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ASSESSMENT OF THE MICRO-ECONOMICAL IMPACT FACTORS OF E-GOVERNANCE PROJECTS

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Abstract

Today ITC plays a crucial role in any economy and its importance is increasing also in the public sector. Nowadays ICT becomes increasingly important for the state and municipal institutions, creating opportunities to automate many manual operations. ICT have an important role in both improvements of services as well as internal and inter-institutional cooperation processes promoting availability and quality of services, facilitating administrative processes for people and entrepreneurs, as well as information availability. In order to improve services for people and entrepreneurs as well as provide the participation in decision-making process, additionally to presence services more and more opportunities are created to claim for and receive services electronically.

The paper looks into different perspectives of the e-governance projects in the public sector. Overall framework and flow of the study are based on author experience and one-month internship of research work in India in 2017. The author has set a limitation for the research based only on micro-economical perspective and impact factors for the project success as there is a wide range of conducted studies on macroeconomic impacts from e-government project implementation and there is no doubt about such project importance to the economy. The study is based on qualitative research methods including Delphi method application, scientific literature analysis, and case studies. The aim of the paper is to stipulate importance of the increasing role of e-government and e-governance projects in the public sector by the analysis of actions undertaken by the public entities and organizations. Case studies are based on Latvian government experience with some comparison of Indian government experience.

Key words: e-government, e-governance, project management.
JEL codes: H43, L86, O33

Introduction

The World Bank, (2012) define E-Government as;

> *The use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transformē relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.*

Generally, e-Government is basically the use of Information Communications Technology (ICT) and its application by the relevant government body for the provision of information and public services to the people. In simple terms, e-Government is the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees. It is the use of information technology to support government

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operations, engage citizens, and provide public services in a more efficient and transparent manner.

The aim of e-Government, therefore, is to provide efficient dissemination and management of information to the citizen; better service delivery to citizens; and empowerment of the people through access to information and participation in public and policy decision-making. E-government can support more streamlined and responsive service, wider public participation, and more cost-effective business practices at every level of government. It ranges in complexity from basic access to official information to radically redesigned public processes.

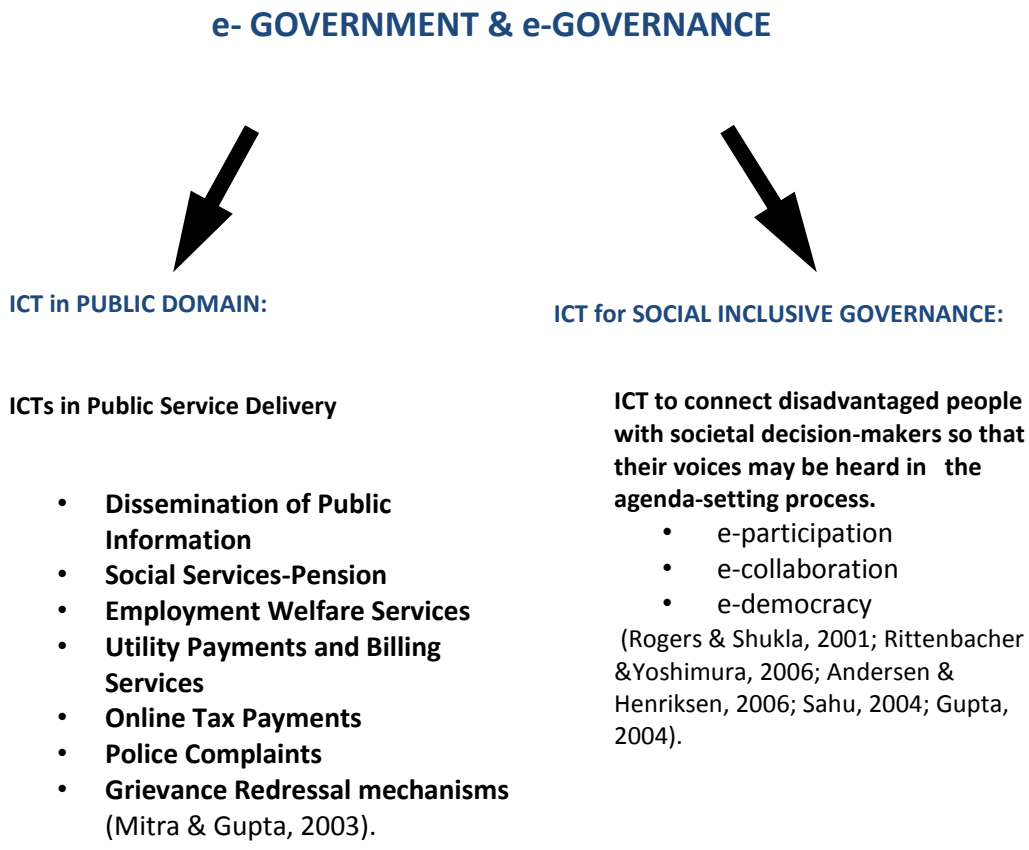

Figure 1.**e-Government and e-Governance different application**
Source: Author construction based on Dr. Charru Malhotra (2017)

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Furtherore the government agencies intend to use Information & Communication Technology (ICTs) for**:**

