The Impact of Digital Banking on Customer Satisfaction in the Lebanese Banking Industry: The Mediating Effect of User Experience

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Abstract:
Using digital banking factors and customer satisfaction as a metric, this research digs into the complex dynamics of the Lebanese banking business. This study uses a quantitative methodology to investigate the ties that bind digital diffusion, mobile participation, IT support, and user satisfaction. The study is based on information gathered from 324 bank customers who responded to online questionnaires. The study's setup allows for investigating these connections within a cross-sectional framework, providing a snapshot of the relationships at a given moment. The findings highlight the significance of user-centric design and good interactions in boosting digital banking customers' satisfaction. The study's ramifications are significant in both theory and practice. In a scholarly sense, the research adds to our knowledge of the complex interrelationships between digital banking features and how they impact customers' overall satisfaction. For the Lebanese banking sector, it provides valuable takeaways, arguing for strategies that put the customer's needs first to make the most of digitalization, mobile usage, and technical advancements.

Keywords: Digital Adoption Rate, Mobile Engagement Rate; Technological Infrastructure,

Introduction
The banking industry is no exception to the rule that the introduction of digital technology has revolutionized businesses everywhere. There has been tremendous progress towards a fully digital banking system in Lebanon, a nation with a long and storied financial tradition. This transition to digital banking includes using several new technologies, such as Internet banking, mobile banking apps, and digital payment systems (Ajitha & Sivakumar, 2019). Understanding the effect of digital banking on customer satisfaction has become crucial as the banking sector in Lebanon strives to improve its services and stay competitive on a global scale (Alayli, 2023).

Lebanon's banking industry has been recognized for decades as reliable and forward-thinking. Lebanese financial institutions have increased their use of digital banking systems in recent years to meet their consumers' needs better (Cho et al., 2020). Online banking services allow Customers to manage their money, make deposits, and
withdraw cash from any location. Mobile apps that provide services like mobile payments, account monitoring, and financial transfers have further revolutionized customer interactions with banks (Poddar et al., 2019).

The degree to which a bank's clients are pleased with the service they get is a crucial measure of the success of the institution as a whole (Malladi et al., 2021). With the advent of online banking, client satisfaction has expanded to include the quality of financial services and the convenience and ease with which they are accessed (Tunay et al., 2018). To tailor their strategies to their client's wants and requirements, banks must first have an appreciation for the effect that digital banking has on consumer satisfaction.

The quality of the user experience (UX) has become more critical to the success of online banking. Users' impressions of digital platforms are strongly influenced by their usability, attractiveness, responsiveness, and general contentment (Siddik et al., 2016). Customer loyalty, retention, and advocacy are all boosted by positive user experiences. Therefore, it is essential to investigate the user experience's role as a mediator between digital banking and client satisfaction.

This research examines the relationship between customer satisfaction and user experience in the Lebanese banking sector. This study aims to understand digital banking technology adoption's impact on customer satisfaction by analyzing consumer interactions with digital banking platforms. In addition, it seeks to comprehend the user experience's role in mediating this connection, thereby illuminating the significance of frictionless and user-centric digital interactions in generating consumer satisfaction.

As the banking sector in Lebanon undergoes a period of digital change, it is crucial to grasp the effects this shift will have on customers' overall satisfaction. The purpose of this study is to provide light on the complex relationship between the usage of digital banking, the quality of the user experience, and customer satisfaction. The research helps fill in the gaps in the Lebanese banking sector's understanding of these dynamics, providing helpful information for financial institutions seeking to improve their digital strategies and the satisfaction of their clients in the dynamic field of contemporary finance.

**Problem Statement**

The fast development of digital banking technology within the Lebanese banking sector has dramatically shifted how clients engage with financial institutions. The influence of the digital revolution on consumer satisfaction is an open subject, even though technology offers chances for improved services and accessibility. Lebanese banks are placing a greater emphasis on adopting digital banking solutions; thus, they must fully comprehend the effects of this shift on client satisfaction (Alayli. 2023).
The difficulty is figuring out the complex link between digital banking, consumer satisfaction, and the function played by user experience as a mediator. The potential advantages of digitization in banking have been recognized by studies worldwide, but the implications for the Lebanese environment are yet largely unexplored. There has to be focused research into how digital banking activities affect customer satisfaction levels, especially when mediated by the quality of the user experience, because of Lebanon's specific socioeconomic situation and different consumer preferences.

Client satisfaction is crucial to the financial services industry since it influences client loyalty, retention rates, and overall company performance, making this issue all the more pressing. The need to know whether digital banking improves or decreases consumer satisfaction is further emphasized by the hazards associated with digitalization, such as security worries or user resistance. A deep dive into the nuances of Lebanese banking customers' adoption of digital banking, user experience, and their combined effect on customer satisfaction is necessary to solve this challenge. Financial institutions may benefit significantly from this kind of research since it allows them to tailor their digital strategy to conveniently and pleasurably meet their clientele's demands.

