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Rôle of Digitalization in Improving Health Services in Hospitals in Algeria

Dr. Djouab hanane

University of Bouira Algeria

E-mail : djouab.hanan@gmail.com

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Abstract :

In recent years, the Algerian health and social services network has undergone major transformations: shift to ambulatory care, deinstitutionalization, large-scale structural reforms, crises, etc. And now we are being told that the establishments and organizations in the network will digitize their entire operations before the end of December 2023. Cost of the operation, billions of dinars of the budget allocated to the health sector estimated of 61 billion DA. the Minister of Health recently announced his intention to digitally connect all state and private medical clinics to the network. As can be seen by simply recalling these facts, the management of personal data contained in the files of users of the health and social services network constitutes a crucial issue in the current context. . As this transition takes place, it is therefore appropriate to question the protection of personal information contained in these sensitive files. While ensuring that the current legal framework must provide adequate protection for this sensitive information. And at a time when health issues weigh heavily on societal choices, digitalization has found itself increasingly called upon by all those involved in the field of health," in this research we will present the growing role of digitalization in the improvement of health services.

Keywords: digitalization , health services, health system, hospital establishments.

Introduction:

The pandemic crisis of Corona has opted for all areas of life. Affected by the collapse of health systems in the world . the economic side was most affected by the closure measures and social distancing, which weakened the education and health sectors on the one hand, and activities that lack funding on the other. Most countries have just chosen to coexist with the emergency situation, by strengthening the integration of digitization in all sectors . And abandon traditional working methods and switch to TV –work, online medicine, online teaching, online pay...

This trend is justified, because the development of information and communication technologies has revolutionised the business world by reducing costs, time and distances. Especially since the time taken to produce the same amount of data worldwide increased to 20 seconds in 2016. Instead of 24 seconds in 24 hours in 2012.This evolution in the production of digital data will continue in the coming years, thus offering obvious opportunities in accelerating and sustaining economic growth, particularly for developing countries such as Algeria.[1]

In this context, in 2008, Algeria developed a progressive strategy known as "E-Algerie 2013", presented as an action plan, published by the Prime Minister's services , defines the new e-Government strategy. This strategy was designed to enable economic and social actors (administration, businesses and citizens) to prepare for the profound changes that the transition to an e-government will produce. Considered as an institutional first, the e-Algeria strategy aims to create a framework for thinking that allows the domestication of digital applications and to prepare the human capital called to take charge of the implementation of this strategy. Several axes are identified as essential levers. While the axis called "accelerating the use of ICTs in public administration" defines the actions that the government must take to migrate on-line services of the administration, the axis called "human skills development", identifies the accompanying actions that must take place by 2013 to better prepare public administration staff to acquire the skills, knowledge and know-how necessary for a successful implementation of the strategy e-Algeria.[2]

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I. Problematic

At a time when health issues weigh heavily on societal choices, digitalization is being increasingly sought by all those involved in the field of health. In this research we will present the growing role of digitalization in health. A role that is not just about information appropriating a new space that was not its own a few years ago. Especially since the pandemic of Covid-19, has become one of the public health actors. It is up to her to know what role she wants to play.

These passages emphasizing the link between health and new technologies correspond to the issue that this theme should present in Algeria.

Indeed, the health situation described as critical should occupy a prominent place in the public space, especially with the expression of new needs for health information. The digitization of certain public health issues in Algeria has raised health problems, raised awareness about epidemics and revealed cases such as AIDS, smoking, medical neglect, on one side; and to facilitate the management of patients using the medical record and social assistance of another side . This is the case in Algeria for mental health, health education and chronic diseases. The issue here is the effect of digitization on the health sector for the general public, not the diagnosis of the state of the health system. We question the health/NTIC couple in Algeria, focusing on the treatment of health information systems. The study of health technology themes enabled us to draw up a list of topics covered. Our objective here is rather to discover the nature of the digitization of health systems in Algeria from the legal, economic and social point of view. To study the theme of health and ICTs, we need to return to the sensitive triangle ICT/health/policy.