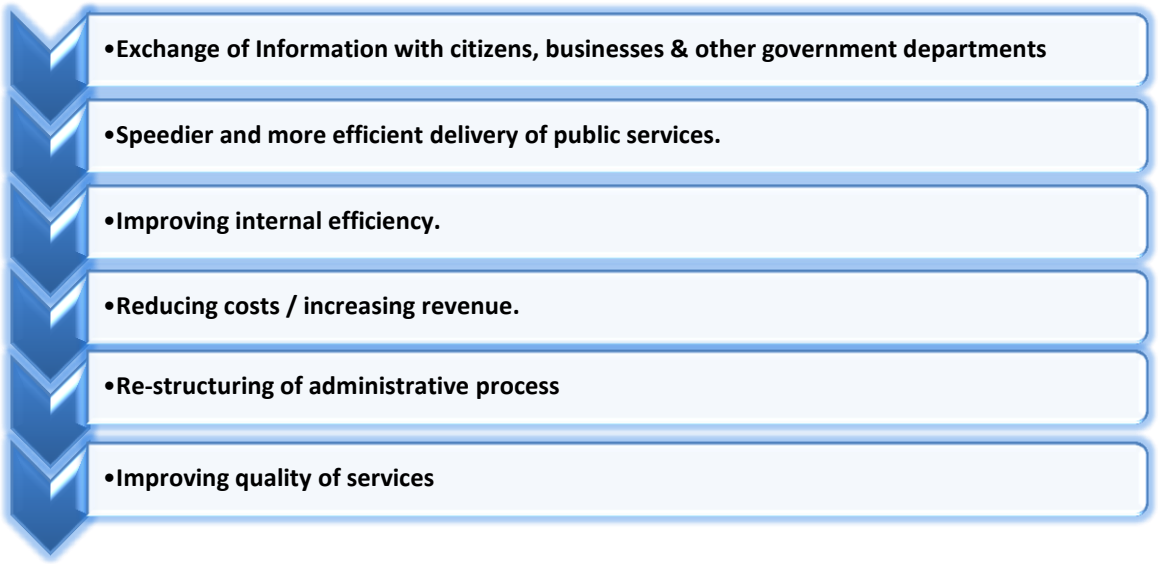

Figure 2. **e-Governance goals**

Meanwhile the advent of new information and communication technologies has made e-Governance as tool to enhance the below relationship.

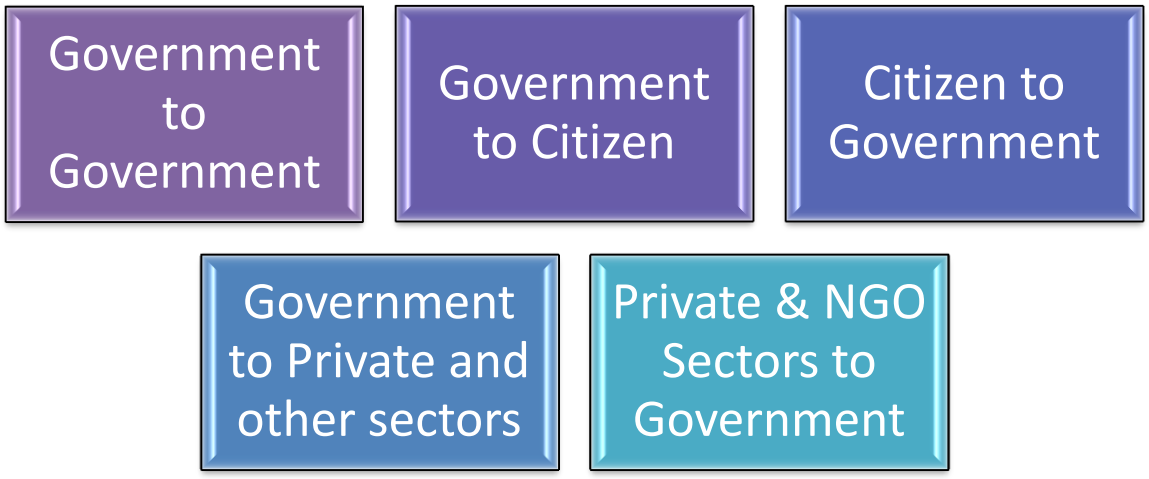

Figure 3. **e-Governance goals**

In 2016 by the attending differend field events author have experience a lot of dramatizations of rapidly changing world where as an example author can provide well know recent quotation:

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> *The world's largest taxi firm, Uber, owns no cars. The world's most popular media company, Facebook, creates no content. The world's most valuable retailer, Alibaba, carries no stock. And the world's largest accommodation provider, Airbnb, owns no property.*

(Tom Goodwin (2015), The Battle Is for the Customer Interface, Havas Media, cited in Hamish McRae (2015), Facebook, Airbnb, Uber, and the unstoppable rise of the content non-generators, The Independent).

Of course, nowadays ICT tools have rapidly increased their importance and their development speed is challenging for every field of economy and moreover important for the public sector. Nevertheless, such quotations are nothing to be afraid off and show just a good way of adoption of different project implementation approach and development of services by using more ICT tools. In this case, an author can as an example provide also the case of Europeans one of the biggest open-air market what also does not owns any food or goods for the sale, simply because it's a marketplace. Same as Uber, AirBnB, Facebook, Alibaba and so do Latvian biggest property seller www.ss.lv what is considered just as a marketplace.

The author points out that this example shows how important is project planning and defining of the best alternative to reach maximum benefit or maximize profit in case of the private sector.

Further, in this paper author provides practical benchmarks from the case study of Latvian project implementation and summarize Delphi analysis results in comparison of Latvian and Indian examples and public sector approach to the e-government project development.

Comparison with an Indian experience is based on author research and study internship and by rising potential of e-government of India as stated in the United Nations e-government survey 2016. *A transparent smart e-Governance with seamless access, secure and authentic flow of information crossing the interdependent barrier and providing a fair and unbiased service to the citizen* (Dr. APJ Abdul Kalam, Former president of India).

E-government and ICT environment in Latvia

One of Latvia's priorities since regaining independence has been to update its outdated data and voice communications sectors. Large investments have been made both in telecommunication and high-speed data transmission networks, and that trend is expected to continue. The Latvian government has adopted the e-Latvia program, which strives to modernize overall communications with the Latvian public and streamline documentation procedures. The most important elements of the program are the coordination and modernization of critical national information systems and the successful implementation of an e-governance system. U.S. companies have had recent successes competing for government contracts in this area, providing both technology and services.

