

AI-Supported Human Resource Governance as a Mechanism to Enhance Performance Quality in Algeria's Health Sector

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Summary: This study set out to examine the nature and strength of the relationship between Human Resource Governance (HRG), across its four core dimensions—Transparency and Justice, Efficiency, Accountability, and Participation—and performance quality in Algerian health institutions. It also sought to explore the contextual role of Digital Transformation, particularly Artificial Intelligence, within this relationship. Adopting a descriptive–analytical design, data were collected through a field questionnaire administered to a sample of 86 administrative and healthcare personnel. Pearson correlation and simple linear regression techniques were subsequently employed to test the study's main hypotheses.

The results indicated a strong, positive, and statistically significant association between all HR Governance dimensions and performance quality, thereby lending support to the primary hypothesis. Regression findings, however, pointed to a marked variation in the magnitude of influence. The Participation and Accountability dimensions emerged as the most influential predictors, jointly accounting for more than 50% of the variance in performance quality. In contrast, the Transparency and Justice dimension showed the lowest practical contribution, explaining only 11.9% (R^2).

In addition, the study revealed a notable implementation gap in relation to Digital Transformation. While respondents recognized its theoretical value in areas such as strategic planning and data analysis, its actual application remained limited in critical clinical domains, particularly those related to diagnostic accuracy and the reduction of medical errors. The study therefore argues that achieving performance excellence in the health sector depends not only on strengthening participatory mechanisms and accountability frameworks, but also on strategically channeling AI investments toward clinical safety and operational efficiency.

Keywords: Human Resource Governance, Artificial Intelligence (AI), Digital Transformation, Performance Quality, Health Sector.

Jel Classification Codes : O15; M53;J24.

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I- Introduction :

The global health sector has been undergoing accelerated transformations driven by ongoing technological advancement. Within this landscape, artificial intelligence has increasingly come to be viewed as a central force in reshaping health systems and enhancing the quality of services delivered. Its role is no longer confined to purely clinical applications—such as early disease detection or medical image analysis—but has gradually extended into managerial and governance domains, particularly human resource governance, which constitutes a foundational pillar of any effective health system.

In the Algerian context, the health sector is confronted with a range of structural challenges. Among the most pressing are the shortage of medical and nursing competencies, the growing phenomenon of professional migration, and the persistent imbalance in the geographical distribution of health personnel. These pressures are further compounded by administrative bureaucracy that continues to constrain institutional efficiency and responsiveness. Under such conditions, human resource governance emerges as a strategic imperative for sustaining the health system and ensuring equitable access to care—necessitating innovative approaches that move beyond conventional management practices.

Human resource governance may be understood as a framework of principles and mechanisms through which the workforce is managed in accordance with standards of transparency, equity, efficiency, and accountability. When effectively operationalized, these principles contribute to optimizing the utilization of human capital while reinforcing institutional trust. In Algeria's health sector, however, the practical implementation of such governance standards remains uneven, shaped by limited digitalization, the absence of objective performance evaluation systems, and the restricted involvement of health professionals in decision-making processes.

From this standpoint, artificial intelligence presents itself as a potentially enabling instrument for strengthening human resource governance. Its analytical capacity allows for the processing of large-scale workforce data, forecasting future staffing needs, and formulating more balanced and evidence-based allocation strategies. In addition, AI-supported systems can enhance recruitment, training, and performance appraisal processes with greater precision and procedural objectivity. For instance, predictive models may identify an impending shortage of physicians within a given specialty or region and generate actionable redistribution or capacity-building scenarios.

Furthermore, aligning governance frameworks with artificial intelligence applications holds the potential to elevate overall health system performance. Such integration can contribute to minimizing resource inefficiencies, promoting fairness in promotion and deployment decisions, and fostering greater professional engagement. The implications extend beyond administrative optimization to encompass improved patient satisfaction, reduced clinical errors, and more timely service delivery.

Despite these prospects, the incorporation of artificial intelligence into human resource governance in Algeria's health sector continues to face tangible constraints. Key barriers include infrastructural limitations, insufficient technological preparedness among health and administrative personnel, and the absence of comprehensive regulatory frameworks to govern the ethical and accountable use of AI technologies.

Research Problem: In light of the preceding discussion, the present study is guided by the following central research question:

To what extent can AI-supported human resource governance contribute to enhancing performance quality in Algeria's health sector?

Study Hypotheses:

Main Hypotheses:

H0: A statistically significant relationship exists between human resource governance and digital transformation in shaping performance quality within Algeria's health sector.

H1: Human resource governance exerts a statistically significant effect on digital transformation in improving performance quality within Algeria's health sector.

Sub-Hypotheses:

H0: A statistically significant relationship exists between the dimensions of human resource governance (transparency and equity, efficiency, accountability, and participation) and digital transformation in influencing performance quality within Algeria's health sector.

H1: The dimensions of human resource governance (transparency and equity, efficiency, accountability, and participation) have a statistically significant effect on digital transformation in improving performance quality within Algeria's health sector.

Methodology

To achieve the study objectives and empirically test the proposed hypotheses, a descriptive-analytical approach was adopted. This approach enables the systematic description and examination of phenomena as they occur in their real-world context.

