Implementation of the eHealth Project in Latvia: Project audit perspective

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Implementation of the eHealth Project in Latvia:

Project audit perspective

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Abstract

In order to improve effectiveness of provision of healthcare service, the project implemented by the Ministry of Health- "E-health in Latvia" is a step towards the right direction. It will provide the possibility for patients to ensure a greater control over their health issues, by maintaining healthy habits, lifestyle, increase substantiation of adoption of decisions and speed of service in the healthcare industry, ensuring quality and accessible information; patients will receive more quality services and in a shorter period of time for issuance of prescription drugs.

Nevertheless, the policy prepared by the Ministry of Health in the area of e-Health will not be implemented in the planned scope and the planned term; therefore the target-to improve the effectiveness of the provision of healthcare services will only be partially achieved.

The project „e-Health in Latvia" is necessary and important for the society, but already from the very beginning there have been substantial deficiencies (errors) - the professionals of industry are not involved in the project, multiple changes of institutions implementing the project, ineffective project management and finally, there has not been sufficient supervision of the project.

This Paper analyzes the implementation of the e-Health Project in Latvia from the audit perspective, showing th results from the performance-compliance audit carried out by the supreme audit institution – State Audit Office of the Republic of Latvia.

Introduction

Consider as an example a country where the Information and communication technology (ICT) environment and enabling environment for eHealth are both in their early stages. Within this national context, eHealth is project-based, featuring a few small initiatives that are seldom connected to each other. Projects tend to be time-limited, proof-of-concept pilots, where ICT is introduced (or imported) to demonstrate a technology in a limited context. The ICT applications used may themselves be innovative, but the projects are rarely sustainable. They fail because of a lack of

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infrastructure and skills, a narrow focus on one particular aspect of eHealth that disregards other concerns and impacts, and a lack of ownership by the health entities involved. The use of ICT in the general population in this country is limited to not much more than mobile phones. The commercial ICT market is fragmented, with little local expertise available. The government has no role in funding and technical support for eHealth. This comes instead from aid agencies, donors, nongovernmental organizations (NGOs) and consultants. In this constrained environment, the country cannot consistently meet its international obligations for public health reporting.

Countries can focus on a range of structured activities that lead to the progressive development of a national eHealth strategy. These include:

- involving the key health and non-health stakeholders in creating a national eHealth vision and plan and its subsequent implementation.

- establishing governance mechanisms to provide improved visibility, coordination and control of eHealth activities that occur across the country's health sector.

- establishing the strategic context for eHealth to provide the foundation for the eHealth vision and plan, and to enable the government to make informed decisions on whether to pursue opportunities that present themselves from the ICT industry and other stakeholders.

- forming an understanding of the current eHealth environment in terms of the programmes, projects and eHealth components that already exist.

e-Health policy and project background

The Ministry of Health prepared the planning documents for the development of the e-health on a timely basis, as the use of information and communication technologies rapidly penetrated the health care industry. However, healthcare industry professionals were not involved in the development of planning documents, no feasibility studies, research and analysis of the health care were performed.

The planning documents prepared - Guidelines „E-health in Latvia" and the implementation plan for years 2008 – 2010 - do not reflect the actual current situation; not all of the activities planned in the guidelines are being developed; the financing does not comply with the planned scope or the time frames; and priorities for implementation of the e-health have changed.

Since the Ministry of Health has not updated the implementation plan or the guidelines, the project owner - National Health Service - is implementing the project activities in 2015 according to the implementation guidelines for years 2008 – 2010 prepared in 2007.

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Although the Ministry of Health started implementation of the e-health policy at the same time with several other European countries, including Estonia, the excessively slow pace of implementation of the e-health policy has led to Latvia significantly lagging behind Estonia and in 2013 it was at the last but one position among the European countries. The following factors can be listed as reasons for so low position:

▪ By the year 2015, 45% of the activities planned in the guidelines of e-health have not been started;

▪ deadlines of the project have for several times been significantly prolonged - from the initial implementation deadlines of the project in 2010 to the 1 December 2015 (for the e-prescriptions information system) and even longer;

▪ By the 1 April 2015 none of the planned 26 e-services were available to the users, not even in the test environment outside of the National Health Service, and risk persists that as of January 1, 2016 not all 31 e-services will be available to users.

Although the completion deadline of the project „E-health in Latvia" is approaching, the activities performed by the Ministry of Health in popularization of the project, information, identification of users have been insufficient because:

▪ Up to 17% of health care professionals have no access to an internet connected computer at their workplaces;

▪ computer and internet literacy of up to 41% of health care professionals are average or weak;

▪ only 11% of health care professionals and pharmacists are duly informed about the project;

▪ health e-services offered in the portal www.Latvia.lv within framework of the pilot project were used only by 9% of population (e-services were available for the time period from 13 August 2010 to 1 October 2013);

▪ 47% of the population is generally informed on the project "E-health" and planned e-services, while on average only 11% of the population were also informed on planned benefits.

> **During the course of the project there is established a lack of coordinated planned activities, ineffective management and control, thereby financial resources of the project amounting to more than 760 thousands of euros have been spent inefficiently and in an counterproductive manner.**

Since the Ministry of Health has not updated the implementation plan for years 2008 – 2010, some of the actual costs of implementation of the e-health activities considerably differ from the planned costs. Namely, for some items costs are lower by 81%, while others are 127% higher than planned.

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Total actual costs of activities managed by the National Health Service exceed the planned costs by 154,364 *euro* and are showing a growth trend of actual costs when approaching the closing of the project.

Improper drafting of procurement documentation or development of non-quality e-health solutions, as well as the slow implementation of e-health after perfecting the initially developed e-health solutions, indicate a risk that financial resources amounting to at least 483 406 euros have been spent unpurposefully.

For the period of implementation of the guidelines, financial means amounting to 196,292 euro have been inexpediently used, covering costs of development of concepts and technical specifications for the activities which were not continued.

> **A risk persists that the aims of the e-health projects cofinanced by the European Regional Development Fund will not be achieved, thereby the funds used amounting to 11 352 647 euros may be found as improperly spent.**

Upon implementation of e-health projects co-financed by the European Regional Development Fund, the requirements of the European Community regulations have not been complied with. Nevertheless all projects of the stage I ended in December 2014. Final inspections of the conclusion of project are suspended for multiple times and, taking into account that a successful implementation of project of II stage is closely tied to results achieved at stage I, the risk persists that during the closing inspections of projects it will be found that the aims of the projects have not been achieved.

> **It was established during the audit that the e-health information system as of April 1, 2015 was not ready from the point of view of information data safety and personald data protection, as well as risk persists that on January 1, 2016 it will be not ready for use, at the moment where it will be mandatory to all healthcare providers to use it**

Although the data safety within the e-health context was initially identified as having a critical meaning, the National Health Service has remained for a long time just at the initial stage of implementation of the safety management of the e-health information system. So far all of the internal legal acts required for safety management of the information systems, including risk management, business contingency testing and standardized users management have not been developed.

National Health Service has not started registration or processing of personal data of the physical persons in the e-health information system – it will be possible only after development of all of the internal legal acts, and there also is a risk that during the

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registration and pre-registration testing any previously unidentified faults might be discovered, elimination of which will require additional time.

Safety audits of the e-health information system have been undertaken only in the test environment with the system not being fully functioning and without involvement of the safety manager of the information systems. Also the National Health Service has not summarized nor assessed at the top level the results of external safety audits and the faults identified, nor provided the managers of the institutions with recommendations for their elimination with a detailed action plan, deadlines and persons in charge.

In the e-Health information system all patients medical records are freely accessible for all medical professionals without any consideration of their actual daily work requirements, Such wide access to so much information is contradictory to the recommendations given by European advisory institutions, and thus it will initially lead to unsubstantiated cases of data processing, damaging public trust in the system.

Also, data processing restrictions by the patients are available only to the restricted amount – a choice must be made between entrusting the medical records to all health care specialists or not to trust these to anybody.

National Health Service currently is unable to independently identify large volumes of all cases of unjustified processing of personal data of physical person and duly act because:

- the audit trail records creation and disclosure functionality are not fully functioning;

- No clear control mechanisms and clear criteria have been introduced for determining whether an audit trail record shall be automatically identified as an unauthorized processing of personal data, no lists of risky data processing cases are formed, and no detailed analysis are performed.

Although the National Health Service as a manager and holder of the e-health system shall be responsible for quality of the data actions of the persons performing personal data processing, the Service is planning to delegate a range of areas of responsibility to the health care institutions themselves, thus avoiding responsibility for several critical issues, e.g. assigning, control and cancellation of users rights to the employees of the health care institutions, on accuracy and justification of the patients records stored in the e-health system. Thus the users will have no technological obstacles for accessing all health records of the patients, and moreover – one medical practitioner can delete information entered by another one.

