# WORKING PAPERS

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# FACTORS AND IMPACTS IN THE INFORMATION SOCIETY
# A PROSPECTIVE ANALYSIS IN LITHUANIA

Lithuanian Free Market Institute

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## Preface

The present working paper has been prepared on the basis of a country monograph that was part of a wider project aiming at studying the factors and impacts of Information Society in the candidate countries.
The study has been carried out by the International Center for Economic Growth, European Center (ICEG EC) and a consortium of 11 other research institutes as sub-contractors to the Institute of Prospective Technological Studies (IPTS) of the Directorate General Joint Research Centre of the European Commission.

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# COUNTRY PROFILE


## General Information about Lithuania

| | |
|---|---|
| Capital - | Vilnius |
| Surface area - | 65 200 sq. km |
| Population - | 3 483 972 |
| Lithuanians - | 83.4% |
| Catholics - | 79% |
| National currency - | litas (1 LTL= EUR 3.45) |

# I. INDUSTRIAL DEVELOPMENT AND COMPETITIVENESS, AND ITS GEOGRAPHY

## I.1. Structure of production

Structural reforms and enterprise reorganisation have had profound effects on the country's industrial development. Those sectors of the economy which required relatively small investments were the fastest to restructure. Relatively low labour costs allowed them to maintain competitiveness, attract foreign investors and find new markets. The apparel, textile, food, wood and chemical industries are the examples. Modernisation of the food industry, Lithuania's largest manufacturing sector, proceeded quite rapidly, but as production capacities exceeded local market needs and export possibilities were limited by high customs duties, import quotas and quality requirements, deteriorating sales became a concern. Such industries as electrical engineering and electronic industries required more time and investments to install new technologies.

Table 1..: **Structure of sales of industrial production by sectors, %***

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|---|---|
| Total industrial sales | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Mining and quarrying | 0.6 | 0.6 | 1.1 | 1.3 | 1.4 | 1.4 | 1.5 | 1.9 | 2.1 |
| Food products and beverages | 29.6 | 32.6 | 23.2 | 31.0 | 29.4 | 27.7 | 26.8 | 23 | 21.8 |
| Tobacco products | 0.5 | 0.8 | 1.4 | 3.0 | 1.6 | 1.5 | 1.8 | 1.4 | 1.5 |
| Textiles | 8.3 | 7.6 | 7.6 | 7.0 | 6.7 | 7.1 | 6.4 | 5.9 | 6.1 |
| Wearing apparel | 3.0 | 2.3 | 5.0 | 5.8 | 7.0 | 8.1 | 10.5 | 9.3 | 8.8 |
| Leather and leather products | 1.6 | 1.3 | 1.4 | 1.6 | 1.8 | 1.3 | 1.2 | 1.1 | 0.9 |
| Wood and wood products | 2.6 | 2.9 | 4.7 | 3.4 | 4.6 | 5.4 | 5.7 | 5.4 | 5.0 |
| Pulp, paper and paper products | 0.9 | 1.4 | 1.7 | 1.4 | 1.5 | 1.2 | 1.4 | 1.2 | 1.3 |
| Publishing, printing and reproduction of recorded media | 0.5 | 0.2 | 1.5 | 2.1 | 2.3 | 2.5 | 3.6 | 3.1 | 3.0 |
| Refined petroleum products | 25.5 | 24.8 | 13.8 | 16.0 | 17.7 | 16.2 | 12.2 | 19.3 | 22.5 |
| Chemicals and chemical products | 3.9 | 4.8 | 7.8 | 7.7 | 6.2 | 6.4 | 6.3 | 5.7 | 4.6 |
| Rubber and plastic products | 0.3 | 0.6 | 0.6 | 1.0 | 1.3 | 1.7 | 3.0 | 2.4 | 2.8 |
| Other non-metallic mineral | 4.0 | 4.2 | 4.1 | 3.5 | 3.3 | 4.1 | 3.4 | 2.9 | 2.8 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| products | | | | | | | | | |
| Basic metals | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 |
| Fabricated metal products | 1.1 | 1.4 | 1.7 | 1.3 | 1.5 | 1.8 | 1.9 | 2.5 | 1.9 |
| Machinery and equipment | 5.3 | 4.0 | 4.4 | 3.2 | 2.9 | 2.5 | 2.3 | 2.1 | 2.4 |
| Office machinery and computers | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 0.1 | 0.2 | 0.2 | 0.2 |
| Electrical equipment and apparatus | 1.4 | 0.9 | 1.3 | 2.0 | 2.3 | 2.0 | 2.2 | 2.0 | 1.9 |
| Radio, television and communication equipment and apparatus | 5.0 | 3.7 | 3.4 | 3.0 | 2.6 | 2.5 | 3.0 | 3.6 | 3.5 |
| Medical, precision and optical instruments | 0.9 | 0.6 | 0.6 | 0.6 | 0.8 | 1.0 | 1.3 | 1.0 | 0.9 |
| Motor-vehicles, trailers and semi-trailers | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| Other transport equipment | 1.4 | 2.2 | 1.8 | 1.7 | 1.7 | 2.1 | 1.9 | 1.9 | 1.9 |
| Furniture | 2.5 | 2.1 | 2.3 | 2.4 | 2.6 | 2.7 | 2.8 | 2.9 | 3.1 |
| Recycling of metal waste and scrap | 0.2 | 0.2 | 0.9 | 0.3 | 0.3 | 0.2 | 0.2 | 0.6 | 0.6 |

**1993 and 1994 data on structure of industrial production by activity and 1995-2000 data on structure of sales of industrial production by activity*
*Reference: Statistics Lithuania, 1998, pp. 264-265; Statistics Lithuania, "Statistical Yearbook of Lithuania," 2002, pp. 421-422.*

The composition of Lithuanian industry has not changed much over recent years. Industrial production has been dominated by food products and beverages, refined petroleum products, wearing apparel, textiles and chemicals. Manufacture has grown steadily, with the exception of a temporary recession in 1999 in the wake of the Russian crisis. Since 1996 an upsurge has been recorded in the manufacture of rubber and plastic products, radio, TV and communication equipment and apparatus, wood and wood products, chemicals, furniture and wearing apparel. Export-oriented sectors have given a strong boost to manufacture as the rates of export growth have accelerated, with textile, furniture, wood, metal and chemical sectors being in the lead among the exporters. The general trend in the country's industries is the orientation towards ISO standards. According to the Lithuanian Standards Board, by December 2002 a total of 270 Lithuanian companies obtained ISO 9000 quality control certificates and 27 companies acquired certificated of environmental management standards ISO 14001.

Table 2.: **Structure of industrial production, current prices, EUR million**

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|
| Mining and quarrying | 21.0 | 25.7 | 17.1 | 30.8 | 34.1 | 35.4 | 41.9 | 75.4 | 88.6 | 83.1 |
| Manufacture | 2 238 | 2 553 | 915.5 | 1 124 | 1 474 | 1 626 | 1 635 | 2 158 | 2 446 | 2 562 |
| Electricity, gas and water supply | 529.7 | 597.6 | 238.6 | 282.0 | 331.6 | 364.9 | 388.7 | 416.6 | 498.2 | 552.2 |

*Reference: Statistics Lithuania, "Statistical Yearbook of Lithuania," 2002, pp. 416-417.*

Industrial production is concentrated around Lithuania's largest cities which are evenly distributed throughout the whole country, so in regional terms industrial production is also evenly distributed. Agriculture is also fairly evenly distributed in regional terms, but there are differences in productivity, the highest being in Marijampole and Siauliai districts and around Pasvalys and Kedainiai. Still, there exist certain differences in terms of regional contribution to GDP and regional employment and unemployment. Districts concentrating around cities with more extensive manufacturing industries, such as Vilnius, Kaunas, Klaipeda, Utena and Panevezys, contribute larger shares to gross domestic product than other regions (see section A1) and have higher employment rates than the country's average. According to the data on officially registered unemployment from the Labour Exchange, these districts also have lower rates of unemployment; although labour force surveys do not confirm this correlation (see section A4).

## I.2. Industry profiles

Certain changes have occurred in the shares of different sectors in gross domestic product. Food production continues to comprise the largest portion of GDP, although it declined from 32.2 percent in 1995 to 21.8 percent in 2001. The food industry suffered heavily from the Russian crisis, but it has started to recover in recent years as export volumes have increased. Exports of dairy products (see Box C1.) are among the most dynamic in the Lithuanian agricultural sector. In 2000 dairy products constituted 30 percent of agricultural and food exports. The main export markets are the EU, USA, Baltic States and CIS. Growing compliance with EU quality standards enhances the growth prospects of food industry (see Box C2.) but increased competition may put significant pressure on food producers.

Oil refining recovered in 1996 and maintained high volumes for three years until the Russian crisis. Manufacture of refined petroleum products rose from 13.8 percent of total industrial production in 1995 to 19.3 percent in 2000. The Lithuanian oil industry exerts a profound impact on the national economy. The primary source of this impact should be attributed to "Mazeikiu nafta," the only oil refinery in the Baltic region, providing for 15-20 percent of tax revenues to the state budget. The company processes crude oil from Russia and small amounts that are extracted in Lithuania, though imports via "Butinge" terminal are also possible and was sometimes used in previous years.

From 1997 a constant growth tendency can be observed in the Lithuanian textile and apparel industry, which is recognized as one of the most developed industries with long-standing traditions and is one of the major local exporters successfully competing in EU markets. A total of 550 enterprises are operating in the Lithuanian textile and apparel industry. The share of the apparel industry went up from 5 percent of GDP in 1995 to 9.5 percent in 2000. Manufacture of textiles outstripped production of chemicals and chemical products in 1997 and remains in the fourth position, although its share slumped from 7.6 percent in 1995 to 5.9

percent in 2000. The Lithuanian textile and apparel industry is the leader in national exports. In 2001 the value of exported production comprised approximately 19.5 percent of all Lithuanian exports. The total export volume of the textile and apparel industry makes up 87.4 percent of total output of the textile and apparel industry. Approximately 83 percent of all textiles and apparel is exported to the EU *(Lithuanian Development Agency, Lideika, Petrauskas, Valiūnas ir Partneriai, 2003, pp. 203-207).* The leaders in the country's textile and apparel industry have either implemented or are in the process of implementing ISO quality standards such as ISO 9000, ISO 14000 and others. In the near future the Lithuanian Textile Institute will issue "European certificates for textile fabrics." In 2002 the last accreditation procedures were completed in the Lithuanian Textile Institute for the accreditation that will be valid in all European countries. Exporters will be able to receive this more quickly and cheaply than their peers in other countries.

**Box 1.: Dairy industry in Lithuania**

Dairy is an agricultural activity in which Lithuania enjoys a definite comparative advantage in terms of the price of dairy industry's basic raw material. Despite its modest yields per cow, Lithuania, whose milk production costs are under USD 0.15/kg, is one of the world's least cost producers. However, a recent sizeable fall in the prices of milk purchase, caused largely by declining markets, have led to significant disagreements between milk producers and processing enterprises and subsequently to indirect interventions on the part of the government. The development potential of the milk processing sector is estimated to be high. This is related to growing export opportunities, given than about 20 milk processing enterprises have EU quality certificates. Significant concentration of the milk processing sector, which has taken place in recent years, may also enhance the growth potential. The number of dairy processors contracted from 38 in 2000 to 24 at the end of 2001. After a rather difficult primary privatization, bankruptcy of many dairies and the secondary tumultuous redistribution of shares, three distinct leaders have emerged in the dairy market: "Pieno zvaigzdes," "Rokiskio suris" and "Zemaitijos pienas." They controlled 80 percent of the milk bulk purchase market in 2001 and 87 percent in July 2002. The relative market share of "Rokiskio suris"grew from 33 to 38 percent in the aforesaid period and that of "Zemaitijos pienas" rose from 18 to 22 percent.

*Reference: Statistics Lithuania, 2/ 2002; World Bank, October , 2002, pp. 68-70.*

The share of chemical production fell from 7.8 percent of the country's GDP in 1995 to 5.7 percent in 2000. As a consequence of industrial restructuring and the Russian crisis the sales volume of chemical products fluctuated between 1997 and 2002. In 2002 the sales volume increased by 6 percent over 1997, meanwhile the volume of production sold by Lithuania's extraction and processing industry during this period rose by 33 percent *(Lithuanian Development Agency, Lideika, Petrauskas, Valiunas ir Partneriai, 2003, pp. 225-230)*. In 2002 there were 67 enterprises operating in Lithuania's chemical industry. The main branches include the production of enzymes and organic and non-organic chemicals, fertilizers, pharmaceutical products and household chemical and cosmetics. A total of 55 percent of the total output of the chemical industry is sold on the domestic market. Exports of Lithuania's chemical industry's production comprised 6.4 percent of the country's total exports in 2001. Of the chemical products, 65 percent were exported to EU countries, 18 percent to CIS countries and 12 percent to the countries of the Baltic region. In 2002, 14 enterprises in the chemical industry had ISO quality control certificates and one enterprise, "Achema," had ISO 14001 environmental protection standard. The chemical enterprises in Lithuania are also gradually preparing to introduce the "Responsible Care" standard. Accession into the EU is now forcing pharmacists to inculcate the requirements of "good manufacturing practice,"

which will become mandatory for Lithuania's pharmaceutical enterprises in 2004.

**Box 2.: Food producers: adjusting to EU quality standards**
According to the State Food and Veterinary Service, there were 38 companies in the Lithuanian agro-business which met the EU quality standards at the beginning of 2002. Out of them, 19 were dairy product producers, 10 from the fish product sector, 5 meat processors and 4 slaughter houses. The number of companies from these sectors which will meet EU norms by 2004 is estimated to be around 314 out of total 675. Based on the action plans provided by agro-business firms, it is estimated that 152 meat processors and 136 slaughter houses will meet EU standards by that time.
*Reference: World Bank, October, 2002.*

The dominating role in the woodworking industry, which comprises over 1 000 companies, belongs to the wood and wood products accounting for 58 percent of total production of this industry. The furniture branch accounts for 28 percent, while the paper branch for 14 percent. The woodworking industry accounts for 10 percent of all Lithuanian exports. Since 1999, wood and furniture industry branches were steadily growing and in 2002 the growth of these branches was estimated to be the fastest in the manufacturing industry on the whole. The wood and wood products branch grew twice as fast as the country's total industry in the period 2000-2001. This increase was largely due to the growing number of employees engaged in this industry. Meanwhile labour productivity in this branch is growing rapidly only in lumber milling, plywood and panels production. In 2000 labour productivity in these sectors was more than twice as high as that in 1996. The growth rate of the furniture branch was around 25 percent for the period 1999-2002. Although Lithuanian furniture production sizes are growing rapidly, in the European context the Lithuanian furniture branch exceeds only its Latvian counterpart. Production by German and Italian furniture branches is more than 100 times bigger. Labour productivity in this branch is not high. Between 1998 and 2001 it increased by less than 10 percent. The Lithuanian furniture branch is export-oriented. In 2001 exports were almost three-quarters of all furniture sales (with almost a quarter of exported furniture and its components are exported to Germany, which is also the main export country for Lithuanian wood and wood products). The paper branch developed unsteadily in recent years. Paper branch exports constitute 53-62 percent of all the branch production, with paper and cardboard comprising the main share of export *(Lithuanian Development Agency, Lideika, Petrauskas, Valiunas ir Partneriai, 2003, pp. 216-218).*

In the former Soviet Union, Lithuania was a leader in the electronics industry, particularly regarding the production and development of television sets, television equipment computers, semiconductors and radio measurement equipment. Lithuanian companies were also among the major suppliers of electronic products to the Soviet military industry and space programmes. During the period of transition, the electronics industry was restructured and is now successfully competing in Western markets. Since 1996 a particular upswing has been observed in the electronics industry, caused largely by growing investments and a rapid export growth. The Lithuanian electronics industry is distributed among three branches of (1) electric equipment and appliances, (2) radio, television and communications equipment and appliances and (3) medical, precision and optical equipment. In 2002 the Lithuanian electronics industry covered 162 companies, of which 24 attracted foreign capital in 2001. Production from the three largest companies - "Vilniaus Vingis," "Ekranas" and "Siauliu Tauro Televizoriai" - account for over 80 percent of the total electronics sector production level (see Box C4).

An intensive growth during the period from 1997 to 2002 was observed in the branch of radio, television and communications equipment and appliances. This branch has survived thanks to

its exclusive feature to preserve existing potential and to re-orient itself towards the production of television technologies. In 2000 the total sales in this branch increased by 34 percent and in 2001 by 10 percent. The estimated growth of this branch in 2002 was 20 percent.

Medical, precision and optical instruments are the fastest growing branch in the electronics industry in Lithuania. The total sales of this branch have more than doubled within the last four years and amounted to EUR 93 million in 2001. Main leaders in this sub sector are companies producing medical hardware and developing and manufacturing precision measuring means. Products of the Lithuanian electronics industry are much specialised and most of the production is exported. In 2002, 30 percent of the production was sold in the domestic markets and 70 percent was exported. Of that exported, 44 percent went to the EU and 26 percent to the CIS countries, Latvia and Estonia. In 2001 the export of electronic products accounted for 4 percent of Lithuania's total exports *(Lithuanian Development Agency, Lideika, Petrauskas, Valiūnas ir Partneriai, 2003, pp. 187-193).*

The growth of plastic and rubber production has been equally impressive. Its share in total industrial production has tripled in the 1996-2001 period. The share of exported production has increased too. About two-thirds of plastic and rubber products are exported. In 2001 the value of exported plastic and rubber production comprised roughly 2 percent of total Lithuanian export. About 20 percent of all exported plastic and rubber industry goes to EU countries, 31 percent to CIS countries and 3 percent to CEFTA *(Lithuanian Development Agency, Lideika, Petrauskas, Valiunas ir Partneriai, 2003, pp. 219-224).* The current export growth is based on the increasing export to the Baltic countries, Russia and Ukraine. Lithuanian companies are regaining Eastern markets and this indicates further potential of this industry. Labour productivity in this industry is among the highest in Lithuania's manufacturing industry but still retains potential for further growth. Of 186 companies in this industry, 168 are engaged in the production of plastics and only 18 in the production of rubber products. The industry offers a wide range of finished and semi-finished industrial and household products, including plastic building materials, automotive components from plastic and rubber, plastic packaging, etc. The main guarantee of the quality of plastic and rubber products made in Lithuania is a strict mechanism of quality control and manufacturers' orientation to ISO standards. In total, 10 percent of Lithuanian plastic manufacturers are certified according to ISO 9000 requirements. The potential for further reasonable growth of this industry is reflected in a growing use of plastic components in plastic branch, a growing demand for plastic packaging materials and a growing use of secondary raw materials in the plastic sector. In Lithuania the recycling and use of secondary plastic raw material in manufacturing almost quadrupled between 1994 and 2000. It is forecasted that the growth level in this industry will remain at the level of 15-20 percent.

