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The Impact of Artificial Intelligence on Human Resource Management Applications:An Empirical Study at Algeria Telecom- Jijel Using PLS-SEM

Djennat Boukhemkhem [1*]

[1] Mohamed Seddik Ben Yahia University -Jijel (Algeria),
djanet.boukhemkhem@univ-jijel.dz

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Abstract

This study seeks to elucidate the impact of Artificial Intelligence on Human Resource Management Applications in organizations, with a specific focus on Algeria Telecom – Jijel as a case study, by examining its four dimensions: expert systems, data mining, knowledge discovery in databases, and big data analysis. A questionnaire served as the primary data collection tool, administered to a sample of 42 employees at Algeria Telecom - Jijel, and the data were analyzed and hypotheses tested using SPSS version 21 and SmartPLS software. The findings revealed a statistically significant impact of Artificial Intelligence on Human Resource Management Applications, an effect attributed to the dimensions of data mining, knowledge discovery in databases, and big data analysis, whereas the expert systems dimension did not show a significant influence

Keywords:
Artificial Intelligence;
Human Resource Management;
data mining;
Algeria Telecom.

JEL Classification Codes: O33 ; M15 ;J24

* **Corresponding author**

1. INTRODUCTION

While artificial intelligence, as a concept, is relatively new, the term itself emerged in 1956 at the Dartmouth Summer Research Project on Artificial Intelligence conference at Dartmouth College in New Hampshire. Although initial reflections on the concept began in the early 1950s, the term "artificial intelligence" has been widely used in academic and professional circles for several years. This new technological development has become a primary concern for organizations of all types, stemming from both the anxieties surrounding its use and the benefits organizations reap from employing advanced management methods. These methods are based on the use of new algorithms, the increase in information volume, and enhanced computing capabilities.

Consequently, artificial intelligence has permeated numerous activities globally, significantly impacting business strategies. Organizations are rapidly adopting new, clearly evolving management approaches. At the technological level, organizations today are required to integrate artificial intelligence into their operations to automate management tasks, leverage data, and streamline decision-making. Human resource management, like other administrative functions, is now subject to the logic imposed by AI, which is transforming management into intelligent human resource management applications. This transformation represents a significant shift driven by technological advancements that enable organizations to enhance their competitiveness by boosting human resource performance and, consequently, organizational performance through innovative AI-based human resource management applications. Numerous challenges and opportunities arise when organizations adopt these

technological advancements in human resource management, including resistance to change, the need for training, performance efficiency, talent acquisition and selection, and reduced task completion times, among others.

Based on the above, the main research question is **"Does artificial intelligence represent a qualitative shift in the performance of human resource management functions, or merely a marginal technical development?**

-What is the conceptual framework of artificial intelligence, and how is it employed in the context of human resource management What AI-based applications are currently deployed in HRM functions (recruitment, training, performance evaluation) at Algeria Telecom - Jijel unit?

-How have these artificial intelligence applications influenced the efficiency and effectiveness of HRM functions at the case study organization?

Research Hypotheses:

The study consists of a main hypothesis and four sub-hypotheses as follows:

Main Hypothesis:

- Artificial intelligence applications have a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

Sub-Hypotheses:

- Expert systems have a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

-Data mining has a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

-Knowledge discovery in databases has a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

-Big data analysis has a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

Research Significance:

The importance of the research is highlighted by the following:

- The scientific aspect, as the importance of the study lies in the scientific analysis of the relationship between artificial intelligence and human resource management applications.
- Testing the artificial intelligence model in the field of public service organizations, especially in the Algerian ones (Province of Jijel), which contributes to generalizing the results to different contexts.
- The applied aspect: The importance of this topic is highlighted by applying the theoretical study to the practical aspects of the organization under study.
- Based on the results and recommendations, organizational decision-makers can enhance their strengths and tackle areas needing improvement weaknesses.

Research Objectives:

The research objectives can be summarized as follows:

- To determine the extent to which Algeria Telecom has adopted the dimensions of artificial intelligence.
- To understand the extent to which artificial intelligence contributes to improving the effectiveness of human resource management within the organization under study.
- To arrive at conclusions upon which to base proposals that, if implemented, could create a suitable environment for applying artificial intelligence to improve the effectiveness of human resource management.
- **Research Methodology:**

The research methodology adopted in this study is the descriptive-analytical method. The theoretical study relied on books, journals, and scientific conferences to obtain data. For the field study, a questionnaire was used as the primary data collection instrument. The data were analyzed using SPSS version 21 and SmartPLS software. The study sample comprises 42 employees at Algeria Telecom -Jijel.

