the impact of user's experience in omnichannel, smart, modular and open banking technologies with age on table. The analysis includes regression weights, R^2, R ,F-values, beta coefficient ,t-values and p-values to assess the strength and significance of each relationship. The result reveals the hypothesis is supported. The omnichannel impacts age, where the p-value is 0.022, showing that the age factor impacts user experience. Smart banking is impacted by age, p-value of 0.001 is below 0.05. The smart banking experience of users is impacted by age. Modular banking runs with this trend, positively impacting age with a p-value of 0.000. However, open banking does not impact age, as the p-value of 0.517 is greater than 0.05; open banking experiences of users are not impacted by age.

H3: The user experience with omnichannel, smart, modular, and open banking technology significantly impacts occupation.

Table 5: Model 3 - Summary of Multi-Regression Analysis between Omnichannel, Smart, Modular and Open Banking Technologies and Occupation

Regression Weights	R2, R, F	Beta Coefficient	t value	p-value	Result and Analysis
Omnichannel-Occupation	R2 =0.882	0.132	1.833	0.067	F(517.969)=0.067,p>0.001>=0.05 Hypothesis not supported
Smart Banking-Occupation	R=0.778	0.246	3.483	0.001	F(517.969)=0.001,p<0.001<=0.05 Hypothesis Supported
ModularBanking-Occupation	F=517.969	0.368	4.733	0.000	F(517.969)=0.000,p<0.001<=0.05 Hypothesis Supported
Open Banking-Occupation		0.154	1.901	0.058	F(517.969)=0.517,p>0.001>=0.05 Hypothesis not supported

The table 5 analyzes whether user experience with different banking technologies -Omnichannel, smart, modular and open banking are significantly related to occupation. The analysis includes regression weights, R^2, R, F-values, beta coefficient ,t-values and p-values to assess the strength and significance of each relationship.The outcomes of the multi-regression analysis of user experience with omnichannel, smart, modular, and open banking technologies impact occupation revealed mixed results. Omnichannel banking does not significantly impact occupation, with $R^2 = 0.882$, Beta coefficient of 0.132 and p-value of 0.067 ($p > 0.05$), indicating user experience with omnichannel is not uniform across several occupations. User's experience with Smart banking impacts occupations, revealing a Beta coefficient of 0.246 and p-value of 0.001 ($p < 0.05$). In the same regard, modular banking has provided a reasonable Beta coefficient of 0.368 and p-value of 0.000, indicating user experience with modular banking is impacted by occupations. On the other hand, open banking users' experience is not impacted by occupation, where a Beta coefficient of 0.154 and a p-value of 0.517 ($p > 0.05$).

H4: The user experience with omnichannel, smart, modular, and open banking technology significantly impacts customer satisfaction.

Table 6: Model 4 - Summary of Multi-Regression Analysis between Omnichannel, Smart, Modular and Open Banking Technologies and Satisfaction

Regression Weights	R2, R, F	Beta Coefficient	t value	p-value	Result and Analysis
Omnichannel-Satisfaction	R2 =0.577	-.144	-3.030	0.003	F (73.318) =0.003, p<0.001<=0.05 Hypothesis supported
Smart Banking-Satisfaction		-.221	-4.556	0.000	F (73.318) =0.000, p<0.001<=0.05 Hypothesis supported
Modular Banking-Satisfaction	R=0.332	-.250	-5.020	0.000	F (73.318) =0.003, p<0.001<=0.05 Hypothesis supported
Open Banking-Satisfaction	F=73.318	-.064	-1.189	0.235	F (73.318) =0.235, p>0.001>=0.05 Hypothesis not supported

