ELECTRONIC HEALTH AS A COMPONENT OF G2C SERVICES

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Abstract

This paper explores electronic health (eHealth) as a segment of electronic government. International practice in electronic health field and electronic health strategies adopted in Europe are analysed. Current practices in delivery of electronic health services in G2C are investigated and perspectives are explained. Future studies of best practices in this field will facilitate the expansion of citizen-centric e-services.

Keywords: electronic health; electronic government; G2C; electronic services; medical information; electronic health records.

Introduction

Implementation of information and communication technologies (ICT) is observed in various fields of human activity, including public administration, education, health etc. The development of ICT and web-technologies has substantially altered the organisation, and delivery of government services.[1] Currently, the establishment and use of new government services is mostly dependent on the development of electronic government (eGovernment) within the framework of national and international programmes, as well as the demand of citizens for online use of electronic services.

Building eGovernment in developed countries is based on electronic interactions of three types, government to government (G2G), government to business (G2B) and (government to citizen (G2C).[2,3] G2C is the expression of mutual relationships between citizens and government, and includes several electronic services (e-services) such as tax submissions and returns, registration and issuing of birth certificates, voter registration and voting, conduct of referendums, provision of medical information etc. Electronic health (eHealth) services delivered to citizens are among services that are approached with special sensitivity. Currently, citizens' expectations regarding e-services delivered in healthcare sphere, such as the use of effective health practices for improvement of quality of health services, new treatment methods, delivery of long-term medical support, and medical insurance are expanding.

In 2000's eHealth was used as a general term for explaining the use of electronic tools and electronic data related to information technologies in healthcare sector.[4] It has been reckoned, in a broad sense, that the use of eHealth will facilitate the solution of several problems encountered by healthcare systems, such as improving efficiency of health services, and effective organisation of management systems.

Electronic health – is the use of ICT for health such as delivery of information, resources and services related to health protection. Aspects of eHealth include electronic health record, mobile health, telehealth, telemedicine, electronic education, social networks where health issues are discussed, analysis of medical data and big data.[1,4,5]

This paper considers eHealth as one of segments of eGovernment and existing practice in the delivery of eHealth services in G2C is explored.

Electronic Health System

At present, there is no single method for establishing an eHealth system. Model selection depends, in the first instance, on the financing mechanism and the state of healthcare administration in the country. The reforms conducted in healthcare systems show that the role of commercially interested enterprises and insurance companies has recently been increasing.[6]

The socio-economic and financial impact and consequences of forming an eHealth system have been explored in Europe and USA. The analysis of prospective spending and expected benefits of an eHealth system indicates that the socio-economic benefit for society outweighs the spending in each separate case. The mutual link between eHealth data and other clinical-medical systems is considered as a main advantage capable of bringing benefits.[1]

Several studies indicate that eHealth not only provides more advanced health services with lower

costs, but also creates broad opportunities which stimulate economic growth.[1,7] The application of ICT in the healthcare sector facilitates better quality and delivery of health services, reduces drug related errors, improves patient satisfaction, and provides innovative models for the delivery of healthcare.[7]

The uptake of ICT in medicine has been slower than in other sectors.[1,7] This is usually attributed to the fact that the administration of health services is a complex process, with many stakeholders, including central and local governance entities, doctors and other experts in the field of medicine. Medical information exchanged between parties needs to be accurate and secure and delivery of high quality health services for the citizens, within and beyond the country's borders also requires maintenance of both semantic and technical compliance of different systems at local, national and international level.[1,7] eHealth requires appropriate organisational, administrative and technical measures, including standards, to be in place at local, regional, national and international levels.

While investigating international practice in the eHealth sector it can be seen that one of the goals is the assessment of the degree of implementation of advanced technologies for delivery of eHealth services to citizens. This is in accord with European Union strategy and indicators.

Electronic health strategies of European countries.

In 2000, European Union (EU) member countries adopted the "eEurope 2002" initiative, one of the primary goals of which was to stimulate the use of Internet as well as to propose the notions of "online government" and "online medicine".[8] In other words, the provision of electronic access to government services and the facilitation of transparent, open and available of medical health information by employing new technologies.