Metalworking and the production of machinery and appliances have long-standing traditions in Lithuania. Currently about 600 enterprises operate in this sector, which, due to timely privatisation, has successfully adjusted to market conditions. The market share of this sector in Lithuania is comparatively small, so most of the products are sold on foreign markets. The sector accounts for 8 percent of Lithuania's entire export turnover. "Baltijos Laivu Statykla," specialising in the manufacture of metal constructions for the shipbuilding industry, is a leader in the area of metal constructions. It exports 95-97 percent of its total production. The production of machinery and appliances includes the manufacture of production equipment and heating and refrigeration equipment and the like for various branches of the industry and personal use. "Snaige" is the leader in this sector. It exports over 90 percent of its production to 30 countries. Exports to the EU comprised 48 percent, while those to the CIS accounted for 43 percent. Every year the enterprise invests an average of EUR 4.3 million in new

technologies. It has introduced ISO 9000 and ISO 14001 *(Lithuanian Development Agency, Lideika, Petrauskas, Valiunas ir Partneriai, 2003, pp. 239-245)*.

Mining and quarrying has shown high rates of growth, mainly due to impressive growth of oil extraction in recent years, with about 400 000 tons of oil extracted per year, compared with 10-12 000 tons in 1990. The share of electricity, gas and water supply dropped from 5.4 percent in 1995 to 4.2 percent in 2002, mainly due to a more efficient use of energy resources in restructured industries. Structural changes in indigenous energy generation have taken place over recent years. The share of solid fuels and that of crude oil has been growing, while the specific weight of nuclear and hydropower has been contracting. The share of solid fuels rose from 12.1 percent in 1996 to 20.1 percent in 2000, while that of crude oil from 3.6 to 10.0 percent respectively. At the same time the share of hydropower and nuclear energy slumped from 84.3 percent to 69.9 percent. Gross internal costs of energy resources and energy losses have gradually declined over the recent years, showing that energy resources are being used more efficiently. Within the energy generation balance structure generation of liquid fuel and nuclear and hydropower prevail.

Between 1998 and 2002 the Ignalina nuclear power station supplied about 76-90 percent of all the electricity consumed in Lithuania, with the rest being produced by thermal electric and hydro-electric power stations. Lithuanian has pledged to decommission the first of Ignalina's two reactors by 1 January, 2005. The decision regarding the closure of the second bloc has to be taken in 2004. Given that the Ignalina power station is the biggest electrical energy producer in Lithuania, its closure will affect the country's entire electricity market. The closure issue is closely related to the restructuring and modernisation of electrical energy production and creating conditions for new market entrants. Strategic objectives in the electricity sector include linking the Lithuanian power grid to the western systems, in particular by interconnecting the power grids of Lithuania and Poland as well as establishing a common electricity market of the Baltic States. Also, the closure of the nuclear power plant entails such politically sensitive issues as re-qualification of the company's personnel and implementation of the Ignalina nuclear power station's region's development projects.

Lithuania may be characterized as a net electricity exporter with a large reserve margin. Currently Lithuania exports electricity to Russia and the Kaliningrad region as well as neighbouring Latvia and Estonia. Plans to export electricity to Poland and Ukraine are being considered. Lithuania is fully dependent on gas and oil pipelines from the Russian federation. The share of natural gas in the aggregate balances of the primary energy resources of Lithuania amounts to approximately 28 percent. The Lithuanian Gas remains the sole owner of the main grid and owns approximately 75 percent of the distribution grids. The gas supply grid is interconnected with the grids of neighbouring Latvia and the Kaliningrad region but is not linked with the grids of Western Europe (see also Part F. Privatisation and de-regulation of other services).

Incorporation into international production and marketing networks can be a successful strategy of growth for many local producers. This would facilitate significantly technology upgrading and acquisition of managerial know-how as well as provide direct access to larger markets, with significant effects on productivity growth. A comparison of CEE-10 in terms of their participation in the international division of labour shows that Lithuania is ranked 7$^{th}$, with less than 10 percent of non-chemical manufacturing exports being network-related. It thus lags behind Estonia but ranks above Latvia (*World Bank, October 2002, pp. 43-44)*.

**Box 3.: "Vilniaus Baldu Kombinatas"**
The case of "Vilniaus Baldu Kombinatas" (VBK), the largest furniture producer in Lithuania, shows that establishing commercial ties with a multinational corporation may be a successful strategy for integrating into a global distribution network and boosting exports. VBK produces both home and office furniture. Since the Lithuanian furniture market is too small to support a company of the size of VBK, VBK relies on exports. About 93 percent of VBK production is exported to Sweden, Belgium, Great Britain, Canada, US and France. About 90 percent of output is sold to the Swedish company IKEA, which in 1999 named VBK its best supplier in the Baltics. This cooperation began in 1998. IKEA has provided support to VBK in terms of technology, production organization and personnel training. VBK is connected to the IKEA's computer system through which invoices and payment and delivery information are being processed. VBK is upgrading its computer system to be able to receive daily information on sales of its products in IKEA stores abroad. VBK is one of the top 25 IKEA suppliers out of 200.
*Reference: World Bank, October, 2002, p. 42.*

The overall importance of international networks in Lithuanian trade has been increasing. Their combined export share has risen from 8.6 percent in 1993 to almost 10 percent in 1997 and to 12.6 percent in 1999. Box C3. and Box C4. contain case studies of firms involved in such international production and distribution networks. Lithuania has been focusing on participating in the international furniture network. This sector accounted for 6.8 percent of non-chemical manufacturing exports in 1999. Lithuanian textile and apparel producers also cooperate successfully with international companies (such as Ikea, Nike, H&M, Zara, C&A and Laura Ashley). Participation in the international automobile network has been less impressive, even though insulated wires and cables produced within the network are among one of the most dynamic export sectors in the country.

**Box 4.: "Vilniaus Vingis" and "Ekranas"**
"Vilniaus Vingis" (VV) is an important manufacturer of electronic components in Central and Eastern Europe. The company's main products include deflection yokes for colour picture tubes and flyback transformers for TV sets and monitors. Yokes account for about 85 percent of total output. The company was established in 1959 as a state-owned enterprise producing radio components. Manufacturing of deflection yokes began in 1976. Ten years later the company acquired technology and equipment for manufacturing deflection yokes from the American concern RCA. In 1993 the company was privatized and three years later it became a supplier of Samsung, Germany. In 1998 the production of deflection yokes for 21'' screen colour picture tubes for Philips Components was begun. In 1999 mass production of mini neck deflection yokes for Philips and Chunghwa Picture Tubes commenced. In 2000 mass production of 29'' deflection yokes was started. Samsung purchases about 37 percent of yokes produced by VV. They become part of TV sets assembled by Samsung and Philips. Another 30 percent of yokes are sold to a Lithuanian company "Ekranas," where they become part of assembled TV sets sold abroad. "Ekranas" itself accounts for 4 percent of Lithuania's total exports to western Europe. Ten percent of VV's output is exported to Philips, Barcelona and 7 percent to Philips, England. Another 10 percent is shipped to Thomson Polkolor in Poland where it becomes part of TV tubes sold all over the world through Thomson's distribution network. VV is growing rapidly, with its sales increasing from LTL 28 million in 1994 to LTL 63 million in 1997 and LTL 135 million in 2001. To remain competitive, VV purchases foreign technology licenses as well as performs in house R&D. The company holds numerous quality certificates. It also places strong emphasis on

training. From a development point of view, this is the area with the most prospects in the Lithuanian machine-building and instrument making sector.
*Reference: World Bank, October, 2002, p. 45.*

## I.3. Services profiles

In the service sector transport and communication have shown the biggest growth in recent years. The share of this sector in GDP rose from 9.1 percent in 1995 to 13.7 percent in 2002. Construction rose considerably reaching a record high in 1998, when it stood at 8.6 percent of GDP. Although the share of construction has dropped since then, the construction sector continues to grow quite impressively and is said to be under revival (a 12.8-percent rise in 2002). This is mainly attributed to the expanding housing loan market and falling interest rates. It is predicted that the housing loan market, which constitutes 2.3 percent of the country's GDP, will grow by 35-40 percent in 2003. Also, increased competition in the construction sector has driven prices down, enhancing the affordability of construction services.

Wholesale and retail trade revived in 2000 after a decline in the previous few years and reached 18 percent growth in 2002. The Lithuanian retail sector has expanded significantly over the past few years. The growth has further accelerated in recent years, especially in 2002, with the growing economy and household income, positive future outlook and development of a consumer credit market. This growth has also been backed by a change in purchasing habits - newly established super/hypermarkets are becoming more popular. The majority of retail sales consist of food products, but the share of non-food consumer goods is increasing every year with economic development. The Lithuanian retail market is dominated by three major players - "VP Market," "IKI" and "ICA/Ahold" ("Rimi"), which together are estimated to control over 50 percent of the total market (see Box C5.).

**Box 5.: The largest retail market players in Lithuania**
"VP Market" is the largest retail market operator in Lithuania. It has successfully competed against both local and international competitors and emerged as pan-Baltic leader. It has entered Latvian and Estonian markets and is considering expansion to Poland, Russia and Ukraine. In the first half of 2002 "VP Market" started to operate the largest shopping and leisure centre in the Baltic, "Akropolis," which occupies over 53 000 square metres. "VP Market" operates 214 trade centres in total: 165 in Lithuania, 48 in Latvia and one in Estonia. The company plans to invest LTL 300 million in 2003, to open 20 new stores and to increase its sales by 13.5 percent in the Baltic countries. "VP Market" operates under five different formats. "IKI" is the next largest player, focusing on the high-end segment with their supermarkets and pursuing a domestic expansion strategy. "IKI Group" is owned by three brothers Ortiz who opened their first store in 1992 in Vilnius. The IKI retail chain consists of 106 stores under three different formats. In 2003 it plans to open 20 new stores. "IKI" chain ownership will be consolidated under a single operator, "Palink," in 2003. The Norwegian "ICA/Ahold," the only foreign player with a pan-Baltic presence, acquired the entire "Ekovalda" retail chain in the middle of 2002. The chain has about 40 stores in different formats. In 2003 all store formats will be readjusted to meet the standard ICA/Ahold store formats. They plan to open 11 new hypermarkets and supermarkets in 2003.
*Reference: Lithuanian Development Agency, Lideika, Petrauskas, Valuūnas ir Partneriai, 2003, pp. 254-259.*

Table 3.: **Changes in the weight of services in GDP, %**

| Sectors | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Construction | 10.0 | 5.5 | 4.1 | 5.1 | 7.2 | 7.6 | 7.1 | 7.8 | 8.6 | 7.8 | 6.0 | 6.1 | 6.5 |
| Wholesale and retail trade | 7.1 | 6.2 | 9.5 | 14.0 | 17.5 | 17.3 | 16.8 | 16.7 | 16.7 | 16.0 | 16.6 | 17.5 | 18.0 |
| Hotels and restaurants | 2.2 | 1.8 | 1.7 | 1.3 | 1.4 | 1.5 | 1.6 | 1.8 | 1.6 | 1.7 | 1.5 | 1.6 | 1.6 |
| Transport and communications | 7.9 | 8.4 | 9.9 | 9.8 | 10.1 | 9.1 | 9.6 | 9.9 | 9.8 | 10.6 | 12.5 | 12.5 | 13.7 |
| Financial intermediation | 5.6 | 3.5 | 8.5 | 7.3 | 5.0 | 2.4 | 2.5 | 2.0 | 2.2 | 2.3 | 2.2 | 2.3 | 2.3 |
| Real estate, renting and business activity | 6.8 | 4.1 | 5.5 | 4.2 | 6.8 | 7.2 | 7.4 | 7.5 | 7.4 | 8.4 | 8.5 | 8.3 | 8.1 |
| Public administration and defence, compulsory social security | 10.9 | 7.7 | 7.4 | 2.9 | 5.0 | 6.2 | 6.8 | 6.3 | 7.0 | 7.1 | 6.9 | 5.8 | 5.5 |
| Education | 27.1 | 0.0 | 0.0 | 2.8 | 4.2 | 4.7 | 4.8 | 5.4 | 6.2 | 7.0 | 6.5 | 6.4 | 6.2 |
| Health and social work | 0.0 | 0.0 | 0.1 | 1.8 | 2.6 | 2.7 | 2.9 | 3.9 | 3.9 | 4.1 | 3.6 | 3.4 | 3.4 |
| Other community, social and personal service | 4.2 | 3.3 | 3.6 | 2.4 | 2.6 | 2.9 | 2.8 | 2.9 | 2.9 | 3.3 | 3.2 | 3.3 | 3.2 |
| Private households with employed persons | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

*Reference: Statistics Lithuania, 3/1999, 2003/03, pp. 112-113.*

With the start of the Russian crisis the prices of real estate in Lithuania soared by an average of 30 percent within several months, but in 1999 the total turnover of real estate declined by almost half, although prices continued to follow an upward trend. Commercial land and land lots for private housing maintained the largest transaction volumes. With the recovery of the national economy in 2000 the Lithuanian real estate and rent market stabilized and started to show signs of growth. In 2000 it reached 8.5 percent of GDP. The activity of market participants increased in line with expanding volumes of loans and investment into real estate projects and the steeply growing construction of commercial premises. Compared to 1991 the prices of real estate boosted by almost 1 000 percent to reach EUR 500-1 000 per square metre in the largest cities of Lithuania. In 1996 no hyper/supermarkets were present in Lithuania. Today there are more than 350 stores that belong to different food, do-it-yourself or home appliances retail operators. Today the total area of A-class office buildings in Vilnius exceeds 30 000 square metres and is expected to triple by the end of 2004. The first modern 20 000 square metre warehouse was constructed in mid-2002. Lithuania's accession to the EU in 2004 is expected to significantly boost the prices for real estate in the country *(Lithuanian Development Agency, Lideika, Petrauskas, Valiunas ir Partneriai, 2003, pp. 269-270).*

The share of financial intermediation in GDP remained stable from 1995 until 2002, but the growth prospects are positive. In 2002 this sector rose by 10.6 percent, mainly due to outstanding results of commercial banking, the insurance market and the lease market. In 2002 the banking sector showed the best performance during the past 12 years. The insurance market grew mostly due to the introduction of mandatory third-party vehicle liability insurance in April 2002 and an upsurge in life insurance stimulated by tax-exemption of life insurance benefits under contracts signed until the end of 2002 (tax-deductions for insurance premiums remain in force). The lease market is among the most rapidly growing sectors (a 56-percent growth in 2002), reflecting strong economic growth, rising investments into production and growing domestic consumption. Financing of heavy transport and passenger cars, industrial and technological equipment and real estate has had the biggest impact on the development of the lease market. Moveable property accounts for 82 percent of the lease

market, with real estate comprising the remaining part. The lease market is expected to maintain a 30 to 40-percent growth. Falling interest rates and intense competition among lease companies will continue to be significant factors.

## I.4. Investment processes

After the Russian crisis industrial investment processes recovered much faster than the rest of the economy. The growth of investments by sectors has varied in recent years. The mining and quarrying industry invested considerably in the past years and now is looking for (and, as of August 2004, finding) new oilfields. It is estimated that there are about 60 million tons of oil for extraction in Lithuania. After a decline in 2000, investments in agriculture have shown a sizeable increase, related largely due to numerous investment projects financed from EU assistance funds and growing banking crediting of the agricultural sector. The food industry, Lithuania's largest manufacturing sector, has stood out in terms of investments. In 2002, investments in the food industry accounted for 36 percent of total investments in manufacture, up from 30 percent in 2001. Labour productivity has increased steadily and the number of workers has diminished *(Lithuanian Development Agency, Lideika, Petrauskas, Valiunas ir Partneriai, 2003).* The food industry has been the most profitable of all manufacturing sectors in Lithuania for the past few years. The textile industry, the second largest manufacturing sector in Lithuania, has invested on a large scale, stimulated by exporting and intense competition. According to the data of the Lithuanian Apparel and Textile Industry Association, in 2000, compared with 1995, capital investments in the textile and apparel industry grew by 73 percent. An allocation of EUR 34.8 million capital investment was made into the textile and apparel industry from own financial resources. In 2000, compared with 1995, capital investments in the manufacturing of textiles increased by 44 percent, while those in the manufacture of wearing apparel grew by 168 percent. The biggest investment is now planned in the linen industry.

Table 4.: **Changes in investment, % y-on-y**

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|
| Total stock investment | 14.3 | 17.9 | 14.6 | 20.5 | -6.7 | 5.3 | 21.0 | 1.9 | 6.2 |

*Reference: Statistics Lithuania*

Investments in transport and storage declined in the past few years but they started to grow in 2002. Investments in domestic trade have largely been driven by a remarkable expansion of supermarket chains, both through new construction projects and reconstruction. Only in Vilnius 180 000 square meters of shopping area was built in 2002. Communications have shown a remarkable investment growth in recent years, although growing competition somewhat decreased the investments: the four biggest companies together invested around one million euros last year, which is 1.9 times less than the year before. A sustainable investment growth has been observed in restaurants and hotels, while new projects are likely to sustain growth prospects in the near future. Investments in financial intermediation fell steadily in 1999 and 2001, but they started to recover slowly in 2002. This is associated with a change of ownership resulting from privatisation of former state-owned banks and increased competition in the banking sector which requires, in addition to attractive prices, new measures to attract clients, such as improving the quality of services and widening the assortment.