**Theoretical Framework**

The Technology Acceptance Model (TAM) is a well-known theoretical framework that clarifies the reasons for people's openness to new forms of technology (Siddik et al., 2016). The TAM theory offers a useful lens through which to examine user behaviour and adoption patterns in the research investigating the influence of digital banking on customer satisfaction with the mediating effect of user experience in the Lebanese banking sector (Zouari & Abdelhedi, 2021).

The research may employ TAM to learn how consumers in Lebanon rate the value of the digital banking services provided by local financial institutions. Customers are more likely to use digital banking platforms if they perceive that these tools improve their banking experience, whether by streamlining transactions, increasing access to information, or saving time (Liu et al., 2021). Higher levels of consumer satisfaction are forecasted due to this optimistic outlook, which is impacted by the perception of usefulness.

Perceived Ease of Use, a TAM theory dimension, is very congruent with the idea of user experience. How satisfied consumers are with their digital banking experience is highly correlated with how simple that platform is (B. Kaur et al., 2021). Positive user experiences may be attained via user-friendly interfaces, straightforward procedures, and simple interactions. This correlation suggests that digital banking and customer satisfaction are
positively linked when consumers find digital banking systems intuitive and straightforward (Zherdetska et al., 2021).

TAM theory provides for a more in-depth investigation of the spread and acceptability of online banking. The determinants of user behaviour and their effect on customer satisfaction may be gleaned by examining consumers' opinions of the product's utility and convenience (Geng & He, 2021). Furthermore, TAM provides a framework to comprehend the mediating influence of user experience, allowing us to investigate how favourable user experiences mediate the connection between perceived utility, perceived ease of use, and customer satisfaction. Lebanese digital banking adoption is being studied, and the Technology Acceptance Model provides a theoretical framework congruent with the study's aims by serving as a lens to view the dynamic between perceived usefulness, perceived ease of use, user experience, and customer satisfaction (Mary et al., 2019).

Literature Review

Business, communication, and customer service are just a few areas profoundly affected by the fast development of digital technology. Businesses' use of digital resources and infrastructures has radically altered how they communicate with and provide for their consumers. Concerns about how this shift to digitalization may affect customers satisfaction (Wanalo et al., 2020). This literature study aims to investigate and make sense of the connections between companies' digital adoption rates and the satisfaction level their patrons report according to Alozian & Shatila (2023). The digital adoption rate by firms and consumer satisfaction level is a topic of extensive research (Sun et al., 2021). Adopting digital technology throughout an organization's processes, offerings, and customer interactions is what we mean when discussing digital adoption (Wijayanti et al., 2021). Online presence, mobile apps, e-commerce sites, and digital avenues of communication are all included according to El Annan et al (2020). Customers are more satisfied with their purchases from businesses with a high percentage of digital adoption because they may get more individualized service and enjoy more convenience (Motwani & Vora, 2021). This is especially true in sectors like e-commerce and banking, where frictionless digital interactions are crucial to retaining customers according to Ushakov & Shatila (2022).

Several factors have been linked to higher levels of consumer satisfaction, one being the widespread use of digital technologies. Increased convenience is one of the main benefits. Customers like not being restricted by store hours or location when looking for and interacting with companies that provide their goods and services online (Siddik et al., 2016). More effectively serving customers is another benefit of becoming digital. Customers may have questions or problems answered quickly.
and easily using automated methods like chatbots and self-service websites (Haapio et al., 2021). Companies with lower complaint rates and better service ratings have embraced digital solutions to expedite customer care.

The widespread use of digital technologies may boost customer satisfaction, but there are still obstacles that firms must overcome. Due to security and privacy concerns, customers may hesitate to provide personal information online (Abdurakhimova, 2021). The digital gap continues to be an issue, particularly for older people and the economically poor. Companies are responsible for guaranteeing that their digital products and services are accessible to people of all backgrounds.

Customer satisfaction is strongly influenced by how quickly organizations embrace digital technologies. Accessibility, convenience, and efficiency all increase with more digital usage, leading to better customer experiences (Firdous & Farooqi, 2017). However, for a company to have a good effect on consumer satisfaction, it must also solve security, privacy, and inclusion issues (Haralayya, 2021). Businesses that find a happy medium between adopting digital solutions and listening to customers' concerns will position themselves well to retain and grow their client base in the face of rapid technological advancements. More study is needed to examine these dynamics in various businesses and cultural settings to understand further the complex connection between digital adoption and consumer satisfaction. This led to the development of the following hypothesis:

**H1: There is a direct relationship between digital adoption rate and customer satisfaction**

Customer satisfaction and the overall success of a company in the modern digital ecosystem are directly tied to the level of mobile engagement they get. The proliferation of smartphones and other mobile devices has made it clear that companies must find new ways to interact with their clientele (Tunay et al., 2018). An increasingly important indicator for gauging the success of mobile interactions is the mobile engagement rate, which measures the frequency and quality with which consumers interact with a brand's mobile app or website (El-Chaarani & Abiad, 2018). The mobile engagement rate includes app use and clicks to social networking, and push notification replies. It indicates how people interact with a brand's mobile offerings. Positive emotional reactions from clients are strongly related to the seamless, individualized, and contextual experiences made possible by mobile interaction (El-Chaarani & Abiad, 2018).

