

EXPERT OPINION

The Role of Human Resources and Health Informatics in the Digital Transformation of the Healthcare System

Haidar Jouni

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Summary

The digital transformation of the primary health and healthcare system is not a process of replacing classical machines and techniques with advanced tools and machines, but rather a process of transformation, programming, and changing concepts, methods, habits, and systems.

The human cadre has an effective role in the process of digital transformation among all sectors of the health sector. There is interconnection and understanding in the process of digital transformation of health between individuals, where workers in the health sector exchange and investigate about adequate education for digital transformations.

Understanding every detail of digital transformation, investing in it, and working to develop it gives success and a strong boost to the system. Digital transformations will transform traditional businesses into an advanced digital world with maximum new technology

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Corresponding Author:

Haidar Jouni
Islamic University of Lebanon
(IUL), Khaldeh, Lebanon
jouni.drhaidar@yahoo.com

Authors' Affiliations:

¹Islamic University of Lebanon (IUL), Khaldeh, Lebanon

What do we already know about this topic?

The digital transformation of health is taking place in most countries that have been asked to bring about change in the health system to unify the concepts, basic concepts, and medical work in the world. It is a process that begins with the idea of introducing digital technology to the health sector. This technology is not new but has been used in the commercial or operational work of an organization, institution, region, or for a society in many sectors

What is the main contribution to Evidence-Based Practice from this article?

For health systems to reach a truly advanced and active stage in the process of digital transformation of health care, a core of education in medical informatics (specific for all health professions) that depends on the consensus of informatics teachers must be established in collaboration with health professions - practitioners.

What are this research's implications towards health policy?

Digital health transformation depends on the involvement of all healthcare professions and digital health policies should warrant the involvement and leadership of healthcare professionals.

Authors' Contributions Statement:

Jouni wrote the original manuscript.

Introduction

What does the term "digital transformation" mean in general, and in the health sector in particular?

The digital transformation of health is taking place in most countries that have been asked to bring about change in the health system to unify the concepts, basic concepts, and medical work in the world. It is a process that begins with the idea of introducing digital technology to the health sector. This technology is not new but has been used in the commercial or operational work of an organization, institution, region, or for a society in many sectors. Digital transformation continues until the moment of complete integration of these technologies with the administrative, medical, and human operations as well as commercial, for organizations, institutions, regions or the entire society. Digital transformation processes will transform traditional businesses into an advanced digital world with the maximum amount of new technology

It is particularly emphasized that "digital transformation also includes individuals: it is not enough to simply introduce the

transformation to digital technology in various health businesses and the associated human staff and other systems. It is also very important to educate health workers about the new concepts of digital transformation because key employees have a role." Key in the process of digital transformation is indispensable for transforming the healthcare system.

"Don't do anything for us without asking us what we really need" is a famous slogan. The e-Health Declaration points out that "Health care informatics and digital transformation projects should not be implemented in such a way that users of the system, i.e. human staff in the health sector, are the last to know about the project." They do not meet with it until it is completed, because this would expose it to many errors, which can be avoided with the active participation of the health staff in the digital transformation. This is the correct way to do this, and the users of the future system will participate in its design from the beginning, during development, to testing, and upon completion, to evaluation and education. These are the postulates of management and changes." For this reason, it is important that

the users of the future health system, that is, the future users, are educated enough to implement the change process, that is, for the digital quality of the health care system transformation. This method of digital transformation gives the health system the strength and momentum to develop and better health productivity with lower health costs.

