DEVELOPMENT OF INFORMATION SOCIETY IN THE CONTEXT OF GROWING GDP

Antanas Keras
Valerijus Keras
Mykolas Romeris University

Abstract

Over the decade the development of information society to a large extent has been determined by the Lisbon Strategy and the job as initiated in it: the European Council and the European Commission are invited to prepare a comprehensive and exhaustive Action Plan for Electronic Europe eEurope. Over the decade both the eEurope Initiative and the eEurope 2005 Action Plan as well as other documents as prepared in this field and the newest document – the i2010 Strategy – have determined the development of information society in the whole European Union, including Lithuania. Of particular importance is the i2010 Strategy – a strategy for digital technologies as intended for growth and job creation. The European Commission's Annual Progress Reports – being very significant documents – are helpful in assessing the achieved results as well as specifying plans for further works, activity directions and pace. The first report of this kind assessing progress in the implementation of the i2010 Strategy has already appeared.

Lithuania over eighteen years of its independence has made a tremendous progress both in developing its economy and creating as well as evolving country's information society. Creating Long-Term Development Strategy of the State of Lithuania, the Lisbon Strategy was taken into account, whereas creating the Strategy for Information Society Development in addition to other documents related with information society development in Lithuania, the mentioned European documents as intended for the information society development were taken into account. Undoubtedly, the creation and development of information society to some extent depend on a country's level of economic development, which is partly characterised by GDP (gross domestic product).

This article deals with the newest indicators for the information society development in Lithuania and their relation with GDP, - what indicators are in Lithuania and how they look like in comparison with countries of various development level.

Keywords:

Development, strategy, information society, GDP, indicators.

Introduction

The issues of the development of information society are becoming more and more topical for both well-developed and of weaker development level countries. The creation and development of information society to some extent depend on the country's level of economic development, which is partly characterized by GDP (gross domestic product). The leading countries of the EU have gained fine results in both developing economy and increasing GDP as well as in expanding information society.

After the restoration of its independence in 1990, Lithuania could not boast of having a properly developed information infrastructure. There were no modern data transfer networks in Lithuania, practically, we did not have computer networks, only - their pilot fragments; essentially, only – initial rudiments of such networks. Such a situation does not surprise - – the country's economic potential was pretty different from the more developed countries, and GDP per capita did not reach USD 2000.

Practically, the most advanced at that time in Lithuania was a computer system for collective usage of the Lithuanian Academy of Sciences, which via communication channels linked institutes of the Academy of Sciences with Computer Centre of the Academy, being in the Institute of Mathematics and Cybernetics. Of significant importance is the fact that the system in addition to works as implemented in Kaunas University of Technology, Vilnius Gediminas

Technical University and Vilnius University contributed to preparing specialists and users for working under the future conditions with future computer technology and computer networks.

Upon restoration of Lithuania's independence, the creation and development as well as implementation of modern computer networks began not only in science institutions but also in other life spheres of the State – in economy, management, etc. There were two reasons in Lithuania which determined successful development of the computer networks. The first being – independent Lithuania was already able to receive modern information technologies, including technologies of computer networks, which, due to so-called embargo, could not be obtained by the Soviet Union (and Lithuania till recovery of independence). Embargo was no longer a threat to the independent Lithuania. Of particular importance was the second reason – in the last year before the restoration of independence Lithuania had managed to prepare qualified specialists who were able already not only to successfully master modern computer networks and work with them in independent Lituania, but also further develop them in the future.

Over eighteen years of its independence Lithuania has made a tremendous progress in both developing its economy and creating as well as evolving country's information infrastructure and information society. Over this decade the Lisbon strategy and its initiated and later prepared documents by the EU, regulating the development of information society – eEurope, the eEurope 2005 Action Plan and other documents as well as the new i2010 Strategy have significantly contributed to creating and developing information society in Lithuania.

Some time has already passed since the announcement of the Lisbon Strategy, a few works have been accomplished, a great deal of essential documents regulating further works within the spirit of the Lisbon Strategy have been prepared and adopted. Apparently, not all the objectives and tasks as foreseen in the Lisbon Strategy were implemented, some were amended by subsequent documents taking into consideration the real situation and the course of events, some were not implemented. Nevertheless, the key task as solved by means of the Strategy was that it determined the main strategic directions, which should lead towards further development of the European Union meeting challenges of a new decade related with globalisation and rapidly developed as well as evolved knowledge economy and with particularly important problem solving of social cohesion. All this made an undeniable impact on Lithuania, its economy development as well as creation and development of information society.

