

## **Digital Transformation in the Health Sector : Towards the Adoption of the Electronic Health Record in Algeria**

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**Abstract:** The health sector has witnessed significant transformations amidst the information revolution, particularly concerning the improvement and development of the quality of health services through the digitization of its various activities. In this context, the Ministry of Health, in coordination with relevant authorities, has endeavored to reform the health system by adopting the Electronic Health Record, as a pivotal step to modernize patient care methods and improve communication among various stakeholders in the health field.

The Electronic Health Record aims to facilitate medical procedures, ensure information accuracy, and uniformly integrate medical data, enabling the tracking of the patient's therapeutic path and effective analysis of their condition. This system also offers significant potential in health planning by providing an accurate database that aids in making appropriate decisions, in addition to improving the quality of healthcare and ensuring patient safety.

This research paper seeks to highlight one of the manifestations of digitization in the health sector, by focusing on the adoption of the Electronic Health Record as a strategic tool for developing the health system and enhancing its performance.

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**Introduction:**

The health sector is considered one of the sectors of paramount importance and sensitivity, due to its connection with the health and interests of citizens. Therefore, the Algerian legislator has sought to facilitate procedures related to this sector by transitioning from traditional paper-based administration to digital administration, thereby saving considerable effort and financial resources, and leveraging its inherent advantages. This is in line with the developments and requirements imposed by modern technology to preserve the health of individuals, achieve equality in access to treatment and health services, and preserve health structures and institutions. Thus, the use of technological means for the purpose of digital transformation yields benefits for society and all health institutions.

Algeria has witnessed a qualitative leap in the field of modernizing and developing its administrations in recent years, as evidenced by the proliferation of technological means and their applications among members of society. This is also evident in their implementation in the health sector with the aim of alleviating burdens, reducing costs, and shortening appointment waiting times, aspects which constituted a significant encumbrance under the traditional system.

In light of the transition towards electronic administration and the increasing need to improve the quality of health services, the Electronic Health Record emerges as a pivotal model for the digitization of the health sector. However, the adoption of this system raises several questions concerning the extent of awareness among stakeholders of its importance, the effectiveness of its implementation, and the ability to overcome the associated challenges. To what extent does electronic administration contribute to the development of the health sector through the adoption of the Electronic Health Record? And what are the achieved benefits and the obstacles that may limit its effectiveness in the Algerian context?

To address the aforementioned research problem, a descriptive-analytical methodology was adopted as the methodological framework for this study. This is due to the nature of the

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subject, which necessitates an in-depth theoretical review of the fundamental concepts related to electronic administration and digitization, and an objective analysis of their applications within the health sector, with a focus on the Electronic Health Record model.

For the purpose of studying this topic, the research has been divided into two main sections. The first section addresses the conceptual framework of electronic administration, by defining it, clarifying its importance, and its role in modernizing administrative work methods and public service delivery, reviewing the requirements for its implementation, as well as the motivations for its integration into health institutions. The second section is dedicated to the study of the Electronic Health Record as a model for the manifestations of digitization in the health sector.

### **THE FIRST TOPIC : THE CONCEPTUAL FRAMEWORK OF ELECTRONIC ADMINISTRATION IN THE HEALTH SECTOR**

Health institutions of all types, both public and private, are concerned with providing daily healthcare to individuals. Therefore, these institutions need to improve and expedite their services by relying on electronic administration, which in turn depends on the application of modern technology, and utilizes communication networks and the internet to achieve its objectives and deliver health services.

In this context, this section aims to shed light on the conceptual framework of electronic administration in the health sector by addressing the definition of electronic administration and reviewing the requirements for its implementation (first sub-section), then addressing the motivations and importance of integrating this modern administrative pattern into health institutions (second sub-section).

#### **FIRST REQUIREMENT: THE CONCEPT OF ELECTRONIC ADMINISTRATION**

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In light of the accelerating technological transformations witnessed by the world, electronic administration has emerged as one of the effective tools for modernizing work methods within institutions and improving the quality of services provided to citizens. This concept is one of the modern concepts closely linked to the information and communication revolution, as it represents a transition from the traditional management style to a digital one that relies on computing technologies, thereby contributing to enhancing administrative performance efficiency.

To form a comprehensive understanding of this concept, it is necessary to address the definition of electronic administration (first part) by examining the various theoretical approaches that have addressed it, and then to elaborate on the requirements for its practical implementation in the health sector (second part), whether in terms of technological infrastructure, qualified human resources, or the supporting legal and regulatory environment.

