

A Field Study of a Selection of Algerian Commercial Banks was Conducted to Evaluate Their Use of Financial Technology

Fodil Bachir Dif¹, **Abdelouahab Bouabdellah**², **Chaoui Kouini**³

¹⁻³ University of Djelfa (Algeria)¹ MQEMADD

Email: fb.dif@univ-djelfa.dz¹, a.bouabdellah@univ-djelfa.dz², Chaoui.kouini@univ-djelfa.dz³

Received: 21/07/2024; Accepted: 17/11/2024 ; Published: 21/12/2024

ABSTRACT

The purpose of the study is to assess how financial technology is used in Algerian commercial banks. We studied a sample of mixed and public banks in the field. In order to accomplish the study's objective, we employed both the descriptive and data analytic approaches. The questionnaire served as the primary means of information collection, and the study's base was a random sample of sixty employees, representing a variety of methodologies. statistics and using SPSS to process them; it includes a range of banking services for different types of transactions.

Keywords: Financial technology, Financial and banking services, money transactions

Jel Classification Codes: O17; R58; F24

INTRODUCTION:

Financial technology refers to modern innovations and technological advancements in the financial industry. These developments encompass a range of computer software used in banking financial operations, such as customer transactions and financial transfers, which have become increasingly widespread, especially with the expansion of financial liberalization and the technological revolution. The COVID-19 pandemic, regarded as one of the most severe humanitarian, economic, and financial crises globally—surpassing even the Great Depression of 1929 and the financial crisis of 2008 has exacerbated the situation. This pandemic has introduced significant and far-reaching changes across all sectors, demonstrating the efficacy of various financial technology products in bridging the gap between clients and their financial and banking institutions.

The banking sector is among the areas most affected by and intertwined with technology. In developed countries, a new industry known as financial technology (fintech) has emerged. This sector integrates technology with financial and banking services, fostering a new wave of competition between traditional institutions and fintech startups. The objective of this industry is to deliver banking and financial services in innovative and technologically advanced ways.

Research Problem:

Given the context outlined above, the central issue addressed in this study is:

What is the current state of adopting financial technology in Algerian commercial banks?

Sub-questions:

To address this central issue, the following sub-questions are posed:

- What is the significance of financial technology, and in which areas is it applied?
- What mechanisms can be employed to enhance the use of financial technology to improve the services of Algerian banks?
- Have Algerian banks adapted to the evolving demands of financial technology?

Research Hypotheses:

- **Hypothesis (1):** Financial technology plays a critical role in the context of financial liberalization and has diverse applications in banking operations.

- **Hypothesis (2):** Algerian banks possess the tools and mechanisms to effectively respond to financial technology transformations.
- **Hypothesis (3):** Algerian banks have adapted, interacted with, and successfully integrated the changes brought about by financial technology.

Research Objectives:

This research aims to achieve several objectives, including:

- Examining innovations in financial technology and highlighting their role in simplifying financial services in banks.
- Analyzing recent advancements in financial technology and their contribution to enhancing banking performance by enabling management to expand and diversify financial services.
- Assessing the impact of financial technology on transactions within the specific context of the study.

Research Significance:

The significance of this study lies in the critical role of the financial technology sector, with its various fields, in driving transformative shifts in the balance of the financial sector and introducing modern innovations.

The importance of financial technology, its impact on managing financial transactions, and the advancements it has brought especially its clear influence on commercial banks—are all factors that underscore the value of this research.

2. Financial Technology

Financial technology is the field that deals with financial transactions by integrating technical and financial aspects. This section provides an explanation of the concept.

2.1 The Concept of Financial Technology:

The term "**Fintech**," which combines the abbreviations of **Finance (FIN)** and **Technology (Tech)**, has gained significant popularity in recent years. However, there are varying perspectives on the meaning of this term.

