

Adoption of Artificial Intelligence in the Banking Services Sector: An Analytical Reading of International Indicators and Trends

تبني الذكاء الاصطناعي في قطاع الخدمات المصرفية: قراءة تحليلية في المؤشرات والاتجاهات الدولية

Safia derrouiche*, University of Jijel (Algeria), derrouiche.safia@univ-jijel.dz

Abdelhafid meskine, University of Jijel (Algeria), ah.meskine@univ-jijel.dz

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Abstract:

This scientific paper aims to analyze the international indicators and trends related to the adoption of artificial intelligence technologies in the banking services sector, as one of the most prominent drivers of digital transformation in the modern financial industry. By examining international data, it has become clear that the volume of international investments in this field is continuously increasing and growing rapidly, whether in the areas of risk management, predictive analysis, fraud detection, or intelligent customer service. The analysis also indicates that adopting its applications contributes to enhancing operational efficiency, improving service quality, and reducing financial risks, in return for challenges related to cybersecurity, governance, and transparency. The article concludes that achieving safe and sustainable adoption of artificial intelligence requires effective regulatory frameworks and balanced strategies that combine innovation with corporate responsibility.

Keywords: Artificial Intelligence; Banking Services; International Indicators.

JEL Classification Codes: G21; G28; O33; E58; L86.

I- Introduction :

The global banking services sector is witnessing a profound and rapid transformation driven by successive developments in the field of artificial intelligence, which has today become one of the most prominent drivers of innovation and change in the modern financial industry. With the acceleration of digital transformation, the expanding use of smart technologies, the increasing volume of financial data, and the growing complexity of banking operations, the adoption of artificial intelligence is no longer a technical option but has become a strategic necessity through which banking institutions seek to enhance their operational efficiency, improve the accuracy of decision-making, and strengthen the quality of their services in line with the aspirations of modern financial markets.

*Corresponding author

Banking institutions around the world have recognized this importance, realizing that artificial intelligence is no longer merely a supportive technological tool but has become a central element in building competitive capacity and ensuring financial sustainability. It is also an effective means of adapting to the dynamics of the international economic environment and its rapid changes. From this standpoint, this scientific paper aims to analyze the global indicators and trends associated with the adoption of artificial intelligence in the banking services sector. This is achieved by examining recent data and statistics issued by international financial institutions and specialized reports that monitor the development of this field, in order to clarify the features of the transformation taking place in the global banking system in terms of the level of adoption of artificial intelligence technologies, their areas of application, and their impact on financial and operational performance. The paper also observes the most important factors that contribute to either enhancing or limiting this adoption, and explores the mechanisms that ensure a safe and sustainable adoption of these technologies in a way that balances innovation with regulatory and technical risks. It attempts to answer the following main question:

What is the reality of adopting artificial intelligence technologies in the international banking services sector, and to what extent do their applications affect the performance of this sector?

I.1.Study Importance

The importance of this study lies in analyzing the international indicators and trends that highlight the growing role of artificial intelligence in developing the banking sector, as a strategic tool for achieving operational efficiency and enhancing financial innovation. It also seeks to clarify the regulatory and security dimensions associated with the adoption of these technologies, in a way that supports decision-makers in pursuing a safe and sustainable adoption of artificial intelligence in banking services.

I.2.Study Objectives

This study seeks to achieve the following objectives:

- Conceptual understanding of artificial intelligence in the banking sector;
- Analyzing the reality of adopting artificial intelligence technologies in the international banking services sector;
- Monitoring international trends that reflect the trajectory of artificial intelligence development in the banking industry;
- Analyzing the impact of artificial intelligence applications on the performance of the international banking sector;
- Proposing practical recommendations to enhance the safe and sustainable adoption of artificial intelligence technologies in the banking sector.

I.3.Study Methodology

The study relies on the descriptive and analytical method to describe the reality of adopting artificial intelligence technologies in the international banking sector and to analyze the international trends and indicators that reflect the level of spread of artificial intelligence applications and their impact on the performance of banking institutions. It also adopts a spatial comparison approach to highlight differences between various regions, in order to draw general trends and understand the dynamics of digital transformation in the banking sector globally.

II- Theoretical Background on Artificial Intelligence in the Banking Sector

II.1. Definition of Artificial Intelligence

Artificial intelligence is considered one of the most important modern technologies that significantly contribute to rapid technological development and increase opportunities for innovation and growth in various fields ([Jawhar, 2024, p. 88](#)). In English, artificial intelligence is referred to as “Artificial Intelligence” and is sometimes called “machine intelligence,” and it is abbreviated as (AI). It is a branch of computer science and one of the fundamental pillars upon which the technology industry is based today. The term artificial intelligence (AI) refers to systems or devices that simulate human intelligence to perform tasks and that can improve themselves based on the information they collect ([Yasmine, 2022, p. 1115](#)). Among the definitions of artificial intelligence are:

- Artificial things are described as those created or generated by humans rather than existing naturally. Artificial intelligence (AI) is the process of simulating human intelligence in computers designed to think and act like individuals. It also refers to any computer that displays human-like characteristics such as understanding and problem-solving ([Gururaj, 2021, p. 170](#)).
- “FeigenbaumBar” defines artificial intelligence as a part of computer science concerned with designing intelligent computer systems characterized by properties similar to those of humans, including language understanding, learning, and problem-solving ([Saadia & Jamal, 2024, p. 98](#)).
- Artificial intelligence consists of two words: the first is “intelligence,” which means the ability to know, understand, and think; the second is “artificial,” from the verb “to fabricate,” referring to anything made in an unnatural way. Artificial intelligence differs from traditional software by its ability to learn and adapt through data analysis and its use in decision-making ([Rachida & Abdelwahab, 2024, p. 49](#)).
- Copeland & Proudfoot define it as “the process of developing computer systems so that they are capable of performing tasks that usually require the use of human intelligence, such as visual perception, speech recognition, decision-making, and translation.”
- Marvin Lee Minsky defines it as “the construction of computer programs that engage in tasks that are satisfactorily performed by humans, because they require high-level

mental processes such as cognitive learning, memory organization, and critical thinking.”

- Artificial intelligence is also defined as specific behaviors and characteristics possessed by computer programs that make them simulate human mental abilities and working patterns. Among the most important of these characteristics are the ability to learn, infer, and react to situations not programmed into the machine. Artificial intelligence also refers to systems that display intelligent behavior through analyzing their environment and taking actions—with a certain degree of autonomy—to achieve specific goals (Souad, 2022, p. 93).

From the above, it is observed that many researchers in the field of artificial intelligence have presented various definitions that can be categorized into three approaches. The first approach focuses on intelligence as a thinking process, making it a philosophical and intellectual perspective; the second approach emphasizes the behavioral aspect (Saadia & Jamal, 2024, p. 97); and the third approach focuses on the technical aspect, which can be summarized in the following table:

Table No. (01): Comparison of Artificial Intelligence Definitions According to Philosophical, Behavioral, and Technical Approaches

Approach	Main Focus
Philosophical (Thinking and Rationality)	Concerned with the machine’s ability to think like humans by simulating higher mental processes such as perception, memory, and critical thinking.
Behavioral (Performance and Tasks)	Focuses on outcomes and behavior: how the machine acts and performs tasks like a human, regardless of how it “thinks.”
Technical (Programming and Applications)	Focuses on tools and software: how systems and algorithms are built to process data, learn, make decisions, and adapt to new environments.

Source: Prepared by researchers

It is evident from the table above that the definitions of artificial intelligence are distributed among three main approaches. The philosophical approach focused on the mental and intellectual aspect through simulating human thinking, while the behavioral approach concentrated on the practical performance of the machine and its behavior in accomplishing tasks performed by humans. The technical approach, on the other hand, gave attention to the practical and programming aspect through the development of algorithms and intelligent systems capable of learning and decision-making. This diversity in approaches highlights the comprehensive nature of the concept and the difficulty of confining it to a single, inclusive definition, reflecting the multidimensional nature of artificial intelligence.

In light of this, it can be said that most theoretical definitions of artificial intelligence revolve around the machine’s ability to act like humans or to perform actions that require intelligence. However, the concept has undergone rapid development alongside technological progress, such that the convergence point between various modern definitions is the attempt

to simulate intelligent human behavior. From this standpoint, four main types of intelligent systems can be distinguished:

- Systems that think like humans;
- Systems that act like humans;
- Systems that think rationally;
- Systems that act rationally.

In general, artificial intelligence is defined as a set of efforts aimed at developing computerized information systems capable of thinking and acting in a manner similar to humans. These systems are able to learn natural languages, perform tasks in an integrated manner, use perceptual forms to rationalize behavior, and store human experiences and knowledge to support the decision-making process ([Rachida & Abdelwahab, 2024, p. 50](#)).

II.2. Characteristics of Artificial Intelligence

Artificial intelligence is distinguished by a set of characteristics that set it apart from traditional software. The most prominent can be summarized as follows ([Arulmurugan Ramu & Haldorai, 2023, p. 93](#)):

- **Simulation of human abilities:** Its ability to imitate human thinking and perform tasks that require intelligence, such as analysis, inference, and problem-solving;
- **Machine Learning:** Its ability to learn from data and previous experiences, and adapt to new developments without the need for explicit programming for each case;
- **Inference and decision-making:** The ability to process different data to extract accurate results that support decision-making;
- **Response to new situations:** Interacting with situations or problems it has not been previously programmed for, thanks to its ability to generalize and infer;
- **Integration between software and hardware:** It combines advanced algorithms and physical structures (hardware) to provide efficient performance;
- **Cognitive storage and processing:** The ability to store human knowledge and experiences and use them later in thinking and behavior processes;
- **Relative autonomy:** The ability to perform some tasks with a degree of independence without direct human intervention;
- **Continuous development:** Thanks to big data and the advancement of algorithms, artificial intelligence is characterized by a growing ability to improve its performance over time.

