

# *Applications of Information and Communication Technologies in Algeria's Health Sector*

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### **Abstract:**

*The objective of this study is to delineate the current landscape of new information and communication technology applications in the healthcare domain. The findings of this investigation clearly substantiate the significant impact of information and communication technology development on the evolution of medicine and the increasing adoption of electronic medicine by healthcare professionals. Electronic medicine exploits the availability of the enhanced performance characteristics of contemporary telecommunications networks to facilitate internet-based health applications through the deployment of specific components and software solutions.*

**Keywords:** ICTs, Healthcare sector, Digitizing, Algeria

**Jel Classification Codes:** I15, I18, O33

### **Résumé :**

*L'objectif de cet article est de présenter un état des lieux des applications des nouvelles technologies de l'information et de la communication dans le secteur de la santé. Les résultats de cet article démontrent bien que développement des technologies de l'information et de la communication influence fortement l'évolution de la médecine et l'adoption, par les professionnels de santé, de la médecine électronique. Cette dernière met à profit la disponibilité des meilleures performances des nouveaux réseaux de télécommunications pour le bénéfice d'applications de santé sur Internet utilisant des composants et des logiciels spécifiques.*

**Mots clés :** TIC, secteur de la santé, numérisation, Algérie

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## **1. INTRODUCTION**

Within an increasingly digitally-driven global landscape, a heightened awareness prevails regarding the indispensable role of Information and Communication Technologies (ICTs) in the healthcare domain (Salmi, 2022). These technologies are crucial for ensuring the economic viability of health services and enhancing the operational efficiency of healthcare systems. Novel Information and Communication Technologies (NICTs) have undergone significant and rapid development over recent decades, with the healthcare sector experiencing a substantial increase in their applications.

In recent decades, numerous scholarly works have investigated the experiences of diverse organizations or healthcare providers in the implementation of various technologies, including electronic medical records, e-prescriptions, and computerized physician order entry systems. The overall conclusion is that the appropriate conditions for ICTs can contribute to reducing the costs of clinical service delivery by improving task execution modalities, accelerating data processing, and reducing the multiple handling of documents (OCDE, 2010).

In the Algerian context, the integration of ICTs within the healthcare sector is identified by experts in informatics and hospital management as an essential imperative for the modernization of administrative processes, the rationalization of expenditures, and the enhancement of patient care services.

The implementation of ICTs represents a societal endeavor impacting all sectors, including healthcare. The primary goal of digitizing the healthcare sector is to support patients, provide them with accessible services, and facilitate their access to various medical services seamlessly, an objective to which the State has dedicated considerable resources.

Therefore, the aim of this article is to provide a current overview of the applications of new information and communication technologies

within the healthcare sector. It seeks to address the central research question: What are the various forms of ICTs currently applied within the Algerian healthcare sector?

The structure of this paper is as follows: Section one will establish a conceptual framework for Information and Communication Technologies (ICTs). Section two will then detail the Algerian experience concerning the integration of Information and Communication Technologies (ICTs) within the healthcare sector.

## **2. Theoretical Framework Regarding Information and Communication Technologies (ICTs)**

The emergence of Information and Communication Technologies (ICTs) undoubtedly constitutes one of the most significant innovations of recent decades. These technologies are causing profound transformations in economies, societies, and cultures, and are increasingly accelerating the process of globalization. This represents a veritable digital revolution stemming from the convergence of two previously distinct fields: communication and information technology.

ICTs (Information and Communication Technologies) or NICTs (New Information and Communication Technologies) collectively refer to all instruments established for the manipulation, production, circulation, and improved diffusion of information. The ICT sector comprises all businesses operating within the spheres of electronics, telecommunications, or the Internet (Emmanuel-Arnaud & Robert, 1996).

### **2.1 ICT Concept**

Various definitions have been ascribed to the domain of Information and Communication Technologies:

Identified by a range of terms, including Information Technology (IT), New Information Technologies (NIT), and Information and Communication Technologies (ICT), among others, New Information and Communication

Technologies (NICTs) "originated within the preceding twenty-five years through the convergence of telecommunications, electronics, computer science, and information digitization technologies, notably audiovisual information" (Gollac, Afriat, & Loue, 2003).

The construct of Information and Communication Technologies generally denotes services and technologies operating through telecommunications networks. ICTs can be conceptualized as an ensemble of techniques employed in the processing and transmission of information, primarily encompassing computer science, the Internet, and telecommunications.