2. Theoretical Background

Before analyzing the effects of artificial intelligence on various human resource management applications, it is essential to clarify its development, definition, types, and engineering.

2.1 Evolution and Concept of Artificial Intelligence:

The emergence of artificial intelligence coincided with the advent of the computer. The concept did not constitute a distinct technology in its own right; rather, the technology existed in its simplest forms within computers. However, the concept became clearer around 2000, with the development of algorithms and the emergence of widespread access to information. With these developments, the conceptual paradigm shifted.

Artificial intelligence is no longer limited to the input of rules into a machine for application; it enables computers to learn and discover rules through classification and association. Deep learning is a subfield of artificial intelligence characterized by machines' ability to learn autonomously. Unlike the classical symbolic approach, in which information is provided to the machine, the deep learning approach has machines learn from data. This process is inspired by neuroscience, enabling the processing of large volumes of data and improving system performance through feedback. The following table presents

definitions of artificial intelligence from several researchers (lahrache R & bekkaouiA, 2025, p. 261)

Table 1. Evolution of AI Definition

Researcher	AI definition
Herbert Simon 1957	Artificial intelligence is the science of creating machines capable of performing tasks that require intelligence; it is the ability to achieve goals under conditions characterized by complex information.
Ganascia (2017)	Artificial intelligence is a branch of computer science aimed at developing machines that simulate various functions of human intelligence.
Benhamou, al. 2018	A set of techniques and algorithms that enable computer systems to simulate human cognitive abilities, such as learning, reasoning, decision-making, and processing complex data, to solve problems more effectively and flexibly.
Henlein, Kaplan (2019)	The system's ability to interpret data correctly, learn from it, and use what it has learned to achieve goals with flexibility and adaptability.
Geetha, Bhanu (2021)	The artificial intelligence system is capable of understanding, analyzing, interacting, and adapting to its environment. It learns from past experiences and can solve complex problems independently.

In addition to its technological capabilities for perception, analysis, response, interaction, and independent learning, artificial intelligence can be critically defined by considering its ethical and social implications. From this perspective, it is not merely an independent information-processing system but rather a set of technologies whose design and use raise issues of responsibility, transparency, and accountability.

Therefore, a critical definition of artificial intelligence underscores the need to integrate governance mechanisms that ensure that the decisions produced by these systems respect ethical principles and anticipate the risks associated with their widespread application across societies and institutions (benali, 2025, p. 689) Based on the above, there are multiple definitions of artificial intelligence. In this context, many researchers emphasize that there is no single comprehensive definition; each researcher has their own definition of this technological development. The concept depends primarily on the researcher's approach to the subject.

2.2 Types of Artificial Intelligence According to Tasks Performed:

It can be divided, according to the tasks performed, into narrow artificial intelligence, general artificial intelligence, and superintelligence.

-Narrow AI:

This is the simplest and most widespread type of artificial intelligence. It is designed to perform a single, specific task and cannot exceed its scope or think beyond its boundaries, yet it excels at its task. Narrow AI is highly intelligent within a single domain but is neither comprehensive nor conscious. Examples include facial recognition, speech recognition, autonomous vehicles, Google Translate…etc. This relates to the level of intelligence assigned to most current computers, where most programs are typically specialized in a single, specific area and can be mathematically proven. (benali, 2025, p. 690)

-Artificial General Intelligence (AGI):

This type of intelligence operates in complex situations, performs multiple tasks, and adapts to the environment. It represents a level

of intelligence comparable to that of humans. This type is characterized by the ability to think logically, plan, solve problems, demonstrate abstract thinking, and learn rapidly. AGI is a level of intelligence capable of understanding, learning, and thinking in any field with the same flexibility and generality.

It is no different from humans; it possesses the ability to think logically, to deeply understand information, to learn from experience, to plan, to solve new problems, and to exhibit creative abilities (el kahtane, 2022, p. 7)

-Superintelligence:

This type of intelligence exceeds human capabilities and is currently more theoretical than practical. Superintelligence is characterized by high reasoning power, the ability to learn rapidly and plan strategically for the long term, a superior ability to understand human behavior, and the capacity for innovation and providing solutions to problems that humanity faces, such as developing new treatments for diseases, managing the economy, and solving problems that have plagued humanity for centuries (el kahtane, 2022, p. 8)

On the other hand, technologies have not yet developed sufficiently to enable applications of superintelligence. General artificial intelligence applications are currently undergoing rapid development and can be used in discriminatory or generative ways (Patesson, 2024, p. 14)

2.3 Artificial Intelligence Engineering:

This is an engineering discipline that combines computer science and mathematics to design intelligent systems capable of mimicking human capabilities.

