

**DEVELOPING THE LEBANESE HEALTH SECTOR
BY IMPLEMENTING THE ELECTRONIC HEALTH RECORD**

As the need for any developing country to become an information society, or at least interacting with it, is growing and proving itself right, these countries are entering this new digital world regardless of how aware, ready, equipped or knowledgeable they are. Lebanon is a developing country that has qualified personnel, especially in the health sector (doctors, nurses, technicians, and non-medical professions) that is also trying to find its place in this new world. The managements of this sector are bringing advanced technology to produce high quality medical services. Hospitals, clinics, laboratories, and other health facilities have the freedom to acquire the technology they want to work with, but this without paying attention into combining these technologies together to avoid overuse, duplication, misdistribution, and fraud. The availability of medical technology and the information and communication technology (ICT), can be benefitted from a lot more than the current situation, by simply integrating the efforts, technologies, and resources into one digital solution that can provide more productivity, transparency, and efficiency. This can be made by creating a unique electronic health record for each citizen, after taking the Lebanese peculiarities into account. These peculiarities can be concluded by assessing the readiness and awareness of concerned parties in the health sector, and then by presenting an applicable model that can be implemented to put Lebanon on the information society map, and digitizing one sector that will be followed by others to become an information society.

The Lebanese health sector has been a pioneer in providing excellent healthcare of the Lebanese and surrounding nations, as Lebanon was once called as “The hospital of the middle east”. Lebanon has the qualified human resources, and the healthcare institutes have always strived to acquire the latest technologies. Yet these initiatives are left to each facility to determine the need, use, and budget to acquire these technologies. Nowadays, information and communication technologies has conquered all domains and imposed itself as a mandatory route towards digital improvement, which is now considered the shortest way towards a productive economy in the whole information society.

The availability of qualified human resources, and the high quality of acquired medical technology, in addition to the increased availability of information technology and systems with the ability of remote access and control, all that can make a solid background to start thinking of integrating

these resources into a national productive platform. Given the fundamentals of a plan for the new solution, this can't be applied without assessing the preparedness, willingness, and awareness for such solution, taking into consideration special circumstances of the Lebanese case. So before designing, planning, or implementing any projects, a holistic assessment should be performed to start on solid basis, or to forget the whole idea.

A socioeconomic study based on statistical and analytical approaches will be made to assess the readiness of the Lebanese health sector for digitization and implementation of the electronic health records, in addition to integrating the healthcare processes of the public and private sectors into a central and unique databases supervised by the official authority which is the Lebanese ministry of public health (MoPH), with a primary foundation is to be secure to preserve the privacy of personal data, and at the same time to allow the proper disclosure of information that will allow to reduce the errors and frauds that happens because of lack of surveillance and duplication of health data.

The socioeconomic approach will divide the stakeholders of the health sector into functional levels while using different in accordance, and assessing their readiness regarding their ability to improve their role and functionality using an integrated electronic health record. The assessment should start from the top leadership, till the normal citizen, passing through all levels, taking all the Lebanese peculiarities into account, as it shows from the division of levels, and the difference depending on level, sample diversity, questioned details about willingness in case of available resources, and expected results.

The study will provide the extent of readiness of all stakeholders of the health sector in Lebanon, starting from the ministry of public health's using direct interview tool for data gathering, passing through guarantors such as insurance companies with indirect interviews using phone calls, the national social security fund and others, public and private healthcare institutes like hospitals, clinics, pharmacies, diagnostic centers, ambulatory services and others, doctors, nurses and health professionals, reaching the final and most important beneficiary: the patient. This third level of participants were surveyed using directed questionnaire tool, each group is surveyed with a specific questionnaire according to respective responsibilities.

The awareness of the all these groups of stakeholders is also important, so it is not only important that they are technologically ready, they should also be aware that such solution will bring benefits to their everyday lives and health related experiences. The concerns of exposing health private data should be a basis of all work. The positive and negative answers will be assessed and handled in a way that should make such solution transparent, vital, and professional to all.

