

FORMULATING AN INNOVATIVE MODEL FOR LEBANON'S HEALTHCARE SECTOR: METHODOLOGY AND RESEARCH RESULTS

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The article presents the methodology and results of a study on the formation of an innovative model for the development of the Lebanese health sector, which improves the efficiency of the existing system through the introduction of information and communication technologies (ICT). In this model, based on the characteristics of the national health system and taking into account its condition, as a basic element, the creation and use of a national electronic medical record is provided, which provides access to a variety of related services, which will have a positive impact on human development. In addition, the article presents the results of assessing the risks and threats associated with the readiness and willingness of human resources and stakeholders to implement an innovative solution.

Keywords: innovative model, research results, information and communication technology (ICT), healthcare.

ФОРМИРОВАНИЕ ИННОВАЦИОННОЙ МОДЕЛИ ДЛЯ ЛИВАНСКОГО СЕКТОРА ЗДРАВООХРАНЕНИЯ: МЕТОДОЛОГИЯ И РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЙ

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В статье представлены методология и результаты исследования по формированию инновационной модели развития сферы здравоохранения Ливана, повышающей эффективность существующей системы за счет

внедрения информационно-коммуникационных технологий (ИКТ). В данной модели, исходя из особенностей национальной системы здравоохранения и с учетом ее состояния, в качестве базового элемента предусмотрено создание и использование национальной электронной медицинской карты, открывающей доступ к множеству сопутствующих услуг, что позволит положительно влиять на развитие человека. Кроме того, в статье представлены результаты оценки рисков и угроз, связанных с готовностью и готовностью человеческих ресурсов и заинтересованных сторон к реализации инновационного решения.

Ключевые слова: инновационная модель, результаты исследований, информационно-коммуникационные технологии (ИКТ), здравоохранение.

Overview and purpose. The health sector is one of the most important components of any society. It is a prerequisite of any society regarding the social security and wellbeing of its residents. Human development in a society can't be achieved without the availability of health services at all times, with high quality, and within the reach of people in need. One of the successful factors for increasing the efficiency of economic sectors is the adoption of Information and communication technologies (ICT) into its processes, and healthcare sector is not an exception, as proved in many experiences from around the world in both developing and developed countries.

The purpose of this research is to develop a theoretical approach, model and techniques that contribute in increasing the productivity of the management of the healthcare system as a step into the whole information society, by accomplishing more efficient use and benefit of available ICT.

This is accomplished by creating a unique electronic health record for each citizen who wants to access health services all around the Lebanese territories. This will allow to centralize health data, improve the quality of services, and provide managements with effective tools for better access to relevant information.

The methodological and conceptual approach used the inclusive development and dissemination of innovative criteria to others to ensure that such a solution is fairly accessible to all citizens. The study will also formulate methodological and practical recommendations for expanding eHealth coverage for all stakeholders, overcoming internal gaps and external risks, and using available resources for the best governance processes, quality of life and people's access to health services. In addition to suggesting monitoring mechanisms to ensure the good implementation of this national decision.

Research methodology. The scope of the study covers health care facilities in Lebanon's health care system, both private and public, including hospitals, primary care centers, physicians and employees, guarantors, pharmacies, outpatient services, and diagnostic centers.

The study relied on the use of the “triangulation method”, which allows the use of different methods and tools for data collection and analysis because it combines qualitative and quantitative method approaches [1], in such a way as to avoid limitations or biases in the use of a single tool. One of the data collection methods used is document analysis. This method was used by the researcher as he read medical record forms from many hospitals as well as those distributed by the Department of Health. Documented conditions from accreditation standards were also an important source of documents, especially those related to information technology. Added to this are the general rules and regulations of the Ministry of Health, especially those related to the organization of the sector. Finally, documents from health facility policies and procedures and internal regulations complemented the analyzed literature. Interviews were used as a qualitative tool for data collection. The researcher applied this method to the top positions in the health sector of the country. Open and semi-open-ended questions allowed the interviewer to obtain extensive technical and scientific insights from relevant professionals and stakeholders, adding their opinions, concerns, and experiences to the study. These interviews were conducted using a structured approach. Closed-ended questionnaires were used as a quantitative tool. This method allowed the development of multiple questionnaires for different levels of similar professionals: IT managers, HR managers, quality managers, doctors, nurses, technicians, clinic managers, pharmacists, patients and citizens were targeted with questionnaires appropriate to their type of work.

Risk in Lebanese healthcare system addressed by research. The importance of this study is that by approaching the situation taking the Lebanese peculiarities into account; it is expected to handle the following risks and decreasing their negative effects on the healthcare system. Risks related directly to the health sector stakeholders will be solved, and issues that have indirect negative interference will be overridden or decreased. Some of these risks were also approached as challenges facing the innovative development of the healthcare sectors in Lebanon and Belarus [2]. The findings allowed to confront such risks and more:

a) Forgery: for billing and financial issues. The system allows instant electronic billing that can be monitored not only on premises but at the centralized management, guarantor systems, and the patient himself.

b) Denial or delay of health service: The system allows up-to-date status of vacancies in healthcare centers in addition of available services in each. Added to that an alert to the authorities initiated by the citizen to complain about denial or discrimination in health services.

c) Bureaucracy: the system will provide the option of electronic approvals and communication, which will save him a lot of bureaucratic steps. This is also valid for other stakeholders like managements, doctors and others.

d) Political issues: A centralized monitoring from the ministry of public health will decrease the political interference in the distribution of health services.

e) Weak coverage: The electronic solution will be accessible throughout all the Lebanese territories equally, and will provide full coverage.

f) Immaturity of organizations: the budget includes supplying centers with sufficient technology, in addition to a nationwide training schedule for preparing human resources to manage the available processes.

g) Duplicity: This risk threatens the whole system, by allowing one citizen to have multiple health identities in Lebanon. The system suggests two solutions, either adopting the national identity as exclusive identifier, or defining a unique health id for patients.

h) Distant services: The system will provide instant map for requested services, ambulatory services available, and vacancies allowing better distribution and access to health services.

i) Resistance of change: This risk faces any new suggestion in all domains. Since this system approached the Lebanese case peculiarities, and will be built for the Lebanese platform, the premonitions will be overcome, and the resistance will decrease.