II.3. Types of Artificial Intelligence

Artificial intelligence varies according to the field in which it is used and the ways and methods of its adoption. Some divide it into two types: general artificial intelligence and narrow artificial intelligence, while others divide it into three types ranging from simple reaction to perception and self-interaction (Al-Asad, 2023, p. 168). In general, it is classified according to the following types (Ertbaz, 2022) (Rachida & Abdelwahab, 2024) (Ali & Khaled, 2024) (Fatiha & Jouida, 2024):

- **Weak AI:** This type is considered one of the simplest forms of artificial intelligence and is also called reactive machines. It is designed to perform a specific task or a set of tasks in a defined environment. A good example of this is the Deep Blue robot developed by IBM. However, this type does not have the ability to build a memory base to use for future predictions (ARGAAM, 2023).
- **Strong AI:** Also known as limited memory, this type is capable of thinking, analyzing, discussing information and ideas, and evaluating them like humans. It is supported by the database it possesses, the stored information, and past expectations and memories, which it integrates and uses for future predictions. Some experts expect that this type will emerge between 2030 and 2045, others predict it will be developed in the next century, while some believe it will never be developed at all (Al-Misawi, 2021, pp. 15-16).
- **Superintelligence:** This type is still under experimentation and consists of theoretical ideas that are being studied and tested. It can be divided into two types: the first is called self-awareness, which focuses on understanding human thoughts and emotions that are reflected in their behaviors. It has the ability to construct representations of itself, thus possessing consciousness. The second type is called theory of mind, which is the focus of scientists' future work. It is more advanced than limited memory; through this type, the machine can predict human emotions, situations, interactions, beliefs, and intentions.

Experts expect it to emerge by 2060. Scientists' opinions on this type of intelligence vary between support and opposition, considering it a potential danger to individuals and societal ethics, as the machine would almost entirely replace humans in all aspects (Al-Misawi, 2021, p. 16).

II.4. The Emergence and Development of Artificial Intelligence in the Banking Sector

The history of artificial intelligence began in ancient times through myths, stories, and rumors about artificial beings endowed with intelligence. The seeds of modern artificial intelligence were planted by classical philosophers who attempted to describe the human thought process as mechanical manipulation of symbols. This work culminated in the invention of the programmable digital computer in the 1940s, which inspired a group of scientists to seriously discuss the possibility of building an electronic brain (Yasmine, 2022, p. 1158). The development of artificial intelligence in the banking field can be summarized in the following stages:

Table No. (02): The Emergence and Development of Artificial Intelligence in the Banking Sector

Time Period	Event / Innovation	Features and Characteristics	Examples / Institutions
1967	Launch of the first ATM by Barclays Bank	Beginning of financial service digitization, facilitating access to money	Barclays Bank – United Kingdom
1970s	Introduction of card-based payments	Enhancing ease of payment and transfers, beginning of bank card adoption	Various commercial banks
2000	Wide expansion of online banking services	Providing remote services, increasing financial inclusion	Multiple global banks
2010	Emergence of mobile banking services	Enabling banking transactions via smartphones	Most major global banks
	Launch of smart banking services	- Fully digital banking branches - Interactive multimedia wall - Opening virtual accounts without paper documents - Video chat services	Citigroup Smart Bank – Tokyo
	Introduction of robots for customer service	Use of robots for direct interaction with clients	Santander – Spain
	Adoption of voice digital assistants	Use of Amazon Alexa as a digital assistant for customer service	UBS Bank
2020 (Post COVID-19 Pandemic)	Increased need for Artificial Intelligence in financial services	- Enhancing digital and automated services - Improving customer experience - Driving financial innovation	Multiple global financial institutions

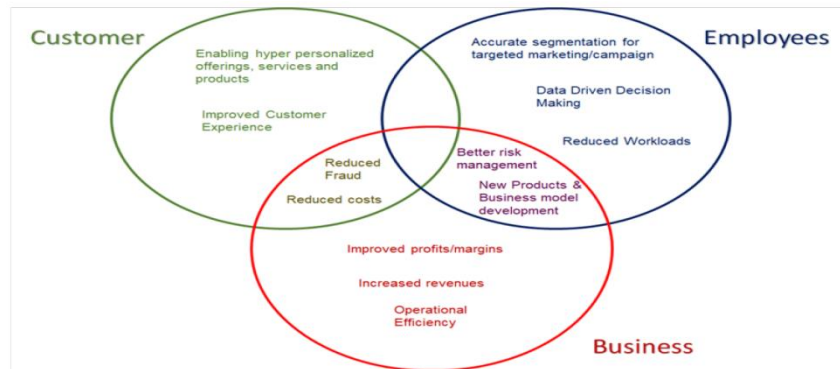
Source: Prepared by us based on: [\(Sedawi, 2024, pp. 209-210\)](#)

It is clear from the table above that the emergence of artificial intelligence in banks was gradual. It began with the digitization of banking services (ATMs, cards, electronic services), then moved to smart services (digital branches, robots, voice assistants), leading to the acceleration of adoption during the COVID-19 pandemic, where artificial intelligence became a central element in delivering innovative services and achieving financial inclusion.

