Development and Application of Information Society Strategies in Lithuania

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This paper presents an overview of alternative Information Society notions and benchmarking approaches, international and European context of Information Society development in Lithuania. The guidelines, problems, challenges and success stories of Lithuanian Information Society development policy, current status and future prospects are presented, too.

1. Information Society notion and evaluation parameters

Information Society is a post-industrial society in which information technology (IT) is transforming every aspect of cultural, political, and social life and which is based on the production and distribution of information [BusD, 2008]. Characteristics of the Information Society are: (1) information becomes an economic good, (2) widely applied IT with integration of different IT types, (3) national economy dominated by the information sector, (4) special status of knowledge [Pawl, 1992].

There are various different paradigms and measurements of Information Societies. E.g., Andrew S. Targowski indicates even 14 alternative types (or qualitative states) of Information Societies (i.e., Dossier, Computer, Mass Media, Networked, Virtual, Informative, Communicative, Knowledge, Automated judgment, Informed, Learning, Global, Self-sustainable, and Monitoring), each type having specific paradigm, purpose, main information solution, measures [Targ, 2005].

Frank Webster in his book [Webs, 2002] has presented a typology of Information Society theories [Dral, 2007]:

- Technological vision of the Information Society (IS):
  - Puts emphasis on ICTs and their transformative powers.
  - Technological innovation: new possibilities in transmission and storage of information.
  - Society has moved from the "Industrial Revolution" and now entered an "Information Age". "Computer technology is to the information age what mechanisation was to the industrial revolution" (John Naisbitt quoted in Frank Webster).
- Economic vision of the IS:
  - Concerned with "economics of information" (Fritz Machlup). Assesses the size and growth of the information industries.
  - Puts emphasis on the importance of knowledge to the economy.
  - Technological innovation central for increasing productivity and thus for growth of economics and competition between economies (inspired by Joseph Schumpeter´s thinking).
- Occupational vision of the IS:
  - Focuses on occupational change- argues that the predominance of occupation is found in information work: "service workers" now in the majority.
  - Emergence of "white collar" society and decline of "blue collar" workers (influenced by Daniel Bell).
  - Many OECD and EU documents on the IS focus on this aspect of the IS.
- Spatial vision of the IS:
  - Puts emphasis on the information networks which connect locations and have great impact on the organisation of time and space.
  - Information Networks are linking together locations within and between offices, towns, regions, nations, continents and the entire world, seen in increase in transborder data, telecom facilities, ISDN, movements of money across nations, Internet [Cast, 1996].
  - Concepts of "information superhighway" and "wired society" are found in these arguments.

- Cultural vision of the IS:
  - Contemporary culture is manifestly more heavily information laden than any of its predecessors- we are existing in a media saturated environment.
  - Growth of institutions dedicated to investing everyday life with symbolic significance - e.g. global advertising, publishing empires, film industry, fashion industry, etc.
  - Interactivity of new technologies provides many channels to consume cultural products, thus increasing our dependence on information for everyday interaction.

There are used many various approaches, methods, frameworks for the evaluation, measurement of Information Society in different countries, depending on the investigation needs. The paper [Scia, 2004] analyses Information Society international benchmarking during 1996-2003 years using:

- Networked Readiness Index, evaluating 48 indicators, grouped into: Environment (Market, Political and Regulatory, Infrastructure), Readiness (Individuals, Business, Government), and Usage (Individuals, Business, Government);
- Digital Divide (ORBICOM), evaluating 21 indicator, grouped into: Infodensity (Networks/Infrastructure, Skills) and Info-use (Uptake, Intensity of use);
- Digital Access Index (ITU), evaluating parameters: Infrastructure, Knowledge, Affordability, Quality, and Actual usage (that was used by the World Summit of the Information Society);
- McConnell International e-readiness assessment, evaluating several indicators: connectivity, e-leadership, information security, human capital, e-business climate;
- Mosaic (Interned development within a country): evaluating pervasiveness, geographic dispersion, sectoral absorption, connectivity infrastructure, organizational infrastructure, sophistication of use;
- Economist Index, evaluating many indicators: connectivity and technology infrastructure, business environment, consumer and business adoption, social and cultural environment, legal and policy environment and supporting e-services, and a large number of qualitative variables;
- Statistical Indicators Benchmarking the Information Society (SIBIS): evaluating ICT access and usage elements (such as Internet readiness), the digital divide, information security, and factors determining access to and use of ICTs (such as perceptions of barriers, digital literacy, learning and training, and benchmarks applications like e-commerce, e-work, e-science, e-government and e-health);
- Connectedness Index (Conference Board of Canada), evaluating 42 indicators, grouped into: availability, reach, use, price, inputs, impacts, and socio-economic enablers;
- Technology Achievement Index (UNDP), evaluating creation and diffusion of technology, and how prepared users were for new technologies;
- UNDP Composite Index (for ICT and human development), evaluating 9 indicators: availability or supply-linked, efficiency and speed, targeting social sectors, targeting vulnerable groups;
- Information and Communication Technology Development Indices (UNCTAD), evaluating 12 indicators, grouped into: connectivity, access, policy.