The descriptive method was employed to construct and refine the study's theoretical framework. Relevant concepts related to human resource governance, artificial intelligence, and their linkage to performance quality in the health sector were examined through specialized academic sources and prior empirical studies.

At the empirical level, data were collected using a structured questionnaire administered to a sample of employees working in Algeria's health sector. This step aimed to derive evidence-based findings from the sample and extend them, within methodological limits, to the broader population.

The quantitative data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS). Statistical procedures were applied to test the study hypotheses and generate statistically significant inferences.

I.1. Conceptual Framework: Foundations of AI-Supported Human Resource Governance

Understanding the intersection between human resource governance and artificial intelligence necessitates a clear conceptual grounding in the core constructs underpinning this study. These constructs extend beyond procedural definitions to encompass interconnected theoretical frameworks that collectively shape the analytical foundation of the research.

1) Human Resource Governance

Human resource governance has progressively moved beyond its traditional confinement to administrative routines—such as payroll administration and recruitment processing—to assume the character of an integrated strategic framework. Within this framework, human resource policies and practices are aligned with broader institutional objectives while being guided by foundational governance values, notably transparency, equity, and accountability (Armstrong & Taylor, 2020). In this sense, governance functions as an internal regulatory architecture through which employee-related decisions are structured, monitored, and legitimized according to defined principles rather than discretionary judgment.

These principles constitute the structural pillars of human resource governance:

- **Transparency:** Transparency entails ensuring access to accurate, timely, and comprehensible information regarding all human resource policies and procedures. This includes the explicit communication of recruitment requirements, performance evaluation criteria, and promotion and reward systems (Jackson & Schuler, 2020). Such procedural clarity serves to minimize organizational uncertainty and reinforces employee trust in institutional decision-making processes.
- **Equity:** The equity principle ensures that employees are treated in a fair and impartial manner irrespective of personal or professional background. It extends beyond formal legal compliance toward fostering an organizational climate in which individual contributions are recognized through objective assessment. The adoption of measurable and standardized performance indicators represents a key operational mechanism for realizing equity in practice (Budhwar & Debrah, 2013).
- **Efficiency:** Efficiency within human resource governance transcends the mere completion of administrative tasks to emphasize optimal resource utilization. It reflects the capacity of the institution to mobilize human capital in ways that maximize productivity while minimizing procedural redundancies. This includes aligning workforce capabilities with institutional priorities and streamlining administrative workflows (Ulrich & Dulebohn, 2015).
- **Accountability:** Accountability delineates responsibility structures by clarifying who is answerable for specific decisions and outcomes. It establishes a governance environment in which performance consequences are traceable to decision-making processes. Robust accountability systems require the systematic documentation of employee-related actions, thereby enabling oversight, auditability, and corrective intervention where necessary (Paauwe & Boon, 2018).

2) Artificial Intelligence

Artificial intelligence has shifted from being a speculative technological prospect to an operational driver of digital transformation across multiple sectors, including human resource management and healthcare systems. It is commonly conceptualized as a specialized domain within computer science concerned with the design of algorithms and computational systems capable of replicating aspects of human cognition—such as learning, reasoning, pattern recognition, and complex decision-making (Russell & Norvig, 2020).

Within organizational contexts, AI applications constitute a strategic enabler for improving operational efficiency and strengthening performance outcomes.

In the context of this study, Artificial Intelligence (AI) is conceptualized as a subset of digital transformation. While digital transformation refers to the broader process of integrating digital technologies into organizational operations, AI specifically denotes advanced systems capable of learning from data, generating predictions, and supporting decision-making processes. Accordingly, AI is treated as an enabling technological tool within the wider framework of digital transformation, particularly in strengthening human resource governance and improving performance quality.

Administrative Applications in Human Resources

In the field of human resource management, artificial intelligence is increasingly deployed to automate high-volume, routine processes. For example, machine learning algorithms can screen and classify thousands of résumés within seconds, identifying candidates whose competencies most closely align with institutional requirements. Beyond recruitment, AI-driven predictive analytics tools are utilized to forecast employee turnover patterns, enabling HR departments to formulate proactive talent retention strategies (Acemoglu & Restrepo, 2019).

Health Applications

The healthcare sector represents one of the most transformative arenas for AI integration. Advanced intelligent systems are now capable of analyzing complex medical imaging—such as MRI scans—with levels of diagnostic precision that, in certain controlled contexts, rival or complement clinical expertise. AI is also embedded within Clinical Decision Support Systems (CDSS), assisting physicians in diagnostic evaluation and treatment planning. Furthermore, its administrative applications extend to optimizing hospital operations, including appointment scheduling, patient flow management, and resource allocation efficiency (Davenport & Kalakota, 2019).

3) Performance Quality in the Health Sector

Performance quality in the health sector represents a multidimensional construct that extends well beyond the narrow notion of service adequacy. It constitutes an integrated evaluative framework through which the effectiveness, safety, efficiency, and patient-centeredness of healthcare delivery are assessed (Donabedian, 2005). Within this perspective, quality is examined not solely in terms of procedural compliance but also through measurable outcomes that reflect the real impact of health services on patient well-being.