-Discriminatory Artificial Intelligence:

This type of intelligence relies on pre-existing information and applies rules to it to sort and differentiate among it. It analyzes and extracts relevant information based on specific inputs. This process is based on understanding existing information rather than generating new information. Therefore, tools based on this type of engineering primarily enable the creation of classification tasks, i.e., assigning received data a conceptual dimension, transforming it into models or concepts that can be used in decision-making, and converting it into understandable and usable data. Developing this type of tool has become a major focus for artificial intelligence (hachemi & melliani, 2024, p. 51)

-Generative Artificial Intelligence:

Generative artificial intelligence, particularly conversational (interactive) generative artificial intelligence, or large language models, is an AI system capable of understanding and generating human language. For example, in ChatGPT and DeepSeek, since Google created this technology in 2015, the Large Language Model (LLM) has evolved and specialized according to three engineering models. These models are called "decoders only," and they generate data based on the context they receive (the input). This approach is typically used in models that generate text word by word, based on previously generated words via statistical inference of the language (hachemi & melliani, 2024, p. 51)

Finally, encoding and decoding systems combine the two previous models. An encoding network, based on the provided information (inputs), generates a contextualized, composite representation, which is then passed to a decision network. This network generates a specific sequence of outputs according to the required task. This approach is used in tasks such as summarizing, translating texts, and responding to chatbot questions—tasks in

which the results depend heavily on the input information (saadane & al, 2024, p. 355)

2.4 Dimensions of Artificial Intelligence:

The dimensions of artificial intelligence fall into the following categories (saadane & al, 2024, p. 355):

-Expert systems : are computer programs that mimic human decision-making processes in specific areas. In human resource management, expert systems can analyze complex data to provide recommendations for talent management and training needs Algeria Telecom, relies on the expert system "HR Access" in the areas of salaries, compensation, recruitment, and training monitoring

-Data mining (exploring data): It involves extracting necessary data from a massive amount of data. In human resources management, this technological technique can be used to identify hidden patterns and trends in employee data, such as retention rates, performance, and professional training needs

-Knowledge discovery in databases: seeks to uncover significant relationships and patterns. This requires employing advanced algorithms and machine learning techniques to extract valuable information to inform human resource management strategies.

-Big data analysis:involves processing various types of data, both structured and unstructured, programmed and unprogrammed, that are too large to be easily processed using modern software.

2.5 Analyzing the Impact of Artificial Intelligence on Human Resource Management Applications:

Having analyzed artificial intelligence with respect to its development, concepts, and types, we now examine its impact on human resource management applications. This integration has been somewhat delayed. The development of AI applications in

human resource management has clearly advanced during the COVID-19 pandemic.

- Competency Management:

Artificial intelligence not only affects the recruitment process but also reshapes the competencies that organizations need to succeed in the current work environment. It leads to a change in the type of competencies required in the labor market. Routine and manual tasks are gradually being performed by machines. Great cognitive skills, such as the ability to solve complex problems, critical thinking, and creativity, are constantly evolving. This technological development has revolutionized the field of training, making the process more efficient and easier for human resource managers to manage (Ragavendran, & Shree, 2023, p. 3268) . A 2016 OECD study was optimistic about the impact of automation on jobs, suggesting that only 25% to 35% of jobs would be affected. These discrepancies in findings diminish the significance of such studies. The future of work is shaped by numerous factors, including technological advancements, public policies, and organizational strategies (Héry & Levert, 2017, p. 8)

- Recruitment:

Recruitment is a crucial and sensitive function within human resource management. This task enables organizations to attract and appoint the most qualified candidates in the labor market. Attracting top talent is no easy feat, as the goal is to acquire the ideal candidates. Initial selection and screening of job applicants' resumes to determine the appropriate job requirements constitutes a very heavy task for those in charge (Froese & AL, 2022, p. 1130), as the recruitment process goes through several stages, which are assessing the needs for competencies, searching for candidates from inside or outside the organization, selecting candidates based on interviews, tests, and embodying the

recruitment process, which includes the appointment decision, reception, and integration (بوخمخم، 2012، صفحة 142)

Artificial intelligence (AI) accelerates the recruitment process, as the demand for new talent continues to grow. It automates repetitive tasks by first analyzing large datasets to identify trends, thereby streamlining the hiring process. Much of the repetitive, lengthy, and mentally demanding work, such as gathering candidate data, initial screening, scheduling meetings, and responding to candidate inquiries, can be done with the help of intelligent robots (Ragavendran, & Shree, 2023, p. 3268)

At IBM, AI demonstrated how talent management can be optimized, enabling the rationalization of recruitment processes and empowering HR professionals to assume a more advisory, human-interest role. This is also true for organizations with well-designed models.

