

The Impact of Banking Process Digitization on the Performance of Banking Activities : Empirical Evidence from Commercial Banks in Bejaia

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Abstract:

In this paper we measure the effect of digitizing banking procedures on the bank activities performance. Indeed, we carried out a field survey on a sample of commercial banks of the wilaya of Bejaia, through which we distributed a survey to the executives employed in these banks.

The results show that digitization has a positive and significant effect on the performance of banking activities. Then, digitalization facilitates the internal procedures of banks, which improved their effectiveness and simplified their management. Digitization also promotes the climate of innovation in banks and makes it possible to the latter more competitive, especially on the international market.

Keywords: Digitization; Banking Activities ; Costumer services ;Survey ; Bejaia.

Jel Classification Codes : C93 ; M2; O30.

ملخص:

تهدف هذه الدراسة إلى تحليل أثر رقمنة الإجراءات البنكية على أداء الأنشطة المصرفية. ولتحقيق ذلك، تم إجراء مسح ميداني شمل عينة من البنوك التجارية في ولاية بجاية، حيث تم توزيع استبيان منظم على الإطارات العاملة بهذه البنوك. أظهرت نتائج الدراسة أن الرقمنة تُحدث تأثيراً إيجابياً وذا دلالة إحصائية على أداء الأنشطة البنكية. إذ تساهم في تبسيط الإجراءات الداخلية، وتعزيز الكفاءة التشغيلية، وتسهيل الإجراءات الإدارية. كما تسهم الرقمنة في تعزيز مناخ الابتكار داخل البنوك، مما يزيد من قدرتها التنافسية، خاصة في السوق الدولية.

الكلمات المفتاح: الرقمنة ؛ الأنشطة البنكية ؛ الخدمات البنكية ؛ استبيان ؛ ولاية بجاية.

تصنيف JEL : C93 ؛ M2 ؛ O30

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I. Introduction:

The banking sector has undergone significant transformations in recent decades, arguably more than any other field. The rise of the internet and the rapid spread of ICT have given a major boost to the expansion of digitization, impacting all sectors of society such as healthcare, the environment, industry, and the economy.

However, the most notable changes have occurred in the financial sector. Indeed, banking activity has been propelled into a new era: the digital era. New forms and dimensions of banking services have emerged, such as online banking and virtual banking. The digital transformation of the banking sector is reflected in the enhancement of the online customer experience, the redesign of operational processes, and the emergence of new professions (Béziade & Al., 2014, p. 11).

In Algeria, banks have aligned themselves with this trend by adopting a comprehensive digitalization approach for most internal procedures and services offered to customers, with the goal of improving performance and supporting their competitiveness. In this context, our research revolves around the central question: What impact does digitalization have on the performance of banking tasks in the Wilaya of Béjaïa?

This study aims to examine the effect of digitalizing banking tasks on the consolidation of service quality through a field study conducted among commercial banks in the Wilaya of Béjaïa. The survey is carried out using a questionnaire distributed to 40 executives working in various departments of the four public banks (BNA, BADR, CPA, and CNEP).

This work is based on two hypotheses, which are stated as follows: First hypothesis: Digitalization fosters the consolidation of performance in banks. Second hypothesis: Technological progress in banking operations is an indicator of the efficiency of banking activity.

To analyze this issue, this paper is divided into three sections. The first section presents a literature review of key works that have analyzed this issue. The second section presents the results of the field study. The third section discusses the results obtained and provides some recommendations aimed at optimizing the digitization process.

2. Digitalization in Banking: Impact on Performance and Competitiveness:

Digitalization in banking refers to the process of transitioning from an analog information system to a digital information system to optimize information processing (Caprioli & Al, 2017, p. 12).

(Mieszala, 2015, p. 26) states that customer service in the banking sector has advanced more rapidly than in other industries due to the emergence of new technologies and the digitalization of various services (Mieszala, 2015, p. 26). According to (Abolhassan, 2017, p. 36), the dematerialization of contracts, now widely offered to customers, leads to cost reductions and a significant improvement in banking service quality. The same observation is highlighted by (Winasis, Riyanto, & Ariyanto, 2020), who demonstrate that digitalization significantly contributes to reducing costs associated with banking services.

Several studies have emphasized the importance of electronic banking services in achieving greater operational efficiency and gaining a competitive advantage. Most of these studies have underlined the positive impact of digitalization on banking performance (Kutnjak, Pihiri, & Furjan, 2019). (Almutairi, 2013) conducted a study aimed at demonstrating a creative approach to achieving a competitive advantage for Kuwaiti commercial banks. In this study, a questionnaire was designed and distributed to a sample of 102 banking executives in Kuwait, and the data were analyzed using statistical methods. The study concluded that all aspects of creativity,

fostered by digitalization, have a significant effect on gaining a competitive advantage for Kuwaiti commercial banks. It further recommended that Kuwaiti commercial banks adopt new and contemporary models for managing operational tasks to achieve distinction and superiority over foreign banks operating in Kuwait.