The analysis of Information Society measurement in Europe during 2000-2005 period by ESIS, Eurostat, BISER, INRA, ESPON, and Statistics Finland projects using eEurope, Networked Readiness, and ESPON 123 indices is presented in [FrHi, 2006] paper. Digital Opportunity Index 2005/2006 (presenting data in table form and on maps: whole World, Africa, Americas, Asia-Pacific, Europe)[1] was used evaluating Information Society in the World Information Society Report 2007[2]. And, 2008 Knowledge Economy Index with Knowledge Assessment Methodology (taking into consideration: 1. Economic and institutional regime, 2. Education and Skills, 3. Information and communication infrastructure and 4. Innovation system) was used in [WBI, 2008; KAM, 2008].

National e-strategies of Information Society development around the World are overviewed in the Report on the World Summit on the Information Society Stocktaking [ITU, 2008].

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1 http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/WISR07-stats.pdf

2 http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/report.html , http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/WISR07_full-free.pdf

2. European Information Society development policies

The main guiding document of Information Society development in Europe is EU policy framework "i2010 - A European Information Society for growth and employment" [CEC, 2005]. It promotes the positive contribution that information and communication technologies (ICT) can make to the economy, society and personal quality of life. All i2020 policies[3] are grouped into sections:

- *Regulating the Market*[4]*,* with two main areas of Information Society regulation at European level: Transmission (regulating the Networks: Electronic Communications regulatory framework, Mobile Roaming Charges, Radio Spectrum policy, 112 - a single emergency number for Europe, regulating the telecommunications equipment market, preventing health-related effects of Electromagnetic Fields, etc.) and Content (regulating what flows through networks: Audiovisual regulation, Copyright and related rights in the Information Society, Web Accessibility);
- *Stimulating the Information Society*[5]*,* with three main directions: Research and Innovation (Public R&D Funding, Encouraging Private R&D Investment, Coordination of R&D in Europe, Innovation through ICTs), Infrastructure (Europe's electronic communications regulatory framework, Bridging the Broadband Gap, Space policy), Content and Services (Cultural Heritage, Security-Reliability-Protection, Radio Frequency Identification, advanced services based on publicly created information, VAT on electronic services);
- *Exploiting the Benefits*[6], with three main directions: Public Services (eGovernment, Electronic Public Procurement, eHealth, eLearning, Electronic Customs), Society & Environment (eInclusion, Environment, Road Safety), eBusiness and eCommerce (".eu" domain**,** ICT Industries and eBusiness, Consumer policy and e-commerce, Online Financial Services, e-Invoicing Rules, VAT on electronic services, etc.).

European i2010 policies of Information Society development are obligatory to EU member states; the evaluation is annual [CEC, 2008]; that definitely has very positive influence on the development of Information Society in Lithuania.

2.1. European success story: national Information Society development in Finland

Good example of national Information Society development policy is demonstrated by Finland [ISSPP, 2007; FinG, 2007; MTCF, 2008a; MTCF, 2008b]. Their primary goal is to increase citizens' wellbeing and economic productivity by utilising information and communications technologies. At the same time, the objective is to strengthen Finland's position as a leading Information Society country. This work utilises Finland's traditional strengths, such as speed of reaction to changes that take place in the operating environment, as well as the long-term, close cooperation of the public and private sector. Information Society development in Finland is promoted in all areas, both in the development of infrastructure, public electronic services, and content as well as in safeguarding fundamental requirements such as security and trust. As the Information Society develops, the challenges also change, so Information Society work is a continuous process.

On 21 June 2007, the Finnish Government adopted a resolution on the objectives of the national Information Society in the period 2007–2011 [FinG, 2007]. The resolution includes the Government's key objectives and priorities to accelerate Information Society development.

The background to the resolution is the third national Information Society strategy, "A Renewing, Human-Centric and Competitive Finland" [ISSPP, 2007]. It covers the period 2007–2015 and it was prepared during 2006 as part of the implementation of the previous Government's Information

3 http://ec.europa.eu/information_society/tl/policy/a2z/
4 http://ec.europa.eu/information_society/tl/policy/regulate/
5 http://ec.europa.eu/information_society/tl/policy/stimulate/
6 http://ec.europa.eu/information_society/tl/policy/exploit/

Society programme. The strategy outlines the national vision and strategic intent for the kind of Information Society the Government wishes to create in Finland.

On 21 June 2007, the Government appointed a minister-led Ubiquitous Information Society Advisory Board. The Advisory Board's task is to ensure the implementation of the national Information Society strategy as well as the aims outlined in the Government resolution.

During its term of office, the Ubiquitous Information Society Advisory Board is expected to provide insight on the identification of priorities for the national Information Society policy as well as on the setting of ambitious but realistic goals.

The Ubiquitous Information Society Advisory Board will report to the Government annually on the progress of key projects presented in the action programme. The action programme will be supplemented flexibly during the Government's term of office and updated according to new measures or perceived shortcomings.

