

The Impact of Artificial Intelligence on Human Resource Management in Public Administration -Automation of Human Resource Management-

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Received: 06/11/2024

Published: 07/03/2025

Abstract:

In light of the scarcity of legal studies on artificial intelligence, particularly with regard to clarifying the vision in human resource management, we present data ranging from possibility to impossibility. This occurs in a context where demands for the ethics and regulation of artificial intelligence are still in their infancy in order to avoid a negative impact on other value-driven motivations.

The management of human resources in public administrations and institutions through artificial intelligence is a crucial factor in growth. It is essential to keep pace with developments in public service and public engagement in order to develop governmental functions. In Algeria, we must adapt to the global trend towards intelligent software in human resource management, addressing the challenges and obstacles while attempting to provide a clear picture of its positive and negative effects.

Keywords: Artificial Intelligence, Administrative System Efficiency, Human Resource Automation, Electronic Administrative Functions.

Introduction: C-A. Colliard, a French international law professor. Colliard stated in 1950: 'Law is not made by philosophers with their theories or lawyers

with their legal formulas, but by engineers with their inventions that create and evolve the law.¹

The Fourth Industrial Revolution has taken us by surprise with its rapid and astonishing developments, particularly in artificial intelligence, which is transforming industries such as commerce, labour, health, education and entertainment. This has compelled legislators to reassess their legal frameworks in order to address the concept of an intangible virtual reality. The concept of artificial intelligence has evolved from a specific, non-material notion to a tangible, general framework, progressing from simple, controllable software to intelligent systems. This transformation has sparked extensive legal discussions about the need to regulate this new type of intelligence within various Western legal systems, including those in Europe and America, as well as in the Arab world, Algeria among them.

In light of the economic and digital growth experienced by countries such as Algeria, the Algerian legislature must establish its legal position on a variety of issues related to artificial intelligence. This involves either protecting ‘artificial intelligence’ with regard to the outcomes it generates, or safeguarding ‘us’, society and its various components, by ensuring the ethical and legal regulation of these outcomes to prevent negative repercussions. Consequently, the Algerian legislator will need to amend many legal rules to align with these changes and ensure that national legislation is compatible with that of leading countries in this field. This can be achieved by establishing a specialised legislative policy for artificial intelligence in the digital environment and translating it into structured legislation².

The field of human resources relies heavily on interpersonal interactions. Therefore, the use of natural language processing is key to artificial intelligence, helping computers to interpret, understand and process human language. The significance of natural language processing lies in its ability to enable us to manage large volumes of textual and audio data through various algorithms that perform tasks such as content classification, modelling, contextual extraction, sentiment analysis, machine translation, summarisation and converting text to speech and vice versa. Despite the availability of artificial intelligence

¹- C-A. Colliard, *La machine et le droit privé français contemporain*. In *Le Droit privé français au milieu du XXème siècle*. Etudes offertes à G. Ripert, Ed. LGDJ, 1950, pp. 115-137.

²- Artificial Intelligence in Human Resources, Thakaa Center, [website], accessed on 12/1/2022 at 16:14.

technologies that can transform human resource management, few organisations have the capability to build predictive models due to limited access to human resource data and the complexity of using it.

The relationship between human resource management and artificial intelligence is a key topic in modern administrative theory. Digitalisation has emerged as a bridge between human resource management and achieving administrative goals, necessitating the creation of roles to develop strategic dimensions for artificial intelligence.

This brings us to the core idea of our research paper, which aims to clarify the relationship between the law governing human resource management in public institutions and artificial intelligence. We begin by posing the following question: To what extent has the automation of human resource management occurred through the use of artificial intelligence? We will explore the potential of AI to influence HRM and its capacity to emulate human reasoning in administrative processes, as well as the impact of this integration on organisational frameworks in Algeria.

The re-engineering of human resources and information technology within public administrations and institutions, particularly within the Algerian legislative system, necessitates addressing the following:

Section One: The relationship between human resource management law and artificial intelligence in public administration.

First requirement: The transition to artificial intelligence and automation in human resource management in public administration.

Second requirement: Limitations of electronic administrative functions in human resource management under artificial intelligence.

Section Two: The Automation of Human Resource Management Tasks: Between Reality and Expectations

First requirement: Artificial Intelligence and Decision-Making in Human Resource Management

Second requirement: The impact of artificial intelligence on human resource management functions

Conclusion

In this section, we will summarise the key observations, suggestions and recommendations.