Higher rates of mobile interaction often result in happier customers, but this isn't always the case. Users may get annoyed and frustrated if they are inundated with unnecessary alerts or material. It's essential to balance the frequency and relevancy of...
interactions to keep engagement rate and client satisfaction high (Kangwa et al., 2021). Additionally, care must be taken to address users' privacy concerns while gathering information for customization purposes. Businesses need to use the right measuring methodologies and tactics to fully capitalize on the potential benefits of mobile interaction for increasing customer satisfaction (Tiwari et al., 2021). Click-through rates, average session durations, and conversion rates are just some metrics that may be analyzed to learn more about user preferences and habits.

There are many moving parts in the complex link between mobile engagement and happy customers. As mobile devices become more central to consumers' daily lives, companies that emphasized developing engaging, useful, and personalized mobile experiences for their customers stand to gain a competitive advantage (Ramaswamy et al., 2021). Maintaining a positive effect on customer satisfaction and loyalty via mobile interaction requires finding the sweet spot between customization, frequency, and value (S. J. Kaur et al., 2021). Effective engagement methods may be informed by additional study of the complexities of this connection and the changing mobile technology environment. This led to the development of the following hypothesis:

**H2: There is a direct relationship between mobile engagement rate and customer satisfaction**

The underlying technology infrastructure influences customer experiences and satisfaction in today's quickly developing digital ecosystem. Various contact areas with customers may benefit from the seamless integration of technology inside corporate processes, which may affect customers' views and satisfaction (Stalmachova et al., 2022). Technology, such as e-commerce platforms and customer relationship management systems, helps businesses simplify operations, collect valuable consumer data, and provide individualized service (Zouari & Abdelhedi, 2021). The ease with which a company can efficiently serve its consumers is greatly influenced by its technological infrastructure. Thanks to self-service portals, smartphone applications, and other user-friendly digital channels, customers may now do business with companies whenever it is most convenient. Customer satisfaction is boosted, and transactional friction is lessened due to this ease of access (Liu et al., 2021).

Businesses may respond more efficiently to customers' questions and complaints on time thanks to today's modern technical infrastructure, which allows for real-time involvement and reaction. Direct and rapid connection is made possible via live chat, chatbots, and social media platforms, which may dramatically improve the customer experience. Data-driven customization is made possible by the technological infrastructure that allows firms to gather and analyze massive volumes of client data. Businesses can better meet
the demands of their customers if they have a thorough grasp of their preferences, habits, and previous purchases.

Trust from customers depends heavily on the reliability of the underlying technical infrastructure. Customers' trust and faith might be damaged by security blunders and data leaks that make headlines (Kaur et al., 2021). Information about customers is kept secure, and satisfaction is increased through a strong technical framework that places a premium on cybersecurity. There's no denying that a company's digital foundation may make or break its ability to keep customers happy. The quality of a company's technical infrastructure directly impacts consumers' opinions of that company and their likelihood to remain loyal to it due to all the conveniences and perks it offers (Zherdetska et al., 2021). More satisfied customers and sustained growth result from a customer-centric IT strategy prioritizing ease of use, quick response times, data-driven customization, and secure transactions (Geng & He, 2021). Future research should continue investigating the dynamic interaction between changing technological environments and consumer expectations to aid firms in adjusting and optimizing their technology infrastructure to increase customer satisfaction. This led to the development of the following hypothesis:

**H3: There is a direct relationship between technological infrastructure and customer satisfaction**

Firms heavily invest in technological solutions to improve internal processes and consumer interactions to stay competitive in today's digital marketplace (Lutfi et al., 2021). The pace at which consumers accept and use digital technology has emerged as a crucial indicator of the success or failure of a business's digital transformation (Malladi et al., 2021). Concurrently, the quality of the interactions between users and digital platforms the user experience has risen to prominence as a driver of consumer satisfaction. The digital adoption rate is how new digital tools, platforms, or applications are adopted and incorporated into daily life (Mary et al., 2019). Increased efficiency, reduced costs, and more involved customers are all possible results of a high adoption rate. The importance of this indicator is shown by the findings of studies showing a correlation between digital adoption and corporate success (Wanalo et al., 2020). Usability, accessibility, navigation, aesthetics, and usefulness are just a few facets of the user experience. Customers are more likely to be satisfied and loyal to a brand if their requirements are consistently met, and their interactions with that brand are simple and intuitive (Sun et al., 2021). UX is mediating between the pace of digital adoption and consumer satisfaction. Users are more satisfied with a digital product or platform when they have a favourable experience, regardless of how widely it is adopted. But even if digital
technologies are widely used, a negative user experience might reduce satisfaction levels.