Digitization is entering effectively the economic sectors in all societies. The level of implementation differs from one nation to another accord-

ing to its peculiarities. Some nations are moving faster towards crossing the digital divide into becoming digital economies, while others are hindered by many obstacles that are slowing them down from coping with the new era.

The weak linkage between the ministry of public health, public and private healthcare institutes, and the population makes it necessary to find newer and more progressed solutions to integrate the healthcare data in a way that provides unique, fast, secure, efficient and productive use of health records, which will reflect positively on the management of this sector at all levels: leadership, managements and beneficiaries.

After assessing the readiness of stakeholders of the Lebanese health sector, getting the necessary feedback on positive points and concerning issues, the socioeconomic study results are put into thorough investigation to come up with an applicable model that can be put into action smoothly, without resistance, obstacles, or delay.

One of the proposed solutions for digital improvement is the electronic health record (EHR), that has been implemented in many developed and developing countries. The peculiarities of the Lebanese situation can be obstructing of such solutions, especially with the lack of unique identifiers (national ID) for Lebanese citizens and many other related issues.

Some attempts for digitization are made now trying to benefit from the Covid-19 (vaccination and quarantine) and economic crisis (support of needy people, social studies and assistance, financial evaluation) as opportunities to increase the use of digitally integrated data, using many platforms, but this still needs a lot in order to become a whole integrated solution, that combines information to be more useful.

A multi-level model that takes the vertical functional levels into account regarding their responsibilities and areas of authority (ministries, guarantors, health facilities managers, employees, citizens), and horizontal management and working functions, of different job descriptions at the same level (nurses, maintenance, accountants, human resources, information technology...), with a preparatory model of requirements needed at each level in order to integrate all efforts, and synchronize the inputs into one system, that will generate secure, efficient and accurate outputs.

The stages of the model will pass into a preparatory stage by providing the necessary infrastructure, funding, legislations, human resources, information and communication technologies ICT and others. This work will be done by the coordination among different ministries and governmental directorates related. The second stage is to create a demo model that can be tested on a selected group of experts and institutes. Then the implementation stage will come to overcome all difficulties and obstacles faced in the testing period. After the implementation stage comes the surveillance, monitoring and im-

provement stage which will keep this solution up-to-date regarding maintenance, functioning, commitment of stakeholders, transparency and continuity.

This functional model takes the peculiarities of the Lebanese status in consideration especially regarding cost, the involvement of all stakeholders, the technical issues, and the human reactions.

After evaluating the opinions of stakeholders, and taking the peculiarities and available resources into account, the solution will be by creating a unified database hosted at the ministry of public health, which will be accessible by all health related parties, but each with pre-defined privileges, authorities, and access credentials. All health facilities will be connected using a dedicated portal as a front end that will make internet connection with the main server entering or requesting digital data related electronic health records.

After assessing the readiness of the Lebanese health sector for digitized solution and getting the necessary data, advices, concerns and feedback, a Lebanese model has been proposed that takes all related opinions into account, in addition to the technical issues that could affect the implementation of the solution. The lack of unique identifier for Lebanese citizens is a common problem that is hindering any digital solution. This can be overcome by using the national identity number as a unique identifier, and create a health identifier for those who don't have an ID. Another option is that ministries of health and interior can coordinate a unique identifier for each citizen that can be used in health, and in the future in all other domains. As for the resistance of change raised by some stakeholders, they are only based on previous attempts that failed to meet all requirements. If the authorities were serious enough, and the implementation is smooth enough, then all parties will be committed especially if no other options will be available. The unilateral attempts were successful (especially Covid-19 vaccination, quarantine, travelers' test results, traveler declaration and registration), so this solution can be implemented especially that it studies the Lebanese concerns and provides solutions for each obstacle addressed. On the other hand, the delay in implementing such solutions is separating citizens from health services more and more especially with the scarcity of hospital beds, the high cost of hospitalization these days, and the multiple health records that could lead to different histories, and eventually to treatment conflict, and medical errors, and worse health results. Such solution is only a step towards joining all the loose circles into one chain that will improve the connectivity, and decrease the size of expenditure. Given the current and forecasted social and economic situations, the implementation of such solution is just a matter of time, and time is not on our side so far.