Both Internet and electronic commerce are rapidly penetrating the Latvian market and increasing the need for information and communications technologies (ICT) products, services, and support. The total ICT sector turnover reached approximately $4 billion and the sector accounts for approximately 4% of total GDP.

For these reasons, the ICT sectors, including computer services, computer software, computer hardware and peripherals, and telecommunications services, have significantly increased their roles in Latvia's economy during recent years.

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Since 2002, the Cabinet of Ministers of the Republic of Latvia has approved the implementation of e-government concept; e-government has become an important public policy component.

Since 2010, ICT has been playing an important role in the improvement of the quality of life by providing electronic access and ICT skills, focusing on digital skills and the needs of the people-oriented public services.

Using the methodology and indicators, annually the EU member states prepare comparable figures for the use of ICT and its impact on sustainable economic development and social welfare. Considering that most of the EU member states have already introduced 20 basic services proposed by the EC, new indicators and methodologies will be developed, which will allow analyzing the availability of e-government in the future. One of comparable indicators, which will allow comparing the EU member states at the level of e-government implementation to meet citizens' needs, has promoted the development of public services.

In 2015, the Latvia's e-index was released, being the first national-level initiative helping state and municipal institutions to evaluate their digital development, to assess the necessary approaches and provide solutions for a more efficient development, as well as to identify the best examples implemented by other institutions and thereby enable exchange of experience and motivate further development of the digital transformation. Latvia's e-index was nominated as European Public Sector Award Best Practice example. Detailed information about this project can be found online at https://joinup.ec.europa.eu/community/epractice/case/latvia%E2%80%99s-e-index-national-egovernment-benchmark-state-institutions-and-muni.

The Information Society Development Guidelines for 2014 - 2020 were elaborated to ensure continuity of existing policies and to determine the priorities in the area of Information and Communication Technology (ICT) for the European Union Structural Funds Programming period for 2014 – 2020. Guidelines were developed in close cooperation with ICT industry, national ICT associations, Latvian Chamber of Commerce and Industry, Latvian Confederation of Employers, Latvian national committee of UNESCO, representatives of all ministries and representatives of local (municipal) governments. Wide coverage of different stakeholders involved in the development of the Guidelines provides a solid ground for 360-degree analysis of current shortcomings, as well as thorough understanding of future development needs and priorities, following the overall objective of enhancing the national competitiveness, economic growth and job creation. The goal of the Guidelines is to provide the opportunity for anyone to use ICT, to create a knowledge-based economy and to improve the overall quality of life by contributing to the national competitiveness, and increasing an economic growth and job creation. The focus of the Guidelines is economic growth and job creation. Each action line of Guidelines aims at improving competitiveness, economic growth and job creation.

Research and case study

Author research based on the trainings, workshops and study visits in differend Indian public entities or public ICT service providers.

During trainings and workshops author discussed the e-government project life cycle, solutions of the cloud technologies and open data in the public administration as well as e-government project implementation challenges of e-government project and its audit

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perspectives. Government has no business to do business. The focus should be on Minimum Government but Maximum Governance.

E-Government essence does not lie in "e", but in "governance"

Within the study on e-government projects and e-services, it was concluded that e-government is the essence of effective management in the implementation of the use of information and communication technologies (ICT). This means that the importance of direct service efficiency, rather than the process of digitization.

Effective e-government can be implemented by the transformation of public administration services, which means not just undertake activities for existing service transformation to the e-environment, but also assure the new solution confirmation with a customers (citizens) needs. Unfortunately, often this transformation does not reach the desired objectives; in fact, in many cases, this process is only the digitization, rather than reduction of administrative burdens or the improvement of the service's organizational structure.

At root, it has the power of ICTs, which provide three basic change potentials for good governance for development:

Automation: replacing current human-executed processes which involve accepting, storing, processing, outputting or transmitting information. For example, the automation of existing clerical functions.

Informatisation: supporting current human-executed information processes. For example, supporting current processes of decision making, communication, and decision implementation.

Transformation: creating new ICT-executed information processes or supporting new human-executed information processes. For example, creating new methods of public service delivery (Heeks Richard 2001).

Author stipulates that it is not just about finishing projects as per Specifications, in Time and within Budget. It is also about Changing People Behavior to Embrace & Adopt the Change. E-services implementation and the process of transformation, it is important to respect the three main elements – customer centricity (user friendly), efficiency and effectiveness.