II.5. The Importance of Artificial Intelligence in the Banking Sector

The banking sector has undergone a radical transformation as a result of adopting artificial intelligence technologies, as banking institutions view this technology as a strategic tool for achieving growth and enhancing competitiveness. The main benefits can be summarized in the following figure:

Figure No. (01): Benefits of AI for Various Stakeholders in the Banking Industry



Source:(Manjaly, 2021, p. 211)

This triple classification (Customers – Business – Employees) shows that the impact of artificial intelligence is not limited to a specific aspect of banking activity but extends to create comprehensive added value that affects all stakeholders:

- **Customers:** Artificial intelligence in the banking sector directly contributes to improving the customer experience by providing easy, fast, and accurate services, which enhances their trust and loyalty toward the financial institution. It also allows banks to offer highly personalized offers and services that suit each customer's individual needs through deep data analysis. In addition, artificial intelligence plays an important role in reducing fraud through intelligent systems capable of detecting unusual patterns and suspicious operations in a short time, which also reduces operational costs by automating many tasks and minimizing the need for manual intervention in transactions.
- **Employees:** Artificial intelligence is an effective tool to support employees in the banking sector, as it enables precise customer segmentation for efficient and effective marketing targeting, which increases response rates and reduces resource waste. It also facilitates decision-making and provides accurate insights that support employees in managing daily operations and formulating long-term strategies. In addition, intelligent automation solutions reduce the burden of routine work, allowing employees to focus on value-added tasks and enhancing their productivity within the institution.
- **Business/Institution:** Artificial intelligence represents a strategic lever for banking operations, as it contributes to improving profits and profit margins by maximizing resource efficiency and reducing unnecessary expenses. It also increases revenues by introducing innovative marketing and sales channels and opening up new avenues for providing financial services. Moreover, the application of AI technologies enhances operational efficiency by automating routine processes and speeding up transactions. It

also strengthens risk management through predictive analytics tools capable of detecting unusual patterns and forecasting potential crises before they occur. The impact extends further to developing new products and business models that align with digital transformations and future customer needs, ensuring sustainable competitiveness in the banking market.

Conversely, the overlapping areas between customers, employees, and businesses reveal shared dimensions that reflect the real added value of adopting artificial intelligence in the banking sector. The intersection between customers and businesses manifests in reduced costs and lower fraud rates, which strengthens client trust and achieves financial savings for the institution. The intersection between employees and businesses highlights the pivotal role of artificial intelligence in improving risk management and developing innovative and sustainable business models and products. Meanwhile, the intersection between customers and employees enhances marketing accuracy and improves the customer experience by leveraging data-driven decisions, achieving functional integration that boosts the efficiency of the entire banking system.

Overall, it can be said that artificial intelligence in banks is not merely a technical tool directed at a single party, but rather achieves a clear threefold integration: on one hand, it enhances customer satisfaction; on the other, it relieves employees of burdens; and at the same time, it increases the operational efficiency and profitability of the banking institution as a whole, making it an indispensable strategic choice for the future of the banking industry.

III- Applications of Artificial Intelligence in the Banking Sector

The possibilities of applying artificial intelligence in the banking sector are multiple and wide-ranging. While some applications have reached a mature stage, many others are still under development. With future advancements, the number of use cases is expected to increase significantly. Currently, the most common applications are as follows ([Manjaly, 2021, p. 212](#)):

- **Risk Management and Fraud Detection:** Predictive analytics and algorithms are used to detect unusual activities and identify abnormal patterns in transactions, helping to prevent fraud and money laundering more quickly and accurately. They also assist in detecting and responding to cyber threats in real time to protect customer data and the financial system ([Qaboushi, 2018, p. 25](#)). In light of increasing regulations such as Basel III and the General Data Protection Regulation (GDPR), artificial intelligence has become a key tool for managing regulatory and operational risks. According to a study by the Arab Monetary Fund, estimates indicate that artificial intelligence algorithms helped enhance credit card fraud detection with a predictive capability exceeding 94 percent in 2023 ([Qaboushi, 2018, p. 25](#)). The Citi GPS report notes that AI-enhanced credit models can be customized by customer segments, sectors, or geographic regions, allowing for more accurate and tailored assessments. AI can also

continuously monitor borrower behavior and link it to major economic variables to adjust risk profiles in real time, helping to reduce defaults and improve credit portfolio quality.

- **Anti-Money Laundering Analysis:** Money launderers use banks to conceal the sources of their illicit funds. While banks have traditionally applied certain measures and regulations to combat money laundering, the technological advancement in the banking sector has led to the emergence of AI-based systems with high analytical capabilities, offering smarter and more accurate data analysis and anti-money laundering solutions (Abdelghani & Hajra, 2022, p. 312).
- **Credit Scoring:** Massive amounts of financial data are analyzed using alternative data models to determine creditworthiness with greater accuracy, thereby reducing lending risks. AI-powered automation is also used to streamline loan application processes and provide quick credit decisions for small and medium-sized enterprises (Sedawi, 2024, p. 214). According to the World Bank, these technologies enabled more than 250 million people worldwide to access loans for the first time between 2020 and 2024. Additionally, these models improved scoring accuracy by 40% compared to traditional methods.
- **Customer Service / AI Chatbots:** Many banks and financial institutions use chatbots to serve and communicate with customers, responding to their inquiries through digital platforms. These chatbots connect the client with the appropriate person to provide responses and solve problems quickly and efficiently. Banks also use chatbots to anticipate and identify customer needs and provide them with the necessary support. According to an OpenText report, AI-powered chatbots can offer 24/7 service and provide instant responses to 80% of routine customer inquiries, allowing employees to focus on more complex issues (Qarsham, 2024, p. 150). This not only improves operational efficiency and reduces costs but also raises customer satisfaction by providing quick and accurate answers to their requests and inquiries. An example is Bank of America's virtual assistant "Erica," which serves more than 50 million customers with an average of 58 million interactions per month.
- **Asset & Wealth Management:** Today, major investment firms rely on artificial intelligence for portfolio management and trading. Algorithmic trading currently represents 60% to 75% of trading volume in U.S. and European markets (Groette, 2024). Meanwhile, robo-advisors use AI to provide personalized investment recommendations, and institutions benefit from predictive models to analyze thousands of macroeconomic indicators for fast and accurate decision-making.