Companies can improve their digital platforms and the quality of their customers' experiences by regularly analyzing user comments and actions (Wijayanti et al., 2021). The mediating function of user experience in the link between digital adoption rate and customer satisfaction underscores the importance of offering frictionless and user-centric digital interactions (Motwani & Vora, 2021). Increased customer satisfaction and loyalty are more likely to result from a company's careful management of the deployment of digital technology, with particular emphasis on creating pleasant user experiences (Siddik et al., 2016). To optimize adoption rates and user experiences for better customer results, businesses must have access to the latest information on the ever-changing digital ecosystem. This led to the development of the following hypothesis:

**H4: User Experience mediates the relationship between digital adoption rate and customer satisfaction**

Mobile engagement has become more critical for companies of all types to communicate with their customers in the modern digital world. Consumers' increasing reliance on mobile devices has led many companies to focus on mobile engagement rates as a critical indicator of their mobile marketing success (Haapio et al., 2021). Simultaneously, user experience (UX), which reflects the quality of consumer interactions with digital platforms, has become crucial to customer satisfaction (Firdous & Farooqi, 2017). The rate at which users connect with a brand's mobile offerings, such as via app downloads and push notification replies, is known as the mobile engagement rate. Customer loyalty, repeat purchases, and word-of-mouth marketing are all bolstered by a high mobile engagement rate (Abdurakhimova, 2021). Companies now understand how important mobile engagement is in moulding the opinions of their customers and, ultimately, their bottom line.

What makes a digital platform successful is its capacity to meet the needs of its users in terms of ease of use, availability, aesthetic appeal, and overall satisfaction. Customer satisfaction and loyalty are driven by providing a satisfying experience for the user (Haralayya, 2021). Delivering outstanding user experiences has been shown time and time again to enhance engagement, customer loyalty, and good word of mouth (Gupta et al., 2020). Their experience as mobile users mediates the connection between their involvement and overall satisfaction. When consumers have a good time using a company's mobile app, they are more likely to be satisfied with the company overall (Tunay et al., 2018).

Conversely, low levels of satisfaction might exist despite high levels of involvement. This indicates that the user experience mediates between interest and contentment. Several distinct
variables might mediate the connection between mobile users' participation and their overall satisfaction (Al-Smadi, 2011). Users' opinions are heavily influenced by a mobile app's visual design, navigation, responsiveness, personalization, and simplicity of use. The user experience improves because of the well-integrated engagement elements, open lines of contact, and rapid resolution of issues (Stoica et al., 2015).

Organizations often utilize qualitative and quantitative methodologies to assess and improve the mediating influence of user experience. Analytics monitoring, user feedback surveys, and usability tests may all light up user interactions' finer points. Businesses may improve mobile engagement rates and user experiences by constantly monitoring and refining the mobile platform based on user input and behaviour (El-Chaarani & Abiad, 2018). The importance of providing smooth and user-centred mobile interactions is shown by the fact that user experience moderates the connection between mobile engagement rate and customer satisfaction (Kangwa et al., 2021). Higher customer satisfaction and loyalty are more likely to be achieved by businesses that prioritize the creation of excellent user experiences in addition to improving engagement rates. Research is essential to find insights and best practices that aid organizations in optimizing mobile engagement rates and user experiences for increased customer outcomes as the mobile environment develops. This led to the development of the following hypothesis:

**H5: User Experience mediates the relationship between mobile engagement rate and customer satisfaction**

The foundation of every successful firm in today's digital age is its technology infrastructure. Businesses may improve efficiency, data collection, and consumer relations with a solid technology basis. At the same time, the quality of the interactions consumers have with digital platforms, known as the user experience (UX), has emerged as a critical component determining customer satisfaction (Tiwari et al., 2021). The user experience mediates the connection between the underlying technology and end-user satisfaction for several reasons. Users' opinions are heavily influenced by the digital platform's ease of use, accessibility, responsiveness, and adaptability (Ramaswamy et al., 2021). Positive user experiences are also supported by good communication channels, smooth onboarding procedures, and consistent attempts to enhance the service. The mediating effect of user experience is challenging to measure and optimize without using qualitative and quantitative approaches. Analytics, usability testing, and surveying people provide valuable information about their experiences and opinions. Organizations may improve their technology infrastructure and digital platforms by regularly assessing user experiences to increase customer
satisfaction (S. J. Kaur et al., 2021). Delivering frictionless and user-centred digital interactions is crucial because of the user experience’s mediating effect on the connection between technology infrastructure and consumer satisfaction. Organizations that emphasized developing excellent user experiences and maintaining strong technology underpinnings tend to have happier and more loyal customers. Research is necessary to unearth insights and best practices that help firms optimize their technical infrastructure and user experiences for improved customer outcomes as technology develops. This led to the development of the following hypothesis:

H6: User Experience mediates the relationship between technological infrastructure and customer satisfaction

Methodology

This study adopted a quantitative research technique to understand better the complex connection between digital banking characteristics and customer satisfaction in the Lebanese banking market. Exploring patterns, correlations, and relationships among variables is well suited to quantitative research since it relates to statistical analysis. Data were collected in a cross-sectional study at a fixed moment in time. Within the constraints of this design, we were able to investigate the ties that bind the levels of digital adoption, mobile engagement, technical infrastructure, UX, and CS.

Information was gathered from a statistically significant sample of Lebanese bank customers using online, pre-tested, structured questionnaires. Questions included how often people used digital banking, how they felt about the whole experience, and how satisfied they were with the service. Statistically usable data were collected from the combination of Likert-scale and closed-ended questions. Purposeful sampling was used to choose the sample size of 324 people. This method aimed to collect data from a cross-section of the Lebanese population; hence, the volunteers had to come from different backgrounds.

The vital independent factors were digital adoption, mobile engagement, technical infrastructure, and user experience. Customer satisfaction served as the study's dependent variable. Statistical programs were used to analyze the survey's quantitative data. The demographics and distribution of the variables were summarised using descriptive statistics. The correlations between the explanatory and response variables were analyzed using regression. An expanded regression model was used to probe the moderating function of user experience. All phases of this study were conducted with the utmost regard for ethical standards. The participants' replies were kept anonymous and collected after obtaining informed consent. Ethical review boards found that the research followed all of its protocols.
Findings

Table 1 Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>204</td>
<td>63.0</td>
</tr>
<tr>
<td>Male</td>
<td>120</td>
<td>37.0</td>
</tr>
<tr>
<td>Total</td>
<td>324</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The provided table illustrates the gender distribution among a total of 324 respondents. Among these respondents, 204 individuals (63.0%) identified as female, while 120 (37.0%) identified as male. This data underscores a gender imbalance within the sample, with a higher representation of female participants than their male counterparts.

Table 2 Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>132</td>
<td>40.7</td>
</tr>
<tr>
<td>26-30</td>
<td>60</td>
<td>18.5</td>
</tr>
<tr>
<td>31-35</td>
<td>60</td>
<td>18.5</td>
</tr>
<tr>
<td>36 and above</td>
<td>72</td>
<td>22.2</td>
</tr>
<tr>
<td>Total</td>
<td>324</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The table presented offers a comprehensive breakdown of the age distribution among the total of 324 participants in the survey. The data is organized into four distinct age categories: "18-25," "26-30," "31-35," and "36 and above." Notably, the largest age category is "18-25," which includes 132 respondents, accounting for 40.7% of the total sample. This finding suggests a considerable presence of younger participants in the survey. The "26-30" age group follows, with 60 respondents (18.5%), indicating a significant representation of individuals in their late twenties and early thirties. Similarly, the "31-35" age group encompasses another 60 respondents (18.5%), revealing a consistent distribution across age ranges. Moreover, the "36 and above" category, including respondents aged 36 and beyond, comprises 72 participants (22.2%). This category contributes to the diversity of age groups within the sample. The cumulative percentages of respondents within each age category align with the total sample size, indicating that the data is well-distributed across the various age groups.

Table 3 Education Level

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelors</td>
<td>150</td>
<td>46.3</td>
</tr>
<tr>
<td>Masters</td>
<td>126</td>
<td>38.9</td>
</tr>
<tr>
<td>Others</td>
<td>42</td>
<td>13.0</td>
</tr>
<tr>
<td>PhD</td>
<td>6</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>324</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The presented table provides a comprehensive breakdown of the distribution of respondents' education levels among a total of 324 participants in the survey. The data is categorized into four distinct education categories: "Bachelor," "Master," "Others," and "PhD." The "Bachelors" category constitutes the most prevalent education level, with 150 respondents (46.3% of the total sample). This finding suggests a substantial
presence of individuals who have completed their undergraduate education within the surveyed population. Following closely, the "Masters" education level encompasses 126 participants (38.9% of the total sample). This category represents respondents who have pursued advanced education beyond their undergraduate studies, highlighting a significant proportion of participants with higher qualifications. The "Others" category includes 42 respondents (13.0% of the total sample). This diverse group likely encompasses individuals with various educational backgrounds and qualifications that do not fit the parameters of the previous categories. Lastly, the "PhD" category comprises a smaller subset, with 6 participants (1.9% of the total sample) holding doctoral degrees. This category represents individuals who have achieved the highest level of academic attainment.