The majority of IT companies in Lithuania were started on the basis of local capital. For a number of years difficult access to capital was one of the main barriers to a faster

development of young IT enterprises. This prevented companies from increasing the scale of their local operations and from investing into development of new products, thus making it more difficult to build international marketing channels. The first private offering of a Lithuanian IT company to international financial investor was executed only in 1997. As the Association of Information Technology, Telecommunications and Office Equipment Companies in Lithuania "Infobalt" informs, in 1999 and 2000 investment funds and other financial institutions invested over USD 7 million into the Lithuanian IT market, including software development, services and PC assembling *(Infobalt 2001)*. Today the companies that received international funding are the strongest performers among all IT enterprises. These include "Alna," "Sonex grupe" and "Informacines Technologijos." Despite an economic slowdown, foreign investors remained active in 2000, targeting large, diversified companies or niche enterprises in specific, promising market segments. Number of financial investors active in Lithuania raised new funds in 2000, the majority of which is intended to be invested in high-tech enterprises. The process of merging IT firms has started, but the firms remain relatively small. Acquisitions and mergers of IT firms on the scale of the Baltic region would help to maintain competitiveness thereof in the Single market.

In 2003 "European Investment Monitor" by "Ernst & Young" has included Lithuania in the top twenty territories in terms of investment attractiveness. Lithuania has moved by nine positions to locate fifteenth. This is attributed to an improving investment climate, including a strong and credible banking sector offering favourable credit terms. Other factors include relatively low labour costs, a low profit tax, low inflation and expanding relationships with foreign companies. Accession into the EU is expected to augment investment flows in Lithuania.

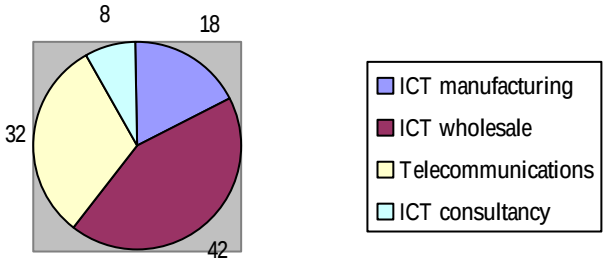
## I.5. General overview of the Lithuanian information technology and communication market

The Lithuanian ICT market approximately amounted to EUR 1 229 billion in 2002. Communications were estimated to total EUR 629 million and comprised the biggest share of the ICT market. The IT market and the market for IT services, complex solution and communications equipment were estimated to amount to EUR 300 million each *(Infobalt 2003)*.

According to the study "Indicators for the Information Society in the Baltic" Regions *(RISO, Department of State Informations Systems, 2003),* telecommunications account for 56 percent of total value added of the Lithuanian ICT sector. ICT manufacturing ranks second with 21 percent, followed by wholesale with 12 percent and ICT consultancy with 11 percent. According the above mentioned study, in 2001 value added created by the Lithuanian ICT sector made up 12 percent of total value added in manufacturing, 27 percent of total value added in services, and 22 percent of total value added in the private sector. These are the highest figures among the surveyed countries of the Baltic Region (with the exception of Finish manufacturing, making 23 percent of total value added in manufacturing).

According to the aforesaid study "Indicators for the Information Society in the Baltic Regions," the structure of the Lithuanian ICT sector in terms of ***turnover*** is the following:

Graph 1.




*Reference*: *RISO, Department of State Informations Systems, 2003.*

In recent years the markets of ICT equipment, software products, carrier services and IT services have shown the biggest growth. The market for end user communications equipment grew the most, followed by mobile telephone services and datacom and network equipment.

Table 5.: **Lithuania: Market for ITT Products, EUR million at constant 2000 exchange rates**

| | **1999** | **2000** | **2001** | **2001/00** |
|---|---|---|---|---|
| | | | | % |
| Server systems | 9 | 13 | 13 | *0.4* |
| Workstations | 1 | 1 | 1 | *-16.8* |
| PCs | 35 | 30 | 34 | *11.1* |
| Add-ons | 10 | 11 | 11 | *6.0* |
| **Computer hardware** | **55** | **55** | **59** | ***7.0*** |
| Copiers | 3 | 3 | 3 | *1.2* |
| Other office equipment | 9 | 10 | 11 | *7.5* |
| **Office equipment** | **12** | **13** | **14** | ***6.1*** |
| Mobile telephone sets | 12 | 20 | 32 | *55.1* |
| Other end user communications equipment | 21 | 22 | 23 | *5.0* |
| **End user communications equipment** | **32** | **42** | **55** | ***29.1*** |
| LAN hardware | 7 | 8 | 9 | *7.1* |
| PBX, key systems and circuit switching equipment | 46 | 49 | 48 | *-1.8* |
| Cellular mobile radio infrastructure | 48 | 71 | 82 | *15.5* |
| Packet switching and routing equipment | 12 | 14 | 16 | *11.9* |
| Other datacom and network equipment | 21 | 24 | 28 | *14.6* |
| **Datacom and network equipment** | **134** | **137** | **183** | ***9.6*** |
| **Total ICT equipment** | **233** | **278** | **311** | ***11.9*** |
| System software | 9 | 10 | 11 | *15.6* |
| Application software | 12 | 13 | 15 | *13.1* |

| | | | | |
|---|---|---|---|---|
| **Software products** | **20** | **23** | **26** | ***14.2*** |
| **IT services** | **35** | **40** | **44** | ***10.2*** |
| Telephone services | 192 | 204 | 214 | *5.0* |
| Mobile telephone services | 118 | 159 | 187 | *18.1* |
| Switched data and lease line services | 6 | 8 | 10 | *18.1* |
| CaTV services | 9 | 12 | 14 | *19.5* |
| **Carrier services** | **325** | **382** | **425** | ***11.2*** |
| **Total ICT** | **614** | **723** | **806** | ***11.5*** |
| **Total IT** | 152 | 166 | 182 | *9.7* |
| **Total telecommunications** | 462 | 557 | 624 | *12.0* |

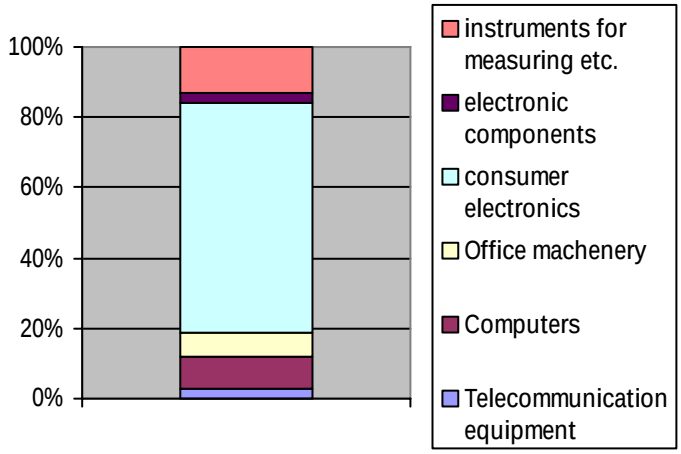
*Reference: International Trade Centre UNCTAD/WTO, 2002;*

The ICT sector in Lithuania employs four and six percent of the total number of employees in manufacturing and services respectively. In ICT manufacturing more than 80 percent of the employed work in enterprises larger than 100 employees (such as "Vilniaus Vingis" and "Ekranas" (see Box C4.) or "Baltijos Automobiliu Technika"). In ICT services, only 44 percent of employees work in such enterprises. Small business is prevailing in ICT services *(RISO, Department of State Informations Systems, 2003).*

*ICT manufacturing*

According to Statistics Lithuania, ICT manufacturing accounted for 8.7 percent of total industrial turnover in 2000 *(Statistics Lithuania, "Statistical Yearbook of Lithuania," 2002)*. As the sector in general is growing, this difference is most likely of the estimation character. According to aggregation used by the Lithuanian statistics, radio, television and communications equipment is the largest sector of ICT manufacturing, followed by electrical machinery and apparatus. The study "Indicators for the Information Society in the Baltic Regions" *(RISO, Department of State Informations Systems, 2003)* presents the following structure of Lithuanian ICT manufacturing:

Graph 2.



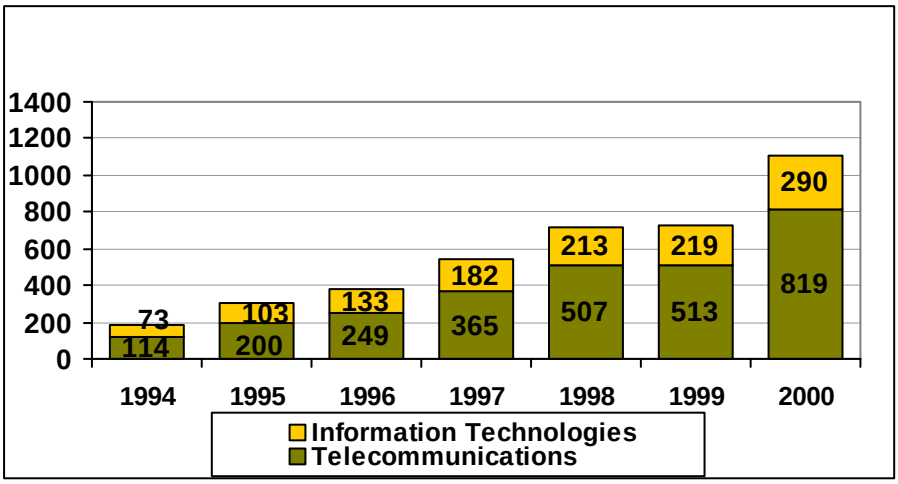

*Reference*: *RISO, Department of State Informations Systems, 2003.*

*ICT services*

As "Infobalt" states, in 2000 almost three quarters of the Lithuanian ICT service market were made up by the telecommunications sector, leaving 26 percent of the market to information technologies *(Infobalt 2001)*. ICT services are among the fastest-growing sectors of the

Lithuanian ICT market. The Lithuanian ICT service market has grown almost five times during the last six years. In 2000 the aggregate turnover of Lithuanian ICT service companies exceeded EUR 1 billion. In 2002 the ICT service sector accounted for 7 percent of GDP.

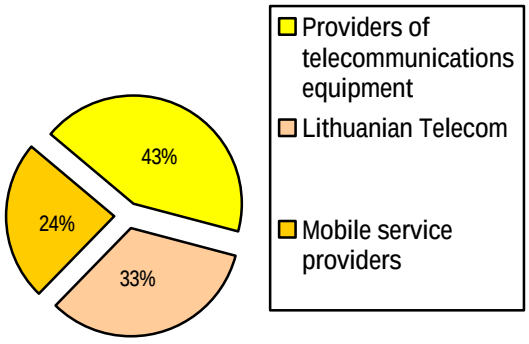
Graph 3.: **ICT service market in Lithuania in 1994-2000, EUR million**




*Reference: Infobalt 2001*

The telecommunications sector has grown almost six fold in the past several years. In 2000 the sector rose by 32 percent and reached EUR 812 million. In 2001 telecommunications accounted for 4.5 percent of GDP. Telecommunications are not only one of the fastest growing sectors of the economy in Lithuania but also a sector attracting most foreign investments. As the Lithuanian Agency of Economic Development reports, by the end of 1999 total investments in the telecommunications sector made up about EUR 600 million. In 2002 the revenue of four largest Lithuanian telecommunication market operators ("Lietuvos telekomas," "Omnitel," "Bite GSM" and "Tele2") reached a total of EUR 629 million, up from EUR 532 million in 2001 and EUR 448.6 million in 2000. In 2004 alone, the profit of telecommunication companies grew by 10 percent. At the end of 2003 the profit of the whole telecommunications market in Lithuania was over 2 billion litas *(Infobalt 2001, 2003)*.

Graph 4.: **Telecommunications market structure in Lithuania, 2000**

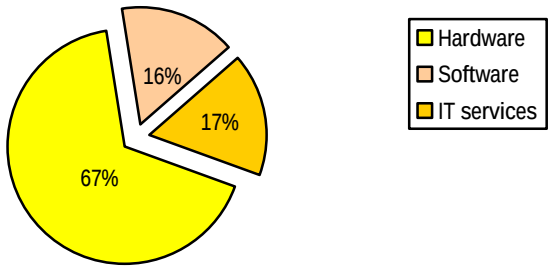



*Reference: Infobalt 2001*

As "Infobalt" informs, Lithuania is now the fastest growing market of information technologies in the Baltics. The Lithuanian IT market has been developing faster than the overall economy by nearly three times. In 2002, the volume of sales among IT wholesalers grew by 27 percent, sales of personal computers increased by 43 percent. The general IT

market share reached EUR 265 million. In the first half of 2002 the share of information technology in GDP reached 6 percent, up from 5 percent in 2000. It is forecasted that the indicator for the entire year could reach 6.5 to 7 percent. The growth rate shows that the input of the IT sector in the Lithuanian economy will exceed 10 percent of GDP in three years. In 2002 the Lithuanian IT sector has grown mostly due to the recovered domestic consumption. So last year IT companies increased their sales mostly in the domestic market, including for small and medium-sized businesses. Some computer hardware dealers offering production for home users raised their turnover by 70 to 100 percent. Revenues of 20 largest Lithuanian IT companies grew by 17 percent in 2002. Lithuanian sales comprised 120 000 new computers, or 60 percent more than in 2001 (75 000). The PC market was mostly boosted by home users and SME. The wholesale market of computer hardware grew by 27 percent to EUR 144.2 million. The growth in computers and the overall IT sector is partly influenced by Internet boom. (*Infobalt 2003*).

Graph 5.: **IT market structure in Lithuania, 2000**




*Reference: Infobalt 2001*

The software sector in Lithuania is showing a fast growth. The domestic market is already too small for its capacities, while the capacities of individual firms are too negligible for foreign markets. The markedly fast growth of this sector in the last years is related to large-scale investments into the country's economy and rapidly expanding IT and telecommunications services. According to "Infobalt", the software market in Lithuania made up EUR 40.6 million in 2000. However, due to piracy, more than EUR 22 million could have been lost (more about piracy see F). In spite of a large-scale piracy in FSU, export of software and related services is one of the main exports of the Lithuanian IT sector (see also Section A9).

Currently the Lithuanian IT sector employs more than 10 000 highly qualified specialists. Growing use of computers in households and the need for faster computerisation of state institutions implies a growing demand for IT products and services and hence a growing demand for IT specialists. Student enrolment in the field is growing, although the quality of training is a concern, while brain drain threatens to absorb qualified specialists (see part G for more about IT skills).

**Export strategies**

Experience and business contacts established on the former Soviet market facilitated Lithuanian companies in entering IT Services markets in FSU (see also section A9). As "Infobalt" reports, "Informacines Technologijos," a leading distributor of Oracle products and software developer, provided training services in Russia and Ukraine. "Penki kontinentai" distributed banking equipment and developed IS for a number of banks in FSU. "Elsis" and

"Technograma" produced and exported electronic equipment in FSU. First attempts to export software development service to the West were made by "Alna" and "Penki kontinentai" in the middle of 1990s. Today "Alna," the largest Lithuanian IT company, pursues a software export strategy the most actively. In 2000 the company signed a USD5 million contract with Bentley Systems to design and test software applications. Several start-ups just several years ago successfully entered western markets with innovative solutions and web design services. Today these enterprises generate more than half of their revenue from export activities.

Lithuanian computer assemblers and communication equipment manufacturers are expected to significantly increase their sales to FSU. Today local computer assemblers sell PCs to Latvia, Estonia, Ukraine and Russia. "Lintec Baltica," a Lithuanian-German joint venture, exported about 40 percent of its products to Germany in 2000 and planned to sell computers to Sweden and Finland. The leading call centre provider "Nelte" exported over 50 percent of its services in 2000.

Table 6.

| **Largest IT exporters in Lithuania in 2000** | | | |
|---|---|---|---|
| | | **Export, EUR million** | **Export as % of total sales** |
| Alna | IT solutions, consulting | 3.1 | 12 |
| Elsis | IT systems | 2.6 | 18 |
| Strauja | IT solutions and services | 0.5 | 15 |
| Kordab Vilnius | IT solutions and services | 0.4 | 65 |
| Hnit-Baltic GeoinfoServisas | GIS GPS navigation equipment | 0.4 | 25 |
| Kemek Elektronika | | 0.2 | 10 |
| Sintagma | IT solutions and services | 0.1 | 3 |
| Fima | Data networks | 0.1 | 1 |
| Baltic Amadeus | IT solutions and services | 0.1 | 1 |
| DBiT | Computer systems and products | 0.1 | 10 |
| Compidea | IT solutions and services | 0.1 | 5 |
| Baltic Optical Disc | CD-Audio, CD-ROM, CD-Extra, Photo-CD, Video-CD manufacture | | 47 |

*Reference: Infobalt 2001*

*ICT growth trends*

The trend is towards continued growth of the ICT service market in the coming years. A rapidly growing GDP has influenced the growth of home and small business users section, therefore sales of computer hardware in this segment is developing dynamically. An unfilled domestic market and especially a low-level utilization of modern technologies in state institutions are the main factors of growth. The development of household computerisation

and fast computerisation of state institutions are opening up wide opportunities for market participants. Other factors of ICT service growth are rapidly growing investments into the Lithuanian finance, energy and telecommunications sectors, a growing interest of foreign companies in Lithuanian specialists and expanding export of IT solutions (see below about export strategies). As "Infobalt" notes, the yet unfilled Lithuanian market and qualified specialists are factors that have lately attracted considerable interest of foreign investors. The bulk of investments has gone into telecommunications and the IT sector. The general trend reveals that the investors are mostly attracted by software development and export as the internal market has only recently begun to develop traditions of using legitimate software.