Furthermore, other emerging applications include resume-free recruitment, which relies on algorithmic analysis of skills and career paths from databases. This approach enables the identification of suitable candidates (based on appropriate skills) who are then classified according to sophisticated criteria (hasinat & hajouji, 2025 , p 102)

Another emerging application of artificial intelligence in human resource management, particularly in recruitment, is facial recognition. This technology enables candidate identification and can simplify and secure the applicant screening and interview process.

Artificial intelligence has effectively contributed to the development of recruitment and talent acquisition. However, its integration into organizations requires critical, reflective

consideration of its limitations and its role in human decision-making in talent management.

- Predictive Human Resource Management:

Strategic predictive human resource management is essential. It aims to balance available talent and skills with those required, particularly with respect to long-term objectives. Achieving this balance and avoiding shortages or surpluses enhances the organization's competitiveness (بوخمخم، 2012، صفحة 108)

- Labor Relations:

This includes the relationship between employers and employees, which significantly affects productivity and employee satisfaction. Integrating voice interaction technology enables the development of advanced consultation systems that facilitate communication, support conflict resolution, and improve the organizational climate.

- Talent Management:

Every organization, through its human resources management, strives to ensure that its employees possess the skills and knowledge necessary to achieve its goals. This can only be achieved through training and talent development. Therefore, a suitable training system is essential for any organization to ensure the provision of qualified staff. Human resources managers can now train and evaluate human resources using artificial intelligence technology (saadaoui & belmoufeq, 2023, p. 1140), a key factor in achieving optimal talent utilization and skills development. Human resource management gains access to effective training and evaluation tools for continuous employee development. Furthermore, it enriches the learning experience by making content interactive, engaging, and accessible, thereby facilitating the rapid acquisition of diverse skills within training platforms. Artificial intelligence enables the development of

tailored training programs that meet employees' specific needs, thereby enhancing their effectiveness. (mohamed, 2025, p. 693)

- Continuous Employee Performance Evaluation:

AI algorithms enable the collection and analysis of data in real time, allowing for continuous and objective evaluation of HR performance. This contrasts with traditional approaches, which are typically annual or semi-annual. This method allows for dynamic and personalized monitoring of individual and team performance. AI thus contributes to the early detection of performance deviations, generating constructive feedback that informs the design of training programs tailored to each employee's specific needs. This mechanism ensures greater transparency, reduces subjective bias, and enables employees to benefit from fairer and more motivating support. (mohamed, 2025, p. 694)

- Compensation Management:

Organizations are required to design an effective compensation and benefits system that meets labor market demands. The compensation system must be fair and competitive to retain talent and improve individual and team performance. Artificial intelligence neural networks are a fundamental tool for ensuring fairness in the compensation system. Based on Big Data, this technology enables the establishment of an intelligent support system that helps build a fair compensation system. The AI system saves time and helps keep abreast of market developments and employee trends. Based on Big Data analysis, relevant historical data can be compiled and used to predict future wage trends. AI is used to monitor the labor market, ensure that employees receive competitive compensation, and create a system that adjusts

compensation based on employee performance. This encourages the achievement of record performance levels. (saadaoui & belmoufeq, 2023, p. 1144)

3.The empirical part of the study

This section covers the study sample, the testing of the study model, and the hypothesis testing.

3.1 study sample

Table 2. Sociodemographic Data

Sociodemographic Data			
Gender	Male	18	42,9
	Female	24	57,1
	Total	42	100
Age	Less than 30 years old	6	14,3
	From 30 to 40 years old	11	26,2
	From 40 to 50 years old	25	59,5
	Total	42	100
Professional Experience	Less than 5 years	8	19
	Between 5 and 10 years	2	4,8
	Between 11 and 15 years	9	21,4
	More than 15 years	23	54,8
	Total	42	100