Several core indicators are commonly employed in assessing healthcare performance quality:

- **Patient Satisfaction:** Patient satisfaction encompasses more than perceptions of clinical treatment alone; it reflects the totality of the patient experience within the healthcare system. This includes accessibility of appointments, waiting durations, clarity of communication with medical personnel, and the physical environment of care facilities. As such, satisfaction levels function as a proxy indicator of how effectively health services respond to beneficiary expectations and needs (Pekacz et al., 2019).
- **Clinical Effectiveness:** Clinical effectiveness refers to the capacity of healthcare professionals—physicians, nurses, and allied technicians—to deliver care grounded in up-to-date scientific evidence and established best practices. The emphasis lies in ensuring that diagnostic and therapeutic interventions generate optimal patient outcomes while minimizing avoidable complications (Institute of Medicine, 2001).
- **Service Timeliness:** Timeliness constitutes a critical dimension of operational performance. The reduction of waiting times in emergency units and outpatient departments not only improves patient perceptions of care but may also carry life-saving implications in acute cases.

This indicator is closely linked to workflow optimization and the strategic allocation of medical resources (Porter & Teisberg, 2006).

- **Reduction of Medical Errors:** Minimizing medical errors remains a central objective of healthcare quality governance, given the severe clinical and ethical consequences such errors may entail. This dimension focuses on establishing systemic safeguards designed to prevent inaccuracies in diagnosis, medication administration, and surgical procedures—thereby reinforcing patient safety standards (Kohn et al., 2000).

4) The Relationship Between Governance and Health Performance Quality

Governance constitutes a regulatory and institutional framework through which human resources are managed in a manner that promotes fairness, accountability, and operational coherence—particularly within high-sensitivity sectors such as healthcare. When reinforced through artificial intelligence applications, governance principles—namely transparency, equity, efficiency, and accountability—can exert a multidimensional influence on health performance quality. This influence may be observed across three interrelated levels:

- **Ensuring Equitable Distribution of Medical Competencies Across Algerian Provinces:** One of the structural challenges confronting Algeria's health system lies in the uneven geographical distribution of medical and nursing personnel. Professional competencies tend to be concentrated in major urban centers—such as Algiers, Oran, and Constantine—while many interior and southern provinces continue to experience acute workforce shortages.
- Within this context, AI-supported governance systems can enable advanced workforce analytics by integrating demographic indicators, epidemiological trends, and institutional capacity data. Such evidence-based modeling assists policymakers in directing medical competencies more equitably across regions. In doing so, it operationalizes the governance principle of equity while contributing to the reduction of territorial health disparities (WHO, 2020).
- **Reducing Administrative Bureaucracy:** Administrative bureaucracy remains a persistent impediment to healthcare performance optimization. Excessive procedural layers, paperwork burdens, and hierarchical approval chains often delay service delivery and diffuse the productive capacity of medical personnel.
- AI-enabled governance mechanisms offer practical avenues for administrative streamlining through the deployment of electronic human resource management systems (e-HRM). These platforms automate core HR functions—including recruitment processing, promotion tracking, and workforce scheduling—thereby minimizing manual intervention, accelerating decision cycles, and enhancing institutional responsiveness. Collectively, such efficiencies translate into measurable improvements in organizational performance quality (Bondarouk & Brewster, 2016).
- **Strengthening Job Security, Organizational Trust, and Innovative Work Behavior:** Governance environments grounded in transparency and equity play a critical role in reinforcing perceived job security among healthcare professionals. When physicians and nurses recognize that appointment, evaluation, and promotion decisions are informed by objective datasets and AI-assisted analytics, perceptions of favoritism and procedural bias tend to diminish.
- This climate of procedural justice fosters higher levels of organizational trust and psychological safety. In turn, employees become more inclined to engage in creative problem-solving, propose clinical or managerial innovations, and contribute proactively to service improvement initiatives. Such behavioral activation ultimately feeds back into enhanced healthcare quality outcomes (Alonso-Galbán et al., 2019).

5) Challenges Facing AI Implementation in Health Human Resource Governance in Algeria

Notwithstanding the substantial potential of artificial intelligence to strengthen human resource governance in the health sector, its effective deployment within the Algerian context remains constrained by a series of interrelated technical, organizational, and human challenges.

➤ **Technical Constraints: Limitations in Digital Infrastructure**

A primary barrier to AI integration in Algeria's health system lies in infrastructural fragility. Although national initiatives have sought to advance digitalization, many public hospitals continue

to operate with limited broadband capacity, fragmented data repositories, and the absence of interoperable information systems across institutions.

Such structural deficiencies restrict the capacity of AI-driven platforms to aggregate, process, and analyze clinical and administrative datasets in a reliable and scalable manner (Benhabib, 2021). Without robust digital architecture, the predictive and analytical advantages of artificial intelligence remain largely underutilized.

➤ **Organizational Constraints: Incomplete Regulatory and Governance Frameworks**

From an institutional standpoint, Algeria—similar to several developing health systems—faces regulatory gaps concerning the governance of artificial intelligence applications. Comprehensive policies addressing health data protection, algorithmic accountability, and liability allocation in cases of AI-related medical error remain insufficiently articulated.