The national Information Society policy is formulated in the best interests of citizens and companies. The Ubiquitous Information Society action programme [MTCF, 2008a] aims to secure the strong, rapid and balanced development of Finland's Information Society. Action programme projects and measures seek to safeguard the current service offering and to create new services for citizens and companies. The projects help to enhance the productivity of Finnish society as well as international competitiveness.

The ubiquitous Information Society action programme is centred on the development of public administration Information Society projects. The public administration's task is to promote the development of the Information Society by creating operating conditions for companies and by actively developing its own services and operating practices. Business life is also strongly involved in developing the Information Society with its own resources.

In terms of Information Society development, the key measures of the Government's term of office will be directed towards developing the following:

- Information Society basic requirements (trust or service quality, information security, compatibility through standardisation),
- Information Society infrastructure development (electronic identification methods, electronic invoicing);
- the innovation environment and market (competitiveness of communication sector, copyright system changing);
- content and services (new distribution paths for TV programs, e-services in social services and health care, public administration services from single location, uniform, secure and reliable single gateway to public services online);
- expertise/skills and preparedness (new kinds of learning environments, a safe media environment for children and young people).

In the Ubiquitous Information Society Action Programme projects, international influence is exercised via: (1) active involvement in implementing and guiding EU's Information Society policy; (2) development work in international organisations: OECD, World Summit of the Information Society, UNESCO, the International Labour Organization , etc.; (3) close relations with pioneering Information Society countries outside EU: US, Japan, South Korea. At the same time, Finnish technology and service innovations are actively marketed abroad. Promoting Information Society development everywhere, in less developed countries too, is also in accord with Finland's objectives.

4. Information Society development in Lithuania

4.1. Guidelines of Information Society development

Information and Knowledge Society development is one of strategic goals (priorities) of the Government of the Republic of Lithuania (2006)[7].

Development of Information Society in Lithuania is guided by interwoven *national and European strategy documents*. On the one hand, there are approved:

1. Conceptual Framework of the National Information Society Development of Lithuania (2001)[8] and Lithuanian Information Society Development Strategy [LISDS, 2005], approved for 6-year-long period with 5 priorities:
   - Competence of Citizens, social cohesion,
   - Modernization of Public Administration (using IT),
   - Knowledge Economy,
   - Lithuanian Culture and Language;
2. Lithuanian Information Society Development 2006-2008 Program [LISDP, 2006], indicating concrete tasks, means, expected results, funding needs, deadlines, and responsible institutions.

On the other hand, Lithuania seeks to comply with the European requirements:

3. EU policy framework "i2010 - A European Information Society for growth and employment" [CEC, 2005]. It promotes the positive contribution that information and communication technologies (ICT) can make to the economy, society and personal quality of life. The detailed results of progress evaluations of 52 benchmarking indicators (for which up-to-date data is available) are issued annually [CEC, 2008];
4. National Lisbon Strategy Implementation Program [NLSIP, 2005]. It has the Guideline No. 9 "Spread of information and communication technology, the ease of effective use and the creation of a universally receptive knowledge-based society". The implementation of Lisbon Strategy in Lithuania is controlled by EU with annual national self-assessment Progress Reports[9] and European Commission's assessment of National Reform Programme for Growth and Jobs[10].

In addition, EU structural assistance (period 2007-2013) for Lithuania is allocated in accordance with:

5. National general strategy: The Lithuanian Strategy for the Use of European Union Structural Assistance for 2007-2013 [NGS, 2007]. It has 4 general (horizontal level) areas, the first of which is Information Society. There is presented EU structural funding allocation for Broadband Networks, ICT (Access, Security, Risk Prevention, Research, Innovation, e-Content, etc.), Services and Applications for Citizens (e-Health, e-Government, e-Learning, e-Inclusion, etc.), Services and Applications for SMEs (e-Commerce, Education, Networks, etc.); and
6. Operational programs for implementation of this strategy: Human Resources Development, Economical Growth, and Cohesion Promotion. The largest part of funds (45.72 %) are allocated to Operational programme for the Economical Growth for 2007–2013 [OPEG, 2007]. The 3rd priority (i.e., investment direction) of Economical Growth operational programme is "Information Society for All", funded by the European Regional Development Fund (ERDF), with Information Society Development Committee under the Government of the Republic of Lithuania as a responsible authority. "Information Society for All" has 2 sub-priority areas:
   - Development of e-Services and Content (Services of e-Government, e-Health, e-Learning; e-Public Procurement; e-Commerce; e-Democracy; Lithuanian Language and Culture; Scientific Data Archives; Intelligent Management Systems; Development of Digital TV);

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7 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=319951 (in Lithuanian)
8 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=130056
9 http://ec.europa.eu/growthandjobs/pdf/nrp2007/LT_nrp_en.pdf
10 http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-progress-report-LT_en.pdf

– Development of Infrastructure (Broadband Networks; Compatibility; e-Security)].