### **Firstly: Definition of Electronic Administration**

The topic of electronic administration currently receives widespread attention, which has been positively reflected in the multiplicity of definitions surrounding it. Among these definitions is that it signifies administration whose cornerstone and basis is the use of computers and internet networks, which provide various websites to support and enhance access to information and services and deliver them to employees, institutions, and businesses in society with transparency and efficiency<sup>1</sup>.

It is also possible to agree on another definition of electronic administration as the use of all modern technologies and their employment within various institutions to provide more effective services with the least possible effort and time, all to ensure the continuity of the organization, whether it is an institution or a state, and for the efficient and effective use of resources, whether human or material<sup>2</sup>.

Based on the foregoing definitions of electronic administration, it is evident that it is characterized by a set of fundamental characteristics, which can be summarized as follows<sup>3</sup>:

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- Paperless administration: As it primarily relies on computers and only secondarily and supplementarily on paper, thus depending on electronic archives, email, electronic directories and notebooks, voice messages, and automated tracking application systems.
- Remote administration: Involving electronic communication via mobile phones, new international telephones, electronic conferences, and other modern means of communication.
- Administration with open time: As electronic administration is not bound by official working hours, with work being continuous 24 hours a day, regardless of day or night. Thanks to electronic administration, the world can now operate in real-time, 24 hours a day, taking into account the interest of the citizen.
- Administration without location: As it primarily relies on modern means of communication such as the internet, mobile phones, electronic conferences, and remote work.
- Administration without rigid organizations: This is because work is carried out through network institutions and flexible smart institutions that rely on knowledge creation.

**Secondly: Requirements for Implementing Electronic Administration in the Health Sector**

The adoption of electronic administration by health institutions, which relies on information and communication technology, necessitates a set of fundamental conditions that can be summarized as follows:

- Qualifying human resources, foremost among them physicians and workers in various medical and health services, and training them in the use of digital technologies and modern management applications.
- Providing a technological infrastructure that includes all necessary digital equipment and means, to ensure the integrated operation of administrative and technical work.
- Securing the internal and external networks of health institutions, allowing for the secure exchange of information between various health structures, while ensuring the complete protection of sensitive medical data and information.

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- Defining the modernization of digital health services, including the needs of citizens and users, and regulating their areas of use in healthcare and medical record management.
- Building a national organizational structure that includes specialized national networks and centers for digital health, based on unified standards and reference models for information exchange and performance development<sup>4</sup>.
- Enhancing linkage and coordination between public and private health institutions, alongside bodies supporting the health sector, in order to unify efforts and integrate roles.
- Developing clear policies and strategies for the advancement of e-health, and investing in information technologies to serve the modernization of the health sector and improve the quality of its services.
- Enacting precise legal and legislative frameworks that define the procedures and mechanisms for implementing electronic administration in the health field, while ensuring their compatibility with legality requirements and the protection of personal information<sup>5</sup>.

### **SECOND REQUIREMENT: MOTIVATIONS AND IMPORTANCE OF IMPLEMENTING THE ELECTRONIC ADMINISTRATION SYSTEM IN THE HEALTH SECTOR**

Technological advancement and increased reliance on digital systems have led to the emergence of electronic administration as a strategic option for modernizing public facilities and improving service quality, particularly in sensitive sectors such as health. In this context, serious consideration of implementing the electronic administration system within health institutions has become necessary, owing to its direct impact on performance effectiveness and better addressing patient needs.

The significance of this orientation lies in its response to a set of objective motivations and practical necessities, such as the need to rationalize resources, expedite procedures, and facilitate access to health information. Furthermore, the importance of electronic administration in the health sector is linked to the opportunities it provides for improving the quality of medical

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services, ensuring coordination among various healthcare stakeholders, and achieving transparency and accuracy in the management of medical records.

In this sub-section, the most prominent motivations justifying the adoption of this system in health institutions will be addressed (first part), followed by an examination of aspects related to the importance of electronic administration and its pivotal role in developing the health system.

### **Firstly: Motivations for Implementing the Electronic Administration System in the Health Sector**

Technological development, electronic culture and its applications, and the evolution of communications have led to the interconnectedness of international and national societies. Consequently, it has become necessary to respond to the requirements of the electronic environment and adapt to it. This has prompted most countries worldwide, including Algeria, to review their health systems. This review involves transitioning from a traditional paper-based administration system to an electronic administration system based on the digitization of health administration services on computers and smartphones. This was particularly crucial for confronting the COVID-19 crisis that affected all countries globally. Indeed, thanks to this transformation, nations were able to address the pandemic crisis on one hand, and to rapidly upgrade health system services with minimal effort and damage compared to countries suffering from a lack or weakness in the use of digitization at the level of health institutions<sup>6</sup>.