The absence of a structured AI governance framework heightens ethical and operational risks, particularly in relation to privacy protection, equity in algorithmic decision-making, and accountability mechanisms (European Commission, 2021). In this context, institutional readiness becomes as critical as technological readiness.

➤ **Human Constraints: Resistance to Change and Limited Digital Competencies**

At the human level, AI integration encounters a dual challenge. On one hand, segments of the workforce may perceive intelligent technologies as a potential threat to professional autonomy or job stability, thereby generating resistance to organizational change. On the other hand, there exists a skills gap in digital literacy and data-driven decision-making capabilities.

Many healthcare professionals have not yet received structured training in advanced digital competencies or in the operational use of AI-supported systems. This gap constrains adoption capacity and slows the diffusion of innovation within the health sector (Al-Kahtani et al., 2022).

II– Methods and Materials:

First: Study Tools and Sample:

1) Study Instrument:

To empirically examine AI-supported human resource governance as a mechanism for enhancing performance quality in Algeria's health sector, a structured questionnaire was developed as the primary data collection instrument. The analytical descriptive approach guided the field investigation, while the Statistical Package for the Social Sciences (SPSS V26) was employed to process and analyze the collected data.

The questionnaire was structured around the following components:

Section One: Demographic Characteristics

This section captured the general profile of respondents through a set of background variables, including gender, age, educational attainment, and years of professional experience.

Section Two: Study Variables

This section was organized into two principal axes:

First Axis – Human Resource Governance (Independent Variable)

This axis comprised 20 measurement statements distributed across four governance dimensions:

- Transparency and Equity (5 items)
- Efficiency (5 items)
- Accountability (5 items)
- Participation (5 items)

Second Axis – Artificial Intelligence in the Health Sector

This axis included 9 measurement statements designed to assess the level of AI utilization within health institutions.

The questionnaire items were measured using a three-point Likert scale designed to capture respondents' evaluative positions in terms of agreement intensity.

To ensure the validity of the research instrument, content validity was established through expert evaluation. The questionnaire was reviewed by a panel of specialists in human resource management and healthcare administration to assess the clarity, relevance, and alignment of the items with the study constructs. Based on their feedback, minor revisions were implemented. The scale categories were structured as follows:

Table 1: Three-Point Likert Scale

Response Category	Score
Disagree	1
Neutral	2
Agree	3

To analyze respondents' perceptions of the study variables, descriptive statistical techniques were employed. The arithmetic mean was used to determine the overall response tendency, while the standard deviation served as an indicator of response dispersion and homogeneity.

For interpretive purposes, the scale range length was calculated using the following formula:

$$(3-1) \div 3 = 0.67$$

This interval classification facilitated the categorization of response levels according to their relative intensity.

The use of a three-point Likert scale was a deliberate methodological choice adapted to the study context. Given the diversity of respondents—including healthcare and administrative staff with varying levels of familiarity with survey instruments—the simplified scale was intended to reduce response complexity and enhance clarity.

This approach also helped minimize ambiguity and reduce central tendency bias, thereby improving response reliability. While more detailed scales (such as five-point Likert scales) may provide finer distinctions, the three-point scale was deemed appropriate for capturing general perceptions within the study environment.

Table 2: Arithmetic Mean Categories for Three-Point Scale

Response	Range	Comment
Disagree	From 1 to 1.67	Low (majority disagree)
Neutral	From 1.67 to 2.34	Medium (balance between agreement and rejection)
Agree	From 2.34 to 3	High (majority agree)

Source: Al-Kharousi Hussein. (2022). Descriptive analysis and interpretation of data extracted from Likert scales in educational and psychological research. pp. 13-16.

III- Results and discussion :

1. Study Sample:

The study was conducted using a randomly selected sample drawn from employees working in public hospital institutions and neighborhood health establishments in the province of Oran. A total of 95 questionnaires were distributed to potential respondents. Of these, 90 were returned, yielding a high response rate. Upon preliminary screening, four questionnaires were excluded due to incomplete responses or inconsistencies that rendered them unsuitable for statistical analysis.

Consequently, 86 questionnaires were deemed valid and retained for analysis, representing 90.52% of the total returned questionnaires.

The sample size ($n = 86$) is considered statistically adequate for the applied analytical techniques, particularly Pearson correlation and simple linear regression. These methods can yield reliable results with moderate sample sizes.

Furthermore, the sample exceeds the commonly accepted minimum threshold ($n \geq 30$) required for parametric statistical analysis, which supports the robustness and validity of the study findings.

Table 3: Demographic Characteristics of Sample Members

Characteristics	Category	Frequency	Percentage %
Gender	Male	17	19.76
	Female	69	80.23
Age	Less than 30 years	34	39.53
	Between 30-40 years	28	32.55
	Between 40-50 years	16	18.60
	Over 50 years	8	9.30
Profession	Assistant Nurse	25	29.06
	Nurse	22	25.58
	General Practitioner	18	20.93
	Specialist Doctor	9	10.46

	Administrative	12	13.95
Years of Experience	Less than 5 years	28	32.55
	From 5 to 10 years	38	44.18
	More than 10 years	20	23.25

Source: Prepared by researchers based on SPSS outputs.