Main results of the study.

a) Developed a conceptual approach to the formation of an innovative model of development of the Lebanese health sector, based on the provisions of theories of innovation, information society theory, the concepts of human and inclusive development and a review of global experience in the development of health systems in developed countries, providing equal opportunities of access to the solution for all citizens, regardless of any criteria (region, literacy, financial, political or social differences, etc.) based on the application of modern achievements in the field of ICT and the experience of advanced countries, taking into account the characteristics of the existing health care system in the country and the factors that promote and hinder its development, achieving better results for the economy and the well-being of citizens.

b) A theoretical and methodological approach was developed to assess the readiness of the Lebanese health sector to increase the use of ICTs as part of the integration of health facilities according to a set of quantitative and qualitative parameters, grouped according to six criteria of information society development (economic, spacial and technological, political, social, cultural, physical and infrastructure). The piloting of this approach enabled the identification of facilitators and barriers to the development of ICTs and took them into account in shaping the innovative development model of the Lebanese health sector and developing recommendations to increase the coverage of all stakeholders in the e-health system. The piloting showed the level of readiness [3, p. 11] (availability of technology), awareness [4, p. 103], and willingness (ability to implement a computerized system with appropriate human resources) of Lebanese stakeholders to adopt the new system. It was found that all levels of the health system support such a solution, provided it is implemented professionally, without exceptions, while maintaining transparency and

confidentiality of medical data. The consensus among authorities, managers, doctors, nurses, technicians, patients, and citizens was that such a solution would provide better quality services and access, and would have a positive direct impact on the cost, time, and effort spent in the old system. The ratios found by the researcher’s study about willingness among stakeholders are shown in the table below:

Question	MoPH	Guarantor managers	Hospital managers	Doctor	Nurse	Hospital technician	Ambulatory services	Pharmacy	Clinic	Citizen
Are you willing to implement this innovative solution	Yes	Yes	62.5 %	36 %	85 %	72.5 %	83 %	93 %	52.5 %	90 %
Do you thing that implementation will be successful?	Yes	Yes	75 %	30 %	75 %	70 %	80 %	87 %	45 %	40 %

Data gathered from researcher’s survey of the Lebanese health sector about ICT adoption.

c) Based on this conceptual approach, an innovative, integrated, multi-level model for the development of the Lebanese health sector has been developed, based on the use of ICT that integrates health data and better uses the resources of health facilities, taking into account the interests of all stakeholders, determining its requirements and capabilities, and supporting data authentication and security. As medical institutions are the hospitals (private and public), primary healthcare centers, clinics (internal and external), diagnostic centers (laboratories and radiology), pharmacies (internal and external), and ambulatory services, while the stakeholders are the ministry of public health (MoPH) and its related offices, the guarantors (NSSF, COOP, military systems, insurance companies, and other non-governmental organizations), the ministries and public authorities related to this solution, the healthcare managements, and professionals, providing the health services to patients. The key element of the model is a unique electronic medical record for each citizen, which contains information about the health data of a citizen including demographics, medical procedures history, allergies, medications, and previous interactions with healthcare institutes to provide solid background for any current or future treatment reducing errors and duplicated services.

d) A methodology has been created to assess the effectiveness of medical institutions in terms of using ICT in their processes and integrating health data with the national health care system, based on sociological tools (questionnaires and interviews) developed for different levels of professionals (IT managers, HR managers, quality managers, doctors, nurses, technicians, clinic managers,

pharmacists, patients and citizens). The methodology for assessing the effectiveness of the system and the effective participation of all parties can form the basis of the new accreditation concept, which, unlike the existing one, is supplemented by a new variable based on the percentage of use of the new model in the most important processes of the healthcare institution. It allows identifying the risks to the implementation of the innovative model of health care development and taking them into account.

e) Formulated practical and methodological recommendations for enhancing e-health coverage for all stakeholders, based on the innovative model of development of the Lebanese health sector and taking into account the facilitating and hindering external factors and internal risks in the health care delivery system, such as forgery, denial or delay of health service due to bureaucracy, political issues, weak coverage, immaturity of organizations, duplicity, distant services, resistance of change and others. Recommendations were to (1) implement the innovative model by adopting equal ICT in all related organizations, (2) allowing monitoring for this adoption by applying the new formula that integrates the ICT into the accreditation of hospitals, (3) statistical and scientific analysis about the readiness and willingness of the Lebanese sector to implement such solution, (4) increasing the chances for implementing customized customer care, (5) paving way in front of integrating artificial intelligence more into healthcare information systems.

Conclusion. The study showed that there is a chance to implement an innovative model for the development of the Lebanese health sector. This solution will be supported by Lebanese programmers and the participation of all parties with resources (financial, human and technological) and providing only the necessary resources. The implementation of the proposed idea will pave the way before future ideas of modernization. The research carried out can become a theoretical and practical basis for similar projects in other sectors of the economy.

The methodological and conceptual approach used the inclusive development and diffusion of innovation criteria among others to insure that such solution is accessible to all citizens fairly. The research will also formulate methodological and practical recommendations for enhancing e-health coverage for all related parties, and overriding the internal weaknesses and external risks and using the available resources for the best management processes, quality of life, and people access to health services. In addition to proposing monitoring mechanisms that will guarantee the good implementation of this national solution.

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