Evaluation of the key trends and priorities of information society development in Lithuania for 2014-2020

Summary in English

This study aimed to assess the key trends of information society development in Lithuania and to suggest priorities, objectives, key targets and expected results for 2014-2022 (taking the possible funding from EU Structural Funds into consideration). The research was based on previous research and evaluations, media articles and statistical data (Statistics Lithuania, Eurostat, Digital Agenda Scoreboard, etc.). Lithuanian and EU's documents and laws were also analysed; approximately 70 interviews were conducted in Lithuania and abroad; case studies were carried out in five foreign countries (Austria, Canada, Estonia, United Kingdom and the USA). Also, EU's policies on information society development were assessed. Based on this data, the study proposed eight recommendations for information society development in Lithuania 2014-2020.

Lithuanian information society in a comparative context

Lithuania holds average positions in various international comparative indexes and this position has not changed much since 2007.

- ICT Development Index: Lithuania dropped from 33rd place (2007, among 154 countries) to 35th place (2010, among 152 countries)[1];
- Network Readiness Index: Lithuania dropped from 39th place (2007, among 122 countries) to 42nd place (2010, among 138 countries)[2];
- Digital Economy Ranking: Lithuania increased its position from 41th place (2007, out of 69 countries) to 34th place (2010, among 70 countries)[3];
- E-Government Development Index: Lithuania remained in 28th place (2008, among 182 countries; 2010, among 183 countries)[4].

These numbers indicate that investments in information society helped Lithuania to maintain its position in international rankings. However, other countries have also devoted a lot of effort to information society, thus overall Lithuania's position has not improved. Only in a few areas (for example, fiber optic deployment) Lithuania has been developing very fast and this trend is reflected in the Digital Economy Ranking; nevertheless, there was a number of negative trends that prevented the country from gaining higher position in the rankings.

This study revealed that the lack of consenus on the main priorities and major projects is the key problem impeding information society development in Lithuania. Although some policy documents aim to address this issue (for example, Program of Information Society Development 2011-2019), there is a lack of inter-institutional agreement and cooperation. Various public agencies implement measures relevant for information society development, however they do not see themselves as a part of a larger picture and common effort. The existing coordination system in Lithuania ensures some cooperation at the level of

[1] International Telecommunication Union, UN.
[2] World Economic Forum and INSEAD.
[3] the Economist Intelligence Unit and IBM.
[4] United Nations.

implementation (for example, making sure that new information systems are formally approved and have integrated solutions for interoperability) and this is an important achievement as compared to the period until 2006. However, there is a lack of a higher-level agreement on questions where a thorough inter-institutional discussion and some compromises are needed (e.g. the optimal number of public data centers in Lithuania).

Trends of information society development in Lithuania since 2007

For the analysis the key information society developments and achievements, we used an analytical model based on the three groups of ICT users (people, business and the government). In addition, we examined the development of ICT infrastructure. These four perspectives helped to structure the study yet they also overlap with each other (for example, both e-Government services and ICT infrastructure are important for individuals, business and the government), which is unavoidable given the horizontal nature of information society policy.