## I.6. International co-operation and competition. Regional cross country agreements

Lithuania is member of common Baltic institutions: the Baltic Council of Ministers (including Information Society Committee established under the Council), Baltic Assembly, Baltic Summit and the working groups within a framework of the Baltic Free Trade agreement. Those institutions facilitate the co-operation between the governments, parliaments and Presidents of Estonia, Latvia, and Lithuanian. Baltic Free Trade agreement foresees more liberal trade regime then the respective countries have with the EU as import barriers (both tariff and non-tariff) are abolished for the agricultural goods as well.

Lithuania participates in implementing the Northern eDimension action plan. Lithuania participates in the eEurope+ initiative, aimed at helping to accelerate reform and modernisation of the economies in the EU candidate countries, encourage capacity and institution building, improve overall competitiveness and enhance social cohesion. Participation in this programme is intended to help implement effectively the Information Society by means of joint actions that address the specific situation of the candidate countries. The provisions of the eEurope+ action plan are reflected in the Information Society Development strategic plan and the action plan for the implementation of the 2001-2004 Programme of the Government of Lithuanian.

Lithuanian also participates as a full and equal member of EU information society programmes, including IST, eContent, eSafe and other PHARE programmes that are not directly related to information society development.

## I.7. Major actors in ICT industry

### Manufacturing sector

The electrical and optical equipment industry is another growth industry. "Ekranas" - one of the sector's leaders, hiring over 4 000 employees, specializes in manufacturing of colour picture tubes and exports more than 90 percent of total production. The company holds 18.5 percent of the small TV tube market and 12.5 percent of medium-sized TV tube market in Europe. "Ekranas" sales amounted to EUR 121.9 million in 2002 and profits before tax were EUR 6.4 million. In the first quarter of 2003 "Ekranas" suffered a loss of EUR 1.7 million but lessened it to EUR 0.4 million by the end of the first half of 2003 and at the time its sales revenues reached EUR 54 million. In 2003 the company plans to invest about EUR 24 million and to produce 3.9 million TV tubes. 57% of "Ekranas" stock capital belongs to foreign investors ("Farimex S. A." - 15.9%, "CPT Investment Ltd." - 14.3%, "Profilo Sanayi Ve Ticaret A. S." - 12.9%, "Henley trading Ltd." - 8%, "Redoak Investment Holding" - 5.9%) *(Ekranas, Jusu tarpininkas)* (see also Box C4. for additional information on "Ekranas").

A producer of TV sets "Siauliu tauro televizoriai" (STT) is a subsidiary of "Ekranas", which

holds 77.5 percent of shares." In 2002 the company's sales soared by 83 percent and amounted to EUR 32 million. In 2002, over 80 percent of STT production were exported to Western Europe countries, while by the midst of 2003 about 30 percent of its production STT sold on Russian market, 3 percent stayed in Lithuania and the rest went to the West European markets. In 2003 STT plans to invest about EUR 0.5 million and expects to double its turnover and receive EUR 1 million of after-tax profit *(Jusu tarpininkas)*.

"Vilniaus Vingis" is one of the biggest manufacturers of electronic components in Europe. The company holds the first place in sales of deflection yokes in Europe. Every fourth TV set made in Europe is assembled in complete with the company's made deflection yoke. The main customers are advanced manufacturers of picture tubes: "LG Philips Displays" (Spain, UK), "Samsung" (Germany, Hungary) and "Ekranas" (Lithuania). In 2002 "Vilniaus Vingis" investments into new technologies and new products amounted to EUR 3.9 million. In spite of the 2001 worldwide recession, the company's sales increased by 11.2 percent and reached EUR 44 million in 2002. The sales revenue by the end of June 2003 was over EUR 20 million and it is expected to reach EUR 46 million by the end of the year. *(Vilniaus Vingis, Jusu tarpininkas)* (see also Box C4. for additional information on "Vilniaus Vingis").

"SY Wiring Technologies" is a subsidiary of Siemens - Yazaki Technologies and produces wiring for automobile manufacturer Renault. Based in Klaipeda, the company employs over 3 000 people - this number grew by 1 000 in 2002 alone. Its turnover mounted by 20 percent in 2002, reaching EUR 80 million. In 2003 the company plans to make turnover of EUR 115 million and expand its personnel to 4 000 people. *(Vilniaus bankas, www.vbfin.lt/pdf/sektoriu_analize2002.pdf)*.

Table 7.: **Major producers of electronic equipment**

| | Turnover, million euro | | Personnel (end of 2002) | Ownership (% of shares) |
|---|---|---|---|---|
| | 2002 | I half of 2003 | | |
| Ekranas | 121 | 54 | 3 801 | Foreign investors - 57 %, company's management - 35.2% |
| Siauliu tauro televizoriai | 32 | 27 | NA | Ekranas - 77.5%, State property fund of Lithuania - 23.34%. |
| Vilniaus Vingis | 44 | 20 | 2 113 | Vinvesta (Lithuania) - 37.8%, |
| SY Wiring Technologies | 80 | NA | 3 000 | Siemens - Yazaki Technologies - 100% |

*Reference: Ekranas; Jusu tarpininkas; National Stock Exchange of Lithuania www.nse.lt/nvpb/eie.php?id=5485; Zvybas E.; Vilniaus bankas, 2003; Vilniaus bankas, www.vbfin.lt/pdf/sektoriu_analize2002.pdf.*

## I.8. ICT services

The IT sector is one of the leading growth industries in Lithuania. The largest companies - "Alna," "Sonex grupė," "Blue bridge," "Penki kontinentai" and others - supply software and integrated IT solutions to industry, trade, energy production and telecommunications in the Baltics and in the CIS. Projects of Lithuanian companies are valued by such corporations as "Microsoft," "Compaq," "Hewlett-Packard" and "Cisco systems."

Table 8.: **Major IT enterprises**

| | Turnover, million euro | | | | Personnel (IV qtr. 2002) | Ownership |
|---|---|---|---|---|---|---|
| | 1999 | 2000 | 2001 | 2002 | | |
| Sonex grupė | 13.1 | 18.9 | 30.7 | 41.9 | 400 | 33% EBRD, 67% - Lithuanian |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | shareholders |
| Alna group | 13.7 | 25.4 | 24.0 | 33.8 | 250 | EBRD, Lithuanian shareholders |
| Blue Bridge | 10.3 | 9.6 | 13.6 | 17.0 | 52 | NA |
| Informacinės technologijos | 2.3 | 4.1 | 5.8 | 6.7 | 112 | 69% company's personnel, 22% foreign investors |
| Penki kontinentai | 4.6 | 7.5 | 13.6 | 22.2 | | NA |
| Baltic Amadeus | NA | 6.8 | 7.5 | 8.5 | 108 | Lithuanian shareholders |

*Reference: Knowledge Economy Forum; Sonex; Alna; Baltic Amadeus; Blue Bridge; Penki kontinentai; Informacines technologijos.*

Recently the IT market has received considerable attention from foreign investors. The European Bank of Reconstruction and Development invested in "Alna" and "Sonex grupė" The Baltic Investment Fund and EQVITEC Technology Fund became shareholders of "Informacinės technologijos." *(Knowledge Economy Forum; Alna).*

Four major players in the telecommunications market are "Lietuvos Telekomas" (Lithuanian Telecom), the owner of a fixed-telephony network, and three providers of mobile communication services: "Omnitel", "Bite GSM" and "Tele2".

Table 9.: **Major telecommunication enterprises**

| | Turnover, million euro | | | | Personnel (end of 2002) | Ownership (% of shares) |
|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | I half of 2003 | | |
| Lietuvos Telekomas | 281 | 295 | 280 | 118 | 4 531 | Amber Teleholding A/S (Sweden) - 62.94 %, Lithuanian state - 9.48 %. |
| Omnitel | 93 | 138 | 202 | 107 | 574 | TeliaSonera AB (Sweden) - 55%, Motorola Inc. (USA) - 35% |
| Bitė GSM | 45 | 65 | 101 | 56 | 441 | TDC (Denmark) - 100% |
| Tele2 | - | 17 | 43 | NA | 52 | NetCom (Sweden) - 100% |

*Reference: Lietuvos telekomas; Omnitel; Bite GSM; Tele2.*

In August 2003 "TeliaSonera" made an agreement with "Motorola Inc." on acquiring thirty five percent of "Omnitel" shares from the latter company. This contract is to be approved by the Competition Council of Republic of Lithuania by the end of 2003 *(Omnitel)*.

Since 2003 the legal environment for telecommunication activities has been changed - the new Law on Telecommunications came into force. As a result, companies expressed their willingness to enter a fixed telecommunication market and started negotiations with the incumbent operator "Lietuvos Telekomas". In March 2003, the first alternative fixed communication service provider "Eurocom" started to operate. According to "Eurocom", within three months of operation, they attracted 3 600 subscribers. *(Baltic News Service, 3 June, 2003)*

In the last years of "Lietuvos Telekomas"' monopoly, competition with mobile operators increased significantly and "Lietuvos Telekomas" started loosing clients (the number reaches 200,000, according to the magazine *"NK Verslas"* estimates). Various evaluations show that "Omnitel" holds about 50 percent of the mobile communications market, "Bitė GSM" and

"Tele2" both have around 25 percent of the market each *(Bite GSM; Tele 2;Ebiz.lt)*. The number of mobile service providers continues to increase with emergence of virtual operators: In September 2003 "Bite GSM" had agreements with four potential service providers on use of its network for their services and estimated, that by the end of 2003 the new operators will hold 1-2 percent of market share, and by the end of 2004 - 3-4 percent of the market. "Eurocom" started to operate on the first of July and in September 2003 had about 11,400 of subscribers. Nevertheless, one of the newcomers - "Rcom" withdrew from the market in two months since beginning of activities. *("Verslo zinios" .4 September, 2003;.6 October, 2003)*

## I.9. Future of ICT industry in Lithuania

Year 2002 was very successful for producers of electronic equipment. They plan to raise their turnover at least by 50 percent in 2003. A fast development is due to the expansion to European and other markets and the trend might persist for several years. Some risks for the sector's stability might be inferred from the fact that Lithuanian enterprises export mostly to single markets, so diversification of sales could prevent detrimental effects.

Various new trends can be observed in the Lithuanian ICT market. Many enterprises are investing in security and business management systems and are buying consultations. Several dozens of companies invested in CRM systems in 2002. In order to be ready to compete in the EU market, the companies are trying to keep up in terms of technologies and know-how. The IT sector's share of GDP will grow substantially in few upcoming years. IDC experts forecast 11.8 percent increase of IT market annually until 2006.

The sales of information technologies grew by 27 percent in 2002. Total sales by top five wholesale computer companies amounted to EUR 145 million. The dynamics of the sector was mainly caused by household clients. The choice of users is also changing. For example, the sales of digital cameras, portable PCs and LCDs (liquid crystal displays) increased by several hundred percent in 2002. The growth of computer sales in 2003 is estimated to be about 23 percent. A more modest growth is foreseen due to falling prices and investments of the biggest clients - telecommunication companies. The up growth of hardware market should also influence the expansion of IT services market.

Internet use was a weak point in Lithuania for some time. In 2002 the situation improved markedly as the number of users doubled. Surveys show that the bulk of new users come from public infrastructure, including schools, Internet cafés and public access internet points (the latter is associated with the initiative "Window to the future," see B3). The level of internet penetration rate in September 2003 has reached 24.4 percent. Due to several factors future increase of internet users is foreseen. First of all, computer sales for households are increasing rapidly, cable internet is offered widely in the biggest cities and competition in telecommunications market is intensifying. The Internet market is expected to reach EUR 58 million.

"Lietuvos Telekomas" is expected to recover after 2002 difficulties such as the end of the monopoly, the loss of clients for mobile operators and a rather negative image in society. The company has started to apply discounts for end-users and this enhances prospects that retail prices will go down. The main shareholder of "Lietuvos Telekomas" - "TeliaSonera" - has prepared a new strategy for the Baltic States with major targets to improve its public image and to focus more on income from the Internet and data transmission services.

In 2003 six people in ten had mobile phones, while a year later the number of users has

increased to seven in ten. The competition is based on prices, supply of new services and public campaigns. The competition between three mobile operators is rather fierce. The smallest mobile operator "Tele2" has entered the fixed telecommunication market. Due to a recent legislation several virtual operators and suppliers of telecommunication services are entering Lithuanian market which is affecting the prices of services and shifting the market shares of the incumbent players.

Just like in 2002, the major income generator will be SMS services: from information and parking payments to lotteries and a virtual casino. Today one subscriber of mobile telecommunication services sends on average 35 messages per month. It is forecasted that SMS services will make 20 to 25 percent of the income for mobile operators in the coming two or three years. In 2003 the growth of the mobile market is forecast to increase by EUR 145 million and to total EUR 0.5 billion. The results of the sector will strongly depend on regulations and court decisions regarding the SMP status (see part F1.1) *(LFMI estimates, Naujoji Komunikacija, January, 2003, pp. 22-24, "Verslo zinios" 15 September, 2003;,Vilniaus bankas, www.vbfin.lt/pdf/sektoriu_analize2002.pdf).*

## I.10. Conclusions

Sectors providing goods and services for export will remain the main driving force of Lithuanian economic development. Mining and quarrying industry is expected to pick up in the coming years as oil extraction increases. Oil refinery is likely to grow following new investment and modernisation plans. The prospects of the steadily growing textile and apparel industry may be threatened as increasing competition from cheap producers in developing countries and the growth of local labour costs make it more difficult to preserve a competitive edge. A welcome strategy for apparel companies would thus be to reposition themselves into a higher value added segment of the industry, to supplying foreign retailers with time-sensitive fashion products. A rising domestic market and recovering export markets are expected to sustain the growth of the food industry, especially as integration and increased compliance with EU quality requirements expand export opportunities of Lithuanian producers. It is predicted that wholesale and retail trade, construction, transport, storage and communications will constitute a growing share of GDP. Likewise, a sizeable growth is projected for financial intermediation. It is envisaged that the initial effect of the Structural Funds will boost the construction sector, with a lesser impact on industry and education. New employment positions will enhance the demand for intermediate products, which will produce secondary effects on such service sectors as trade, transportation and storage and communication.

Optimistic expectations regarding the country's economic development, falling interest rates and improving terms of crediting, the need to maintain competitiveness at a high level and integration-related investment projects will sustain positive investment growth prospects. Considerable investments are envisaged in all industries, including oil refining, food, textile and apparel, wood and furniture and chemical industries. The EU Structural Funds are expected to have a marked influence on the growth of the investments. According to the Ministry of Finance, the major effect of the EU financial assistance on investments is envisaged in 2005, when real gross capital formation is expected to grow up to 10 percent. By the end of 2006 a share of gross capital formation is predicted to amount to 23 percent of GDP *(Ministry of Finance, http://www.finmin.lt/finmin/index.jsp)*. Considerably low interest rates on loans and a vast expansion of the lease market have created favourable conditions for investment funding from borrowed funds. The loan portfolio has increased sizeably in recent years and in near future the credit volumes are likely to grow at a steady pace and thus

helping to tackle short-term and long-term financial problems of enterprises. Intensifying investments processes have also been reflected in a remarkable growth of lease of investment goods and construction volumes.

The Lithuanian ICT sector has shown a remarkable growth in the past several years and the trend is towards continued growth in the coming years. This can be explained by an unfilled domestic market and especially a low-level utilization of modern technologies in public institutions (e.g. health care establishments), rapidly growing investments into the Lithuanian finance, energy and telecommunications sectors, increasing interest of foreign companies in Lithuanian ICT specialists and expanding export of IT solutions. The yet unfilled Lithuanian market, qualified specialists and a possibility to invest into Lithuanian ICT companies at favourable conditions are the factors that have lately attracted considerable interest of foreign investors. Telecommunications are one of the fastest growing sectors of the economy in Lithuania. It is also a sector attracting most foreign investments. Information technologies are one of the fastest-growing sectors of the Lithuanian ICT market. The software market in Lithuania is growing rapidly. In the last years this is related to large-scale investments into the country's economy and a rapidly expanding market of IT and telecommunications services.

Lithuanian IT companies have potential to expand their export activities. The following makes Lithuanian IT companies attractive to international software developers:

1 qualified, multilingual and cost-effective workforce;
2 growing international experience and high quality of products and services;
3 well-developed telecommunications infrastructure;
4 a favourable geographic position in between CIS, Scandinavian and Western European markets.

