

The Fields of AI Employment in Public Administration in Algeria "Banks as a model"

مجالات توظيف الذكاء الاصطناعي على مستوى الإدارة العامة الجزائرية
" البنوك أنموذجاً "

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abstract:

Artificial Intelligence (AI) constitutes a powerful driver for improving performance, enhancing efficiency, and providing innovative solutions to challenges. However, the Algerian public administration has not yet begun employing AI, remaining instead within a traditional framework. Given these transformations, the banking sector is one of the most vital sectors that could greatly benefit from AI applications in various areas. Through technologies such as machine learning and smart systems, as well as big data analytics, the banking sector in Algeria could witness significant development. This would enable better management of resources, reduction of errors, and enhanced service provision in financial operations.

Keywords: Artificial Intelligence, Public Administration, Banking, Efficiency Enhancement, Smart Systems, Performance Improvement.

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ملخص :

يُعد الذكاء الاصطناعي قوة دافعة لتحسين الأداء، تعزيز الكفاءة، وتوفير حلول مبتكرة للتحديات التقليدية في هذا السياق، لم تكن الإدارة العامة الجزائرية بمنأى عن هذه التحولات، إذ بدأ توظيف الذكاء الاصطناعي في مختلف المجالات، هذا ويُعتبر قطاع البنوك أحد المجالات الحيوية التي يمكن أن تستفيد بشكل كبير من تطبيقات الذكاء الاصطناعي فمن خلال تقنيات مثل تعلم الآلة (Machine Learning) ، تحليل البيانات الضخمة (Big Data Analytics) ، والأتمتة الذكية، يمكن للبنوك في الجزائر تحقيق تطور ملحوظ في تقديم الخدمات للعملاء، تحسين إدارة الموارد، وتقليل المخاطر المالية.

الكلمات المفتاحية: الذكاء الاصطناعي ؛ إدارة العام ؛ البنوك ؛ تحسين الأداء ؛ تعزيز الكفاءة ؛ الأتمتة الذكية.

Introduction:

In any country, public administration is one of the fundamental pillars on which all the governmental, social and economic activities rely on. It aims is to improve performance and facilitate access to the public services that provides. In the last years, public administration in many countries has witnessed a big progress in the use of modern technologies. One of the most prominent of these technologies, that has shown promising results in performing and developing services, is artificial intelligence.

The Artificial intelligence is considered one of the modern technological fields that relies on simulating human intelligence using progressed systems and software, in order to facilitate making-decisions, improving administrative performance, and increasing operational efficiency in various institutions in Algeria. Regardless the challenges that face public administration, there are ongoing efforts to get benefit from artificial intelligence technologies to improve government work, especially in bank sector.

Problematic issue:

One of the problems that faces Algerian public administration is in improving the effectiveness of public services and delivering them quickly without errors, especially in the Bank sector, which plays an important role in the national economy. With the increasing demand for banking services and rising the customer expectations, it has become necessary to improve the efficiency of the banking system and provide innovative services. From this, show up the importance of studying the use of artificial intelligence in Algerian banks as a tool to develop performance and achieve competitive advantages.

The main question in this study is: How can the artificial intelligence technologies be used or employed in Algerian public administration, specifically in banks, to improve service quality and efficiency?

Importance of the Study:

The importance of this study relies on shedding light on how artificial intelligence technologies can improve the quality of Bank services provided to customers in Algeria, and increase the efficiency of the public banking system, and contribute in speeding up Bank procedures and reducing human errors. Additionally, to that, this study provides a deep understanding for government institutions on how to employ artificial intelligence to develop administrative performance in Algeria, which will contribute in accelerating technological development in the public sector.

Hypotheses:

First Hypothesis: The use of artificial intelligence technologies in Algerian banks can contribute to improve operational efficiency and reduce human errors in banking operations.

Second Hypothesis: The application of artificial intelligence in Algerian banks will enhance the customer experience by providing faster, more accurate, and reliable banking services.

Third Hypothesis: Employing artificial intelligence in financial risk management in Algerian banks can help predict threats and mitigate potential risks.

Chapter One:

The Evolution of the Concept of Artificial Intelligence in General and in Algeria Particularly:

First Section:

The Evolution of the Concept of Artificial Intelligence in General:

We can define the Artificial intelligence as the ability of machines and computer systems to simulate human intelligence by learning patterns, analysing data, making decisions, processing natural language, and reasoning ¹ Artificial intelligence has developed and is closely linked to advances in computer science, mathematics, and data. From this perspective, we will discuss. the evolution of the concept of artificial intelligence through its main stages, focusing on the scientific contributions that formed the foundation of this field. Later, we will explore its development in Algeria.