According to the "Autonomous Next Research" report published by Business Insider Intelligence, the amount of cost savings resulting from the use of AI in the banking industry is estimated at around 446 billion USD by 2023. However, selecting the appropriate use cases is a critical decision for each bank, depending on the problem or need the bank seeks to address, as well as the availability of the allocated budget.

IV-Challenges of Adopting Artificial Intelligence in the Banking Sector and Ways to Overcome Them

Adopting artificial intelligence in the banking sector is a necessary strategic step to keep pace with digital transformation and enhance competitiveness. However, this adoption does not occur smoothly, as banks face a set of obstacles, the most important of which are outlined below:

- **Data Privacy and Security:** Since AI systems rely on massive amounts of customer data, privacy and cybersecurity represent a critical challenge. Banks must implement strong protection measures and comply with continuously evolving data protection regulations.
- **Ethical Concerns and Bias:** Banks must ensure that AI systems are designed and trained to be fair and unbiased, avoiding discriminatory decisions, especially in sensitive areas such as credit granting.
- **Regulatory Compliance:** Banks must ensure that their AI-based systems comply with existing laws and be prepared to adapt to any new regulations that may be enacted.
- **Lack of Transparency:** Advanced machine learning models pose a challenge because they sometimes act as “black boxes,” making it difficult to understand how decisions are made. This lack of transparency can create regulatory compliance difficulties and weaken customer trust.
- **Skills Gap:** Implementing and managing AI systems requires specialized technical skills that are currently scarce in the market. Therefore, banks need to invest in training and recruitment to build the necessary capabilities.
- **Fear of the Unknown:** Many employees and customers feel concerned about the unknown impacts of AI, including fears of job loss or the replacement of human workers by machines. It is therefore essential to maintain transparent and continuous communication about how AI is used and its impact within financial institutions.

Overcoming these obstacles requires planned and systematic efforts. First, banks must accurately identify the obstacles, which may vary from one institution to another. Intangible factors such as culture, skills, and work style can be addressed through the implementation of change management models such as Kotter’s 8-Step Model or the ADKAR model. As for hard factors like organizational structure, systems, and strategy, they should be managed exclusively by the institution’s top leadership. Researchers have attempted to apply McKinsey’s 7S Framework to highlight the extent of institutional readiness for adopting change and integrating artificial intelligence in the banking sector at the global level ([Manjaly, 2021, p. 215](#)).

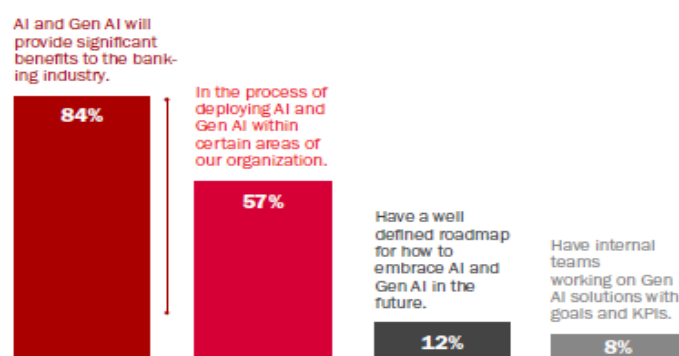
V-The Reality of Artificial Intelligence Adoption in the Banking Sector at the International Level

V.1. The Readiness of the International Banking Sector to Adopt Artificial Intelligence:

A case study on artificial intelligence in retail banking, conducted under the sponsorship of OpenText and covering more than 200 financial institutions around the world, illustrates

the extent of the financial sector's progress in adopting Artificial Intelligence (AI) and Generative Artificial Intelligence (Gen AI). The research findings showed that 84% of financial institutions believe that AI and Gen AI provide significant benefits to the banking services industry. On the other hand, only 12% of these institutions have a clear roadmap for implementing these technologies, while only 8% have internal specialized teams working on Gen AI solutions. Positively, the report indicated that 57% of institutions are currently in the process of implementing AI or Gen AI solutions within specific areas of their organizational operations. This is shown in the following figure:

Figure No. (02): The Readiness of the Banking Sector to Adopt Artificial Intelligence



Source: Digital Banking Report, 2024, p. 20

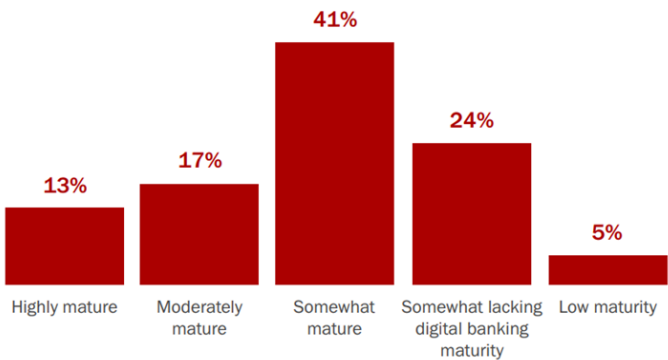
Despite the gap between theoretical potential and practical application, the large banks included in the study are ahead of their smaller counterparts in developing AI and Gen AI strategies. This is due to their possession of larger assets and broader budgets dedicated to innovation, as more than 40% of regional and global banks confirmed that they have a well-defined strategy for implementing these technologies, in addition to allocating a significant portion of their technology budgets to their development.