The demographic distribution of the sample reveals several noteworthy patterns. Females constitute the overwhelming majority of respondents, accounting for approximately 80.23% of the sample, compared to 19.76% for males. This gender composition reflects the structural profile of Algeria's health workforce, where women represent a central pillar of nursing and frontline healthcare professions.

With regard to age structure the most represented group is employees under 30 years old (39.53%), followed by those aged between 30 and 40 years (32.55%). In contrast, older cohorts—those aged 40–50 years and above 50—collectively account for 27.9% of the sample. This distribution suggests that the surveyed workforce is relatively young, a factor that may signal an increased need for continuous training and the accumulation of professional experience.

From a professional standpoint, assistant nurses and nurses together represent the largest proportion of participants (54.64%), followed by general practitioners (20.93%). Specialist doctors account for 10.46%, while administrative staff represent 13.95%. This pattern indicates that the study primarily captures the perspectives of nursing personnel, who constitute the operational backbone of healthcare delivery with comparatively lower representation from specialized medical and administrative cadres.

In terms of professional experience the largest segment of respondents falls within the 5–10 year category (44.18%), followed by those with less than five years of experience (32.55%), and finally those exceeding ten years (23.25%). This distribution reflects a workforce largely positioned within the mid-career stage—often regarded as a formative phase in the consolidation of professional practices and in the capacity to engage with organizational reforms such as governance frameworks and digital transformation initiatives.

2. Study Tool Reliability:

The reliability of the research instrument was assessed using Cronbach's Alpha coefficient, a widely accepted measure of internal consistency. This indicator evaluates the extent to which the items within each axis are statistically interrelated and collectively measure the same underlying construct.

Table 4: Cronbach's Alpha Reliability Coefficients

Axes	Number of Items	Cronbach's Alpha
Human Resource Governance	20	0.826
Artificial Intelligence in Health Sector	9	0.866
Total Score	29	0.870

Source: Prepared by the researchers based on SPSS outputs.

The results demonstrate satisfactory internal consistency across all measurement axes. The Human Resource Governance dimension (20 items) recorded a Cronbach's Alpha value of 0.826, indicating strong internal coherence among its items. The Artificial Intelligence in the Health Sector dimension (9 items) achieved a coefficient of 0.866, reflecting a high level of measurement consistency.

At the aggregate level, the overall questionnaire (29 items) yielded an Alpha value of 0.870, suggesting that the instrument, as a whole, exhibits robust internal reliability. These values exceed the commonly accepted threshold of 0.70, thereby supporting the suitability of the instrument for subsequent statistical analysis and hypothesis testing.

3. Descriptive Statistics Results for Study Variables:

This section presents and analyzes the data obtained through the research questionnaire using descriptive statistical techniques. Respondents' perceptions were examined by calculating the arithmetic mean to determine overall response tendencies, alongside the standard deviation to assess the degree of dispersion and response consistency.

❖ Independent Variable: Human Resource Governance:

This variable was operationalized through several core governance dimensions, each measured through a set of structured questionnaire items, as detailed in the following analysis.

3-1 Transparency and Equity Dimension:

Table 5: Sample Members' Response Results Related to Transparency and Equity Dimension

Statements	Arithmetic Mean	Standard Deviation	Rank
Recruitment and promotion criteria in the institution are clear and announced to all employees	2.4070	0.83141	01
The institution applies the principle of equity and equality in dealing with all health and administrative personnel	2.3256	0.83232	02
The institution's compensation and rewards policies are characterized by transparency and clarity	1.9186	0.88404	03
HR management decisions are based on objective criteria and specific data	1.7674	0.76195	05
The institution provides equal opportunities for professional development and growth for all employees	1.8605	0.79945	04

Source: Prepared by researchers based on SPSS outputs.

The descriptive analysis of the Transparency and Equity dimension reveals noticeable variation in employees' perceptions regarding the extent to which these governance principles are implemented within their institutions.

The item related to the clarity and public communication of recruitment and promotion criteria recorded the highest arithmetic mean (2.4070), reflecting a relatively positive level of agreement among respondents. This suggests that procedural transparency in staffing practices is comparatively well established.

The application of equity and equality in dealing with health and administrative personnel ranked second, with a mean score of 2.3256, indicating moderate approval levels. However, perceptions appear less favorable concerning compensation and reward transparency, which registered a mean of 1.9186 positioning respondent attitudes within a neutral range.

A similar evaluative pattern emerges regarding the provision of equal professional development opportunities, which yielded a mean of 1.8605, suggesting limited confidence in the fairness of career advancement mechanisms.

The lowest-rated item concerned the objectivity of administrative decision-making, with a mean score of 1.7674. This finding points to a degree of skepticism among employees about the extent to which HR decisions are grounded in clear and data-driven criteria.

Overall, these results highlight partial implementation of transparency and equity principles, with stronger performance in procedural clarity and comparatively weaker perceptions in financial fairness and professional growth opportunities.