First: Theoretical Beginnings:

The concept of artificial intelligence began as a philosophical idea inspired by questions about the possibility of mimicking human intelligence using machines. In 1950, Alan Turing proposed a test to measure the machine's ability to imitate human intelligence behaviour, which is now known as the Turing Test ². From here, the concept of artificial intelligence emerged as a theoretical idea in the mid-20th century through the research of this scientist ³, after that, came the foundational phase (1956), marked by the Dartmouth Conference in 1956, which is considered the official starting point of artificial intelligence as an independent field of study.

Researchers at this conference discussed the possibilities of developing advanced intelligent systems ⁴.

Second: Software Developments and Machine Learning

It is the phase of early algorithms from 1960 to 1970 which witnessed the development of programs based on logical rules and algorithms to solve problems. However, their performance was limited due to the primitive capabilities of computers⁵. Also, this period witnessed progress in intelligent software capable of solving simple problems using algorithms ⁶. Then, came the phase of symbolic artificial intelligence (1980-1990), which focused on building expert systems based on predefined rules and knowledge to derive logical conclusions as medical diagnostic systems⁷, and with the advancement of computing in the 1990s (1990-2010), machine learning became a central pillar of artificial intelligence where systems can learn patterns from data and improving their performance over time ⁸, also Machines where able to learn from data and enhance their performance without the need for explicit programming ⁹.

Third: The Era of Deep Artificial Intelligence (2010 till now)

Algorithms of deep learning and reinforcement learning became the main focus, and contributed in advancements in natural language processing, computer vision, and automation ¹⁰, from these perspective AI has since evolved across various fields, like: Medicine, where AI improved disease diagnosis and treatment planning using intelligent systems ¹¹. Industry, where the integration of robotics and intelligent systems enhanced productivity and reduced costs ¹². also, in Education field, where AI-driven technologies have transformed learning and teaching methods through interactive platforms ¹³.

The Historical Development of AI in Algeria:

Algeria has followed the global AI trend by developing its technological infrastructure, strengthening higher education, encouraging scientific research, and creating legal frameworks for digital transformation. Despite challenges, Algeria seeks to have a position among leading nations in AI adoption, particularly in the administrative and economic sectors.

1. Foundational Phase and Development of Digital Infrastructure and AI Education

At the beginning of the (1990 -2004), Algeria started implementing programs to modernize its public administration by adopting a national strategy for the development of information and communication technology (ICT) ¹⁴ .

Even, began the thinking of enhancing public administration services, laying the groundwork for future AI integration ¹⁵ . Some universities were equipped with AI laboratories ¹⁶ . After that, in the field of digital infrastructure development to enhance higher education in AI, the ministry launched Master's and Ph.D. programs specialized in artificial intelligence and data science ¹⁷ , with strengthening the expertise of professors and researchers, along with legislation encouraging scientific research ¹⁸ .

2. Digital Transformation and the Role of AI in Electronic Services

Digital transformation is the integration of digital technologies across all sectors to improve performance and efficiency ¹⁹ . Algeria adopted it as a strategy to enhance transparency, combat bureaucracy, and deliver high-quality services ²⁰ .AI has played a key role in various sectors, such as:

Banks, where AI-powered platforms analyse customer behaviour and detect fraud-government services, where chatbots (AI) are used to provide instant assistance to citizens on ministers platforms ²¹ .Automated fraud detection and big data analysis, improving decision-making processes ²² .

3. Legal Framework for Information Activities and Digital Infrastructure

Information activities is a group of activities related to the production, processing, storage, protection, and exchange of data through digital systems²³. However, digital infrastructure includes technological systems, software, and servers that facilitate the management, storage, and operation of electronic systems²⁴. Information activities were regulated which contributed in regulating the practices of developing smart software and databases, Algeria enacted Law No. 04-09, which defines the conditions for engaging in IT-related activities such as software development, web hosting, system analysis, and electronic maintenance services²⁵.

4. E-Commerce and AI in Digital Economy Development

The Algerian government has sought to keep up with this transformation by enacting new legislation to regulate e-commerce and promote digital innovation. This effort aligns with the broader goal of digital transformation to enhance the efficiency of business operations, AI has contributed to enhancing competitiveness and expanding markets²⁶ and The E-Commerce Law has further promoted the use of AI in analysing consumer behaviour and developing smart marketing technologies²⁷. Also, data protection has become a legal foundation for AI development, ensuring that personal data—a critical resource for feeding AI systems—is safeguarded under legal frameworks²⁸.

In addition to that, investment in AI and technology sectors has been encouraged. The new Investment Law was introduced to stimulate investments in innovative industries, including artificial intelligence²⁹.

Chapter Two:

The Use of Artificial Intelligence in Algeria's Public Administration

AI has become a vital tool in enhancing public administration performance, thanks to its ability to analyse data and support smart decision-making, so, AI technologies are used increasingly in governments and public administrations to improve efficiency, transparency, and service quality. So, what are the key areas where AI is being used in public administration?