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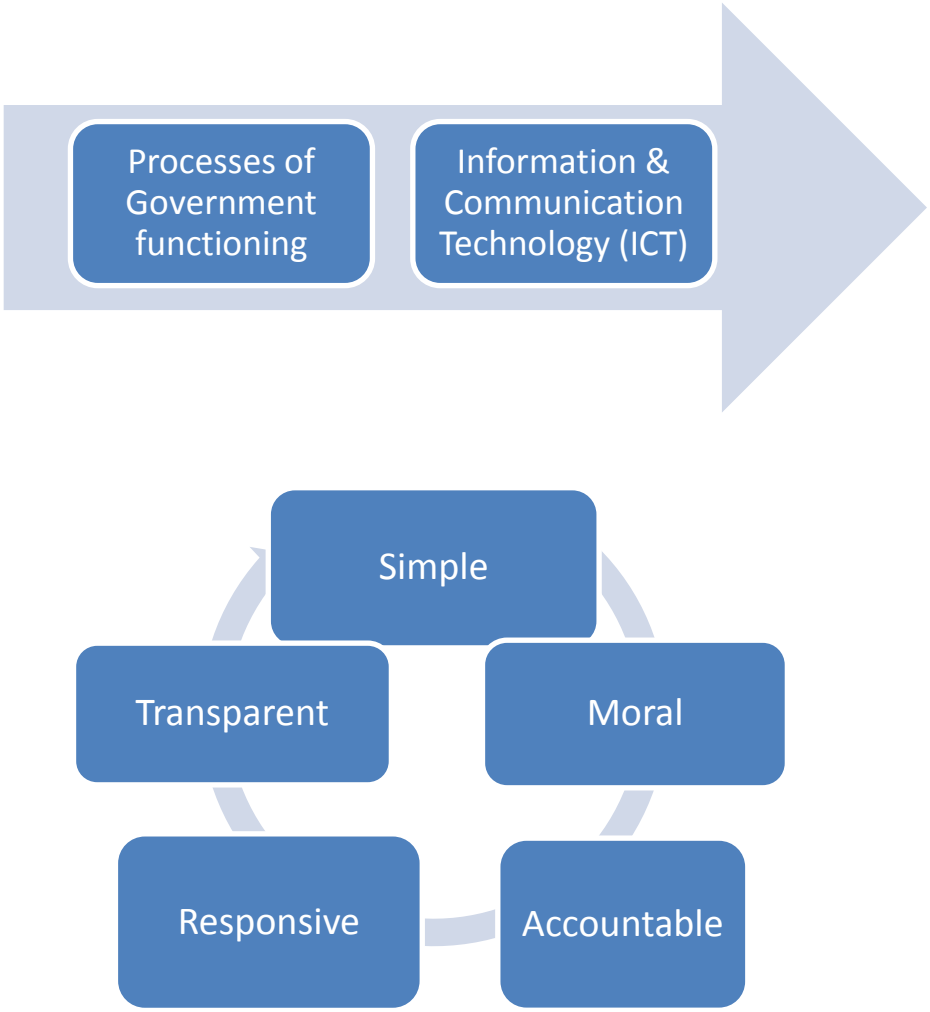

Figure 4. **E-governance and transformation factors**
Source: Author construction based on Nishant Jaiswal (2017).

E-government projects

E-government project implementation is attributed to a number of risks (uncertainty), and should be implemented in accordance with generally accepted project management best practices, which includes a project feasibility studies, planning, implementation, and conclusion, of course, adequate control activities shall be performed.

During the discussions and the analysis of the Indian government experience, it was concluded that e-government projects problems observed are common in several countries. As the most important aspect was mentioned insufficiently rigorous project planning to be attributed to a number of factors - the lack of a needs assessment, weak risk analysis, weak risk management during the project implementation, as well as issues of technical specifications and contractual development (legal aspects). An important drawback is the lack of stakeholder

ISSN 2256-0513, e-ISSN 2501-0263

involvement in the e-project planning and implementation. Public authorities formally involve the potential audience and the final recipients of the service for project development without adequate advisory support.

Increased risks of e-Government projects can be described by such factors as:

- High requirements volatility
- Need for more domain integration
- Bureaucratic Organizational environment based on Interlinked Processes (G2G, G2B, G2C2G)
- Emergence of systemic risk that cross national and sectoral boundaries (ripple effects)
- Complex feedback loops
- Discontinuity
- Diseconomy of scale
- Ambiguity- Uncertainty Rules (events, Political scenarios….)
- IT Policy & Law

The e-Government has now embraced the convergence capabilities of ICT, computers, Internet, Telecommunications, multimedia, digital broadcasting, and social media etc. that further aggravate the system's & user's vulnerability. Traditionally, e-G entered around only the operations of government; but now includes citizen engagement and participation in governance through the use of ICT to achieve good governance.

Open data in public administration

During the study much attention was given to the open data and its accessibility. Open data is the preferred way in which the generally available information is accesable to the citizens. Public administration data availability and open manner is one of the e-government policy framework 2014- 2020 principles in Latvia as well as in EU in general.

Open data access can be extended to all the information what public authority publishes, such as public registers and public information systems, public research, statistics, charts and more. Approach is based on the idea that public information is transferred in a form to be processed and analysed furthermore by the reciever.

In accordance with the open data fundamental principles information must be available:

- free of charge;
- online, without access restrictions;
- machine-readable format that can be automated process with readily available applications.

Pursuant to those principles would ensure an open-system idea. However, to fully be able to use the published information (data), it should also contain a metadata or structured information that defines the set of information.

Open data examples Latvian:

- Natural data management system "Oak": http://ozols.daba.gov.lv/pub/ (able to "export GIS data ');
- Company register open data: http://dati.ur.gov.lv;

ISSN 2256-0513, e-ISSN 2501-0263

- Riga open data catalog: https://opendata.riga.lv/;
- Statistical database: http://www.csb.gov.lv/dati/statistikas-datubazes-28270.html(iespēja export data in different formats);
- Regional development indicators module: http://raim.gov.lv (Section "Data selection", "Free access to the data");
- Procurement Monitoring Bureau, open-system (Open PMB) Service: http://open.iub.gov.lv/.

Although discussions on public administration open data assurance in Latvia has been a topical issue for the recent years. Latvia is on the bottom between European Union countries in the field of open data (European Commission's 2016 annual report, see Fig.5). In November 2016 Latvian Open Technology Association (LATA) sent to the Prime Minister Mr. Māris Kučinskis and Information Society Council, chaired by the Prime Minister, proposals for the Latvian public administration open data policy improvements.