The "Electronic Europe 2005" Activity Plan, specified strategic goals and activities based on initiatives in eGovernment and eHealth sectors.[9] It aimed to satisfy and meet the needs of citizens by providing access to online government services and content, using multiple platforms. This required broadband Internet access, mutual relations between national systems at the EU level, the maintenance of secure information structures and the delivery of Pan-European e-government services to citizens. In 2004, the Commission approved the first action plan on eHealth: with eHealth was described as the application of ICT to all functional fields affecting the health sector.[10] In general, ICT-based tools and services would facilitate the improvement of preventive measures, diagnostics, treatment, monitoring and administration.

In the last 10 years, several plans, strategies, and directives have been adopted and carried out by European Commission to improve the eHealth sector.[8-12] The "eHealth Action Plan 2012-2020" adopted in 2012 is directed towards compliance with the goals of the "Europe 2020" programme through the elimination of obstacles.[12] One of the main goals of the Action Plan is the creation of route map of eHealth based on adopted framework programmes, and the maintenance of four-stage relations (legal, organisational, semantic and technical) according to a mutual exchange programme.[12]

The application and improvement of ICT in eHealth sector is carried out by the *DG INFSO* competence group (*ICT for Health Unit of DG INFSO*) at the level of the European Commission.[13] This group supports the rich database which stores the information on all issues of EU level policy and scientific research.

Currently, eHealth development in European States can be divided into several stages: member states shape the strategy for the eHealth sector; standards have been developed for Electronic Health Records; moreover, large volumes of Patient Summaries are already being stored in four countries; an ePrescription service is being applied in three countries and other countries are at the stage of realising this; cross border telemedicine is being implemented at a regional level in Northern European countries; and legal issues are being prepared in some countries. Large-scale Pan-European pilot projects have been developed based on Electronic Health Records standard.[1,13]

In general, it can be noted that European Commission plans to facilitate the establishment of effective and operative state services in member countries, especially, the expansion of health systems by developing this strategy with ICT implementation.

Electronic health services in G2C

G2C (government to citizens) reflects the mutual relations between citizens and government and mainly covers e-taxes, e-employment, e-voting, and eHealth.[1-3] The services most required by citizens in everyday life in the G2C sector include, information, education, e-employment, and eHealth. eHealth is considered as an important sector which is being developed at the crossroads of medical informatics, medicine and business sectors. It encourages the formation of new information relations between patients and medical

experts and increases efficiency and raises quality. At the same time, eHealth services are associated with medical experts or medical staff as G2C services.

eHealth provides a mutual link between citizens, patients and medical facilities for information transfer. Citizens or potential patients search for satisfactory and reliable eHealth services proposed by medical experts via appropriate web-pages. Concerns have been raised about finding appropriate medical experts, the accuracy of diagnosis and proposed treatment.[3]

In practice, the following can be considered as eHealth applications:[1,3,13]electronic health records; electronic health cards; e-prescription services; medical information networks; telemedicine services; portable systems; portals specialised in health. In addition there are ICT tools for disease prevention, diagnostics, health monitoring and the management of quality of life.[12]

The implementation of special cards is being implemented for the purpose of delivery of e-services in the G2C sector in several countries and across borders.[3,14,15]

In several EU countries eHealth records are considered as a main element of eHealth. Structured electronic medical documents are collected in these records based on the information transferred from distributed data bases. The European epSOS system completed in 2014 is indicated as one of the popular projects of information transfer on patient and e-prescriptions.[13,14]

At present, a unified information system is being implemented in the health sector in USA and European countries. Within the framework of e-government, the establishment of a unified information system segment is being considered. Experts estimate the investment required in the eHealth sector will be US$21.6 – 43.2 million in the next 10 years. Electronic health records, national information structure in health sector, regional health information organisations (RHIOs), electronic exchange of medical data are attributed as main priorities of currently conducted works.[14]