(Westerman, Bonnet, & McAfee, 2014), in a study conducted on 50 major American companies and institutions, demonstrated the positive impact of digitalization on their performance. This impact is mainly observed in the streamlining of tasks and improved customer proximity.

The study by (Omari & Batained, 2014) shows that e-services in Jordanian banks enhance their competitiveness, even providing a competitive advantage over foreign banks.

The growing adoption of digital technologies in banking has not only transformed internal operational processes but has also redefined customer interactions. According to (Bounfour, 2016), digital transformation is a strategic imperative for financial institutions seeking to enhance their efficiency, agility, and service personalization. In this regard, the integration of artificial intelligence (AI), big data, and blockchain technologies into banking services has further reinforced the competitive positioning of banks in global markets (Vanderlinde & O'Donnell, 2018).

Moreover, studies have highlighted that digital banking fosters financial inclusion by facilitating access to banking services, particularly in remote areas. (Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2018) demonstrate that mobile banking solutions have significantly increased the banked population worldwide. Similarly, (Srinivasan & Eden, 2019) argue that digital financial services contribute to economic growth by promoting financial literacy and enabling efficient capital allocation.

However, while digitalization offers numerous benefits, it also presents challenges, particularly in terms of cybersecurity and data protection. (Arner, Barberis, & Buckley, 2017) emphasize that the increasing reliance on digital banking solutions exposes financial institutions to cyber threats, requiring substantial investments in cybersecurity infrastructures. Additionally, regulatory frameworks must continuously evolve to ensure compliance with data protection laws, such as the General Data Protection Regulation (GDPR) in the European Union (Zetzsche, Buckley, Arner, & Barberis, 2018).

Despite these challenges, the digitalization of banking services continues to accelerate, driven by the increasing demand for seamless, efficient, and personalized financial solutions. As emphasized by (McKinsey & Company, 2020), banks that successfully integrate digital innovations into their business models will be better positioned to achieve sustainable growth and long-term competitiveness.

II. The Effect of Digitalization on the Performance of Banks in the Wilaya of Bejaia :

II.1 Methods and Materials:

In this research, data collection was conducted through a questionnaire, chosen for its ease of access to the elements of our sample.

Our field survey was carried out in the wilaya of Bejaia, given that digitalization affects all banks nationwide in a similar manner, particularly public sector banking agencies. These banks offer the same services at comparable rates. Therefore, the survey results are likely to be generalized to other similar contexts.

The selection of the survey population is relevant, as the questionnaire primarily targets banking executives in Bejaia. The surveyed agencies belong to the Algerian public banking sector, specifically BNA, CNEP, BADR, and CPA.

II.2 Data Analysis:

We distributed our questionnaire to a sample of 40 executives from public commercial banking agencies (BADR, BNA, CNEP, and CPA) in the wilaya of Bejaia and collected 30 responses. The following table summarizes the examined population.

Table 01: Questionnaire Response Rate

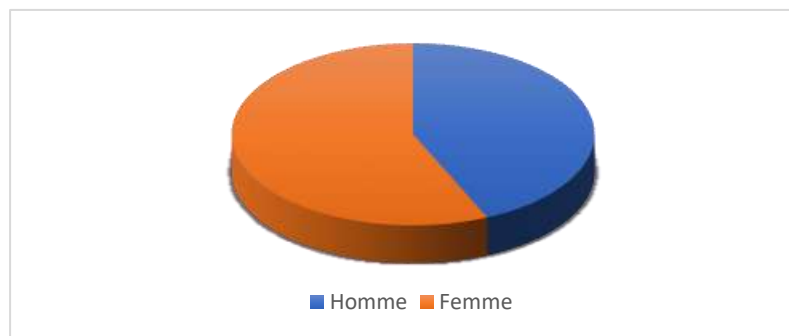
<i>Banking Agency</i>	Number of Distributed Questionnaires	Number of Collected Questionnaires	Response Rate (%)
<i>BADR</i>	10	08	80.00%
<i>BNA</i>	11	10	90.90%
<i>CNEP</i>	09	06	66.66%
<i>CPA</i>	10	06	60.00%
<i>Total</i>	40	30	75.00%

Source: Analysis of the questionnaire results

According to the table, we observe that the total response rate is 75%, which represents an acceptable rate.