II. Reality of the health system in Algeria:

If the health status and social health indicators of populations are the indices for assessing the level of ie societies, the health theme should not only be on the media agenda but above all animate it. Moreover, health topics have always been the focus of political and scientific discussions. Their importance has led them out of the closed and intimate sub-space characterized by discretion to appropriate a new space: the public space. A space where the traditional and new media consolidate their status as facilitators. Thus, the «health issues have undergone a double transformation in the digitization theme, quantitative in their degree of social isibility and qualitative in their politicisation». The development of this theme in several countries where it constitutes a media field and an object of research in information sciences and communication prompts us to question its reality in Algeria. The scale of the security and economic crisis has led to a critical health situation characterized by the deterioration of the state of health of the populations. Indeed, “the social health reality is defined by a dual transition, demographic and epidemiological, which disrupts the field of health.”

A simple glance at a «layman» in a hospital will be enough to see that access to care is not always guaranteed and the quality of care is not enviable. It is also the opinion of specialists who give a negative opinion and which the appearance of new chronic and mental diseases only confirms. All these social health indicators, in red, demonstrate the seriousness of the situation leading to the expansion of categories and areas of health vulnerability.[3] Health can therefore provide a theme and a subject to be treated as a priority and an urgent matter. By discovering the current experience and practice of new health information systems in this area, exploring the digital field and the products available there, have made it possible to make findings and formulate hypotheses converging on the embryonic state of this now field in order to provide better care and improve the quality of health care and services in hospitals .

III. Digitization:

Document digitization is a set of activities that aims to transfer information recorded on an analog medium to a digital medium to meet a functional need or institutional priority. Like any project, it is executed within a specific time by a temporary and multidisciplinary team according to an allocated budget and must result in the production of one or more deliverables.[4]

IV. Document Digitization Objectives:

The objectives of a document digitization project can be four-fold:

1. Preservation of documents Digitization for preservation is used to identify documents that are out of date, have been altered or whose manipulation may cause irreversible deterioration. Original documents will be retained unless they are completely unrecoverable. The scanned copy is the preferred consultation copy for users.

2. . Document dissemination Digitization for dissemination is the process of scanning documents that will be used in a dissemination project such as an exhibition or to make documents accessible to users on-site or remotely. The original documents will be retained, but as in the previous case, the consultation will be done from the scanned copy.

3. . Document Backup Scanning for document backup is primarily intended to be used with documents of vital importance to institutions (essential documents) and requiring the retention of a second copy, as a precautionary measure (Backup copy). Usually this backup will be done on a different medium and preferably kept in a different place than the originals. The original documents will be retained, but the consultation will be done from the scanned copy.

4. Document substitution Digitization for substitution is intended to streamline the cost of storage space and physical resources required for document storage. It also aims to facilitate access and consultation of documents. The original documents will be disposed of once they have been scanned and validated by a quality control. This type of digitization is increasingly being used in academic institutions due to the problems of lack of physical space for document storage in offices or semi-active document repositories. However, the implementation of these projects must be strictly framed by laws, regulations and standards to ensure the evidential value of documents and their durability.

V. Legislative, regulatory and normative framework:

As public bodies under the Health Act, hospitals are required to perform efficient document management based on legal requirements to which they are subject. The legislative, regulatory and normative framework serves as a basis for the creation of management and compliance tools related to the legal issues of digitization, namely legibility, interoperability, integrity, the authenticity and sustainability of information and keeping it up to date.

1. Legislative and regulatory framework:

The provisions of the relevant laws mentioned and commented below are not exhaustive or fully transcribed. The targeted provisions are intended solely to facilitate understanding of these laws, while presenting the agency responsible for health digitization in Algeria.

Art. 2. — The National Health Digitization Agency, hereinafter referred to as the “Agency” by abbreviation (ANNS), is a public industrial and commercial institution with legal personality and financial autonomy.

Section 3. — The agency is under the supervision of the minister responsible for health.

Art. 4. — The headquarters of the agency shall be in Algiers.

Art. 5. — One or more of the agencies' annexes may be established, the territorial jurisdiction, organization and operation of which shall be determined by order of the Minister responsible for health.

Art. 6 - As part of the implementation and monitoring of the national health strategy for digital development, the the main mission of the agency is to establish a national health information system that ensures the digitization of medical activities and promotes the sharing, exchange, security and confidentiality of health data among health professionals, health structures and establishments and users with due regard for medical and professional secrecy. In this capacity, it is responsible for: - setting up the digital hospital through a platform centred around the patient, which will give health professionals real-time visibility of the care pathway in a secure manner and significantly improve the quality of care by integrating, including patient admission data, clinical data, Treatment protocols, medical units and services, intensive care management, hospital technical facility (medical analysis laboratory, medical imaging and hospital pharmacy) and the standardization and maintenance of medical equipment; - set up the shared medical record, accessible to health professionals by means of an identifier assigned to each patient and consisting of all data facilitating the exchange, the sharing and security of personal data necessary for the medical care of the patient and the coordination of medical care; -