The truth is that the twentieth century was characterized by the eradication of educational illiteracy, while the twenty-first century is the century or era of digital literacy in all human fields in the sectors of work, health, education, trade, and various administrations to develop life and work for the better in terms of actual value and productivity. Thanks to the development of digital technologies and their widespread availability among members of society through increasingly high-quality digital information and communications infrastructure, literacy has become more widespread among populations around the world every day. However, the twentieth century was characterized by educational literacy, while our days' work complemented educational literacy wherever it exists. In addition to digital literacy, it also seeks information literacy in an advanced step, which implies "recognition of necessary information, and knowledge of the effective way to access it, in various sectors, the most important of which is health. Imagine that you are at home feeling pain in the hand. Thanks to the development of information, you will call a doctor and consult him via video or phone call. In the case, you are asked to have an x-ray or examination, you will go to the medical center, and your health card will be shown, which the doctor had entered. What is required of the medical work, what is requested of you is carried out, and within seconds the doctor can

review the results and prescribe the appropriate treatment for you. This process, which was completed in an ideal time, is one of the digital transformation processes for health that we are talking about, which saves time and money and with a positive defense for the individual, health and the system from were productivity.

The basic slogan that we work on and for remains "structuring information, transforming it into new knowledge, and disseminating information to those who need it."

Regarding health and health care, digital and information literacy includes the desire to do something such as using digital services and accepting the exchange of data in the field of health care for workers and sector users, i.e. individuals, and giving directions for the future strategic use of data at the individual, local and global levels in health systems and work. To stimulate information and digital innovations to develop health systems.

Working on digital and information progress in the health sector and digital healthcare requires:

1. The doctor, who is the backbone of the health component, must be trained in how to use data on individuals and conclude informational analyses. He must also improve information literacy to use digital health to prevent diseases for society, which improves the performance of primary health care.
2. The authorities responsible for health policy must train a human cadre who has general knowledge about health and is skilled in informatics, which facilitates the collection and analysis of data from various sources and provides a picture of the health situation, progress and areas of lapses, as well as planning new initiatives. These are known as data specialists (data experts) in Health care institutions.
3. Training doctors to enhance their horizons

of expertise in the field of digital health, as well as thinking about creating new jobs that care and combine medicine and technology to enhance the capabilities of expertise in the field of digital health, highly qualified groups that contribute to strengthening program management and monitoring in the health sector as well as developing it.

4. Hospital managers must improve the digital efficiency of their organizations and work to train nursing and medical staff on new technologies, which include:

A• Educational contents about e-health for all health professions.

B• Contents about the health system for IT specialists (IT professionals) working in the healthcare field.

* Formation of joint teams consisting of IT specialists on the one hand and primary health care specialists on the other hand, since health care professionals deal with data in health care (but also for others) through interactive health information.

“People-Adapted Interactive Health Systems” states that such systems should target:

1-The needs of those who use these systems, that is, they must be designed according to human health needs

2-Human-friendly design is an approach to developing interactive systems that aims to create systems that are usable and useful by focusing on users and their health and psychological needs and requirements.

3-By applying human factors/ergonomics knowledge and usability techniques. This approach improves the effectiveness and efficiency of the system itself and improves the feeling of the people - its participants.

4- Health system, citizen satisfaction, accessibility and sustainability; and prevent potential adverse effects of use on human health, safety and performance.

The importance of health care and information culture:

After all that was mentioned in brief, all the mentioned sources emphasize one thing: the necessity of teaching health professions information technology and teaching programmers and digital informatics men the foundations of digital health, because such interaction can generate an effective, active and permanently developed system.

Future health professionals complete their education at least one of three levels:

* Secondary schools, medical institutes and other health-oriented schools.

* Health applied arts.

* Medical colleges and colleges of other health fields at different levels.

There is a big interest in the subject of medical informatics by countries and institutions to create a new educational and specialized field that emulates the progress and works to develop the future system. This, in turn, will open the horizon to new job opportunities that enrich medicine and technology and be the cornerstone for new future sciences. These studies can be university studies with a single degree or training courses with separate certificates. The idea of medical informatics contains many fields of study, including, but not limited to:

- E-health
- Health informatics
- Health and artificial intelligence
- Medical informatics
- Biomedical and health informatics
- Mobile health
- Clinical informatics
- Public health informatics
- Informatics in nursing
- Dental informatics
- Digital health (health) and artificial intelligence
- Medical informatics in educating future

doctors - what and when?