Section One: The Relationship Between Human Resource Management Law and Artificial Intelligence in Public Administration

The law is linked to the digital algorithms that define artificial intelligence in its modern form. Mathematics, as a statistical and survey-based science founded on probability processing, has deep roots in legal history. However, blending this mathematical discipline, which was previously understood within the framework of human cognition, with the intangible digital realm has created a unique relationship, both legally and in terms of its extension into legal sciences. We will therefore explore this relationship from two angles: first, the transition to artificial intelligence in human resource management in public administration; and second, the limitations of electronic administrative functions in human resource management in Algeria under artificial intelligence.

First Requirement: Transition to artificial intelligence and automation in human resource management in public administration.

Artificial intelligence is one of the most recent innovations in computer science of the last five decades of the twentieth century. It is defined as a collection of intelligent machines or directed programming, which is the ability to discover things autonomously. This field encompasses various disciplines, including computer science, biology, linguistics, cognitive psychology, mathematics, engineering and many more. The aim is to produce systems that rely on

knowledge in a specific area, enabling computers to think, see, speak, hear, move and sense³.

AI has a broad scope applicable across various domains. It is defined as the study of how to programme computers to perform tasks better than humans, effectively replacing some jobs⁴.

Additionally, artificial intelligence offers intelligent machines that operate and interact like humans, involving activities such as speech recognition, planning and problem solving⁵.

Additionally, artificial intelligence provides us with intelligent machines that can operate and interact like humans, performing activities such as speech recognition, planning and problem solving. AI has contributed to the evolution of numerous subjects, including deep learning, machine learning, computer programming and medicine.

In the long term, researchers suggest that we can expect the adoption of governmental computing and augmented reality to fundamentally transform the role of institutions, allowing governments to take a more personalised approach and meet the unique needs of each citizen. Furthermore, we may one day be able to move objects with our thoughts alone and achieve ideal bodies through nanotechnology⁶.

Automation is defined as the “elimination of human intervention, either entirely or partially, in the execution of industrial, domestic, administrative, or scientific tasks.”⁷ According to the Dictionary of All Meanings, it refers to “self-automatic management or computer operation in the field of administration.”⁸ In our study,

³- Dr. Mufrih Jaber Musfer Al-Talidi, The Impact of Introducing Artificial Intelligence on the Future of Jobs in the Saudi Government Sector: A Case Study on the Ministry of Justice in the Asir Region. Arab Journal of Science and Research Publications, Vol. 5, No. 1, January 30, 2021, pp. 79-96, p. 80.

⁴- Same reference, p. 80.

⁵- Same reference, p. 80.

For more see: Abdul Hafiz Laqwi, Jihad Bouazouz, Forecasting Economic Applications of Artificial Intelligence, Arsad Journal of Economic and Administrative Studies, Vol. 6, No. 1, June 2023, pp. 1-12, p. 9.

⁶- For more see: Abdul Hafiz Laqwi, Jihad Bouazouz, Forecasting Economic Applications of Artificial Intelligence, Arsad Journal of Economic and Administrative Studies, Vol. 6, No. 1, June 2023, pp. 1-12, p. 9.

Noura Mohammed Abdul Rahman Al-Anqari, Dr. Haifa Othman Al-Dakheel, The Role of Automation in Human Resource Management Functions: A Field Study on Government Agencies in Saudi Arabia, Arab Journal of Administration, Vol. 43, No. 3 (September), 2023, p. 78.

⁷- Noura Mohammed Abdul Rahman Al-Anqari, Dr. Haifa Othman Al-Dakheel, The Role of Automation in Human Resource Management Functions: A Field Study on Government Agencies in Saudi Arabia, Arab Journal of Administration, Vol. 43, No. 3 (September), 2023, p. 78.

⁸- Same reference, p. 78.

human resource management in public administrations is one of the administrative activities focused on the effective use of human resources. It primarily involves formulating policies, developing programs, determining procedures, and conducting necessary activities to meet the administrative needs for human competencies, which includes recruitment, development, motivation, and management of individuals.

These activities are crucial for enabling effective and efficient government operations, helping administrations to achieve their goals while addressing the human factors necessary for optimal performance.

Numerous attempts have been made to define artificial intelligence (AI) from a legal perspective. McCarthy (2007), for example, defines intelligence as ‘the computational part of the ability to achieve goals in the world’. Minsky (1961) outlined the functions necessary for achieving artificial intelligence, including searching, pattern recognition, learning, planning and inference (or generalisation from observed examples). Therefore, any artificial system or process that performs any of these functions to achieve goals can be described as artificial intelligence⁹.