3-2 Efficiency Dimension:

Table 6: Sample Members' Response Results Related to Efficiency Dimension

Statements	Arithmetic Mean	Standard Deviation	Rank
Human resource skills are effectively invested in the institution to achieve organizational goals	2.3488	0.80830	03
Tasks and administrative operations related to HR are accomplished with high efficiency and speed	2.4767	0.77803	02
The institution applies effective systems to identify and meet training needs periodically	2.6047	0.75583	01
The institution plans to employ and distribute HR in a way that achieves maximum benefit from their capabilities	2.1163	0.91290	04
Employee requests (such as leave and training) are responded to in a timely manner without unjustified delay	1.9651	0.91327	05

Source: Prepared by researchers based on SPSS outputs.

The analysis of the Efficiency dimension items reflects noticeable variation in employees' perceptions of how efficiency-related practices are implemented within their institutions. "Training systems effectiveness" recorded the highest arithmetic mean (2.6047), followed by "efficiency in completing administrative tasks" with a mean of 2.4767, indicating general employee agreement regarding these two aspects.

More neutral evaluations appear in relation to “investment in employee skills” (mean = 2.3488) and “planning for resource utilization” (mean = 2.1163), suggesting that these areas are viewed as moderately applied rather than strongly established. The lowest-rated item concerns “responsiveness to employee requests,” which obtained a mean of 1.9651, reflecting a degree of dissatisfaction with delays in handling administrative procedures.

Overall, the results point to relatively positive perceptions of training and task execution efficiency, while highlighting the need to improve institutional responsiveness and administrative processing speed in order to strengthen employees’ overall sense of efficiency.

3-3 Accountability Dimension:

Table 7: Sample Members' Response Results Related to Accountability Dimension

Statements	Arithmetic Mean	Standard Deviation	Rank
Management and employees are held accountable for their performance based on specific and announced criteria	1.7907	0.81336	03
There are documented mechanisms for monitoring and reviewing HR-related decisions	1.7791	0.85956	04
Responsibilities and authorities related to HR management are clearly defined	1.8353	0.84300	02
Management provides periodic reports on HR performance and its contribution to institutional goals	1.7093	0.80974	05
There are effective mechanisms in the institution for dealing with employee complaints and grievances	1.9651	0.86020	01

Source: Prepared by researchers based on SPSS outputs.

The analysis of the Accountability dimension items indicates that accountability mechanisms within the surveyed health institutions remain relatively limited in effectiveness, as all arithmetic means fall within the neutral range with a tendency toward disagreement, reflecting employee dissatisfaction with these practices.

“Mechanisms for dealing with complaints” recorded the highest mean within this dimension (1.9651), followed by “clarity of responsibilities and authorities” with a mean of 1.8353. Lower evaluations were observed for “performance accountability” (1.7907) and “decision review mechanisms” (1.7791). The weakest-rated item overall relates to “providing periodic reports,” which registered a mean of 1.7093, suggesting low perceived transparency in performance reporting practices.

These results point to the need for strengthening formal accountability structures, particularly through clearer performance review procedures, more systematic reporting practices, and more responsive communication channels for handling employee complaints.

3-4 Participation Dimension:

Table 8: Sample Members' Response Results Related to Participation Dimension

Statements	Arithmetic Mean	Standard Deviation	Rank
Management involves employees in making decisions related to policies and procedures that affect them	1.5349	0.73080	05
Management encourages employees to present their ideas and suggestions to improve the work environment	2.0465	0.85277	04
There are open and effective communication channels between management and workers in the institution	2.6047	0.70759	01
Employees' opinions and comments are taken into account when planning development and training programs	2.0698	0.76375	03
The work environment in the institution allows cooperation and interaction among all departments	2.1744	0.87032	02

Source: Prepared by researchers based on SPSS outputs.

The analysis of the Participation dimension items reveals noticeable variation in employees’ perceptions. Although respondents acknowledge the presence of open and effective communication channels between management and staff, other aspects of participation appear comparatively weaker. The statement “there are open and effective communication channels” recorded the highest mean (2.6047), indicating that employees generally perceive communication as accessible.

However, the remaining items within this dimension fall within neutral or lower evaluative ranges. Interdepartmental cooperation achieved a mean of 2.1744, reflecting a moderate level of interaction. Similarly, the items related to “encouraging idea submission” (2.0465) and “considering employees’ opinions” (2.0698) suggest limited institutional support for active involvement.

Most notably, the statement concerning employee involvement in decisions that directly affect them obtained the lowest mean (1.5349), falling within the disagreement range. This finding highlights a substantial gap between communication and actual participatory practice. The existence of communication channels does not necessarily translate into meaningful engagement in decision-making processes.

Overall, the results suggest that while formal communication structures are present, deeper participatory mechanisms remain underdeveloped. Strengthening structured avenues for employee involvement in workplace-related decisions may help bridge this gap and foster a more inclusive organizational climate.