Recently the Information Society Development Committee has approved the Plan of Implementation of "Information Society for All" priority measures [PI"ISA", 2008]. It designates the ERDF funding for e-Government services (LTL 168 million), e-Democracy (LTL 17 million), Intelligent Management Systems (LTL 85 million), and Broadband Electronic Networks (LTL 149 million). The schedule of funding of "Information Society for All" priority measures has been approved, too[11].

In addition, there are approved:

- Law on Electronic Signature [RLLES, 2000],
  Electronic Signature Monitoring Authority (2002)[12],
  Requirements for Providers of Certification Services Issuing Qualified Certificates, of the Requirements Applicable to Electronic Signature Facilities, of the Procedure of Registration of Providers of Certification Services Issuing Qualified Certificates, of the Electronic Signature Monitoring Regulations (2002)[13] ;
- Position Paper on E-Government (2002)[14] and
  Plan of Means for Implementing the Concept of Electronic Government (2003)[15] ;
- National Program for Social Integration of the Disabled for 2003-2012 (2002)[16] ;
- Strategy for Creating the Integral System of State Registers (2002)[17],
  Plan of Means for Implementation of the Strategy for Creating the Integral System of State Registers (2003)[18],
  Law on State Registers (2004)[19] ;
- Law on Legal Protection of Personal Data (2003)[20] ;
- Law on Electronic Communications (2004)[21] ;
- Strategy for the Public Administration Development until 2010 (2004)[22] (with special attention to e-Government) and Plan of Means for 2007-2010 for Implementing the Strategy for the Public Administration Development until 2010 (2004)[23] ;
- Program of General Computer Literacy [GCLP, 2004] ,
  Standard of General Computer Literacy (2005)[24],
  Strategy of Introduction of Information and Communication Technologies into the General Education and Vocational Training for 2008-2012 (2008)[25],
  other *eSchool*-related Lithuanian policy documents[26] ;
- Law on Information Society Services (2006)[27] ;
- Lithuanian eHealth Development Strategy for 2007-2015 (2007)[28] ;

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11 http://www.ivpk.lt/fondai/12.htm (in Lithuanian)
12 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=165046 (in Lithuanian)
13 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=198003 (in Lithuanian)
14 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=313042
15 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=273447 (in Lithuanian)
16 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=279741 (in Lithuanian)
17 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=245654 (in Lithuanian)
18 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=253228 (in Lithuanian)
19 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=250197
20 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=208886
21 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=242679
22 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=316688 (in Lithuanian)
23 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=321487 (in Lithuanian)
24 http://www.emokykla.lt/admin/file.php?id=185
25 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=312799 (in Lithuanian)
26 http://www.emokykla.lt/en.php/documents/lithuanian_policy_documents/1126
27 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=277491 (in Lithuanian)
28 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=306637 (in Lithuanian)

- Law on Documents and Archives (1995; last amended on 15 April 2008)[29] ;
- etc.

So, Lithuania has enough strategy documents and good prospects of EU funding for Information Society development.

4.2. Information Society development current status

According to [CEC, 2008], Lithuania lags behind with many aspects of Information Society development, i.e., most of the Lithuanian benchmarking indicators are below the EU average. However, fast progression in Internet usage by households and intensive e-commerce activities are laying the foundations for further developments.

Broadband**.** In October 2007, broadband penetration reached 13.7%, compared to 10.6% a year earlier, but still lags behind the EU27 average of 20%. Broadband services are provided through a number of alternative platforms. The mobile market is well developed in Lithuania and is expected to be a source for future growth in broadband connectivity and use of online services.

Overall growth in take-up of broadband and amongst enterprises is stalling, but households seem to be converting from narrowband faster with now 77% of connected households using broadband. This corresponds with the usage of online services where Lithuania is above EU average in services requiring higher bandwidth, and placed below EU average in the low bandwidth consuming services. As in the other Baltic countries Internet telephoning/videoconferencing is a major driver of growth.

Online Public Services**.** The average score for all public services for *fully-online availability* is 35%, well below the EU average. Online availability of services both to citizens and to enterprises has remained constant over the past few years. *Online sophistication* is 12 points below the average. Two out of nine relevant services reach the fifth level of sophistication.

Take-up by citizens lies 12 points below the average, whereas for businesses it is 11 points above. What is significant is that 60% of companies have used eGovernment to send filled in forms, against an EU average of 45%.

The goals of Lithuania's eGovernment strategy are to improve transparency of the decision making process, efficiently deliver high-quality public services and provide information to the public, businesses and institutions by exploiting the possibilities offered by information technology.

ICTs in the Economy**.** ICTs have a minimal impact on the Lithuanian economy. Investment in ICT-related R&D is very small as are exports of ICT products. Enterprise take-up of broadband has not grown, and is well below EU average. Use of ICT tools and online services among enterprises is low with the exception of selling online which is above average. But having a rather good level of digital literacy of the population and basic user skills in the workforce, Lithuania has a sound basis for future developments.