Despite significant advancements in AI research aimed at imparting characteristics of intelligence to computers, it is premature to claim that programs can mimic human thought processes and creativity. The current success of AI programmes is more about developing specific software specialising in defined practical fields, incorporating accumulated human experience in these areas. Humans make decisions based on their feelings, knowledge, and personal experiences, both consciously and unconsciously. The information that humans use can be vague, ambiguous, unclear and subjective, which makes it difficult for computers to replicate human intent¹⁰.

Artificial intelligence is widely regarded as one of the most significant inventions in the technology sector in modern times. Studies conducted at several US universities have shown that increased reliance on AI and robots in

⁹- Osundi Osoba, William Wilser, Risks of Artificial Intelligence on Security and the Future of Work: An Analytical Perspective, RAND Corporation, p. 18. [source].

¹⁰- Dr. Mufrih Jaber Musfer Al-Talidi, Same Reference, p. 86.

Dr. Noura Mohammed Abdullah Al-Azam, The Role of Artificial Intelligence in Enhancing the Efficiency of Administrative Systems for Human Resource Management at Tabuk University, Sohag University, Faculty of Education, Educational Journal, April Issue, Vol. 1, No. 48, 2021, p. 472.

business activities leads to fewer job opportunities for people using traditional methods that do not require training or development. Conversely, others assert that this technology will create many jobs.

Although artificial intelligence is still in its infancy, it has already permeated all aspects of our daily lives, from electronic applications that perform tasks automatically and quickly to robots that operate using AI and computers that utilise the same system for data entry and file storage¹¹.

Human resource management has attracted the attention of institutions and researchers due to its positive impact on achieving desired organisational outcomes. This includes providing organisations with the best employees, equipping them with the necessary skills to perform their tasks and motivating them through various means, such as compensation, rewards, incentives and profit sharing. Additionally, HRM focuses on protecting employees by emphasising occupational health and safety, and by regularly evaluating their performance to identify and address shortcomings for the future. These efforts align with the organisation's short-term goal of achieving its institutional objectives and its long-term goal of establishing a competitive position¹².

Therefore, in order to address the changes occurring at both local and global levels, there must be fundamental shifts in the management style and operations of public administration, as well as in how services are delivered. This requires the adoption of modern management methods that align with contemporary organisational developments, as traditional administrative methods are no longer sufficient.

Second Requirement: Limitations of Electronic Administrative Functions in Human Resource Management Under Artificial Intelligence

Technology continues to significantly impact human resource practices, leading to clear changes in traditional administrative functions, which have shifted to electronic operations aimed at optimizing time, money, effort, and resources.

In our study, we observed that artificial intelligence outperforms human performance in its ability to accomplish multiple tasks and enhance recruitment

¹¹- Dr. Noura Mohammed Abdullah Al-Azam, The Role of Artificial Intelligence in Enhancing the Efficiency of Administrative Systems for Human Resource Management at Tabuk University, Sohag University, Faculty of Education, Educational Journal, April Issue, Vol. 1, No. 48, 2021, p. 472.

¹²- Dr. Noura Mohammed Abdullah Al-Azam, Same Reference, p. 471.

quality while interacting with employees. However, building an artificial intelligence system is not a simple task; it requires a large amount of data, which can be costly and time-consuming. To achieve optimal benefits from AI, systems must be fed with neutral data to reduce bias against new job candidates and avoid discrimination among employees in various matters. Additionally, intelligent systems must be highly secure due to their direct interaction with personal data of candidates and employees.

With the widespread emergence of automation and artificial intelligence, recruitment is another area preparing for significant disruptions. The common concern here is that automation and AI may replace human workers in the labor market, leading to soaring unemployment rates¹³.

Previously, the focus was on the fear that automation would compete with human employees. However, artificial intelligence (AI) is a form of automation that can learn and adapt, making it a natural extension of the process.

Nevertheless, human intelligence, which AI seeks to replicate, is distinguished by its unique capabilities, including acquiring knowledge and learning and understanding through practical experience. This results in the ability to make fine distinctions between issues, generalise from specific cases, exclude irrelevant information and respond flexibly and quickly to various situations while avoiding incorrect biases and repetition. Humans can avoid specific behaviours when faced with similar situations, which are considered mechanical rather than intelligent. Furthermore, humans can make correct decisions based on their sensory and cognitive awareness of a problem's aspects, potential outcomes and desired results, as well as the decisions that lead to those results. They can also derive general laws from limited examples and comprehend the essence of things while distinguishing between different types of information.