> **The supervision and control of the implementation of the e-health ensured by the Ministry of Health has not been sufficiently effective**

Ministry of Health has not prepared all informative reports required by the legal act of the Cabinet of Ministers on the implementation progress of the e-health policy, and also

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the inefficient supervision has resulted in too slow implementation of the project, not all of the problems identified have been resolved and the inefficient use of the funding assigned has been permitted.

Comparison of implementation of e-health in Latvia to experience of other European countries

E-health has a huge potential for ensuring efficient, quality healthcare therefore the costs of governments in the area of e-health are just ever increasing. The studies[1] refer to financial, legal, social and ethical implementation obstacles, including low awareness level of users concerning e-health benefits, the system in general, as well as insufficient evidence on the cost efficiency and mutual replace ability, as well as increased requirements for patient safety.
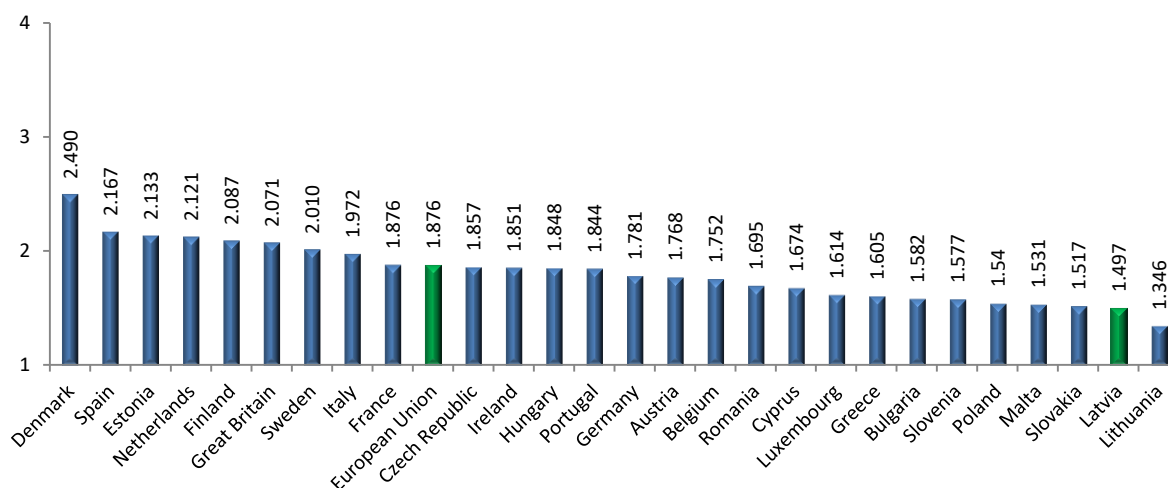
Data has been compared by the four equal measuring volumes – electronic health card, health information exchange, tele-supervision, personal health records by expressing these in the indices according to the Factors analysis method.

Figure 1. **Implementation of the e-health system in the practices of family practitioners in the EU[2]**

E-health accessibility was assessed within the interval from 1 to 4, where index 4 means that all the potential of e-health has been used. Nevertheless as we see in Figure 1, in European countries the accessibility index is fluctuating between the numbers 1.3 to 2.4, indicating that the system is accessible, however used just to the restricted level.

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[1] Survey of the health care services „Exploring the challenges of implementing e-health: a protocol for an update of a systematic review of reviews", Available at http://bmjopen.bmj.com/content/5/4/e006773.full, viewed on 27.04.2015.
[2] Study of the European Commission „Benchmarking Deployment of eHealth among General Practitioners (2013)".

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If looking at the Baltic countries, Estonia is leading (index 2.133). Estonia stands out by its position in comparison to other countries with similar institutional features. It is well known that the state has in past years made considerable investment to development of not only the e-health, but also IT programmes.

In 2008 in Estonia (development of projects in 2006 – 2008) four various e-health projects have been implemented – electronic health card, electronic booking, electronic imaging and electronic registration, as well as e-prescription introduced in 2010.

Latvia (index 1,497) and Lithuania (index 1,346) which is just introducing the e-health system is left in the last place.

Authors of the study learned from the leader of the e-health introduction – Denmark - the following aspects:

▪ the long-term objectives shall be defined at the beginning of the project, however they shall be updated on a regular basis considering the needs of users and technology developments;

▪ strategy is required to ensure smart use of all resources and careful planning in order to decrease delay and failure risks on larger scale projects;

▪ National IT strategy shall be developed with more stringent guidelines and policies in order to decrease the number of mutually contradictory systems used in the health care sector.
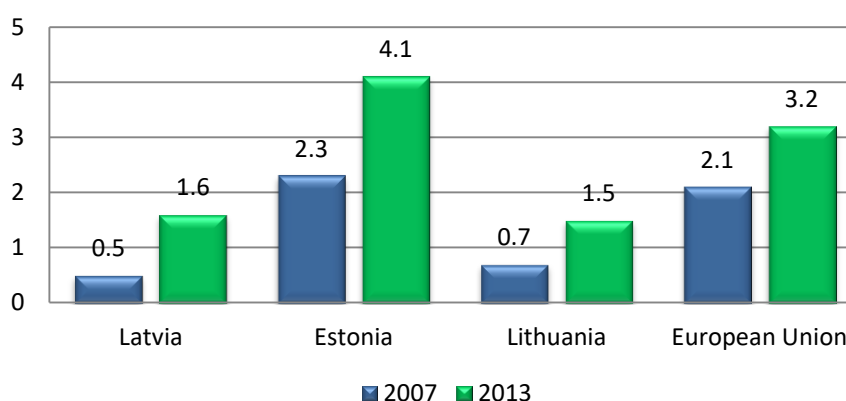
(Indexes, where 0 – 0%, 1-20%, 2-40%, 3-60%, 4-80%, 5-100%)[3]

Figure 2. **Use of the e-health in practices of family practitioners in 2007-2013**

As indicated in the Figure 2 the Baltic countries are experiencing increased use of e-health in the practices of family practitioners over the period from 2007 to 2013. Largest growth is seen in Estonia – by 1.8 points, followed by Latvia with a growth of 1.1 points and Lithuania with 0.8 points. It should be pointed out that Estonian growth exceeds the EU average growth.

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[3] Study of the European Commission „Benchmarking Deployment of eHealth among General Practitioners (2013)".

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Meanwhile, upon evaluating the total output costs of solutions in various Baltic countries, it can be concluded that they are drastically different. For instance, in Estonia, total costs for the I stage were fluctuating between 2.3 mln. euros; meanwhile in Lithuania, forecasted costs were more than 20 mln. euros.

An approximate conceptual comparison of costs of e-health solutions in Baltic States can be found in Table 1. The table encompasses solely those solutions that are comparable, grounding upon joint targets of use of solutions and similar functionality (i.e. in every country the architecture of solutions actually differs, but they are comparable, since the actual targets of their use are equal).

Table 1

Comparison of costs of e-health solutions in Baltic countries

Country Solution	Latvia (approximate costs, ir EUR) [4]	Estonia (approximate costs, in EUR)	Lithuania (approximate costs in EUR)
E-prescription	320 000	230 000	1 700 000
Electronic health card	1 950 000	1 600 000	2 800 000

In Latvia the costs of implementation of e-health solutions of stage I in comparison to neighboring countries (please refer to Table 1), are not substantially higher. Nevertheless it should be taken into account various solution architectures, applied principles, development technologies, time for implementation of projects, etc. and other cost-impacting aspects.

e-Health development in Latvia

Intention and plan to implement e-health in Latvia initiated in mid-2003 can be said to be the starting point of the e-health project in Latvia. Considering that use of information and communication technologies in health care industry were steadily expanding, the Ministry of Health decided to develop the Information Technologies Council and later in November, 2003 created also a task group with main objective of developing a policy document - guidelines „E-health in Latvia".

The task group of the Ministry of Health prepared a policy document - guidelines „E-health in Latvia", which on 17 August, 2005 was adopted by the Cabinet of Ministers[5].

E-health is a programme for improvement of quality and efficiency of health care by use of information and communication technology tools.