- Surgical informatics
- Informatics in family medicine
- Informatics in Medical Technology
- Psychological informatics

The future of medicine and health in the era of information:

We can list many specializations in the future, that is, after starting the first steps.

Medical informatics has begun to appear in many curricula as a separate entity in the curriculum, whether it is university, institute, or secondary school education.

As for the medical staff, by studying the patient's medical file and reviewing the available information, this remains sufficient to build a diagnostic perception of the case, and the doctor must estimate whether the information available is sufficient or whether he needs some other options to form a better perception, and among those options are digital information for the patient, as well as artificial intelligence in Advanced stages.

We must pay attention to the nature of (bio)medical data, i.e. "the key questions in the field of artificial intelligence are those related to the nature of biomedical data and knowledge, their representation, and their use in 'computer systems'," and what is more, "several recurring themes are emerging as a tool for new research." , such as planning and validating experiments, collecting data - knowledge, researching the literature, diagnosis and treatment planning - creativity for the user with better results, and teaching (Shortliffe E,1999).

Coira insists that medical students need to understand "the dynamic and uncertain nature of medical knowledge" (Coierra E, 1998).

Medical students should also be able to "maintain up-to-date personal knowledge and skills", "evaluate knowledge according to

scientific facts obtained through statistics", "interpret uncertain clinical data and deal with file and errors", "structure and analyze clinical decisions In terms of risks and uses, "apply clinical knowledge and adapt it to the individual circumstances of patients", "approach, evaluate, select and apply therapeutic guidelines, adapting them to local conditions, communicate and record differences in treatment plan and outcome", "structure and record clinical data in a form appropriate to the immediate clinical task" . , to communicate with colleagues for epidemiological purposes", and to communicate using "the most appropriate communication".

Hence, we see that digital medicine as a field of study "requires the firm belief that the practice of medicine in the twenty-first century requires objectivity, accuracy, and knowledge, taking into account available sources of information." Likewise, digital medicine as an educational subject suffers from difficult ambitions but is still insufficient to achieve them, until now. Researching the form and content of the subject to be taught.

Educational materials in digital health - medical informatics - should include: Healthcare - treatment and prevention, organization and management, quality improvement and research - assumes the linking of a lot of medical and health data from electronic records (medical, health and personal). With contemporary information technology today has the ability to visualize a lot of data because "a picture speaks more than a thousand words." This was written a long time ago (Powsner & Tufte, 1994) he writes more and more today (Jin Y, 2016). On the other hand, artificial intelligence methods (data mining, machine learning, etc.) make this possible by linking data of various types (digital, encrypted, imaged,

etc.(Davenport & Kalakota, 2019; Sonicki & Kern, 2021) and its disclosure of new medical knowledge, building or improving existing clinical and other guidelines. Moreover, there are many different applications (information systems in hospitals, primary health care, public health institutes, etc.) Making improvements to current applications, to adapt to the needs of health professions. There is a need to evaluate existing ones of applications as well as establish certification standards for existing and future applications by design that are adapted to human elements “Ergonomics of human interaction and design of human-friendly interactive systems.”

All the above requires the active role of health professions, and therefore their proven knowledge of medical informatics. Imposing a solution from any side (e.g. from IT specialists, managers, authorities etc.) will not lead to

good results. “Don't do anything for us without us.” This is what the doctors and nursing staff say because they are the people most knowledgeable about medical conditions and how to treat them, and they are the ones who say, “Don't ask what we need and what we want,” but rather ask, “How can we work together to achieve a distinctive medical service” that the doctor is satisfied with? And the patient and the health system. They must be the guiding thread in the process of digital transformation of medicine and health care. For us to reach a truly advanced and active stage in the process of digital transformation of health care, a core of education in medical informatics (specific for all health professions) that depends on the consensus of informatics teachers must be established in collaboration with health professions - practitioners.

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