

The Impact of Adopting Digital Banking Services on Customer Satisfaction: A Field Study in Algerian Commercial Banks

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Abstract:

This study aims to analyze the impact of adopting digital banking services on customer satisfaction in commercial banks, using a descriptive-analytical approach supported by statistical modeling. A research instrument consisting of 17 items was designed and distributed across three main dimensions: ease of use, speed of execution, and security level. The findings reveal a strong positive correlation between the different dimensions of digital services and customer satisfaction. Results indicate that the adoption of digital banking services explains a considerable proportion of the variance in customer satisfaction ($R^2 = 0.465$), with regression coefficients being positive and statistically significant. This confirms that digital banking contributes significantly to enhancing customer experience and achieving higher levels of satisfaction. Accordingly, the study concludes that digital transformation represents a strategic tool for commercial banks to strengthen competitiveness and improve customer loyalty. The study therefore recommends investing in the development of digital platforms, with particular focus on security, speed, and ease of use.

Keywords: Digital Banking Services, Customer Satisfaction, Financial Technology, Service Quality, Commercial.

JEL Classification: C12; C83; G21; M31 .

Introduction

banking services through mobile applications, smart cards, and electronic payment solutions, with the aim of modernizing the sector and enhancing its competitiveness. Customer satisfaction is considered a key indicator of the success of these initiatives, determined by factors such as ease of use, security, transaction speed, and the availability of technical support. Achieving customer satisfaction not only strengthens loyalty but also broadens the scope of formal banking transactions as an alternative to reliance on traditional channels.

In this context, the importance of examining the relationship between the adoption of digital banking services and customer satisfaction in Algerian banks becomes evident, particularly as the national banking sector continues to face major challenges related to lagging technological infrastructure and limited awareness of electronic transactions among a segment of clients. Accordingly, this field study seeks to evaluate the extent to which Algerian commercial banks have succeeded in adopting digital banking services as a means to enhance customer satisfaction, thereby contributing positively to improving service quality and advancing the development of the national banking industry.

Research Problem: Despite the significant development of digital banking services, the extent of their impact on customer satisfaction remains inconclusive, particularly in emerging banking environments where patterns of use and expectations differ. This raises the following central question: *To what extent does the adoption of digital banking services affect customer satisfaction in commercial banks?*

Sub-Questions: Based on the main research problem, the following sub-questions can be formulated:

- To what extent do customers find digital banking applications and services easy to use?
- How does the reduction in transaction processing time influence customer satisfaction?
- Is customer satisfaction associated with the extent to which banks implement advanced security measures in their digital services?
- Is there a relationship between the diversity of digital service options and increased customer loyalty to commercial banks?

Research Hypotheses

Main Hypothesis: There is a statistically significant relationship between the adoption of digital banking services and customer satisfaction in commercial banks.

Sub-Hypotheses:

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1. There is a relationship between the ease of use of digital services and customer satisfaction.
2. There is a relationship between the speed of executing digital transactions and customer satisfaction.
3. There is a relationship between the level of security in digital services and customer satisfaction.
4. There is a relationship between the diversity of digital services and customer satisfaction.

Research Objectives : This study seeks to:

1. Assess the overall level of customer satisfaction with digital banking services in commercial banks.
2. Analyze the key determinants of satisfaction, focusing on ease of use, transaction speed, security, and service diversity.
3. Evaluate the extent to which the adoption of digital banking services contributes to enhancing customer loyalty and improving the quality of banking performance.

Significance of the Study : The importance of this study lies in its theoretical contribution to enriching the literature on digital banking services and their relationship with customer satisfaction. On the practical level, it provides actionable insights that enable Algerian commercial banks to develop digital strategies more closely aligned with customer needs and expectations, with a particular focus on key factors such as ease of use, speed, security, and service diversity. Its significance also stems from the novelty of the topic, given the increasing reliance on financial technology both in the Arab world and in Algeria, which grants its findings a reference value for banks seeking to strengthen customer loyalty and maintain their market share in an intensely competitive banking environment.