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[4] In order it could be possible to perform comparing with solutions of neighbouring countries, the costs of e-prescription were added also provisional costs of users interface.
[5] The Order of the Cabinet of Ministers of 17 August 2005 No. 560 "On the Guidelines "E-health in Latvia""

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The meaning of e-health in a wider sense is defined as a health care model directed to the patient – an ecosystem (see Figure 3), where the involved parties – health care professionals (medical practitioners, pharmacists), patients, health care administration institutions – are interacting by using opportunities provided by the information technologies in order to organize and provide treatment processes along with the most efficient administration of the health care system.
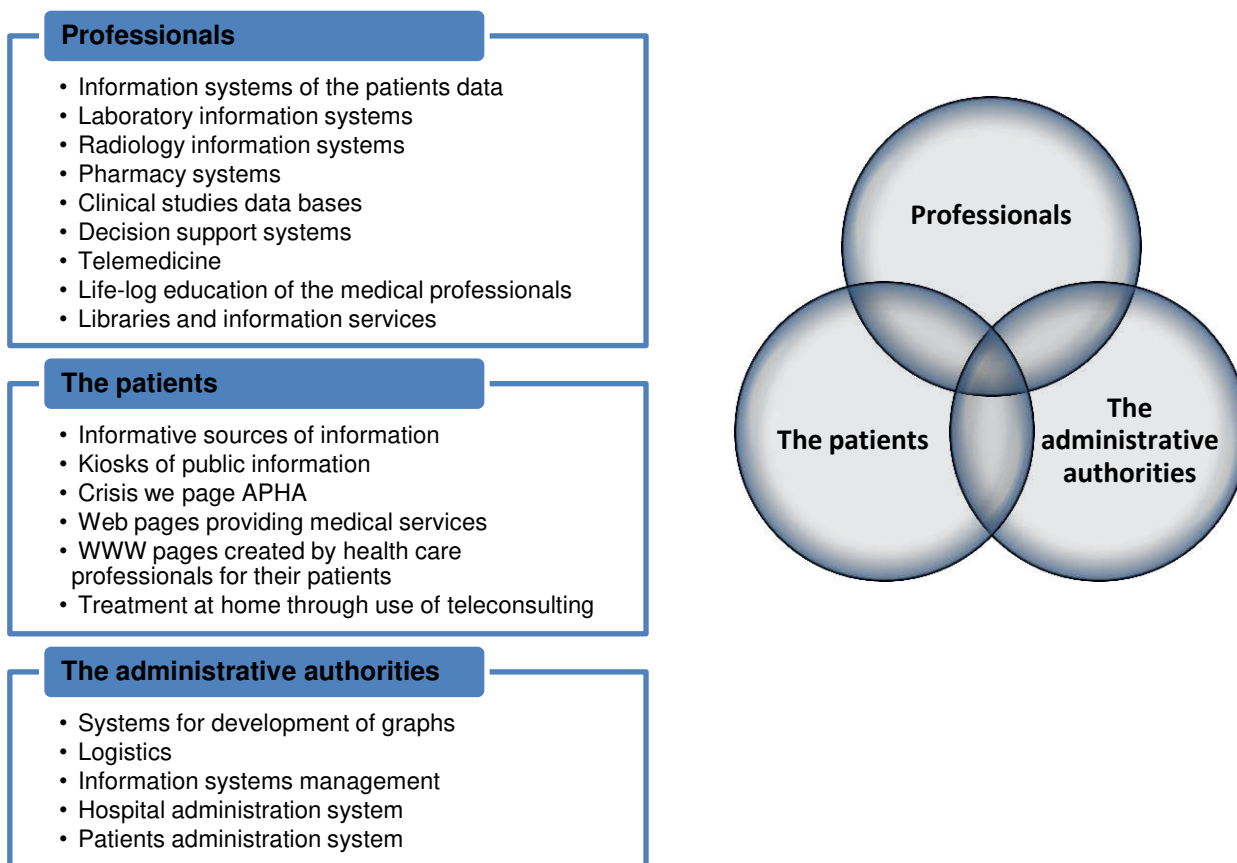
Professionals

- Information systems of the patients data
- Laboratory information systems
- Radiology information systems
- Pharmacy systems
- Clinical studies data bases
- Decision support systems
- Telemedicine
- Life-log education of the medical professionals
- Libraries and information services

The patients

- Informative sources of information
- Kiosks of public information
- Crisis we page APHA
- Web pages providing medical services
- WWW pages created by health care professionals for their patients
- Treatment at home through use of teleconsulting

The administrative authorities

- Systems for development of graphs
- Logistics
- Information systems management
- Hospital administration system
- Patients administration system

Figure 3. **E-health ecosystem**

Funding of e-health projects

For the period from 2007 to 2014 funds were allocated to the implementation of the e-health programme from the state budget and structural funds, for total amount of 20 593 809 *euro*.

According to provisions of the e-health implementation plan, funding for implementation of the e-health projects will be assigned from state grants, for the period starting from 2007 to 2014 for implementation of the guidelines - 2 844 400 *euro* were assigned from the state main budget and used, out of these - 953 544 *euro* for remuneration -

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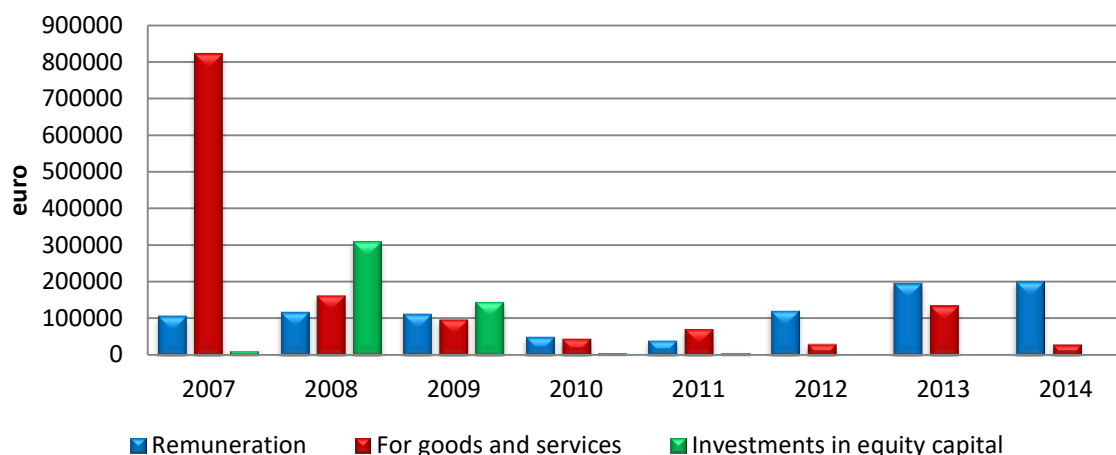1 406 818 *euro* on goods and services and - 484 038 *euro* on equity capital (see Figure 4).

Figure 4. **State grant expenditure to introduction of e-health (years 2007 – 2014)**

As of 2009 funding has been attracted for implementation of the e-health from the European Regional Development Fund (planning period 2007 – 2013), which allowed for target oriented and active implementation of the guidelines and planned activities. The amount available until year 2014 was 17 749 409 euro, including:

- Project for Development of Unified Control Information System of the Sector by the Health Care Inspection - 325 630 euro;

- Project for Setting up of the Control Information System and Dispatcher's Centres of Emergency Medical Assistance Service and Centre for Catastrophe Medical Aid 5 445 196 euro;

- National Health Service is in charge of the existing four projects of e-health implementation for the total value of 11 978 583 euro, see Table 2.
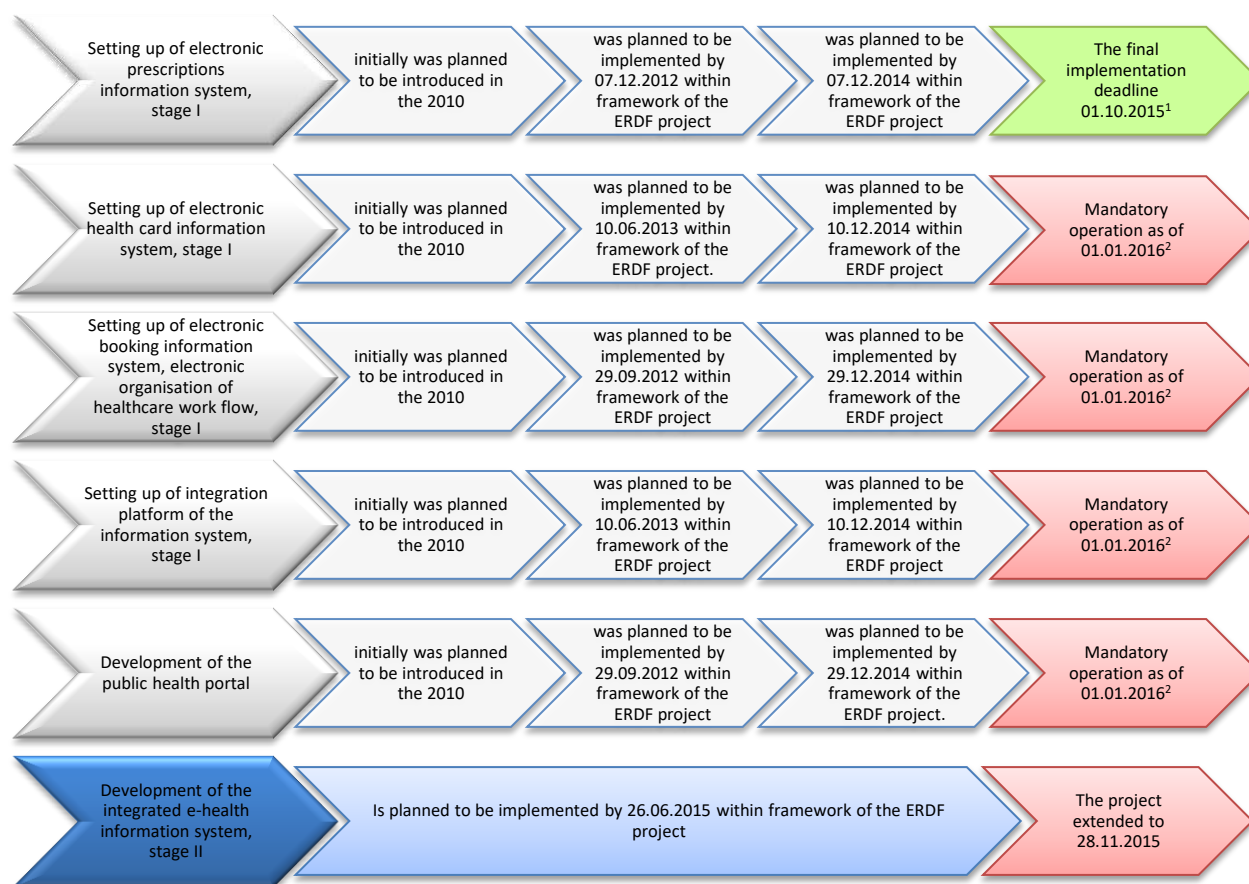
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Table 2