### **Secondly: The Importance of E-Management in the Health Sector**

The importance of e-management is manifested as follows:

- A. Enhancing the effectiveness of performance and decision-making by ensuring the availability of information and data to those who require it, and facilitating its retrieval through its presence on the intranet and the ability to access it with minimal effort via available automated search tools.

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- B. Employee flexibility, enabling staff to easily access the intranet from any location to perform their duties at their preferred time and place. Consequently, with the application of e-management tools, the traditional office is no longer geographically constrained, as work can be performed from home, on the road, at an airport, or from other geographically remote administrative units.
- C. A reduced need for numerous filing cabinets, consequently saving space and the expenditure on personnel designated for the maintenance of these files.
- D. Facilitation of remote meetings and the streamlined, rapid dissemination of instructions and administrative procedures to employees, customers, and clients.
- E. Streamlining the completion of client transactions through a single entity performing this task on behalf of other departments<sup>7</sup>.

## **THE SECOND TOPIC : THE ELECTRONIC MEDICAL RECORD AS A MODEL FOR THE MANIFESTATIONS OF DIGITALIZATION IN THE HEALTH SECTOR**

Health services are an extension of public service, aiming to protect individuals and ensure their prevention, both directly and indirectly, from all risks and epidemics, and to provide healthcare and support them within and outside hospitals through various functions intended to enable individuals to adapt to their environment<sup>8</sup>.

Information systems are considered one of the most significant advanced software applications that directly serve all healthcare and administrative activities. The existence of an integrated information system, which facilitates the exchange of information among personnel within the health institution, can ensure the institution's comprehensive control over all its activities and resources. In this framework, the Electronic Medical Record is among the most prominent manifestations of digitalization adopted with the aim of developing mechanisms for preserving health information and facilitating access to it, thereby ensuring the provision of more effective and efficient healthcare. Therefore, this chapter will highlight the Electronic Medical Record as a practical model embodying digitalization in the health sector, by defining the latter and demonstrating its importance in enhancing the quality of health services (First Sub-chapter),

without neglecting the challenges and disadvantages that may accompany the digitalization process in the health sector (Second Sub-chapter).

### **FIRST REQUIREMENT: DEFINITION AND IMPORTANCE OF THE ELECTRONIC MEDICAL RECORD**

The Algerian legislator, through the provisions of Law No. 18/11 of July 2, 2018, concerning health, published in the Official Gazette No. 46 of July 29, 2018, particularly Articles 26 and 13, paragraph 02, has obliged all public health structures to provide a medical record for each patient, considering it one of the means of diagnosis, patient treatment, and an endeavor directed towards protecting and promoting their health<sup>9</sup>.

Referring to Article 26 of Law No. 18-11 on health, Article 26 stipulates the following: "Every patient must have a single medical record at the national level." In addition, Article 292 confirms the existence of an electronic record, as it states: "Public and private health structures and institutions are required to prepare a single, computerized medical record for each patient and to update it. They must maintain the confidentiality of the information in their possession."

#### **Firstly: Definition of the Electronic Medical Record**

The Electronic Medical Record is defined as the file containing all of a patient's health information, elucidating their health status and contributing to the rapidity of diagnosis and patient treatment. Furthermore, this file can be transmitted via digital platforms to numerous hospitals within their country or province in the event of a serious accident. This file facilitates the physician's ability to treat and judiciously manage the patient, thereby averting medical errors that could critically endanger the patient's life, particularly for individuals with cardiovascular diseases, chronic illnesses, and critical conditions<sup>10</sup>.

Medical records provide all information necessary for patient identification. These files contain a multitude of medical documents; consequently, the manual review of patient files is a time-consuming process, especially amidst rapid population growth and increasing patient demands. Accordingly, the adoption of Electronic Medical Record systems by health institutions

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assists them in transitioning from the traditional paper-based management of patient medical files towards electronic medical record systems<sup>11</sup>.