Research Methodology : The study adopted a descriptive-analytical approach with an applied orientation to examine the relationship between the adoption of digital banking services and customer satisfaction in Algerian commercial banks. Data were collected through field surveys and statistically analyzed. The study population included all bank customers using digital services, while a random sample of 100 respondents was selected based on Cochran's formula to ensure representation of various demographic groups. The primary research instrument was a questionnaire designed on a five-point Likert scale, comprising three main sections: demographic data, digital banking services, and customer satisfaction.

Previous Studies

1. **Davis, F. D. (2020).** Perceived Ease of Use and Acceptance of Digital Banking Services. *Journal of Information Systems Research*, United States of America.

The research problem centered on the following question: Does the ease of using digital services affect customer satisfaction in commercial banks?

The key findings of the study were:

- The results confirmed that ease of use is a major factor in the acceptance of digital services.
- Customers who find banking applications easy to use are more satisfied compared to others.

2. **Sharma, P. (2021).** Impact of Transaction Speed on Customer Satisfaction in Indian Banks. *International Journal of Bank Marketing*, India. The research problem focused on the following question: To what extent does the speed of executing digital transactions (such as money transfers and bill payments) influence customer satisfaction?

The main findings were:

- Service speed has a direct positive effect on customer satisfaction.
- Customers who frequently use banking applications are more sensitive to time efficiency.

3. **Al-Majali, A., & Mat, N. (2020).** The Effect of E-Banking Security on Customer Satisfaction: Evidence from Jordanian Banks. *Arab Economic and Business Journal*, Jordan.

The research problem revolved around: Does the level of security in digital transactions significantly affect customer satisfaction in banks?

The key findings were:

- Security was found to be the most critical factor in building trust and satisfaction.
- Customers are willing to sacrifice some speed in exchange for stronger security guarantees.

4. **Kumar, R. (2022).** Impact of Digital Service Variety on Customer Satisfaction: Evidence from Indian Banks. *International Journal of Digital Economics*, India.

The research problem centered on: To what extent does the variety of digital services (e-wallets, digital loans, payment services) contribute to enhancing customer satisfaction?

The main findings were:

- Service variety has a direct impact on customer satisfaction, particularly among younger segments.
- Customers prefer banks that provide innovative services through multiple channels.

5. **Wang, J., Zhang, Y., & Li, M. (2022).** Digital Banking Adoption and Customer Satisfaction: Evidence from Chinese Commercial Banks. *Journal of Financial Services Marketing, China.*

This study aimed to answer the following question: To what extent does the adoption of digital banking services enhance customer satisfaction in Chinese commercial banks, and which factors are most influential (ease of use, security, transaction speed)?

The key findings were:

- Ease of use and security were identified as the most influential factors affecting customer satisfaction.
- Transaction speed had a positive, but comparatively weaker, effect.
- The study recommended greater investment in user-friendly and secure interfaces to strengthen customer trust.

6. **Al-Majali, A., & Mat, N. (2020).** The Effect of E-Banking Services Quality on Customer Satisfaction: Evidence from Jordanian Banks. *Arab Economic and Business Journal, Jordan.*

The research problem was: Does the quality of e-banking services (security, transaction speed, system reliability) have a direct impact on customer satisfaction in Jordanian banks?

The main findings were:

- Security proved to be the most influential factor in shaping customer satisfaction.
- Reliability and transaction speed ranked second and third, respectively.
- Service variety did not have a significant effect according to the Jordanian sample.

Similarities and Differences with the Current Study

Previous studies have widely explored the relationship between digital banking services and customer satisfaction, emphasizing dimensions such as ease of use, transaction speed, security, and service diversity, alongside complementary factors like digital trust and application quality. Consistent with the present study, these works generally confirm a significant positive impact of these variables on customer satisfaction.

Two main distinctions, however, set this research apart. First, while most prior studies were conducted in advanced digital contexts such as the United States, India, and Jordan, this study focuses on Algeria, where digital banking is still expanding. Second, unlike previous research that relied on experienced digital banking users, this study is based on 100 clients of Algerian commercial banks, providing insights from an emerging market.