E-health projects

Project title	time period of implementation	total financing
Setting up of electronic visit booking (e-booking) system, electronization of health care workflows (e-referrals), stage I, creating of public health portal, provision of information security and protection of personal data (project ID No.3DP/3.2.2.1.1/09/IPIA/IUMEPLS/015)	from 30.10.2009 to 29.12.2014	3 150 846 *euro*
Setting up of electronic prescriptions system, stage I (project ID No.3DP/3.2.2.1.1/09/IPIA/IUMEPLS/003)	from 08.07.2010 to 07.12.2014	581 385 *euro*
Setting up of electronic health card and integration platform's information system, stage I (project ID No.3DP/3.2.2.1.1/09/IPIA/IUMEPLS/019)	from 11.06.2010 to 10.12.2014	3 525 371 *euro*
Development of e-health integrated information system, stage II (project ID No.3DP/3.2.2.1.1/13/IPIA/CFLA/008)	from 29.04.2013 to 28.06.2015 extended to 28.11.2015	4 720 981 *euro*
Development of unified control information system of the health care sector, stage I (project ID No.3DP/3.2.2.1.1/09/IPIA/IUMEPLS/006)	from 23.09.2009 to 22.03.2013	325 630 *euro*
Setting up of the Control Information System and Dispatcher's Centre's of the Emergency Medical Assistance Service and Centre for Catastrophe Medical Aid (project ID No.3DP/3.2.5.2.0/09/IPIA/VSMTVA/001)	from 06.04.2009 to 30.06.2015	5 445 196 *euro*

Currently the National Health Service is introducing e-health information system's solutions of the stage I, which are e-prescriptions, electronic health card, electronic visit booking, electronic regulation of work flow, e-health portal and integration platform, as well as integrated information system of the stage II of the - e-health.

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No more detailed information is available on implementation activities and deadlines of other e-health information systems, just the information that systems were supposed to start running in the production environment already as of 2015 so that any shortcomings in their operations could be identified and eliminated by 1 January 2016, when it is mandatory for all health care institutions and pharmacies to start using the e-health information system.

By 2016 none of the e-health information systems is running in the production environment and the health care institutions or pharmacies which have signed contracts for testing of the system are unable to test it.

Setting up of electronic prescriptions information system, stage I	initially was planned to be introduced in the 2010	was planned to be implemented by 07.12.2012 within framework of the ERDF project	was planned to be implemented by 07.12.2014 within framework of the ERDF project	The final implementation deadline 01.10.2015[1]
Setting up of electronic health card information system, stage I	initially was planned to be introduced in the 2010	was planned to be implemented by 10.06.2013 within framework of the ERDF project.	was planned to be implemented by 10.12.2014 within framework of the ERDF project	Mandatory operation as of 01.01.2016[2]
Setting up of electronic booking information system, electronic organisation of healthcare work flow, stage I	initially was planned to be introduced in the 2010	was planned to be implemented by 29.09.2012 within framework of the ERDF project	was planned to be implemented by 29.12.2014 within framework of the ERDF project	Mandatory operation as of 01.01.2016[2]
Setting up of integration platform of the information system, stage I	initially was planned to be introduced in the 2010	was planned to be implemented by 10.06.2013 within framework of the ERDF project	was planned to be implemented by 10.12.2014 within framework of the ERDF project	Mandatory operation as of 01.01.2016[2]
Development of the public health portal	initially was planned to be introduced in the 2010	was planned to be implemented by 29.09.2012 within framework of the ERDF project	was planned to be implemented by 29.12.2014 within framework of the ERDF project.	Mandatory operation as of 01.01.2016[2]
Development of the integrated e-health information system, stage II	Is planned to be implemented by 26.06.2015 within framework of the ERDF project			The project extended to 28.11.2015

[1] *Implementation plan of the E-prescriptions by the National Health Service, dated 16.04.2015.*
[2] *State Auditor's Office has not received any detailed plan for implementation of the projects.*

Figure 5. **Time-frame for implementation of the e-health information systems**

Within the framework of the e-health project, on 13 August 2010 a pilot project was started offering to the public four e-services at the unified public services portal www.Latvia.lv:

- **my family doctor** – within the framework of this service a person can obtain information on his/her own family doctor and that of minor children;

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- **my health care services covered by the state** – within framework of this service a person can obtain information from the "Management Information System" managed by the National Health Service on his/her or children's visits to doctors, diagnoses and treatment paid from the state budget;

- **my data at the register of sugar diabetes patients** – within framework of this service a person received information on electronically stored information on his diseases at the register of sugar diabetes' patients;

- **Data of my new-borns** – within framework of this service a person receives information stored in the state information system „Register of New-Borns".

The four e-services were available to the public at the portal www.Latvia.lv as of 1 October 2013, i.e. only for 25 months and the number of requests for these e-services was 248 808 (according to the National Health Service information) or on average less than 2000 hits per week.

Impact assessment of the policy documents

The Ministry of Health has not performed an initial assessment of the planning document Guidelines „E-health in Latvia" during the development process of the document, and also did not perform an interim assessment for purposes of supervising the course of implementation of the planning document and identification of amendments required. As of year 2008 to 2009 the ministry outsourced and involved consultants that have provided the following opinions:

- On options of measures to be taken and their assessment for efficient application and maintenance of the e-health project results for the 10 (ten) years period;

- On the plan for implementation of the measures of efficient application and maintenance of the e-health project results;

- On the assessment methodology of the resulting indicators of the measures taken for the Implementation plan of the Guidelines „E-health in Latvia" for years 2008 - 2010.

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Stakeholders interests in implementation of the e-health system
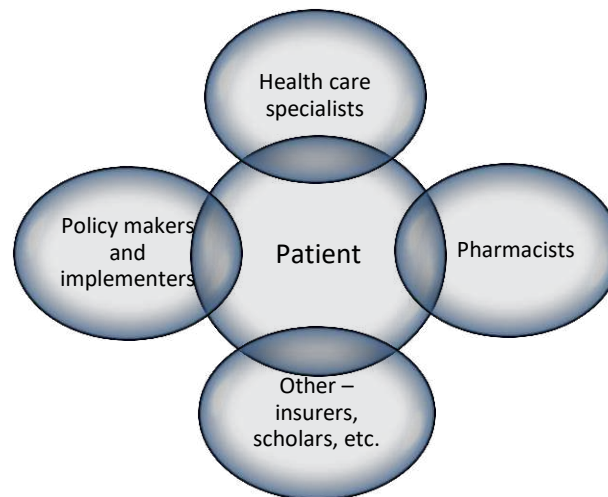

Figure 6. **Stakeholders of the implementation of the e-health information system**

Main stakeholders for implementation of the e-health information system:

- patients (inhabitants) shall be considered as primary beneficiaries who will be benefiting from setting up and use of the e-health information system;

- health care specialists (service providers) are considered as one of the key indicators of the health care information and one of the main users of the system;

- pharmacists are users and creators of the health care system;

- authors and implementators of the health care policy are interested in efficient administration of the health care system and its financial resources, therefore they are one of the most active users of the health care information;

- other concerned parties, e.g., insurers, researchers, scholars are users of the health care information.

According to the information at the disposal of the State Auditor's Office, the work groups for drafting of the e-health Guidelines and the implementation plan were mainly attended by one stakeholder - employees of the Ministry of Health and its subordinate institutions, i.e. health care policy makers, implementers, managers and administrators. No health care professionals, pharmacists or information and communication technology specialists were invited.