implementing telemedicine, telecare, teleradiology and teleconferencing for health professionals allowing remote medical care of patients, the exchange and sharing of data in complete safety, Taking particular account of the inadequacies in the provision of care in areas with insufficient health coverage; — develop medical training through online platforms, in collaboration with relevant institutions and bodies, to provide distance-learning for medical and paramedical training for health professionals and encourage e-learning; —create interpretable networks and clusters of care at local, regional and national levels to facilitate the referral of patients to the most appropriate health structures and institutions for their hospitalization and management, especially in emergency situations; - develop and implement the codification of diseases and occupational acts (medical and paramedical) through a platform, in coordination with the sectors concerned, health professionals and social security organizations; - implement a health monitoring and data platform for health authorities, health professionals and users to provide reliable information on health, including emerging and re-emerging diseases Epidemics and pandemics, scientific, epidemiological and demographic data and the provision of care; — develop a portal for reporting adverse health events, enabling people to report any adverse event or unusual adverse health effects to the health authorities in order to avoid epidemics, Pandemic and health disasters; - Digitize the management and preservation of medical records and other health records; - contribute to the design and development of legislative and regulatory measures that will provide a framework for the use of information and communication technologies (ICTs) in the health sector, including those related to the practice of the health profession, the preservation of medical secrecy, the exchange, sharing, security and confidentiality of personal health data; - to provide all scientific and technical information and documentation necessary for training in the field of health; —to design, develop, produce, acquire and disseminate in all media all documents, books, publications, information and teaching, medical, scientific and technical means.

Art. 7. — The agency is also responsible for:form of the national health information system that integrates reference systems and standards as well as all health data and ensures interoperability with information systems in other sectors of activity, in accordance with the laws and regulations governing information and communication technologies; - provide and secure the digital identification of health structures, establishments and health professionals by creating an identification repository that allows for confidentiality, equipment security, hosting and storing data and carrying out periodic audits; - to prepare specifications for studies and achievements in the field of digital development in the health sector; - to prepare periodic reports to submit to the Minister responsible for health, on the progress of actions taken and on the evolution of digital development indicators and propose any measures aimed at improving them.[5]

2. Normative framework:

A. ISO 15489 Information and documentation – "Records management":

International standard adopted by the International Organization for Standardization (ISO) to harmonize best practices in archival records management. It identifies the characteristics that an archival document must have. [6]

- **Authenticity:** undisputed character of a document. To ensure the authenticity of a document, policies and procedures must be in place and documented to control the creation, receipt, transmission, preservation and disposition of a document from the document.
- **Reliability:** accuracy and completeness of information.
- **Integrity:** completeness and non-tampering of information.
- **Usability:** intelligibility and usability of the document. It must be able to be located, retrieved, communicated and interpreted.

B. ISO 19005 (PDF/A) Document Management – Electronic Document File Format for Long-Term Preservation:

International standard adopted by the International Organization for Standardization (ISO) that defines a file format for electronic documents for long-term preservation. Metadata, electronic signatures, passwords and cryptography are used to ensure the authenticity, reliability, completeness, usability and integrity of documents.[7]

The PDF/A is developed as a series of standards, subdivided into several parts. Only the part (PDF/A -1) has been approved. Note that PDF/A-1b is recommended as the long-term preservation format by BAnQ for unstructured documents. The PDF/A-1 consists of two levels:

- PDF/A-1a: Used to ensure the preservation of the logical structure of a document;
- PDF/A-1b: To ensure that text can be displayed correctly on a reader.

VI. Application of digitalization in the field of health services:

Digital health is concerned with the entire life cycle of digital health, including developments related to big data, data management, as well as transformation of the health system, including public policy and implementation.
Digital health includes:
• Electronic medical record
• Technology tools for remote care
• Mobile health apps (m-Health)
• Health data science
• use of artificial intelligence.

VII. Definition of digital health:

According to the WHO, digital health is defined as the use of information and communication technologies in support of health and related areas within the concept of eHealth. It is an umbrella concept that includes eHealth (e-Health), mobile health (m-Health), the use of big data and artificial intelligence.
According to the "Food and Drug Administration", the broad spectrum of digital health includes mobile health (m-Health), health information technologies, wearable health devices, telehealth and telemedicine, as well as personalized medicine to better monitor and manage the health of individuals and wellness activities. [8]

Therefore, Digital Health encompasses digital tools, clinical interventions and related data to promote, protect and improve health, including clinical, management, research and public health. By the nature of its field, digital health is at the interface of health sciences, humanities and social sciences, and information science and technology.