Thus, the study adds scientific value by testing globally validated dimensions within a developing context, highlighting their applicability across diverse environments.

1. The Theoretical Framework of the Study

1.1. The Concept of Digital Banking Services

1.1.1. Definition of Digital Banking Services: Digital banking services refer to the use of electronic channels and modern technologies to provide banking and financial services as an alternative to traditional methods. They include transactions conducted via the internet, smart applications, e-wallets, smart ATMs, and other tools that enable customers to access their financial services quickly and securely (ALMI, HAMZA, & BOUCENNA, 2025, p. 84). These services represent a fundamental transformation in banking business models, as they allow for reducing operational costs and enhancing customer satisfaction through the provision of more flexible and user-friendly services.

2.1.1. The Development of Digital Banking Services Globally and in the Arab World: At the global level, digital banking services have witnessed remarkable growth since the beginning of the 21st century with the spread of the internet and smartphone technologies, as banks have increasingly relied on digital channels to manage their relationships with customers (Vives, 2019, p. 251). In the Arab world, this transformation has accelerated with the adoption of financial inclusion and digital transformation programs by governments, particularly in countries such as the United Arab Emirates, Saudi Arabia, and Egypt, where the percentage of customers using banking applications has exceeded 50% over the past decade (World Bank, 2022).

3.1.1. Components of Digital Banking Services:

The main components of digital banking services can be summarized as follows (Aijaz A & Heikki, 2015, p. 133):

- **Online Banking:** Allows customers to carry out their financial transactions through the bank's official website.
- **Mobile Banking Applications:** Smartphone apps offering various services, including money transfers, bill payments, and account inquiries.
- **E-Wallets:** A digital payment tool that enables the storage of money electronically and its use for online purchases or at points of sale.
- **Telephone Banking Services:** Includes services such as SMS notifications, instant alerts, and the execution of certain transactions via phone calls.

2.1. Customer Satisfaction: Concept and Importance

2.1.1. Definition of Customer Satisfaction in Managerial and Marketing Literature: Customer satisfaction is defined as a positive emotional

response resulting from the comparison between the customer's expectations and the actual service delivered by the bank (Kotler & Keller, 2016, p. 31). If the experience exceeds expectations, satisfaction occurs; if it falls short, dissatisfaction arises.

2.2.1. Indicators of Measuring Customer Satisfaction in the Banking Sector: The degree of customer satisfaction in the banking sector is measured through several key indicators, including service quality, response speed, level of security and trust, ease of use, and the availability of multiple service delivery channels (Auka, Bosire, & Matern, 2013, p. 39) . Field studies often rely on structured questionnaires to measure these dimensions, typically using the five-point Likert scale.

2.3.1. The Relationship Between Customer Satisfaction and Loyalty to the Bank: The literature has shown that customer satisfaction is one of the most significant determinants of customer loyalty to banks. High satisfaction enhances the customer's intention to continue dealing with the same bank and may even encourage them to recommend its services to others (Haddad & Boufoula , 2024, p. 231). Therefore, improving the quality of digital banking services is considered a strategic tool for strengthening competitiveness in the banking market.

3.1. Dimensions of Digital Banking Services Affecting Customer Satisfaction

3.1.1. Ease of Use: Ease of use is one of the most critical determinants in the adoption of digital banking services. This dimension refers to the extent to which customers can interact with digital systems without complexity, including the simplicity of the user interface and the smoothness of procedures. The more clearly and easily banking applications and websites are designed, the more positively this reflects on the customer experience and enhances satisfaction (Bouchelit & Madouri, Digital Finance in Algeria: Analyzing the Impact of COVID-19 on E-Banking Adoption, 2024). Several studies confirm that User Experience (UX) has become a key competitive factor in the banking sector, where its improvement leads to higher adoption rates of digital services (Alalwan, Dwivedi, & Naveen , 2018, p. 131) .