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In early April, 2014 survey of the health care institutions – hospitals providing health care services and using information and communication technologies - revealed that out of 13 health care institutions:

- seven are using the information system „Ārsta birojs" ("Doctor's Office"), while six are using their own tailor made and maintained information systems;

- nine are entirely or partially satisfied with the current information system, but four are not satisfied with the functionality offered by the information system;

- in response to questions related to introduction of the e-health in Latvia, five respondents indicated that they are looking for a centralized solution meaning that hospitals will have to maintain health care services information systems, but six – for a decentralized solution (the health care institution shall maintain its local information systems with option of connecting to state integration platform for data exchange), but two had no opinion;

- in response to a question on whether the e-health system will improve quality of the health care, ensure more efficient use of every euro invested in the health care, improve communication options, five of the health care institutions replied that it will improve, while seven emphasized problems due to which at least at the beginning the situation will not improve, e.g., because the entire process will be overloaded due to insufficient capacities, costs will increase – acquisition of new hardware, training of employees, hiring of new employees, as documents will still be kept also in a printed format;

- nine health care institutions were not satisfied with communication by the project managers concerning project development, indicating that no sufficient information is provided; five health care institutions had no thorough understanding of the activities to be performed in order to start using the e-health system, while three health care institutions have started working on integration of the systems, six have not started, and the rest had no answer.

In early April, 2015 survey was done of the pharmacies with the widest chain of points of sale involved in provision of the health care services – by trading prescription drugs and using information and communication technologies, establishing that out of six pharmacies:

- four are satisfied with the currently used information system, while two are not fully satisfied with the current information system;

- three would like the e-health system to be decentralized, but two would like to give up the existing information systems and operate in high quality e-health system;

- four pharmacies believe that the e-health system will improve quality of healthcare and operations of the pharmacies, as communication will improve between the pharmacies and health care institutions, at the same time decreasing fraud risk (fraudulent prescriptions, stolen prescriptions), volumes of human resources

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required, documents circulation. One pharmacy believes that time required for servicing one client will increase;

▪ four pharmacies are not satisfied with communication by the project managers concerning project development, indicating that insufficient information is provided, while three pharmacies had no thorough understanding of the activities to be performed in order to start using the e-health system.

Within the framework of the survey performed in cooperation with the Market and Public Opinion Research Centre SKDS, the State Auditor's Office established willingness of residents to use various e-health services. Respondents were of rather positive, not negative opinions about the e-health services – 50% to 54% of the respondents replied that they would be using them, while 33% to 37% would not. E.g., 54% of residents are willing to obtain information on improvement of their health in a single portal, 51% would use the option of electronic communication with healthcare professionals, and 51% would also like to track financing of healthcare services received by them. However 50% would use the internet to track the course of their healthcare (diagnoses, treatment process, drugs).

Implementation of e-health in the framework of European Regional Development Fund

E-health project solutions are developed in the framework of the funds granted by European Regional Development Fund according to the facility program "Infrastructure and Services" supplemental activity 3.2.2.1.1. Sub-activity "Development of information system and electronical service". The institution responsible for transfer of implementation of sub-activity – Ministry of Environmental Protection and Regional Development – is Central Finance and Contracting Agency. Responsible institution for implementation of projects and the recipient of funds is the National Health Service.

According to the European Parliament and Council Regulation[6] the Appropriations shall be used in accordance with the principle of sound financial management, namely in accordance with the principles of economy, efficiency and effectiveness:

▪ the principle of economy requires that the resources used by the institution in the pursuit of its activities shall be made available in due time, in appropriate quantity and quality, and at the best price;

▪ the principle of efficiency concerns the best relationship between resources employed and results achieved;

▪ the principle of effectiveness concerns the attainment of the specific objectives set and the achievement of the intended results.

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[6] European Parliament and Council Regulation of 25.10.2012, NO.966/2012 „on the financial rules applicable to the general budget of the Union and repealing Council Regulation", Article 30

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According to the European Council Regulation[7] 'irregularity' includes any infringement of a provision of Community law resulting from an act or omission by an economic operator which has, or would have, the effect of prejudicing the general budget of the European Union by charging an unjustified item of expenditure to the general budget.

Cabinet Regulations[8] provide that the Ministry of Environmental Protection and Regional Development should assess, within ten working days prior to approval of final payment request of the project, the functionality of results of the project and the compliance with the project application. The Central Finance and Contracting Agency shall prepare the respective payment order on reimbursement of justified expenses or with a transfer to the state budget income within 30 working days' time after the acceptance of request of final payment.

Cabinet Regulations[9] provide for „If a non-conformity has been determined during on-the-spot verification of the project, the Managing Authority, the Certifying Authority and the Co-operation Institution or the Responsible Institution shall notify thereof in accordance with the procedure by which shall be notified regarding the non-conformities determined in the implementation of the European Union Funds specified in regulatory enactments, shall take a management decision regarding utilization of the allocated financing and shall recover the non-eligible expenses".

In compliance with the guidelines of the Ministry of Finance regarding application of financial adjustments[10], if as a result of implementation of project the target of the project is not achieved, the financial adjustment amounts to 100% from the justified expenses.

In compliance with the information available in the European Union structural funds and Cohesion Funds management information system[11], the requests for final

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[7] Council Regulation (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999, paragraph 7 Article 2.

[8] Cabinet Regulations NO.576 of 21.07.2008 „Regulations on activity program „Infrastrucure and services" supplementing 3.2.2.1.1. sub-activity „Information system and electronical services development", paragraph 9.13 of project application selection", Paragraph 29 of Regulations No.1041 of the Cabinet of Ministers of 09.11.2010 „Procedure by which the resources are anticipated for implementation of projects confinanced from the budget resources of European Union Structural funds and Cohesion Funds, as well procedure of payment and procedure of preparation of declaration on expenses".

[9] Cabinet Regulations No.140 of 16.02.2010 „Procedures by which the Managing Authority, the Certifying Authority, the Co-operation Institution or the Responsible Institution Conducts an Inspection at the Place of Implementation of the Project Financed by European Union Structural Funds and the Cohesion Fund", paragraph 25

[10] Appendix No.2 „Determination of scope of Financial Adjustment"of the regulation No.10 of 18.07.2014 „Guidelines on application of financial adjustment for the European Union Structural Funds, Cohesion Funds, European Economical Zone Financial instrument, Norwegian financial instrument, projects financed within the scope of the cooperation programs of Latvia and Swizterland".

[11] European Union Structural Funds and Cohesion Fund Management Informatiohn System, avaiable: https://www.visr.eps.gov.lv/visr/default.aspx?action=2&rid=181, veiwed on 25.06.2015.

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reimbursement of payments of three projects of Stage I of the e-health implemented by the National Health Service have been submitted in the following terms:

- stage I of Electronical subscription information development - January 7, 2015;

- electronical visits booking (*e-booking)* , healthcare work-flow electronization (*e-referrals),* Stage I, creation of Public health web site, information security and personal data protection ensuring – January 21, 2015.

From the total Stage I actually used for the project European Regional Development Fund and State Budget Funds amounted to 6 918 297 euros, the financing from European Regional Development Fund or justifiable expenses is 6 631 666 euros.

During the audit it was established that the final inspections of functionality by the Ministry of Environment and Regional Development from February 2015 had been suspended[12] to the month of April, since, as the production environment was not year prepared, the functionality tests were not possible to perform.

Responding to the request of the State Audit Office to submit the planned final functionality test results on April 2015, the National Health Service informed that the tests in the environment of production of functional testing will be possible solely at the moment where the users will have really undertaken the use of system. Since after the installation of the e-health system production environment it is planned to perform performance audits and safety audits, after completion of which there will be concluded agreements with the healthcare institutions on data input in production site, it was planned that real users will be able to start using the system no sooner than September 1, 2015.

The e-health project "Development of e-health integrated information system" of Stage II implemented by the National Health Service is tightly related to the e-health projects of the Stage I, since the implementation of project ensures a succession to solutions created for Stage I. Therefore the development of solutions of e-health of Stage II is influenced by how successfully implemented projects of the stage I of e-health have been. For the project of Stage II of e-health, the planned justified expenses of which are 4 720 981 euros, deadline was prolonged from June 28, 2015 to November 29, 2015.

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[12] Central Finance and Contracting Agency letter No. 39-2-40/743 of 11.02.2015 „On approval of final payment requests according to agreement No.3DP/3.2.2.1.1/09/IPIA/IUMEPLS/003, No.3DP/3.2.2.1.1/09/IPIA IUMPELS/015, No.3DP/3.2.2.1.1/09/IPIA/IUMEPLS/019."

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E-Health project implementation deadlines

According to the implementation plan of the Guidelines „E-health in Latvia" approved in 2007 completion of the activities for implementation of the e-health was planned by the end of 2010.