Another definition, such as that of Herbert Simon (Nobel Prize in Economic Sciences 1978) and which appears to be the most encompassing, focused on their characteristics. According to HERBERT, NICTs help to make: "All information accessible to humans, in verbal or symbolic form, will also exist in computer-readable form; books and memoirs will be stored in electronic memories..." (Peyrat, 2001) .

The UNDP defines ICTs as "instruments for the manipulation of information, comprising a diverse array of products, applications, and services utilized for the production, storage, processing, distribution, and exchange of information" (PNUD, 2001). The concept of Information and Communication Technologies integrates the notion of technology, initially possessing a purely technical connotation, with the concepts of information and communication. This has evolved into the most prevalent tool enabling the rapid and cost-effective circulation of information, and facilitating communication among individuals without discrimination, at any time and with complete autonomy.

Chapron B. (2006) characterizes ICTs as a somewhat vaguely defined term that arose with the expansion of communication networks, encompassing all aspects of the Internet and multimedia. This definition

also includes the concept of enhanced usability associated with these products and services.

(Tristan & Daniel, 2012) define ICTs as follows: Within both corporate and civil contexts, a diverse array of tools and resources, sometimes significantly different, are categorized under the rubric of "information and communication technologies." These tools share the commonality of producing, transforming, or exchanging information through electronic components and can manifest as hardware, such as computers, mobile telephones, and wired networks, or as software that augments the hardware to facilitate a broad spectrum of tasks.

Networks, whether physical or virtual, are also considered ICTs. Although their functions are not systematically related to information, embedded computer systems are also often classified among ICTs. Robotics, on the other hand, occupies a distinct place – although it massively uses ICTs since its purpose is to replace human labor. It is generally considered that ICTs constitute the hardware and software part of the company's information system (IS), whose function is to acquire, process, and store information useful to the structure. In addition to ICTs, the IS includes personnel, data, and procedures.

The Quebec government (Ministry of Economic Development and Regional Development) has identified six activities belonging to the ICT industry (Curien & Muet, 2004):

 **Telecommunications:** This sector is divided into two sub-sectors: service providers and manufacturers.

\* Companies offering public telecommunication services, regardless of the type of support used (fiber optics, copper, radio waves, etc.) and the type of content (data, voice, images, etc.).

\* The telecommunications equipment industry encompasses manufacturers of products and accessories for the transmission, emission, or reception of information. This also includes

manufacturers of wires, cables, and optical fibers used to communicate information.

- ✚ **Multimedia:** Information technology enabling the simultaneous use of multiple types of digital data (textual, visual, and audio) within the same application or medium, by integrating interactivity provided by computing.
- ✚ **IT services and software:** This includes companies from whom a client purchases IT products and services. Products: computers, software, etc. Services: software design, website creation, etc.
- ✚ **E-commerce and electronic media:** E-commerce encompasses any transaction that takes place on the Internet.
- ✚ **Microelectronics and components:** Manufacturers of semiconductors, suppliers of microelectronic components and instrumentation.
- ✚ **IT equipment:** Manufacturers of computers and peripherals, companies in instrumentation.

Digitization represents the process of "transforming analog information (irrespective of its form or medium) into digital encoding"(Canadian Council of Archives, 2002). Within the framework of digitization, the scope of the selection process encompasses the initial determination of documents for digitization, their subsequent evaluation, and the hierarchical organization of the selected items.

## **2.2 Types of ICTs**

This part will explore the various and most frequently encountered types of ICTs, the necessity of which is inseparable from an information system within an enterprise.

### **2.2.1 Digitization**

In the context of ICTs, the primary technological revolution that often comes to the forefront is that of digitization. This technique has fundamentally reshaped the landscape of information and communication by facilitating easier data storage and enabling faster and more efficient data transfer. Digitization "involves the transformation of sound, text, or an

image into a sequence of numerical values that a computer can encode and subsequently reconstruct into its original format" (Taib, 2015).

This innovation "offers the substantial merit of constituting, primarily, a singular encoding system, irrespective of the modality of data employed (sound, text, image). Secondly, the digital signal, in network transmission, provides a routing quality markedly superior to that of the analog counterpart. These advantages have positioned digitization as a core element within the operational paradigms of NICTs, establishing it as a universal standard. Presently, it encompasses all forms of information processing (sound, image, text, video) across a multitude of sectors (press, cinema, music, etc.). For the enterprise, digitization presents significant opportunities, enabling the expansion of the informational scope utilized for internal or external objectives: videos integrated into internal training accessible via the Internet, online electronic catalogs facilitating product visualization, website animations, etc."