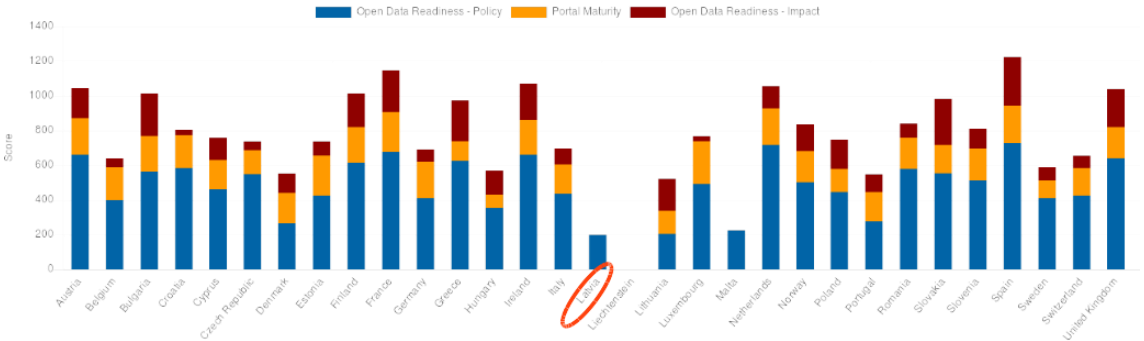

Figure 5. **Government Open data accesability in the European Union**
Source: European Commission E-gov report

Legal and security aspects of e-government solutions

By the increased use of information and communication technologies and e-services, the data security and legal aspects becoming more and more topical issue. In the process of transforming, the range of services requires a knowledge-based approach, providing liability and other legal aspects of the implementation. The new approach to cloud computing, an introduction of third-party software usage in the public administration internal and external communication (eg Skype, WhatsApp, e-mail service providers) suggests as safety aspects, especially in the field of sensitive data protection. At the same time author concludes that most of the users do not read the third-party developed privacy policies or applications and software terms of use.

In recent years cybercrime and crimes committed in the electronic environment rapidly increasing. Moreover, the world now facing new threats and countries must also consider cyber-terrorism, this is a brand new concept for public administration. Unfortunately, a few high-profile international cyber footprints leading through the Latvian-based servers and Latvian nationals have participated in such kind of committed offenses.

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These examples lead to the need of discussion about the legal basis for the adjustment in cyber security. However, the debate was concluded that public administration is facing a significant lack of competence – lack of appropriate personnel who have the appropriate knowledge at all management levels. In addition, the aspects of cyber security can not be attributed only to the judiciary and lawyers. Responsibility should be taken for every party involved - both public administration authority and the customer/user.

Key findings and best practices:

- The public sector is often outsourcing a "thinking" process, which is not considered as best practice. It is preferable to purchase only professionals - expert advice or other types of services, but not giving up professionalism and ability to think by them and to analyze specific processes in specific sectors.
- Public sector poor knowledge, lack of experience in ICT project planning. Technical specifications are developed careless, are not defined clearly and thoughtfully by the contractual conditions, which subsequently causes unnecessary additional costs. Does not store a copyright ownership, poor licensing policy solutions developed.
- E-government projects transition from the simple digitization of the electronic services, which is understandable to the people and that they use. G2C principles (G2C - Government to Citizens). Transformation of e-government solutions from simple digitization processes on a real full cycle service to the public (electronic solutions, mobile solutions).
- ICT systems security aspects are often forgotten in the planning of e-government projects. Safety aspects are not always addressed in the audit. There may be problems with the centralized electronic procurement systems, manipulation and fraud schemes analyzed IT system audit files, as well as methods of fraud, which is not shown in a particular system audit files. Security aspects should always be more than one security element (data encryption, passwords, chip card, biometric data etc., Etc.).

During the study author analysed the latest United Nations annual report on e-government and e-government index. In the latest report, Latvia is ranked as 45th, while India 107th (Instead of Lithuania – 23rd , but Estonia 13th). Although Latvia assessment provides a high index of human capital in ICT, but it is lagging behind in e-participation index in comparison with other European countries, being only as 85th in the rank position. This might suggest that there is plenty of e-solutions, but citizens are not using them for various reasons, perhaps because of e-government solutions are not fulfilling G2C (Government to Citizens) approach. This could be attributed also to the possible receipt of the service alternatives that people seem more comfortable and simpler compared to electronic solutions.

Delphi results could be summarized according to the standard project phase model as shown in the Table No.1.

ISSN 2256-0513, e-ISSN 2501-0263

Table No.1

Problems identified in the project audits

No.	Project phases	Problems
1.	**Initialization**	• Weak problem analysis; • Defined goals not always comply with other strategic goals and/or problem analysis; • No links between policy making, planning and budgeting (political influence).
2.	**Planning**	• No plans at all or they are very general, outdated; • Weak ICT project planning; • No detailed alternative analysis.
3.	**Implementation**	• Poor HR management; • Weak change management; • Weak procurement and contract management; • Weak risk management.
4.	**Closure, controlling, ex-post**	• No result and goal achievement analysis or it is formal; • Slow product implementation and or start of processes the project was aimed for; • No future business strategy or it doesn`t comply with project specific goals; • No ex-post monitoring and/or evaluation.

Source: Prepared by the author

E-Governance in Latvia and its audit perspective (Case study of e-government project)

There is currently no overall eGovernment legislation in Latvia. However, the 'Law on State Information Systems' provides a legal framework for the operation of State Information Systems and the cooperation of concerned organizational units.

There are no specific units designated for the audits in the field of e-governance and in the case of audits where should be assessed information and communication systems information system auditors are engaged in the audit work. IT auditors working at the Audit and Methodology department of the SAO of Latvia.

The information systems auditors of the State Audit Office keep taking active part in the "E-management" subgroup of EUROSAI, wherein audits performed in the field of ICT are examined and a database is developed for summarizing information on audits performed by supreme audit institutions in the field of ICT, on risks found and conclusions made therein. The database services as grounds for a way how Member States share experience with performed IT audits.