Source: Outputs of the SPSS

table (2) presents the sociodemographic characteristics of the study sample from Algeria Telecom – Jijel, focusing on gender, age, and professional experience. Regarding gender distribution, females constitute the majority at 57.1%, while males account for 42.9%, indicating a relatively balanced representation with a slight female predominance. In terms of age, the largest group of

respondents falls within the 40 to 50 years category, representing 59.5% of the sample, followed by those aged 30 to 40 years at 26.2%, while employees under 30 make up only 14.3%. This distribution reflects a mature workforce with substantial professional exposure. Concerning professional experience, over half of the respondents (54.8%) have more than 15 years of experience, 21.4% have between 11 and 15 years, 19.0% have less than 5 years, and only 4.8% have 5 to 10 years of experience. This highlights that the sample is largely composed of long-tenured employees, whose extensive experience offers informed insights into HR practices and the integration of AI technologies within the organization

3.2 Testing the Study Model

To ensure the validity of the model, we must first assess the measurement model before proceeding to evaluate the structural model. To evaluate the measurement model, we use indicators of convergent validity, check for multicollinearity issues, and assess discriminant validity.

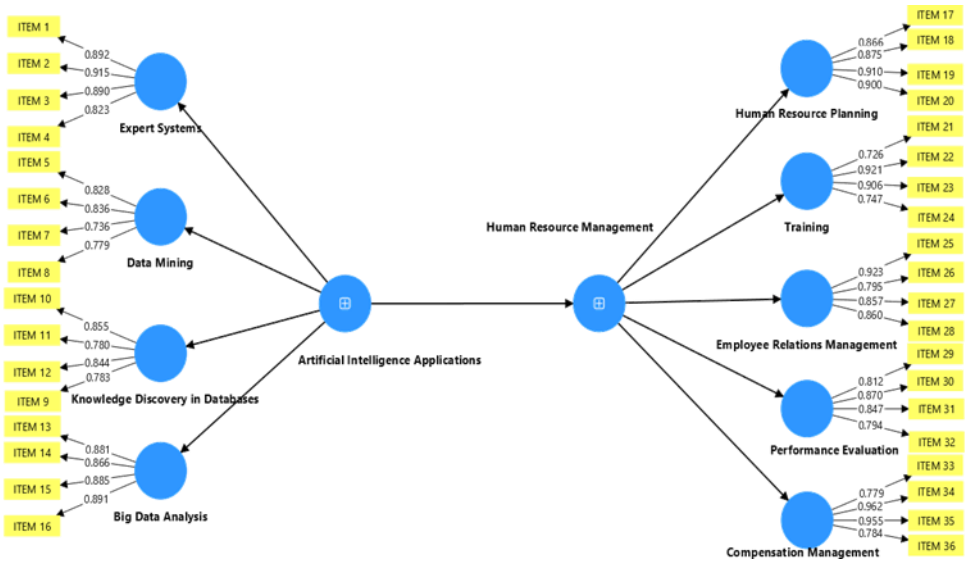
Table 3. Convergent validity, model reliability, and verification of the absence of multicollinearity problem

Variable	Factors	Item	FL	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	VIF
Artificial Intelligence Applications	Expert Systems	ITEM 1	0.892	0.903	0.905	0.933	0.776	2.812
		ITEM 2	0.915					3.959
		ITEM 3	0.890					3.386
		ITEM 4	0.823					2.016
	Data Mining	ITEM 5	0.828	0.806	0.811	0.873	0.633	1.880
		ITEM 6	0.836					1.866
		ITEM 7	0.736					2.669
		ITEM 8	0.779					1.646
	Knowledge Discovery in Databases	ITEM 9	0.783	0.833	0.842	0.889	0.666	2.172
		ITEM 10	0.855					4.091
		ITEM 11	0.780					2.020
		ITEM 12	0.844					2.365
	Big Data Analysis	ITEM 13	0.881	0.904	0.904	0.933	0.776	2.582
		ITEM 14	0.866					2.399
		ITEM 15	0.885					2.750
		ITEM 16	0.891					2.903
Human Resource Management	Human Resource Planning	ITEM 17	0.866	0.911	0.913	0.937	0.789	2.411
		ITEM 18	0.875					2.703
		ITEM 19	0.910					3.242
		ITEM 20	0.900					2.981
	Training	ITEM 21	0.726	0.844	0.850	0.897	0.688	1.398
		ITEM 22	0.921					4.102
		ITEM 23	0.906					4.453
		ITEM 24	0.747					1.547
	Employee Relations Management	ITEM 25	0.923	0.882	0.884	0.919	0.739	4.398
		ITEM 26	0.795					1.912
		ITEM 27	0.857					2.371
		ITEM 28	0.860					3.693
	Performance Evaluation	ITEM 29	0.812	0.857	0.891	0.899	0.691	1.530
		ITEM 30	0.870					2.351
		ITEM 31	0.847					2.410
		ITEM 32	0.794					2.362
	Compensation Management	ITEM 33	0.779	0.894	0.919	0.928	0.765	1.971
		ITEM 34	0.962					3.943
		ITEM 35	0.955					3.547
		ITEM 36	0.784					1.732