2.2 The Emergence and Development of Financial Technology

The concept of financial technology evolved with the internet revolution and the proliferation of smartphones, making it essential to offer specific facilities for businesses. Financial technology is now widely used across various contexts, including business-to-business transactions, banking operations, and customer interactions. In recent years, the field of financial technology has witnessed extraordinary growth (Nacira Zaaf, September 26, 2019, p. 03.). The key developments in financial technology can be summarized in the following phases (Emilio Abad-Segura, 2020, p p 03-04):

- **Phase 1886–1967:**

This period corresponds to the beginning of financial globalization, with financial technology taking shape through developments such as the telegraph and railroads, along with the establishment of the first transatlantic cable and the Federal Reserve wire transfer system in the United States in 1918. In 1950, Diners Club introduced credit cards as a way to reduce reliance on carrying physical cash.

- **Phase 1967–2008:**

Barclays Bank built the first automated teller machine (ATM) and introduced the first pocket calculator. The world's first digital stock exchange, NASDAQ, was established, credited with initiating financial markets' digitization. The Society for Worldwide Interbank Financial Telecommunication (SWIFT) was founded in 1973. Computers became widely available in the 1980s, enabling global access to online banking, which was further facilitated by e-business models and e-commerce in the 1990s. Online banking fundamentally changed how people viewed money and their interactions with financial institutions. This era concluded with the global financial crisis.

- **Phase 2008–2019:**

In 2009, programmers under the pseudonym Satoshi published a white paper outlining the concept of blockchain technology, which enables peer-to-peer transactions without the need for a central bank or regulatory authority.

- In 2011, Google Pay, a peer-to-peer payment service enabling free financial transfers via computers or mobile devices, was introduced.
- In 2012, Coinbase, a cryptocurrency trading platform, was established.
- In 2014, Apple Pay, a mobile payment service, was launched.
- In 2015, cryptocurrency gained wider recognition.
- In 2016, the first undergraduate program in financial technology, focusing on fintech and digital innovation, was introduced.
- In 2018, the first fintech investment by Google Ventures took place.
- In 2019, the EU High-Level Conference on the International Approach to Sustainable Finance was held to emphasize the necessity of linking financial technology to global sustainability.

2.3 Definition of Financial Technology

There are numerous definitions of financial technology, but the most relevant ones are:

Financial technology refers to technological financial innovations that can drive the development of new business models, financial applications, products, or related services, all of which are expected to have a profound impact on financial markets, institutions, and the broader financial sector (Belka Belkacem et al., 2021, p. 439.)

The above definition highlights that financial technology encompasses any technological innovation within the financial sector that leads to the creation of new business models, methods, or products that influence markets and institutions.

It is also described as the integration of financial innovations that produce new business models, applications, processes, or products that significantly impact financial markets, institutions, and the provision of financial services (Riham Ahmed Mamnouh Hussein, December 2020, p. 477.).

The preceding definitions indicate that financial technology includes advancements in the finance field that leverage technology to develop business models, applications, and products with significant influence on markets, financial institutions, and service delivery transactions.

It is further defined as a multidisciplinary subject combining finance, technology management, and innovation management (Kelvin Leong and Anna Sung, April 2018, p :75.).

According to this description, financial technology is a multidisciplinary field encompassing finance, technology management, and innovation management.

- ✓ **Characteristics of Financial Technology:**

The main characteristics of financial technology are as follows (Lezahri Zouaoui et al., 2018, p. 66.):

- Financial technology combines knowledge, skills, methodologies, and financial and cognitive foundations.
- Technology, in its various forms, serves as a tool for financial and banking institutions to achieve their objectives rather than being an end in itself.
- The primary applications of financial technology are concentrated in financial and banking services.
- The use of financial technology is not limited to financial and banking services but extends to administrative operations as well.

- ✓ **Importance of Financial Technology:**

The importance of financial technology can be summarized in the following points (Malika Ben Alqama et al., 2018, p. 93):

- It enhances financial inclusion, broad-based development, and the diversification of economic activities through innovations that help provide financial services to individuals currently excluded from the banking sector.

- It increases access to alternative sources of funding for small and medium-sized enterprises (SMEs).
- It strengthens financial stability by optimizing the use of technology to ensure effective regulatory compliance and risk management.
- It facilitates foreign trade and international remittances, as well as providing cost-effective and efficient cross-border payment channels.