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However, ICT projects are worth being emphasized in particular. These projects include the e-health system project, saving of electronic documents and data in the National Archives of Latvia, etc. The inability to define clear goals and measurable results to be achieved, to ensure professional project management and successful project implementation has prohibited the State from using all of its potential that had to be given for investments in ICT development — neither efficiency improvement, nor more convenient availability of services to inhabitants, nor availability of information to the State administration for making better decisions. To provide support to the executive authority for improving the situation, the State Audit Office has summarized the main conclusions and recommendations, as well as, in cooperation with the State Chancellery, invited all interested parties for discussion: a new practice that is planned to be continued also in other areas, in which the State fails to achieve goods results.

The State Audit Office has concluded three-year cooperation with 14 local governments of Latvia in the implementation of recommendations in the field of information technologies which resulted from the audit "Software Management Assessment in Local Governments and Local Government Educational Institutions" conducted in 2013. The recommendations were implemented 97% in the Riga and Ventspils local governments, Alsunga, Alūksne, Cesvaine, Jēkabpils, Koknese, Krustpils, Līvāni, Rauna, Rundāle, Sēja and Skrīveri District local governments.

In 2013 when the implementation of the audit recommendations were initiated in the audited local governments software management was not developed; even the basic IT security mechanisms and control were not implemented, thus failing to provide for assigning responsibilities and development of the main regulations and their application to the protection of information systems and data. Due to unlimited access rights and insufficient control over users' activities almost one fifth of the inspected software installed in local governments' computers was used illegally and the local governments were not able to prove the user rights of the software. More information available online at: http://www.lrvk.gov.lv/uploads//Majaslapa%20ENG/News/informacijas-tehnologiju-parvaldibas_eng_final.pdf.

In 2016 The State Audit Office has taken a new initiative and made its very first public discussion paper in the area of information and communication field. Discussion paper includes the insights and reflections on challenges gained during the audits by the State Audit Office that would allow prevention of systemic problems and invite the public to find better solutions. ICT play a major role in the economy of Latvia and its importance in the last years have increased. This leads to better understanding of public expenditures and efficiency of e-governance and ICT projects implemented in Latvia.

CASE STUDY ON E-HEALTH PROJECT AUDIT

DESCRIPTION OF THE AUDIT

Objective of the audit

Objective of the audit is to verify efficiency and productivity of the actions by the institutions in charge for implementation of the e-health, as well as to audit economy and productivity of use of funds invested in the project for achievement of set objectives and gaining the planned benefits, including:

- is the policy implemented by the Ministry of Health in the area of the e-health updated and compliant with the directive of the European Parliament and the Council;

ISSN 2256-0513, e-ISSN 2501-0263

- do the activities of the National Health Service in fulfilment to the e-health policy ensure for successful and quality implementation by the set deadlines and achievement of objectives and results set in the guidelines;
- will the access to the e-health information system be ensured;
- have the financial means invested within course of implementation of the e-health been used in an efficient and productive manner;
- if the e-health information system set up by the National Health Service relevant (of high quality), covering the required scope and functionalities;
- is the high level information security and protection of personal data ensured in the e-health information system;
- has the Ministry of Health provided sufficient supervision over successful introduction of the e-health.

Legal grounds

The performance audit „The Health Care Information Systems" has been conducted according to the work plan of the State Auditor's Offices for the year 2014 and the audit assignment No.2.4.1-7/2014 of the Third Audit Department of 31 March 2014.

The audit was performed by the head of the audit group – Senior State Auditor Mareks Zvirgzdiņš, State Auditor Līga Kotāne and the Information Systems Auditor Mārtiņš Vilmanis.

Liability of the auditors and the audited unit

Auditors of the State Auditor's Office are liable for provision of the audit opinion based on sufficient appropriate and reliable audit evidence.

The Ministry of Health and the National Health Service are in charge for adherence to the legal acts and accuracy of information provide to the auditors.

Audit scope and limitations

The audit has been performed in accordance with international audit standards applicable in the Republic of Latvia. The audit has been performed as to obtain sufficient assurance on the measures taken by the audit entities included in the scope of the audit – the Ministry of Health and the National Health Service – for implementation of the health care policy, i.e. successful implementation of the Guidelines „E-health in Latvia".

The audit has been performed for the time period starting from the 1 January 2007 through to 1 April 2015.

Since the audited time period covered the day of transition from the Latvian national currency lats to the euro, all the numerical values used in the audit report have been translated into euro by applying the currency exchange rate of one euro being equal to 0.702804 lats.

The audit scope covers:

- the Ministry of Health as the leading authority of the health care sector developing the health care policy, organising and coordinating implementation of the health policy;
- the National Health Service which according to the health policy is implementing the e-health policy and is a holder of the e-health information system;
- the providers of the health care services which have to enter the patient related data in the e-health information system.

Audit limitations:

- the audit tests were performed without using sensitive data of the patients, therefore no achievement of resulting indicators of the implementation of the e-health was tested, since

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the majority of these are patient related and the productively used time for obtaining of information, filling in of medical records and communication with health care professionals;

- the audit scope does not include and tests the activities in the area of the management information systems of the emergency medical aid and catastrophe medical assistance, including the project of the European Regional Development Fund „Setting up of the Control Information System and Dispatcher's Centres 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), that was implemented by the Emergency Medical Service, e-health activities for development of unified control information system of the health care sector, including the project of the Health Care Ministry „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)" and in the area of development of a universal information system for supervising and monitoring of the infectious diseases there were undertakings I which were involved various currently reorganized institutions, but systems maintenance is ensured by the National Health Service;
- the safety of the data of the information system in conjunction with the external factors was not assessed, e.g.,., unauthorised access of the third parties to the data of the system, safe data storage (protection of various levels), fragility of the software (protection against unauthorised software and malware), cryptography keys and methods;
- at the moment of carrying out the audit there was not possible an inspection of the solution in the production environment (including applicability tests, solution development scope tests, functionality and in-build control tests, etc.), thereby the inspections were carried out in integrated test environment. During the performance of audits, we observed also that some functionality of solutions does not work. We received an approval that during the performance of tests in the test environments there were installed the delivered changes. This fact should be taken into account, upon analysing the conclusions of tests, that due to the changes of deliveries may not be repeatedly observable;
- together with the integrated system's test environment unstableness we could not fully verify all the planned inspections. The situation where it is not possible to perform all the planned tests in full significantly increase the risk in the production environment there could be discovered major applicability problems. It should be taken into account that the availability and the response times may differ in the production environment.