Source: Based on SMART PLS 4

Fig.1. Convergent validity, model reliability, and verification of the absence of multicollinearity problem

Source: Based on SMART PLS 4



The results presented in Table (3) provide strong empirical evidence supporting the adequacy of the measurement model for examining the impact of artificial intelligence applications on human resource management at Algeria Telecom – Jijel. Convergent validity was confirmed through factor loadings exceeding the recommended threshold of 0.70, ranging from 0.736 to 0.915 for AI applications dimensions and from 0.726 to 0.962 for HRM dimensions, while the Average Variance Extracted values for all constructs ranged between 0.633 and 0.789, surpassing the minimum acceptable value of 0.50. In addition, internal consistency reliability was demonstrated through Cronbach's alpha values ranging from 0.806 to 0.911 and composite reliability values exceeding 0.70, indicating high consistency and stability of the measurement scales. Furthermore,

the Variance Inflation Factor values ranged from 1.398 to 4.453, well below the critical threshold of 5, confirming the absence of multicollinearity issues. Overall, these findings confirm the robustness of the measurement model and provide a solid foundation for proceeding to the assessment of the structural model and testing the hypothesized relationships

- Discriminant Validity:

Here, we assess the distinctiveness of the variables. According to Fornell-Larcker criteria, the relationship value between a variable and itself should be greater than its relationship with any other variable to confirm that the dimensions are independent (Hair & al, 2017, p. 148)

Table 4. Discriminant Validity

	Big Data Analysis	Compensation Management	Data Mining	Employee Relations Management	Expert Systems	Human Resource Planning	Knowledge Discovery in Databases	Performance Evaluation	Training
Big Data Analysis	**0.881**								
Compensation Management	0.195	**0.874**							
Data Mining	0.434	0.276	**0.796**						
Employee Relations Management	0.509	0.208	0.523	**0.860**					
Expert Systems	0.406	0.203	0.401	0.464	**0.881**				
Human Resource Planning	0.391	0.232	0.463	0.564	0.249	**0.888**			
Knowledge Discovery in Databases	0.166	0.203	0.371	0.482	0.358	0.253	**0.816**		
Performance Evaluation	0.315	0.339	0.448	0.242	0.510	0.178	0.468	**0.831**	
Training	0.513	0.207	0.564	0.844	0.368	0.768	0.438	0.222	**0.830**

Source: Based on SMART PLS 4

Discriminant validity was assessed using the Fornell-Larcker criterion, which requires that the square root of the Average

Variance Extracted (AVE) for each construct be greater than its highest correlation with any other construct. The results in Table 4 confirm that all diagonal values (square roots of AVE) exceeded the inter-construct correlations. For instance, the square root of AVE for Big Data Analysis was 0.881, surpassing its correlations with Training (0.513) and Employee Relations Management (0.509). Compensation Management recorded a value of 0.874, higher than its correlations ranging from 0.195 to 0.339. All artificial intelligence dimensions (Data Mining, Expert Systems, Knowledge Discovery) and human resource management dimensions (Planning, Training, Employee Relations, Performance Evaluation) met the criterion, with diagonal values ranging from 0.796 to 0.888. These findings confirm that all constructs are empirically distinct, strengthening the measurement model's credibility and supporting further structural model analysis

-Coefficient of Determination (R Square):

The coefficient of determination (R^2) is the primary metric for assessing the structural model's predictive power. It represents the proportion of variance in the endogenous (dependent) construct explained by all exogenous (independent) constructs associated with it. Calculated as the squared correlation between the actual and predicted values of the dependent variable, R^2 reflects the total effects of external latent variables on the internal latent variable. The R^2 values obtained in the study are presented below

Table 5. coefficient of determination R^2

	R-square	R-square adjusted
Human Resource Management	0.551	0.544

Source: Based on SMART PLS 4

The R^2 value of 0.551 indicates that artificial intelligence applications (expert systems, data mining, knowledge discovery, and big data analytics) explain 55.1% of the variance in human resource management practices at Algeria Telecom – Jijel, reflecting moderate to strong explanatory power. The adjusted R^2 (0.544) confirms model stability. This demonstrates that AI technologies significantly influence HRM functions, while the unexplained variance suggests other factors may also play a role, supporting further analysis.

