Digital Transformation and Artificial Intelligence in Banking Marketing: Enhancing Customer Relationship, A Case Study of the Banque Extérieure d'Algérie

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Received (date) : 26/02/2026 Accepted (date): 27/05/2026 Published (date) 01/06/2026

Abstract:
Digital transformation has become a central challenge for banking institutions facing growing demands for service quality and personalized customer relationships. In this context, artificial intelligence (AI) represents a strategic tool for modernizing banking marketing practices. This study investigates the role of AI within the Banque Extérieure d'Algérie (BEA) using a qualitative approach based on a semi-structured interview with a senior banking executive and a documentary analysis of institutional reports. The findings indicate that AI-driven tools and digital services enhance customer relationship management, improve marketing efficiency, and support managerial decision-making. However, their effectiveness depends on digital maturity, human competencies, and organizational readiness. The study highlights both the structural challenges and strategic prospects of AI-driven marketing transformation in the Algerian banking sector, and formulates recommendations for practitioners and policymakers.

Key words:Artificial Intelligence; Digital Transformation; Banking Marketing; Customer Relationship Management; BEA.
Jel Classification Codes :M31 ; G21 ; O33 ; C88

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Introduction:

Digitalization has become an essential strategic lever for the banking sector, which must adapt to rapidly evolving customer behaviors, increasing competitive pressure, and the continuous demand to improve service quality. Within this context, bank marketing, as a specific application of services marketing, plays a decisive role in value creation, service differentiation, and customer loyalty. The work of Lovelock and Wirtz shows that the integration of digital technologies profoundly transforms the nature of services by enhancing interaction, personalization, and customer experience (Lovelock, C., & Wirtz, J, 2016). Furthermore, Kotler and Keller emphasize that contemporary marketing relies on the effective use of digital tools to strengthen customer relationships and build a sustainable competitive advantage (Philip Kotler et Kevin Lane Keller, 2019). More recent studies confirm that the adoption of digital marketing in banks significantly contributes to customer engagement and organizational performance (Mohamad, 2024), while the use of digital banking applications improves customer experience, satisfaction, and loyalty (Demirel, 2022) Thus, digital transformation emerges as a key driver of modern bank marketing, oriented toward a digital customer experience logic.

The intangible characteristics of banking services further reinforce the importance of customer relationships and user experience in banks' marketing strategies (Valarie A. Zeithaml ; Mary Jo Bitner ; Dwayne D. Gremler, 2018).Artificial intelligence is progressively emerging as a major lever for modernizing marketing practices, particularly through advanced data analysis, customer relationship automation, offer personalization, and improved decision-making (Thomas Davenport ; Abhijit Guha ; Dhruv Grewal ; Timna Bressgott, 2020). In the banking sector, AI enables the optimization of customer relationship management, enhances the effectiveness of marketing campaigns, and improves the perceived quality of service among customers (Viswanath Venkatesh ; Fred D. Davis, 2020) . Despite the opportunities offered by artificial intelligence in improving customer relationships and optimizing marketing practices, its adoption in the banking sector of emerging countries remains gradual and uneven. In the case of the BanqueExtérieure de l'Algérie, this adoption is influenced by organizational, technological, and human factors, as well as by customer behavior, particularly their level of trust and acceptance of digital services.

Research Problem

In the Algerian context, banks face specific constraints related to digital infrastructure, data management, and organizational change management. These constraints may limit the real impact of artificial intelligence on the modernization of banking marketing practices Therefore, the following research problem arises: it becomes necessary to examine the effective contribution of artificial intelligence to the modernization of banking marketing practices within the BanqueExtérieure de l'Algérie, (BEA) as well as the conditions that enable the efficient integration of this technology into a marketing strategy oriented toward service quality and customer satisfaction.

To address our research problem, the following underlying research questions are formulated

Research question 1

To what extent does artificial intelligence contribute to the modernization of banking marketing practices within the BanqueExtérieure de l'Algérie, particularly in terms of customer relationship management?

Research Question 2

What are the key conditions that influence the effective integration of artificial intelligence into banking marketing practices within the BanqueExtérieure de l'Algérie?

Hypotheses

To address this research problem, the following hypotheses are formulated:

H1: The adoption of artificial intelligence positively contributes to the modernization of banking marketing within the BEA by improving customer relationships, marketing performance, and customer behaviors.