II.3.1 Respondent Identification: First Axis – Sample Description:

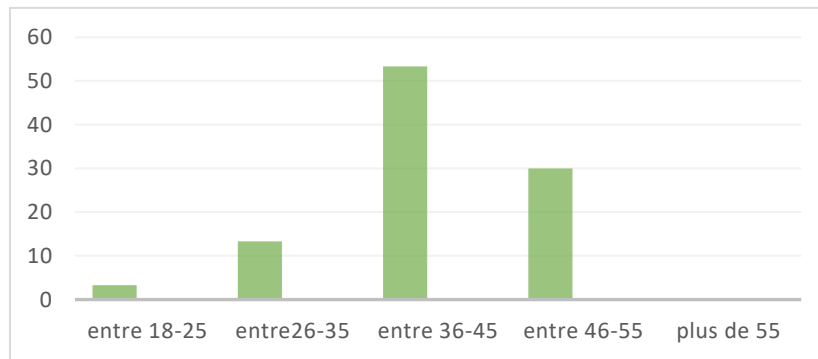
Figure 1: Sample Distribution by Gender



Source: Constructed based on the questionnaire results

Women represent 56.7% of respondents, compared to the male population, which accounts for 43.3%.

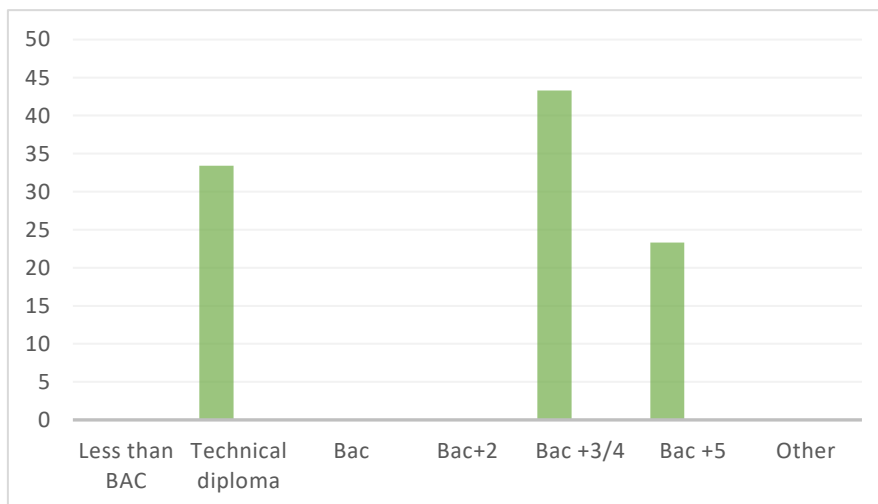
Figure 2: Sample Distribution by Age



Source: Established based on the questionnaire results

The graph above illustrates the age distribution of respondents. We observe that more than half (53.3%) of the respondents fall within the 36–45 age group. Meanwhile, the 26–35 age group accounts for 13.3% of the respondents.

Figure 3: Sample Distribution by Education Level

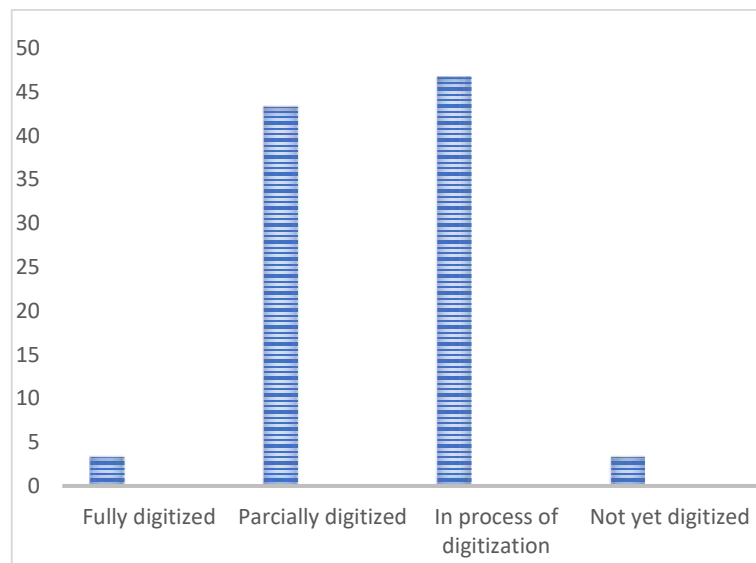


Source: Established based on the questionnaire results

The majority of respondents hold a higher education degree, accounting for 67.3%, while those with an applied diploma represent 32.7%.