### **2.2.2 Databases**

The second technological domain explored in this section pertains to databases. "Databases represent tools with a long-standing history of utilization (e.g., client databases, product catalogs, article repositories, bibliographic indices). They are architected to effectively manage and leverage substantial volumes of information."

- **The Technical Dimension:** From a technical standpoint, databases are realized through software instruments that facilitate the translation of their conceptual models into operational management systems. Prominent examples include database management systems (DBMS) and enterprise resource planning (ERP) suites.
- **The Organizational Dimension:** From an organizational perspective, the adoption of databases signifies a restructured information system, yielding the following benefits:

- Information is managed in a holistic and singular manner: updates are therefore global and applied consistently across all applications utilizing the information.
- Applications designed for the processing necessary for the management of each product interface with the database, retrieving required information and performing updates as needed. These updates are subsequently accessible to other applications.

Access to information is significantly facilitated, enabling various employees to retrieve necessary information for their tasks from their workstations efficiently and with minimal effort.

At the end of this paragraph, it is important to emphasize that databases are essential components of the information systems of the third millennium. In the modern enterprise, these technologies represent "the primary tool for information knowledge."

- **Networks:** In the context of NICTs, it appears fundamentally important to dedicate a section to computer networks and their diverse applications. Indeed, these interconnected infrastructures "currently form the structural framework of organizational information systems." Their effective operation underpins the operational capabilities of enterprises and ensures the availability and confidentiality of information crucial for the conduct of activities (Deterie & Broyez, 2001).
- **Applications of Computerized Networks:** Over time, computer networks "have evolved to encompass a range of applications and software that facilitate the free flow and sharing of information, as well as enhanced collaboration. We can thus distinguish various applications: those relevant to the entire enterprise, those pertinent to departments or workgroups, and finally those at the individual level."

### **2.3 Objectives of Digitization (ICT)**

The objectives underpinning a project for the digitization of documents can be categorized into four primary rationales (Deterie & Broyez, 2001):

- ✚ **Preservation of Documents:** Digitization for preservation targets documents with obsolete formats, those exhibiting degradation, or whose physical handling could lead to irreversible deterioration. The original documents will be retained, unless their condition renders them entirely unrecoverable. The digitized version will serve as the primary access copy for users.
- ✚ **Dissemination of Documents:** Digitization for dissemination aims at documents intended for use within a dissemination initiative, such as an exhibition, or for providing accessibility to documents for users on-site or remotely. The original documents will be preserved, but, as in the preceding case, consultation will occur via the digitized copy.
- ✚ **Archival Backup of Documents:** Digitization for the archival backup of documents primarily targets documents of critical importance to institutions (essential records) that necessitate the retention of a secondary copy as a precautionary measure (security backup). Typically, this backup copy will be created on a different medium and, ideally, stored in a location separate from the originals. The original documents will be preserved, with access primarily through the digitized copy.
- ✚ **Substitution of Documents:** Digitization for substitution aims to optimize the conservation costs associated with the space and material resources required for document storage. It also seeks to enhance the ease of access and consultation. The original documents will be eliminated once they have been digitized and a quality assurance process has validated their integrity. The adoption of this type of digitization is increasingly prevalent in academic institutions, given the challenges of physical space limitations for document storage in offices or in semi-active document repositories.

However, the implementation of these projects must be rigorously governed by laws, regulations, and standards to ensure the evidentiary value and long-term preservation of the documents.

### **3. The Integration of Information and Communication Technologies (ICTs) within the Healthcare Sector**

The healthcare sector is in a state of significant flux, currently experiencing technological modernization and facing heightened demands for service diversification from a patient population increasingly informed about quality and safety standards. New Information and Communication Technologies (ICTs) have undergone a period of rapid advancement over the past several decades, with the healthcare sector witnessing a considerable expansion in their applications.

#### **3.1 Digitization Initiatives in Algeria: The e-Algeria 2013 Project**

The most substantial modernization endeavor involves the digitization process initiated in 2009 through a multisectoral plan designated "e-Algeria 2013." This plan was formulated over a six-month period with the participation of more than 300 experts, encompassing 12 strategic axes and 1000 specific actions, with a total budgetary allocation of 385.5 billion Algerian Dinars. The objective was to achieve comprehensive digitization across all sectors by 2013, thereby positioning Algeria at a comparable level to Malaysia and South Korea, two nations serving as key reference points during the plan's development. Subsequent to this target date, the plan was redesignated "e-Algeria," acknowledging the impracticality of establishing a definitive completion timeline. The principal actions of the plan pertaining to public administration are summarized as follows:

The modernization of information technology infrastructure through the procurement of updated hardware and software (Fortas, 2017).