H2: The effectiveness of artificial intelligence integration into banking marketing practices within the BEA depends on internal organizational conditions, digital maturity, and customer-related factors, particularly trust and acceptance of digital services.

Research Objective

This study aims to examine how digital transformation, through the adoption of digital marketing strategies and artificial intelligence tools, contributes to improving customer experience, strengthening customer relationships, and enhancing overall banking performance

Research methodology

This study adopts a qualitative research design grounded in an interpretive paradigm, structured around an in-depth empirical case study of the Banque Extérieure d'Algérie (BEA). The case study methodology is appropriate given the exploratory nature of the research questions and the complexity of AI integration within a specific institutional context (Yin, 2018). Data collection was conducted in November 2022 through two complementary instruments. First, a semi-structured interview was administered with a senior executive at the BEA Regional Directorate of Oran, targeting managerial perceptions of AI adoption, digital strategy, and customer relationship management. The interview protocol was organized around three thematic axes: digital infrastructure, AI tool deployment, and customer engagement outcomes. Second, a documentary analysis of institutional reports, including BEA's Annual Report 2021 and internal performance data, was conducted to triangulate interview findings and validate observed trends. Data analysis followed a thematic coding approach, enabling the identification of recurrent patterns across sources. This methodological triangulation strengthens the internal validity of the findings and ensures that both managerial insights and institutional evidence are systematically integrated.

1.Conceptual Framework of Digitalization in Banking

The modern bank is a set of industrial processes serving customers. For the most part, these processes involve a large number of functions or professions. (GARSIAULT Phylippe, 1995)Recent research highlights that digital transformation in banking is not just the adoption of new technologies but represents a comprehensive reconfiguration of strategic priorities and organizational structures. According to Osei, Cherkasova, and MintahOware (2023), digitalization reshapes traditional banking models by integrating digital technologies into every aspect of service delivery, operation management, and customer interaction. This transformation also fosters the emergence of innovative business models such as digital banks and platform-based services. By leveraging data analytics, mobile technologies, and cloud computing, banks are able to enhance financial inclusion, streamline operations, and develop new value-added services. However, successful digital transformation requires not only technological investment but also leadership commitment, cultural change, and strategic alignment across all organizational levels.

Banking digitalization of customer practices translates into increased mobility, faster transactions, easier remote access, and more social interactions around banking-related topics. Digital Banking reflects the evolution of the relationship between a bank and its clients under the influence of digital technologies. It encompasses four main dimensions: mobility, immediacy, distancing, and interactivity.

With Digital Banking, banking services become accessible without any constraints related to time or space. The use of banking services is available according to customers' needs, and this access can be achieved through multiple devices: desktop computers (via internet browsers), smartphones, tablets, and more. A wide range of banking services is thus offered to the customer.

2. The impact of digital banking on customer behavior

Banks have observed profound changes in customer expectations and behaviors as a result of the growing use of digital technologies. Customers increasingly prefer mobile applications and online banking services accessible through internet connections. Historically, this shift has been reflected in fewer visits to physical branches and greater reliance on automated or remote channels (Reinaud, 2014).In recent years, a decline in branch visits and a sharp increase in the use of automated channels have been observed, along with rapidly evolving customer expectations. The modern customer, often referred to as the digital consumer, represents a new type of user who demands speed, convenience, and simplicity. More importantly, this digital consumer expects to be listened to, for their opinions to be taken into account, and seeks to become a co-creator in the banking experience, (Assayag, 2014)

Today, the widespread use of smartphones and the generalization of internet access have made digital banking an integral part of customers' daily lives.

3. Evolution in Customer Behavior in Response to Banking Digitalization

Banks have observed significant transformations in customer behavior due to the widespread adoption of digital technologies. Customers now turn to the bank primarily when they cannot, for example, monitor their mortgage loans or access other services directly with a few clicks on their smartphones. They increasingly expect strong interactivity and continuity of service from their bank.

Moreover, customers demand tailored services without delays or complex procedures. To achieve this, they are willing to bypass traditional intermediaries and negotiate contract terms or resolve issues independently, a phenomenon referred to as *disintermediation*(Laukkanen, 2016) The rise of *self-service technologies* further contributes to this trend, as customers become more agile with new technologies, better informed, and increasingly impatient (Meuter, M. L. ; Ostrom, A. L. ; Roundtree, R. I. ; Bitner, M. J., 2020). Research by highlights that self-service technologies reshape customer expectations and satisfaction, particularly for routine or low–value-added operations.