Furthermore, electronic medical records are considered more effective than traditional paper-based files, as they facilitate rapid access to patient-specific information from any healthcare unit. This contributes to improving the quality of service delivered to patients and reducing costs by enhancing patient safety, accelerating service delivery, optimizing time to serve a larger volume of patients, and alleviating the workload on medical and nursing personnel by minimizing redundant examinations. Consequently, the implementation of this system in health institutions yields numerous benefits, the most significant of which are summarized as follows<sup>12</sup>:

- **Rapidity of Diagnosis:** The electronic record contains the patient's medical history, which includes all medical results, diagnoses, treatments administered, prescribed medications, laboratory test results, and radiological images. This enables the attending physician to expeditiously reach an accurate diagnosis and make optimal therapeutic decisions. Additionally, the electronic medical record facilitates communication among individuals and healthcare delivery teams, including physicians, nurses, technicians, and administrators, as it enables physicians to electronically request medication from the hospital pharmacy, which in turn allows nurses to prepare the patient's medications.
- **Mitigation of Medical Errors and Identification of Accountable Parties:** The electronic medical record provides the ability to identify the physician responsible for the patient and the nurse who monitored the administration of their treatment, thereby offering the capability to identify all parties implicated should a patient be subjected to a medical error. Moreover, this system facilitates the reduction of medical errors during medication dispensing through an automated alert system that verifies the efficacy of the prescribed medication and its potential interactions with other medications or the patient's allergies to it. Consequently, this system supports informed decision-making regarding the appropriate type of medication to be administered to the patient.

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- **Preservation of Patient Medical Confidentiality:** The electronic medical record contains sensitive personal medical information pertaining to the patient, which necessitates protection. This system provides a password, enabling healthcare providers (nurses, physicians, professors, laboratory administrators, and others) to access the patient's file, each according to their defined scope of practice.

Consequently, the medical information contained within the electronic file encompasses all aspects related to the pathological condition, represented by the dates of medical examinations, previous treatments, results of examinations, analyses, imaging, radiology, and surgical procedures performed on the patient; medical certificates detailing vaccinations and medications taken by the patient; the extent of improvement in the patient's condition and their response to these treatments and recommendations. Additionally, dates and measurements of blood pressure, body temperature, and blood glucose levels are recorded<sup>13</sup>.

### **Secondly: The Importance of the Electronic Medical Record**

The electronic medical record possesses profound importance, manifested through the enhancement of the quality of health services provided to patients by bringing health services closer to them, safeguarding their rights, and preserving their freedom to choose a physician. It enables physicians to diagnose the patient's condition with high accuracy, rapidity, and facility upon reviewing the information and documents contained within the medical file. It obviates the need to copy documents, certificates, and medical reports for each visit to the physician to remind them of treatment stages, as all medical and therapeutic procedures are systematically and sequentially recorded electronically in the medical file. The elimination of the phenomenon of loss and damage to medical documents and information and the difficulty of their retrieval, which was prevalent in the era of paper-based records<sup>14</sup>.

### **SECOND REQUIREMENT: ADVANTAGES AND DISADVANTAGES OF DIGITALIZATION IN THE HEALTH SECTOR.**

E-management possesses advantages; however, it concurrently encompasses a range of disadvantages, which will be addressed subsequently.

### **Firstly: Advantages of Digitalization in the Health Sector**

Applications of information and communication technology in the health domain have contributed to the development and modernization of health services. Patient-related data are now transferred digitally between various health institutions without the need for physical documents, which were conventionally transported via traditional methods. The physician or healthcare professional (nurse, administrator, among others) merely needs to click a button to access the patient's file and the required images and reports concerning their health status, automatically and rapidly<sup>15</sup>.

The state's implementation of digitalization in the health sector is of paramount importance. Among the advantages of electronic services in the health domain is the improvement of electronic operations and the quality of health services, which contributes to cost reduction, ease of data acquisition and sharing, and facile network connectivity and communication. The existence and development of an electronic system aids in the provision of electronic health services. The use of computers in the health field plays a significant role in accelerating medical transactions and patient follow-up, and contributes to enhancing operational efficiency and reducing expenditures, owing to the emergence of several manifestations of digitalization, such as the electronic medical record, for instance<sup>16</sup>.

Digital administration, in general, also presents advantages, which are as follows:

- It contributes to increasing governmental transparency concerning the improvement of services, simplification of procedures, and facilitation of transactions between the government and all segments of society.
- It contributes to providing accurate data and information and making it accessible to all segments of society.
- It assists in presenting the procedures for obtaining governmental services and their models in a manner that ensures ease of interaction with organizations.
- It leads to the opening of new communication channels among societal segments.
- It enables citizens to find information and access services from their respective locations without the need for their physical presence.