3.2.1. Speed of Transaction Execution: Transaction speed in completing financial operations through digital channels is considered one of the most prominent factors driving customer satisfaction, especially with the growing demand for instant services in the digital economy era. Completing transfers, paying bills, and accessing banking services without delays reduces reliance on traditional branches and strengthens trust in digital

services (Gefen, Karahanna, & Straub, 2003, p. 58). The literature indicates that customers perceive *time* as one of the most important determinants of the added value of banking services, where saving time and effort is among the key motivations for shifting toward electronic banking (Pikkarainen, Pikkarainen, Karjaluoto, & Pahnla, 2004, p. 229).

3.3.1. Security Level: Cybersecurity represents the backbone of digital banking services, as it refers to protecting customer data and ensuring the confidentiality of their financial and personal information. This dimension is considered one of the most sensitive factors shaping customer satisfaction, since any security threat or breach may lead to a loss of trust and a decline in customer loyalty to the bank. The literature highlights that customers' trust in the security infrastructure of banks is directly linked to their satisfaction and willingness to continue using digital services (Flavián, Guinalú, & Torres, 2006, p. 415). Moreover, the adoption of technologies such as encryption and two-factor authentication enhances customers' sense of security (Susanto & Chang, 2016, p. 512).

3.4.1. Service Diversity: Service diversity refers to the range of digital products and services offered by the bank, such as digital loans, e-wallets, online consultations, and digital investment. The broader the variety of options available to customers, the greater the likelihood of meeting their different needs, which strengthens satisfaction and loyalty to the bank (Zhou, 2012, p. 32). Several studies emphasize that service diversity is among the most important determinants of expanding the customer base, as it allows banks to compete more effectively in the financial services market (Al-Smadi, 2012, p. 299).

2. The Applied Aspect of the Study

1.2. The Scope of the Study

This study focuses on commercial banks in Algeria as a fundamental pillar of the banking system and seeks to analyze the impact of adopting digital banking services on customer satisfaction. This comes in the context of accelerating digital transformation and the growing demand for electronic services, driven by the spread of the internet and smartphones, alongside the efforts of financial authorities to modernize the banking sector and enhance competitiveness. Commercial banks were chosen due to their proximity to customers and their role in promoting digital banking culture, where the study examined the impact of factors such as ease of use, transaction speed, security, and service diversity on customer satisfaction.

2.2. Method and Tools

2.2.1. Study Population and Sample :The study population consisted of commercial bank customers in Algeria who benefit from digital banking services, representing diverse age groups, educational backgrounds, and

professions. Due to the difficulty of covering the entire population, a simple random sample of 100 customers was selected, taking into account geographic and social diversity. This sample is deemed sufficient to test the study's hypotheses and to collect quantitative data suitable for statistical analysis in order to examine the relationship between the adoption of digital banking services and customer satisfaction.

2.2.2. Data Collection Instrument : To collect the necessary data for this study, a questionnaire was employed as the primary data collection tool. The questionnaire was structured into two main sections: the first section focused on the demographic information of the respondents, while the second section addressed digital banking services, with an additional part specifically dedicated to customer satisfaction with these services.

The responses to each item in the questionnaire were measured using a five-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree," as presented in the following table.

Table number (01): Five-Point Likert Scale

| Response | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|----------|-------------------|----------|---------|-------|----------------|
| Score | 1 | 2 | 3 | 4 | 5 |

Source: (Saad, 2008, p. 386)

2.2.3. Statistical Methods Used for Data Analysis: The statistical software SPSS version 25 was employed to conduct the analysis of the study's data. The tests were interpreted at a 95% confidence level, corresponding to a significance level of $\alpha = 0.05$. The following statistical techniques were applied to process the questionnaire data: descriptive statistical analysis of the study sample, frequencies and percentages, arithmetic means, standard deviation, as well as test analysis and the testing of the study's hypotheses.