- The deployment of Geographic Information Systems (GIS) to facilitate spatial analysis of data.
- The digitization of archival materials to enable the dematerialization of administrative records.
- The provision of Enterprise Resource Planning (ERP) systems and dedicated databases to each administrative body.

- The creation of digital repositories and electronic directories.
- The implementation of standardization and security protocols to ensure information accessibility for all external and cross-governmental inquiries.
- The establishment of a secure and interoperable inter-agency network to support the electronic management of inter-governmental procedures at various levels.
- The introduction of 447 online services: \* 295 targeted at citizens (112 informational and 183 interactive). \* 86 targeted at administrative staff (19 informational and 67 interactive). \* 66 targeted at businesses (24 informational and 42 interactive).
- The formulation of regulatory frameworks pertaining to: \* The unique electronic identification of individuals and enterprises, electronic signatures, and the validation and certification of electronic transactions. \* The safeguarding of personal data and the limitation of its utilization to authorized governmental entities. \* The legal validity and enforceability of electronic contracts (Lounes, 2018).

Subsequent to the initial three-year period following the e-Algeria plan's inception, authorities recognized the primary imperative of developing the foundational infrastructure necessary for electronic governance; this was addressed in 2012 through a project focused on enhancing broadband and ultra-broadband capabilities (Borhane & Soltani, 2020).

### **3.2 The Evolution of ICT Applications within the Algerian Healthcare Sector**

Over the past decade, a significant number of computer applications have been developed and implemented within the healthcare sector. These developments are instigating notable changes in the practices of stakeholders within the healthcare system. The subsequent section will detail the diverse forms of NICTs currently applied within the Algerian healthcare sector.

### **3.2.1 Telemedicine**

Telemedicine encompasses the utilization of telecommunications and information technologies to facilitate remote healthcare access and delivery. This involves the collection, organization, and sharing of requisite clinical information to evaluate a patient's condition, formulate a diagnosis, and establish a treatment plan in conjunction with the broader healthcare team (Lahchem & Kaci, 2020).

In Algeria, the State is actively engaged in establishing a regulatory framework for telemedicine to promote its adoption and institutionalization, with the following objectives (Lounes, 2018):

- Establishment of a national standardization body for e-health.
- Formulation of a long-term strategic plan.
- Implementation of a comprehensive health information system.
- Development of collaborative partnerships between the private sector and relevant associations in ICTs to advance public health services through e-health initiatives.
- Introduction of the electronic health record system.

Telemedicine, an initiative spearheaded by the Ministry of Health over several years within the framework of healthcare sector digitization, has enabled the provision of care to populations in the High Plateaus and Southern regions facing a scarcity of medical specialists. Furthermore, it has enhanced training and management protocols, ensuring an optimized organizational structure capable of addressing the comprehensive healthcare needs of the citizenry.

### **3.2.2 Teleconsultation**

This entails the assessment of a patient, or patient-related data, conducted remotely without direct physical interaction, facilitated by a telecommunication system (Benamirouche, 2009):

Teleconsultation was introduced in Algeria on March 29, 2020. The global circumstances surrounding the progression of the COVID-19 pandemic have placed Algeria in a situation characterized by escalating healthcare demands. It was within this context that several startups affiliated with ANPT mobilized their resources to develop digital solutions aimed at mitigating the spread of the Coronavirus. One such startup, Ibn-

Hamza, specializing in the e-Health domain, offers Algerian citizens a novel video-based medical teleconsultation service, eTabib.dz. This platform allows citizens to access free, remote medical consultations, obviating the need for physical travel; these teleconsultations are provided by volunteer medical practitioners across various specialties.

### **3.2.3 Telemonitoring (Remote Patient Surveillance)**

This refers to the remote surveillance of patients' health status.