❖ Dependent Variable: Artificial Intelligence in the Health Sector

Table 9: Sample Members' Response Results Related to Dependent Variable - Artificial Intelligence in Health Sector

Statements	Arithmetic Mean	Standard Deviation	Rank
Digital transformation systems contribute to improving medical diagnosis accuracy	1.8023	0.85157	09
Digital transformation tools help reduce medical and administrative errors	1.9651	0.77380	08
Digital transformation systems are used in analyzing patient data to improve treatment plans	2.3294	0.79265	01
Smart scheduling systems enhance administrative operations efficiency in the institution	2.0941	0.83983	04
Digital transformation is used to provide immediate feedback to medical and administrative personnel about their performance	2.2000	0.85635	02
Digital transformation helps analyze and predict future needs for health personnel	2.1412	0.83314	03
Using digital transformation contributes to increasing patient satisfaction with quality of services provided	2.0714	0.83285	05
Smart technologies improve planning and distribution of human resources to different departments	2.0698	0.76375	06
Utilizing digital transformation in the health sector enhances governance principles in general	1.9651	0.86020	07

Source: Prepared by researchers based on SPSS outputs.

The analysis of this dimension’s items indicates that employees’ perceptions of the impact of digital transformation remain generally within the neutral range, as most arithmetic means fall between (1.67 and 2.34). This reflects the limited scope of effective and widespread application of these technologies within the surveyed institutions.

Employees’ perceptions appear more positively oriented toward analytical and planning functions. Items related to “analyzing patient data to improve treatment plans” (2.3294), “providing immediate feedback to personnel” (2.2000), and “predicting future health personnel needs” (2.1412) ranked highest within this dimension. These findings suggest that respondents recognize the strategic value of digital transformation in supporting administrative decision-making and human resource planning, even if its practical deployment remains incomplete.

In contrast, items capturing the direct operational impact on performance quality recorded the lowest means. The statements most closely associated with medical safety and diagnostic precision “reducing medical and administrative errors” (1.9651) and “improving medical diagnosis accuracy” (1.8023)—occupied the lowest ranks. This indicates that smart technology applications directly linked to performance enhancement have yet to reach a mature implementation stage within these institutions.

Overall, the results reflect a gap between the perceived strategic importance of digital transformation in planning and analysis and its tangible application in areas affecting service quality and clinical outcomes. This disparity underscores the need to move beyond conceptual

adoption toward more concrete implementation of intelligent technologies in both clinical and administrative domains.

4. Testing and Discussing Study Hypotheses:

4-1 First Main Hypothesis:

H0: There is no statistically significant relationship between human resource governance and the use of digital transformation in performance quality in Algeria's health sector.

H1: There is a statistically significant relationship between human resource governance and the use of digital transformation in performance quality in Algeria's health sector.

Table 10: Results of Testing First Hypothesis

Study Variables	Pearson Correlation Coefficient	Significance Level	Decision
Transparency and Equity	0.345	0.001	Accept
Efficiency	0.664	0.000	Accept
Accountability	0.712	0.000	Accept
Participation	0.772	0.000	Accept

Source: Prepared by researchers based on SPSS outputs.

The analysis of the Pearson correlation coefficients indicates that all dimensions of human resource governance are positively and statistically significantly associated with the dependent variable (performance quality in the health sector through digital transformation). The significance level (Sig) values for all dimensions were below 0.05, supporting the acceptance of the alternative hypothesis that a relationship exists.

However, the correlation coefficients (R) reveal noticeable variation in the strength of association across dimensions. Interaction- and oversight-related dimensions emerge as the most influential. The Participation dimension recorded the highest coefficient (0.772), reflecting a very strong relationship, followed by Accountability (0.712), indicating a strong association. This suggests that employee involvement and structured accountability mechanisms represent key drivers in enhancing performance quality through digital transformation.

The Efficiency dimension ranked third, with a moderately strong correlation (0.664), confirming its importance as a supportive though not independently decisive factor. In contrast, the Transparency and Equity dimension recorded the lowest coefficient (0.345), representing a comparatively weak relationship with the dependent variable. This pattern implies that, in practical terms, strengthening participatory and accountability frameworks may yield greater performance gains than focusing solely on procedural transparency measures.

4-2 Second Main Hypothesis:

H0: There is no statistically significant impact of human resource governance on the use of digital transformation in performance quality of the health sector in Algeria.

H1: There is a statistically significant impact of human resource governance on the use of digital transformation in performance quality of the health sector in Algeria.

Table 11: Results of Testing Second Hypothesis

Study Variables	Constant	Regression Coefficient B	Determination Coefficient R ²	F Value (Calculated)	Significance Level	Decision
Transparency and Equity	1.281	0.370	0.119	11.364	0.001	Accept
Efficiency	0.766	0.733	0.441	66.089	0.000	Accept
Accountability	-0.018	0.875	0.507	86.257	0.000	Accept
Participation	0.462	0.775	0.597	124.258	0.000	Accept

Source: Prepared by researchers based on SPSS outputs.

The table above, which examines the impact of human resource governance dimensions on the dependent variable (performance quality through digital transformation), indicates that all sub-hypotheses are statistically significant. The significance levels (Sig.) for all models were below 0.05—ranging between 0.001 and 0.000—supported by high calculated F values reaching 124.258. This supports acceptance of the alternative hypothesis that a positive impact exists.

The coefficient of determination (R²) reveals clear variation in the strength of impact across dimensions. Participation emerges as the most influential dimension, explaining 59.7% of the

variance in the dependent variable, followed by Accountability at 50.7%, positioning these two dimensions as the principal drivers of performance improvement within the studied institutions.