Human resource problem solving relies on previous knowledge, how to use that knowledge and consultation of experiences and situational assessments¹⁴.

¹³- Mourad Sami, Towards a Comprehensive Perspective to Activate the Role of Artificial Intelligence and Business Intelligence in Supporting and Empowering the Public Sector Under Vision 2030, *Economic Studies Journal*, Vol. 6, No. 2, December 2019, pp. 1-22, p. 2.

¹⁴- Mufrih Jaber Musfer Al-Talidi, The Impact of Introducing Artificial Intelligence on the Future of Jobs in the Saudi Government Sector: A Case Study on the Ministry of Justice in the Asir Region. *Arab Journal of Science and Research Publications*, Vol. 5, No. 1, January 2021, p. 86.

Therefore, the question remains as to the reality of artificial intelligence in public administrations and institutions. What administrative functions has AI provided for human resources, and what is currently practised in Algerian public administrations and institutions?

Currently, the annual human resource management plan is used as an analytical tool to organise the management of human resources in Algerian public institutions, and to inform the management system and policy for providing human resources. Established under Executive Decree No. 95-126 dated 29 April 1995¹⁵, this plan is primarily based on the predictive management of human resources. It is a work programme prepared by the manager according to the annual budget allocated to them and serves as the reference framework for achieving set objectives. These include the rational and effective use of human resources, as well as improving the efficiency of the public service sector through the development of the training system. It is therefore essential that this plan is prepared with great care, reflecting the established norms of the Algerian system and diverging significantly from electronic planning.

Electronic planning primarily uses strategic planning to achieve strategic objectives; decisions made using electronic systems encompass the entirety of an organisation's departments and management. In the context of the electronic revolution, electronic planning relies on new knowledge systems, such as decision support systems, expert systems and artificial neural networks, as well as simplifying work systems and procedures.

Electronic organisation aims to distribute authority, tasks and horizontal network relationships in order to achieve operational coordination and accomplish the common goals of the organisation's stakeholders. The internet has shifted the focus of management from structures and formal organisational characteristics to a shared common goal. In the age of the internet and information technology, electronic leadership must influence the management of institutions and public administrations, as well as the nature of their relationships with internal and external environments. This involves transitioning from traditional leadership styles to electronic ones. This is reflected in the emergence of technologically

¹⁵- Executive Decree No. 95-126, dated April 29, 1995, amending and supplementing Executive Decree No. 66-145, dated June 2, 1966, concerning the regulation of certain decisions affecting the status of employees, Official Gazette of the People's Democratic Republic of Algeria, No. 26.

savvy leaders who can adapt to this evolution and use it to give their administration a competitive edge.

Conversely, activity monitoring in traditional administration involves comparing actual performance with desired performance in order to identify significant changes in human resource strategy that require correction. This is achieved by comparing inputs with outputs, making it a retrospective form of monitoring that follows planning and execution. However, this is considered a drawback of traditional monitoring, as there is a time gap between the report highlighting discrepancies and the necessary documentation, review and approval stages before corrections can be made, since reports are usually produced periodically — monthly, quarterly or annually.

What about electronic monitoring in the human resources management process? This real-time monitoring improves the flow of information between managers, employees and stakeholders via the internal electronic network. It reinforces the principles of equality, accountability, and administrative oversight by enabling direct and continuous correction of errors as they occur. It resolves many practical issues by enabling electronic service requests via the internet and providing detailed information on all administrative procedures and requirements, as well as a follow-up process¹⁶.

Furthermore, it disseminates all regulations and procedures related to electronic services and their organisational standards, making them easily accessible electronically.

The advantages of electronic monitoring are clear: it relies on quality control and standardises process measurements while reducing routine procedures and administrative formalities. It promotes the use of multiple communication channels for information exchange and ensures easy access under specific conditions. This facilitates the monitoring of various operations and diverse decision-making processes at all administrative levels, providing transparency and ease while eliminating the waste of time and unnecessary complication of procedures.

¹⁶- Fares Qatar, Toufik Hanashi, The Role of Information and Communication Technologies in Improving Administrative Functions for Human Resource Management at the Tebessa Cement Company. Knowledge Groups Journal, Vol. 7, No. 1, April 2021, p. 91.

In conclusion, the use of artificial intelligence in human resource management is highly significant, leading to a qualitative shift in administrative activities. The following section will provide a clearer picture of this vision through the study of results.

