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Prospects for the introduction of e-health in the Republic of Kazakhstan and its organizational and economic mechanisms

B.T. Smailov

doctoral student in the specialty "Economics"

b_smaylov@bk.ru

Ye.A. Buketov Karaganda University

Resume: The article is devoted to the issues of digitalization of the health care system in the Republic of Kazakhstan. The problems, key directions and prospects for the development of e-medicine are highlighted, including in the context of the main strategic and program documents for the development of the national healthcare system. Particular attention is paid to the consideration of the organizational and economic mechanisms of the functioning of e-health in Kazakhstan.

Key words: national healthcare system, e-healthcare, healthcare modernization, healthcare innovation.

E-health is a phenomenon that emerged around the world in the late 1990s and is associated with the use of information and communication technologies in the medical industry. This term is interpreted in different ways, as evidenced by a 2005 study that found 51 unique definitions, covering both “Internet medicine” and “practically everything related to computers and medicine” [1].

Today, e-health is an innovative system aimed at implementing a whole range of functions in the field of public health, implemented on the basis of a comprehensive electronic document circulation (with mandatory personalization of medical data), which provides prompt remote access to all patient information and its sharing by medical personnel on based on information and communication technologies.

According to the World Health Organization (WHO), global trends in e-health development are associated with the following aspects. First, in the near future, over 75% of patients in the world will use electronic services. Second, over 80% of patients confirm the enormous benefits of portable electronics and their potential for healthcare. Third, in 2015, 33 European Union countries (72%) reported using mobile communications to access electronic patient records, 32 countries (70%) to monitor patient status, and 24 countries (52%) use mobile apps. as a decision support tool [2]. At the same time, the main directions of development of e-health in the world are:

- personalized medicine;
- diagnostics via computer and mobile applications;
- robotic surgery.

The introduction of e-health, "SMART-medicine", remote prevention and treatment is especially in demand in countries with a large territory, in particular in Kazakhstan.

The development of e-health in the Republic of Kazakhstan as part of the modernization of the existing model is aimed at strengthening its focus on the needs of the patient, improving the quality and availability of medical services, as well as improving public health management.

As follows from the "Concept for the development of e-health in the Republic of Kazakhstan for 2013-2020," the implementation of e-health in our country "should provide the possibility of automated receipt of timely, relevant, reliable, and sufficient information that provides a safe, fair, high-quality and sustainable health care system focused on the needs of the patient" [3].

At the same time, all medical organizations and departments of the Ministry of Health of the Republic of Kazakhstan (MH RK) will have high-speed and secure access to e-health systems based on paperless technology. The national health repository will include electronic health passports, as a central component integrating information from various information systems of medical organizations, as well as a repository of high quality statistical, analytical and financial data.

Until recently, the weaknesses of the digitalization of the healthcare system in Kazakhstan were the following:

- non-systemic approach, according to the principle of "stimulus-response" without a single development strategy;
- outdated, not based on standards, architecture of the Unified Health Information System (UHIS), lack of a unified approach to its construction;
- the emergence of web applications in addition to the Unified Health Information System (UHIS) led to a violation of the principle of a unified database, a unified data dictionary, and led to an explosive growth in the need to ensure interoperability between systems;
- lack of uniform regulations and standards for e-health;
- Lack of qualified IT specialists, project managers, insufficient training and staff turnover;
- insufficient number of players in the ICT market for e-health services (monopolization of systems development);
- ineffective distribution of efforts and responsibility for the implementation and maintenance of systems (centralization).

The current situation is the result of a number of factors that determined the approaches and methods of implementing the UHMIS in which the end users of information systems were not involved in the decision-making process. First of all, this is a concentration of efforts on collecting analytical information for making management and financial decisions, at the expense of functionality and information that allows medical personnel to provide safe, high-quality, timely and affordable medical services. In addition, the lack of a regulatory framework to abolish the maintenance of paper medical records for medical organizations operating MSS has led to the fact that medical personnel are forced to actually double work with documentation, both in paper and electronic formats, to the detriment of the time spent with the patient.

In 2013, the State Program "Informational Kazakhstan - 2020" was adopted, which introduced the term "e-health" (e-health) and identified ways for further development of health informatization [4]. The Republic of Kazakhstan has set itself the target of 100% achievement of the following indicators in the field of e-health by 2020:

- the share of healthcare organizations connected to the unified healthcare network;
- the proportion of the population provided with "electronic health records";
- integration of information systems of healthcare organizations with a single integration platform;
- the level of computer literacy of medical workers;
- the number of computers for medical workers [4].

Thus, taking into account the provisions of the State Program "Informational Kazakhstan - 2020", there is a need to rethink the conceptual vision of the further development of e-health in the Republic of Kazakhstan.

Based on the analysis of the priority needs of the health care system, given taking into account the directions of the State Program "Deesauilyk" [5] and the key priorities of the State Program for the Development of Health Care for 2020-2025 [6], it is possible to formulate the following main tasks of e-health in the Republic of Kazakhstan:

- facilitating the process of making clinical (medical) decisions;
- reduction in the number of medical errors;
- increasing the availability and improving the continuity of medical care;
- improving the quality of medical services;
- improving the quality and efficiency of political, managerial and financial decisions;

- providing conditions for continuous professional development in the healthcare sector;
- increasing public access to information about their health and to the management of issues of their confidentiality;

- increasing the profitability and efficiency of investments and operating costs in healthcare.