According to the Cabinet of Ministers Regulations of the Unified Electronic Information System of the Health Care, the health care institutions and pharmacies shall sign agreements with the National Health Service by 31 December 2015. After signing the agreement, the health care institutions would be obliged to use the options available in the health information system according to the specifics of the health care institution and the requirements set in the Regulations. Starting from 1 January 2016 the family practitioners would have to submit the health data of patients online to the health information system. Although the above-mentioned Cabinet of Ministers regulations required that pharmacies should provide data into the online health information system on the medicinal products or medical devices issued on the basis of e-prescription, without delay, but no later than three working days after service was provided, regulations did not indicate the date from which pharmacies were obliged to start data entry to the health information system.

The Ministry of Health in its informative report of 2 October 2014 on the implementation of the Guidelines "E-health in Latvia" informed that since the state budget financing assigned for implementation of the Guidelines and the implementation plan in 2008 and 2009 was significantly below the necessary amounts, and implementation of the e-health projects of the European Regional Development Fund was started only in 2009 and 2010, a majority of e-health services included in the plan would now be implemented much later, i.e. in 2014.

According to final amendments of 2014 to the deadlines of the e-health service projects of the European Regional Development Fund implemented by the National Health Service the implementation will have to be completed by December 2014 (see Table 3).

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Table 3

Deadlines for implementation of the e-health services

Title of the project	Number of e-services	Implementation deadlines
Setting up of an electronic booking, electronic organisation of the health care work load system, stage I, development of public health portal, provision of the information security and personal data protection	13	29.12.2014.
Setting up of electronic prescriptions system, stage I	5	07.12.2014.
Setting up the electronic health card and integration platform information system, stage I	8	10.12.2014.

According to the plans for implementation of the Prescriptions and Electronic Sickness Leave Act, the deadline for implementation of services in the production environment was set for 1 October 2015, when they were to become available to healthcare institutions and pharmacies. The mandatory deadline for introduction of e-prescriptions and electronic sickness leave act services was 1 January 2016 (the most recent actual implementation plans and updated deadlines of the developed e-health services were presented to the State Auditor's Office).

According to the regulations for development of the e-health information systems, the developer of the information system shall perform the actions required for development of the information system, including implementation and guarantee maintenance. The National Health Service by the set deadline approves the information system or issues a motivated refusal to approve the works completed, or informs the developer of the information system of another time when the information system will be approved or a refusal to approve will be sent. Every component of the service is considered as approved if it complies with the functionality required in the work assignment and the offer for completion of works, and the acceptance testing and integration test with the other components of the information system have been successful.

Prolongation of the deadlines for implementation of the e-health and the causes thereof

Upon summarizing of the information on the planned deadlines for implementation of the e-health services, it was concluded that deadlines were prolonged not only for the projects of the European Regional Development Fund within the framework of which the health care e-services are developed, but also the agreements for development of information systems and for certain assignments within framework of the contracts.

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Three e-health projects of the European Regional Development Fund stage I had been started in 2009 and 2010. Although the initial completion date of the project was set at 30 to 36 months, upon amendment of the project regulations, the term of the project implementation was prolonged by two years, for one of the projects – by one and half years, without changing the total costs of the projects (table 4). When time allocated for implementation of the project was prolonged, the deadline for implementation of the health care e-services developed within the framework of the project was also prolonged.

Table 4

Projects for development of the e-health solutions by the European Regional Development Fund projects and their implementation term

Title of the project of the European Regional Development Fund	Length of the project implementation and total costs		Time frame by which the length of the project implementation has been prolonged
	Initially planned	**As amended**	
Setting up of an electronic booking, electronic organisation of the health care work load system, stage I, development of public health portal, provision of the information security and personal data protection	30.10.2009. – 29.09.2012. (35 months) 3 150 963 *euro*	30.10.2009. – 29.12.2014. (62 months) 3 150 846 *euro*	2,3 years
Setting up of information system of electronic prescriptions, stage I	08.07.2010. – 07.12.2012. (30 months) 581 385 *euro*	08.07.2010. – 07.12.2014. (53 months) 581 385 *euro*	1,9 years
Setting up the electronic health card and integration platform information system, stage I	11.06.2010. – 10.06.2013. (36 months) 3 527 850 *euro*	11.06.2010. – 10.12.2014. (54 months) 3 525 371 *euro*	1,5 years
Development of Integrated e-health information system, stage II	29.04.2013. – 28.06.2015. (26 months) 4 720 981 *euro*	29.04.2013. – 28.11.2015. (31 months) 4 720 981 *euro*	0,4 years

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In March 2015 there were amendments made also in the deadline of the fourth European Regional Development Fund e-health project "E-health integrated information system development Stage II", by extending it from June 28, 2015 to November 28, 2015, maintaining the total costs of the project unchanged, namely, 4 720 981 euros.

The National Health Service provided information that the main causes for prolongation of the implementation deadlines of the European Regional Development Fund projects were concerns with delays in procurement procedures, including termination of procurement procedures without any result in the cases when offers received did not comply with the set requirements, or changes in the procurement regulationsAlso all of the projects were prolonged in order to adjust the developed e-services to the new www.latvija.lv test environment. Deadline of one project was prolonged because additional activities were implemented, where the savings of the projects were used.

According to the Terms of Reference of the Ministry of Health,[13] the Ministry is organizing and coordinating implementation of the sectoral policy in the subordinate institutions of the Ministry as well as the overall implementation of the health promotion policy, which includes management of implementation of the guidelines „E-health in Latvia".

In the Guidelines „E-health in Latvia" and the implementation plan of the Guidelines for the years 2008 – 2010, the Ministry of Health was appointed as the institution in charge of implementation of the guidelines and the plan, and also as of 1 May 2008 the Ministry had to submit to the Cabinet of Ministers by the May 1 of the respective year a report (overview) on the implementation of the guidelines and the plan.

For the period from the start of the implementation of the Guidelines up to now four reports were to be prepared by the Ministry of Health to the Cabinet of Ministers, i.e. by the 1 May 2008, 1 May 2010, 1 May 2012, 1 May 2014. However, the Ministry had prepared only two informative reports:

- informative report of 23 April 2008 on the implementation of the Guidelines „E-health in Latvia" and the implementation plan for years 2008 – 2010 in 2007;

- informative report of 6 November 2014 on the implementation of the Guidelines „E-health in Latvia" in 2008 – 2013 and the implementation plan for years 2008 – 2010.

In 2013 the Ministry of Health established the Information Technologies Council, which as of 2009 was charged with supervision over the implementation of the e-health policy. Initially the terms of reference provided that the council meetings were to be held at least once per quarter, while as of the 2009 – at least once per year.

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[13] Regulations of the Cabinet of Ministers of 13.04.2004 No.286 „Terms of Reference of the Ministry of Health".

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The Information Technologies Council started its work in 2003, but no information is available on its operations in 2003 and 2004. A total of six Council meetings have been held – four in 2005, one in 2006, none in 2007 and 2008, while according to the information provided by the Ministry the last Council meeting was held in early 2009.

In order to ensure successful achievement of objectives set in the implementation plan of the guidelines and operational management and coordination of e-health implementation activities, on 1 February 2008 the Ministry of Health approved a Procedure for Performance of the e-health Project and the Sub-Projects[14]. This procedure provided an organizational and methodological framework for the implementation activities and on 21 February 2008 a task group was set up in the Ministry[15], comprised of representatives of the Ministry and subordinate institutions. The task group began meeting on average once per month.

In October 2008 a member of the task group, the Head of the e-health Division of the Policy Planning Department of the Ministry of Health, proposed development of a new document since the Implementation Plan of the Guidelines for years 2008 – 2010 was obsolete and not relevant for the current situation – the task group agreed with the proposal, nevertheless it was never actually implemented.

For the period from the meeting of the task group of 8 September 2009 until the next meeting of the project management and supervision work group held on 15 May 2012, i.e. for more than 2.5 years, not a single supervisory meeting of the e-health project supervised by the Ministry of Health was held. The dynamics of the supervisory meetings organized by the Ministry of Health are shown in the Figure 7.
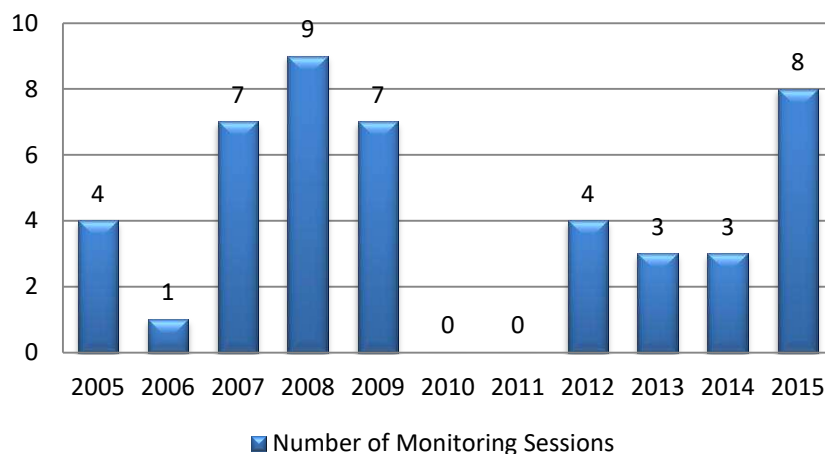
Figure 7. **Frequency of supervisory meetings organized by the Ministry of Health**

In order to provide for project management of health sector investment projects funded from public sources and implementation supervision on 10 October 2011, the Ministry

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[14] Legal act of the Ministry of Health of 01.02.2008 No.IeNA/8 „Procedure for implementation of the e-health project and its sub-projects".
[15] Order of the Ministry of Health of 21.02.2008 No.31 „On setting up of the task group".