3. The Role of Financial Technology in Developing Banking Services in Algeria

3.1 Algeria's Development Goals, Digital Transformation, and the COVID-19 Pandemic:

The COVID-19 pandemic has demonstrated the significant advantages of digital financial services, as they largely eliminate the need for human interaction in commercial and financial transactions. This allows local businesses to remain operational during economic downturns.

Consumers can use digital payments to transfer money, pay bills, and purchase goods and services from the comfort of their homes, supermarkets, or retail outlets. Digital financial services also enable governments to efficiently and securely provide social transfers and other financial assistance to the most vulnerable populations, particularly in situations where transportation and mobility are risky or restricted.

Digital transformation is considered one of Algeria's main developmental objectives and a key factor in advancing banking services. Improving access to digital payments serves as a gateway to digital financial services, particularly for Algerian groups less familiar with the financial sector. This transformation paves the way for achieving financial inclusion (Union of Arab Banks, (11, 2019).)

In Algeria, 57% of adults and 71% of women still lack access to basic transactional accounts, which would allow them to send and receive payments more securely and efficiently. This lack of access to bank accounts prevents them from benefiting from a wider range of financial services, such as savings, insurance, and credit (Delor Dorothy and Boubard Isabelle, (22.2.2012))

Despite mobile broadband coverage in Algeria being higher than the average in the Middle East and North Africa (MENA) region, the adoption of digital financial services remains significantly low. Only 16% of Algerians, and just 11% of women, participate in digital transactions, compared to 23% and 18% in the MENA region, and 36% and 32% in emerging markets and developing countries, respectively.

According to World Bank data, financial inclusion remains a major challenge in Algeria, with only 43% of adults holding a bank account in 2017. This figure is even lower for women, at just 29% (Fintechnews Africa., . (2021, 62).)

According to the Global Findex report, while millions of Algerians have bank accounts, many still rely on non-banking methods for sending and receiving domestic remittances. As a result, increasing the amounts available to remittance recipients and encouraging the adoption and use of digital channels is more critical than ever to maximize financial inclusion.

3.2 Digital Identity and the Evolution of Financial Technology Services in Algeria

Digital identity refers to the representation of an individual's identity within a digital or computer system. It is the persona created by the user, acting as a bridge between their real-world identity and virtual presence (Shafia Haddad and Asma Belaghmas, (2021), Volume 10, Issue 4, pp. 210-214.).

Since the implementation of digital identity in Algeria in 2016, financial institutions have been able to interact with consumers more rapidly while meeting anti-money laundering (AML) and know-your-customer (KYC) compliance standards. Developments in open application programming interfaces (APIs) have also enabled digital financial service providers to access data from numerous public and private systems, resulting in faster and more cost-efficient delivery of financial services while maintaining system integrity and regularity.

Digital financial services have facilitated the emergence of new business models, such as e-commerce platforms, including the entry of Jumia into the Algerian market, alongside local platforms like Ouedkniss, Batolis, and IdealForme.

Telecommunications companies have also leveraged digital financial services to expedite payments and offer prepaid solar energy services, insurance, and lending solutions.

Despite this progress, Algeria continues to face challenges in three critical areas that need to be addressed:

- Appropriate legal and regulatory frameworks.
- Adequate financial and digital infrastructure.
- Effective government support mechanisms.

While Algeria has made significant strides in promoting financial technology innovations and establishing digital financial services, there remains room for further efforts to raise awareness about their benefits and foster growth.

By expanding access to digital financial services, Algeria can enhance economic activity, improve the daily lives of its citizens, enable them to grow their assets or invest in productive projects, and, most importantly, mitigate the effects of shocks such as those caused by the COVID-19 pandemic.

Although digital financial services offer numerous advantages, they also pose risks to individuals and the broader financial system. These challenges include concerns about data privacy, limited access to technology (the digital divide), cybersecurity threats, private equity issues, and financial integrity risks. Additionally, regulatory authorities struggle to manage competition in this field effectively. Addressing these challenges requires robust regulation and comprehensive oversight by the relevant authorities.