VIII. Health Information System (SIS-dz):

It is a comprehensive information system, bringing together all types of health actors and resources. The health information system in Algeria is composed of 6 systems:Information system related to compulsory reporting of diseases, information systems related to maintenance, information systems related to the electronic record of vaccination, Health-related application, information systems related to scorpion poisoning.[9]

1. Human Resources Information System (HRIS):

Human resources information system for public health (Rh santé Dz), which is a comprehensive web-based human resource management platform dedicated to the public health sector. It was approved in November 2014 and was designed by a company specializing in the development of applications and programming on the Internet called "spider network".

2. Mandatory Reporting Information System: MDO

This platform contains all information and data from the patient's personal information (address, age, gender, hospital status). Related to diseases requiring mandatory reporting, such as: viral and bacterial meningitis, AIDS, etc.

3. The maintenance related information system: CMMS

includes data and data related to the maintenance and monitoring of medical devices and para-medical equipment.

4. Electronic vaccination record information systems: DEVAC

This digital platform provides access to vaccinator data and all data on the type and date of vaccination. Such as the Covid 19 (astrazinica ...).

5. Health Activities Application: SISDZ 8080

It is one of the most important applications of the health system as it includes medical activities, obstetric activities, and daily, monthly and semi-annual reports and statistics, Whether for the patient or health users.

6. Scorpion poisoning information systems: EVEN.SCO

Due to the high number of scorpion bite deaths nationally, especially in the south, started in 2014. The stages of scorpion poisoning can be classified according to the degree of danger in 3 stages: Cases of mild, moderate and severe stings.

IX. Prerequisites for the success of the health sector digitization system:

The success of the health digitalization system requires a set of elements, the most important of which are

1. Technology watch: Once the balance sheet has been drawn up and the lessons learned from this experience, it is still necessary to ensure the sustainability of digital files. Therefore, a watch must be provided for as long as necessary. This covers two aspects: technological and legal aspects. The technological watch is summarized in the following points:

- All master files, including metadata, must be saved on two types of media, stored in two separate locations.

The tendency to store data on large servers or removable disks facilitates the migration of data from one site to another and from one medium to another.

- Whatever the medium, it will become obsolete in the longer term. In accordance with best practices in the field, it is recommended to perform migrations every 5 years. For this purpose, it is necessary to carry out a technological watch. In the case of a substitution scan, it is imperative to ensure the integrity of the documents and to keep all project documentation. We will therefore have to ensure that support migrations are also documented in order to meet the requirements of technological monitoring in order to comply with our legal obligations.

2. Legal Watch:

A legal review should also be carried out to ensure that the health care institution takes into account any legislative changes related to format and media transfer, in particular, changes relating to the legal equivalence of documents whose original medium would have been eliminated.[10]

X. Benefits of Digitizing Health:

The digitalisation of the health sector is now a "pressing need" for management modernisation, rationalization of expenditure and improvement of services to patients, according to experts in IT and hospital management. [11]

- When it is used for healthcare, digital transformation is positive for health care, social and medico-social stakeholders and organizations. Digital technology makes it possible to be more efficient in making a medical appointment, in carrying out administrative procedures prior to admission to a health facility, in consulting at a distance

and in being monitored continuously outside of consultations. It also improves the fluidity of care and the quality of patient management, in particular by avoiding unnecessary examinations and medication errors.

- Due to the health crisis, the increase in emergency room admissions and the use of telemedicine has shown the usefulness for authorized health and social professionals to have access to patient data, Including a consultation of the file to find out about medical history, allergies, comorbidities or even the person of trust or advance directives. Yet, digital health can only be beneficial if it is responsible, protective and humanized.

It is thus up to the public authorities to support the digital transformation of health by allowing users of the health system to benefit from its benefits, especially on the quality of care, while ensuring the implementation of ethical safeguards guaranteeing health system users that there will be no degradation of the relationship of care and no derogation from medical confidentiality due to the deployment of digital health.