## I.11 SWOT analysis

| **Strengths** | **Weaknesses** |
|---|---|
| • Divergent composition of the economy;<br>• Strong export-oriented manufacturing sectors;<br>• Rising domestic market;<br>• Growing service sector;<br>• Growing investments;<br>• Comparably low labour costs;<br>• Improving credit conditions, low credit costs;<br>• Rapidly growing lease market;<br>• Relatively low profit tax;<br>• Low inflation;<br>• Growing ICT market size and value; Participation in international ICT programmes;<br>• Qualified, multilingual and cost-effective IT specialists;<br>• Growing international experience and | • Small domestic market;<br>• Prevalence of labour-intense manufacturing, low-technology sectors;<br>• Insufficient modernization;<br>• Insufficient compliance with EU quality standards;<br>• Insufficient capabilities of domestic companies to export;<br>• Inefficient agriculture and its effects on other sectors, especially the food industry;<br>• Loss-making oil refinery "Mazeikiu Nafta". |

| | |
|---|---|
| high quality of IT products and services;<br>• Well-developed communications infrastructure;<br>• Favourable geographic position. | |
| **Opportunities**<br>• Expanding export markets and opportunities;<br>• Expanding international co-operation;<br>• Continued investment growth;<br>• Growth of crediting;<br>• Integration-related inflow of fund;<br>• Improved business conditions;<br>• Growth of ICT market;<br>• Ongoing energy restructuring;<br>• "Mazeikiu Nafta" reconstruction and investments by the new owner "Yukos";<br>• Decentralisation of the electrical energy sector plus alternative energy sources from the EU;<br>• Growth of electronics, oil refining and plastic and rubber industries and communications, retail and wholesale trade, real estate and financial intermediation sectors. | **Threats**<br>• Competition from cheaper products from developing countries;<br>• Lack of qualified labour;<br>• Growth of labour costs due to expanding regulations, bureaucracy and heavy labour taxation;<br>• Growing pressure on the textile industry;<br>• Insufficient compliance with EU regulations;<br>• Dependence on external markets, in particular FSU;<br>• Sensitivity (of State budget) to Oil trade (global Trade, and in particular FSU);<br>• consequences of the closure of the Ignalina nuclear power station;<br>• Threatened agricultural sector, food, textile and wood industries. |

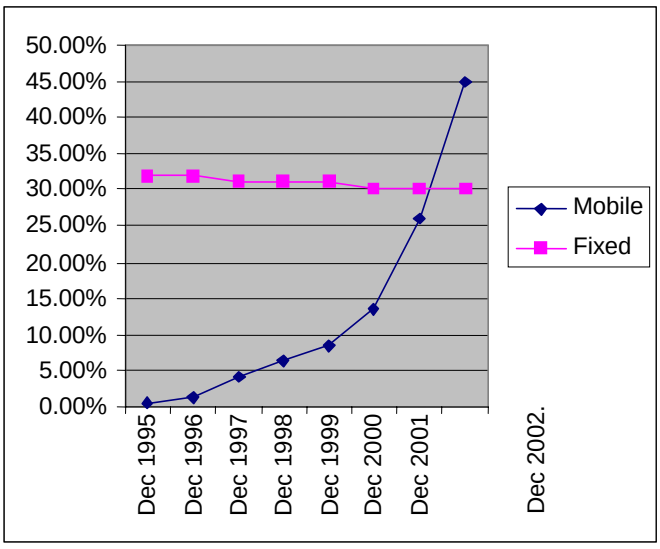
*The factors underlined in the above SWOT are estimated by the authors to be the most relevant to IST-related developments in the country.*

# II. IST PENETRATION RATES - TIME SERIES ON INFRASTRUCTURE, EQUIPMENT AND USAGE

## II.1. Telecommunications

The telecommunications market in Lithuania is marked by a rapid growth of mobile penetration, which exceeded the usage of fixed-line telephony in 2002. However, monthly expenditure for mobile communication per person is comparably low: according to the largest mobile operator "Omnitel", an average client bill is around 14 euro, while European average is about EUR 40. *("Verslo Zinios" 8 July, 2003)*

Graph 6.: **Fixed and Mobile Telephony Penetration**




*Reference: World Bank Knowledge economy Forum in Helsinki, March, 2002, presentation of the Lithuanian case study.*

At the beginning of 2003, a total of 47.6 percent of the population in Lithuania used mobile connection services. In July 2003 the level of usage was over 51 percent, while in late 2004 it was over 85 percent (although one has to bear in mind that the number includes the cases when people have two or more mobile phones and use two or more providers – a growing trend in the country) *(RRT)*. The number of clients of the fixed line network, declining in 2002-2003, now is stable at 24 percent. Business customers of "Lietuvos Telekomas", also, remain stable in this respect. Some customers are disconnecting their fixed telephones in response to tariff rebalancing and some are substituting mobile services for fixed services as the providers of mobile services cover all the country's territory. The overall number of fixed lines has diminished over the last four years. It decreased by 64 895 lines to 821805 over the last year alone, and by over 28.6 percent since the beginning of 2002. The characteristic feature of telecommunications use in Lithuania is that many mobile network subscribers are not users of the fixed network *(Ebiz.lt)*. Another major development in the telecommunications market over the last two years is a rapid decrease in prices. Driven by growing competition, both fixed and mobile service providers are lowering their service prices. In 2003 alone the communication prices decreased by almost 15 percent. This year the trend is persisting. "Lietuvos Telekomas" alone cut its rates for city-to-city call by 35 percent, from 40 to 26 Lithuanian cents a minute.

Table 10.

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|
| Number of public fixed phone lines, thousand | 1 048.2 | 1 109.8 | 1 144.6 | 1 180.1 | 1 151.7 | 935.9 | 824.2 | 821.8 |
| Number of fixed lines per 100 inhabitants | 29.4 | 31.4 | 32.6 | 33.8 | 33.1 | 27 | 23.9 | 23.9 |
| Subscribers to mobile telephony service | 150.8 | 267.6 | 343.6 | 508.9 | 1 018.0 | 1 645.6 | 2169.9 | 2979. 51 |
| Number of subscribers of fixed line telephony per 100 inhabitants | 4.2 | 7.6 | 9.8 | 14.6 | 29.3 | 47.6 | 63 | 86.7 |

*Reference: Statistics Lithuania, www.std.lt/web/main.php?parent=424, RRT, 2004.*

According to public survey, people located mobile telecommunications in the third place in terms of market liberalisation, after retail trade and catering (*Spinter tyrimai, 2003*). "Omnitel" and "Bite GSM" have made their pricing systems more transparent. After these changes, average user prices decreased, while the prices for companies, organizations and other entities with large numbers of subscribers increased. Services are also getting more global. In 2003 a contract of network partnership between "Vodafone" and "Bite GSM" was signed. It will allow "Bite GSM" clients to use services of "Vodafone" in 24 European countries *("Verslo Zinios" 22 July, 2003).*

Faced with increased competition, "Lietuvos Telekomas" has changed it strategy as well: it started active marketing, decreased the tariffs for overseas calls and from fixed to mobiles and lowered internet connection fees. A long-term goal of the company is to have a data transmission as a major income generator. "Lietuvos Telekomas" continued developing its ADSL-based access network. Currently, ADSL services are available to 85 percent of "Lietuvos Telekomas"' customers. The company offers several "DSL Takas" service plans with different speed and price schemes. During 2002 the number of ADSL users increased from 2 400 (end of 2001) up to 10 500 *("Lietuvos rytas," 14 July, 2003)*. "Lietuvos Telekomas" predicts that 21 000 internet users will be employing DSL technology at the beginning of 2004 *(Ebiz.lt)*.

"Lietuvos Telekomas" offers its customers a broad range of new modern voice telephony (ISDN Duetas, Directory Inquiry Service 118, lines 900, 800, 700, telemarketing services, etc.), Internet (Tako Zona, ISDN Takas, DSL Takas, Tako Pastas, etc.) and data communication (broadband, videoconferencing, leased lines, etc.) services. In 2003 the rate of the network digitalisation reached 88.5 percent, up from 20 percent some five years ago *(Lietuvos telekomas)*.

"Omnitel" introduced GPRS services in February 2002. They are also provided by "Bite GSM" *(Information Society Development Committee)*. Both operators provide the service in more than 20 countries *(Omnitel; Bite GSM)*. At the beginning of 2003 there were about 9 000 users of GPRS services in Lithuania, about eight times more than at the beginning of 2001 (1 100). "Omnitel" had about 6 000 GPRS service clients and was planning to increase the number four to five times in a year. About 3 000 people used "Bite GSM" GPRS. A 150-percent increase is predicted *(Ebiz.lt, www.ebiz.lt/article.php3/1/4736/1)*. In addition, "Bite GSM" also provides HSCSD (High Speed Circuit Switched Data) services. At the end of 2002 it had over 550 users of HSCSD *(Ebiz.lt, www.ebiz.lt/article.php3/15/3928/7)*.

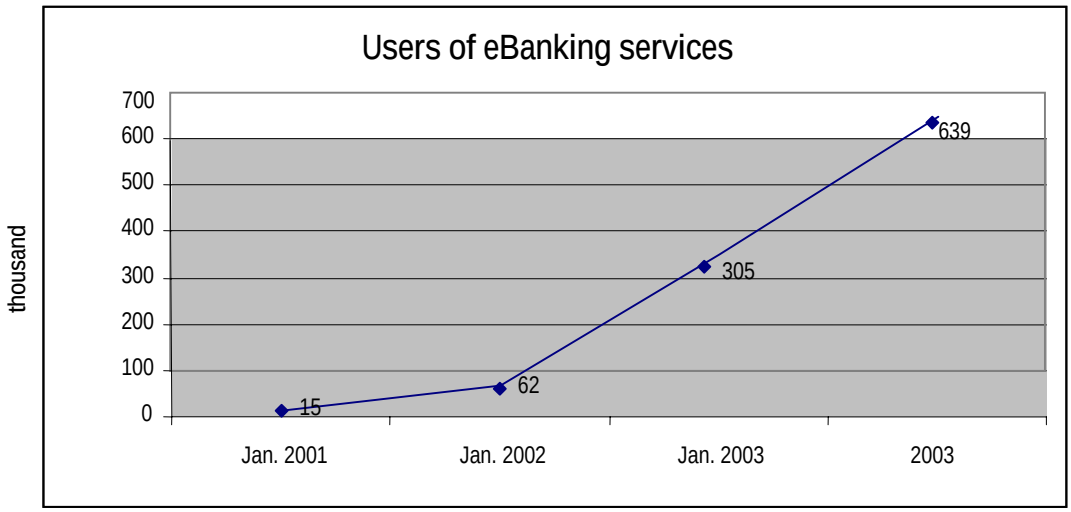
Mobile service providers and representatives of governmental institutions generally think that

it is too early to issue licences for UMTS (Universal Mobile Telecommunications System) services in Lithuania, although preparations have been made in this direction since 2001. In spring 2003 "Omnitel" CEO Zabulis predicted that UMTS service will commence in Lithuania not earlier than in 2006 *(Ebiz.lt, www.ebiz.lt/article.php3/23/4889/0)*. EDGE (Enhanced Data Rates for Global Evolution) technology is seen by "Omnitel" as dispensable as well, since the CS3/CS4 technology, which is implemented by the company, allows speeding up the data transfer by means of GPRS connection *(Ebiz.lt, www.ebiz.lt/article.php3/15/5643/2)*. "Bite GSM," on the contrary, announced plans to use EDGE from the beginning of 2004 as a very promising and fast connection *("Verslo zinios" 10 October, 2003)*.

## II.2. IST in financial services

In the banking sector the first step of providing electronic services was with software operating under the Electronic Account Handling Agreement, which enables users to perform bank transactions directly from PC. But later a shift was made towards online banking services. Since the second half 2000, when eBanking services were introduced in Lithuania, the growth of their use has stabilized.

Graph 7.




*References: Naujoji Komunikacija, www.nkm.lt/081/aktualijos.htm#bankininkyste, "Lietuvos rytas" 2003.10.13.*

At the end of 2003 there were about 639 000 users of internet banking services. Of these, more than half (344 000) were subscribers to *hansa.net*, provided by "Hansa Bankas." At the same time "Vilniaus bankas" service "VB Internetas" had 244 800 subscribers, and the third follow-up, "Nord/LB Lietuva," had 17 600 users of its eBanking service *(Lietuvos rytas," 13 October, 2003; Verslo zinios, 19 January, 2004)*. eBanking services include managing of personal or corporate accounts, national and international transfers as well as currency exchange and service payments, including public utilities and trade securities. At the beginning of 2004 personal income report online service should be introduced. In the second half of 2001 some banks started offering lending services online, phone-banking services and services via e-mail *("Verslo zinios" 19 September, 2003)*. In September 2003 there were over 93 thousand of subscribers of mobile banking services - almost 9 times more than at the beginning of 2003 *("Verslo zinios" 23 October, 2003)*

At the end of the first quarter of 2003 there were about 1.6 million banking cards issued by commercial banks (up from 0.9 million in January 2002). In 2002 the total number of

transactions made by using banking cards reached EUR 2,173 billion, and it was 3/4 larger than in 2001 (EUR 1.197 billion). In September 2003, there were 1.11 million "Visa" paying cards in Lithuania, or a half of all "Visa" cards in the Baltic States *("Verslo zinios" 19 September, 2003).*

In March 2003 the Central Securities Depository of Lithuania started to sell government securities online only, transacting through eBanking services. Monthly turnover of such trade reaches EUR 300 000. A financial brokerage company "Jusu tarpininkas" has offered online trade of stocks since the end of 1999. The turnover of such online trade was EUR 4.25 million in 2002 *(Naujoji Komunikacija, www.nkm.lt/index.phtml?lst=articles&ptid=1&tpid=4&arid=448).*

## II.3. eCommerce

A survey conducted by "Taylor Nelson Sofres" in 2001 showed that 84 percent of internet users had never shopped online. The most recent statistics show even lower numbers. *TNS Gallup* survey (June 2004) results show that while over one third of the population use internet banking services, only two thirds of that number use internet for their shopping needs – that makes it 12 percent of those using internet and only six percent of the total population *Verslo zinios, 2004 06 30).* Meanwhile, in the period from June 2001 until June 2002, a total of 66 to 63 percent of the EU population never used online shopping *(Flash Eurobarometer 125*).

At the end of 2001 there were 32 web sites of Lithuanian enterprises offering online shopping services. Eight of these web sites make it possible to pay with bank cards, and twelve others make it possible to make payments through internet banking services *(Lithuanian Union of Computerniks)*. At the beginning of 2003 the number of web sites grew to 44. According to the data of HansaBankas, the turnover of 13 online shops using the *hanza.net* eBanking service comprised EUR 1.5 million in 2002, and almost a third of a million users of *hanza.net* services came from Lithuania *("Verslo zinios" 19 September, 2003).*

A low level of online shopping can mainly be attributed to small supply of goods. And internet stores have to stand their ground in competition with supermarket chains. Nevertheless, there are several exceptions: the successful online store www.24x7.lt offers computer hardware and software, items of household appliances and mobile phones. Its annual turnover reaches EUR 150 000. Online bookstores are also noteworthy: this kind of internet trade is one of the most popular as big discounts (compared to ordinary shops) are offered. Due to intense competition monthly turnover of such shops rarely exceeds EUR 6 000 but they are especially popular during Christmas and at the start of the school year *(Naujoji Komunikacija, www.nkm.lt/index.phtml?lst=articles&ptid=1&tpid=4&arid=448).*

## II.4. IST in public administration

The main data that state and municipal institutions provide on their web sites pertain to their activities and contain contact information, such as lists of telephone numbers and e-mail addresses of the staff. Web sites of central government institutions often provide drafts of legal acts, although the information is not always up-to-date and comprehensive. Municipalities tend to describe the local legal and economical environment for business. Ministries provide plans and reports of their activities. Governmental websites provide statistical data and some specific information, such as taxpayers' codes, lists of certified products, customs tariffs and rules, ongoing bankruptcy procedures, etc., but rarely in other languages than Lithuanian. Mainly there is only one-way online interaction: various kinds of

information are provided for the public and business, almost all legal acts and some forms can be found or downloaded from the net, but it is an exception when any feedback can be given. Such services as registration with official institutions via internet or fax are unavailable. Some statistical information can be submitted online to the official bureau of statistics, Statistics Lithuania. Documents from the Register Centre can be ordered online. Social contributions' payers declarations can be filled up and delivered electronically, although manual supply of the same forms is still requested. (For ICT usages in public administration service see also Chapter B.) According to a sociological survey carried out in mid-2001 by "SIC Gallup Media," more than 56 percent of all Internet users in Lithuania used eGovernment services (i.e. about five percent of the population).

There is a portal (www.svarstome.lt) devoted to public discussions on major questions of debated legislation. Citizens may express their opinion on such topics as pension reform, development of the educational system and analysis of IT instillation policy in the educational sector. There is no legal obligation for experts in working groups to take into account the opinions expressed. The portal is not very popular though but it is maintained as part of public consultation policy.

Major problems hindering the expansion of eGovernment services are not technical. Although registers and databases are not properly regulated and handled, work on creating a portal for providing public information and public services has been postponed because of a lack of financial resources. The most important factor is that the government does not recognize citizens as users of its services. On the grounds that obligations to provide information or other eGovernment services are not clearly established by law, state institutions generally avoid such actions.

According to Statistics Lithuania, there were 61 PC on average in every central government and municipal institution at the beginning of 2002. In June the number reached 65. There was 0.4 PC for each public servant. In June 2002, there were 0.4 PC per person in public administration institutions. In each public administration institution there were 90 employees working with PCs. Of them, 68 percent used internet. A total of 97.2 percent of public administration institutions had access to internet, and there were on average 46 PCs connected to internet in each institution. An average of 61 employees in each institution used internet. A total of 50.1 percent of state and municipal institutions had their web sites which provided information on these institutions, their work plans and public services. A total of 92.3 percent of all ministries, 62 percent of their subordinate institutions and 87.9 percent of all municipalities had their web sites. More than a third of all state and municipal institutions provided some public administration services through internet *(Statistics Lithuania, "Informacines technologijos," 2003.)*

## II.5. IST in health services

"Alna" presented a report on demand for information and assessment of IT infrastructure in the health care sector under a project "Consultancy assistance for the assessment of demand of information and IT infrastructure in all levels of health protection" carried out by the Ministry of Health Care of the Republic of Lithuania, 28 January, 2003. Comments from the report are presented in Box E1 *(Ministry of Health, www.sam.lt/esveikata/docs/AtaskaitaB.pdf, 2003).*

**Box 6.: Conclusions from the "Alna AB" report**

Most health care establishments have local networks and servers. A total of 23 percent of

computers have no access to internet. Out of those with internet access, 30 percent use dial-up connections and others have faster and permanent connections such as DSL. About 40 percent of all health care establishments use technique with Pentium and older processors as servers, while 30 percent have Pentium III or better processors. Various types of operational systems are used in the servers, including those not suitable for the purpose - Windows 95 and Windows 98. All establishments use various types of software, and only one IS - "Sveidra" - is standardized. Only about 75 percent of software is legalized. A very small portion of medical equipment that could be connected to computers. The number of equipment for teleconferences and demonstrations is exceptionally small. Operational management is quite expeditious and constantly informed about the current status (e. g. numbers of patients, free beds, financial status and status). But most data are not keyed into computers but analyzed without use of computer programs. A total of 58 percent of medical staff use computers but level of computer literacy is low. Doctors use computers for filling out documents, communicating via e-mail and browsing the internet. Most specialists would like to acquire more skills in working with PCs, so it may be concluded that, with a higher level of computer literacy, administrative efficiency would improve conspicuously (In Lithuania health care specialists spend more than half of their work time on filling out papers - diagnoses, conclusions, journals, prescriptions etc. Most data on specific case histories, diagnoses, curing methods and likewise are collected - even from the internet - not in electronic form, but in paper documents.) There is a demand for the exchange of information on patients among several health care establishments. Since most data are recorded in paper case histories, it is quite difficult for other health care establishments to obtain needed information. Results of medical investigations are transferred to doctor manually and that may take one working day. Radiograms cannot be transmitted among several doctors (e. g., when needed for consultation) because they are stored in different places - by patients, doctors, in archives, etc. Health care establishments would like to get information on patients' health insurance directly from the social security databases. But the potential for cooperation in this sphere has not been exploited. A patient cannot register via internet or email for a doctor visit. One must spend from 10 to 30 minutes at the reception to get a coupon, even if prior registration by phone has been made.