4.3. Main problems and challenges

There are problems because of lack of central managing institution for all Information Society activities: Information Society Development Committee (ISDC) has a lower status than Ministries (head of it is not a member of Lithuanian Government), on some Information Society questions ministries make decisions without coordination with other ministries and ISDC. Not all responsibility boundaries are clear, better coordination would be helpful. There is some redundancy of Information Society - related institutions; some work is duplicated by several governmental institutions; some important areas are left out of scope by all institutions.

Sometimes the available Information Society development finances of EU structural funds are spent, but the expected outcome is not delivered. E.g., National Audit Office has cleared up that LTL 17 million are spent on development of e-Health information system, but it is not functioning yet; consequently, three Committees of Lithuanian Seimas will apply to Prosecution Service to

29 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=319540

investigate this case [Mate, 2008].

IT standardisation in Lithuania is one of biggest problems for Lithuanian IT companies: long term IT standardisation policy and plans, interoperability framework for IT systems (e-services) development and operation are lacking. Because of that, plenty of closed (proprietary) systems are developed and used, having low competition possibilities, and high development/usage cost.

Involvement in EU's Information Society policy institutions, international standard Committees and working groups, development work in international organisations is low. Closer relations, cooperation with pioneering Information Society countries are lacking.

4.4. Success stories[30]

Developing Information Society in Lithuania, there is a good tradition of fruitful cooperation between responsible governmental institutions (Information Society Development Committee, Ministry of Education, Centre of Information Technologies of Education, Ministry of Economy, etc.) and associations of IT professionals and companies (Association of the information technology, telecommunications and office equipment companies Infobalt, Lithuanian Computer Society, representative office of the ECDL Fund in Lithuania, Knowledge Economy Forum[31]. (E.g., 1 % of Lithuanian population has ECDL computer driving licences, already). We hope that fruitful collaborative work will continue and expand in the future, too.

For the period of 2004-2006, LTL 217.7 million (over €63 million) of EU Structural Funds Support was assigned for the implementation of the Lithuanian Information Society projects in two main areas: IT infrastructure and eServices. Of this, some LTL 158.9 million (€46 million) came from the European Regional Development Fund. In all, five major infrastructure projects were financed and 14 projects in the area of eGovernment and eServices. These were part of the Information Society for All project, of the Economic Growth Action Programme, which the Government wishes to continue implementing in the next programming period 2007-2013. It is intended that 4% of the total amount allocated to Lithuania should be assigned to this end. 70% (LTL 577 million or €167 million) of funding for the Information Society for All priority would be assigned to the development of eContent and eServices, while the remaining 30% (LTL 247 million or €71.5 million) would go to IT infrastructure.

The project "Rural Area Information Technology Broadband Network (RAIN)"[32] creates broadband infrastructure in white areas, where this infrastructure is missing but the potential for eliminating the digital divide between urban and rural areas is strong. The project aims to transform the lives of individuals, increase social cohesion and contribute to economic growth. RAIN's initial phase (which has been successfully finished in 2008, already) entails laying fibre-optic channels to all local administrations in rural territories (some 3,200 km).

RAIN uses the most modern fibre-optic infrastructure with unlimited transmission capacity and is targeted at creating the basic broadband infrastructure connecting rural townships. Technological neutrality and open access to this infrastructure for all existing and new operators will be guaranteed. The infrastructure will be operated by an independent, non-profit public company, which must provide it to all operators. The operator is not entitled to provide services to end users – guaranteeing competition in all territories.

A later phase, in 2008-2010, will expand this infrastructure so that rural inhabitants and organisations can experience equivalent broadband services (price and technical range) as urban areas. It is also planned to develop the infrastructural part of the network and to invite all existing and new operators to complete the last mile and deliver services to end users. RAIN is expected to improve opportunities for rural inhabitants to use ICT for education, training, creativity and

30 http://www.epractice.eu/index.php?page=document.list&cntr=15
31 http://www.zef.lt/
32 http://www.rain.lt/EN/index_1.php

entrepreneurship. It is hoped that RAIN could become a model for Central and Eastern European countries for engaging rural communities in modernising their activities.

RAIN is also expected to stimulate existing and new commercial operators to provide broadband Internet services in rural areas to citizens, non-governmental organisations, public bodies and enterprises. RAIN will create more favourable conditions for economic and cultural activities, the development of alternative activities and partnerships, the provision of services, and communication with self-governance and public bodies.

At present rural Internet access points (RIAPs) still are one of the most important sources of access for the population living in rural areas (Lithuania has about 23 000 small villages; 33 % of the population live in rural areas in 2007). Development of RIAPs network is a project with the aim to set up and provide computer services with Internet access mostly to small communities in rural and remote areas of Lithuania. During 2007-2008, 400 public Internet access points are opened to Lithuanian people in rural areas. The project "Development of Rural Internet Access Points Network"33 is financed by EU Structural funds and Lithuanian Government and is implemented by the Ministry of Interior. This initiative is generating new IT knowledge influencing the development of economics, social life, education and decrease of unemployment in rural areas. After implementation of the project at the end of 2008 Lithuania will have the biggest number (875) of established RIAPs (considering population density) in EU.