The paper aims at analysing index dynamics of the Lithuanian information society development in the latter decade, their connections with GDP and what the newest indexes of the Lithuanian information society development are in the context of GDP in comparison with other countries of various development level.

Development of the Information Society in Lithuania over the Last Decade

Over the last decade till 2000 Lithuania fulfilled a remarkable number of the significant passages applying the information technologies as well as establishing and developing computer networks. There were significant achievements gained but weak results occurred as well.

Telecommunication networks were successfully developing. An academic network Litnet was developing with a great success. Other computer networks were being created too – computer network VIKT of the state institutions and various commercial computer networks.

The cellular phones came into more common use; however, the main telephone line was still prevailing.

As for the households, their computerisation was really weak.

From 2000 to 2001, in Lithuania the sociological research was carried out (aulauskas M.P., 2001) and it proved the fact that citizens' value provisions are ambivalent: on the one hand, they are favourable for the informatisation of the country since the development of the information society is related to the optimistic perspective of a democratic society, on the other hand, too pessimistic evaluation of the actual state and too critical attitude towards the actions of the authorities tend to relate such a perspective only with further future. Optimistic evaluation – even 72.3 percent of the respondents of the age of 15 and older – directly relate the processes of the informatisation with the expectations of a better life. Even 72.8 percent of the respondents believed the computerization to be favourable and very favourable for the economic welfare of the country.

Such an evaluation is without doubt both a great optimism and challenging the authority, that should justify this optimism.

We will further analyse how the information society has been developed in our country over the last decade.

In the table as provided below (Table 1) some of the important indexes that characterise the development of the Lithuanian information society in addition with GDP dynamics from 2000 to 2007 are pointed out.

Table 1. Development of the Lithuanian information society

	2000	2001	2002	2003	2004	2005	2006	2007
Number of mobile phone subscribers per 100 inhabitants	9.8	14.6	29.3	47.1	61.0	89.1	127.9	139.4
Number of main telephone lines per 100 inhabitants	32.6	33.8	32.9	26.8	23.9	23.9	23.5	23.4
Percent of all households owned personal computers	5.3	8.5	12.0	19.3	25.0	29.0	36.5	42.0
Percent of all households had an access to the Internet at home	2.3	3.2	4.1	6.2	10.6	14.4	31.7	40.3
Number of PC per 100students (General schools)				2.5	4.0	4.6	5.1	6.5
Number of PC per 100 students (Universities)				4.4	4.7	5.3	5.5	6.4
Gross domestic product (GDP), EUR	3528	3893	4329	4763	5276	6055	6989	

As we can see from the table the growth of the most important indexes that characterise the development of the information society, in a few cases, is remarkable enough.

Mainly, the number of cellular phone subscribers per 100 inhabitants increased – from 9.8 to 139.4 whereas the number of main telephone lines per 100 inhabitants decreased from 32.6 to 23.4. Nevertheless, this decrease is positive because it proves that the users are adopting modern technologies – from the main telephone line to the mobile one.

Supplying the households with the computers increased prominently – from 5.3 percent up to 42.0 percent, and one part of the households who has an access to the Internet at home - from 2.3 up to 40.3 percent.

There are some problems with computerization of schools. The number of the computers at school should be raised since in 2006, 100 students shared 6.5 computer in the secondary schools, whereas in the universities 6.4 computer was shared by 100 students. But it is not enough for schools and universities. It is necessary to bear in mind that the development of the country's information society in the future will highly depend on the capacity of the students to use the information technologies.

The very positive result in the education and science system assuring the access to the Internet for the users should be noticed – all the universities, science institutions, colleges, majority of schools are connected to the academic network Litnet (which has been a member of the European academic network GEANT since 2004) and can use the Internet. Besides, at present the broadband network RAIN is on the verge of being finished, which will ensure the broadband connection with all the rural regions of the country.

It should be noted that even though less than half of the population (from 16 to 74 years old) of the country uses computer and Internet; nevertheless, the young people use it more actively: 88.1 percent of the young people use the computer (from 16 to 24 years old), and respectively 84.2 percent use the Internet. These are quite fine results that allow making favourable prognosis for the further development of the information society in Lithuania since by developing the information society it is very important that as more people as possible in the country would be able and eager to work with the computer and Internet.