Table 2

Assessment criteria

Audit issues	The criteria set	Criteria has been achieved/ criteria has not been achieved
1. Will the e-health policy be able to solve problems and achieve the objective?		
1.1. Has objective and high quality information been used in drafting of the policy documents?		
Development of the policy for use of information and communication technologies in the health care	Policy has been developed	Criteria has been achieved – the policy has been developed
Justification of the policy	Policy is prepared on a quality basis	Criteria has not been achieved – policy have not been prepared on basis of studies performed, surveys and situation analysis, no alternatives have been studied

ISSN 2256-0513, e-ISSN 2501-0263

Audit issues	The criteria set	Criteria has been achieved/ criteria has not been achieved
1.2. Have the policy documents been updated?		
Topicality and actual reflect of the current situation by the policy documents	Policy is updated, corresponds to the current situation	◘ Criteria has not been achieved – the policy has not been updated
1.3. Has the assessment of policy documents been assessed?		
Policy impact assessment	Has been performed assessment of impact of policy	◘ Criteria has not been achieved – no assessment of impact of policy has been performed
1.4. Have the interests of all stakeholders been considered in implementation of the e-health system?		
Involvement of stakeholders in the development	Stakeholders have been involved and the interests have been safeguarded	◘ Criteria has not been achieved – no industry professionals have been involved in drafting of planning documents
1.5. Have the criteria been set for measuring of resulting indicators and achievement of objectives?		
Policy objectives and resultative indicators	Achievable objectives and measurable resulting indicators have been set	◘ Criteria has not been achieved – the defined objectives are not detailed and measurable, the resulting indicators cannot be assessed, are incomplete and not updated
1.6. Will the user's access be ensured to the e-health system?		
Accessibility of the e-health system	Has been provided accessibility to the potential users	◘ Criteria has not been achieved – there is a risk that after introduction of the e-health information system it will not be accessible by all users
2. Are the actual activities performed by the National Health Service justified for achievement of the set objectives?		
1.1. Does the management of implementation of e-health enhance the achievement of e-health objectives?		
E-health management	Orientated to achievement of e-health objectives	Criterion is not achieved – implementation of e-health is not oriented to achievement of e-health objectives
2.2. Do the activities taken for development and implementation of the e-health comply with the plan		
Compliance of the activities taken for implementation of the e-health with the planned activities	Activities comply with the planned activities	◘ Criteria has not been achieved – about 54% of the planned activities are being implemented according to the plans
2.3. Do the activities taken for development and implementation of the e-health comply with the financial budget?		
Acquisition of e-health implementation budget	Acquisition of the granted budget ~ 100% (+/-5%) Stage I 10 102 002 euros Stage II 4 720 981 euros	◙ Criterion is not achieved , the acquisition of the funding of Stage I- 97% ◘ It is possible that the criterion will not be achieves- the acquisition of finances of Stage II is insufficient, at the end of the project- solely 3%.
Financial estimated of e-health implementation	The costs of implementation of e-health activities fall under the planned financial estimates	◘ Criteria has not been achieved – costs of implementation of the e-health activities deviate from the planned ones by - 81% to 127% ◘ Criterion has not been achieved- the e-health implementation budget exceeds the defined budget

ISSN 2256-0513, e-ISSN 2501-0263

Audit issues	The criteria set	Criteria has been achieved/ criteria has not been achieved
		for 154 364 euros.
2.4. Is implementation of the e-health meeting the set deadlines?		
E-prescriptions implementation deadline	07.12.2014.	◘ Criterion has not been achieved – not implemented by the set deadline, planned to implement by 01.10.2015.
Electronic health card implementation deadline	10.12.2014.	◘ Criteria has not been achieved – not implemented by the set deadline
Implementation deadline for electronic booking, electronic organisation of the health care work flows and public health portal	29.12.2014.	◘ Criteria has not been achieved – not implemented by the set deadline
2.5. Are the health care service providers ready to join the e-health system?		
Awareness and readiness of users of e-health system	Upon initiating mandatory usage of system, 100% of users shall be aware, trained and technically ensured.	◘ Criteria has not been achieved: ▪ computer hardware is available only in workplaces of 83% of health care professionals and 97% of pharmacists ▪ computer and internet skills of 59%-71% of health care professionals and pharmacists are good and very good ▪ about 15% of the potential users have undergone general training of use of information technologies; ▪ 4% of potential users have received the training in e-health information systems ▪ only 115 from the health care specialists and pharmacists are informed on the implementation of the „E-health in Latvia" project; ▪ 12 from the 13 of the surveyed pharmacies and health care institutions having agreements on testing of the e-health, have not started testing it by the February, 2015
2.6. Is public informed and educated on implementation and benefits of the e-health?		
Awareness of Latvian population on implementation of the e-health in Latvia	60% of Latvian population has been informed	◘ Criteria has not been achieved – only 47% of Latvian population are informed on the introduction of the e-health
Awareness of Latvian population on benefits of implementation of the e-health	40% of Latvian residents have been informed	◘ Criteria has not been achieved– approximately - 11% of the Latvian population have been informed on benefits of implementation of the e-health
2.7. Is the e-health web site easy to use?		
Information system shall be used according to the intended usage	Shall be used without a particular training of users	◘ Criterion is not achieved- during the inspections it has been observed that many average or unsubstantial deficiencies of applicability, as well as could not perform all the applicability tests since the e-health system is not yet ready.
3. Will necessary information security and personal data protection be ensured in the newly built e-health information system?		
3.1. Has the system been completed from the point of view of information system's security?		
Development of internal legal acts and actions in the area of management of the	Internal laws and regulations have been drawn up, activities are	◘ Criteria has not been achieved – not all of the required internal legal acts have been developed and not all of the actions are performed in the area