3.3 Financial Technology and the Development of Banking Services in Algeria

The banking and financial sector in Algeria is characterized by outdated technological infrastructure, poor payment systems, and a lack of new digital banking services, all of which hinder progress toward financial inclusion goals. However, digital platforms and technology can significantly contribute to financial inclusion in Algeria by providing individuals and businesses with relevant, affordable financial products and services tailored to their needs (SEKAK, R., (2020, 12 20)

Digital technology serves as a powerful tool for financial inclusion, making it easier for unbanked populations to access basic banking and financial services. This is particularly important in Algeria, where there is a high rate of smartphone and digital adoption, with over 37 million mobile internet subscribers and more than 3.5 million fixed broadband subscribers.

While the use of digital and online payments remains low, adoption has increased rapidly in recent years. The first ten months of 2020 recorded over 486,000 online transactions, more than double the total volume of online transactions in 2019. The Algerian government has also focused on digitization and startups by appointing deputy ministers and drafting a series of relevant legislations, as highlighted in the December 2020 report by **the Digital Arabia Network and the Algerian-German Association for Students and Academics (DAA)**. (The Algerian-German Association for Students and Academics, 2020)

4. Field Study

The field study aims to identify the extent of financial technology usage in commercial banks. A specially designed questionnaire was utilized to collect data from the study sample. The analysis and interpretation of the study results were conducted using statistical data processing through specialized software.

4.1 Study Sample:

After sorting and identifying the valid questionnaires retrieved from employees of commercial banks, it was found that the number of usable questionnaires amounted to 50.

4.2 Structure of the Questionnaire:

First: Personal Information

This section provides demographic characteristics or general data about the study sample, such as educational qualifications, current job position, and professional experience.

Second: Data on the Subject, divided into two axes as follows:

- **Axis 1:** Includes the dimension related to financial technology, consisting of 17 statements.
- **Axis 2:** Includes the dimension related to Algerian commercial banks, containing 14 statements.

4.3 Questionnaire Processing:

The responses of the sample individuals were processed and analyzed using the SPSS software. The statistical methods employed for analyzing the questionnaire results included:

- Frequencies and percentages.
- Means and standard deviations.
- Cronbach's Alpha coefficient to test the reliability and validity of the questionnaire.
- Pearson correlation coefficient.

To determine the degree of agreement related to the statements and axes of the study, a five-point Likert scale was used, as explained in Table (01). The minimum and maximum category limits were calculated by determining the range $(3-1=2)$, which was divided by the number of categories (3), resulting in an actual length of agreement for each range = 0.66.

Table (01): Five-Point Likert Scale for Determining Responses

Code	Range	Response
1	1–1.66	Disagree (Low)
2	1.67–2.33	Neutral (Moderate)
3	2.34–3.00	Agree (High)

Source: Prepared by the Researchers

4.4 Demographic Characteristics:

The following is an overview of the characteristics of the institutions forming the sample, based on the personal data of the sample members and the representative of the institution they belong to.

First: Gender

The following table illustrates the distribution of the study sample members based on the gender variable, as shown below:

Table (02): Distribution of the Study Sample Members by Gender Variable

Gender	Frequency	Percentage (%)
Male	31	62%
Female	19	38%
Total	50	100%

Source: Prepared by the Researchers

According to the table above and the frequencies of the study sample members, which totaled 50 individuals, the number of males was estimated at 31 individuals (62%), while the number of females was estimated at 19 individuals (38%).

Second: Age

The following table shows the distribution of the study sample based on the age variable, as outlined below:

Table (03): Distribution of the Study Sample Members by Age Variable

Age Group	Frequency	Percentage (%)
Under 30 years	8	16%
31–40 years	22	44%
41–50 years	11	22%
51 years and above	9	18%
Total	50	100%

Source: Prepared by the Researchers

From the table above, and considering the frequencies of the study sample members, which totaled 50 individuals, it is observed that the number of individuals under 30 years old is approximately 8, representing 16%. Meanwhile, the number of individuals aged between 31 and 40 years is around 22, accounting for 44%. Additionally, the number of individuals aged between 41 and 50 years is estimated at 11, representing 22%, and the number of individuals aged 51 years and above is approximately 9, accounting for 18%.