The Index DOI of the Lithuanian Information Society and GDP within the Context of other countries

In this decade the key works in creating information society undoubtedly have encompassed a very rapid Internet (as well as broadband networks) development, a fast increase in the number of computers, an increase in the number of households possessing computers (also with an access to Internet), creation and development of eGovernment in addition to a great deal of other important works. Indexes of the development of information society may be analysed in two aspects. Firstly, we can analyse separate index dynamics within the country and witness the progress made. However, if only separate aspects (both internationally and in the international context) will be touched upon, it will be quite difficult to compare the results of the Lithuanian information society development and GDP within other countries' context. Integrated indexes are necessary in order to have such a comparison possible. One of such internationally acknowledged indexes of the information society development could be mentioned - Digital Opportunity Index (DOI).

As it is indicated in the work (Digital Opportunity Index (DOI) – Methodology), index DOI has been developed as an instrument that help to witness a progress as achieved by reducing digital exclusion, and implementing the resolutions of the World

Summit Meeting on the issues of information society. This index – it is a powerful instrument of an appraisal of the strategy and activity directions as well as of the gained results intended for the examination of the global and regional tendencies of infrastructure development, its possibilities and utilisation. These tendencies characterise information society, reflect its development level. DOI, first of all, focuses on the utilisation of the new technologies including broadband and mobile Internet. At the same time it reflects, how the newest technologies are being implemented in a concrete country by creating and developing information society.

An index DOI encompasses the following eleven criteria characterising opportunities, infrastructure and utilisation:

Opportunities - Percentage of population covered by mobile cellular telephony, Mobile cellular tariffs as a percentage of per capita income, Internet access tariffs as a percentage of per capita income),

Infrastructure - Proportion of households with a fixed line telephone, Mobile cellular subscribes per 100 inhabitants, Proportion of hoseholds with Internet access at home, Mobile Internet subscribes per 100 inhabitants, Proportion of hoseholds with a computers,

Utilisation - Internet users per 100 inhabitants, Ratio of (Fixed) Broadband Internet subscribers to total Internet subscribers, Ratio of (Mobile) Broadband Internet subscribers to mobile Internet subscribers).

General index DOI is measured by scores from zero to one. Index DOI score can never be less than zero and bigger than one. Its main advantage is that the index (as well as its constituent parts are separate criteria out of the eleven as described above) is standardised and may be used for the intercomparison of both separate countries and separate regions.

Table 2. Digital Opportunity Index (DOI) 2005/06 – World; HDI and GDP per capita ranks

DOI rank	Country	DOI value	HDI rank	GDP per capita rank	GDP per capita rank minus HDI rank*	DOI rank minus HDI rank**
3	Denmark	0.76	14	8	-6	-11
6	Netherlands	0.71	9	12	3	-3
9	Sweden	0.70	6	13	7	3
10	United Kingdom	0.69	16	11	-5	-6
11	Finland	0.69	11	14	3	0
13	Luxembourg	0.69	18	1	-17	-5
18	Austria	0.67	15	9	-6	3
19	Germany	0.66	22	20	-2	-3
21	Spain	0.65	13	24	11	8
23	Belgium	0.65	17	15	-2	6
24	Estonia	0.65	44	44	0	-20
26	France	0.64	10	18	8	16
28	Italy	0.63	20	21	1	8
30	Slovenia	0.62	27	31	4	3
31	Ireland	0.61	5	4	-1	26
32	Portugal	0.61	29	35	6	3
33	**Lithuania**	**0.61**	**43**	**46**	**3**	**-10**
34	Malta	0.60	34	36	2	0
36	Hungary	0.59	36	38	2	0
39	Cyprus	0.57	28	30	2	11
42	Czech Republic	0.57	32	34	2	10
44	Slovakia	0.55	42	41	-1	12
46	Latvia	0.54	45	49	4	1
49	Greece	0.53	24	29	5	25
53	Poland	0.51	37	48	11	16

* A positive figure indicates that HDI rank is higher than GDP per capita rank, a negative the opposite.

** A positive figure indicates that HDI rank is higher than DOI rank, a negative the opposite.

Development of information society and GDP dynamics in Lithuania over this decade was analysed in the previous part of this work.