"A Computer Literacy Basics for e-Citizens" project has been successfully finished by the Association "Window to the Future" (W2F) on May 2008[34]. The objective of the project was to provide training on basic computer literacy, as well as raise awareness about safe Internet usage, to 50 000 persons. The content of the training courses is based on the computer literacy standard developed by the Government-approved qualification programme, which corresponds to the latest version of the European Computer Driving Licence (ECDL) programme.

The Lithuanian State Tax Inspectorate has announced that over 844 000 taxpayers submitted their income tax declarations on-line in 2008, bringing the percentage of on-line declarations to 88 %. The Inspectorate also received 59 000 on-line asset declarations and almost 530 000 applications for the allocation of a 2 % tax rebate. The new features this year included an increase in the amount of data provided in the pre-filled tax forms, an on-line calculator of tax-free income, and the option to fill in or amend the declaration on-line. All these features further encouraged Lithuanians to switch from hard-copy declarations to the electronic version, bringing the percentage of on-line declarations up to 88% (from 75% in 2007, 46% in 2006, 25% in 2005, and close to 20% in 2004). The on-line declaration system has not only facilitated the process of declaring income, but has also reduced errors, cut processing and storage costs and has reduced the amount of paper wastage (i.e., it has calculated that, if all residents had filled in hard-copy declarations, they would have used 20 tonnes of paper. By submitting eDeclarations, the Lithuanian taxpayers have preserved a small grove of more than 300 trees this year, it reveals). Another development in 2008 was that a higher number of eDeclarations were submitted from 'public hotspots' in rural areas. The Tax Inspectorate has established a successful co-operation with the Ministry of the Interior and the Association of Public Hotspots, which allows people with no computer or internet access to use the hotspots for free in order to submit their tax declarations. Over 5 000 declarations were submitted this year through this service, which is twice as many as last year.

A government-backed multi-stakeholder programme has developed a special eSignature which Lithuanians can use for electronic signatures using their mobile phones since November 2007. Just one year ago, the Lithuanian government, two leading telecommunications companies (Omnitel and Bitė Lietuva), two major banks (Hansabankas/Swedband and AB SEB Vilniaus bankas), as well as the Window to the Future Association (Langas į ateitį) signed up for the eSignature Initiation Programme. And the programme has already yielded its first results: qualified, secure mobile

33 http://www.vipt.lt/

34 http://www.langasiateiti.lt/naujienos/naujienu-archyvas/?newsid=132 (in Lithuanian)

eSignatures which were developed based on the technical recommendations of the stakeholders. The new system allows Lithuanians to sign electronically using a mobile phone with a new eSignature-compliant SIM card. People who wish to take advantage of the mobile eSignature needs to replace their SIM card and sign an eIdentity agreement. Since mobile penetration is very high in Lithuania and because mobile eSignature is very simple and convenient, the new solution is expected to become very popular. To eSign social security documents, customers have to submit their mobile phone number and then they will receive a request to enter their six-digit PIN code in their phone. The security of eSignatures is guaranteed by UAB SSC, the only Lithuanian company officially authorised to issue digital certificates. Thanks to the latest technological standards, the digitally signed documents are more secure than the ones signed by hand (i.e., according to specialists in the field, this mobile eSignature infrastructure is especially secure: two codes, known only to the user, protect the ID key contained in the telephone from illegal use. This means that, even if the telephone is lost or stolen, another person cannot use the eSignature). Now eSignature can be used with the Social Insurance Fund, the State Tax Inspectorate and the eGovernment Portal. In future, the range of services for which citizens can sign electronically will be significantly expanded.

In a first for a Lithuanian state institution, the Lithuanian Social Insurance Fund SODRA has introduced a new on-line system for communicating with its clients using certified eSignatures on January 2008. Now users are able to employ the new Electronic Servicing System for Insurers (EDAS) to find information in the SODRA databases and to submit their social insurance notifications and applications. Access to the service is limited to those whose identity has been verified by way of eBanking systems or a qualified electronic certificate. In order to make full use of all of the EDAS' functions, an insurer must first obtain a qualified electronic certificate (Class 3), the necessary secure equipment for Generation eSignature and a contract with one or more Lithuanian banks for the provision of eBanking services. However, for the simple submission of applications or the location of relevant information on the 'Insurer's Portal' it is necessary only to be a user of eBanking services. On the other hand, insurers who are still not ready to communicate with SODRA on-line can submit their signed social insurance notifications in hard copies to the territorial offices of SODRA, as before.

Under the EU structural fund project „Creation of interoperability – capacity to interact of information systems of public administration institutions"[35] a central (state) website of electronic services is developed. It will become a mediator between business, residents and institutions providing services. Such a website would guarantee organization of provision of 20 main public electronic services, authentication of users while providing third- and fourth- sophistication level services as well as could provide services which are not attribute to any other institution, or new complex services (i.e. composed of electronic public services which are already being provided).