Table 6. Effect Size Coefficient (F-Square)

	f-square
Artificial Intelligence Applications -> Human Resource Management	1.226

Source: Based on SMART PLS 4

The effect size (f^2) measures the contribution of artificial intelligence applications to explaining human resource management at Algeria Telecom – Jijel. The f^2 value of 1.226 far exceeds Cohen's benchmark for a large effect (0.35), indicating an exceptionally strong practical impact. This confirms that AI technologies—such as expert systems, data mining, knowledge discovery, and big data analytics—are core drivers of HRM practices, including planning, training, performance evaluation, and compensation. The high f^2 value aligns with the R^2 (0.551), reinforcing that AI's influence is both statistically significant and practically meaningful. Additionally, the Goodness of Fit (GoF) value of 0.532 indicates a large model fit, confirming the overall

validity and robustness of the structural model. These findings strongly support the study's hypotheses and highlight AI's strategic role in transforming HRM within the telecommunications sector. To further validate the model's quality and its potential for future application, we calculated the Goodness of Fit (GoF) as follows:

The GoF criterion is used to determine whether the study model is valid based on specific GoF benchmarks (less than 0.1 = poor fit, 0.1 to 0.25 = small fit, 0.25 to 0.36 = medium fit, greater than 0.36 = large fit). The GoF is calculated using the following formula:

$$\boldsymbol{GOF = \sqrt{(\overline{R^2} \times \overline{AVE})}}$$

In this study, the GoF value was 0.532, indicating that the study model has a large fit.

3.3 Testing the first main hypothesis

Main hypothesis: Artificial intelligence applications have a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

Table 7. Main Hypothesis Testing Results

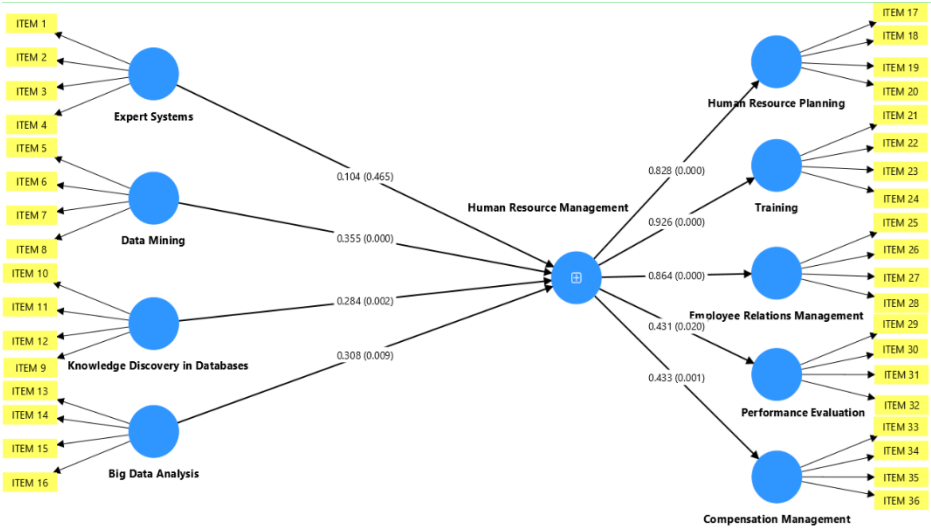
Variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Artificial Intelligence Applications -> Human Resource Management	0.742	0.718	0.115	6.471	0.000

Source: Based on SMART PLS 4

The study tested the hypothesis that artificial intelligence applications significantly impact human resource management at

Algeria Telecom – Jijel using SMART PLS 4 software. The results confirmed a strong, positive, and statistically significant relationship (β = 0.742, t = 6.471, p = 0.000), indicating that increased use of AI technologies like data mining and big data analytics enhances key HR functions such as planning, training, and performance evaluation. With AI explaining 55.1% of the variance in HRM performance (R^2 = 0.551) and demonstrating a very large effect size (f^2 = 1.226), the findings provide robust empirical support for accepting the main hypothesis. Ultimately, the study concludes that AI is a strategic driver for transforming human resource management and boosting organizational effectiveness in the telecommunications sector.