Section 1: Definition of Public Administration and Its AI Applications

1. Definition of Public Administration

Public administration is a discipline in social sciences that is concerned by developing and implementing public policies and services. It is an essential part of government operations in different countries, aiming to organize human and material resources to achieve shared goal. To better understand this concept, we will explore a historical and theoretical review of public administration.

- a. Linguistic Definition: The term "administration" refers to the process of organizing and coordinating activities to achieve objectives, while the word "public" relates to matters of interest to the whole society ³⁰.
- b. Terminological Definition: Public administration is the activity through which public policies are implemented and public services are provided in an organized and efficient manner. It involves aspects such as planning, organization, coordination, and supervision ³¹.

2. AI Applications in Public Administration

1. **Big Data Analysis**: AI technologies are used to analyse vast amounts of data to generate insights that support decision-making. Also, Public administration relies on data analytics for policy decisions, allowing AI systems to quickly and accurately process massive datasets, identify patterns, and make informed decisions ³².

2. **Human Resource Management:** AI is used to facilitate recruitment processes, assess performance, and plan professional training and development programs ³³.

By using AI technologies such as chatbots and intelligent systems, user experience can be improved by providing faster and more accurate services.

3.Improving Public Services:

AI can enhance citizen experiences by offering smart services, including virtual assistants, chatbot-based interactions, and interactive service applications ³⁴.

4.**Financial Oversight and Auditing:** AI systems are used to detect financial fraud and monitor government financial performance by analysing financial transactions and identifying unusual patterns ³⁵. AI also helps in combating corruption and promoting transparency, as its algorithms can detect suspicious activities and prevent administrative fraud.

5.**Disaster and Emergency Management:** help AI technologies in predicting natural disasters and planning effective responses to risks ³⁶.

3. Employing AI in Algeria's Public Administration

Last years have seen significant advanced in the use of AI technologies in Algeria in various sectors, including public administration. This trend has started to gain a place with efforts to improve public services and enhance administrative efficiency. AI is become an essential tool to optimize public administrative over the world; from this, I will present the fields of applications that use AI in Algeria's public administration, by concentrating on examples and challenges associated with implementing these technologies.

1. AI and Its use in Algerian Administration

AI contributes in enhancing efficiency and effectiveness, particularly in accelerating administrative processes and reducing human errors. It also increases transparency, as AI-powered systems monitor administrative

operations and detect corruption. However, AI plays an important role in data-driven decision-making, enabling officials to make well-informed choices by analysing big data, enabling decision-makers to make informed decisions by this, the Algerian government has implemented AI-powered solutions across various public services, including:

- Smart Government Services: In 2021, Algeria launched AI-powered electronic applications to facilitate access to official documents, such as commercial registers and driver's licenses ³⁷.

- Population Data Analysis: In 2020, the Algerian Ministry of Health used AI to analyse COVID-19-related data, which helped in the efficient allocation of medical resources³⁸.

-Education and School Administration: Since 2019, Algeria has employed AI to enhance e-learning systems, particularly during the COVID-19 pandemic ³⁹.

-Human Resource Management: Since 2022, some Algerian government institutions have adopted AI-driven systems to evaluate employers' performance ⁴⁰.

-Financial Oversight: In 2023, the Algerian government began implementing AI-powered systems to review financial transactions and detect patterns linked to corruption⁴¹.

Chapter 3:

Artificial Intelligence in Algerian Banks

With rapid advancements in digital technology, AI has become one of the basic tools transforming Algeria's banking sector. Banks have started employing AI to improve operational efficiency, enhance security, and offer innovative customer services.

From this standpoint, I will highlight on the use of AI applications in Algerian banks, providing real-world examples dates.

Section 1:

The Importance of AI in Banking and Its Applications

1. The Importance of AI in the Banking Sector

- **Enhancing Operational Efficiency** AI helps automate routine banking operations, leading to reduced operational costs.
- **Strengthening Financial Security** AI-powered systems detect financial fraud and counter cyber threats.
- **Improving Customer Experience** Banks use smart chatbots to provide instant and accurate services to customers.
- **Data Analysis and Decision-Making**, AI algorithms provides the capacity to analyse vast amounts of data, assisting banks in making precise investment decisions ⁴²

2. AI Applications in Algerian Banks (with Examples)

The rapid development of AI technologies has led to a fundamental change in how various industries operate, especially the banking sector in Algeria. Many banks have started adopting AI applications to improve internal operations, financial security, and customer services.