Now Lithuania is undertaking implementation of two projects related to digital libraries: "Establishment of the Lithuanian National Radio and Television virtual library" and "Creation of an integral virtual information system of libraries". The first project involves a TV and radio public virtual library and seeks to ensure electronic access to Lithuanian audiovisual heritage recorded in television programmes. The second project is being implemented in cooperation with the Lithuanian Art Museum and Lithuanian Archive Department. This project anticipates harmonization of a data bank of digital cultural heritage objects belonging to libraries, archives and museums holding over 3 million digital pages of original manuscripts, newspapers, old books, registers of births marriages and deaths, works of art, folk graphics, maps, drawings, paintings and other valuable cultural heritage objects of high historic value.

Since February 2007 the Lithuanian Ministry of Culture is implementing a national programme to provide free internet access to the general public through their local library within three years. The first step is to equip all national libraries with computers. The programme is part of the wider

35 http://www.evaldzia.lt/govgate/investicinis.html (in Lithuanian) , http://www.evaldzia.lt/govgate/index_en.html

international *Global Libraries*[36] initiative supported by the Bill and Melinda Gates Foundation, which has already provided an initial grant of over €220.000. It is believed that public libraries, of which there are 1.382 in Lithuania, could become a strategic link in the efforts to improve access to the internet, especially in rural areas. The first wave of library computerisation is expected to take place in 2008, while the second should follow in 2009. The project aims to make at least six computers available for every 10.000 residents.

5. Conclusions

Because of the availability of EU Structural funds, there are prepared and implemented valuable costly Information Society projects in Lithuania. Information Society development policy documents (except IT standardisation ones) are prepared, but in some cases neglected (delaying needed actions). Current status of Information Society development in Lithuania is rather promising. On the other hand, serious improvements of Information Society development policy based on the examples of European leading countries (first of all, consolidating Information Society development activities) would be helpful.

References

[BusD, 2008] Information Society. Definition of term. In: *BusinessDictionary.com* , 2008. http://www.businessdictionary.com/definition/information-society.html

[Cast, 1996] M. Castells. *The Rise of the Network Society* (Vol. 1 of the *The Information Age: Economy, Society and Culture*). Wiley-Blackwell, 2nd edition, January 2000, 594 p.

[CEC, 2008] Commission of the European Communities. *Communication "Preparing Europe's digital future. i2010 Mid-Term Review"*, Brussels, 17.4.2008, SEC(2008) 470. http://ec.europa.eu/information_society/eeurope/i2010/mid_term_review_2008/index_en.htm Volume 3: ICT Country Profiles http://ec.europa.eu/information_society/eeurope/i2010/docs/annual_report/2008/sec_2008_470_Vol_3.pdf

[CEC, 2005] Commission of the European Communities. *Communication "i2010 – A European Information Society for growth and employment"*. Brussels, 1.6.2005, COM(2005) 229. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0229:FIN:EN:PDF http://ec.europa.eu/information_society/eeurope/i2010/

[Dral, 2007] C.A. Dralega. *Theories of the Information Society & Network Society*. Presentation, University of Oslo, Fac. of Humanities, Department of Media and Communication, October 2007, 46 p. http://www.uio.no/studier/emner/hf/imk/MEVIT3220/h07/Lecture%20notes/The%20Information%20&%20Network%20society(1).ppt

[FinG, 2007] Finnish Government. *Resolution on the Objectives of the National Information Society Policy for 2007-2011*. 21 June 2007, 8 p. www.arjentietoyhteiskunta.fi/files/38/periaatepaatos_tietoyhteiskuntapolitiikan_tavoitteista_engl_.pdf

[GCLP, 2004] *General Computer Literacy Programme*. Approved by Resolution No. 1176 of 15th September 2004 of the Government of the Republic of Lithuania. http://www.ipc.lt/english/apie/skelbiami_dok/2004/General%20Computer%20Literacy%20Programme.doc or http://www.emokykla.lt/admin/file.php?id=191

[FrHi, 2006] L. Frank, T. Hirvonen. Measuring the Information Society in Europe: From Definitions to Description. In: *RePEc (Research Papers in Economics), IDEAS database*, Conference paper of European Regional Science Association, August 2006, 22 p. http://ideas.repec.org/p/wiw/wiwrsa/ersa06p764.html

[ISSPP, 2007] Information Society Strategy preparation project. *A Renewing, human-centric and competitive Finland – The National Knowledge Society Strategy 2007–2015*. September 2006, Report. ISBN 978-952-5631-24-1, Prime Minister's Office, Finland, 2007, 48 p. http://www2.vnk.fi/julkaisukansio/2006/tietoyhteiskuntaneuvosto/tietoyhteiskuntastrategia/en.pdf

[ITU, 2008] International Telecommunication Union. *Report on the World Summit on the Information Society Stocktaking*. 2008, 70 p. http://www.itu.int/wsis/ , http://www.itu.int/wsis/stocktaking/docs/2008/WSIS-Stocktaking2008-e.pdf