There is a demand to raise the level of ICT usage in the health care system. This is seen as a possibility to improve the quality of services and to ameliorate working conditions for the staff. But the overall system does not provide incentives to change the situation, and reform is not foreseen, albeit being continuously discussed.

## II.6. IST in educational services

In 1996, there was on average one PC per 100 pupils in secondary (general) schools. In 2001 the number was 2.5 PCs per 100 pupils. In the school year 2001-2002, there were on average 8.7 PCs per 100 students in higher education institutions *(Statistics Lithuania, "Informacines technologijos," 2003)*.

In the school year 2001-2002, only 33.9 percent of all secondary (general) schools in Lithuania had access to internet *(Ibid.)*. According to official data, about 900 of around 2 000 secondary schools and gymnasiums in Lithuania in 2003 had access to internet, although surveys by "Spinter tyrimai" show that more than 90 percent of all schools use internet. The Ministry of Education and Science's data show that there are about 23 000 computers in secondary schools, of which 13 000 are connected to internet *(Baltic News Agency, 13 May, 2003)*. (The EU level of schools connected to internet in March 2001 was 89.0 percent and in March 2002 it was 93.0 percent)
*http://europa.eu.int/information_society/eeurope/2002/benchmarking/list/2002/e_learning/sc*

*hools_connected/index_en.htm*).

**Box 7.: Survey "Analysis of IT Implementation Policy in the Educational System in Lithuania,"**
carried out by the Democracy Institute, financed by the Open Society Fund, December 2002. Major conclusions of the analysis are the following: The framework of legal and strategic documents on IT implementation in education is not complete in terms of consistency. -78 The goals of IT implementation in education and their priorities are not clearly stated. -78 The sequence of work laid down in the documents is difficult to implement. -79 The attention to the Lithuanian language in electronic media is insufficient. -80 Importance of the digital divide problem is not emphasized enough. -81 Though the level of computerization in schools is not satisfactory, the present infrastructure is sufficient to cope with computer illiteracy in schools. Further computerization of schools shall not be self-fulfilling target but a means for achieving new goals. -82 Due to centralized procurement, schools have no choice in selecting HW and SW. Either this choice shall be provided or presently purchasable specifications have to be approved as standard (in case of SW- MS Office). -83 Computerization of schools is usually seen in its narrow sense - as a tool for computer literacy. Wider outcomes of the process (such as influence to learning of other subjects) are not analyzed. -84 Production of learning applications is highly centralized. -85 Teacher training programs are consistently carried out, but the funding is insufficient. -86 There are no means to cope with computerization side-effects foreseen. -87 Institutional responsibility of IT implementation in education is scattered, the management is centralized in state level with undervalued role of municipalities and communities. -88 Regulating documents doe not cover IT security issues. -89 The funding is scarce and not stable.
*Reference: Institute of Democratic Politics, 2003*

## II.7. IST in households

According to surveys carried out by Statistics Lithuania *(Statistics Lithuania, "Informacines technologijos" 2003)*, 19 percent of all Lithuanian households had a computer in the first quarter of 2003. During the last several years this number has been growing fast: in the first half of 2002 it was 12 percent, and in the second half of 2000 it was just over 6 percent. In five biggest cities 19 percent of households had a computer in 2002. The indicator for other towns was 10 percent and for rural areas it was 5 percent. (According to OECD data, 47.3 percent of households in Germany, 32.4 percent of households in Ireland and 59.9 percent of Swedish households had access to home computer in 2000 (*OECD*). The rapid rise of PC usage is expected to continue, up to the level of 35 percent of all households *("Verslo zinios" 19 September, 2003)*.

Table 11.: **Households with computers, %**

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | I Q 2003 |
|---|---|---|---|---|---|---|---|---|
| All households | 1 | 2 | 2 | 3 | 5 | 9 | 12 | 19 |
| 5 biggest towns | 2 | 3 | 4 | 5 | 10 | 14 | 19 | 30 |
| Other towns | 1 | 1 | 1 | 2 | 4 | 6 | 10 | 20 |
| Rural areas | 0 | 0 | 0 | 1 | 1 | 3 | 5 | 7 |

*Reference*: *Statistics Lithuania, www.std.lt/web/main.php?parent=889*

Almost 37 percent of all persons aged from 15 to 74 had a possibility of using a computer either at home or at work in the first quarter of 2003. Half of them used PC daily, while a

third about once a week. The biggest share of all persons using a PC on a daily basis was among working people. Students were the largest group among those who used it at least once a week. About 12 percent of the population used computers at home. About 3 percent used computers at home for professional purposes *(Statistics Lithuania, www.std.lt/web/main.php?parent=163&module=540&id=604)*.

The level of internet connection in households is rising less rapidly. A total of 48 percent of all households with a computer, or 5.9 percent of all households, had access to internet in 2002 and in the first quarter of 2003 the rate was 6.2 percent (5 percent in 2002). In the biggest cities 55 percent of households with computers (10 percent of all households) and 34 percent of households with a computer in rural areas (1.7 percent of all households) used internet. (By mid-2002, 40.4 percent of EU households had Internet access, according to the eEurope Benchmarking Report for 2002, up from 18.3 percent in March, 2000). *http://europa.eu.int/information_society/eeurope/2002/benchmarking/list/2002/internet_users_june2002/since_lisbon/index_en.htm*). Due to the new marketing policy of "Lietuvos Telekomas" (see below), introduced in September 2003, the level of internet usage in Lithuanian households is expected to double in one year *(Ebiz.lt, www.ebiz.lt/article.php3/1/5531/4)*.

Table 12.: **Households with access to internet, %**

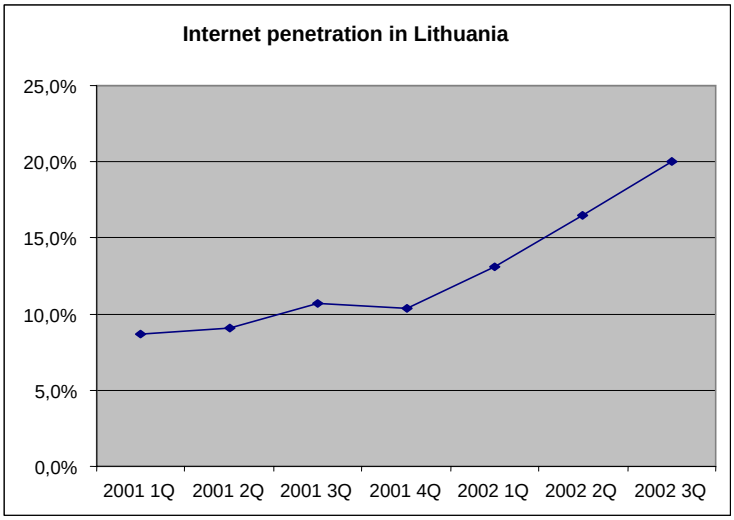
| | December, 2000 | 2001 | 2002 | 2003 | 2004 IQ |
|---|---|---|---|---|---|
| All households | 2.3 | 3.2 | 4.1 | **6.2** | **10.6** |
| 5 biggest towns | 4.8 | 6.3 | NA | **9.7** | **18.7** |
| Other towns | 1.2 | 1.8 | NA | **7.2** | **10.1** |
| Rural areas | 0.3 | 0.6 | NA | **1.1** | **2.0** |

*Reference: Statistics Lithuania, www.std.lt/web/main.php?parent=890, RTT.*

A total of 85 percent of students and pupils use internet, while the level among working population is about 31 percent. A total of 11 percent of all Lithuanians uses internet at home. 77 percent use e-mail, while 71 percent get their daily news on internet, read papers and magazines. Almost two thirds of internet users have their private e-mail account, while 23 percent use e-mail through office account.

The same number - only 0.7 percent of all households - had ordered goods or paid for the services via internet in 2004 as in the last couple of years. The majority of non-users of eCommerce indicate that there is no need for ordering goods or services online, while a tenth of respondents said they simply do not trust these services. *(Statistics Lithuania, http://www.std.lt/web/main.php?parent=176&module=628&id=954)*.

The internet penetration doubled in the first three quarters of 2002 as it rose from 10 to 20 percent. In the spring of 2003 the number of internet users was 21.9 percent (according to the "TNS Gallup" data) or 24.4 percent (results of a survey by Statistics Lithuania). In spring 2003 it was forecasted that by the end of the year the internet penetration rate would exceed 30 percent, although in September the same was predicted for the summer of 2004 (*Ebiz.lt. www.ebiz.lt/print_article.php3/1/4595/4; "Verslo zinios," 2003.10.06).*




*Reference: World Bank March, 2002*

Although internet use in Lithuania is increasing, it is still quite low as compared to the European level. According to the Flash Euro barometer 88 data, 41.9 percent of the EU population used internet more or less frequently in 2000 *(http://europa.eu.int/information_society/eeurope/2002/benchmarking/list/source_data_pdf/fl88va.txt).*

Differences of IST usage depend on personal revenues. Of all people earning over 1 000 Litas per month (approx. EUR 290), 46 percent had a computer at home and 19 percent were subscribers to internet services. And only 2.4 percent of persons whose income was less than 400 Litas (approx. EUR 115) had a PC, while none of them was connected to internet. This also explains divergences between rural and urbanized in IST usage areas.

Financial constraints were an important factor for the comparatively low level of internet access in the households. About 30 percent of all households without Internet access claimed that a high subscription fee and high user charges were the main reasons for this, while 22 percent indicated expensive equipment, and 7 percent indicated "other" reasons, such as limited technical possibilities of their computers, absence of conditions for households living in rented apartments or recently acquired computers. More than half of the households polled said they had no need to access Internet or use electronic mail *(International Trade Centre UNCTAD/WTO, October 2002).*

Table 13.: **Internet connections tariffs of "Lietuvos Telekomas"**

| Plan | Peak time | Off peak time | Monthly fee | Additional fees | Type and internet connection speed (download/upload) | Notes |
|---|---|---|---|---|---|---|
| "Atviras takas" | Workdays 7 a.m. - 20 p.m.: LTL 0.11 - 0.15/ min (EUR 0.0318 - 0.04344/ min) | LTL 0.03/ min (EUR 0.00868/ min) | - | Connection fee – LTL 0.04 (EUR 0.0116) | Phone line: up to 64 kB/s(ISDN line - up to 128 kB/s) | Different tariffs are applied according to the time spent online |
| "iD1" | - | - | LTL 77 (EUR 22.3) | Subscription fee – LTL 99 (EUR 28.7), fees for | ADSL :256/128 kB/s | 60 hours / 1200 MB per month, and on holidays |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | surfing the net over the limit | | - without restrictions |
| "iD2" | - | - | LTL 39 Lt (EUR 10.7) | Subscription fee – LTL 99 (EUR 28.7), fees for surfing the net over the limit | ADSL: 256/128 | 60 hours / 1200 MB per month |
| "Tako zona" | 7 a. m. - 6 p. m.: LTL 0.12 (EUR 0.0347) | | LTL 118 (EUR 34.2) | | 56/ ISDN - 128 Phone line/ISDN | Unlimited access from 18 p. m. - 7 a. m. |

*Reference: Lietuvos telekomas*

Table 14.: **GPRS and cable internet**

| Plan | Tariffs | Additional fees | notes |
|---|---|---|---|
| GPRS Internet service by Omnitel | LTL 0.009/ kB (EUR 0.0027/ kB) – LTL 9.216/ MB (EUR 2.67/ MB) | - | Payment for downloaded/ uploaded volumes of information |
| GPRS Internet service by Bite GSM | LTL 3 -7 /MB (EUR 0.87 - 2.03/ MB) depending on mobile service monthly bill amount | - | Payment for downloaded/ uploaded volumes of information |
| Cable TV (Skaineta) | From LTL 69 (EUR 20) | Subscription fee LTL 135 (EUR 39.1) | For subscribers of cable TV network |

*References: Omnitel; Bite GSM; Skaineta.*

Due to increased competition in telecommunications market (after the abolition of the monopoly of "Lietuvos Telekomas"), internet connection costs were lowered significantly in 2003, first of all by the telecoms and subsequently by operators of cable TV networks and providers of wireless connection. Until 2003 the use of internet by modem connection at non-working hours and 20 hours per month could raise a monthly bill of LTL 156 (EUR 45), which was about 15 percent of an average statistical monthly salary in Lithuania. In the second half of 2003 the bill for the same level of usage was only LTL 36 (EUR 10.4). Although internet services of cable TV networks have advantages to modem connection, the costs were also higher (approximate average EUR 30 in 2002) and even in the largest towns it was not available everywhere. The GPRS connection is mostly used by business people, while wireless connection (by radio waves) was expensive, about EUR 90 per month *(Baltnetos komunikacijos)*, so it was largely available for households by joint lease.

## II.8. Conclusions

Business and households are sectors where the levels of ICT penetration are rising most rapidly. Providers of telecommunication services are playing a major role in this respect, both by providing ICT services and by representing the advanced level of IST. Other sectors, such as financial services and trade, represent the general tendency of growing ICT usage. Overall ICT penetration is lower in industrial sectors, although incoming foreign and domestic investments are changing the situation.

The public administration sector is lagging behind the private sector in terms of ICT usage. eGovernment in Lithuania manifests as having a website for almost every institution, although services provided on the net are scarce: mainly some information is provided and only one-way communication (either government to business or business to government) is possible.

Health services are one of the least influenced sectors in terms of advancement of information society technologies. Due to low levels of funding and an ineffective system of health care services, general conditions of work in medical institutions are not improving significantly. The computer literacy level among medical staff is quite low and health care institutions do not exploit ICT possibilities, such as connection to common databases, exchanging of urgent and relevant information, etc.

Recognizing the need for education on IST-related matters, the educational sector encounters the problem of absence of clear goals and concrete plans of IT implementation in education. The present infrastructure is sufficient to cope with computer illiteracy in schools, though computerization of schools is still recognized as a self-important goal but not as a means for achieving broader goals such as higher quality of education. Wider outcomes of the process (such as influence on learning of other subjects) are not analyzed and funding for the purposes is scarce and unstable.

Usage of internet and related services is really low in Lithuania, as compared to the EU level. Still, there are several positive signs: the competition in telecommunications market (after its liberalization since January 2003) has brought significant reduction of internet connection costs. eServices are becoming more popular among population as banks and other companies expand the supply of online services and their benefits. This, along with overall economic growth and increasing income of households, indicates the trends towards the improvement of situation.

## II.9. SWOT analysis

| | |
|---|---|
| **Strengths**<br>• Expanding ICT-related sectors (telecommunications, IT industry and services) and increasing level of ICT usage in service sectors;<br>• Steady growth of internet penetration in business and public sector as well as in households;<br>• Private initiatives to support ICT infrastructure. | **Weaknesses**<br>• Low level of ICT penetration in such sectors as education, health services, lower-tier municipal institutions;<br>• Narrow scope of eGovernment services, a lack of detailed and sound public policy on the matter. |
| **Opportunities**<br>• Growing competition in ICT services diminishes costs for end-users and offers new services;<br>• Recognized need for expanding eGovernment services;<br>• Private initiative pursuing social goals (such as internet penetration, ICT literacy) have a snow-ball effect attracting both private and public partners;<br>• Diminishing costs for internet and hardware speed up the internet penetration in households. | **Threats**<br>• Insufficient pace of growth of ICT penetration in public sector and households;<br>• Inefficient use of EU funds for IST projects. |

# III. NATIONAL AND REGIONAL IS POLICIES

## III.1. Institutional settings and their influence on IS policies

The institutional setting for IS policies in Lithuania has been changed several times during the twelve years of the Independent state (see "The history"). It remains complicated and contains dispersed and overlapping functions. A list of the IS related institutions and their declared functions is presented in Annex B1. The actual role and activities of these institutions are enumerated below under "The Institutional setting behind the policies."

## III.2. The History

- In 1992 the Ministry of Communications and Informatics was founded.
- In 1998 the Ministry of Communications and Informatics was closed and public administration functions pertaining to communications were transferred to the Ministry of Communication, while those pertaining to information were delegated to the Ministry of Public Administration Reforms and Local Authorities.
- At the end of 2000 the Ministry of Public Administration Reforms and Local Authorities was closed. The functions of public administration pertaining to information were transferred to the Ministry of the Interior.
- In February 2001 an Information Society Development Commission (ISD Commission) under the Government of Lithuania was set up.
- In May 2001 a Communications Regulatory Authority (CRA) started to function. (It was set up in 2000 after reorganization of the National Radio Frequencies Agency).
- In August 2001 the Information Society Development Committee (ISD Committee) under the Government of the Republic of Lithuania launched its activities.
- At the end of 2002 proposals to establish a separate ministry for Information Society issues were discussed, but the ruling coalition declined them. The same proposal was raised again in a World Bank report called "Lithuania. Aiming for Knowledge Economy" in the spring of 2003.
- At the beginning of 2003 a Science and Technology Commission started to function.

## III.3. IS policies

Most of the present strategic IS documents were adopted in 2001 and 2002, although a broad information society development project "National communication and informatics programme" (unofficially called "Lithuania 2000") was initiated back in 1992. Major goals of the programme were to facilitate integration into the EU, to increase efficiency of public administration, to increase the quality of public services, to create favourable conditions for a market economy, and to create a national system of information services. The Ministry of Communications and Informatics, which was later abolished, headed the programme. A state-owned enterprise "Infostruktura" was established to implement it. For numerous reasons, including too high a level of centralization and poor financing and managerial skills of public administration, only fragmented results were achieved and the programme was terminated together with the closure of the ministry.