Furthermore, by means of comparative analysis, we will examine general index DOI and Gross Domestic Product (GDP), which characterise information society following the newest data – what

Lithuania has gained, what well-developed countries have achieved, what the newest EU member states have gained and how Lithuania and its neighbours look with respect to these issues in a general context of the countries of the world.

Index DOI size by scores is presented in Table 2 for all EU member states. This table also contains data on what priority the EU member states take by locating themselves among all - 181 countries of the world-countries as analysed in the report (World Information Society Report 2007) by both index DOI and GDP.

As we can see from the data of Table 2, the index DOI of the development of the information society in Lithuania among the EU countries is quite fine – we find ourselves after Slovenia, Ireland and Portugal. We are very slightly lagging behind from Slovenia, but have the same DOI as Ireland and Portugal. Considering that the development of the information society in the contemporary world essentially determines the economic expansion, we could state that in Lithuania the preconditions for the development of the information society and economic expansion exist. They need to be employed in the best of way in the years to come.

It is important to assess what for the country pays greater attention – either for the growth of GDP or for the development of the information society. Leading countries of EU – Denmark, United Kingdom and other countries pay great attention for both of them – for the development of the information society and for the growth of GDP.

Examining the data from Table 2, it is noticed that Slovenia, the economy of which was also remarkably stronger before entering the EU, and GDP was much higher than of the other new EU member states, has a good position both according to HDI, and according to GDP, and according to DOI. It could be stated that this is also the goal for Lithuania in the nearest future – to seek for the country's strong economy (fine GDP index), well developed information society (fine DOI index), good quality of life according to HDI that could contribute to assuring stronger social cohesion as it is emphasized in the Lisbon Strategy.

At the moment Lithuania and Estonia according to GDP are in the adjacent positions – Estonia is in the 44th place among 181 world countries, whereas Lithuania is in the 46st place. Thus, from this point of view they are close enough to each other. According to DOI, Estonia is in the 24th place, whereas according to HDI – in the 44th place in the world. According to DOI, Lithuania is in the 33rd place in the world, whereas according to HDI – in the 43rd place. Therefore, it could be pointed out that according to the quality of life, even if quite slightly, we have overtaken Estonia. Apparently, Estonia is more concentrated on the contemporary digital technologies; nevertheless, Lithuania's lagging behind according to GDP is really slight, and according to the development of the information society and its index DOI, we have the possibilities to improve our position in the future, especially bearing in mind our human potential in the sphere of the information technologies and the gained fine position according to this indicator at the moment among the new EU member states.

By examining the Baltic countries it could be noticed that Sweden and Finland have gained brilliant results (Table 2). According to DOI and HDI, they have significantly surpassed Estonia, Lithuania and Latvia. It is true that Finland, occupying the 11th position according to HDI in the world, is slightly lagging behind Sweden – that respectively occupy the 6th places in the world. Bearing in the mind the troublesome historical road as walked through in the twentieth century, the Soviet Union's aggression and following actions of the Soviet Union, the results that Finland has gained are without doubt very good. Lithuania has got many things to learn from the experience of Finland, both in developing economy, expanding information society and improving the quality of life in the country.

It is interesting to analyse what results in developing information society according to DOI index were achieved by the countries that had gained different results according to HDI index. These results also are provided in Table 2. The results show that some of the countries, having the high HDI index, have gained fine results according to DOI (Sweden, Netherlands); nevertheless, Ireland according to HDI occupies the 5st place, but according to DOI, occupies just the 31st place. Even though Ireland, according to the succession slightly overpasses Lithuania (33rd place according to DOI), it has the ratio of the same size DOI = 0.61.

By examining the Baltic countries – leaders according to HDI and the world countries that are situated next to them according to HDI index, it could be observed that both Estonia and Lithuania (respectively being in the 44th and 43st place according to HDI) pay more attention to the development of the information society, paying less attention to the improvement of the life quality. Other countries – Portugal, Malta, Hungary, Slovakia pay approximately the same attention to the development of the information society and to the improvement of the life quality. We can draw a conclusion that in the future our countries also will be more attempting to implement technologies and at the same time to set up as much as possible better conditions to the improvement of the life quality. It must be main priorities in the future policy of our countries.