This readiness gap also indicates that many traditional banks and credit institutions may face difficulties in fully leveraging the benefits of artificial intelligence in the near term. This is due to challenges related to assessing individual use cases and allocating sufficient resources. However, despite these challenges, the commitment to keeping pace with progress and development in this field remains strong in most banking institutions, regardless of their size or category.

V.2. Rates of AI Adoption in the Global Banking Sector:

A survey conducted by Accenture (2024) on more than 500 financial institutions in 45 countries showed that 78% of banks and financial institutions have already begun integrating AI into at least one of their core functions, such as credit, compliance, or customer management. This percentage is expected to rise to 95% by 2030. The level of AI maturity in the banking sector can be illustrated in the following figure:

Figure No. (03): The Level of AI Maturity in the Global Banking Industry



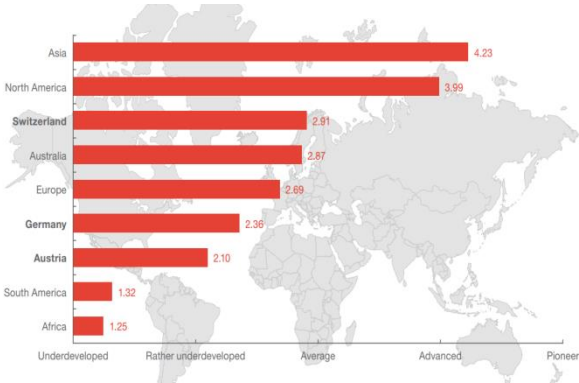
Source: Digital Banking Report, 2024

The figure above shows that the global banking sector is still in a transitional phase toward maturity in adopting AI, with a clear gap between ambitions and regulatory and technical preparedness. Only 13% of institutions have reached a high level of maturity, while 41% are at a partial maturity level. This dominant category reflects a partial and non-integrated reliance on AI technologies. These results indicate that the majority of banks are still in the pilot or limited application stage, whether in customer service or fraud detection, without reaching the stage of full strategic integration.

The low levels of AI maturity reflect the presence of structural challenges, the most prominent of which is a severe shortage of specialized expertise. 55% of banking institutions reported having weak or non-existent in-house AI skills, compared to only 14% that reported strong skills in this field. Therefore, strengthening internal training and strategic alliances are considered two critical elements to accelerate maturity and achieve sustainability in the smart transformation of the financial sector.

The following figure also shows that there are significant regional disparities in the level of AI adoption maturity within the global banking sector:

Figure No. (04): Regional Differences in AI Maturity in the Banking Sector



Source: PwC (2020). How mature is AI adoption in financial services? PwC Report

Asia and North America topped the ranking, reflecting clear progress in applying AI technologies and integrating them into banking operations. This lead is attributed to massive

investments in research and development, the adoption of digital policies that support innovation, and a focus on improving customer experience and smart automation in banking institutions.

Europe and the German-speaking countries (DACH region) such as Germany and Austria fall into the intermediate level of digital maturity, reflecting a more conservative approach to AI adoption due to strict regulatory constraints and a strong emphasis on compliance and ethical data use. Switzerland and Australia, on the other hand, show relatively better performance thanks to their advanced digital banking environments and investments in financial technology (FinTech).

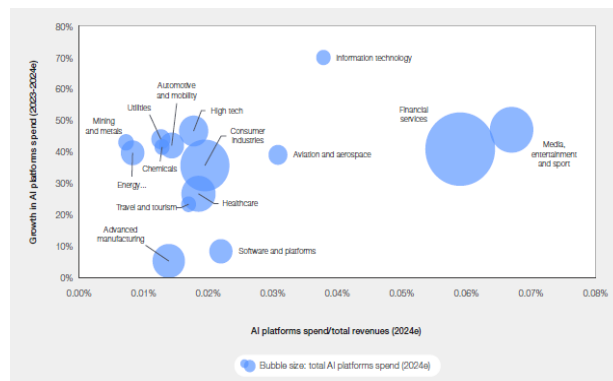
In contrast, South America and Africa recorded the lowest maturity levels, indicating a clear digital gap between these regions and the rest of the world. This lag is attributed to limited digital infrastructure, weak technical capacities, low investments in research and development, and a lack of specialized AI expertise.

This disparity clearly indicates that the shift toward AI has become a strategic necessity for banks in lagging regions, not only to enhance operational efficiency and reduce costs but also to ensure their ability to compete globally. Countries that are slow to invest in AI may face the risk of financial and technological marginalization in the near future.