### **3.2.4 Deployment of Intranet Infrastructure in Algeria**

The Algerian Ministry of Health, Population, and Hospital Reform has established a dedicated intranet network, "Santé Algérie," intended to modernize information dissemination and enable real-time data utilization, according to the project coordinator, DOCTOR BENKACI, an advisor on Information and Communication Technologies (ICT) within the ministry. This initiative, undertaken in collaboration with the Ministry of Post and Information and Communication Technologies, involves the installation of local networks and the interconnection of 899 healthcare facilities via a fiber optic network, facilitating instantaneous access for diverse communication modalities (data transfer, messaging, remote work). Furthermore, it encompasses the development of health information systems to promote decentralization, the establishment of localized facility networks, staff training programs, and evaluation mechanisms. A unified computer network will connect all constituent services within each healthcare establishment through a central server.

The overarching objective of the "Intranet Santé Algérie" project is to decentralize the healthcare sector and advance the national health information system, with the aim of providing healthcare professionals, particularly physicians and specialists, with readily accessible health information and data (Algerie-dz, 2006).

### **3.2.5 Implementation of Electronic Medical Records (The Chifa Card System)**

The digitization of medical records was significantly advanced by the introduction of the "Chifa" card, implemented in 2006 as a response to the escalating costs associated with medication reimbursements by the social

security system. The primary objectives of this initiative were to manage healthcare expenditures, streamline and enhance the flexibility of reimbursement procedures for delivered services and medications, achieve greater fiscal control over social security-reimbursed healthcare costs, simplify and expedite reimbursement processes for insured individuals and contracted partners within the third-party payer system, realize administrative efficiencies, improve productivity to more rapidly address demand, and effectively combat instances of abuse and fraud (Benbahmed, 2009).

The "Chifa" card functions as a social security card with integrated data recording and storage capabilities, enabling the identification of the insured individual and their beneficiaries to facilitate their access to social security benefits. Its primary function is to enable reimbursement without the need for formal requests or the submission of paper-based claim forms. Presentation of the card at medical practitioners' offices, dental clinics, pharmacies, hospitals, CNAS (National Social Security Fund for Salaried Workers) offices, and various healthcare establishments allows beneficiaries to receive care and medication without upfront payment. Additionally, the card contains the insured's personal information, as well as comprehensive medico-administrative data, facilitating improved patient management and enhanced tracking of their medical history.

The "Chifa" card is regarded as a significant innovation in the medical cost containment strategies within Algeria. Its advantages include the curtailment of abuse and fraudulent activities, and the establishment of enhanced control over expenditures related to medical services. It represents a more efficacious regulatory instrument, introducing a novel modality of medical oversight.

The initial phase of implementation involved five pilot wilayas (Annaba, Oum El-Bouaghi, Tlemcen, Médéa, and Boumerdès), followed by an expansion to an additional five wilayas in January 2007 (Oran, Constantine, Blida, Souk-Ahras, and Mila). By 2011, the Chifa system encompassed all 48 wilayas. Consequently, by 2019, 14 million Chifa cards had been distributed, providing social security coverage to over 39 million Algerian citizens (MTESS, 2022).

While this development represents a crucial advancement in social welfare provision, the economic outcomes remain subject to discussion. Specifically, within a framework of mandatory coverage for chronic illnesses, where 90% of the population benefits from 80% to 100% insurance coverage, the insured population exhibits a reduced price sensitivity towards medications. Consequently, the deployment of the Chifa card appears to have contributed to an increased volume of medication consumption (Snoussi, 2017).

### **3.2.6 Strategic Implementation of a Computerized Management Accounting System in Public Healthcare Establishments**

To facilitate improved management of budgetary allocations to healthcare establishments and the costing of medical procedures, public authorities have adopted a project for the implementation of a management accounting system within these establishments. This initiative is in anticipation of the formalization of contractual relationships between public healthcare establishments and social security agencies (Cour des comptes, 2018).

#### **➤ Project Overview**

This initiative was mandated to the Ministry of Finance (MF) in direct coordination with the Ministry of Health, Population, and Hospital Reform (MSPRH). The framework agreement established between the two ministries on May 23, 2009, pertaining to the system's implementation, is designed to provide hospital establishments with a standardized and integrated accounting framework encompassing a triple accounting system: financial, budgetary, and analytical accounting.

The project's objectives also include the establishment of:

- Real-time tracking of financial commitments and budgetary resources within healthcare establishments.
- The generation of cost data delineated by service, nature of expenditure, medical procedure, and per diem hospitalization costs.
- The facilitation of cost comparisons across comparable hospital entities.

- The provision of a unified and standardized instrument conducive to modern and transparent management practices, incorporating a comprehensive suite of indicators and dashboards for administrative personnel.