Third: Educational Level

The table below illustrates the distribution of the study sample members based on the educational level variable, as outlined below:

Table (04): Distribution of the Study Sample Members by Educational Level Variable

Educational Level	Frequency	Percentage (%)
Secondary or below	11	22%
University	27	54%
Postgraduate	12	24%
Total	50	100%

Source: Prepared by the Researchers

From the table above, and considering the frequencies of the study sample members, which totaled 50 individuals, it is observed that the number of individuals with a secondary qualification or below is approximately 11, representing 22%. Meanwhile, the number of individuals with a university qualification is around 27, accounting for 54%. Additionally, the number of individuals with a postgraduate qualification is estimated at 12, representing 24%.

Fourth: Current Job Position

The following table illustrates the distribution of the study sample based on the current job position variable, as detailed below:

Table (05): Distribution of the Study Sample Members by Current Job Position Variable

Current Job Position	Frequency	Percentage (%)
Executive	12	24%
Control Officer	16	32%
Other Positions	22	44%
Total	50	100%

Source: Prepared by the Researchers

According to the table above, and considering the frequencies of the study sample members, which totaled 50 individuals, the number of executives was estimated at 12, representing 24%. The number of control officers was estimated at 16, accounting for 32%, while the number of individuals in other positions was estimated at 22, representing 44%.

Fifth: Professional Experience

The following table illustrates the distribution of the study sample based on the professional experience variable, as detailed below:

Table (06): Distribution of the Study Sample Members by Professional Experience Variable

Professional Experience	Frequency	Percentage (%)
Less than 5 years	16	32%
6–10 years	23	46%
11–20 years	8	16%
More than 20 years	3	6%
Total	50	100%

Source: Prepared by the Researchers

From the table above, and considering the frequencies of the study sample members, which totaled 50 individuals, it is observed that the number of individuals with professional experience of less than 5 years is approximately 16, representing 32%. Meanwhile, the number of individuals with professional experience between 6 and 10 years is around 23, accounting for 46%. Additionally, the number of individuals with professional experience between 11 and 20 years is estimated at 8, representing 16%.

4.5 Data on the Subject

This section contains data related to the subject and consists of three axes as follows:

Table (07): Division of Dimensions

Dimension	Content
Dimension 2	Covers financial technology and consists of 17 statements.
Dimension 3	Includes Algerian commercial banks and contains 14 statements.

Source: Prepared by the Researchers

First: Hypothesis Testing, Presentation, and Analysis of Results

To address the main hypothesis, the researchers analyzed it through three sub-hypotheses:

1. The First Hypothesis:

Financial technology is considered highly significant in the context of financial liberalization and its numerous applications within the banking sector.

This hypothesis was tested using the Sign Test based on the responses of the study sample to the questions related to the first hypothesis, as detailed in the table below:

Table (09): Results of the Sign Test for Questions Related to the First Hypothesis

Single Sample Selection		
Test Value = 4		
Significance Level (Sig)	Degrees of Freedom (ddl)	T
0.000	44	16.179

Source: Prepared by the researchers based on SPSS statistical program outputs.

The hypothesis can be tested by referring to the **Sig** value obtained directly from the SPSS application. If the **Sig** value is less than 0.05, the null hypothesis is rejected ($p = 0.05$), while the alternative hypothesis is accepted ($p \neq 0.05$). The null and alternative hypotheses are as follows:

$$H_1: p > 0.05 \quad H_0: p \geq 0.05$$

Based on the **Sig** value in the table above, it is evident that **Sig = 0.00**, which is less than 0.05. Therefore, we reject the null hypothesis (H_0), which states that financial technology does not play a critical role in the context of financial liberalization and has no diverse applications in banking operations. Instead, we accept the alternative hypothesis (H_1), which states that financial technology plays a critical role in the context of financial liberalization and has diverse applications in banking operations.