The table 6 present the result of Model 4, a multi regression analysis examine omnichannel, smart, modular, and open banking technologies on customer satisfaction—the outcomes of the multi-regression analysis present mixed outcomes. The analysis includes regression weights, R^2, R, F-values, beta coefficient, t-values and p-values to assess the strength and significance of each relationship. Omnichannel banking has a substantial adverse effect on customer satisfaction, with a Beta of -0.144 and a value of p equal to 0.003 ($p < 0.05$), meaning that it causes a drop in customer satisfaction. Implementation or usage of omnichannel banking increases, and customer satisfaction tends to decrease. Smart banking also has a negative influence, as evidenced by Beta -0.221 and the value of p equal to 0.000 ($p < 0.05$). Utilitarian or modular banking negatively affects one's satisfaction with values, as depicted with a Beta equal to -0.250 and a value of p equal to 0.000 ($p < 0.05$). On the other hand, open banking is not significantly related to these dimensions, as shown with a Beta of -0.064 and p equal to 0.235 ($p > 0.05$), inferring that the impact is neutral.

H5: The frequency of using banking technology significantly impacts users' experience with omnichannel, smart, modular, and open banking technology.

Table 7: Model 5 - Summary of Multi-Regression Analysis between Omnichannel, Smart, Modular and Open Banking Technologies and Frequency of Use of Banking Technology

Regression Weights	R2, R, F	Beta Coefficient	t value	p-value	Result and Analysis
Omnichannel-Frequency to use	R2 =0.424	0.110	2.082	0.038	F(32.262) =0.038, p<0.001<=0.05 Hypothesis supported
Smart Banking-Frequency to use	R=0.180	0.133	2.466	0.014	F(32.262) =0.014, p<0.001<=0.05 Hypothesis supported
ModularBanking-Frequency to use	F=32.262	0.282	5.105	0.000	F(32.262) =0.000, p<0.001<=0.05 Hypothesis supported
Open Banking-Frequency to use		-.038	-0.643	0.520	F(32.262) =0.520, p>0.001>=0.05 Hypothesis not supported

Table 7 presents the results of model 5, the multi regression analysis investigate the relationship between user's experience with digital banking and frequency to use banking technologies. The table includes regression weights, R^2, R, F-values, beta coefficient, t-values and p-values to assess the strength and significance of each relationship. The hypothesis has supported that experience with omni-channel banking technologies has increased the frequency of using banking technologies, supported by a beta coefficient of 0.110 and a p-value of 0.038. Smart banking contributes positive user experience, potentially encouraging more frequent interactions or higher satisfaction levels, with a beta of 0.133 and a p-value of 0.014. On the other hand, modular banking has the highest beta

of 0.282 alongside a significant p-value of 0.000. Experience with modular banking contributes more strongly to increased usage. On the contrary, open banking reports no significant relationship with the frequency of use of banking technologies, as depicted by a beta value of -0.038 and a p-value of 0.520, which lacks of adoption and limited usage of banking technologies.

Discussion

The study outcomes will increase the knowledge of customers wishing to embrace multiple banking technologies and bankers seeking to customize their services. Results show that female users use omnichannel, smart, modular and open banking services more than male users, as they are probably inclined to use such services for day-to-day tasks because of their ease and availability. In addition, individuals aged 19-30 years have the highest rates of adoption of these services because they are acquainted with technology and prefer modern banks that offer various services. However, the unemployed users are also early adopters, possibly owing to the wide range of applications offered to them. Greater transparency and control over financial transactions increase the likelihood of using digital banking platforms, as they give users confidence in financial monitoring. Similarly, a study analyzed digital banking opportunities and challenges, including knowledge gaps, cybersecurity concerns, financial transparency issues, new services for Gen-Z, and emerging banking trends (37). As represented in models 1 to 5 and Figure 2, gender, age, satisfaction, and frequency of using banking technologies are vital in determining the digital banking experience with omnichannel, smart, modular, and open banking technologies.