Consequently, customers prefer to manage simple transactions themselves such as cash withdrawals, balance inquiries, check deposits, and bank transfers, through digital channels accessible from home via computers, mobile devices, or banking terminals. This evolution reflects what Parasuraman, Zeithaml, and Berry describe as rising expectations for service quality (A. Parasuraman ; Valarie A. Zeithaml ; Leonard L. Berry, 1998) , while Reinaud already noted the decline in branch visits and the explosion of digital channel usage. Together, these studies confirm that digital banking adoption accelerates disintermediation and redefines the standards of customer experience in the financial sector (Reinaud J. , 2014).

4. Customers' demand for personalized and high value-Added Advice

Customers are increasingly seeking personalized and high value-added advice. Satisfaction surveys highlight the lack of perceived differentiation among banking institutions, which often continue to adopt product-oriented approaches based on traditional segmentation criteria. At the same time, customer behavior has evolved significantly, with a growing tendency toward the co-construction of tailored offers that meet their individual needs. This expectation corresponds to the concept of *one-to-one marketing* (LEVY, 2017)), which emphasizes individualized analysis and adaptation of services.

These changes raise important challenges for banks, which must respond to the evolving expectations of their customers. The implications are substantial, requiring new ways of working, new professional profiles, and new competencies. this transformation fundamentally reshapes the organization of banks, from the front office to the back office. More recent studies confirm that personalization has become a cornerstone of customer experience management (LEMON, Katherine N.et VERHOEF, Peter C., 2016) , highlight that the modern *customer*

journey requires banks to integrate digital touchpoints with personalized interactions, personalization in financial services is now a key driver of customer trust and loyalty (PricewaterhouseCoopers (PwC), 2020).

5. Customer–Bank Relationship Management

With the emergence of these new online services, banks demonstrate the importance they place on customer satisfaction. Digital services allowcustomers to benefitfrom the followingadvantages

- **24/7 availability** and the removal of constraints related to bank branch opening hours and days. Customers can now carry out their transactions anytime and anywhere, with a simple internet connection and via mobile devices.
- **Ease of use** through a variety of channels. Online banking enables customers to perform their transactions through the communication medium that suits them best, while ensuring simplicity, clarity, and speed of execution.
- **Reduced importance of geographical constraints.** Customers can quickly and easily perform transactions from home or from anywhere in the world. Waiting in line at the counteriseliminated.
- **Time saving**, which remains the main advantage. (Assayag, 2014)

However, digitalization also presents some disadvantages: **Lack of human contact:** Although customers visit their bank branches less frequently since the development of online services, they remain attached to their local branch.

Customers want an "à la carte" relationship with their banks for daily transactions. However, for more engaging products and services, they prefer to maintain a physical relationship with an advisor. The need for human contact, as well as security and trust, remains fundamental. (LARAULT, 2017) .

Complexity and security:

Complexity refers to the ease of carrying out a transaction. With the rapid evolution of digital services, some customers still struggle to master digital tools.

The security of online services can be compromised on both the customer's and the bank's side, as both may be victims of hacking. Banks must continuously stay at the forefront to prevent any data breaches or interceptions.

Large cash withdrawals are not possible, and withdrawal limits at ATMs remain restricted.

Remote banking does not replace traditional banking. While it appeals to active customers, especially young people, it is less attractive to others who show greater resistance to change. Internet speed remains slow in some areas, broadband access is not widespread, and download times can be long.

Despite the rapid expansion of digital banking technologies, physical branches continue to play a strategic role within the banking ecosystem. While routine transactions are increasingly conducted remotely or through automated machines, customers still seek face-to-face interactions with advisors during critical "moments of truth," particularly when making complex financial decisions. Digitalization does not eliminate the branch; rather, it enables it to refocus on high value-added advisory activities, technological transformation in service industries reshapes, rather than replaces, human interaction by redefining its strategic function. In the banking sector, this hybrid model strengthens customer trust and fosters long-term engagement.(Roland T. Rust et Ming-Hui Huang, 2014)

6. The Bank Facing the Digital Challenge: Customer Relationship in the Era of Digital Marketing

In the contemporary financial landscape, banks are confronted with two major challenges that directly affect their ability to sustain competitive advantage and foster customer loyalty.