The “Vitale 2” card was implemented in France in 2007. These cards are prepared in compliance with the IAS (Identification, Authentication and Signature) standard. The card stores important information and is used as a unique tool to access health services.[15]

Sweden carried out a pilot project related to the large-scale implementation of eHealth records.[16] Patient information, including past medical history, pathologies, chronic diseases, allergies, test results, medication etc. is stored in the card. A special organisation was created to manage the within the framework of national eHealth strategies. This organisation is directly responsible for the issue of electronic prescriptions. The cost of implementation of information technologies in health sector in Sweden constitutes 2-3% of healthcare spending, and is rapidly increasing.[14]

Electronic records have been implemented in Germany.[14] Creating an appropriate infrastructure in healthcare system facilitated use of patient’s electronic records, the implementation of these cards, and issuing electronic prescriptions. The card can be used for both administrative and medical purposes. Administrative uses address issues such as insurance, benefit entitlement and the issue of electronic prescription. Use of the card for medical services is provided by mutual consent, allowing access to information in electronic medical records such as, chronical diseases, allergic reactions etc.[14,16]

The healthcare system of Estonia is considered to be one of the most developed in Europe.[14] The government of Estonia has created a central database of healthcare in which data about each inhabitant of the country is collected using various mobile software programs. The disease history of every person, from birth to death, is recorded and people can access their own data using their Citizens’ ID card which enables confidential access to all their medical information, via a patient portal www.eesti.ee.

The usefulness of and benefits of eHealth requires appropriate and ongoing monitoring of a number of clinical-medical, economic and administrative indicators. These range from the efficiency of services for citizens and government, the adequacy of treatment provided, and the reduction in management and spending costs, Timely, accurate, complete and clear information is needed for the analysis of costs and effectiveness, assessment of existing strategy, and conduction of national and international comparisons.

Access to such information facilitates identification of best practices, assessment of quantitative and qualitative indicators of eHealth, control of the efficiency of budget resources, determination of successful medical facilities and the improvement of indicators characterising people’s health. Moreover, the information present in citizen-oriented systems must be accessible for medical facilities as well as patients, so that both parties can use it in accordance with their

needs and requirements.

Advantages and problems of eHealth

eHealth has significant impacts on the lives of citizens, the working conditions of health personnel (doctors, and administrative staff) and the activities of health offices and the whole eGovernment system. In general eHealth covers several perspectives: technological, research, economic, political, international cooperation and stakeholders.

Some advantages of eHealth technologies are the following:

- Electronic health records of the patients may be archived which in turn may be beneficial to the medical practitioners in treatment of diseases
- With the advent of innovation and new technologies, multimedia files and data in form of pictures, videos, and text can be relayed in real time on various types of computing devices, including smartphones
- eHealth services may play an important role in addressing the shortage of doctors and overcoming disparities in the doctor patient ratios in underserved areas around the world
- Real time video-conference can be used to conduct training sessions, treatment of diseases, collaborations, and so on
- Internet resources can be used by large number of people to study and to get knowledge about health related issues at their own convenience
- Possibility using satellite based medical diagnosis and care to elderly in their homes and other.

The Main problems of implementation of eHealth are the following:

- Lack of national eHealth strategies especially in developing countries
- Uncoordinated efforts between government, public administration and medical facilities
- Lack of eHealth services in realising the strategy of e-government, as well as in G2C segment
- Inadequate financing and ineffective organising
- Lack of legal framework
- Issues around confidentiality, privacy, data security, protection of personal information Lack of universal software platforms in health system in different medical facilities.

Conclusion

Currently, there is no uniform practice does not exist regarding the establishment of eHealth systems. Even in developed countries several models are being proposed for creation of government eHealth system. One of the biggest problems for eHealth is the matter of administration of medical facilities and management and integration of daily data for supporting the administrative decisions. The investigation of international practice and the implementation of best practices can help to eliminate such problems.

In this paper, eHealth is considered as a segment of eGovernment, and international practice and adopted eHealth strategies are analysed. The perspectives of delivery of eHealth services in G2C are explained. The study of best practices in this field in future research works will facilitate the expansion of citizen-centric e-services.

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