Regression Analysis

The presented regression analysis delves into the intricate relationships between the independent variables - Digital Adoption Rate, Mobile Engagement Rate, and Technological Infrastructure - and the dependent variable, Customer Satisfaction. The table is divided into the model summary and the coefficients table. In the model summary section, key indicators provide insights into the model's overall fit. The coefficient of determination (R-squared) at 0.062 signifies that approximately 6.2% of the variability in Customer Satisfaction can be explained by the combined influence of the included independent variables. The adjusted R-squared value at 0.053 considers model complexity, indicating a moderate level of explanatory power while accounting for predictor count. The standard error of the estimate

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.249</td>
<td>.062</td>
<td>.053</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Digital Adoption Rate, Mobile Engagement Rate, Technological Infrastructure and Customer Satisfaction

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>3.138</td>
<td>.193</td>
<td>16.28</td>
</tr>
<tr>
<td>Digital Adoption Rate</td>
<td>.339</td>
<td>.070</td>
<td>4.484</td>
</tr>
<tr>
<td>Mobile Engagement Rate</td>
<td>.249</td>
<td>.080</td>
<td>3.114</td>
</tr>
<tr>
<td>Technological Infrastructure</td>
<td>.176</td>
<td>.059</td>
<td>2.985</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Customer Satisfaction
at 1.000 indicates the average distance between the predicted and actual Customer Satisfaction values.

Transitioning to the coefficients table, a more granular picture emerges. The constant term (Constant) stands at 3.138, representing the predicted Customer Satisfaction score when all independent variables are zero.

Moving to the individual independent variables, the Digital Adoption Rate is 0.339, with a standardized coefficient (Beta) of 0.236. This indicates that as the Digital Adoption Rate increases, Customer Satisfaction has a corresponding positive effect. The t-value of 4.484 and a significance level of 0.001 highlight a statistically significant relationship.

Similarly, the Mobile Engagement Rate carries a coefficient of 0.249, with a standardized coefficient (Beta) of 0.228. This implies that a heightened Mobile Engagement Rate relates to elevated Customer Satisfaction. The t-value of 3.114 and a significance level of 0.002 reinforce the statistical significance of this relationship.

By comparing the coefficients (B) of the two regression models, a compelling insight emerges regarding the mediating effect of User Experience on the relationship between the independent variables and Customer Satisfaction. The first regression, focused solely on the independent variables (Digital Adoption Rate, Mobile Engagement Rate, Technological Infrastructure), demonstrated their direct impact on Customer Satisfaction. The specific B values associated with each independent variable in this model are (1) Digital Adoption Rate: 0.339, (2) Mobile Engagement Rate: 0.249, (3) Technological Infrastructure: 0.176.

Table 5 Regression Two: Mediation Analysis of User Experience

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.401²</td>
<td>.160</td>
<td>.150</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Digital Adoption Rate, Mobile Engagement Rate, Technological Infrastructure, User Experience and Customer Satisfaction

By comparing the coefficients (B) of the two regression models, a compelling insight emerges regarding the mediating effect of User Experience on the relationship between the independent variables and Customer Satisfaction. The first regression, focused solely on the independent variables (Digital Adoption Rate, Mobile Engagement Rate, Technological Infrastructure), demonstrated their direct impact on Customer Satisfaction. The specific B values associated with each independent variable in this model are: (1) Digital Adoption Rate: 0.339, (2) Mobile Engagement Rate: 0.249, (3) Technological Infrastructure: 0.176.
Engagement Rate: 0.249, (3) Technological Infrastructure: 0.176. A more intricate picture unfolds in the subsequent extended model that incorporates User Experience as an independent variable. The coefficients (B values) for the independent variables in this model exhibit the following changes: (1) Digital Adoption Rate: 0.449, (2) Mobile Engagement Rate: 0.445, (3) Technological Infrastructure: 0.599 and (4) User Experience: 0.374.

This comparative analysis uncovers a distinct pattern. With the inclusion of User Experience, the B values for Digital Adoption Rate, Mobile Engagement Rate, and Technological Infrastructure have increased compared to the previous model. This alteration implies that when accounting for the influence of User Experience, the relationships between these independent variables and Customer Satisfaction become more pronounced.

The coefficient of User Experience (B = 0.374) is of notable significance, which demonstrates a significant and positive impact on Customer Satisfaction. This underscores the role of User Experience as a mediator, intensifying the effects of the other independent variables on Customer Satisfaction.

The change in B values across the models underscores the dynamic and influential nature of User Experience in shaping customers’ overall satisfaction. By enhancing the relationships between Digital Adoption Rate, Mobile Engagement Rate, Technological Infrastructure, and Customer Satisfaction, User Experience amplifies the impact of these factors. In conclusion, this comparison provides compelling evidence for the mediating effect of User Experience, highlighting its pivotal role in the complex interplay between digital adoption, engagement, infrastructure, and the ultimate satisfaction of customers in the Lebanese banking industry.

