

**SHAPING AN INNOVATIVE MODEL FOR HEALTH  
SECTOR DEVELOPMENT IN LEBANON: METHODOLOGY  
AND RESEARCH FINDINGS**

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 study "Innovative Model for Health Development in Lebanon" included three chapters. The first chapter examined the conceptual framework for the innovative model of health development in Lebanon, as cleared in the study of the researcher on this regard [1], in particular presented the chronological and fundamental development of the concepts of human development and information society, then explored the relevance of ICT in the health sector using the methodology of diffusion of innovation to promote inclusive development, then defined the research methodology (methods, tools, limitations and sources of information). The second chapter of the study examined the prerequisites for the innovative development of the health sector in Lebanon based on information and communication technologies": assessing the dynamics of human development indicators, examining the criteria of the information society and their applicability in the Lebanese context. Then, the economic subsectors of health and ICT were analyzed to assess their readiness for a new innovative model of economic development, taking into account the challenges that such a solution may encounter. Those challenges were also studied in comparison with Belarus [1] as a country in the same group according to the human development index. The third chapter of the study focused on the restructuring of health care management using ICTs through the development and implementation of an integrated EHR. This step analyzed the steps and phases to be followed in building a new innovative model for health care development in Lebanon, including financial, time and technology factors, and presented the new model with participants, roles, operations, linkages and data exchange pathways. The readiness and

willingness of the participants to make this decision were then examined and analyzed. The study yielded findings and conclusions of practical and scientific significance.

*Relevance of the study.* Human development relies largely on ICT in order to raise the quality of life, education, and income. This is evident in developed countries who have become information societies by adopting ICT in their economic sectors. For a developing country to become an information society, it must develop its economic sectors to cross the digital divide border, one relevant important tool is ICT, and one very important sector as a starting point is the healthcare sector.

The availability of personal ICT among citizens (smart devices and internet connections), and sufficient working ICT in the Lebanese society as part of technology procurement, makes any solution that depends on this technology relevant if it is feasible enough, and will allow high productivity and improvement compared to the current status of an economic sector. The healthcare sector can benefit a lot from unifying its processes into a digital platform.

With correct diffusion of innovation to all relevant parties, using an innovative model to develop the economic sector allows for inclusive development and equal opportunities among citizens, and facilitates data exchange among economic entities related.

The high percentages of readiness, awareness and willingness among Lebanese people regarding an innovative solution to develop the healthcare sector processes show the relevancy of the topic especially regarding the increase of human development indicators, information society criteria, and economic progress.

*Research Goal and Objectives.* The aim of the study was to develop theoretical and methodological approaches to the formation of an innovative model of health sector development in Lebanon, based on the use of ICT that ensures the integration of health data and better use of financial, human and technological resources of health facilities, taking into account the interests of all stakeholders that determine the requirements for it and its capabilities. In accordance with the set goal, the following tasks were solved in the course of the study:

- to formulate a conceptual approach to formulate an innovative model for ICT-based development of the Lebanese health sector in the context of current theories and concepts of social development;

- to develop and test methodological approaches to assess the readiness of the Lebanese health sector to increase the use of ICT in the framework of the integration of health facilities to identify the factors that promote and hinder its development, achieving better results for the

economy and the welfare of citizens;

- to develop an innovative integrated model for the development of the Lebanese health sector based on the use of ICTs that takes into account the interests of all stakeholders that determine its requirements and its capabilities;

- to create a methodology for assessing the performance of health care institutions in terms of the use of ICT in their processes, as well as the integration of health data with the national health care system;

- to create and test a methodology to assess the effectiveness of medical institutions in terms of the use of ICT in their processes, as well as the integration of health data with the national health system to clarify the risks to the implementation of the innovative model that exist in the health care delivery system itself;

- to offer practical and methodological recommendations on expanding the coverage of the e-health system for all stakeholders, taking into account the external factors promoting and hindering its development and internal risks in the health care delivery system.

*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 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.

*Main results of the study.*

1. 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.

2. 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 (availability of technology) 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.

3. 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.

4. 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.

5. 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.

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.

#### REFERENCES

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