The actual major strategic documents for IS development in Lithuania are a conceptual framework for Information Society Development and an action plan of the Government's

2001-2004 Programme. They lay down most of the same goals of "Lithuania 2000," but the goals are better structured and responsible institutions are listed.

The conceptual framework for Information Society Development in Lithuanian together with a strategic plan of Information Society Development (2001) and its detailed plan for 2002 are a positive example of consistent policy planning, starting with defining goals and priorities and finishing with concrete steps, funding and responsible institutions. Despite a number of highly questionable provisions, the documents shall be evaluated positively, primarily because they are consistent and include implementation monitoring. In addition to that, the most controversial provisions of the plan, such as a project for integration of state communication and data transmission networks (see Box B1. in Annex B2.) or the establishment of a governmental eSignature certification centre, were abandoned during the implementation phase.
Similar provisions are laid down in the Action Plan of the Government's 2001-2004 Programme, in the chapter on Information and Knowledge Society Development.
However, a large number of actual documents and a lack of a clear hierarchy thereof are serious weaknesses of IS policy. Some strategic documents (e.g., A Conceptual Framework for eBusiness, approved in 2001) have not found their place in the whole policy framework and thus remain ineffective.

Innovation and R&D policies have been addressed separately from IS issues so far, and this is an obvious weakness of both. These policies are the responsibility of the Ministry of Economy and are addressed as part of industrial policy (which hardly exists despite export being set as a priority). Innovation and R&D policies have just started to be developed, so it is too early to evaluate them.

The parliament also exerts influence on IS policies. During the 2000 parliamentary elections all major political parties developed rather fragmented and superficial attitudes towards the IS issue, although no party ranked it among the priority issues for their campaign. This did not happen either during the recent presidential elections in late 2002. Information society issues were touched upon but were not explored or prioritized. In 2001 and 2002 there were two politicians who chose this issue to be their trademark. These are Ex-Prime Minister and the present leader of the Conservative Party Andrius Kubilius, who withdrew his candidacy for presidency in favour of President Valdas Adamkus, and Mayor of Vilnius and presently the leader of the Liberal-Centre Party Arturas Zuokas. Mr. Kubilius is advocating a knowledge economy-oriented state policy, promoting clusters, technology parks, selection of separate economic sectors to achieve a break-through in growth and to increase competitiveness of the country. During his tenure as a mayor, Mr. Zuokas has pursued municipal policy favouring the aforesaid activities and a strategic goal to make Vilnius "a city of knowledge."

## III.4. Driving motivations of IS policies

As stated in the Government's Action Report for 2002, its target is to increase transparency of decision-making, the quality and efficiency of public services as well as information provision to the public, business and public institutions through ICT use.
Promotion of ICT-based production and services is another goal stated in the Report. To achieve this goal, the Ministry of Economy and municipalities of the largest cities are providing financial contribution to the creation of technology parks and business incubators.

Major motivations for IS policies are twofold. Political motivations come first. Information society as a rather new and sound slogan draws a vision of a modern Lithuania and an open,

moving and forward-looking society, in contrast to an old-fashion, post-Soviet province still solving the problems of the past (land and savings restitution, agricultural problems, etc.). Though both *Lithuanias e*xist, the choice of the future direction is demonstrated.

Second, the development of IS is seen as the basis for increasing the country's competitiveness and its ability to co-exist as an equal partner in the EU and in the entire global market. While the competitiveness of Lithuanian firms is a core issue in this case, the policy is mainly focused on the country's competitiveness. Attention politicians pay to the country's ratings and positions in different indexes and benchmarking lines is un-proportionally big compared with the efforts that are being taken to create a competitive legal and economic environment for business and society at large.

Major disagreements in IS policy are threefold. First of all, they are related to a relatively low importance assigned to IS issues in comparison to other state problems (such as agriculture or increases of state social security pensions). It resembles the fact that part of the population still finds itself living in an agricultural/industrial society and wants to go on that way, while the rest sees and measures the economic reality in terms of knowledge society and considers its issues as rising and therefore of priority. The second type of disagreements comes from a different approach to the capabilities and consequences of state regulations of the market. State institutions tend to administrate, predefine, restrict, control and penalize. This approach is usually shared by the academia, adding a prefix "scientific" (scientifically grounded predefinition, restriction and etc.) Market participants and some analysts treat this type of policy as inefficient and unfavourable for business and consumers in general. The third type of disagreements is among different public institutions regarding distributions of authority, functions and funds. In the first case differences in opinion usually compete at the political level. In the second case they compete in society (mainly in the media), and in the third case they compete at all levels of public administration and legislature.

Lithuanian IST policy is far from being sophisticated, because there are usually two types of proposals for problem solving. One of them is to create a new responsible institution or a work group and the other is to request more funds from the budget. So it is a natural consequence that IST policy does not respond adequately to market changes. As ill-targeted policy actions disturb the market and squander public resources (e.g., the establishment of a new inefficient public institution having the right to impose regulations on enterprises or individuals), in many cases a weak implementation of such actions is more preferable.

## III.5. Objectives and results of the IS policy

Four priorities were set out in the Conceptual Framework for Information Society Development in Lithuania:
1) Competence of the population in ICT use,
2) Public administration,
3) eBusiness
4) The Lithuanian culture and language in an electronic environment.

An Action Plan was worked out according to these priorities. The 2002 budget allocations for the above mentioned were the following:

Table 15.: **Budget allocations for IS in 2002, EUR million**

| | |
|---|---|
| Competence of the population in ICT use | 8.5 |
| Public administration | 0.8 |

| | |
|---|---|
| eBusiness | 14 |
| Lithuanian culture and language in an electronic environment | 0.2 |
| Total | 23.5 |

*Reference: Committee for Information Society Development, presentation in Parliament, September 2003*

In February 2003 the Committee for Information Society Development presented a 2002 Report on the plan's implementation (see Annex B2.). According to the Report, the majority of the items foreseen in the plan either had been implemented or were being implemented. As mentioned above, the most controversial provisions of the plan were skipped due to a lack of resources. It should also be mentioned that many targets of the plan (such as promoting or advocating something) are difficult to evaluate.

eGovernment, although not included into the plan as a separate item, is in high demand. In the middle of 2002, after several years of debates, the government approved a conceptual framework for the development of eGovernment. The framework foresees a decentralized, demand-driven approach. However, the present public administration does not support this approach. Therefore, continuous attempts to make eGovernment another pre-defined and top-down enforced project are unavoidable. The eGovernment concept can be implemented only together with the introduction of a new type of public administration. For the time being different institutions are implementing separate eGovernment services.

According to Taylor Nielsen Sofres, 8 percent of the Lithuanian population used eGovernment services in 2002.

**Box 7. ISDC Survey "Status of eGovernment services and its perspectives" 2003**

| eGovernment services according to eEurope+ indicators, 2002.05 | | |
|---|---|---|
| Service | Type | Level |
| Personal income tax | Declaration | 2 |
| | Notification of assessment | 0 |
| Job search | Excluding employment procedures | 4 |
| Social benefits | Disability | 1 |
| | Children allowance | 1 |
| | Benefits of the Sickness fund | 1 |
| | Student scholarships | 1 |
| Personal documents | Passport | 1 |
| | Drivers license | 1 |
| Car registration | | 1 |
| Application for building permission | | 1 (0), depending on municipality |
| Declaration to the police | Reports on incident | 0 |
| Public libraries | View of catalogues, search, ordering | 4 |
| Certificates (request and delivery) | Birth | 1 |
| | Marriage | 1 |
| Enrolment in University | Applications | 2 |
| Announcement of address change | Declaration of the living place | 1 (0) |
| Health related services | Information on services, registration | 0 |
| Social contributions | For employees | 2 (1), manual delivery is also obligatory |
| Corporation tax | Declaration | 2 |
| | Information | 2 |
| VAT | Declaration | 2 |
| | Information | 2 |
| Company registration | | 2 |

| | | |
|---|---|---|
| Submission of statistics | | 3 |
| Customs declarations | | 2 (0), manual delivery is also obligatory |
| Environment-related permits | Permissions and reports | 1 |
| Public procurement | Information and reports | 2 |

The levels: 1 - information on the Internet site; 2 - partial automatization (such as provision of the forms at the Internet site); 3- partial interaction (for ex., e-questions); 4 - interaction: both request and delivery of the service are carried out in electronically.
*Reference: Government of the Republic of Lithuania, http://www.lrv.lt/main.php?cat=22&gr=5&d=2001*

As the above estimates show, the plan to achieve at least 3-level services in 2005 as provided in the conceptual framework for the Development of eGovernment is not realistic.

Administrative capacities are being strengthened for the management of the Structural Funds inflows: a National Payment Agency was established under the Phare program, its staff was trained and methodological support was provided; The key ministries - the Ministry of Economic, the Ministry of Communication, the Ministry of Social Security and Labour, the Ministry of Health Care and the Ministry of Education - established necessary agencies to deal with the projects. The Ministry of Finance is the coordinating institution *(Ministry of Economy, www.ekm.lt 2003).*
According to ISD Committee, fifty-two information society development projects are planned for 2003. Public funding is estimated to total EUR 42.6 million, with EU assistance planned at EUR 13.8 million.

## III.6. The Institutional setting behind the policies

The Communications Regulation Authority (CRA) implements and shapes (of late) telecommunication policy. Before CRA was established as an independent regulator, telecommunication policy had been formed mainly by the Ministry of Communication. The CRA is a new public institution established in 2000 and one of the most modern ones. The leading staff is young, well-educated and with good knowledge of EU legislation. A lack of competence and experience as a competition regulator are major weaknesses of this institution. Expertise is clearly lacking in economics, finances and business. The institutions could also be more circumspect towards market processes. Over-extensive and over-detailed regulations carried out by CRA can damage the telecommunication sector.

The Ministry of the Interior is responsible for eGovernment and security of information technologies. In the field of eGovernment the work has just started. A conceptual framework for eGovernment, which was mainly shaped by members of parliament and NGOs, was approved in 2002. Institutional capacities of the ministry in this field are clearly insufficient.

The Ministry of Education is engaged in computerization of educational establishments, first of all secondary schools, and eEducation programmes. It draws student enrolment plans for tertiary institutions. The ministry has already experience in working with municipalities and private public partnerships, especially in the field of computerization of schools. It is also possible to mobilize more resources than the ministry's alone.

The Ministry of Economy deals with IS issues from the perspective of industrial policy. Its activities are mainly related to SME support programmes, business incubators, technology parks and similar subsidy-type engagements. The ministry's administrative capacities in IS policy are weak, both in terms of staff and experience. The Ministry of Economy is also in charge of the work of the so-called Sunset Commission, an interagency, public-private initiative to identify and reduce regulatory obstacles to business development. Although a

separate group to deal with ICT was established within the commission, the results proved to be negligible.

The Science and Technology Commission has just started its work and does not give reason to expect any substantial changes in the field of science and innovation policy.

The Information Society Development Committee coordinates implementation of general IST policy documents, collects information on IS in Lithuania and the European Union, evaluates budgets for ICT projects in line ministries, deals with integration of state registers, the use of the Lithuanian language in IT, the use of open code SW and regulation of Internet content. It temporarily serves as a supervisory institution and prepares by-laws for qualified eSignature certification centres, sets e-qualification standards for public officials, etc.

The Information Society Development Commission serves as a bridge for IST issues and decisions to be passed to the Government. This is a rather successful set-up, as IST issues are often too specific to be addressed directly at cabinet sittings. Outside experts are also more frequently invited to meetings of the Commission.

The Information Society Council comprises public representatives, including academia and business people, politicians and public activists. Its task is to represent public opinion on IST issues at the highest, presidential level. Its influence is bound to depend on President-Government relations and the president's general influence.

## III.7. Specific important actors

For the Information society in Lithuania specific important actors are mainly NGOs (see Annex B3.). They had actively supported the idea of Information society even before official policies "discovered" this issue. NGOs play an important role in IS education activities, organisation of public debates, in bringing up new ideas and projects, analysis of separate issues and the execution of IS projects.

## III.8. Conclusions

- IS national policy is rather new and, despite an impressive number of documents, not properly integrated into general public policy. The best evidence is the fact that major general legal acts, such laws on labour regulations, taxation, accounting etc., do not take into consideration the specifics of IST (such as the possibility to use eSignature instead of a manual one and the stamp, the possibility to employ part-time, flexible employees or persons working at home; taxation of IST products and alike).
- Innovation and R&D policies are just appearing and are not integrated into IS policies in turn.
- A lack of a stable institutional framework is one of the factors that has made IS policy fragmented, therefore the establishment of a separate ministry for IS affairs is often proposed. However, there is no reason to expect it will work better than the existing ministries. IN addition to that, as the narrow institutional approach prevails, a separate ministry could even complicate integration of IST dimension into the general economic policy.
- The eGovernment dimension of the present IS policy is underdeveloped. A public administration reform that would set a framework for the communication of public institutions with the public on a service-provider-client basis is an essential precondition for the implementation of eGovernment. Consequently, IS policy would be improved significantly if a proper public administration reform were carried out.
- eGovernment services are clearly lagging behind private eDevelopments. An outdated public administration system and narrow institutional interests tolerated at the governmental level are the main reasons for this.
- Information society in Lithuania is progressing rather fast. The private sector, with its ideas,

initiatives and certain pressure on politicians, is the driving force behind this development.

## III.9. SWOT analysis - IS

| **Strengths** | **Weaknesses** |
|---|---|
| • Presence of all major strategic policy documents for IS;<br>• An active private and NGO sector;<br>• Well-educated new public servants in newly established and better financed institutions;<br>• Competitive pressure in the EU and world markets. | • Abundance of strategic IS documents and a lack of hierarchy thereof;<br>• An unstable and fragmented institutional framework for IS policy;<br>• A low rank of IS policy in comparison with traditional policies on the governmental agenda;<br>• Prevailing superficial and simplified understanding of IS policy issues among politicians and academia;<br>• An out-dated system of public administration and narrow institutional interests;<br>• Weak traditions of state institutions' cooperation with the private sector as a partner. |
| **Opportunities** | **Threats** |
| • Learning from world experience: as IS issues (such as eSignature, regulation of telecommunications, ID cards, etc.) began to be dealt with rather late in comparison with EU countries, the approaches and methods that did not work can be avoided;<br>• Using the know-how of investors and EU support. | • Delayed public administration reform and other structural reforms; formal reforms or improper goals;<br>• Direct transmission of EU legislation without regard to local problems; these priorities and traditions can give the opposite results (e.g., the threat to misuse, or actual misuse of, regulatory powers by so-called independent regulators);<br>• Recognising IS as a fashionable issue, to initiate or support projects at the governmental or parliamentary level that are economically unjustified but PR or narrow interest-driven (such as establishing a new ministry, setting up state-owned or subsidised qualified certification centre for eSignatures or "creating" a competitor for fixed line operator with public money). |

# IV. INSTITUTIONAL CAPACITIES AND REGULATORY BACKGROUND

## IV.1. Telecommunications

### IV.1.1.1. Regulation/deregulation

The last amendments to the law on Telecommunications came into force on 1 of January, 2003. It has brought essential changes into telecommunications regulatory policy in Lithuania. The law abolished a monopoly right for the fixed telephony of "Lietuvos Telekomas"; set Communication Regulatory Authority (CRA) as independent regulator of telecommunications market with the obligation to guarantee an effective competition (based on the 25 percent SMP concept); abolished licensing for telecommunication activities that need no radio frequencies; defined radio frequencies allocation procedures; defined the rights of the users, including the carrier (pre-)selection and number portability right (comes into force from 2004) and to receive universal services. The law states that the loss of providing universal services is compensated by the decision of the government and by means of the service providers. The procedures as well as the scope of the services shall be decided by the government. In spring 2003 the latter decision was not announced. The law was prepared with respect to the old (1998) EU telecommunication regulatory framework, but some provisions, such as abolishment of licensing, carrier (pre-) selection and number portability right, come from a new framework (2002).

In order to comply with the new EU regulatory framework after accession, the Lithuanian Government has adopted a conceptual framework for the Law on Electronic Communication (2003). The new law will have to embody three aspects: technological convergence, a more flexible regulation (making the sector-regulation closer to general competition rules) and closer cooperation of the regulators in the EU. A part of needs caused by technological convergence - namely integration of regulating institutions and procedures of different communication service providers, including the procedures for radio spectrum allocation - is not foreseen in the Lithuanian framework. Telecommunication regulator (CRA) will continue to deal with telecommunication providers and the broadcast regulator - the Radio and Television Commission of Lithuania - with the broadcasters separately. The law on Electronic Communication is under preparation and is planned to be adopted at the end of 2003, or the first half of 2004 at the latest.

LFMI considers that the first versions of the draft law show a further tendency to increase the rights of CRA to regulate in terms of the scope of regulated activities, a variety of tools (including the price cap), the right to make a final decision and the level of intrusion. On the other hand, no provisions are foreseen to secure separation of legislative and control functions of CRA and to increase its responsibility for actions harmful to consumers and service providers. Seeking to escape any corrections to the CRA's policy, a provision that decisions of CRA are not suspended during the case investigation in court is included into the draft proposal of the law on e-communication.

Present practice of telecommunications regulation is rather controversial. First of all, 52 by-laws to the amended law had to be prepared in half a year. The by-laws were prepared by CRA and there was no time left for any discussions with the operators and the public. In general the provisions clearly exceed the principles of minimum regulation level and proportionality that are declared in the EU directives as well as in the law. CRA also considers interconnection prices as an obstacle to competition among all operators and aspires to regulate them.

Meanwhile, already in January CRA announced SMPs (Significant Market Power) in four markets - public fixed communication networks and services - incumbent operator "Lietuvos Telekomas"; leased lines services - "LT"; public mobile communication and services: "Omnitel" and "Bite" (two from the existing three mobile operators); national network connection - "LT" and "Omnitel". It also assigned the obligations for SMPs foreseen by law: transparency, non-discrimination, separation of accounting, obligation of network connection, transparency and access to the infrastructure, etc. Mobile operators took CRA to court. CRA submitted an appeal, which was rejected by the court and the obligations for the SMP operators were suspended. In May 2003, the court satisfied the complaint of the operators: it repealed SMP status and all obligations set up by the CRA for "Omnitel" and some of the obligations for "Bite" (according to the requests provided in their complaints) (*Baltic News Service, 16 May, 2003*).