Section Two: The Automation of Administrative Tasks in Human Resource Management Reality vs. Expectations

The use of artificial intelligence in current work and administrative functions could have significant implications for the future, particularly with regard to security. This could place a considerable burden on governments, especially with regard to the use of artificial tools. Cybersecurity is a particularly vulnerable area when it comes to artificial intelligence. One of the most prominent functions of such tools, whether informational or physical, is the manipulation of information. Therefore, these tools must be specifically designed to prevent information warfare, which is a key consideration when implementing artificial intelligence¹⁷.

In practice, complications may arise that could lead to unexpected and serious systemic consequences. Moreover, excessive reliance on AI can reduce flexibility and cause rapid economic and social chaos due to a lack of control over the employment of specialists in AI research and development¹⁸.

However, the motivations behind this technology are not all negative; there are also positive aspects that enhance its value. Thus, we will closely examine the outcomes of automating human resource management, highlighting its importance. Firstly, we will discuss: Artificial Intelligence and Decision-Making in Human Resource Management. In the second section, we will explore: The impact of artificial intelligence on human resource management functions.

First requirement: Artificial Intelligence and Decision-Making in Human Resource Management

According to the Organisation for Economic Co-operation and Development (OECD), information technology (IT) encompasses a range of technologies that allow for the collection, storage, processing and transmission of information in

¹⁷- Osundi Osoba, William Wilser, Same Reference, p. 5.

¹⁸- Same reference, p. 17.

the form of sounds, data and images. This includes microelectronics, electronic dimensional science, and associated technologies¹⁹.

An OECD study finds that only 9% of jobs in its 21 member countries face the risk of complete automation. This task-based analysis enhances the overall value of the job. Furthermore, a report by the International Labour Organization (ILO) confirms that analyses of job susceptibility to automation are only relevant at the economic sector level²⁰.

Indeed, recent technological advancements have contributed to the development of administrative work methods and provided opportunities to improve administrative communication. This creates an effective electronic administrative environment that saves time and effort. Consequently, administrations have been compelled to shift from traditional to electronic methods of performing tasks, capturing the attention of various functions and administrative levels within institutions due to the significance of this development.

The decision-making process for human resources is one of the most important and comprehensive functions through which we can highlight the extent of the impact of artificial intelligence on public administration, whether positive or negative. Decision-making is central to the administrative process as it is intertwined with all management functions and activities. When management performs the planning function, specific decisions are made at each stage of developing the plan, such as setting objectives, outlining policies, identifying suitable human resources and choosing the most appropriate methods and techniques for their operation.

When management establishes the appropriate organisation for its various tasks and activities, it makes decisions regarding its organisational structure, type and size; the basis for dividing departments and sections; and the individuals needed to carry out different tasks. It also decides on the appropriate scope of supervision, lines of authority, responsibility and communication²¹.

¹⁹- Fares Qatar, Toufik Hanashi, Same Reference, p. 87.

²⁰- Shaikha Saif Al-Mansoori, Dr. Ali Nasser Al-Tahita, The Role of Artificial Intelligence in Decision-Making at the Ministry of Interior in the United Arab Emirates. Journal of Knowledge College, Vol. 32, No. 3, 2021, p. 93.

²¹- Same reference, p. 92.

Decision-making is defined as ‘the contribution of workers and employees to making decisions, setting specific work objectives, and committing to implementing those decisions to achieve goals’²².

Predictive analytics are widely applied in automating human resource management activities, utilizing advanced analytical capabilities that encompass a range of statistical methods, data mining, text analysis, real-time recording, and machine learning. These analytics help in discovering patterns in data and understanding what has happened and what will happen by creating a formula or algorithm that simulates outcomes for future predictions. The goal is to enable managers and decision-makers to make better decisions at lower costs²³.

Decision tree algorithms are used to build predictive models. This simple and common method constructs a tree-like model consisting of decisions and their potential consequences. Each node represents a test of a specific attribute, while each branch represents the possible outcomes of that test. Decision trees are utilized to predict business outcomes, candidate performance, and the impact of policies that reduce employee turnover.