V.3. The Volume of Banking Sector Spending on AI Applications

The following figure represents the relationship between the growth of AI spending and the percentage of spending from total revenues for each sector, while the size of the circles reflects the total spending on AI in each industry during 2024:

Figure No. (05): Volume of AI Spending by Economic Sector



Source: Artificial Intelligence in Financial Services, World Economic Forum, January 2025, p. 8

From the figure, the Information Technology sector tops the list in terms of the growth of spending on AI applications. The Financial Services sector ranks second in terms of the total volume of spending, reflecting its leading position in employing AI to improve customer experience, risk management, and operational efficiency. Traditional sectors such as energy, manufacturing, tourism, and healthcare show relatively lower growth rates, as they are still in the early stages of adoption.

It is natural for the financial sector to occupy a leading position in this field, as it is one of the most exploratory, investing, and rapidly applying sectors when it comes to AI technologies. While other sectors are still in the pilot phase, financial institutions have managed to achieve tangible results and expand the scope of these technologies within their organizations. International estimates indicate that financial services companies spent about USD 35 billion on AI in 2023, and this figure is expected to rise to around USD 97 billion by 2027, driven by growing investments in banking, insurance, financial markets, and digital payments.

V.4. The Impact of AI on the Profitability of Banking Institutions:

The following figure shows the results of a study conducted in August 2024 within the *Digital Banking Report*, based on City GPS Study data, on the expected impact of adopting AI applications on the profitability of banking institutions:

Figure No. (06): The Impact of AI Adoption on the Profitability of Banking Institutions



Source: City GPS Study, August 2024 Digital Banking Report

The financial services sector is witnessing a fundamental transformation driven by AI technologies. The results indicate that about 93% of financial institutions expect AI adoption to increase their profits over the next five years through automating routine tasks and improving operational efficiency. On the other hand, 7% of these institutions foresee the possibility of a short-term decline in profits due to the high costs of adopting new technologies and the regulatory and security risks that may accompany the initial stages of implementation.

The results also reveal variations in expectations regarding the size of the financial impact. Most institutions do not expect massive immediate gains but rather gradual improvements ranging between 0% and 10%, which reflects a realistic view of the return on investment in this technology. Profit increases are expected to come mainly from productivity gains, as AI helps automate routine tasks and enhance human capabilities.

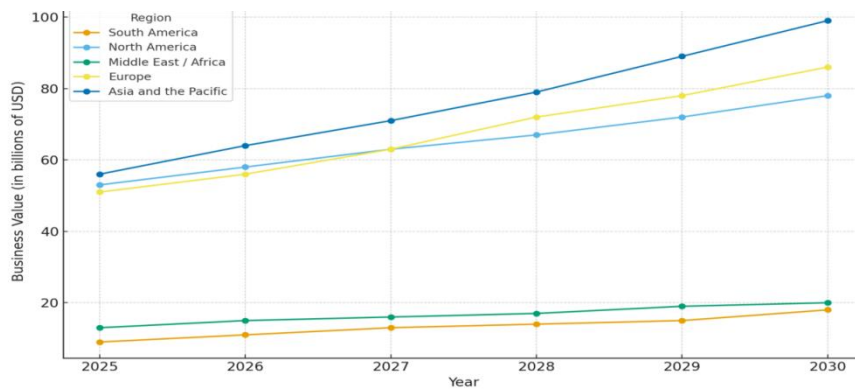
The study indicates that about two-thirds of the work performed in the banking and insurance sectors has a high potential for automation or support through AI, a proportion

higher than that expected in most other sectors. According to estimates by McKinsey Global Institute (2023), AI applications in the banking sector could add between USD 1 and 1.5 trillion annually to the global financial sector's total output. This would positively reflect on the overall profitability of banks and could boost banking sector profits by 9%, equivalent to approximately USD 170 billion by 2028.

V.5. The Achieved and Expected Commercial Value of Artificial Intelligence in the Banking Sector by Region

The banking industry makes extensive use of artificial intelligence in providing its banking services to its users, as illustrated in the following figure:

Figure No. (07): The Commercial Value of Artificial Intelligence in the Banking Sector by Region



Source: Prepared by us based on statistics from the website: <https://www.statista.com>

The graph shows, during the period between 2025 and 2030, an upward trend in the achieved and expected commercial value from the application of AI technologies in the banking sector across different regions of the world. The Asia-Pacific region leads the other regions, witnessing significant growth from USD 56 billion in 2025 to about USD 99 billion in 2030. This reflects the leading role of countries such as China, Japan, and South Korea in adopting banking AI technologies.

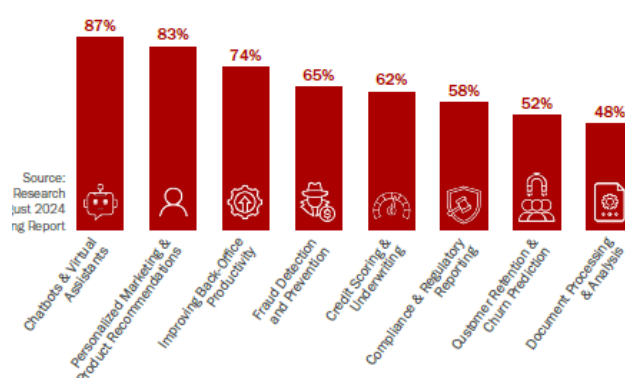
North America and Europe record relatively high levels with gradual growth, indicating the maturity of their financial markets and the development of their technological infrastructure. In contrast, the Middle East and Africa, as well as South America, occupy lower levels in terms of total value; however, they are achieving significant growth rates, indicating that the adoption of AI in the banking sector is still in a phase of gradual development and expansion.