ISSN 2256-0513, e-ISSN 2501-0263

Audit issues	The criteria set	Criteria has been achieved/ criteria has not been achieved
information systems and data protection	regular and correspond to requirements of external laws and regulations	of information systems safety management and data protection
Safety assessment of the e-health and elimination of the safety drawbacks	Activities are sufficient and in the defined scope	Criteria has not been achieved – activities for assessment and elimination of the safety deficiencies of the e-health are not sufficient

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 is not implemented according to the good practice, e-health plan is not developed, upon unifying all the e-health project activities, measures for coordination of project activities are not ensured;
  - Project managers have not sufficient education and experience in management of projects of similar complexity, moreover project managers have been changed for multiple times;
  - In the level of the program 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 are simultaneously started three major e-health projects that the results of which are ensured with partial compatibility.
- The State Auditor's Office believes that the guidelines „E-health in Latvia" will not be introduced in Latvia in full, because the implementation period of the guidelines was by the end of the 2015 and by the late 2014 no e-health activities were even started for the implementation of which the funding amounting to 46% from the total financing of the e-health was assigned.
- National Health Service has not ensured a timely and compliant with technical specifications and good management practice accepttesting 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 accepttesting has been taken minutes of and the pilot operation minutes that were presented instead of accepttesting minutes do not certify that the requirement of technical specification is observed and that the customer performs accepttest, thereby the delivered functionality of the solution cannot work according to the defined requirements.
- Since 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.

ISSN 2256-0513, e-ISSN 2501-0263

- 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[‡‡‡‡‡], thereby risk persists that upon using these solutions, healthcare processes will not be improved, thereby creating e-health information system users unsatisfaction and unwilling to use e-services, thereby not obtaining planned benefits.
- By the 1 April 2015 the National Health Service has not ensured users access to any of the 26 e-services notwithstanding the fact that introduction of the e-health policy was started in 2007, currently 9 762 697 euro have already been used for implementation of the e-health measures managed by the Service, and 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 in disposal of the Ministry of Health there was available financing in order the solutions of the e-health project, Stage I were possible to start to use (in production environment) in planned term, i.e., from year 2013, nevertheless the Ministry plans to start partially use the e-health information system by year 2016, thereby in three years' time direct financial benefits have not been gained amounting to 3 millions of 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 has not been 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.
- Due to an incomplete procurement documentations or non-quality e-health solution developed, as well as slow implementation of e-health, upon improving the initially developed e-health solutions 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 has been included a payment also 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.

[‡‡‡‡‡] 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"

ISSN 2256-0513, e-ISSN 2501-0263

- Risk persists that during the implementation of e-health have not been used the most beneficial and profitable information and communication technology solutions, 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 practice and not employed other benefits of standard solutions;
  - there are 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 been 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 by 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 in time, since they have not been necessary or received services are 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 has 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 have not been 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 to 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, as 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-

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prescriptions information system will be available at the production environment, while concerning the other three realized 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 have 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 will 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 the final inspections of projects it will be established that the aims of the projects are not achieved, thereby the funds amounting to 11 352 647 euro used in European Regional Development Fund may be recognized as inexpediently spent.
- Ministry of Health has not ensured preparation of the thorough action plan for involvement of the health care service providers in the e-health information system, e.g., the health care 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 of the fast approach of the deadline for implementation of the Guidelines „E-health in Latvia" the Ministry of Health has not paid due attention to readiness and awareness of the health care service providers which is evidenced by the following data:
    - 17% of the health care professionals and 3% of pharmacists at their work place do not have access to the computer hardware, thus the users have no access to the e-health information systems;
    - self-assessment of 29%-41% of the health care 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 health care professionals and pharmacists are duly informed on the implementation of the project „E-health in Latvia";
    - 12 institutions out of 13 surveyed health care 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.
- National Health Service has not ensured due information and education of the public on implementation of e-health, including the planned health care 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

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informed on benefits of implementation of the e-health which indicates to low awareness level in relation to introduction of the e-health services and benefits brought by their use, which in turn increases the risk that the public will not be using the new e-health services.

E-health web site developed by the National Health Service more than 50% from applicability tests were not able to perform, since the web site was available only in test environment with a 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, non-complete assistant information, system does not support most popular internet web browsers, no activities were implemented that would ensure an easy access for information for people with functional disorders etc.). Prevention of mentioned deficiencies would improve usage of information system.

Conclusions

The author concludes that e-Government projects have rapidly increased their importance in public service delivery improvement processes. Nevertheless, any project is implemented in a strong condition of uncertainty what leads to possible risk occurrence during the implementation. Author practical studies showed partial potential and knowledge sharing of Indian government experience as well as provided an analysis of the case study of e-Government project audit perspective. The study shows that Latvia is ranked only by the 85th place in the e-participation index what is serious alert for the e-government policy improvement. Meanwhile, the biggest impact factor at the micro-economical level still reveals as human resources and lack of knowledgeable and appropriate personnel in the public sector.

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