2. Testing the Second Hypothesis:

Algerian banks possess advanced tools and mechanisms to effectively respond to financial technology transformations.

This hypothesis is tested using the Sign Test for the responses of the study sample to the questions related to the second hypothesis, as shown in the table below:

Table (10): Results of the Sign Test for Questions Related to the Second Hypothesis

Single Sample Selection		
Test Value = 4		
Significance Level (Sig)	Degrees of Freedom (ddl)	T
0.000	43	23.257

Source: Prepared by the researchers based on SPSS statistical program outputs.

Based on the **Sig** value in the table above, which is **0.00** and less than **0.05**, we reject the null hypothesis (**H₀**) stating that Algerian banks have not adapted to changes in financial technology. Instead, we accept the alternative hypothesis (**H₁**) indicating that Algerian banks have indeed adapted and responded to these technological developments.

3. Testing the Third Hypothesis:

Algerian banks have adapted to and successfully integrated the changes brought by financial technology.

This hypothesis was verified using the Sign Test for the responses of the study sample to the questions related to the third hypothesis, as shown in the table below:

Table (11): Results of the Sign Test for Questions Related to the Third Hypothesis

Single Sample Selection		
Test Value = 4		
Significance Level (Sig)	Degrees of Freedom (ddl)	T
0.000	43	13,635

Source: Prepared by the researchers based on SPSS statistical program outputs.

Based on the **Sig** value in the table above, which is **Sig = 0.00** and less than **0.05**, we reject the null hypothesis (**H₀**) stating that Algerian banks have not adapted to and interacted with the transformations occurring in financial technology. Instead, we accept the alternative hypothesis (**H₁**) indicating that Algerian banks have adapted to and responded to the developments in financial technology.

5. CONCLUSION

This study aimed to evaluate the use of financial technology in Algerian commercial banks, particularly in the (Ouargla-Touggourt) region. The theoretical framework was first explored by discussing the key concepts of financial technology and the evolution of commercial banking activities. This theoretical analysis was then applied to a field study involving public and joint banks. The research focused on the question: "How is the use of financial technology evaluated in Algerian commercial banks?" The findings are summarized as follows:

- Algerian commercial banks have access to modern digital technologies and collaborate with key partners to integrate the latest innovations.
- There is a positive relationship between the use of financial technology and the performance of Algerian commercial banks.

- Financial technology has been identified as the most effective tool for delivering advanced and modern banking services.
- Algerian commercial banks manage their financial resources efficiently and effectively, helping them achieve their objectives.
- The study confirmed that financial technology reduces customer costs in currency exchange and money transfer operations.
- Joint banks in Algeria stand out for offering a comprehensive range of digital products and services.
- Financial technology acts as a competitive advantage, helping banks achieve customer satisfaction and attract more clients.
- However, Algerian commercial banks have weaknesses in strictly implementing IT security regulations, anticipating cybercrime threats, and addressing system failures.
- The adoption of financial technology is no longer limited to developed countries; all nations are working to modernize their financial sectors and leverage financial technology to support their economies.

In conclusion, the study found that commercial banks offer a wide range of services across various banking transactions. Based on the results, the following hypotheses can be confirmed or rejected:

- Hypothesis (1):** The hypothesis stating that "*Financial technology plays a critical role in the context of financial liberalization and has diverse applications in banking operations*" was accepted, as this was evident in the dimensions of the financial technology axis across public and joint banks.
- Hypothesis (2):** The hypothesis stating that "*Algerian banks possess advanced tools and mechanisms to effectively respond to financial technology transformations*" was accepted, supported by the correlation between the study variables using Pearson's correlation coefficient.
- Hypothesis (3):** The hypothesis stating that "*Algerian banks have adapted to and successfully integrated the changes brought by financial technology*" was accepted.