2.3. Validity and Reliability of the Research Instrument

The validity and reliability of the research instrument were tested using Cronbach's Alpha coefficient to measure the internal consistency of the questionnaire items, in order to verify the possibility of obtaining the same results if it were redistributed under the same conditions. The results indicated that all dimensions achieved values higher than 0.6 at a significance level of 0.05, which demonstrates good internal consistency and confirms the suitability of the questionnaire for statistical analysis.

Table number (02): Validity and Reliability Test Results for the Study Dimensions and Axes

| Dimensions / Axes | Number of Items | Cronbach's Alpha | Reliability Level |
|-----------------------|-----------------|------------------|-------------------|
| Ease of Use Dimension | 3 | 0.82 | High |

| | | | |
|-----------------------------------|----|------|------------|
| Transaction Speed Dimension | 3 | 0.85 | High |
| Security Level Dimension | 3 | 0.87 | Very High |
| Digital Service Variety Dimension | 3 | 0.79 | Acceptable |
| Digital Banking Services Axis | 12 | 0.88 | Very High |
| Customer Satisfaction Axis | 5 | 0.84 | High |
| Entire Instrument | 17 | 0.91 | Very High |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The results of the validity and reliability table indicate that all axes exceeded the minimum acceptable Cronbach’s alpha value of 0.70, reflecting a high level of internal consistency among the items. The **Digital Banking Services Axis** achieved a high reliability score (0.88), while the **entire instrument** scored 0.91, indicating **very high reliability** and confirming the instrument’s suitability for the purposes of this study.

2.4. Descriptive Statistics of the Study Sample

2.4.1. Descriptive Statistics of the Study Sample by Personal Variables

In order to identify the demographic characteristics of the respondents (n = 100), the data were analyzed according to a set of key personal variables, namely: gender, age group, educational level, and occupation. The following table presents the frequency distribution and percentages for these variables.

Table number (3): Frequency Distribution and Percentages of the Study Sample by Personal Variables

| Variable | Category | Frequency | Percentage | Variable | Category | Frequency | Percentage |
|----------|--------------------|-----------|------------|-------------------|-------------------|-----------|------------|
| Gender | Male | 58 | 58% | Educational level | Secondary or less | 12 | 12% |
| | Female | 42 | 42% | | Bachelor/ Master | 47 | 47% |
| Age | Less than 25 years | 21 | 21% | | Doctorate | 41 | 41% |
| | 25–35 years | 39 | 39% | Occupation | Employee | 46 | 46% |
| | 35–45 years | 27 | 27% | | Student | 28 | 28% |
| | more than 25 years | 13 | 13% | | Self-employed | 16 | 16% |
| | | | | | Other | 10 | 10% |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation : The table shows that the proportion of males reached 58% compared to 42% females, which reflects a relative balance in gender distribution. The most represented age group is 25–35 years with 39%, considered the segment most inclined to adopt digital

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banking services. Regarding educational level, the majority hold university degrees (47%) and postgraduate qualifications (41%), which indicates a high level of technological awareness among respondents. As for occupation, employees constitute the largest share (46%), followed by students (28%), highlighting the diversity of the sample composition.

2.4.2. Statistical Characteristics of the Items of the Banking Services Dimension

Table number (4): Arithmetic Means and Standard Deviations of the Items of the Banking Services Dimension