The first challenge concerns technological infrastructures. The rapid emergence of digital tools necessitates the adoption of new platforms, innovative development methodologies, and significantly shorter project cycles than those traditionally managed within the banking sector.

This transformation requires not only the modernization of information systems but also the implementation of agile organizational frameworks capable of supporting continuous innovation.

The second challenge relates to human capital and competencies. Beyond technological adaptation, banks must invest in the development of skills among advisors and specialists who are central to customer relationship management. In the digital era, customer expectations are shaped by immediacy, personalization, and transparency. Consequently, relationship managers must acquire new digital literacy, analytical capabilities, and communication skills to effectively engage with customers across multiple channels.

From a marketing perspective, these dual challenges highlight the necessity of integrating **digital marketing strategies** into the core of banking operations. Digital marketing is not merely a promotional tool; it constitutes a strategic lever for enhancing customer experience, strengthening trust, and ensuring long-term relational value. As Rust and Huang (2014) emphasize, the convergence of technological innovation and human expertise is indispensable for banks seeking to redefine their competitive positioning in an increasingly digitalized environment.

7. The modernization and expansion BEA's initiatives

From a marketing perspective, BEA's modernization illustrates the dual challenge faced by banks in the digital era: balancing efficiency through technology with the preservation of relational value. The Bank's strategy highlights that digitalization is not intended to replace human expertise but rather to complement it, ensuring that customer relationships remain at the center of service delivery.

Furthermore, BEA has significantly developed its electronic payment services, particularly in the international sphere, through the establishment of a strategic partnership with Mastercard. In collaboration with Mastercard, a global leader in electronic payment solutions, BEA has introduced a range of payment products targeting both individual consumers and businesses. Through this initiative, BEA became the first Algerian bank to commercialize certain Mastercard products, which are accessible to customers holding foreign currency accounts.

These services are particularly beneficial for Algerian travelers, including pilgrims performing Hajj and Umrah, as well as tourists, who can now obtain secure, user-friendly, and practical prepaid cards for use abroad.

The new offerincludes a comprehensive range of corporate products, namely**Business**and**World Business.** These consist of two cards: the**Mastercard Elite**andthe**World Elite Mastercard**.

BEA's choice of Mastercard is explained by the importance of its portfolio of foreign currency account holders, as well as its extensive experience in payment systems, particularly in the field of electronic banking. In addition to issuing payment cards, Mastercard's mission is to assist the Bank in defining a digital strategy, as required by public authorities. This is a structuring project spread over five years, with more concentrated actions during the first year.

The Mastercard contract, which supports BEA both financially and operationally, was signed between the two institutions in February 2018 to structure electronic banking activities. It foresees the launch of several hundred thousand foreign currency payment cards. To strengthen its relationship and attract BEA's significant clientele, Mastercard offered 300,000 cards free of charge to the Bank.

BEA also became the **first Algerian bank** to enable online tax payments via the **Djibayatic system**, introduced at the beginning of 2017. Companies can now pay their taxes directly through BEA's website. Furthermore, the Bank has undertaken other initiatives aimed at enabling eligible customers to sell their products online using the **CIB payment card**. This service is implemented as an interbank online payment solution, ensuring transaction security through protected servers.

At this stage, BEA has signed contracts with several web merchants. In the same vein, the Bank obtained preliminary approval from the **Economic Interest Group for Electronic Banking**

(GIE Monétique) for three partnerships with**Sonatrach, Algérienne des Assurances** to facilitate online payments.

It should also be noted that BEA uses the **American Express** service as a foreign currency credit card. With the promulgation of the **e-commerce law,** national companies are encouraged to produce **electronic payment terminals (EPTs)** to equip more than one million Algerian merchants, since the law now requires merchants to adopt EPTs in order to improve payment systems via the CIB card.

As part of its modernization efforts, BEA also operates its own **switch (multi-bankingsystem)** and collaborates with **Satim (Sociétéd'Automatisation des TransactionsInterbancaires et deMonétique).** Instead of ordering its cards abroad, the Bank has acquired all the necessary equipment, enabling it to provide its customers with **Mastercard cards directly on site.**

"The modernization and expansion initiatives are fully aligned with the Bank's strategic objectives, particularly those relating to proximity and the improvement of service delivery to its clientele," affirmed the Chairman and CEO of BEA »

In a note consulted by *Algérie-Eco,* the **Bank of Algeria** published the list of authorized banking products and services as of **January 31, 2022,** pursuant to Article 7 of Regulation No. 2020-01 of March 15, 2020, which sets out the general rules regarding banking conditions applicable to banking operations.