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of Health set up another task group[16]. On 17 January 2014 an additional control work group was set up for high and medium risk projects[17], which was charged with supervision and management of e-health projects financed by the ERDF.

Within the three years' time, members of the task group met 10 times, an average of three times per year. Main problems identified were the following:

- deadlines for implementation of the project (signing of the agreements) were being delayed as of 2012;

- starting from early 2012 use of the budget resources has been slow, even if the planned funding is brought forward to later months;

- weak communication with the National Health Service, no timely responses are provided to requests, low quality of completing monthly project implementation report tables;

- already in 2013 problems identified concerned development of an integrated environment – definition of classificatory development of integrated test environment had been delayed;

- in early 2014 a risk was identified that in early 2015 the use of e-health system will not be launched, as the implementation deadlines had not been adhered to;

- anticipated number of persons to be trained for working in the e-health is too low, e.g. it was planned to train for working in the e-prescriptions module only 40 healthcare specialist and pharmacists.

Although various problems were identified during the work group meetings, no efficient solutions of the problems were sought, as these problems are still persistent.

In order to ensure efficient implementation of the e-health projects on 15 January 2015 the Ministry of Health set up a supervision committee for the implementation of the e-health projects[18]. The committee was to ensure systematic information flow regarding implementation of the project and get involved in resolution of problematic issues with the overall task being to ensure start of pilot testing as of 1 September 2015. By 26 March 2015 eight committee meetings had been held, on average once per week.

The supervision committee started active cooperation with the e-health project owner National Health Service concerning operations of the e-health, whereby the following situations were analyzed:

- it is possible that not all of the planned e-services in the project will be launched by the set deadline;

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[16] Order of the Ministry of Health of 10.10.2011 No.207 „On setting up of the task group for Project management and suervision".
[17] Order of the Ministry of Health of 17.01.2014 No.17 „On setting up of the additional control work group for the high and medium risk degree projects".
[18] Order of the Ministry of Health of 15.01.2015 No.2 „On setting up a supervision committee for the e-health projects".

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- the stage II of the project will not be completed by the set deadline and not all of the ERDF financing will be used, therefore all of the costs of stage II of the project will not be eligible.

The Ministry of Health believes that actions taken by the Ministry for supervision and control of the e-health project were aimed at identification of operational shortcomings, analysis of risks and problematic issues, provision of recommendations for improvement of operational efficiency, elimination of deficiencies, decreasing of risks, and implementation of recommendations.

Conclusion of project implementation, audit findings and recommendations

◆ Management of the e-health implementation is not sufficiently effective, and it is not primarily orientated to achievement of e-health objectives, for:

⚠ The existing management of projects is orientated to precise fulfilment of procedures of procurement and delivered product acceptance;

⚠ Project integration management and the overall management of architecture are not implemented according to good practice, e-health plan is not developed, unifying all the e-health project activities, measures for coordination of project activities are not ensured;

⚠ Project managers have insufficient education and experience in management of projects of similar complexity; moreover project managers have been changed multiple times;

⚠ At the program level there is no program manager elected; the set e-health management organizational structures are implemented incompletely;

⚠ Nevertheless according to the good practice it is recommended to introduce e-health solutions gradually, in Latvia there were simultaneously started three major e-health projects, the results of which ensured only partial compatibility.

◆ The State Auditor's Office believes that the guidelines „E-health in Latvia" will not be introduced in Latvia in full, because for the implementation period of the guidelines, by the end of the 2015 and by the late 2014, no e-health activities were even started for which funding amounting to 46% of the total financing of the e-health was assigned.

◆ National Health Service has not ensured timely compliance with technical specifications and good management practice for acceptance testing of all developed e-health solutions, since the delivered information systems are accepted even 11 months after the end of term of general agreement, not all the developed solutions acceptance testing had taken minutes of, and the pilot operation minutes

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that were presented instead of acceptance testing minutes do not certify that the requirement of technical specification was observed or that the customer performed acceptance test. Therefore the delivered functionality of the solution did not work according to defined requirements.

◆ The developed e-health solutions are not semantically compatible and there are cooperation problems in the integrated testing environment; moreover the e-signature system does not fully encompass the specifics of health industry business processes; there is a high risk for initiation of valid system operation, quality use of developed e-services and ensurance of planned benefits.

◆ The developed e-services of e-prescription and electronic sick-leave certificates do not comply with the requirements of the Regulations of the Cabinet of Ministers[19]; thereby risk persists that upon using these solutions, healthcare processes will not be improved, thereby creating e-health information system users dissatisfaction and unwillingness to use e-services and not obtaining planned benefits.

◆ By 1 April 2015 the National Health Service had not ensured users access to any of the 26 e-services, notwithstanding the facts that introduction of the e-health policy was started in 2007, and currently 9 762 697 euro have already been used. The Service is still improving the development of existing seven e-services and creation of five new e-services, thus attracting to the stage II of the project „Development of integrated e-health information system" funding of 4 720 981 *euro*.

◆ Since there was available financing at the disposal of the Ministry of Health for the e-health project, Stage I could have been started (in production environment) from year 2013; nevertheless the Ministry planned to start partially using the e-health information system by year 2016. In three years' time direct financial benefits have not been gained amounting to 3 million euros (under a provision that on January 1, 2016 Stage I will be implemented entirely), that could have been diverted to provision of other healthcare services.

◆ Since the implementation plan of the Guidelines „E-health in Latvia" was developed in 2007 and was never updated, the actual costs of implementation of the e-health activities differ from the planned ones – actual costs of some activities for implementation of the e-health are lower by 81% and even up to 127% higher than planned costs.

◆ Actual costs of activities managed by the National Health Service in the Guidelines „E-health in Latvia" will increase the planned costs by 154 364 *euro*; therefore there is a risk concerned with economy and productivity of funding used for implementation of the e-health.

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[19] Regulations No.175 of 08.03.2005 of the Cabinet of Ministers „Regulations for Manufacture and Storage of Prescription Forms, as well as Writing out and Storage Prescriptions „ Regulations No.152 of 03.04.2001 of the Cabinet of Ministers „Procedures for issuance of Sick-Leave Certificates"

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◆ Due to incomplete procurement documentation and low quality e-health solutions developed, as well as slow implementation of e-health, there is a risk that financial resources amounting to at least 483 406 euros are spent unpurposefully, because:

⚠ in the procurement "Introduction of supplements of integration for development of unified health industry electronic information system" organized after acceptance of e-health solutions developed during the Stage I, the ordered work assignments amounting to 124 206 euros partially or fully overlap with the work assignments of Stage I or eliminate admitted errors in designing;

⚠ works ordered in Stage II amounting to 59 200 euros, in order to identify and eliminate deficiencies in applicability in solution of Stage I;

⚠ for suppliers of Stage II there was included a payment for developed e-health solution guarantee in Stage I; the estimate of double paid guarantee amounts to more than 300 000 euros, nevertheless it is also included for suppliers of Stage I.

◆ Risk persists that during the implementation of e-health the most beneficial and profitable information and communication technology solutions have not been used, thereby, possibly raising the price, because:

⚠ adaptation possibilities of standard solutions have not been evaluated and not performed, their comparison with solutions that have to be newly developed, thereby there is a risk that the accumulated experience has not been taken into account, the good practices not considered, and other benefits of standard solutions not employed;

⚠ there were not evaluated all possibilities of repeated use of Latvia state information and communication technology solutions;

⚠ due to the lack of technological unification of e-health, various e-health solutions have applied various development technologies, thereby raising the price for their maintenance.

◆ Within the process of implementation of the e-health policy for the period starting from 2007 through to 2011, financial means of 196 292 *euro* have been used in vain or unpurposefully for paying for development of the concept and technical specifications for the activity which is no longer been pursued, and for paying in 2010 for updating of the concept and technical specification developed in the 2007, for drawing up information system security documentation, nevertheless the documentation has not been validly used, as well as by paying for the activities which do not comply with the Guidelines „E-health in Latvia".