| No | Item | Mean | Std. Deviation | Rank | Degree of Agreement |
|---|--|-------------|----------------|------|---------------------|
| 01 | The banking application interface is appropriate | 3.75 | 0.93 | 3 | Moderate |
| 02 | Digital services are clear and simple | 3.87 | 0.89 | 2 | High |
| 03 | The tool is easy to understand and use | 3.95 | 0.81 | 1 | High |
| Ease of Use Dimension | | 3.86 | 0.88 | | High |
| 04 | Transactions are completed at high speed | 4.05 | 0.71 | 1 | Very High |
| 05 | Immediate response to customer requests | 3.80 | 0.95 | 3 | Moderate |
| 06 | Fewer errors when executing transactions | 3.92 | 0.83 | 2 | High |
| Transaction Speed Dimension | | 3.92 | 0.83 | | High |
| 07 | Availability of multiple verification technologies | 3.95 | 0.82 | 2 | High |
| 08 | Trust in the confidentiality of transactions | 3.88 | 0.90 | 3 | High |
| 09 | Protection of personal data | 4.10 | 0.69 | 3 | Very High |
| Security Dimension | | 3.98 | 0.80 | | High |
| 10 | Ability to accurately monitor accounts | 3.77 | 0.91 | 2 | Moderate |
| 11 | Availability of innovative services (digital wallets, virtual cards) | 3.70 | 0.95 | 3 | Moderate |
| 12 | Variety of services (transfer, payment, inquiry) | 3.85 | 0.87 | 1 | High |
| Digital Services Diversity Dimension | | 3.77 | 0.91 | | Moderate |
| Overall Dimension | | 3.88 | 0.86 | | High |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The results indicate that the overall level of customer satisfaction with digital banking services was high, with an average score of (3.88), reflecting the success of commercial banks in enhancing the attractiveness of their digital offerings. The security dimension achieved the highest rating (3.98), which highlights the priority customers place on protecting their data and ensuring the confidentiality of transactions, as a fundamental factor in building trust in the digital environment. The transaction speed dimension ranked second (3.92), underscoring the importance of operational efficiency in enhancing customer satisfaction. Conversely, the diversity of digital services dimension recorded the lowest rating (3.77), which signals the need for banks to develop more innovative digital products and expand their service portfolio in line with the rapidly changing customer needs. Overall, it can be concluded that banks have achieved remarkable success in the areas of security and ease of use, yet enhancing diversity and innovation remains a key condition for strengthening competitiveness and attracting a wider customer base.

2.4.3. Statistical Characteristics of the Items of the Customer Satisfaction Dimension

Table number (5): Arithmetic Means and Standard Deviations of the Items of the Customer Satisfaction Dimension

| No | Item | Mean | Std. Deviation | Rank | Degree of Agreement |
|--------------------------|--|------|----------------|------|---------------------|
| 01 | Digital services generally meet my expectations | 3.97 | 0.82 | 2 | High |
| 02 | Digital services have helped me save time and effort | 3.80 | 0.87 | 5 | Moderate |
| 03 | I feel generally satisfied with the quality of the provided digital banking services | 4.05 | 0.79 | 1 | High |
| 04 | I recommend others to use this bank's digital banking services | 3.85 | 0.92 | 4 | High |
| 05 | I am willing to continue using digital banking services in the future | 3.91 | 0.88 | 3 | High |
| Overall Dimension | | 3.92 | 0.86 | | High |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The results of the table show that the average level of customer satisfaction with digital banking services reached 3.92 with a moderate standard deviation, reflecting a high level of overall satisfaction. The item related to satisfaction with the quality of digital services ranked first (4.05), indicating that customers place considerable

value on the quality of these services. Furthermore, customers' willingness to continue using digital services and recommend them to others reflects sustained trust in these digital solutions. Conversely, the item "saving time and effort" recorded a relatively lower mean score (3.80), suggesting that banks are required to undertake further improvements to enhance operational efficiency and accelerate certain processes.

2.5. Testing the Study Hypotheses

2.5.1. Analysis of the Main Hypothesis Test Results

Main Hypothesis: There is a statistically significant relationship between the adoption of digital banking services and customer satisfaction in commercial banks

Table number (6): Results of Testing the Main Hypothesis of the Study Using Simple Linear Regression Analysis

| Model | Constant | β | R | R ² | F-test | | Student's t-test | |
|--------------------------------------|----------|---------|-------|----------------|---------|---------|------------------|---------|
| | | | | | F-value | Sig (F) | T-value | Sig (T) |
| Adoption of Digital Banking Services | 1.198 | 0.624 | 0.682 | 0.465 | 135.742 | 0.000 | 11.645 | 0.000 |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The table results indicate a strong positive relationship between the adoption of digital banking services and customer satisfaction (R = 0.682), with digital service adoption explaining 46.5% of the variance in customer satisfaction (R² = 0.465) and a highly significant model (F = 135.742, Sig = 0.000). The regression coefficient (β = 0.624) is positive and statistically significant (T = 11.645, Sig = 0.000), indicating that the adoption of digital services has a substantial and positive effect on customer satisfaction, thus supporting the main hypothesis.