Providing accurate data is essential for making correct decisions, as the decision-making process is one of the fundamental elements of successful management, serving as the core of administrative operations. Therefore, many institutions in the developed world rely on artificial intelligence in their daily operations. Expert systems solve problems and make decisions at a level of performance equal to or exceeding that of human experts in certain fields. These tools range from “Roomba” robots and recommendation engines on the internet to more advanced and complex information systems like IBM’s Watson. Such intelligent devices have become integral to the decision-making processes of organizations. However, the use of these technologies has also brought challenges related to the procedures for developing staff to adapt to new systems and the inherent weaknesses of humans in this area. It raises questions about

²²- Shili Ilham, Managing Human Resources Amid Challenges of Applying Artificial Intelligence, *Arsad Journal of Economic and Administrative Studies*, Vol. 6, No. 1, June 2023, pp. 79-94, p. 90.

²³- Shaikha Saif Al-Mansoori, Dr. Ali Nasser Al-Tahita, Same Reference, p. 84.

how users can determine the logical outcomes of device performance and which organizations are most ready and in need of artificial intelligence²⁴.

The importance of automation in the human resources planning process for public administrations is undeniable. It saves time and is effective in evaluating management objectives and quantitatively and qualitatively assessing future needs. Automation assists planning officials by providing the necessary data for human resource planning and helping them to accurately predict and determine quantitative and qualitative human resource requirements.

A field study conducted by academic researchers found that automating human resource management at the Gulf Bank of Algeria significantly improved the planning process. Using specialised software to automate the human resource planning system produced highly accurate information. This was achieved by advertising job vacancies electronically, expanding the recruitment pool and providing suitable, qualified human resources to meet the required numbers. This attracted candidates to fill vacant positions, increasing efficiency and helping to achieve management goals²⁵.

However, the issue remains confined to the study sample — the Gulf Bank of Algeria — where certain departments still demonstrate a weak link between the use of information and communication technology (ICT) and recruitment and hiring processes. Automation plays a significant role in recruitment and appointment processes, particularly in its ability to advertise job vacancies electronically, search for qualified individuals and encourage them to work in administration.

Automation's role in facilitating effective hiring decisions based on publicly announced criteria is undeniable. Furthermore, the administration considers applicants' technological skill levels during the hiring process. The adoption of automation and the shift from traditional paper-based administration to electronic management have led to significant changes in human resource management functions. Automation has simplified recruitment and hiring procedures, making them faster and more accurate at selecting the most suitable candidates and thus enhancing motivation and increasing employee satisfaction.

²⁴- For more see: Ben Jakhnoun, Nadia; Samali, Ben Yemnia, The Impact of Automating Human Resource Management on Achieving Quality Banking Services: A Case Study of Gulf Bank, Master's Thesis, Faculty of Economic and Commercial Sciences, 8 May 1945 University, Qalmah, Algeria, 2015, p. 66 and beyond.

²⁵- Fares Qatar, toufik Hanashi, Same Reference, p. 86.

This is achieved by helping individuals adapt, learn effectively, and improve their experiences and competencies to meet organisational goals, ultimately raising job satisfaction. Automation increases employees' motivation to achieve institutional objectives and improves their overall satisfaction.

Using an automated payroll system and incentives in human resource management achieves more favourable results among employees. Promotion decisions are based on information derived from HR information systems, which help to reduce staff turnover and motivate employees to fulfil managerial roles. It is also important to recognise its contribution to training and development, such as identifying administrative training needs and facilitating training processes.

Achieving effective training for employees requires responding to the demands of the surrounding environment, keeping pace with rapid technological advancements, and objectively identifying gaps in employee performance, as well as determining training needs at the individual level. Providing a suitable electronic administrative environment for training enhances the process of automated training needs analysis.

Moreover, establishing an electronic performance evaluation system contributes to reducing errors, preventing bias, and increasing the accuracy of evaluation results. It saves time and effort while enhancing effectiveness based on data extracted from applications used to monitor working hours. The results of performance evaluations are linked to a computerized program that supports decision-making regarding human resources, thereby increasing the efficiency of human resource management, which includes performance evaluation functions.

In conclusion, implementing automation improves the performance of human resources in public administration, enhancing efficiency in training and development by organising training courses for employees across various departments.

However, the automation process faces several obstacles and technical issues, such as slow and frequent maintenance when implementing automated systems, as well as high costs and expenses associated with updating human resource operating systems, particularly given employees' limited expertise in using

information technology programmes. Additionally, the high cost of training employees to use advanced IT programmes can be problematic. In some cases, the equipment and tools used may be unsuitable for electronic work, or human resource management systems and procedures may not align with modern technological applications. This can lead to various material, human and administrative obstacles, as well as political, legal and security challenges that hinder the automation of human resource management.