- Improving the services provided to citizens and better managing patient records, the modernisation of the health system will contribute to decision-making in the sector.
- Telemedicine, launched by the Ministry of Health for years as part of the digitalization of the sector, has helped to support the population of the Hauts-Plateaux and Southern regions that suffered from a lack of specialist doctors, To improve training and management, and ensure optimal organization that will enable the health system to meet all citizens' needs.
- Facilitates statistics of STDs and chronic disease.

XI. Disadvantages of digitizing health:

Dematerialization, computerization or digitization is the action of changing paper documents into digital format. The goal is to reach “zero paper”. For example, accounting documents, employment contracts, invoices, purchase orders, delivery notes, etc.

- **Data security:**

The main disadvantage of dematerialization is mainly related to data security. Regardless of the media used, there is a real risk of lost scanned documents and fraud. For example, there are viruses, hacking, etc. So it is very important to ensure the security of the computer network. To optimize data security, it is strongly recommended to set up an Electronic Archiving System and protective software. This will allow you to prevent any modification or deletion of all your scanned documents.[12]

Conclusion:

Health organizations are huge budgeting machines, hospital logistics and the associated exchange of goods represent major budgetary and human issues. Faced with a growing population and reduced budgets, these organizations are in constant reform so that they can meet the dual challenge of improving the quality of care (patient management) while reducing costs. To do this, they must comply with the new management rules. Among the management tools, we find the transition to the digitalization of the health system.

. In Algeria, health organizations have been using an information system since the 1990s, with the sole aim of improving management by controlling costs and improving the quality of its services in the face of a growing population and a reduced budget. It was found that the hospital information system has evolved with the evolution of technology and have followed each other. But have we achieved the results we wanted? Cost reduction and service quality improvement. The information system helps organizations record their data but their exploitation so that they can generate value is not used. Does not man have a hand in the successful implementation of its systems? Next to each information system, there is the presence of man. Medical staff and administrators have a hand in the success of the information system in achieving its objectives. Putting public health organizations in competition with the private sector by allowing insured patients to choose the organization that can offer them better quality of care. And therefore the withdrawal of automatic financing from the health insurance fund. This can boost awareness in public health organizations to initiate the data of the information system that would allow for cost estimates.

[1] e-Commission. “e-Algeria 2013 Synthesis” in Prime Minister’s Portal. www.cg.gov. dz/index.php (accessed 20 October 2010).
[2] Sid Ahmed BENRAOUANE, “E-algerie 2013: Réflexion Sur La Stratégie De La Conduite Du Changement”, Volume 20, Numéro 2, to be published on 2010-12-01, scientific journal IDARA , p 2.
[3] .Aissa Merah, “The Challenges of Information and Communication: Health Information in Algeria. Study of a successful but isolated experience,” Publisher: GRESEC, 2009/1 (Volume 2009), p. 63.
[4] Buresi, Charlette and Cédelle-Joubert, Laure, “Conduire un projet de numérisation”. Paris, 2002: Tec et Doc. 326 p.
[5] OFFICIAL JOURNAL OF THE ALGERIAN REPUBLIC No. 47, Executive Decree No. 22-251 of Aouel Dhou El Hidja 1443 corresponding to June 30, 2022 concerning the national agency for health digitalization. P 13.
[6] International Organization for Standardization (ISO). 2001. “Information and documentation: Part 1: Guiding principles”. Geneva: ISO, ISO 15489-1:2001.
[7]Records and Archives Management Division. University of Montreal. 2009 (June). Scanning procedure. Montreal: University of Montreal, 114 p.
[8] World Health Organization, “Appropriate Technology Uses for Health Services,” Seventy-first World Health Assembly, New York, 2018, p. 1.
[9] Hassan ben kadi , ammar ziane, “the Algerian experience in digitalization of the health sector”; scientific review of legislative and political studies, volume 07, No. 1, p165.
[10] Mevel, O., & Abgrall, P. (2009). “Information management in the organization: a new approach to information intelligence based on the capture and processing of weak signals”. International Journal of Economic Intelligence, 1(1), 123-137. Available at https://doi.org/ 10.3166/r2ie.1.123-137.
[11] Digitization of the health sector, a pressing need; Published: Tuesday, 15 March 2022: https://www.aps.dz/sante-science-technologie/137120-la-numerisation-du-secteur-de-la-sante-e-necessite-imperieuse
[12] Dematerialization of documents: the disadvantages, the site: https://www.tourdefrance-demat.fr/dematerialisation-des-documents-lesinconvenients/#:~:text=Le%20principal%20inconv%C3%A9nient%20de%20la,virus%2C%20le%20piratage%2C%20etc