II.3.2 Second Axis: The Digitalization of Financial Operations in the Institution:

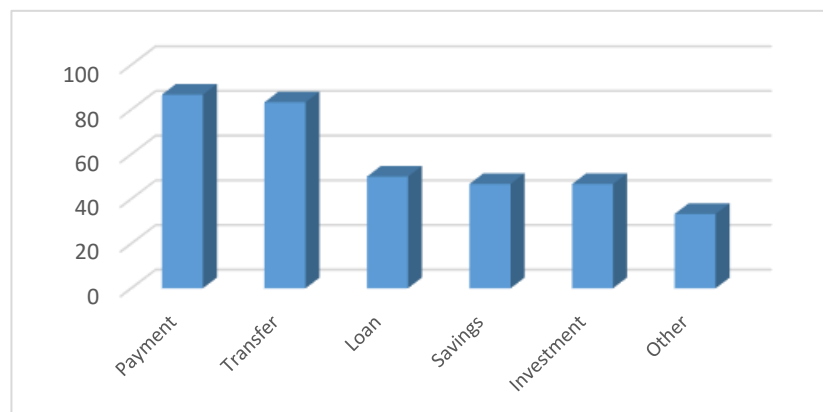
Figure 4: Distribution of Employee Responses on the "Degree of Digitalization of Financial Operations"



Source: Established based on the questionnaire results

The majority of respondents, 90%, believe that the digitalization process is currently underway in their bank. Only 3.3% believe that their institution has not yet effectively initiated the digitalization process.

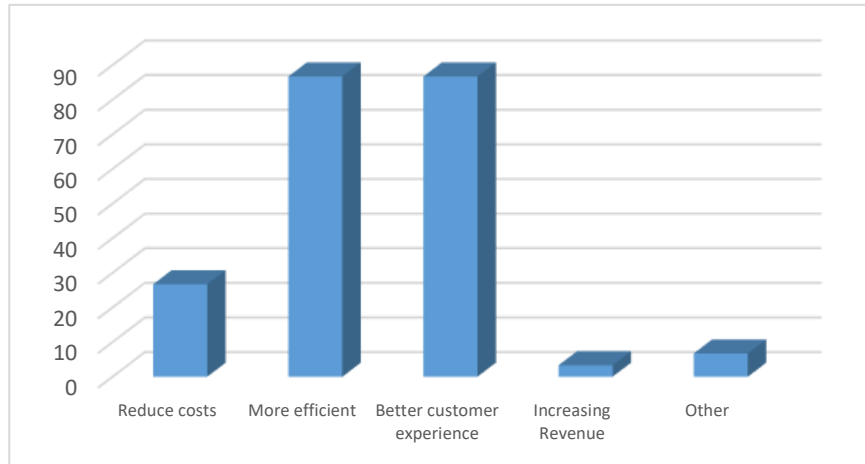
Figure 5: Distribution of Employee Responses on "The Main Types of Digitalized Financial Operations"



Source: Established based on the questionnaire results

The analysis of the questionnaire indicates heterogeneity in terms of digitalization across different services. Indeed, payment procedures are the most digitalized, with 86.7%, followed by transfer operations at 83.3%. However, the savings and investment services are only digitalized at a rate of 46.7%.

Figure 6: Distribution of Responses on "The Main Benefits of Digitalizing Banking Tasks"

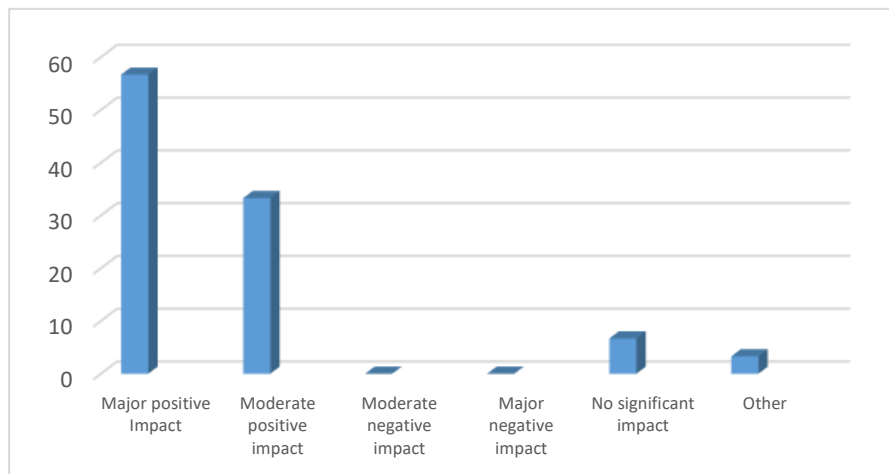


Source: Established based on the questionnaire results

The results reveal that the main benefit of digitalization is the improvement of task efficiency and the enhancement of customer experience, with 86.7% of respondents highlighting this. Meanwhile, 26.7% of respondents emphasize that digitalization helps reduce costs. Only 3.3% of respondents mentioned that digitalization contributes to increasing revenue.