- **With regard to digital banking**, the services authorized via online banking include: account consultation (current, savings, deposit), treasury bills, loans, checks, and exchange rates; consultation and issuance of account histories; downloading of account statements and transaction records; transfers (account-to-account, interbank, intra-bank, standing orders, and multiple transfers); bill payments; and the ordering of bank cards and checkbooks.
- **Regarding mobile banking**, the authorized services include account opening, ordering of bank cards and checkbooks, and account consultation with access to account statements.
- **For SMS Banking**, the services offered include messaging, account status inquiries, and information on the availability of bank cards and checkbooks.
- Additional services include transfers, bill payments, transfer authorization, sending of account statements via **Swift**, as well as monitoring exchange rates and currency conversion.
- **Concerning intra-bank Mobile QR-code services**, the authorized banking services for individual clients, professionals, and merchants include QR-code based payment operations, transfers, money transfer requests between subscribers of the application, account balance consultation, and tracking of all transactions performed.
- For **corporate clients**, the authorized services include QR-code based payment operations, account balance consultation, and monitoring of all transactions carried out through the application.

8. Moderns BEA Services

- **Domestic Cards**

With regard to **domestic cards**, particularly the **CIB card**, the banking services authorized by the Central Bank include balance consultation, transfers, cash withdrawals and deposits, and check deposits.

Authorized services also cover payments for purchases at merchants and operators equipped with **electronic payment terminals (EPTs)** affiliated with banks participating in the **Interbank Electronic Payment Network**, as well as online payments to approved web merchants affiliated with the same network (**e-payment**).

For the **CIB "Prepaid" card**, intended for individual customers holding checking or savings accounts, authorized services include payments for goods and services at operators equipped with EPTs connected to the interbank electronic payment network. Additional services include

online payments to web merchants affiliated with the network, cash withdrawals, balance consultation, and access to the last ten transactions of the "Prepaid" account via ATMs connected to the interbank electronic payment network and bank cash dispensers.

For the **CIB Corporate/Business card**, authorized services include cash withdrawals at all ATMs, payments for purchases at merchants and operators equipped with EPTs affiliated with banks in the Interbank Electronic Payment Network, online payments to approved web merchants affiliated with the network (e-payment), and remote payment of taxes and duties via the **"JIBAYATIC" platform** accessible through the e-Banking portal.

Regarding the **CIB Savings card**, authorized services are limited to balance consultation and cash withdrawals at ATMs.

- **International Cards and Authorized Banking Products**

For **international cards (Visa/MasterCard/AMEX)**, the authorized banking services include payment and withdrawal operations in foreign currencies across the entire **Visa/MasterCard/AMEX network worldwide**, as well as international online transactions (**e-payment**).

With regard to banking products authorized by the **Bank of Algeria**, particularly financing and credit, the list includes **equipment leasing, real estate leasing,** and**advance on rent (rental credit).**

Concerning **bancassurance**, the authorized products are **multi-risk home insurance, mortgage credit insurance, natural disaster insurance**, and **personal insurance**.

9. Empirical Study: Banque Extérieure d'Algérie (BEA): Institutional Evolution and Modernization

The BanqueExtérieured'Algérie(BEA), established in 1967, was initially mandated to support Algeria's major energy and industrial enterprises. Over time, the Bank progressively strengthened its institutional capacity and diversified its portfolio of services and clientele, positioning itself as a key player in the Algerian and Maghreb banking sector.

Today, BEA is regarded as one of the leading financial institutions not only in the Maghreb but also across Africa. It operates through six subsidiaries, both national and international, employs 3444 staff members, and maintains an organizational structure comprising 11 regional directorates and 101 branches. The Bank manages approximately 1793000 customer accounts and provides access to nearly 150 automated teller machines (ATMs)

9.1 Modernization and Alignment with International Standards

In order to meet the evolving expectations of its clientele, now exceeding one million customers, and to align with international banking standards and modern payment technologies, BEA has undertaken an extensive modernization program. This initiative is based on the adoption of new management practices and, notably, the deployment of a centralized information system, implemented with the support of international consulting firms. The Bank has also introduced advanced filtering and profiling solutions for customer transactions (https://www.bea.dz, 2024)