People

Achievements / strengths	Problems / weaknesses
General use of ICT	
- Lithuania is one of the leaders in the EU by the number mobile phone subscriptions (148 subscriptions for 100 individuals (4th place in the EU, 2009).	- Even though ICT usage has increased in Lithuania, the country maintains an average position (18-20th places) among other EU members and this position has not changed for the last five years. This data indicates that other countries have been improving as fast as Lithuania.
Individuals' level of internet skills	
- Individuals, who use the internet, have high internet skills (27 pct. of individuals in Lithuania have high internet skills, 2nd place in the EU, 2011).	- 47 pct. of individuals in Lithuania (aged 16 to 74) have never used the internet or their skills are very low. In 2011 there were approximately 900 000 of individuals in Lithuania who had never used the internet.
Internet demand	
- 2006-2010 the usage of internet banking by individuals has increased considerably (24 pct. pts.).	- High level of self-exclusion; in 2011 73,6 pct. of households that did not have internet at home indicated that they "do not have a need for it"; - The usage of e-services is low, as compared to EU average.
Digital divide	
	- Digital divide is high among certain groups of society. The main factors that determine digital divide are age, income, residence and disability.
Lithuanian language and cultural heritage on the internet	
- 2006-2011 the usage of digital cultural objects increased considerably; - 2010-2011 the number of visitors of the website www.epaveldas.lt increased substantially.	- Not all the digitalized objects are available on the internet; - Low awareness and usage of digitalized cultural heritage; - User interface (www.epaveldas.lt) is underdeveloped and not user-friendly; - Low international accessibility to digitalized Lithuanian cultural objects; - Lack of cooperation among Lithuanian heritage institutions impedes on "one-stop" access to digital cultural heritage; - Lithuanian heritage institutions lack technical equipment, financial and human resources to digitalize cultural heritage; - Lithuanian heritage institutions do not have sufficient initiatives for sharing digitalized cultural objects with the main website www.epaveldas.lt; - The data on availability of digitalized cultural objects is incomplete.
Individual privacy and safety on the internet, harmful (illegal) internet content	
- The amount of regular internet users who use antivirus software has increased in recent years.	- Lithuanians are not fully aware and underestimate security threats on the internet; - Unsafe children behavior on the internet.

Business

Achievements / strengths	Problems / weaknesses
ICT use in business	
- Almost 100 pct. of enterprises in Lithuania use computers and the internet; - The speed of internet used by Lithuanian enterprises, is one of the highest in the EU. - Mobile internet usage has increased considerably.	- Lithuanian enterprises use many ICT tools; however, the internal integration of ICT systems and processes, automatic exchange of business documents (e.g. sending and receiving orders that could be processed automatically) remains low (Lithuania ranks 20th or lower among other EU members).
E-business / e-commerce	
- In 2011 Lithuanian enterprises' total turnover from e-commerce amounted to EU-27 average; by the percent of orders that enterprises received on-line Lithuania ranked 6th among other EU countries.	- Lithuania ranks 25th in the EU (2010) by the percent of individuals who have ordered / bought goods or services on the internet; - Lithuania ranks 25th in the EU by the percent of individuals who have ordered / bought goods or services on the internet from other EU countries.
ICT business	
- 2006-2011 a number of big companies invested in Lithuanian ICT sector (e.g. Barclays Technology Center, Western Union)	- Lithuania lacks ICT professionals and in the future this shortage will increase further; - High fluctuation of R&D investment by ICT businesses shows dependency on a few separate investments.
Green ICT	
	- Even though EU's documents emphasize the usage of smart technologies (grid, meters), Lithuania has made little progress in this field; - Lithuania does not meet its policy targets on green public procurement even though they are lower than those of the EU. - In 2010 only 1,6 pct. of IT enterprises had implemented environmental management systems. As a comparison, these systems were implemented in 47,62 pct. of enterprises in construction sector.