II.3.3 Third Axis: The Contribution of Digitalization to Banking Performance:

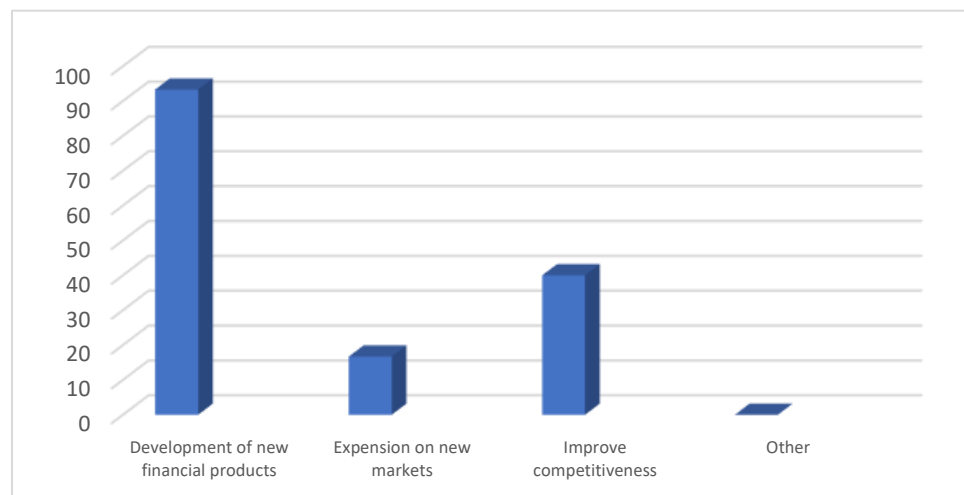
Figure 7: Distribution of Responses on "The Effect of Digitalizing Financial Operations on the Overall Performance of the Banking Institution"



Source: Established based on the questionnaire results

The graph indicates that 56.7% of employees from the surveyed agencies stated that digitalization has a major positive impact, while 33.3% of respondents believe that digitalization has a moderate positive impact. Only 6.7% of employees consider that there is no significant impact. It is worth noting that none of the respondents reported a negative impact.

Figure 8: Distribution of Responses on "The Contribution of Digitalization to Achieving Strategic Objectives in the Banking Institution"

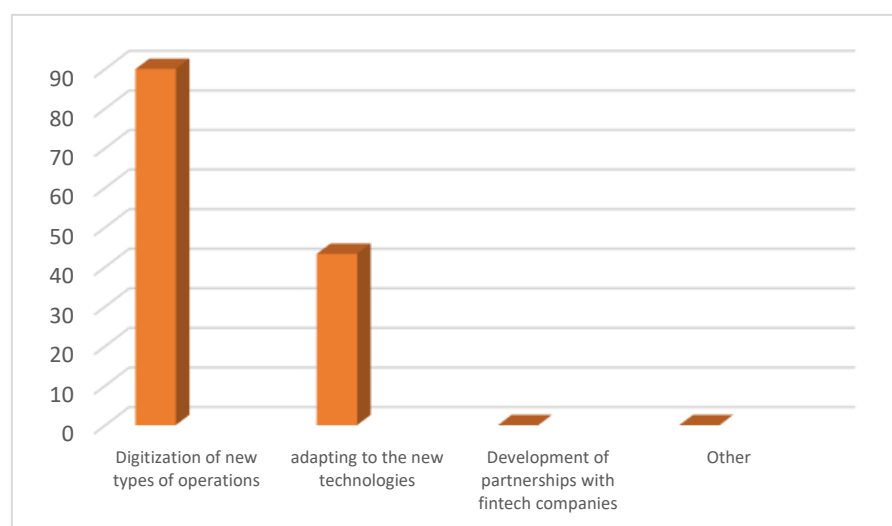


Source: Established based on the questionnaire results

The overwhelming majority of the surveyed executives, 93.3%, indicated that digitalization stimulates innovation and enables the development of new financial products in banks, thereby strengthening their competitiveness in the market. 40% of respondents believe that this innovation dynamic, driven by digitalization, improves the bank's competitiveness, while 16.7% state that this mechanism leads to expansion into new markets.

II.3.4 Fourth Axis: Future Perspectives:

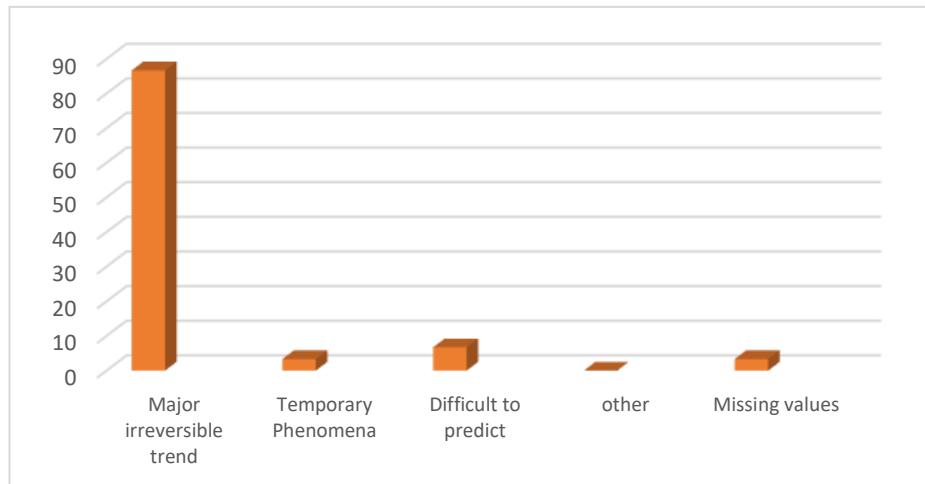
Figure 9: Distribution of Employee Responses on "The Next Phases of Digitalization in Their Institution"



Source: Established based on the questionnaire results

According to the graph above, the upcoming challenge of digitalization is to provide services that are better adapted to this dynamic, such as the digitalization of new types of operations (90%), particularly those involving a certain level of complexity, such as investment and placement choices. Meanwhile, nearly half of the responding executives stated that the challenge of digitalization lies in adapting to new technologies, which are constantly evolving.

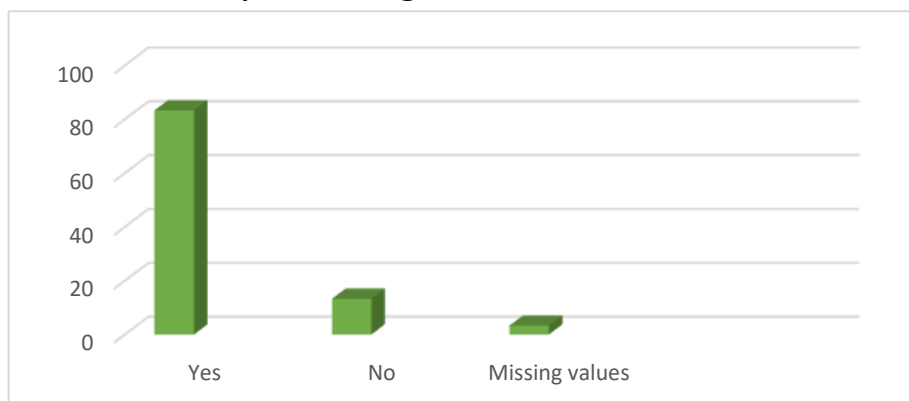
Figure 10: Distribution of Employee Responses on "The Future of Digitalization in the Banking Sector"



Source: Established based on the questionnaire results

The graph above indicates that the majority of respondents believe that the digitalization of financial operations is taking on a major and irreversible trend (86.7%). In contrast, only 6.7% of executives indicate that the future of digitalization is difficult to predict, and that this seemingly irreversible trend remains debatable.

Figure 11: Distribution of Employee Responses on "The Impact of Digitalization on the Quality of Banking Services in Recent Years"



Source: Established based on the questionnaire results

We note that 83.3% of the executives surveyed emphasize that digitalization has positively affected the quality of banking services in recent years. Only 13.3% of respondents confirmed the absence of this effect.

Figure 12: Distribution of Employee Responses on "The Risks of Digitalization for Banking Institutions"



Source: Established based on the questionnaire results

In our research, we also focused on the question of whether there is a systemic risk associated with the general trend towards digitalizing financial operations. Indeed, 66.7% of respondents mention an intensification of systemic risks generated by the digital transformation of banks. The significant rise in digitalization is likely to pose a risk, especially during this initial stage. The changes brought about by digitalization procedures make the future direction of the banking sector, in general, unpredictable.

II.3 Estimation of a Regression Model:

We have constructed two main variables based on the axes of the questionnaire. The first variable, which is our endogenous variable, "Performance", is built from the second and third axes of our questionnaire. It consists of the weighted average of the responses. The second variable, which represents the exogenous variable of our model, "Digitalization", is constructed using the weighted average of the responses from the fourth axis of our questionnaire.

The regression model estimation, using the constructed variables, is performed via the Ordinary Least Squares (OLS) method.

The results obtained from the regression, carried out using SPSS software, are as follows:

Table 2: Regression Results

Coefficients ^a								
Modèle	Coefficients non standardisés		Coefficients standardisés	t	Sig.	Corrélations		
	A	Erreur standard	Bêta			Corrélation simple	Partielle	Partie
1 (Constante)	,409	2,371		,173	,864			
Numérisation	,744	,063	,914	11,900	,000	,914	,914	,914

a. Variable dépendante : Performance

Source: Established using SPSS software

The estimated model is given as follows:

$$Performance = 0,409 + 0,744 \text{ Numérisation}$$

The P-value associated with the Student's t-statistic confirms that the "Digitalization" coefficient is significant at the 1% level.