Among the current projects implemented in our country in the field of e-health:

1) Electronic personal account of the patient and the personal account of the doctor. Patient's personal account - provides patients with access to their own health data and management of access to them for medical personnel, support of preventive functions of primary care, provision of self-monitoring of health status and notification of the need for health-related activities [7]. The advantages of the patient's personal account: constant access to information about the state of his health; obtaining the necessary information about health services (types of services, addresses, ratings of doctors, etc.); receiving healthcare services through mobile technology; assessment of the quality of healthcare services (feedback). Doctor's personal office - provides a doctor's prompt access to the EPZ and EMZ of his patients, a single point of entry for a doctor in the IS "Hospital", "Polyclinic", "Ambulance" [7]. Advantages of a personal doctor's office: a complete picture of the patient's health; patient feedback; access to the workplace from any device, regardless of location.

2) Integrated medical information systems (CMIS) for outpatient clinics, hospitals and mixed-type organizations. Project objectives: automation and unification of business processes of medical organizations of different levels and profiles; development and implementation of uniform mechanisms (formats) of interaction between KIIS and the Platform for Integration and Interoperability and subsequent replication.

3) Building a computing infrastructure with a high level of fault tolerance, security of storage, processing and transmission of data. Project objectives: building a failover cluster of data storage systems; delivery, installation and configuration of data virtualization system, backup system, information security systems.

4) Telemedicine and mobile health: online services through the patient's personal account; wearable medical devices for certain categories of patients with the subsequent transfer of information to the Electronic Health Passport

The Ministry of Health of the Republic of Kazakhstan should implement a policy of decentralization and independence in the case of financing e-health, while leaving some functions centralized.

Medical organizations (IOs) must begin to take responsibility for a certain portion of e-health activities. For example, the state cannot fund user support at automation facilities. It is necessary to change the prevailing perception of the Ministry of Defense that automation is needed by the state, and not by them. This is a prerequisite for sustainable development throughout the country.

It is necessary to consider the possibility of allocating as part of the tariffs of medical organizations (HRC, per capita tariff, etc.) a share of funds intended for the implementation of e-health objectives.

The existing funding structure, which is completely closed at the national level, suffers from one limitation - medical organizations feel compelled to implement information systems. Insufficient quality of information systems is perceived as even more critical against the background of coercion, and thus the effect of rejection of the implemented information systems increases. It is necessary to find mechanisms to increase the feeling of ownership and responsibility for the results of e-health among medical organizations.

Considering the measures for the development of e-health in the context of 3 levels, the following main actors can be identified:

- at the national level: the Ministry of Health of the Republic of Kazakhstan, other bodies involved in the management and implementation of e-health;
- at the regional level: akims of cities and regions, health departments;
- at the local level: medical organizations.

For each e-health component and / or activity, this document should identify 3 main roles (responsibilities) for the indicated stakeholders:

- financing and quality monitoring;
- implementation (execution, including the conclusion of contracts);
- implementation and support.

Financing and quality control policy should remain with the state. The Ministry of Health of the Republic of Kazakhstan should develop regulations and legislative acts that determine the financing models, as well as those responsible who will monitor the quality of the results. This regulation will provide quality criteria, rules for monitoring and assessing quality, quality management measures.

The Ministry of Health of the Republic of Kazakhstan should reserve the right to invest in such important components and activities of e-health that define national standards, interoperability, safety, protection of patients' rights, and other elements common to the whole country. The general rule should be the following: at the national level, only those components that are necessary for the operation of all systems (for example: standards, FTE system), as well as those that are necessary for the MoH itself, should be funded and developed, and the rest will be transferred to the regions and to the MoD.

It is also important to introduce an incentive mechanism using bonuses for those enterprises that successfully implement e-health. This is necessary to overcome the inertia of the IO in the implementation of systems. For this, criteria should be developed according to which a decision on incentives will be made. The incentive mechanism is quite well developed in the Ministry of Health of the Republic of Kazakhstan for the process of providing medical services. This mechanism needs to be tested for e-health processes as well. Meaningful use experience in the United States should be used as a guide to developing incentive criteria. For incentives, it is necessary to provide a pool of funds.

The concept of "Modernization 3.0 in Health Care" includes five initiatives that were proposed by the Ministry of Health in the framework of the Message and supported by the Government. Each of the five healthcare modernization initiatives involves digitalization:

Initiative 1: Integration of the healthcare system around the interests of the patient - Value-Based Healthcare System (eliminating the fragmentation of the provision of medical services between different providers, increasing the continuity).

Initiative 2: Standards harmonized with the OECD.

Initiative 3: Rational use of resources - infrastructure optimization and HR development.

Initiative 4: Flexible Financing System - Developing a performance-based financing approach, measuring results & real costs.

Initiative 5: Transparent and publicly accountable governance of the system When implementing each modernization initiative, a project management approach with horizontal and vertical interaction between local executive bodies (Health Administration), the central authorized body (Ministry of Health) and sectoral subordinate organizations (Republican Center for Health Development and the Republican Center for Electronic Health), medical organizations and the medical community, the nongovernmental sector and professional medical associations [8].

As international experience shows, information systems in healthcare are gradually becoming not just a passive tool for providing accumulated data, but also a mechanism for preventing medical errors and a platform for teaching and disseminating new clinical knowledge, best practices and experience.

The introduction of e-health will bring the quality of medical care to the population to a new level. E-health technologies will allow remote monitoring of the population, better disseminate information among patients, and improve access to health care, especially in remote areas.

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