Public sector

Achievements / strengths	Problems / weaknesses
Digitalisation of public services	
- 2006-2010 online sophistication of Lithuanian public services increased by 16 pct. points, full online availability rose by 32 pct. points; - Online sophistication of public services for citizens has become the same as the online sophistication of public services for businesses; - Lithuania ranks 3rd among other EU members (2010) by the business use of e-Government services.	- Despite intensive digitalisation of eGovernment services 2006-2010, Lithuania holds an average position in the EU by the use of e-Government services among the citizens (23rd in 2010). - Lithuanian e-Government website (www.evaldzia.lt) is less developed and user-friendly than similar websites in the other EU countries (especially Estonia, Austria and the UK); many people are not aware of its existence and do not use it; - There is no systemic monitoring of public services that are not included of EU's list of 20 basic public services; - Low online sophistication of municipal e-services; - Low online sophistication of e-health services; - ITS projects face numerous implementation problems: lack of common vision among public institutions, weak national coordination, fragmentation of functions between national and municipal governments, lack of experience with project implementation and lack of cooperation.
ICT based quality and operations management systems, information systems	
- Better understanding that ICT increase productivity; accumulation of experience on ICT procurement and management (learning from both good and bad practice); - Projects that support sharing ICT resources in the public sector (municipal e-services, e-health services in municipalities, etc.)	- Institutions focus too much on computerisation and not enough on substantial and procedural changes when implementing ICT-based management systems. - Institutions do not share ICT resources but separately invest in ICT separately, although sharing of resources in many cases is cheaper and more effective. - There is a lack of ICT system integration and interoperability within public institutions and among them.

ICT skills of public servants, ICT professionals in the public sector	
- EU Structural Funds support a number of measures that provide training of public servants, including digital literacy trainings.	- There is no exact estimation of how many ICT professionals work in the public sector; - Many experienced ICT professionals are poached by the private sector; - Many institutions in the public sector lack skills to control contractors and service providers from the private sector.

Infrastructure

Achievements / strengths	Problems / weaknesses
Broadband deployment	
- Lithuania ranks 6th in the world and 1st in the EU by fiber broadband penetration; - The speed of the internet is rising; - Lithuanian business intensively uses broadband internet.	- Despite the rising broadband penetration rate 2006-2011, Lithuania stays below EU's average (19th among EU's members in 2011); - The "last mile problem" is still relevant in rural areas; - Low use of the mobile internet.
State information resources and state ICT infrastructure	
- The Law on State Information Resources Management, adopted in December 2011, creates a legal basis for interoperability, optimisation and consolidation of state information resources.	- Purchases of ICT infrastructure and software in the public sector are decentralized and partly coordinated by the Information Society Development Committee under the Ministry of Communications and Transport. - Different organisations buy a lot of ICT resources that are neither sufficiently used nor interoperable with each other; - Public sector organisations tend to accumulate ICT infrastructure and as the result substantial resources for maintenance and further development are needed; - There is a lack of experience and procedures how to share public ICT infrastructure.
E-signature and e-document	
- High use of e-signature in enterprises; - 2011 many banks enabled their customers to use e-banking services and open savings accounts by using e-signature; - About 700 000 people in Lithuania have the means to use e-signature; - The use of e-signature in the public sector increased in 2011 (e.g. project "ELPAS", which enabled ministers to sign documents using e-signature).	- The low use of e-signature in the public sector (certificates of public servants) is determined by the lack of motivation and skills, lack of interoperability among the document management systems, partial coverage (public servants, employed under employment contracts are not provided with certificates of public servants), etc.; - Despite considerable investment in ICT-based solutions, Lithuanian public sector institutions still work on the basis of paper documents. This is caused by the lack of interoperability among the document management systems; slow changes in organisations' internal processes; public servants lack the skills and are unaware of how to exchange electronic documents, etc.
Security of infrastructure	
- Since CERT-LT joined international CERT community, Lithuania can better track local and international cyber security incidents.	- The number of cyber security incidents is increasing; there are more threats that are potentially dangerous for the internal systems of public institutions; - There is no information security management and coordination system in Lithuania (it was being created during this evaluation); - Lack of legal regulation and monitoring of state's critical infrastructure.

Future scenarios

Referring to the key trends of information society development in Lithuania and worldwide, EU's strategic documents and experience of foreign countries, we formulated three future scenarios of information society development in Lithuania. We took into consideration the fact that future progress depends not only on structural or objective factors such as economic, social and technological opportunities and threats which are not determined by any separate country. However, to some extent the state can choose its development path, for example, it could ignore the problems and negative trends or learn from mistakes and work actively to implement its objectives. Two of the three scenarios presented below assume an

active exploitation of future opportunities while one scenario is based on the assumption that the state stays passive and deals with the problems in a limited way.