Thus, this vision remains distant in Algeria, yet it is a paradox and challenge that we will inevitably encounter sooner or later. We must address this by identifying the processes and issues to be resolved and constructing a vision around them.

Section Two: The Impact of Artificial Intelligence on Human Resource Management Functions

It is impossible to discuss the impact of artificial intelligence on human resource management without referencing in-depth studies that provide models and results which define that impact. A 2004 study by Huub Ruel, Tanya Bondrouk and Jan Kees Looise, titled *Innovation or Irritation: e-HRM*, found that electronic human resource management (e-HRM) systems are used to standardise or coordinate HR policies and processes. Furthermore, the researchers identified a ‘gap’ between the technical and practical applications of e-HRM within the five companies studied. A key finding was that, while e-HRM reduced costs and lightened administrative burdens, it did not enhance employee competencies²⁶.

In another study conducted by Bandrouk T, Ruel H, and Veld M in 2009, titled “The Contribution of E-HRM Effectiveness: Results from a Quantitative Study in the Dutch Ministry,” the researchers examined the benefits of implementing e-HRM in the form of self-service applications for employees. The study concluded that the individual application of e-HRM systems impacts both the technical and strategic effectiveness of HR management, reduces costs, and improves the level of HR service²⁷.

A further study by V. Antony Joe Raja in 2011, titled “Challenging and Implementing E-HRM in Software Organizations,” revealed that electronic HR

²⁶- Murad Ahmed, *Electronic Readiness for Management*, Academic Journal of Legal and Political Research, Vol. 6, No. 2, 2022, pp. 606-621, p. 607.

²⁷- Same reference, p. 608.

management increases transparency in administrative functions, notably enhancing oversight by senior management and ensuring flexibility in electronic recruitment, training, and data development.

In a 2014 study by Fahimeh Babaei Nivlouei, titled “Système Électronique de Gestion des Ressources Humaines: L’élément Principal Capacitaire le Paradigme de la Mondialisation,” it was concluded that e-HRM is not merely a tool on the internet for automating and facilitating employee data entry and self-service electronically; rather, it is an effective means to implement HR strategies, policies, and practices through the full utilization of internet-based technologies.

The objective of the 2017 study by Mazen J. Al Shobaki et al., titled “Impact of Electronic Human Resources Management on the Development of Electronic Educational Services in the Universities,” was to identify the impact of e-HRM on the development of electronic educational services in Palestinian universities in Gaza. The study included a population of 35 IT staff members in Palestinian institutions in Gaza²⁸.

The results indicated that the university system provides electronic educational services, which influence the transition to e-HRM by encouraging the use of information technology for certain HR management functions. A general trend towards electronic educational services was evident in the universities studied, and the findings provided clarity regarding the concept of e-learning. However, the availability of electronically published educational and training materials for staff was limited. The study confirmed that the university system has a statistically significant effect on the provision of electronic educational services within e-HRM.

The question posed here is: What is Algeria’s level of readiness for e-government as it moves towards artificial intelligence? Our aim is to measure the electronic readiness index in order to improve the performance of public administrations and transform them into entities that are more efficient, transparent and professional.

Electronic readiness refers to the preparedness to use information and communication technology for e-learning purposes. It encompasses a wide range

²⁸- Same reference, p. 87.

of digital competencies and characteristics, such as the ability to use computers to retrieve, evaluate, store, produce, present and exchange information, as well as communicate and participate in networks via the internet, in order to foster economic growth and enhance well-being. It also encompasses essential digital skills.

Electronic readiness reflects a state's ability to achieve high levels of productivity and growth by relying on information and communication technology indicators and comprehensive laws and regulations related to the use of this technology²⁹.

Algeria has successfully transitioned to e-government by leveraging various competencies, enhancing the organisational structures of certain institutions, and utilising human, technological, and financial resources to deliver exceptional electronic services that promote economic and social growth, and which are widely accepted and appreciated by those who use them³⁰.

However, 25 years after the first report on the classification of e-governments around the world, Algeria is still suffering from regression due to weak policies and ineffective resource utilisation. Reports indicate that Algeria does not face a shortage of human resources, as there is a plentiful supply of human capital, especially given that universities are keeping pace with technical specialities and there are a number of institutes offering specialised training. Nonetheless, infrastructure remains underdeveloped. While the Algerian citizen is increasingly using modern technology in daily and household activities, the administration is slow to acquire the latest equipment, relying instead on traditional management methods in most institutions and departments³¹.