◆ Implementation of e-health has not been primarily directed to implementation of a deliberative, productive and targetful planned solutions, since in the course of implementation of e-health there have been difference services or deliveries ordered

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in time that have not been necessary or received services not being fully employed, for example:

⚠ funds amounting to 81 191 euros for the e-health information system training organized by the National Health Service in year 2014 have been used inefficiently, since the training was carried out at time when the system did not operate even at test regimen;

⚠ for a part of the developed techniques the term of guarantee had expired, although the production environment has not yet been created;

⚠ ordered e-prescription information system performance assessment, although due to functional errors it was not possible to perform various anticipated tasks;

⚠ the amendments in documentation were not performed according to the recommendations of quality controllers, in cases where the corrections have not been easy to implement.

◆ Implementation process of the guidelines „E-health in Latvia" has been dragging too slowly, which will lead to objectives and received benefits for improvement of the health care quality set in the guidelines not being achieved to the full extent. The Ministry of Health has on several occasions prolonged the deadline for implementation of the e-health system, e.g., initially its completion was planned by the year 2010, then the implementation deadline was prolonged to 2012 and 2013, later already for 2014, when Ministry undertook that all of the realized information systems will be available at the production environment, until at the end the undertaking was issued that as of September 2015 in production environment the e-prescriptions information system will be available. Concerning the other three information systems, no particular deadlines are set for their launch.

◆ The National Health Service has not ensured implementation of the e-health information systems by the end of 2014 although the e-health solutions had been actually developed (by 2013); however they are not available to the users and there is a risk that by 1 January 2016 all planned services 31 e-service of the health care would not be available to the users.

◆ Risk persists that upon implementation of e-health projects co-financed by the European Regional Development Fund the requirements of European Community laws and regulations are not observed, since, although all the projects of Stage I were concluded in December 2013, the final inspection of projects are suspended for multiple times, and taking into account that a successful implementation of project of Stage I is closely tied with the results achieved in the Stage I, there is a risk that during final inspections of projects it will be established that the aims of the projects are not achieved. Funds amounting to 11 352 647 euro used in European Regional Development Fund may be recognized as inexpediently spent.

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◆ The Ministry of Health has not ensured preparation of a thorough action plan for involvement of the healthcare service providers in the e-health information system, e.g., the healthcare service providers not providing the state paid services, not issuing the sickness leave acts and not issuing prescriptions for medication have not been identified and contacted.

◆ Notwithstanding the fast approaching deadline for implementation of the Guidelines „E-health in Latvia", the Ministry of Health did not pay due attention to readiness and awareness of the healthcare service providers which is evidenced by the following data:

   ⚠ 17% of the healthcare professionals and 3% of pharmacists at their work place do not have access to computer hardware; thus the users have no access to the e-health information systems;

   ⚠ self-assessment of 29%-41% of the healthcare professionals and pharmacists concerning their computer and internet skills is medium or low;

   ⚠ within the period of the implementation of the guidelines (9 years) only 15% of the planned training of the potential users of the e-health information system have been conducted and 4% of those concerning use of the e-health information system;

   ⚠ only 11% of the healthcare professionals and pharmacists are duly informed on the implementation of the project „E-health in Latvia";

   ⚠ 12 institutions out of 13 surveyed healthcare professionals and pharmacies having signed agreements on testing of the e-health had not started testing yet by the February 2015.

◆ The pilot project of four e-services introduced by the National Health Service in 2010 was not a success, duly announced and promoted, as, regardless of the fact that 76% of the population use internet on a daily basis, only 9% of the population had used these 4 services, while the e-services of the private health care institutions have been used by 20%of the population.

◆ The National Health Service has not ensured due information and education of the public on implementation of e-health, including the planned healthcare e-services as only 47% from the 60% (the audit criteria) Latvian residents were informed on implementation of the e-health, and approximately 11% from 40% (the audit criteria) Latvian residents were informed on benefits of implementation of the e-health. This indicated a low awareness level in relation to introduction of the e-health services and benefits brought by their use, which in turn increased the risk that the public will not be using the new e-health services.

◆ For the e-health website developed by the National Health Service, more than 50% of applicability tests were not able to be performed, since the website was available

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only in test environment with limited functionality. Meanwhile, upon verification of the applicability in the limited amount, there were no material applicability problems identified, but various non-material or moderately material applicability deficiencies, for instance, incomplete assistance information, system does not support most popular internet web browsers, no activities were implemented that would ensure an easy access for people with functional disorders, etc.). Prevention of mentioned deficiencies would have improved usage of information system.

Recommendations

◆ In order to ensure further successful management of e-health projects that would be primarily orientated to the achievement of e-health objectives, the Ministry of Health shall perform the following activities, by ensuring:

⚠ a gradual, unified and mutually agreed e-health project and their activities development and implementation;

⚠ the personnel with a corresponding education and experience shall be involved in the e-health project management;

⚠ the organization structures for e-health management shall be formed and operating according to established objectives.

◆ In order to ensure efficient and productive use of the financial resources assigned to the project by introducing the project end products, the Ministry of Health shall ensure control over the course of the project so that the activities planned would be realized according to the implementation plans, planned financing and realistically set deadlines.

◆ In order to improve health care efficiency and quality of services by providing the health care service providers with a quality, precise and complete patients data, the Ministry of Health shall ensure efficient implementation of the e-health information system by ensuring:

⚠ implementation of the e-health information system to the set scope and deadlines;

⚠ accessibility and quality use of all of the planned e-services (31) to the users.

◆ In order that the e-health information system could be of sufficient quality and efficiently usable, the Ministry of Health shall ensure:

⚠ a timely acceptance testing of developed solutions and documenting of test results according to set requirements;

⚠ testing of developed e-health solutions according to set requirements, obtaining an objective solution and operational assessment, providing a

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time for elimination of identified problems, and repeated testing of solutions;

⚠ a semantic adaptation of e-health information systems and actual common e-health solution data architecture development and maintenance;

⚠ e-signature solution development, upon performance of extensive business process and respective requirements analysis, and implementation of solutions only after their improvement;

⚠ repeated e-prescription and electronic sick-leave certificate testing according to the Regulations of the Cabinet of Ministers[20] and implementation of all necessary amendments and changes to solutions or performance of amendments in the Regulations of the Cabinet of Ministers in order to ensure that the use of solutions is agreed.

◆ In order to ensure the expenditure of financing of the European Regional Development Fund, taking into account the economy, efficiency and efficacy principles, the National Health Service shall perform activities to ensure that the targets set in the projects of the e-health Stage I and Stage II are achieved and the e-health information system is fully available to its users.

◆ In order to ensure in future the use of economically most efficient solutions, the Ministry of Health shall:

⚠ evaluate the available in the market of standard e-health alternative products, the benefits and deficiencies of their usage;

⚠ upon planning of e-health development, to assess the possibilities of usage of existing state information communication technologies solutions;

⚠ Upon performance of further development of solutions, as much as possible to unify the applied technologies.

◆ In order to provide e-health information system availability for data quality, accuracy and completeness e-health system should be used by all healthcare providers, furthermore the Ministry of the Health obliged to ensure that all healthcare providers are active users in e-health system, with targeted actions:

⚠ identifying and analyzing the healthcare providers' opinions, to engage them in use of the e-health system;

⚠ prepare an action plan on how to appeal to all health service providers to engage in use of the e-health system;

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[20] Cabinet Regulations No. 175 of 08.03.2005 „Regulations for Manufacture and Storage of Prescription Forms, as well as Writing out and Storage Prescriptions", Cabinet Regulations No.152 of 03.04.2001 „Procedure for Issuance of Sick-Leave Certificates".

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⚠ provide an opportunity for healthcare providers to attend trainings in information and communication technologies as well as in e-health.

◆ In order to improve the public health condition by facilitating individual control over their own health by providing access to own healthcare data and public promotion of healthy lifestyle, the Ministry of Health shall implement informative and educational campaigns for purposes of involving residents in active use of the health portal and the e-health information system.

◆ To let the e-health website be easily usable, the National Health Service shall involve various groups of persons in repeated applicability tests, for instance, people with visual impairments, after these inspections to perform respective changes in the information system, as well as to prevent the insufficiencies of usage and applicability detected during the audit.

Current situation and actions after the audit

After the audit, the National Health Service fully understood the findings and conclusions regarding eHealth project implementation, and established an elaborate action plan for implementation of audit recommendation. Only by June 2016 was the first public part of the production environment of e-Health IT systems available and implementation of deliverables is still ongoing. Formal EU-funded projects are considered as finished and all reports have been submitted, but nevertheless production tests and implementation are still a big challenge. Those activities involve most important project management components such as stakeholder management, communication, time management, finance planning and management, and change management.

There is no doubt that e-Health policy implementation is the right direction and will lead to better administrative procedures for medical services. Meanwhile, as we can see from the audit results, the policy has been implemented as project-oriented activities what consisted of separate different projects. In this case, we can talk also about a lack of program management to ensure a broad overview of all ongoing projects, ensuring common monitoring and control over the policy rather than over each separate project. We can see that project management was considered mostly as an implementation of different EU co-financed projects while officials have forgotten that EU funds are just a financing source and e-Health policy implementation should be following sound program and project management principles.

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