Avant-garde scenario is likely if the government (after consulting business and society) decides that information society should become the key competitive advantage of the country. Therefore when allocating the funds for R&D, business and infrastructure, priority is given for information society development. Lithuania becomes one of the first countries in the world to implement modern ICT initiatives (for example, e-voting); the country digitalizes all public services and provides access to them exclusively online; all public institutions exchange electronic documents; the public sector gives up on most of ICT infrastructure and purchases cloud computing services from the private sector. ICT profession becomes prestigious and very well paid; many students choose ICT studies; large share of GDP is generated by ICT businesses; Lithuania develops and exports innovative ICT products and attracts a lot of foreign direct investment (FDI). The main risks of this scenario: ICT sector dominates over all other sectors in the country; economic dependence on one area; the public sector faces many risks when it implements untested ICT solutions (in the case of failure, there is a substantial loss of the taxpayers' money and public trust).

Being among the leaders scenario is likely if the main national development strategies identify information society as one of the horizontal priorities in Lithuania (perhaps even the most important one). The leading Lithuanian politicians, civil society and business actors are well aware of and promote connections between country's strategic policies and information society development. For example:

- the public sector should start working with electronic documents only;
- in the energy sector it is important to roll-out smart grid technologies;
- the national health sector should implement electronic health records and e-prescriptions;
- ICT should be used to reduce administrative burden for businesses;
- ITS are used in the transport sector;
- Lithuania should develop a reliable very high speed broadband infrastructure in order to To attract FDI,
- citizens should become smart users of the internet as a part of life-long learning policy.

Efficient coordination of public policy on information society is crucial. It also enables the state to use opportunities provided by the ICT: to cooperate, share resources and increase efficiency of the public sector. As compared to the avant-garde scenario, this scenario is more moderate. Namely, it means that the state and the public sector do not have to be the first in the world to implement modern ICT initiatives. The country advances with ICT solutions consistently but carefully: it carries out pilot projects, participates in international discussions and networks, learns from the experience of foreign countries, etc.

The laggard scenario is likely if the leaders of Lithuanian political sphere, civil society and business neither share a common vision on information society, nor agree on the priority actions to stimulate its development. The public sector heavily invests in ICT infrastructure and services since purschasing ICT is perceived as means to receiving more funds from the state budget. Consequently, in some areas Lithuania is among the leaders of the EU or even the world. However, this also causes high maintenance costs and even higher costs to ensure interoperability among information systems and data centers. Public sector lacks cooperation skills and trust among institutions, thus while their leaders and employees understand the key issues and understand that the current situation is unsustainable, there is little willingness to change the low level balance.

These trends create a vicious circle, strengthened by a strict division of responsibility among the ministries (when it is considered not appropriate for the ministers to "interfere" in the areas of responsibility of

others). The problem is exacerbated by the fact that there is no leader or strong coordinator of information society policy, who would either have a strong institutional status (useful to reach inter-institutional agreement), or would be responsible for allocation of funds (so that investments in overlapping projects and under-utilisation of ICT resources is reduced). Strategic documents on information society development are based on a bottom-up approach: all the institutions suggest measures that they consider part of information society. Meanwhile, cross-institutional discussions are uncommon and formal; institutions rarely cooperate on joint initiatives.

Nevertheless, individuals and business increasingly use ICT because new technologies improve productivity and quality of life. These trends look like continuous progress, for example, in 2010 58 pct. of individuals used the internet, which is 13 pct. points more than three years ago. However, in 2020 it turns out that other countries have improved as fast as Lithuania, thus despite investments the country still lags behind most of the EU's members.

We suggest that "Being among the leaders scenario" for Lithuania. We base our recommendations (part B) on this scenario. Nevertheless, our interviews and situation analysis suggest that the laggard scenario is also likely if appropriate measures are not undertaken.