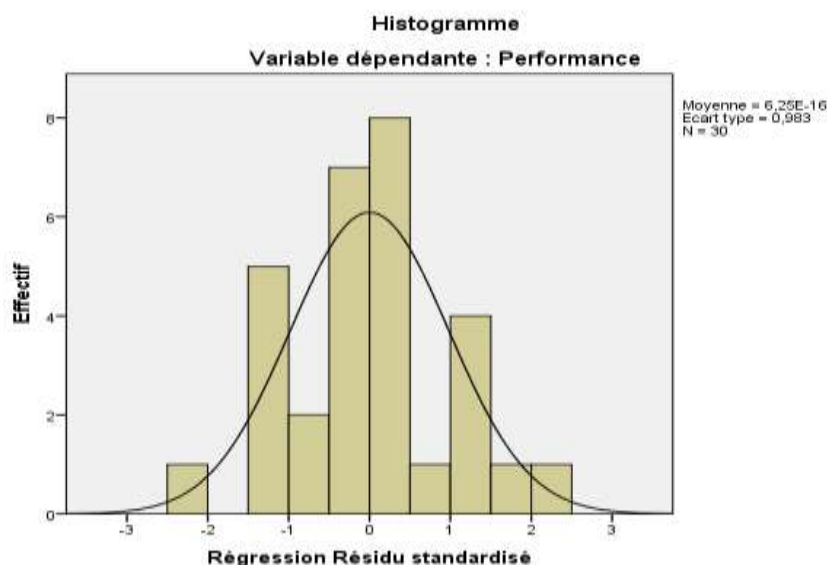
Table 3: Analysis of Variance Results for the Estimated Model

<i>SIG</i>	F	Mean Square	DDL	Sum of Squares
<i>0.0000</i>	141.6210	3522.9430	1	3522.943
		24.876	28	696.524
			29	4219.469
<i>Regression</i>	Residual	Total		

Source: Established using SPSS software

The Fisher test, determined from the ANOVA test, is significantly higher than the tabulated Fisher statistic (which is equal to 4.17), allowing us to conclude that the model is globally significant. The coefficient confirms that the model has a good fit.

Figure 13: Distribution of Residuals



Source: Established using SPSS

The graph shows that the residuals from the regression follow a normal distribution.

Based on these results, the effect of digitalization on banking performance in our sample is positive and significant. According to the executives of the surveyed banking agencies, the digitalization of banking procedures contributes to improving banking activity. This allows us to confirm our first hypothesis.

III. Results and discussion:

The study of the information gathered through the questionnaire highlights the importance of digitalization for the performance of the surveyed banks. The majority of the executives interviewed see a crucial interest in emphasizing a positive perception and recognizing the added value of digitalization in terms of efficiency. In fact, the executives focus on the fact that digitalization promotes the development of new products and services, thereby accelerating innovation, adapting to the evolving needs of customers, and enhancing the overall user experience. This helps banks remain competitive in the market.

The survey indicates that 46.7% of the respondents believe that the transition towards more digitized operations is currently progressing within the banks. Furthermore, 86.7% of respondents agree that one of the main advantages of digitalization lies in improving the efficiency of operational tasks and optimizing customer satisfaction.

The results also show heterogeneity in terms of digitized banking tasks: payments (86.7%), transfers (83.3%), loans (50%), and savings and investments (46.7%). However, there are still some obstacles hindering the digitalization process in banks, such as the challenge of securing transactions, ensuring the accessibility of services for vulnerable populations, and training staff to use new tools.

We also note that most employees place significant importance on the next phases of digitalization, particularly regarding the digitization of complex operations and the adaptation to new technologies.

Based on all these results, we observe that the digitalization of financial operations plays a crucial role in improving banking activities. The employees' responses indicate that the transition towards the digitalization of financial operations is ongoing, confirming our second hypothesis.

The study's findings underscore the significant impact of digitization on the performance of the surveyed banks. A majority of the respondents acknowledge digitization as a key strategic driver for bank development, especially within the context of an increasingly competitive and digitalized environment. This digital transformation is viewed as an acceleration of innovation, which has become a fundamental catalyst for enhancing organizational performance.

III.1 Impact on Operational Efficiency:

One of the key findings from this study is that digitizing banking tasks enhances the efficiency of operational processes. The fact that 86.7% of respondents report that digitization improves the efficiency of operational tasks highlights the importance of this transformation in streamlining internal processes. Tasks that were previously time-consuming and susceptible to human error, such as payments or transfers, are now automated and expedited, enabling banks to reduce operational costs and improve employee productivity.