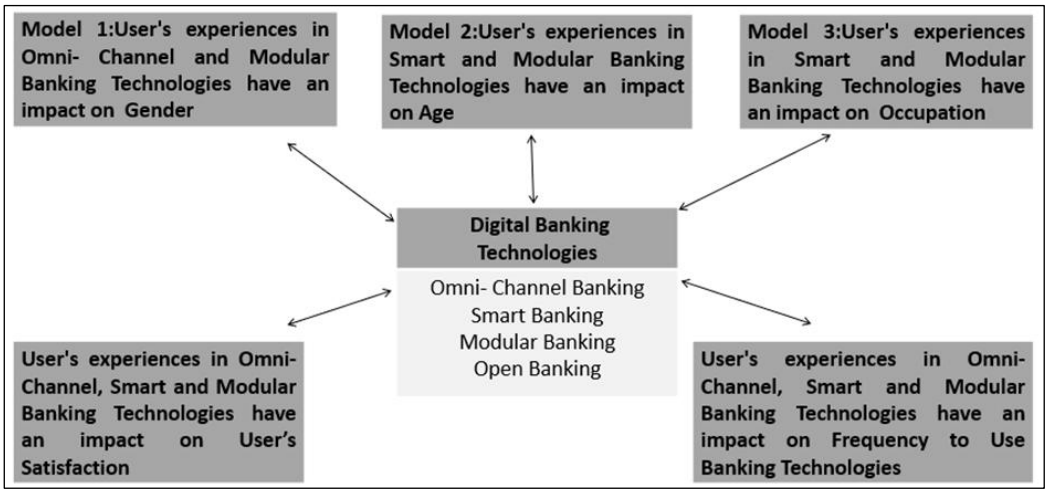

Figure 2: Result Outcome-User's Digital Experiences in Omnichannel, Smart, Modular Banking and Open Banking Technologies have an Impact on Gender, Age, Satisfaction and Frequency of Using Banking Technologies

Figure 2 summarizes the findings of five regression models. Models 1 to 5 examine how users' experience with digital banking technologies impacts various demographic and behavioral factors. The results of model 1 provide evidence that gender significantly impacts the use of omnichannel and modular banking technologies, as these seem to appeal to male and female users differently. For the most part, the findings imply that some banking technological innovations, particularly the omnichannel and modular varieties, are tailored to specific gender needs. In contrast, smart and open banking technologies are largely gender-neutral. Is a need for gender design in digital banking for customers in omni-banking? (17). The results of model 2 suggest that age affects users' experiences with omnichannel and modular banking technologies, and open banking is age-blind and provides similar experiences for all. Qatawneh and Makhlouf have also noted in their work that mobile banking and smart banking, which are very appealing to senior citizens, confirm age as an important factor in clients' choice of digital banking services (21). The multi-regression results of model 3 indicate that user experience in the context of smart and modular bank technologies varies by occupation, which implies that such technologies appeal to certain job

levels or professions. Smart and modular banking is easy for professionals as it is available and effective, especially with the current generation that prefers self-service and digital banking services. On the other hand, experiences with omnichannel and open banking are not differentiated by occupation, signifying a more homogeneous experience across different occupations; as suggested, for active customers, it is no longer an option to provide self-service features using digital banking services (37). The results of model 4 show varied results. There is a significant but negative relationship between customer satisfaction and adopting all three bank-customer interface technologies – Omnichannel, smart, and modular banking. It can, therefore, be inferred that using such systems may lead to lower dissatisfaction levels. Differently, open banking does not significantly affect its users, meaning it has a rather ambivalent bearing on user satisfaction. This indicates that there are technologies that influence the levels of customer satisfaction. The banking industry adapts to digital banking channels for customer satisfaction through dynamic technological changes (35). Findings from Model 5 imply a positive and meaningful impact of frequency of use and user experience with Omnichannel, smart, and modular banking technologies—modular banking, being the most responsive and having enhanced interaction, improves the user's experience. On the contrary, open banking does not correlate significantly with frequency of use and user experience. The respondents experiencing the convenience of all multiple digital channels from a single view are likely to increase their frequency of using banking technologies (3). The investigation of user interactions with technologies applied in banking presents distinct outcomes. Omnichannel banking varies by gender and age and has an inverse relationship with customer satisfaction, albeit the experiences improve with increased usage. Modular banking has similar gender and age impact satisfaction levels of customers. Smart banking is gender-neutral, although customer satisfaction is low and improves with use. Open banking benefits all ages and genders, ensuring an average experience but not affecting satisfaction levels. Overall, the figure illustrates how different digital banking experience relates to user characteristics and behaviors.