The key initiatives for information society development in Lithuania 2014-2020

We assume that priorities, mentioned in the Programme of Information Society Development 2011-2019, will remain relevant in the future: (1) strengthening ICT skills of individuals; (2) developing the content and encouraging the usage of e-government services; (3) development of ICT infrastructure.

We suggest eight middle-range policy initiatives. Not all of them are new: the country is influenced by international processes and agreements, most of which have influence on Lithuania's policy documents. Representatives of Lithuania's public and private sectors participate in the EU's and other international organisations' working groups and conferences; they share ideas some of which find their ways into formal policy documents. Several measures presented in this study were mentioned by the interviewees or mentioned during the discussion on February 3, 2012 or public presentation of this study on April 25, 2012.

What initiatives do we suggest?

Based on the analysis of Lithuania and foreign countries and EU's priorities for information society development, we suggest eight initiatives to be implemented 2014-2020:

1. Universally available and very fast broadband internet;
2. Citizens as smart users of the internet;
3. Lithuanian language and cultural heritage on the internet;
4. All public services are accessible and can be used on the internet;
5. Optimisation and smart management of public sector ICT resources;
6. ICT skills and solutions for business;
7. Green ICTs and sustainable development;
8. Individual and public security on the internet.

The sequence of these initiatives is not important – all of them are crucial for Lithuania to become an information society leader in 2020 or 2022. These initiatives are *complex* and *cross-sectoral*, i.e. they include development of skills and infrastructure, and they must be implemented by several public institutions. Moreover, it is necessary to allocate clearly responsibilities for implementation among the institutions and to ensure an effective coordination mechanism. Business and civil society should also participate in this process: offer ideas, take part in the implementation of different projects, etc.

For each of these initiatives the study recommends concrete implementing actions, financing sources, responsible institutions and time-frame. Recommendations will be useful for updating the Programme of Information Society Development 2011-2019 and its implementation plans after 2014 and to prepare Structural Funds' Operational Programmes 2014-2020. In addition, recommendations will also help to in the development of various sectoral programs and implementation plans, including: the Programme of Computer Literacy 2012-2019, the Public Management Development Programme 2012-2020 and its implementation plan, the Programme of Digital Preservation of Lithuanian Cultural Heritage, etc. We also suggest that two new policy documents should be prepared: Broadband and NGA Development Programme 2020/2022 and the Programme of Optimisation and Consolidation of Public Sector's ICT Infrastructure and Services.

1. Universally available and very fast broadband internet

The key tasks	Target for 2020 / 2022
(1) Ensure consistent development of broadband internet infrastructure. (2) Resolve the „last mile" problem. (3) Encourage the use of the broadband internet.	Universal access to very fast internet (30 Mbps or more) in 2020. At least 50 pct. of households subscribed to 100 Mbps or faster internet in 2020. 95-98 pct. of individuals, enterprises and organisations are within 1,5 km from a NGA network node.

2. Citizens as smart users of the internet

The key tasks	Target for 2020 / 2022
(1) Solve the digital divide. (2) Encourage people to become smart users of ICT and the internet.	95 pct. of individuals aged 16-74 regularly use internet (at least once a week in the last 3 months). 0 pct. of individuals aged 16-74 who have never used the internet. All public sector websites meet accessibility requirements for people with disabilities. Lithuania is among the first five members of the EU by percent of individuals who have high internet skills (as measured by Eurostat). 100 pct. of individuals aged 16-74 know how to use e-signature.

3. Lithuanian language and cultural heritage on the internet

The key tasks	Target for 2020 / 2022
(1) Ensure that Lithuanian language can be easily used in ICT and internet. (2) Digitalize Lithuanian cultural heritage and to increase its accessibility.	20 pct. of individuals use e-services, related to the Lithuanian cultural heritage. 100 pct. of digitalized cultural objects and Lithuanian language and literature resources are accessible on the internet. (If this is not possible due to copyright or data protection requirements, these objects should publicly accessible and information about

	their access available on the internet). In 2015 at least 240 000 digitalized cultural objects from Lithuania should be accessible in Europeana website.