By contrast, the Transparency and Equity dimension appears comparatively weaker in practical terms, explaining only 11.9% of the variance. Although statistically significant, its explanatory power remains limited relative to the other governance dimensions.

The regression coefficients (B) were positive across all dimensions, confirming a direct relationship—meaning that increased application of any governance dimension is associated with improved performance quality. Notably, Accountability (0.875) and Participation (0.775) demonstrate the largest direct contributions to increases in the dependent variable for each unit rise in their application.

IV- Conclusion:

The relationship between artificial intelligence (AI) and human resource governance in Algeria's health sector extends beyond a simple reciprocal interaction to reflect a strategic complementary dynamic. This study demonstrates the existence of a strong, positive, and statistically significant relationship between human resource governance—across its four dimensions—and performance quality in Algeria's health sector. This finding suggests that the adoption of governance principles constitutes an effective mechanism for achieving a qualitative improvement in institutional performance.

The results further reveal variation in the strength of this relationship. The Participation and Accountability dimensions emerge as the most influential drivers, jointly explaining more than 50% of the variance in performance quality. This underscores that quality improvement is closely linked to empowering employees to engage actively while aligning their performance with structured accountability and reporting systems. In contrast, the Transparency and Equity dimension appears comparatively less influential, indicating that while its presence is necessary, it remains insufficient on its own to generate substantial performance transformation—particularly given employees' relatively weak perceptions of compensation transparency and decision objectivity.

With regard to digital transformation (AI), although employees acknowledge its theoretical value in planning and analytical functions, the lower mean scores related to improving diagnostic accuracy and reducing errors indicate that practical AI deployment remains limited in critical performance-related domains. This reflects a gap between strategic orientation and operational implementation.

The study also suggests that artificial intelligence should not be viewed merely as a contemporary technological tool, but rather as a foundational enabler for strengthening governance principles—namely transparency, equity, efficiency, and accountability. Contrary to concerns that AI may replace the human element, it instead operates as a strategic partner, alleviating routine administrative burdens and allowing health and administrative personnel to concentrate on more complex, judgment-intensive, and innovative responsibilities.

- Recommendations:

Based on the study findings particularly the identified strengths and weaknesses the following recommendations are proposed for health institutions in Algeria:

1) Strengthening Participation in Decision-Making

- ✓ **Activating joint work teams:** Establishing permanent advisory committees that include representatives from both health and administrative staff to contribute to the formulation of policies and procedures affecting their work, rather than relying solely on one-directional communication mechanisms.
- ✓ **Developing proposal platforms:** Designing a digital system for receiving, monitoring, and evaluating employee proposals, coupled with material or moral incentives for implemented suggestions, in order to reinforce employees' sense of inclusion and value.

2) Reinforcing Accountability and Transparency Mechanisms

- ✓ **Implementing a digital performance management system:** Transitioning toward an electronic performance management framework built on clearly defined and publicly communicated key performance indicators (KPIs), accompanied by periodic and transparent reporting on HR performance and decision rationales.

- ✓ **Reviewing compensation policies:** Reassessing and clarifying compensation and reward structures to ensure full transparency and alignment with objective, measurable performance criteria, thereby addressing concerns related to equity and fairness.

3) Directing Digital Transformation Toward Core Quality Outcomes

- ✓ **Investing in diagnostic AI systems:** Prioritizing investment in artificial intelligence applications that directly support Clinical Decision Support Systems (CDSS), enhance diagnostic accuracy, and reduce medical errors, rather than limiting digital transformation efforts to administrative scheduling and planning functions.
- ✓ **Developing specialized training programs:** Providing targeted training for medical and auxiliary personnel on the effective integration of AI tools into daily professional practice to maximize their contribution to performance quality and occupational safety.

Strategic Recommendations for Decision-Makers in Algeria

The realization of this vision depends on Algeria's capacity to address the structural challenges associated with AI adoption. In this regard, the following strategic directions are recommended:

- **Building robust digital infrastructure:** Investing in high-speed communication networks, secure data storage systems (data centers), and interoperable technological platforms capable of integrating diverse health information systems.
- **Establishing a legislative and ethical framework:** Developing clear regulatory provisions governing the use of artificial intelligence in the health sector, particularly concerning data privacy, algorithmic accountability, and liability for AI-assisted decisions.
- **Investing in human capacity development:** Recognizing that AI effectiveness depends on skilled human oversight, educational and health institutions should strengthen training programs focused on digital analytics, data governance, and AI-related competencies for both medical and administrative professionals.

Artificial intelligence represents a significant opportunity for Algeria to develop a resilient and sustainable health system capable of adapting to emerging challenges. Rather than a technological luxury, AI should be regarded as a strategic necessity for improving quality of life through more efficient, transparent, and accountable governance of human resources.

The integration of contemporary AI applications—such as telemedicine, intelligent diagnostics, and crisis management systems—further reinforces the strategic role of artificial intelligence in enhancing healthcare performance. These technologies contribute not only to improving clinical outcomes but also to strengthening governance mechanisms through data-driven decision-making and more efficient human resource management.

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