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- It helps to increase customer loyalty, ensure rapid responsiveness to needs, and simplify the delivery of services provided to them.
- It ensures the quality and accuracy of services provided by subjecting electronic performance to more stringent oversight than that imposed on employees in traditional administration, which aids in delivering better service performance and less exploitation of the administration's resources.
- The elimination of bureaucracy and administrative corruption, as service delivery in e-administration is based on the principle of justice and equality in providing services to citizens.
- Providing services in the best possible manner through the rapid flow of electronic information.
- Reducing the costs and burdens on the organization, as e-administration, unlike traditional administration, does not consume large quantities of paper and writing materials and does not require a large workforce, which helps in addressing the problem of data preservation and documentation.
- Simplifying and shortening administrative procedures for patients, especially by providing the possibility for citizens to avoid traveling to the administration, as well as reducing administrative complexities, thanks to increased work capacity, reduced need for travel and meetings, and simplification of procedures that lead to improved services due to information flow programs and electronic service performance.
- Facilitating communication procedures between departments and sections within a single health organization, as well as with other organizations, and providing automatic archiving of patient file information and access to accurate and documented information.
- Control, security, protection, and safety of information.
- Promoting the concept of quality management to improve the quality of services provided.
- E-administration assists in timely decision-making due to the availability of accurate and necessary data when needed, in addition to providing feedback on all activities and needs.

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- It eliminates multiple administrative levels; indeed, it can be said that there is only one administrative level connected to the network, whereby the network becomes the administration<sup>17</sup>.

Furthermore, e-administration contributes to achieving excellence by improving the performance of its services and developing them in a manner that eradicates bureaucracy and reduces its costs. E-administration is more suited to present and future requirements because it expands participation among all stakeholders within or outside the organization, thereby elevating transparency and clarity to their highest levels. It also provides motivation for all to engage in fruitful interaction and continuous presence with the organization without physically attending the administration, which adds to the organization's values and propels it towards establishing its sustainable advantage.

### **Secondly : Disadvantages of Digitalization in the Health Sector**

Digitalization has disadvantages that can be addressed as follows:

- Weak internet flow and lack of comprehensive network coverage throughout the nation.
- Deficiency in legal and legislative frameworks and the precipitous implementation of e-administration.
- Resistance to change from subordinates and fear of job loss due to inadequate training and skills required for new job functions.
- Significant concerns among individuals interacting with administrations regarding the success of hacking attempts against the administrations they deal with, and the potential for such breaches to involve the deletion, destruction, or illicit exploitation of their personal data.
- Lack of control software to monitor deliberate breaches.
- Information security challenges encompass a wide range of elements, some of which are technical, relating to the technical systems, programs, and devices used, while others are related to individuals and the administrative bodies responsible for e-administration globally<sup>18</sup>.

**Conclusion:**

In conclusion, it can be asserted that digital transformation in the health sector is no longer an option, but rather an imperative dictated by the increasing challenges confronting the health system, whether in terms of efficiency and quality or responsiveness to the growing needs of citizens. This research has highlighted how e-administration, with its concepts and mechanisms, represents a fundamental gateway to reorganizing the health sector on modern and effective foundations.

The electronic medical record serves as a practical and central model in this trajectory, owing to the advantages it offers concerning information preservation, enhancement of healthcare quality, and facilitation of the medical follow-up process. However, the materialization of this system in Algeria encounters a number of challenges, whether at the legislative, organizational, or technical level, which necessitates the adoption of a comprehensive strategic vision centered on modernizing infrastructure, qualifying human resources, and fostering a digital culture within health institutions.

Through this study, a number of conclusions are drawn, the most important of which are:

- E-administration represents a radical transformation in the management of the health sector through the introduction of modern digital tools that contribute to improving performance effectiveness, reducing time and costs, and elevating the quality of health services.
- The electronic medical record is one of the most prominent applications of digitalization in the health sector, due to its capacity to store patient health information in an organized and secure manner, enabling physicians and health institutions to access it rapidly when needed.
- The adoption of an e-administration system in health requires a set of fundamental prerequisites, including the availability of adequate digital infrastructure, clear legislation, and qualified human resources.
- Despite the numerous advantages of the electronic medical record, such as diagnostic accuracy and improved communication among professionals, several challenges hinder

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its implementation in Algeria, most notably a lack of funding, weak institutional coordination, and limited digital awareness.