**Discussion**

The current study's results deeply comprehend the interconnected web of factors influencing customer satisfaction in the Lebanese banking business, including digital adoption, mobile engagement, technical infrastructure, user experience, and overall consumer satisfaction. The investigation sheds light on critical observations that have important implications for future studies and real-world applications in the banking industry. The independent factors' influence on customer satisfaction were broken down and uncovered by the regression analysis. Initial regression findings showed statistically significant positive connections between digital adoption rate, mobile engagement rate, technical infrastructure and consumer satisfaction. Coefficients (B-values) revealed an upward trend in consumer satisfaction with advances in digital adoption, mobile engagement, and technology infrastructure. These results highlight the
significance of these factors in shaping consumers' evaluations of their banking encounters.

Significant changes were discovered after including user experience as a mediating variable in a regression model. The mediation function played by user experience was highlighted by its inclusion, strengthening the impact of digital adoption, mobile engagement, and technical infrastructure on customers' perceptions of their experiences. An increase in the size of the coefficients for these independent variables highlights the essential role that user experience plays in determining satisfaction levels. The importance of the user experience in directing the influence of technology elements towards customer satisfaction is shown by this mediation effect. The second regression model's stronger connections highlight the crucial mediating role of user experience. These findings are consistent with the study's theoretical foundations, which posit that user perceptions and experiences are essential to shaping technology adoption and use behaviour.

In addition, the results have real-world consequences for the banking sector in Lebanon. Banks may create and execute strategies prioritising intuitive interfaces, user-friendly navigation, and personalized interactions by recognizing that customer satisfaction is driven not only by the technical elements of digital banking but also by the quality of user experience. To further increase the favourable benefits of digital adoption, mobile engagement, and technical infrastructure on customer satisfaction, financial institutions may take advantage of the moderating role played by user experience.

The results shed light on the intricate relationship between digital adoption, mobile engagement, technical infrastructure, user experience, and customer satisfaction in the Lebanese banking sector. This research highlights the importance of user experience as a mediator, demonstrating the necessity for an all-encompassing strategy that combines technological progress with user-centric design principles to improve the banking experience. These findings can influence academic and business practices, resulting in a customer-centric digital banking ecosystem that exceeds expectations.

**Recommendations**

Banks in Lebanon should put money into programmes that teach clients how to use computers and the internet safely and securely. Customers may learn more about the advantages and benefits of digital banking via these programmes, which might include seminars, webinars, and tutorials. Banks may favourably affect the pace of digital adoption by bolstering consumers' trust in utilizing digital platforms via education. New consumers to digital banking might have fewer hurdles to entry if the onboarding process is straightforward. A better user experience may be fostered by providing clear
instructions, user-friendly interfaces, and individualized advice throughout onboarding.

Banks may use client feedback to fine-tune their digital services by setting up a feedback framework. Better matching platforms with user preferences may achieve higher digital adoption rates via consistent feedback collection, analysis, and refinement. Higher mobile engagement rates may be reached by personalizing push alerts and messaging based on user behaviour and preferences. Lebanese banks may use data analytics to offer consumers useful, personalized push alerts, encouraging them to use their mobile banking applications more often.

Adding game mechanics to mobile apps is one way to get people to do more with them. Banks may improve their customers' engagement with mobile banking apps by adding incentives like awards, challenges, and interactive elements. Constantly refining the mobile app's UI may significantly affect use. Users are more likely to get invested in and use a product that is easy to navigate, visually pleasant, and compatible with a wide range of devices.

If banks in Lebanon want to earn their client's trust, they need to invest heavily in cybersecurity. Customers are more likely to be satisfied with a company if they know their personal information is safe inside its technical framework. Digital platforms can stay relevant and competitive only if their underlying technology is constantly upgraded. Lebanese banks should be aware of and adapt quickly to technological changes so they may provide their consumers with the most cutting-edge services possible.

Consistency in the user experience may be maintained via the smooth integration of different digital channels like online banking platforms and mobile applications. The customer experience must be consistent and user-centric across all channels, allowing for a seamless transition between them. Lebanese financial institutions might benefit from a strategy of constant improvement in customer service. Regularly collecting user input, doing usability testing, and analyzing user behaviour may shed light on problems and provide opportunities for improvement, all of which can lead to a better user experience.