[KAM, 2008] *Knowledge Assessment Methodology*. Knowledge for development (K4D) program website,

36 http://www.gatesfoundation.org/grantseeker/Pages/funding-global-libraries.aspx

World Bank Institute, 2008. http://web.worldbank.org/kam (including Global Knowledge Economy Map: http://info.worldbank.org/etools/kam2/KAM_page10.asp)

[RLLES, 2000] *Republic of Lithuania Law on Electronic Signature*. Seimas of the Republic of Lithuania, July 11, 2000. No. VIII – 1822 (amended as of June 6, 2002. No. IX – 934). http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=204802

[LISDS, 2005] *Lithuanian Information Society Development Strategy*. Approved by Resolution No. 625 of 8th June 2005 of the Government of the Republic of Lithuania. http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=257174 (in Lithuanian)

[LISDP, 2006] *Lithuanian Information Society Development 2006-2008 Program*. Approved by Resolution No. 615 of 21st June 2006 of the Government of the Republic of Lithuania. http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=278867 (in Lithuanian)

[Mate, 2008] J. Mateikienė. Procurators will investigate the finances for e-Health system. In: *Elektronika.lt*, 2008-10-01. http://www.elektronika.lt/news/business/13345/ (in Lithuanian)

[MEc, 2007] Ministry of Economy. "Implementation of Objective 3: to create a society that relies on knowledge and advanced technologies in its activities (Guideline 9)". In: *Annual Progress Report on the implementation of the National Lisbon Strategy Implementation Programme of Lithuania,* October 2007, pp. 40-42. http://ec.europa.eu/growthandjobs/pdf/nrp2007/LT_nrp_en.pdf , http://ec.europa.eu/growthandjobs/national-dimension/member-states-autumn-2007-reports/

[MTCF, 2008a] Ministry of Transport and Communications, Finland. *Ubiquitous Information Society. Action Programme 2008-2011*. May 2008, 20 p. http://www.arjentietoyhteiskunta.fi/files/73/Esite_englanniksi.pdf

[MTCF, 2008b] Ministry of Transport and Communications, Finland. *National Information society policy for 2007-2011*. Presentation, 26 September 2008, 20 p. http://www.arjentietoyhteiskunta.fi/files/29/National_Information_Society_Policy_in_short.ppt

[NGS, 2007] *National general strategy: the Lithuanian Strategy for the use of European Union Structural Assistance for 2007-2013*. Approved by the European Commission on the 26th of April, 2007. http://www.esparama.lt/ES_Parama/angliskas_medis/programming_for_2007_2013_tree/front_page/files/NSRF_1.doc

[NLSIP, 2005] *National Lisbon Strategy Implementation Program*. Approved by Resolution No. 1270 of 22nd November 2005 of the Government of the Republic of Lithuania. http://www.ukmin.lt/en/strat_prog/lisbon/doc/Lisabona-angl..doc

[OPEG, 2007] *Operational Programme for Economic Growth for 2007–2013*. Endorsed by the Decision of the European Commission No. K(2007)3740 of 30th July 2007 http://www.esparama.lt/ES_Parama/angliskas_medis/programming_for_2007_2013_tree/front_page/files/OP_EG_1.doc

[Pawl, 1992] A. Pawlowska. Conditions of preserving the universal values in information society. In: L. Zacher (Ed.). *Społeczeństwo informacyjne. Aspekty techniczne, społeczne i polityczne*, Warszawa: Warszgraf, 1992.

[PI"ISA", 2008] *The plan of implementation of "Information Society for All" priority measures*. Information Society Development Committee order No. T-16 of 15th February 2008. http://www.esparama.lt/download.php?law_act_pub=661 (in Lithuanian)

[Scia, 2004] G. Sciadas. International Benchmarking for the Information Society. A background paper for/in: *ITU-KADO Digital Bridges Symposium, Asia Telecom 2004*, Busan, Republic of Korea, 10-11 September 2004, 45 p. http://www.itu.int/osg/csd/ni/digitalbridges/docs/background/BDB-intl-indices.pdf

[SOPEG, 2008] *Supplement to Operational Programme for Economic Growth*. Approved by Resolution No. 788 of 23rd July 2008 of the Government of the Republic of Lithuania. http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=325964 (in Lithuanian)

[Targ, 2005] A.S. Targowski. The Taxonomy of Information Societies. In: Yi-chen Lan (Ed.). *Global Information Society: Operating Information Systems in a Dynamic Global Business Environment.* Idea Group Publishing, 2005, pp. 1-26. http://www.igi-global.com/downloads/excerpts/01%20Lan.pdf

[WBI, 2008] World Bank Institute. *Measuring Knowledge in the World Economies (Knowledge Assessment Methodology and Knowledge Economy Index)*, Booklet, 2008, 12 p. http://siteresources.worldbank.org/INTUNIKAM/Resources/KAM_v4.pdf

[Webs, 2002] F. Webster. *Theories of the Information Society* (International Library of Sociology). London: Routledge, 2nd edition, 2002, 304 p.