Overall, the figure confirms that AI represents a central strategic pillar in developing the performance of banking institutions globally and improving their operational efficiency, especially with expectations of continued growth in commercial value in the coming years as its applications expand and its areas of use diversify in financial analysis, customer service, and risk management.

V.6. The Expected Value of Artificial Intelligence Across Different Banking Business Areas:

Research commissioned by OpenText revealed results related to the value of artificial intelligence across various areas of use that are expected to add the greatest value to banking institutions over the next three to five years, based on the opinions of bank executives who participated in the *Digital Banking Report* study in 2024, as shown in the following figure:

Figure No. (08): The Expected Value of Artificial Intelligence in Banking Business Areas



Source: Digital Banking Report, 2024

The figure shows that the primary focus of AI applications in the banking sector revolves around improving customer experience and increasing operational efficiency, with clear differences in importance levels across various areas:

- **Chatbots & Virtual Assistants** ranked first with 87%, reflecting the growing importance of enhancing customer experience through interactive tools capable of providing instant and accurate responses around the clock;
- Followed by **Personalized Marketing & Product Recommendations** at 83%, indicating the strong trend toward using AI in customer behavioral analysis and tailoring offers and services to meet their individual needs;
- In third place came **Improving Back-Office Productivity** at 74%, reflecting banks' recognition of the role of automation in reducing costs and improving operational efficiency;
- **Fraud Detection and Prevention** accounted for 65%, indicating the increasing role of AI in enhancing financial security and detecting suspicious patterns in real time;
- Followed by **Credit Scoring & Underwriting** at 62%, one of the areas benefiting from machine learning algorithms to analyze data and assess risks more accurately;
- **Regulatory & Reporting** accounted for 58%, reflecting the need to employ AI to reduce human errors and ensure compliance with constantly changing regulations;

- **Customer Retention & Churn Prevention** stood at 52%, highlighting the importance of predictive analytics in understanding customer behavior and anticipating their departure;
- Finally, **Document Processing & Analysis** at 48%, which, despite being the lowest, remains a promising area for improving operational efficiency through intelligent automation.

These results clarify that banks view AI as a multidimensional strategic tool, not only to enhance customer experience but also to improve operational efficiency and reduce risks. Notably, the more “human” areas, such as customer service and marketing, are at the forefront, indicating a shift in the focus of banking institutions from mere technical automation to intelligent personalization and exceptional customer experience — the new axis of competition in the modern banking industry.

According to the World Economic Forum report, institutions that rely on AI in their operational decisions perform 25% better than those that do not use it. Additionally, **Neobanks**, which were built from the outset on intelligent infrastructure, achieve 35% higher customer satisfaction rates due to hyper-personalized services and faster processing.

VI-Conclusion

International indicators show that the adoption of artificial intelligence in the banking sector is no longer a limited technical option, but has become a strategic necessity to enhance performance efficiency and achieve a sustainable competitive advantage. Current trends have confirmed that AI directly contributes to improving the accuracy of financial decisions, personalizing services, and reducing operational risks, making it a fundamental pillar in the digital transformation of banking institutions.

However, this progress is accompanied by a number of fundamental challenges, the most important of which are data security issues, algorithm governance, transparency in the use of intelligent systems, in addition to the risks of excessive reliance on technological solutions without a solid regulatory framework. Therefore, the future of AI adoption in the banking sector requires a delicate balance between innovation and regulatory responsibility to ensure the safe and sustainable use of these technologies, through the implementation of the following suggestions:

- **Adopting a gradual approach to implementation:** It is important that AI be applied gradually and in a targeted manner, starting with low-risk areas such as customer service or data analysis, before moving to more sensitive applications such as loan granting or asset management, in order to reduce potential errors and acquire sufficient organizational and technical expertise;
- **Enhancing regulatory and supervisory frameworks:** Banking regulatory bodies should develop clear legislation governing the use of AI, ensuring transparency, accountability, and the protection of customer data;

- **Investing in cybersecurity:** Banks must adopt advanced systems to detect potential attacks and ensure the integrity of algorithms against hacking or manipulation;
- **Establishing AI ethics principles:** It is necessary to set internal codes of conduct that guarantee responsible and unbiased use of intelligent technologies in banking operations;
- **Developing human capacities and continuous training:** Banking institutions should invest in training employees and enabling them to handle intelligent tools efficiently and responsibly;
- **Enhancing transparency in decision-making systems:** It is important to clarify how AI algorithms work for customers and regulators, to avoid ambiguity and strengthen trust in the digital financial system;
- **Strengthening international cooperation and knowledge exchange:** Among banks, regulatory institutions, and research centers at the international level to exchange best practices and expertise related to the use of AI, ensuring alignment of standards among different financial systems and achieving safe and harmonious global adoption.

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