Here are some examples of AI adoption in Algerian banks:

❖ **BEA (Bank Exterior Algeria) - 2020**

BEA introduced an AI system to detect fraudulent transactions as Algerian bank BEA, since 2020 by using AI systems to analyse financial transaction and identify suspicious activities. This system reduced fraud rates by 30% ⁴³. Even AI-powered chatbots to enhance customer support 24/7.in addition to risk management by using AI algorithms to assess financial risks and improve credit decision-making ⁴⁴.

❖ BADR (Bank for Agriculture and Rural Development) - 2021

In 2021, BADR launched AI-powered chatbots to respond to customer inquiries and provide banking services around the 24/7 ⁴⁵. AI has proven to be a powerful tool in modernizing BADR Bank, enhancing efficiency, improving security, and offering innovative financial services. Despite some challenges, continued investment in AI will lead to an advanced and resilient banking sector ⁴⁶.

❖ CPA (Credit Populaire Algeria 2022):

Algerian laws ensure the regulation of artificial intelligence usage in banks like CPA, ensuring legal protections for customers, financial security, and responsible digital banking services⁴⁷.

Due to the dependence of CPA's reliance on AI, the bank must comply with cybersecurity laws to protect banking systems from cyber threats and ensure the safety of financial data ⁴⁸.

In 2023, CPA launched an AI-powered system for analysing customer data and financial behaviour to evaluate loan applications, reducing processing time by 40%⁴⁹.

❖ BNA (National Bank of Algeria 2020):

The use of Artificial Intelligence (AI) to analyse customer data⁵⁰ in addition to assessing credit risk, improve the customer experience through smart chatbot interactions, which increased operational efficiency ⁵¹. Also, the National Bank of Algeria (BNA) has used AI since 2020 to analyse client data and offer tailored financial solutions according to their needs⁵².

In conclusion, Artificial Intelligence has become a necessary and highly important tool in the Algerian banking sector. Despite the challenges banks face, especially in terms of competitiveness and performance improvement,

long-term investment strategies are being adopted to overcome technical obstacles, develop infrastructure, and achieve technological progress.

The conclusion shows that AI applications are emerging as powerful tools to enhance efficiency in Algeria's banking sector, strengthen security, and improve customer satisfaction. However, banks need to address associated challenges and ensure the effective implementation of this technology to fully benefit from its potential.

Section 2:

Challenges & Strategies for AI Development in Algeria

1. Among the challenges facing the employment of artificial intelligence:
 - a) The lack of qualified professionals, Algeria lacks specialized AI experts, making it difficult to develop and implement AI solutions.
 - b) Technological Infrastructure, AI applications need advanced infrastructure, including high-performance data centre's.
 - c) High Costs of AI Deployment. Developing and integrating AI systems is expensive given Algeria's limited financial resources⁵³.
2. among the strategies to Overcome AI Challenges in Algeria:
 1. Developing Human Capital, Algeria must invest in training programs to enhance AI skills among public sector employees.
 2. Improving Technological Infrastructure. Investment in developing digital infrastructure is essential for artificial intelligence applications.
 3. Strengthening International Cooperation, Algeria can benefit from international expertise in the field of artificial intelligence through partnerships and cooperation.

Employing artificial intelligence in Algeria's public administration represents a significant opportunity to improve efficiency and transparency in service

delivery. However, this approach requires significant investments in infrastructure and human skills development.

Conclusion:

In conclusion, artificial intelligence is one of the modern technological tools that can significantly contribute to improving the performance of Algerian banks and public administration in general. By utilizing it properly, the banking sector can achieve high levels of efficiency and contribute to the development of the national economy, thus improving the social and economic life of citizens.

Artificial intelligence also represents a golden opportunity to improve the quality of public services in Algeria, especially in the banking sector. However, achieving this goal requires serious investments in infrastructure, providing human expertise, and establishing appropriate legal frameworks. Algeria's success in adopting this technology depends on its ability to overcome the challenges mentioned.

Study Results:

The study is expected to yield a set of results that clarify:

- The ability of artificial intelligence technologies to improve performance within Algerian banks, including transaction speed, reducing errors, and increasing transparency.
- The impact of artificial intelligence on enhancing customer satisfaction through more personalized and accurate banking services.
- How Algerian banks can benefit from artificial intelligence in predicting financial risks and offering more accurate advice to customers.

Study Recommendations:

1. Expansion of Artificial Intelligence Use. The Algerian government should encourage banks to adopt artificial intelligence technologies and provide the appropriate regulatory environment for it.

2. Training and Capacity Building

It is essential to train bank employees to effectively use these technologies through specialized educational and training programs.

3. Investment in Technological Infrastructure

Algerian banks should invest more in technological infrastructure to ensure effective integration of artificial intelligence technologies into banking systems.

4. Improvement of Policies and Legal Frameworks

Algeria needs to improve its legislative and regulatory framework to ensure the safe and effective use of artificial intelligence in the banking sector, with guarantees for data protection and privacy.

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