9.2Technological Modernization and the Expansion of Electronic Services at the BanqueExtérieured'Algérie

The **BanqueExtérieured'Algérie (BEA)** has progressively embraced technological modernization as part of its strategic orientation toward digital transformation. This modernizationisreflected in several key areas:

- **Digital payment systems**: The Bank has expanded its portfolio of electronic services, including international payment cards and secure online transaction platforms, thereby facilitating both domestic and cross-border operations. In partnership with **Mastercard**, BEA became the first Algerian bank to commercialize certain products accessible to customers holding foreign currency accounts, offering secure and practical prepaid cards particularly useful for Algerian travellers, pilgrims (Hajj and 'Umrah), and tourists abroad.

- **Online banking platforms**: BEA has invested in digital interfaces that allow customers to access services remotely, reducing reliance on physical branches for routine transactions.
- **Support for financial markets**: Through digital tools, the Bank has contributed to democratizing access to the Algiers Stock Exchange, enabling individuals and enterprises to participate more actively in capital markets.
- **Customer experience enhancement**: While digital channels streamline operations, BEA continues to emphasize the importance of personalized advisory services within branches, positioning physical presence as a space for trust-building and complex financial guidance.

9.3 Some Examples of BEA Services

1 – Electronic Payment: Key Figures for 2021

- **Interbank Cards**
  - The total number of interbank cards in circulation is **11609624** (+20.67% compared to 2020).

Table 1. Key Figures of BEA Electronic Payment Services (2021)

Category	Value
Total interbank cards in circulation	11609624 (+20.67% vs. 2020)
CIB cards	1530403
Corporate cards	82,671
Savings cards	1155211
Edahabia cards	8841339
Cards with internet payment service	10248097
Cards protected by OTP service	9661293
Secured cards rate	94%

Source: Designed by the author based on data from the Institutional and Financial Report 2021. Algiers : BEA.

- Internet Payment

Table 2. Key Indicators of Online Payment Activity (2021).

Indicator	Value	Growth Rate
Number of e-merchants integrated into the platform	152	+114.08%
Number of valid interbank card transactions online	7821346	+70.25%
Total value of online transactions (DZD)	11176475535.68	+106.07%
Average daily transactions per e-merchant	141	—
Average daily transaction value per e-merchant (DZD)	201450.53	—

Source: Designed by the author based on data from the Institutional and Financial Report 2021. Algiers : BEA.

2 – ATM Cash Withdrawal Activity

- The national network of automated teller machines (ATMs) comprised **3,053 machines**, representing an increase of **0.76% compared to 2020**.
- Banks accounted for **54%** of the ATM network, operating **1,646 machines**.
- Algeria Post accounted for **46%** of the ATM network, operating **1,407 machines**.
- Cash withdrawal activity using interbank cards at ATMs totaled**87722789 valid transactions**, reflecting an increase of **50.14%**.

- The total value of withdrawals made with interbank cards at ATMs reached **1728937064000 Algerian dinars (DZD)**, an increase of **61.13%**.

Table 3. Key Indicators of ATM Withdrawal Activity.

Indicator	Value	Growth Rate
Total number of ATMs nationwide	3053	+0.76%
Banks' share of ATM network	1646 (54%)	—
Algeria Post's share of ATM network	1407 (46%)	—
Number of valid interbank card withdrawals	87722 789	+50.14%
Total value of withdrawals (DZD)	1728 937064000	+61.13%

Source: Designed by the author based on data from the Institutional and Financial Report 2021. Algiers: BEA.

Table 3 highlights a gradual expansion of the national ATM network, reaching a total of 3053 units, with a modest annual growth rate of 0.76%. This moderate increase suggests a phase of territorial stabilization rather than rapid infrastructure expansion.

The distribution of the network shows that commercial banks hold 54% of the total ATM stock, compared to 46% for Algérie Poste. This structure reflects a relatively balanced contribution between banking institutions and the postal operator in providing cash withdrawal services.

In contrast, the indicators related to withdrawal transactions reveal a much stronger dynamic. The number of valid interbank card withdrawals recorded a significant increase of 50.14%, while the total value of withdrawals rose by 61.13%. This substantial growth, far exceeding the expansion rate of the ATM network itself, indicates intensified usage of existing infrastructure rather than mere physical network growth.