Additionally, the optimization of the customer experience is a crucial factor emphasized by the respondents. Digital banking services, especially online and mobile services, allow customers to perform transactions autonomously and in real time, thereby improving overall satisfaction. The availability of these digital services better meets the expectations of modern customers who demand speed, convenience, and accessibility.

III.2 Heterogeneity in Digitized Services:

However, as illustrated by the variability of responses regarding the digitization of different banking services, there are still areas where digitization has not advanced as significantly, such as savings and investment services (46.7%). This suggests that there are technical, human, or strategic barriers to the full digitization of banking services. These barriers may stem from the complexity of certain products or customer reluctance to adopt new solutions for services that are perceived as more "complex" or requiring more personalized support.

Furthermore, adopting new technologies and training staff remain substantial challenges for banks, especially in an environment where technologies are evolving rapidly. While the digitization of simpler services is well-established, more complex operations, such as investment management or financial planning, require more sophisticated tools and in-depth training for staff to ensure optimal service quality.

III.3 Barriers to Overcome:

The study also highlights several key obstacles in implementing widespread digitization. Transaction security remains a critical priority for banks. Respondents noted the need to ensure the security of banking data and prevent fraud, especially in an environment where cyberattacks are increasingly prevalent. Security risks are often viewed as significant impediments to broader adoption of digital technologies, particularly in regions where cybersecurity infrastructure may be limited.

Moreover, there is an evident gap in access to services among different customer segments. Certain populations, particularly the elderly or those in rural areas, may face difficulties accessing digital services due to a lack of infrastructure or digital literacy. This raises questions around inclusivity in the digitization process. Banks need to ensure that digitization does not exacerbate existing inequalities or create new forms of exclusion.

III.4 Future Phases of Digitization: Complexity and Ongoing Evolution:

A particularly noteworthy aspect of this study lies in the respondents' perspectives on the future phases of digitization. The results indicate that a majority of participants believe that more complex financial operations, such as investment decision-making and portfolio management, should undergo further digital transformation. This trend reflects a broader shift toward a more strategic and sophisticated form of digitization, necessitating targeted approaches that align with the increasing demands of the financial sector. Unlike the initial stages of automation, which primarily focused on streamlining repetitive and operational tasks, advanced digitalization in financial services now serves as a structural innovation driver. It is fundamentally reshaping decision-making processes and user interactions by emphasizing accessibility, personalization, and alignment with the evolving expectations of clients. This transformation requires the integration of cutting-edge technologies, such as artificial intelligence and predictive analytics, to enhance decision-making efficiency and increase the overall value of digitized financial services. Consequently, the digitization of complex financial operations is no longer merely an operational improvement but a critical step toward redefining the financial ecosystem in a data-driven and customer-centric manner.

III.5 Obstacles in Digital Security and Adaptation:

Additionally, banks must address the ongoing security risks and the need to adapt to emerging technologies. The integration of new technologies into banking systems requires constant adaptation, especially as technological advancements evolve rapidly. While digitization has the potential to transform operations, ensuring that these technologies remain secure and effectively implemented will be crucial to maintaining customer trust and protecting sensitive financial data.

The regulatory environment also plays a significant role in shaping the future of banking digitization. Banks must navigate the regulatory frameworks that govern digital transactions, ensuring compliance while also fostering innovation. This creates a dynamic challenge for institutions to balance the potential benefits of digital transformation with the constraints imposed by regulations.

IV. Conclusion

This research aims to assess the impact of digitization on the performance of banking institutions. The study was conducted through a survey targeting a sample of managerial employees from several banking establishments in the Bejaia region.

The literature review highlights that the digital transformation of the banking sector is a constantly evolving phenomenon that has led to a profound change in financial service models. It is essential for banks to adjust to this new situation by integrating digital technologies to improve operational efficiency, reduce costs, and offer more accessible and personalized services to customers. Digital transformation has also enabled banks to distinguish themselves from their competitors and respond to the evolving expectations of consumers. In fact, the digitization of banking activities is now a key indicator for assessing the effectiveness of banking operations.

The positive response from the employees surveyed underscores that digitization has successfully met the challenge. Respondents particularly appreciate the efficiency of tasks and the innovation dynamic established within the banks.

Through this field study, we have constructed two key variables— "Digitization" and "Performance"—based on the axes of our questionnaire. We regressed the digitization variable on the performance variable. The results of the model estimation show that digitization has a positive effect on the performance of banking activities.

Recommendations to Accelerate the Digitalization Process in Banks:

- Facilitate client interactions with digital platforms to encourage them to adopt the digital evolution of banking transactions.
- Ensure optimal data protection by deploying advanced cybersecurity solutions to safeguard sensitive client information.
- Invest in technologies by adopting AI-based solutions to automate and delegate repetitive tasks while personalizing services.
- Implement real-time evaluation by developing key metrics to track the performance of digitized operations.

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