Based on the preceding analysis, the following recommendations are offered:

- Establishment of a clear legislative and regulatory framework for the adoption of the electronic medical record in Algeria, ensuring the protection of individuals' health data and defining the responsibilities of various actors in the digital health ecosystem.
- Equipping public and private health institutions with integrated and secure information systems that support the safe and effective storage and exchange of medical files.
- Training and qualifying human resources working in the health sector in the use of e-administration technologies and health information systems, through the inclusion of continuous training programs and specialized courses.
- Ensuring interoperability among various information systems adopted at the national level, including linking the electronic medical record with the health insurance database and health regulatory bodies, to facilitate tracking and evaluation.
- Activating public-private partnerships to support digital transformation in health, especially in the field of technological development.
- Raising citizens' awareness of the importance and advantages of the electronic medical record, while guaranteeing their right to access their health information and respecting the principle of privacy and patient rights.
- Establishing a national body to oversee the digitalization of the health sector, tasked with coordinating among various actors, monitoring the progress of digital transformation projects, and providing periodic reports and recommendations.

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<sup>2</sup> Belkacemi Mouloud, *The Experience of Electronic Administration in Algeria: Between Electronic Illiteracy and the Problematic of Application*, Journal of Development and Applied Economics, Volume 02, Issue 02, University of M'sila, 2018, p. 270.

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<sup>3</sup> Zainab Abd Al-Nour, *Legal Mechanisms for Activating Electronic Administration in Algeria*, International Collective Book, Libya, 2023, p. 285.

<sup>4</sup> Abdullah Kibish, *Electronic Administration in Algerian Health Institutions Between Reality and Aspirations, Case Study of the Specialized Mother and Child Hospital in Djelfa*, Journal of Studies in the Psychology of Deviance, Volume 05, Issue 02, Year 2020, pp. 95, 96.

<sup>5</sup> Ahmed Meshnef, Maghnia Lakrench, *The Reality of Electronic Administration in the Health Sector – The Electronic Medical Record as a Model –*, Journal of Comparative Legal Studies, Volume 10, Issue 01, Year 2024, p. 26.

<sup>6</sup> Brish Mohammed Abdel Moneim, *The Impact of Digitalization on the Governance of the Algerian Health Facility and its Role in Facing Crises from a Legal Perspective (Covid-19 Crisis)*, Journal of the Human Resources Development Research Unit, Volume 12, Special Issue 01 Part 01, January 2012, p. 260.

<sup>7</sup> Derman Suleiman Sadiq, *Critical Success Factors for Electronic Administration Projects, A Field Study from Technological Organizations in Mosul*, College of Administration and Economics, University of Iraq, Iraq, 2009, p. 1.

<sup>8</sup> Ammar Zidane, Hassan Ben Kadi, *The Algerian Experience in Digitalizing the Health Sector*, International Journal of Legal and Political Research, Volume 07, Issue 01, May 2023, p. 158.

<sup>9</sup> Ahmed Meshnef, Maghnia Lakrench, op. cit., p. 27.

<sup>10</sup> Nadia kamih, *Electronic Administration in the Health Institution Between Reality and Aspirations*, International Collective Book, Libya, 2023, p. 285.

<sup>11</sup> Sharif Nejma, Addad Rachida, Maouj Said, *Towards the Application of the Electronic Medical File in the Algerian Health Institution*, Algerian Journal of Social and Human Sciences, Volume 11, Issue 01, 2023, p. 13.

<sup>12</sup> Sharif Nejma, Addad Rachida, Maouj Said, op. cit., pp. 21-22.

<sup>13</sup> Ahmed Meshnef, Maghnia Lakrench, op. cit., p. 28.

<sup>14</sup> Ahmed Meshnef, Maghnia Lakrench, op. cit., p. 31.

<sup>15</sup> Sharif Nejma, Addad Rachida, Maouj Said, op. cit., p. 11.

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<sup>16</sup> Mohammed bin Ahmed bin Turki Al-Sudairi, *The Extent of Use of Electronic Business in Saudi Hospitals*, King Abdulaziz University Journal for Economics and Administration, Kingdom of Saudi Arabia, 2014, p. 818.

<sup>17</sup> Khlassi Abdelilah, Nasri Manal, *Electronic Administration as a Strategic Option to Improve Health Services in Algeria*, Journal of the Faculty of Economics for Scientific Research, Sixth Issue, Zawiya University, Libya, 2020, pp. 12-13.

<sup>18</sup> Khlassi Abdelilah, Nasri Manal, op. cit., p. 13.

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