The user experience provided by digital banking services may be significantly improved using user-centred design concepts across the board. Banks in Lebanon should cater to their customers' varying interests by prioritizing user-friendliness, transparency, and personalization. Lebanese banks would mix quantitative measurements like Net Promoter Score (NPS) well with qualitative insights from customer feedback to get a complete picture of consumer satisfaction. Incorporating both methods into one's analysis yields a full view of one's contentment.
After a digital contact, using post-surveys may help get instant feedback. Banks may quickly discover pain spots and opportunities for development by collecting feedback from clients immediately after a digital encounter. If implemented, these suggestions can help Lebanon's digital banking industry become more customer-focused, creating conditions in which increased rates of digital adoption, mobile engagement, and advanced technological infrastructure all work together to provide an optimal user experience and, by extension, greater customer satisfaction.

Limitations

It is essential to note some limitations that may affect the interpretation and generalizability of the findings. However, this study aims to provide valuable insights into the relationship between the digital adoption rate, the mobile engagement rate, the technological infrastructure, the user experience, and customer satisfaction in the Lebanese banking industry.

The lack of generalizability of the sample may limit the study's results. The results may not accurately represent the variety of Lebanese banking sector consumers depending on the sample customers' size and demographics, which might restrict the findings' applicability. Self-report bias occurs when people provide more accurate or socially desired responses on surveys or interviews. User experience, customer satisfaction, and digital interaction results may be skewed due to customers' inherent biases.

The results are contextualized within Lebanon's banking sector's specific cultural, social, and regulatory environment. Since banking businesses in different locations and nations have additional features, it is possible that the suggestions and insights obtained by this research will not be immediately relevant to banking industries in those regions and countries. Due to the cross-sectional nature of the study design, it may not be possible to establish causality between the independent variables (digital adoption rate, mobile engagement rate, technological infrastructure), the mediator (user experience), and the dependent variable (customer satisfaction).

Trends, client preferences, and technical breakthroughs in digital banking and technology may change between the data collection period and the research's conclusion. This ever-changing context can potentially alter the study's long-term significance and usefulness. Economic changes, new regulations, and significant world events may all affect consumers' buying habits, opinions, and satisfaction. Unanticipated impacts on the outcomes might be introduced if these variables were not adequately controlled or accounted for in the investigation.

Complex dynamics and confounding factors may contribute to the link between the independent
variables and customer satisfaction, even though this research aims to investigate the mediating role of user experience. These intricacies may affect the vitality and character of the mediated connection.

Due to these caveats, the study's results should be interpreted cautiously. While this study tries to shed light on the intricate web of interconnections that makes up the Lebanese banking system, researchers and stakeholders should keep these caveats in mind when extrapolating the findings. Some of these gaps might be filled by future research using longitudinal designs, more extensive and more varied samples, and the incorporation of contextual elements for a fuller picture.

Contributions

By delving into the connections between variables, including digital adoption, mobile engagement, technical infrastructure, user experience, and customer satisfaction, this research contributes significantly to the academic literature and the Lebanese banking sector.

By illuminating the complex relationships between digital banking factors and consumer satisfaction in the Lebanese setting, this research adds to the current body of knowledge. The study adds to our understanding of how these variables influence consumers’ impressions and actions by identifying the mediation function played by the user experience. Relationships between digital adoption, user experience, and customer satisfaction are investigated using the Technology Acceptance Model (TAM) as a theoretical framework. To better understand customer behaviour in the context of digital transformation, this implementation of the TAM expands its usefulness to Lebanon’s banking sector.

The research offers valuable information for Lebanese banks who want to improve customer satisfaction via digital efforts. Specifically, the recommendations on digital adoption, mobile engagement, and technical infrastructure provide actionable guidance for improving these areas to provide a more consistent and satisfying user experience for the end user. The research comprehensively explains the relationships between digital adoption, mobile engagement, IT infrastructure, user experience, and customer satisfaction. With this all-encompassing perspective, financial institutions are more likely to pursue customer-centric, integrated strategies.

As digitization continues to gain traction in Lebanon’s financial sector, the study’s conclusions are particularly pertinent. The study's findings may help banks adapt to the challenges posed by new technologies and meet the changing expectations of their customers.

The research gives financial institutions empirical counsel based on findings about the moderating role of user experience. Financial institutions may use these results to focus their efforts better,
allocate funds, and fine-tune their digital activities to serve their customers better. This study paves the way for more investigation into consumer satisfaction in digital banking, user experience, and related areas. This study's approach, theory, and findings may serve as a foundation for future research that seeks to hone down on particulars, develop more precise measuring methods, and investigate the changing dynamics of this environment.

The research helps to close the gap between theoretical considerations and real-world applications. The report bridges the gap between theoretical study and practical application for banks that want to succeed in the digital era by providing actionable advice based on academic theory. What this research adds to the banking world is both theoretically applicable and practically useful, especially in the Lebanese banking sector. The study adds to our knowledge of how digital adoption, mobile engagement, technological infrastructure, and user experience all work together to shape customer perceptions and behaviours in modern banking by examining the complex web of factors influencing customer satisfaction in the digital banking realm.

REFERENCES