Managerial Implications

This study suggests managers should invest in banking platforms to enable personalized customer interactions, leading to greater customer satisfaction. Managers must ensure these channels are seamlessly integrated to provide a consistent and intuitive experience across all touch points. Managers should prioritize investment in cyber security measures to build customer trust and enhance overall customer satisfaction. Managers should experiment with emerging technologies and develop innovative solutions to meet customer needs. According to the study, the technology acceptance model can be used to assess how digital banking technology is being adopted. To determine customer satisfaction, digital banking platforms exceed customer expectations regarding usability, functionality, and service quality. Theoretical frameworks such as the Service Innovation model emphasize improving customer satisfaction by introducing novel digital banking solutions.

Limitations of the Study and Future Scope of the Research

The study was conducted with 594 samples in India only, but expanding the sample size could offer a more comprehensive and representative perspective and improve the generalizability of the findings to the broader population of India. This study may have several limitations due to its reliance on self-reported data, potential sampling bias, and cross-sectional nature from diverse demographic backgrounds, as it may not capture changes in customer satisfaction and experiences over time. This study may overlook contextual factors specific to different geographical regions, cultural backgrounds, and socioeconomic statuses, which could influence how users perceive and interact with digital banking technology. The study also focuses on theoretical insights, leaving the practical implications for banking executives and policymakers as a future research avenue. This study provides valuable insights that can inform future research endeavors in various domains, such as conducting longitudinal studies to track changes in customer experience and satisfaction over time as digital banking technology evolves, comparing the effectiveness of digital banking technology in enhancing customer experience and satisfaction, investigate and compare cultural differences that influence customer perceptions of

digital banking technology and satisfaction levels, and conducting in-depth qualitative studies explore the nuances and intricacies of customer satisfaction with the digital banking landscape. The future research scope emphasizes the need to explore practical strategies for banking executives and policymakers to optimize the benefits of digital banking technologies.

Conclusion

Exploring digital banking technologies and their impact on customer experience and satisfaction opens significant theoretical and managerial insight. Women are more prone to interact with the Omnichannel, intelligent, sectionalized and open banking systems than men. Furthermore, the younger generation aged 19-30 years and those without specific occupations are more inclined towards this form of banking. Enhancing transparency and control in financial transactions fosters trust and accelerates digital banking adoption despite challenges like cyber security and knowledge gaps. Multiple regression analysis of five hypotheses proved differences in gender, age, occupation, satisfaction, frequency of use and user experiences with banking technologies. More specifically, the models show that gender positively predicts the user's experiences of Omnichannel and modular banking. At the same time, age is a factor in smart and modular banking user experience. Occupation contributes to the user experience of smart and modular banking, while satisfaction is experienced across Omnichannel, smart and modular banking. The technology itself facilitates a better user experience of these banking types. The effects of demographics and usage frequency are apparent, and they dominate all banking technologies concerning user experiences and satisfaction. The study acknowledges that designing safe and agile banking systems and other banking products that meet customers' needs is possible. There is a need for future studies to investigate banking technologies that can change customer perceptions and expectations for their satisfaction and involvement with banking.

Abbreviations

None.

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Author Contributions

Both authors worked equally in this manuscript's conception, design, analysis, and writing.

Conflict of Interest

The authors declare no conflict of interest in this study.

Ethics Approval

The responses related to this research were collected through Google Forms after obtaining informed consent from all participants.

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