Most human resource managers express frustration regarding their tasks, which often involve repetitive, time-consuming routine activities such as attendance tracking, shift scheduling, and report preparation. While each of these functions is essential for administrative success overall, executing them manually often takes a significant amount of time. This frequently means that HR managers

²⁹- Murad Ahmed, Electronic Readiness for Management, *Academic Journal of Legal and Political Research*, Vol. 6, No. 2, 2022, pp. 606-621, p. 607.

³⁰- Same reference, p. 608.

³¹- Slim Bouhlamash, The Reality of E-Government Readiness in Algeria: A Review of Indicators and Constraints 2003-2018, *Algerian Journal of Security and Development*, Vol. 8, No. 15, July 2019, pp. 92-103, p. 99.

have less time to focus on strategic HR initiatives. This is where artificial intelligence comes in.

Integrating artificial intelligence into human resource management processes can alleviate the burden on HR managers, enabling them to focus on important initiatives such as strategic organisational-level planning. This is crucial in HR management, as managers use AI technology to support decision-making, allowing for more comprehensive strategic planning.

Employee recruitment through AI is essentially automated, addressing large, complex and repetitive problems and producing quality results. This starts with reviewing and verifying CVs, unlike manual methods. Similarly, AI is used in training to enhance personalised learning experiences that can adapt to the needs of individual employees. In performance evaluation, AI helps HR practitioners to make more accurate, transparent and less biased decisions. It also plays a role in managing compensation systems.

Therefore, there is a need to implement programmes equipped with the correct information and technology, automating routine tasks and human work structures as an initial step to embedding this into the administrative activities of public administrations, particularly in human resource management. Some of the most significant applications of AI in HR management include expert systems, intensive software incorporating knowledge from scientific journals; knowledge discovery in databases (KDD), an analytical process for modelling large data warehouses; data mining, developing methods for handling big data; big data analysis, focusing on extracting and analysing complex information; and file conversion applications changing file formats using specific software or services³².

Conclusion:

Algeria must keep pace with technological developments and harness artificial intelligence in human resource management, which has become an imperative that must be addressed through laws, regulations, and practices. It is not enough to equip individuals with smartphones and other technological means or to open up e-commerce without imposing taxes on it as a qualitative advantage. There

³²- Iman Mekdad, Nassim Hamouda, The Impact of Artificial Intelligence Applications on the Effectiveness of Human Resource Management in the Marriott Hotel Chain, Journal of Economics and Business Administration, Vol. 8, No. 1, pp. 37-57, p. 42.

must also be legal empowerment within public administrations, which is a gap that needs to be addressed. Moreover, the repercussions extend to empowering human resources through training and development, making it a necessity rather than a choice in the face of growing resistance to traditional HR management at all levels. Therefore, we encourage the opening of scientific channels to provide a clear vision across all fields, especially those impacted by artificial intelligence, and the necessity to move towards adopting digital currency in a world governed by unified rules.

To this end, we recognise the need to undertake several initiatives and preparations to embrace artificial intelligence, particularly in human resource management. These include:

1. Raising awareness: educating the public and community sectors about the concepts of artificial and business intelligence to facilitate the adoption of applications based on these technologies. This will be achieved through collaboration between government, educational and media institutions to create digitally savvy citizens who can engage with these technologies.
2. Developing and organising AI tools. We will ensure that AI and business intelligence tools become an integral part of the government's work system, helping to address rapid changes and achieve qualitative improvements in overall performance at all levels. This will be achieved by building a complete, connected, smart digital system that can respond promptly to challenges with practical, efficient solutions.
3. Creating awareness among leaders: Ensuring that leaders, managers and employees in public sector institutions understand the importance of AI and BI, and how they can be applied to facilitate the adoption of these technologies in the development of services within those institutions.
4. Forming work teams: Empowering executive managers to innovate within public sector institutions, studying the opportunities and challenges these institutions face when developing their services and electronic systems using AI and business intelligence technologies. This involves developing implementation plans and finding solutions to anticipated challenges.

Therefore, a focused effort is required to:

1. Promote the concept of AI by continuously integrating it into the operations of public institutions to foster its use in daily tasks.
2. Apply AI across all government sectors: emphasise the necessity of applying AI in all government sectors due to its positive impact on employee performance and its potential to create new job opportunities through innovation.
3. Generate new job opportunities by employing artificial intelligence experts to monitor developments and improve the work environment in public administrations and institutions.
4. Conduct training sessions to clarify the role of AI in enhancing the work environment in public administrations and institutions.

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