Recommendations:

Based on the findings, we recommend the following actions:

- ✓ **Leverage the experiences of developed countries in implementing financial technology** to significantly enhance the quality of banking services. By studying the strategies and practices adopted by these countries, Algerian commercial banks can identify effective methods for adopting and integrating financial technology into their operations. This process involves analyzing case studies, understanding regulatory frameworks, and evaluating the impact of various financial technologies on service delivery and customer satisfaction. By doing so, Algerian banks can develop tailored strategies that align with their specific contexts and contribute to improving banking services.
- ✓ **Improve the regulation and privacy of digital platforms** to ensure secure and efficient financial transactions.
- ✓ **Allocate substantial budgets for training and developing bank managers** in the field of financial technology to enhance their competencies and adaptability to evolving technological trends.

REFERENCES

References in Arabic:

1. Zaafer, N., The Impact of Financial Technology on Improving and Innovating the Quality of Banking Services, National Symposium on the Financial Technology Industry and Its Role in Enhancing Financial Inclusion in Arab Countries, University of Médéa, Médéa, September 26, 2019, p. 03.
2. Belka Belkacem et al., The State of the Financial Technology Industry in India and Kenya, Journal of Research in Financial and Accounting Sciences, Volume 06, Issue 01, University of Chlef, 2021, p. 439.

3. Riham Ahmed Mamnough Hussein, The Impact of Financial Technology on Economic Justice, Scientific Journal of Economics and Trade, Volume 50, Issue 02, Sadat Academy for Administrative Sciences, Egypt, December 2020, p. 477.
4. Lezahri Zouaoui et al., Financial Technology: The Revolution of Financial Payment - Reality and Prospects, Al-Ijtihad Journal for Legal and Economic Studies, Volume 07, Issue 03, University of Ghardaia, 2018, p. 66.
5. Malika Ben Alqama et al., The Role of Financial Technology in Supporting the Financial Services and Knowledge Sector, Al-Ijtihad Journal for Legal and Economic Studies, Volume 07, Issue 03, University of Setif 01, 2018, p. 93.
6. Delor Dorothy and Boubard Isabelle (February 22, 2012), How Digital Financial Services Can Pave the Path to Economic Recovery in Algeria, World Bank Blogs. Retrieved from: <https://blogs.worldbank.org/ar/voices/how-digital-financial-services-can-provide-path-toward-economic-recovery-algeria>.
7. Union of Arab Banks (November, 2019), Financial Technology: Digital Evolution as a Key Pillar of the Future of the Financial and Banking Sector, Union of Arab Banks, Studies, Research, and Reports.
8. Algerian-German Association for Students and Academics (2020), Digital Transformation in Algeria, Digital Arabia Network. Retrieved from:
 - a. https://digitalarabia.network/media/pages/articles/grab-a-coffee-read/da075f7bd51617783451/strategy_paper_algerien_20210406.pdf.
9. Shafia Haddad and Asma Belaghmas (2021), Digital Identity and Algerian Identity Security in the Face of Network Society Challenges, Algerian Journal of Security and Development, Volume 10, Issue 4, pages 210-214. Retrieved from:
 - a. <https://www.asjp.cerist.dz/en/downArticle/291/10/2/148652>.

References in Foreign Languages:

11. SEKAK, R. (2020, December 20). Development Perspectives of Fintech in Algeria. LIBERTE-ALGERIE.COM. Retrieved from:
 - a. <https://www.liberte-algerie.com/economie/sortir-de-larchaisme-bancaire-351026>.
12. Fintechnews Africa. (2021, p. 62). Fintech Development in Algeria Lags Behind MENA Counterparts. Retrieved from Fintechnews Africa: <https://fintechnews.africa/39426/fintech-algeria/fintech-development-in-algeria-lags-behind-mena-counterparts/>.
13. Emilio Abad-Segura, Mariana-Daniela González-Zamar, Eloy López-Meneses, Esteban Vázquez-Cano, Financial Technology: Review of Trends, Approaches and Management, Article in Mathematics Journal, Vol. 9, No. 8, Spain, June 2020, pp. 03-04.
14. Kelvin Leong and Anna Sung, FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way?, International Journal of Innovation, Management and Technology, Vol. 9, No. 2, April 2018, p. 75.