Conclusions

1. Leading countries have achieved good results both according to the improvement of the quality of life and according to the development of the information society; nevertheless, the part of them pay greater attention to the improvement of the life quality. Evidently, these countries suppose that the gained level of the development of the information society meets the needs of the development of economy and social sphere of the country. At the same time it proves that more attention is paid to greater social cohesion, as it is emphasized in the Lisbon strategy.

2. Rapidly developing countries, including Estonia and Lithuania, are more orientated towards the development of the information society, being as a precondition for a faster economy development, even though Lithuania is more attempting to balance both priorities – the development of the information society and the improvement of the life quality.

3. Lithuania has made a tremendous progress since 2000 in creating and developing information society, in particular, in the Internet development and cellular phone utilisation spheres. If the pace of this development is maintained in the forthcoming decade, fairly good results in developing the modern information society are anticipated.

References

Castells M. The Internet Galaxy. Oxford University press, 2002.

Castells M. The rise of the Network Society. Second Edition. Blackwell Publishers, 2000.

Castells M. End of Millennium. Blackwell Publishers, 1999.

Dainauskienė I., Galginaitis J., Keras A., Novickas J. ir kt. Informacinė politika ir jos teisiniai aspektai. LII, Vilnius, 1994.

Digital Opportunity Index (DOI) – Methodology. On line: http://www.itu.int/ITU-D/ict/doi/methodology.html

eEurope. An Information Society For All. Communication on a Commission Initiative for the Special European Council of Lisbon, 23 and 24 March 2000. On line: http://europa.eu.int/ISPO/docs/policy/docs/e_europe/COM(99)_en.pdf

eEurope 2005: An information society for all. An Action Plan to be presented in view of Sevilla European Council, 21/22 June 2002. – Brussels, 28.5.2002 COM (2002) 263 final. On-line: http://ec.europa.eu/information_society/eeurope/2002/news_library/documents/eeurope2005/eeurope2005_en.pdf

Human Development Report 2007/2008. On line: http://hdr.undp.org/en/media/hdr_20072008_en_complete.pdf

i2010-Europos informacinė visuomenė augimui ir užimtumui skatinti. Briuselis, 1.6.2005 KOM(205) 229 galutinis. On line: http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm

i2010. 2007 m. metinė informacinės visuomenės ataskaita. Briuselis, 30.3.2007 KOM(2007) 146 galutinis. On line: http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm

Informacinės technologijos Lietuvoje, 2006. Statistikos departamentas prie Lietuvos Respublikos Vyriausybės. Vilnius, 2006.

Informacinės technologijos Lietuvoje, 2007. Statistikos departamentas prie Lietuvos Respublikos Vyriausybės. Vilnius, 2007.

Lietuvos ekonominė ir socialinė raida, 2007/12. Statistikos departamentas, Vilnius 2008.

Lietuvos informacinės visuomenės plėtros strategija. Vilnius, 2005 – Patvirtinta Lietuvos Respublikos Vyriausybės 2005 m. birželio 8 d. nutarimu Nr. 625.

Lietuvos mokslo ir studijų kompiuterių tinklas LITNET. Faktai iš LITNET istorijos. On line: http://www.litnet.lt/index.php?option=com_content&task=view&id=28&Itemid=16

Nacionalinė Lisabonos strategijos įgyvendinimo programa. Vilnius, 2005 – Patvirtinta Lietuvos Respublikos Vyriausybės 2005 m. lapkričio 22 d. nutarimu Nr. 1270.

Telksnys L., Novickas J, Keras A., Galginaitis J., Petrauskas R. ir kt. Valstybinio informatikos vystymo kompiuterizavimo pagrindu koncepcija. Galutinis projektas.-V., 1991.

Telksnys L. Kaimiškųjų vietovių informacinių technologijų plačiajuostis tinklas RAIN. Padėtis ir perspektyvos. On line: http://www.rain.lt/NAUJIENOS/doc/RAINseimasZ.pps

Šaulauskas M.P. Skaitmeninė Lietuva 2001. Vilniaus universitetas, Informacijos visuomenės studijų centras, 2001.

Valstybės ilgalaikės raidos strategija. Vilnius, 2002 – Patvirtinta Lietuvos Respublikos Seimo 2002 m. lapkričio 12 d. nutarimu Nr. IX-1187.

World Information Society Report 2007. Beyond WSIS. On line:http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/report.html