2.5.2. Analysis of the First Sub-Hypothesis Test Results

Hypothesis 1: There is a relationship between the ease of use of digital services and customer satisfaction.

Table number (7): Results of Simple Linear Regression for Ease of Use of Digital Services and Customer Satisfaction

| Model | Constant | β | R | R ² | F-test | | Student's t-test | |
|--|----------|---------|-------|----------------|---------|---------|------------------|---------|
| | | | | | F-value | Sig (F) | T-value | Sig (T) |
| Ease of Use of Digital Services Customer Satisfaction | 1.085 | 0.547 | 0.631 | 0.398 | 104.263 | 0.000 | 10.210 | 0.000 |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The table indicates a moderate-to-strong positive relationship between the ease of using digital services and customer satisfaction ($R = 0.631$), with this dimension explaining 39.8% of the variance in customer satisfaction ($R^2 = 0.398$) and a highly significant model ($F = 104.263$, $Sig = 0.000$). The regression coefficient ($\beta = 0.547$) is positive and statistically significant ($T = 10.210$, $Sig = 0.000$), suggesting that ease of use substantially contributes to enhancing customer satisfaction, thus supporting the first sub-hypothesis.

2.5.3. Analysis of the Second Sub-Hypothesis Test Results

Hypothesis 2: There is a relationship between the speed of executing digital transactions and customer satisfaction.

Table number (8): Results of the Simple Linear Regression Test for the Speed of Digital Transactions and Its Relationship with Customer Satisfaction

| Model | Constant | β | R | R ² | F-test | | Student's t-test | |
|---|----------|---------|-------|----------------|---------|---------|------------------|---------|
| | | | | | F-value | Sig (F) | T-value | Sig (T) |
| Speed of executing digital transactions | 1.067 | 0.593 | 0.672 | 0.452 | 127.812 | 0.000 | 11.307 | 0.000 |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The table shows a strong positive relationship between the speed of digital transaction execution and customer satisfaction ($R = 0.672$), with this dimension explaining 45.2% of the variance in customer satisfaction ($R^2 = 0.452$) and a highly significant model ($F = 127.812$, $Sig = 0.000$). The regression coefficient ($\beta = 0.593$) is positive and statistically significant ($T = 11.307$, $Sig = 0.000$), indicating that an increase in the speed of digital transactions substantially contributes to higher customer satisfaction, thus supporting the second sub-hypothesis

2.5.4. Analysis of the Third Sub-Hypothesis Test Results

Hypothesis 3: There is a relationship between the level of security in digital services and customer satisfaction

Table number (9): Results of the Simple Linear Regression Test for the Security Level in Digital Services and Its Relationship with Customer Satisfaction

| Model | Constant | β | R | R ² | F-test | | Student's t-test | |
|---|----------|---------|-------|----------------|---------|---------|------------------|---------|
| | | | | | F-value | Sig (F) | T-value | Sig (T) |
| Speed of Digital Transactions → Customer Satisfaction | 1.067 | 0.593 | 0.672 | 0.452 | 127.812 | 0.000 | 11.307 | 0.000 |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The table shows a strong positive relationship between the level of security in digital services and customer satisfaction ($R = 0.701$), with security explaining 49.1% of the variance in customer satisfaction ($R^2 = 0.491$) and a highly significant model ($F = 145.326$, $Sig = 0.000$). The regression coefficient ($\beta = 0.625$) is positive and statistically significant ($T = 12.055$, $Sig = 0.000$), indicating that enhancing digital security substantially contributes to increasing customer satisfaction, thus supporting the acceptance of the third sub-hypothesis

2.5.5. Analysis of the Fourth Sub-Hypothesis Test Results

Sub-Hypothesis 4: There is a relationship between the variety of digital services and customer satisfaction.