The computerization of accounting and management systems within public healthcare establishments was mandated by Executive Decree No. 14-106, promulgated on March 12, 2014. This legislative instrument establishes a system comprising general accounting for financial position, assets, and cash flow; budgetary accounting for tracking budgetary transactions; and analytical accounting for the computation of diverse service delivery costs.

### ➤ **Implementation Protocols for the Computerized Management Accounting System**

The specific implementation protocols for the computerized management accounting system and the healthcare establishments subject to its deployment were defined by interministerial decree issued on October 30, 2014. This system is predicated on the utilization of the "3COH" (Budgetary, General, and Analytical Accounting for Hospitals) software platform, which, beyond core accounting functionalities, manages all operational aspects of the establishment, including procurement, inventory, fixed assets, consumption tracking, budget monitoring, treasury management, general and analytical accounting, and dashboard reporting (Cour des comptes, 2018).

General accounting furnishes precise insights into the valuation and fluctuations of the establishment's asset base, achieved through the generation of three fundamental financial statements: the balance sheet, the statement of income, and the statement of cash flows. Moreover, this system facilitates the administration of inventories, fixed assets, accounts receivable, and accounts payable, alongside the production of key management indicators (e.g., number of admissions, average patient length of stay, mean bed occupancy rate).

With respect to budgetary accounting, the computerized management accounting system provides real-time oversight of the public health establishment's available funds, budgetary commitments, and authorization

of payments, as well as treasury management (Article 9 de l'arrêté interministériel du 6 Moharram 1436). In the realm of analytical accounting, the computerized management accounting system enables the determination of the costs associated with executed activities and rendered services, by organizing the services or organizational units of the public health establishment into accounting aggregation centers, under the purview of the relevant service or unit head, who assumes responsibility for direction and management.

Furthermore, a dedicated data processing center is established under the authority of the establishment's director. This center is staffed by a team comprising a minimum of three individuals appointed by the director, specifically a team leader possessing the requisite management expertise, an accountant, and an information technology specialist.

Additionally, to ensure the long-term viability of the system, a steering committee tasked with the control, monitoring, and operationalization of the system is established within the Ministry of Health.

Data input into this system originates from transactions entered by end-users within auxiliary modules, supported by evidentiary documentation. These transactions are subsequently recorded in specialized journals (e.g., journal of pharmaceutical stock receipts, journal of office supply purchase invoices, journal of fixed asset acquisitions). Typically, these transactions are accompanied by their accounting distribution, serving as a translation into debit and credit entries for relevant accounts (Cour des comptes, 2018).

The deployment of this information system diagnostic project was structured in two phases, spanning from September 2009 to January 2010. The initial "pilot phase" involved 13 designated pilot establishments<sup>1</sup> designated as pilot sites, and a subsequent "deployment

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<sup>1</sup> Sept (07) C.H.U, (1) EHU (2) E.P.H, (2) E.H.S and (1) E.P.S.P

phase," where the system was expanded to 287 establishments located across the 48<sup>2</sup> wilayas.

#### 4. CONCLUSION

The digitization of healthcare plays a role in mitigating the risk of disease and has the potential to contribute to the elimination of certain diseases through progress in early screening before their manifestation (such as cancer). The transition from a primarily curative approach to a more preventative one will likely result in a decrease in healthcare spending. The integration of ICTs into the healthcare system can instigate a significant transformation in the quality of healthcare delivery.

Within Algeria, the advancement of information and communication technologies exerts a substantial influence on the evolution of medical practice and the adoption of electronic medicine by healthcare professionals. This adoption capitalizes on the enhanced capabilities of modern telecommunications networks to facilitate internet-based health applications employing specialized components and software. This transformation impacts professional practices and the fiduciary relationship between patient and practitioner, the quality of online information and services, and the fundamental purpose of these technological instruments. The digitization of the healthcare sector "contributes to the enhancement of services and the reduction of costs." The reform trajectory of the Algerian public healthcare system is temporally aligned with the development of ICTs, notably the Internet.

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Article 9 de l'arrêté interministériel du 6 Moharram 1436. (s.d.). *correspondant au 30 octobre 2014 fixant les modalités d'application du*

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<sup>2</sup> Sept (07) C.H.U, 4 EHS in 4 wilayas, 194 E.P.H in 48 wilaya, 16 E.P.S.P in 16 wilayasand 66 E.H.S in 48 wilayas.

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