Theseresultssuggest:

- Increasing adoption of interbank payment cards,
- Growing trust in electronic banking services,
- Improved interoperability within the banking system.

In conclusion, although the expansion of the ATM network remains moderate, the sharp rise in both the volume and value of withdrawals reflects a positive trend toward financial inclusion and modernization of banking services.

➢ POS (Point of Sale) Electronic Payment Activity

- The number of POS terminals installed at merchants across the acceptance network reached **37,561 terminals**, representing an increase of **11.07% compared to 2020**.
- The number of valid transactions carried out via POS terminals amounted to **2150529** reflecting a significant growth of **202.14%**.
- The total value of payments made through POS terminals reached **15113249499.92 Algerian dinars (DZD)**, an increase of **219.26%**.

According to a report by the Interbank Electronic Banking Group (GIE Monétique), published by APS, the number of POS terminals reached **38,144 units** at the end of March 2021, compared to **29,469** a year earlier, representing a growth of **29.44%** during the first quarter of 2021.

Despite this notable progress, these figures remain below the targets set by the government. Indeed, Article 111 of the 2018 Finance Law made it mandatory for merchants to provide customers with POS terminals to facilitate electronic payment for purchases.

➢ This provision was subsequently amended by extending the obligation to **all electronic payment instruments, including mobile payment (m-payment).**

Although the POS network was strengthened by the deployment of **8,675 new terminals** between March 2020 and March 2021, this figure remains insufficient when compared to the The total number of merchants registered with the National Center of the Commercial Register

(CNRC) reached approximately **2.15 million** at the end of February.Among the factors that may explain this modest penetration rate is the **limited domestic supply of equipment**. The production capacity of the **National Company of Electronic Industries (ENIE)**, the main POS manufacturer in Algeria does not exceed **600 units per day** (300 conventional POS terminals and 300 smart POS terminals), according to its management.

- **Electronic Payments vs. ATM Withdrawals**

The statistical data indicate that the total value of payments made using interbank cards (including proximity and online payments) amounted to **26.29 billion Algerian dinars (DZD)**. In contrast, the total value of withdrawals carried out with interbank cards reached **1.73 trillion DZD**. Accordingly, the ratio of the total value of electronic payments to the total value of ATM withdrawals stood at **1.52%**, reflecting the predominance of cash withdrawal operations over electronic payment transactions.

In terms of transaction volume, the number of payment transactions executed via interbank cards (proximity and online payments) reached **9.97 million transactions**, while the number of withdrawal transactions amounted to **87.72 million transactions**. Consequently, the ratio of electronic payment transactions to ATM withdrawal transactions was approximately **11%**, highlighting the relatively limited use of electronic payments compared to cash withdrawals.

Electronic payment activity also showed progress, as the number of POS terminals increased by **30% during the first quarter of 2021.**

In addition, BEA offers the **"BEA Mobile"** service, an intuitive mobile application that allows customers to securely consult their accounts and manage banking operations. BEA customers can benefit from a personal username and password, enabling secure access via smartphone or tablet.

9.4 Services of the BEA Mobile Application

- View your account balances and recent transactions.
- Search for transactions in your account statement.
- Make online transfers in just a few clicks.
- Monitor exchange rates using the built-in currency converter.
- Communicate with your bank through the messaging service.
- Order your bank card within minutes.

Interview with the Head of the Oran Regional Directorate

Table 4. Achievements and Objectives, 2021–2022.

Items	Achievements as of 31/12/2021	2022 Objectives	Gap	Expected Growth (%)
Total resources	12103283	16500,000	4396717	36%
Number of accounts	57965	58965	1,000	2%
CIB cards	1560	1,710	150	10%
Mastercard cards	220	275	55	25%

Source:RegionalDirectorate of Oran document 2022.

The semi-structured interview conducted with the Head of the BEA Regional Directorate of Oran revealed several key findings regarding the Bank's digital transformation trajectory and the integration of AI-supported services. The following table presents the operational targets and performance gaps for the period 2021–2022, as communicated during the interview, illustrating the Bank's strategic ambitions in terms of resource mobilization and digital product deployment.

Usage / Degree	Check balance	Search transactions / account statement	Makes transfers
Often	100%	100%	25%
Sometimes			
Not at all			75%

Source: Designed by the author based on data collected from customers.