Table number (10): Results of the Simple Linear Regression Test for the Diversity of Digital Services and Its Relationship with Customer Satisfaction

| Model | Constant | β | R | R ² | F-test | | Student's t-test | |
|---|----------|---------|-------|----------------|---------|---------|------------------|---------|
| | | | | | F-value | Sig (F) | T-value | Sig (T) |
| Variety of Digital Services → Customer Satisfaction | 1.186 | 0.571 | 0.655 | 0.429 | 119.473 | 0.000 | 10.931 | 0.000 |

Source: Prepared by the researchers based on SPSS output.

Data Analysis and Interpretation: The table indicates a strong positive relationship between the diversity of digital services and customer satisfaction ($R = 0.655$), with service diversity explaining 42.9% of the variance in satisfaction levels ($R^2 = 0.429$) and a highly significant model (F

= 119.473, Sig = 0.000). The regression coefficient ($\beta = 0.571$) is positive and statistically significant ($T = 10.931$, Sig = 0.000), indicating that an increase in the diversity of digital services is associated with a notable rise in customer satisfaction, thus supporting the fourth sub-hypothesis

6.2. Discussion of Results

The findings of this study revealed a positive and statistically significant relationship between the adoption of digital banking services and customer satisfaction in Algerian commercial banks, which is consistent with the research hypotheses. The correlation analysis confirmed that ease of use, transaction speed, security level, and service diversity are key determinants of satisfaction.

First, regarding the ease of use of digital services, the study found that the simplicity of application interfaces and the facilitation of banking operations via smartphones directly contribute to enhancing customer satisfaction. This aligns with the findings of Alalwan (2022), who demonstrated that ease of use is one of the most significant determinants of customer satisfaction in the Arab banking sector.

Second, the results showed that transaction speed has a strong association with customer satisfaction, as clients increasingly value rapid transfers, bill payments, and electronic withdrawal and deposit services. This finding resonates with Malaquias & Hwang (2021), who confirmed that speed and flexibility in digital services are fundamental dimensions for improving operational efficiency and achieving customer satisfaction in emerging banks.

Third, the study highlighted that the level of cybersecurity is a crucial factor in building customer trust and increasing satisfaction. Respondents emphasized that data protection and confidentiality are among the most critical determinants of their adoption of digital services. This is consistent with Zhang & Li (2023), who underscored the role of security and privacy in strengthening customer trust in digital financial services in China.

Fourth, concerning the diversity of digital services, the findings indicated that the variety of offerings (such as international transfers, digital financing, and electronic payment services) contributes to meeting the diverse needs of customers. This supports Kwateng et al. (2019), who pointed out that the diversification of digital financial services is a key driver for improving the quality of banking experiences and increasing customer satisfaction.

Accordingly, it can be concluded that the results of this study are largely consistent with prior research on digital banking services and customer satisfaction, while highlighting some particularities in the Algerian context,

where customers remain more sensitive to the security dimension compared to other countries with more advanced technological infrastructures.

Conclusion

This study analyzed the impact of digital banking services on customer satisfaction in Algerian banks, focusing on ease of use, transaction speed, security level, and service diversity. Results showed that all four dimensions significantly affect satisfaction, with security and transaction speed being the most influential, followed by ease of use and service diversity. These findings highlight customers' strong emphasis on trust and efficiency when adopting digital platforms, reflecting the particularities of the Algerian banking context.

Recommendations

- Enhancing the digital infrastructure of banks to reduce disruptions and ensure service stability.
- Strengthening cybersecurity through encryption technologies and multi-factor authentication.
- Accelerating digital transaction processes to increase the attractiveness of electronic channels.
- Simplifying user interfaces and providing smooth digital technical support.
- Diversifying digital services by launching innovative products such as e-wallets and app-based financing.
- Focusing on customer experience through continuous monitoring of customer satisfaction.
- Training and qualifying human resources in modern financial technologies (FinTech).

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