4. All public services are accessible and can be used on the internet

The key tasks	Target for 2020 / 2022
(1) Improve public and administrative services, to increase their accessibility, usability and reduce service costs. (2) Ensure accessibility to public data and collaborative e-democracy. (3) Improve the quality and effectiveness of health care (using the ICT) (4) Develop smart management systems.	100 pct. of public and administrative services are fully available on the internet. 10-20 basic public services digital by default. 95 pct. of individuals who use public and administrative services, use these services on the internet (provided they are fully available online). 90 pct. of users access public and administrative services through the single egov portal. All the key EU-level services available for Lithuanian users (the list is to be adopted 2012).

5. Optimisation and smart management of public sector ICT resources

The key tasks	Target for 2020 / 2022
(1) Ensure interoperability of state information resources. (2) Consolidate public sector ICT infrastructure and optimise its management. (3) Purchase part of the public sector ICT as cloud computing services from the private sector. (4) Ensure that public sector institutions exchange merely electronic documents. (5) Ensure that the public sector becomes a smart buyer and manager of ICT. (6) Strengthen ICT profession in the public sector and to improve the expertise of the public sector in the field of ICT.	100 pct. of state and municipal institutions exchange electronic documents only. There is a fully operational State interoperability platform as defined in the State Information Resources Management Law. Lithuania has (…) public data centres (it is impossible to provide a specific number at the moment because it is not known how many data centres operate in Lithuania). 10-20 cloud computing pilot projects carried out.

6. ICT skills and solutions for business

The key tasks	Target for 2020 / 2022
(1) Increase the supply of ICT professionals (2) Improve the ICT competence of all the labour force. (3) Promote R&D and innovations in the ICT business. (4) Promote e-business development (1): business perspective. (5) Promote e-business development (2): population	Lithuania is among the first ten members of the EU in terms of share of individuals working in the ICT sector (as a pct. of total labour force). Lithuania is among the first ten members of the EU in terms of share of employees with ICT specialist skills (as a pct. of total labour force). 80 pct. of individuals ordered / bought goods or services on the

perspective.	internet (percentage of the total population) (in the last 3 months). 50 pct. of individuals ordered / bought goods or services on the internet from other EU countries (percentage of the total population) (in the last 3 months). 60 pct. of enterprises sell goods or services on the internet (pct. of all enterprises in the country).

7. Green ICTs and sustainable development

The key tasks	Target for 2020 / 2022
(1) Identify the potential of ICT in improve energy efficiency in Lithuanian strategic development documents. (2) Reduce energy consumption in the public sector by using ICT. (3) Ensure that all public procurement of ICT is green public procurement. (4) Allocate part of R&D resources for green ICT development.	*To reduce energy consumption and carbon footprint in public data centres by (…)* pct. *(Currently the number of public data centres is not known).* 80 pct. of households in Lithuania use smart meters. 80 pct. of public procurement of ICT is green public procurement (by the value and number of purchases).

8. Individual and public security on the internet.

The key tasks	Target for 2020 / 2022
(1) Ensure the protection of state's critical ICT infrastructure, guarantee security of information systems and networks. (2) Protect residents of Lithuania (especially – children) from harmful internet content. (3) Help Lithuanian residents protect their personal data and privacy in the internet.	100 pct. of critical ICT infrastructure objects identified. 100 pct. of state information resources meet cyber security requirements. 100 pct. of critical ICT infrastructure meet cyber security requirements. Security compliance of 100 pct. state information systems is monitored. 80 pct. of Lithuanian residents feel safe on the internet. 85 pct. of Lithuanian residents are aware of the cyber security principles.