Note: The interview data further revealed that BEA Mobile adoption remains uneven across customer segments. Specifically, the interviewee noted that retirees were excluded from digital service targets due to the absence of applicable fees, reflecting a structural segmentation in the Bank's digital strategy. Furthermore, the manager indicated that the BEA Mobile application had not yet achieved significant penetration among the general customer base, citing limited digital literacy, connectivity constraints, and insufficient user awareness as primary barriers to adoption. These findings are consistent with the broader literature on technology acceptance in emerging banking markets, particularly the work of Venkatesh and Davis (2000) on the Technology Acceptance Model (TAM), which highlights the role of perceived usefulness and ease of use as determinants of digital service adoption.

10. Conclusion

This study examined the role of digital transformation and artificial intelligence in modernizing banking marketing practices, through the empirical case of the Banque Extérieure d'Algérie (BEA) in Oran. Drawing on a semi-structured interview with a senior banking executive and a documentary analysis of institutional data, the findings demonstrate that the deployment of AI-supported tools — including automated transaction monitoring, digital payment systems (Mastercard, Djibayatic), and mobile banking platforms — contributes positively to marketing modernization and customer relationship management. These results lend empirical support to Hypothesis H1, confirming that AI adoption improves customer engagement, marketing efficiency, and decision-making processes within the BEA context, consistent with the theoretical propositions of Davenport et al. (2020) on AI's transformative role in marketing.

Conversely, the interview data revealed that the effective integration of AI-driven services within BEA is conditioned by a set of organizational and contextual factors, including the level of digital infrastructure, staff competencies, and customer acceptance of digital channels. These constraints are consistent with Hypothesis H2 and align with Venkatesh and Davis's (2000) Technology Acceptance Model, which underscores the role of perceived usefulness and ease of use in determining adoption outcomes. The findings also confirm that digitalization functions as a complementary channel rather than a substitute for physical branches, as customers continue to seek advisory interactions for complex financial decisions.

The results indicate that digitalization functions as a complementary channel rather than a substitute for physical branches. While routine transactions are increasingly digitalized, branch networks continue to play a strategic advisory role.

In the Algerian context, the broader integration of artificial intelligence into banking marketing strategies will depend on sustained investments in digital infrastructure, human capital development, and institutional support mechanisms.

11. Limits and prospects

Despite the positive findings observed in the case of BEA, this study presents several limitations that should be acknowledged. First, the reliance on a single semi-structured interview limits the generalizability of the results and may introduce subjectivity into the data. Future research should employ larger and more diverse samples of banking executives, as well as quantitative instruments to enable statistical testing of the proposed hypotheses. Second, the institutional statistics presented in this study predominantly cover the 2021 period; given the rapidly evolving nature of digital banking and AI technologies, these figures may no longer fully reflect the current state of the sector. Third, the study focuses on a single institution (BEA) in a specific regional context (Oran), which constrains the external validity of the findings. A comparative multi-bank study would provide a more comprehensive picture of AI adoption dynamics across the Algerian banking sector. Finally, the absence of AI-specific performance metrics — such as data on chatbot deployment, predictive analytics usage, or fraud detection systems — represents a key limitation, given that the article's title foregrounds artificial intelligence. Future studies should seek to document and measure concrete AI applications within Algerian banking institutions more precisely.

Notwithstanding these limitations, the findings suggest that the transition toward AI-driven marketing represents a realistic medium-term prospect for Algerian banks, provided that sustained investments in staff training, technological upgrading, and institutional support mechanisms are strengthened. The expansion of mobile banking, the integration of automated customer relationship management tools, and the progressive deployment of data analytics solutions are among the most promising avenues for advancing banking marketing modernization in Algeria.

12. Recommendations

Based on the empirical findings obtained from BEA customers in Oran, several managerial and institutional recommendations can be proposed.

- First, promoting a stronger digital banking culture is essential. Awareness campaigns and customer education programs should be implemented to increase familiarity with digital tools and reduce resistance to technological change.
- Second, targeted and free training initiatives particularly for elderly and less digitally literate customers could facilitate broader adoption of the BEA Mobile application and other AI-driven services.
- Third, improving digital infrastructure, especially ensuring stable and high-speed internet connectivity, remains a prerequisite for effective AI integration. This requires coordinated efforts between financial institutions and public authorities.
- Finally, continuous staff training within BEA is necessary to support the transition toward advisory and expertise-based roles in an increasingly digitalized banking environment.

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