Fig.2. effect of artificial intelligence applications on human resource management



Source: Based on SMART PLS 4

3.4 Sub-Hypotheses:

- Expert systems have a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

-Data mining has a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

-Knowledge discovery in databases has a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

-Big data analysis has a statistically significant effect on human resource management at Algeria Telecom - Jijel Unit

Table 8. Sub- Hypothesis Testing Results

Variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Expert Systems -> Human Resource Management	0.104	0.074	0.142	0.730	0.465
Data Mining -> Human Resource Management	0.355	0.367	0.095	3.738	0.000
Knowledge Discovery in Databases -> Human Resource Management	0.284	0.296	0.094	3.027	0.002
Big Data Analysis -> Human Resource Management	0.308	0.304	0.118	2.599	0.009

Source: Based on SMART PLS 4

In table (8) The study tested four sub-hypotheses examining the individual effects of specific AI dimensions on human resource management at Algeria Telecom – Jijel using SMART PLS 4. The results revealed that Expert Systems have a positive but weak and statistically insignificant impact ($\beta = 0.104$, $t = 0.730$, $p = 0.465$), leading to the rejection of the first sub-hypothesis. which at first glance seems contradictory to the fact that the organization uses an expert system (HR Access) in the areas of salaries, compensation, recruitment, and training monitoring.However, this apparent contradiction disappears when analyzing the nature of the expert system used. It was found that the HR Access system operates as a routine operational tool focused on managing daily processes

(calculating salaries, recording leave, tracking training cycles), but it lacks coverage of strategic HR functions, most notably career path planning and competency-based promotions.

In contrast, Data Mining demonstrated a positive and significant effect ($\beta = 0.355$, $t = 3.738$, $p = 0.000$), supporting the second sub-hypothesis. Similarly, Knowledge Discovery in Databases showed a positive and significant impact ($\beta = 0.284$, $t = 3.027$, $p = 0.002$), confirming the third sub-hypothesis. Likewise, Big Data Analysis exhibited a positive and significant effect ($\beta = 0.308$, $t = 2.599$, $p = 0.009$), validating the fourth sub-hypothesis. Overall, three AI dimensions:Data Mining, Knowledge Discovery in Databases, and Big Data Analysis significantly enhance HRM practices, while Expert Systems do not. These findings suggest that analytical, data-driven AI technologies currently play a more influential role than rule-based expert systems in supporting HRM at Algeria Telecom – Jijel, offering practical implications for prioritizing investments in advanced data analytics

4. CONCLUSION

Artificial intelligence, particularly through its core dimensions:Expert Systems, Data Mining, Knowledge Discovery in Databases, and Big Data Analysis has become a transformative force in modern organizations. These dimensions enable organizations to automate complex tasks, extract meaningful insights from vast datasets, and support data-driven decision-making across various functions. In the context of human resource management, AI applications are reshaping traditional practices by enhancing efficiency, objectivity, and strategic alignment. In recruitment, AI reduces bias and automates administrative tasks, allowing HR professionals to focus on strategic activities. It also enables predictive talent management through data analytics, personalized employee development plans, fair and continuous

performance evaluation using real-time feedback, and equitable compensation systems powered by neural networks and big data. Overall, the integration of AI across HR functions improves work quality, fairness, and employee engagement. However, AI adoption is not without challenges, including the need for new technical competencies, organizational readiness, and ethical concerns related to privacy and the extent of AI's role in personal and professional lives.

The findings of this study conducted at Algeria Telecom – Jijel provide strong empirical support for these theoretical claims. The results confirmed that three AI dimensions:Data Mining, Knowledge Discovery in Databases, and Big Data Analysis significantly enhance HRM practices. These dimensions align with the conclusion's emphasis on AI's ability to improve decision-making, automate routine tasks, and foster fairness in recruitment, training, and compensation. However, the non-significant impact of Expert Systems observed in the study highlights a key practical challenge: while expert systems are conceptually valuable, their current integration within the organization may be limited by technical or human factors, such as lack of specialized competencies or resistance to change. This finding underscores the point that AI adoption faces barriers, including the readiness of human capital and ethical considerations related to data privacy and algorithmic transparency.

Therefore, to fully realize the benefits of AI in HRM, organizations should prioritize investments in data-driven technologies particularly data mining, knowledge discovery, and big data analytics, while simultaneously addressing the skills gap

through continuous training and developing clear ethical frameworks to govern AI use. These results not only validate the multidimensional nature of AI but also offer actionable insights for HR transformation in the telecommunications sector. They demonstrate that the successful integration of artificial intelligence into human resource management depends not only on technological adoption but also on the organization's ability to manage the human and ethical dimensions of this digital transformation

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