### IV.1.1.2. Conclusions

1 A positive fact of telecommunication regulation was to abolish exceptional rights for providing fixed communication services: since 1 January, 2003 this market has been liberalized;
2 A positive fact of the change in the institutional setup was to establish CRA - as an independent (from the Ministry of Communication and the Government in general) regulator;
3 The trend to increase exceptional (with respect to general competition policy) regulation of telecommunication both in terms of the scope of activities and in-depths of the rules, is a negative one;
4 Extensive regulation is embodied in legislation (first of all by providing CRA with strong authority and powerful tools to intervene into business activities) and results from the tendency of regulating bodies to exercise their powers without relevant respect to market rules;
5 There are efforts to adjust legislation to technological convergence by converging some of regulations, however institutionally and in terms of most procedures (e.g., allocation of the spectrum) regulation remains separate and for some activities - double;
6 Intrusive regulation of telecommunications violates the interests of consumers as operators have to take a heavier burden of regulation costs and the targets of regulations not always are wanted by consumers. The initiative and motivation to invest in these businesses is much suppressed. It has a crucial impact on information society, as the telecommunication sector is the most vital driving force for its development in Lithuania.

The corresponding institutional implementation capacities have been described above, in chapter B.

### IV.1.2.1. Privatisation

In July, 1998 "Amber Teleholding" (50 percent "Telia AB" and 50 percent "Sonera OY") acquired 60% of Lithuanian Telecom and the company was transformed into a joint-stock company AB "Lietuvos Telekomas". The investor paid LTL 2.04 billion or LTL 4.17 per share (EUR 0.45 billion or EUR 0.9 per share at 1998 rates). It was the most expensive privatisation deal in Lithuania. The company was granted exclusive rights in fixed telecommunications till 31 December, 2003 and the right to raise service prices by 10% plus inflation annually. In 1999, 5 percent of AB "Lietuvos Telekomas" was transferred to

employees at a nominal price of LTL 1 (EUR 0.23). The employee's obligation was to keep shares from trading for 1 year, except trading between employees.

In 2000, 25 percent remaining state-owned shares of AB "Lietuvos Telekomas" was sold on London and Lithuanian Stock Exchanges. This was the first time in Lithuania when the company shares were sold in such a way. The 10 percent left over shares remain a property of the state and the rest of shares are traded on Lithuanian and London (Global Depository Receipt programme) Stock Exchanges *(State Property Fund).*

**Box 8. "Lietuvos Telekomas"**
Till 2003 the Company has already invested over 1.8 billion litas (0.5 billion euros in 2003 rates) into modern technologies and digitalisation of its network, the part that is invisible to the majority of people. In 2002 more than 80 per cent of investments were allocated for modernisation of the network. This allowed the Company to complete digitalisation of its network in five largest cities of Lithuania. In late 2002 the rate of the network digitalisation reached 88 percent, some five years ago it was 20 percent. "Lietuvos Telekomas" continued developing its ADSL-based access network. Currently, ADSL services are available to 85 per cent of "Lietuvos Telekomas"' customers. The Company offers several *"DSL Takas"* service plans with different speed and price schemes. During 2002 the number of ADSL users increased from 2.4 thousand (end of 2001) up to 10.5 thousand.

"Lietuvos Telekomas" offers its customers a broad range of new modern voice telephony (ISDN Duetas, Directory Inquiry Service 118, lines 900, 800, 700, telemarketing services, etc.), Internet (Tako Zona, ISDN Takas, DSL Takas, Tako Pastas, etc.) and data communication (broadband, videoconferencing, leased lines, etc.) services.
In 1998 Lietuvos Telekomas had ten thousand employees, in 2003 - 3.4 thousand.

The Company allocates substantial funds for implementation of support programmes and educational projects. One of the major long-term projects is the education support programme "Kompasas" (years 2000-2003). Lietuvos Telekomas is one of the founders and sponsors of the alliance "Langas i Ateiti*" (Window to the Future*). The aim of the alliance is to encourage Lithuanian people to use Internet at a larger scale thus raising the standard of living and improving competitiveness of the country.

Lietuvos Telekomas' Group, i.e. parent company and its subsidiaries, currently employs more than 4 thousand professionals. The Company regards its qualified and experienced employees as its invaluable asset. Employees are provided with excellent opportunities to study and improve their competence as well as have good career prospects.
*References: Lietuvos telekomas; "Lietuvos rytas" 14 July, 2003*

### IV.1.2.2. Conclusions

6 Privatisation of "Lietuvos Telekomas", despite the provision of the exceptional rights, was the most positive act in telecommunication policy;
7 To complete privatisation in this field, the last state owned telecommunication operator (performing a mixture of public and commercial functions) - Lithuanian Radio and Television Centre (LRTC) has to be sold.

## IV.2. State Registers

A present condition of the state registers is a big obstacle to IS development in Lithuania. The major shortages are (1) an overall lack of integration, (2) an out-of-dated technical base, (3) poor data and poor management (in some registries). Without register integration public institutions can not exchange information efficiently and can not provide the citizens with eServices of one-stop-shop principle (though, this principle is declared as a goal in numerous policy documents and statements). Without this principle, most of eGovernment services loose their sense, as people have to approach different institutions and carry paper documents with them anyway. No eGovernment neither eBusiness services based on poor data can be reliable (such inconsistencies as duplicated IDs in the registers or duplicated registers make eServices of very low value). Existing administrative set-up, based on institutional autonomy, and out-of-dated technical base do not allow creating eServices of good quality (if any).

A survey "The Status of the State Registers and Databases: analysis and evaluation", carried out by company "Sintagma" in 2001, concludes that the legal background is incomplete: requirements are numerous, but in practice the entire legal part is in place only for 5 per cent of the registers. This is mainly due to the lack of resources and poor management. Interconnection between different parts of a register is insufficient: a legal entity, a physical data base and information technologies are often treated separately. Usually the latter two parts are underlined at the expense of the first one. Creation of the registers is hardly coordinated at all. Sixty-three per cent of the registers are financed from the state budget. Fifteen per cent are self supportive, namely the Real Estate Register-Cadastre, the Register of Pharmaceuticals and the Register of the Road Vehicles. The registers' levels of modernisation differ markedly.

**Box 9. Real Estate Register-Cadastre - presently a state enterprise "Centre of Registers"** (www.kada.lt)

The company was established in 1997 under the Ministry of Justice as a profit seeking organisation. It carries out cadastre work, legal registration and valuation of land and other legal property. Since 2002 "Centre of Registers" has been assigned as a manager of the Register of Enterprises.

The enterprise is comparably well equipped in technical terms and provides customers with some eServices (e.g. possibility to order certificates electronically, search in both registers). Some services are public, some - charged. The register is self-supportive. Nevertheless, the procedures for the users are long and costly. The service provider is a pure monopolist and most of the services it provides are not optional for the citizens (such as different certificates demanded by other institutions or banks).

LFMI considers that the activities of this enterprise clearly demonstrate that when a certain technical level is achieved, economic concerns become urgent. In order to solve them, preconditions for the competition should be created.

These problems were acknowledged by the Government and a **conceptual framework for Integrated System of the State Registers** was adopted in 2002. Besides a primary goal - to integrate the main registers - some new provisions on data supply activity, which are important for business, were foreseen. Namely, it is stated that distribution of data can be performed by private companies on competition basis. A framework implementation plan was prepared by the institution in charge - Information Society Development Committee - in 2002, though not adopted by the Government yet. According to the plan, the central legal act on state registers - the **law on the State Registers** is being amended to put it in line with the conceptual framework. Provisions for integration, quality and efficiency were foreseen in the draft law (April, 2003), namely: data input shall take place in the sole register and shall be

circulated among the appropriate registers; managers of the registers (that have to be state institutions or state-owned companies) are obliged to treat equally competing data distributors despite their type of ownership (presently outsourcing is impossible in practice and in a part of registers - legally as well); requirements for private entities, willing to be engaged in data distribution business, shall be listed in the by-laws; supply of the information free of charge is provided for the subjects of the register, related registers, courts and law enforcement institutions for carrying out their functions (present law provides this for all state institutions). After this law is adopted, respective amendments to the specialised registers will follow.

**IV.2.1. Conclusions**

- Integration of the state registers is one of the major preconditions for eGovernment and eBusiness services to develop;
- Despite a rather good understanding of the problem and a rather good quality of conceptual framework, the integration process is doomed to be slow and costly due to the institutional interests, unreformed public administration system and a tendency towards simple centralisation (instead of soft integration);
- Competition, if allowed in register-data distribution market, could move the process quicker.

## IV.3. eSignature

The **law on Electronic Signature** came into force rather early - on 11 July, 2000, however the law wasn't functioning due to several reasons. First of all, the law appeared to be pure transmission of EU legislation, without relevant respect to the market concerns. The law foresaw the same legal force with hand-written signature only in the case of Public Key Infrastructure (PKI) qualified-certificate. Thus, technological neutrality of eSignatures was not preserved in the legislation. To meet the market demands and technological neutrality principle**, amendments to the law** were adopted in June, 2002. According to the amended legislation, eSignature has the same force as a hand-written signature and shall be admitted as evidence in court if the parties agree. This change of legislation made new eServices and tele-services possible - especially those provided by banks, as they already had their own user authentification systems for eBanking. The latter approach is also supported by the Civil Code (effective from July, 2001) which states that eSignature is equated to the hand-written one if it is possible to identify the person and the text is protected. However, public institutions are reluctant to use eSignature equivalents existing in the market and do not provide eServices at the excuse of the infrastructure absence for the qualified certificates services, based on PKI.

Another reason for non-functioning of the law (2000) was institutional - the law foresees an eSignature Supervision Institution, which was appointed only in April, 2002. The functions of eSignature supervision are assigned to the Information Society Development Committee which is in charge of secondary legislation, registration of service providers, voluntary accreditation and supervision. A set of by-laws, such as "Requirements of signature equipment," "Requirements for certification service providers issuing qualified certificates," "Procedure of registration of certification-service providers issuing qualified-certificates," "Procedure of eSignature supervision" were prepared by the Committee in 2002.

In 2003, there is no qualified certificate provider in Lithuania. The Central bank is creating one for its own use (communication with the European bank and Lithuanian commercial banks) and has not been planning to provide public services so far. According to the specialists and analysts, the amendments to the law on eSignature haven't solved all important problems of its application, especially regarding the use of eSignature of a legal person and archives of eSignatures as well as eDocuments themselves. The idea to create state-owned

infrastructure for qualified certificates is periodically on the agenda at different levels of IST policy. This idea is very attractive to many IST sphere officials and politicians (The supervision institution - ISDC is strongly in favour of this), but the budget constrains have sustained the Government from being involved in this expensive and risky business so far. Due to the same reasons, former ambitious plans to introduce ID cards carrying eSignature were made more according to the market demand and ID cards were produced without eSignature.

### IV.3.1. Conclusions

8 After the law on eSignature has been amended and the new Civil Code entered into force, legal preconditions for eSignature services to function are being created, but a legal uncertainty exists due to a lack of courts' practice in applying the new Civil Code in general and provisions on e-issues in particular;
9 eSignature services, though not based on PKI, exist in the market and are provided mainly by the banks;
10 eSignatures with qualified certificates are requested from the security point of view, but they are not feasible from the economic point of view so far. Provision of this service on public money would be an inefficient and socially unjustified action, harmful for competitive eSignature market development.

## IV.4. Internet

The Internet, as a transport to carry information is subject to the law on Electronic communication that is presently (2003) under preparation.

The content of the Internet is regulated by the **"Procedures for harmful information control and restricted public information distribution in public computer network,"** approved by the Government in March, 2003. The statements of Procedures derive from other Lithuanian legal acts and European experience in providing a safe Internet. Both legal provisions and self-regulating means are foreseen in the Procedures. There are many public and private organisations involved in safe-Internet matters: the Information Society Development Committee, educational institutions, the Ministry of Culture, the Ministry of Education, the Ministry of Interior, the Police, the Ethics Commission of Journalists and Publishers, etc.

Another recent (April, 2003) document related to Internet content is a Government decision **"On General Requirements for the Internet Sites of the State Institutions."** The goal of the document in general is to improve the quality of the state institution's internet sites. There are requirements for the general structure, items of mandatory information, restrictions on commercial use, requirements for updating and information in foreign language, a possibility to ask questions and to receive answers in e-form foreseen in the document. Some technical requirements (such as data formats) and management of the site are defined as well. All state institutions have to comply with the regulations until July, 2004. ISDC performs annual monitoring of the state institutions' sites.

### IV.4.1. Conclusions

11 Despite a big concern of numerous public institutions, so-called "safe Internet" can not be secured by administrative measures. Therefore actions pursuing this goal tend to have negligible effects;
12 Standardized requirements for the Internet sites of the state institutions are needed, as separate institutions, being not market agents, lack motivation to provide their "consumers" with convenient services (such as information in English or timely updates).

## IV.5. Copy-right protection

Copy-right is regulated by national legislation, international treaties and conventions. Liability for copyright infringement is foreseen by the Code of Administrative Violations. Collective administration of the copyright is carried out by the Agency of Lithuanian Copyright Protection Association (LATGA). Collective administration of the related rights is carried out by the Agency of the Association for the Protection of Related Rights (AGATA), which was set up in 1999 on the initiative of performers and producers of phonograms. The rights of the authors of computer programmes and databases and their successors in title are administered by the "Infobalt Copyright Agency" established in 1997. The Ministry of Culture is the institution, responsible for the implementation and coordination of the copyright policy in the country.

A conceptual framework for Copyright and its implementation plan for 2000-2003 were adopted by the Government in 2000. It stated in the Framework that according to various sources, the illegal market of products under the copyright exceeds the legal one several times. Lithuania also is one of the transit countries for illegal production. General attitude of the population towards this issue is rather tolerant, which is greatly influenced by economic factors such as a large difference in prices between legal and pirate production and lower purchasing power in comparison with many countries-copyright holders. The major goals of the conceptual framework are the following: to create an efficient legal base for copyright protection, to improve its enforcement and to change public opinion through educational and information campaigns.

One of the first steps was to revise the law on Copyright and Related Rights (1999) with respect to the EU directive 2001/29, Lithuanian membership in WTO and a new Civil Code.

According to the "Infobalt Copyright Agency", which deals with software copyright issues, a continuing improvement of legislation is one of the most important factors for achieving an effective intellectual property copyright protection. Another major target is public opinion and apprehension of pirates, copying, usage and distribution of illegal software.

**Box 10.: Survey of legal SW use by IT professionals, end-users and academic youth, Infobalt, 1998 (444 respondents)**

According to **IT professionals,** an average share of legal software in their companies is 62%. The legalization of pirated software is already being started in 29% companies and 41% of IT professionals think that the companies they work for will start the process in future.

There are several reasons why the companies choose the legalization path. Besides the legal amenability taken up if pirated software is used (89% of IT professionals know this well), there are problems arising when the illegal products are used. The most common problem mentioned by 48% of IT professionals is a lack of the software vendors guarantees for the technical assistance. No information on upgrades and no manuals for usage are also important shortcomings disturbing a fluent and successful business.

**End-users** work with computers mainly both at home and at work (46%) or only at work (34%). Fifty nine per cent of end-users definitely know that a part (10% that all) of the software installed in their computers are pirated. An average share of legal software in end-users computers is around 50%. The intentions of the legalization of the pirated products are

mentioned by 33% of this group of respondents. The main problems arising when the illegal products used are also mainly a lack of the software vendors guarantees for the technical assistance (50%) and no information on upgrades (36%).

It is supposed that our end-users do not understand properly the seriousness of the illegal software copying or downloading because 65% of them believe that pirating is only a breach of the copyright, but do not consider it as a crime equal to theft (only about 30% of end-users consider it being a serious crime like theft).

According to **academic youth,** legal software in the computers they use makes 41% in average of all the software installed. Most of the young people (82%) think they are able to distinguish a pirated and legal software.

Half of young people similarly to end-users consider pirating only as a breach of the copyright (50%), but do not think about it as about a crime equal to theft. Around 40% of youth consider it being a serious crime like theft.
*Reference: Infobalt, www.infobalt.lt/agentura/english/visi/english.htm*

As the "Infobalt Copyright Agency" states, a lot IT users in Lithuania are not aware of the software licensing rules and sometimes a lack of knowledge makes them to become pirates. In years 1999-2000 the Agency together with the biggest software vendors (MS, Novell, Symantec) carried out a broad public anti-piracy campaign, including direct e-mailing for enterprises, targeted seminars and Internet advertising. This intense campaigning had substantial results - the rate of pirate production, as Microsoft Baltic announced, decreased by 11 per cent during the year. In spring 2000 the Agency has started the Software Register which is another tool for pirating prevention. In 2000 BSA Lithuania (Business Software Alliance, see Annex B3.) was established which took over foreign vendors interest representation, the Infobalt Agency now is more focused on the protection of local SW producers' rights.

According to the Agency, in 1999 the pirated software made around 81 percent of Lithuania's software, in 2002 - 65 percent (business applications packages). The most recent survey of BSA shows that the level of pirated software decreased to 53 percent in 2002 (in 2001 it stood at 56 percent) and that the opinion of the society towards this issue is slowly changing. BSA has a target to decrease this level to 35 percent until 2005 (*"Verslo zinios"2003.06.04)*. Since 2000 Lithuania (as well as Latvia) is included in the list of the countries where copyright protection is considered insufficient. According to the report of the US Trade Mission, the copyright legislation in Lithuania is improving, but its enforcement remains a problem (*"Verslo zinios," 6 May, 2003*).

**Box 11.: Survey of enterprises "Tax administration and property protection"**
The survey was carried out in March 2003, as a part of LFMI project „Protection of Ownership Rights and Public Policy on Economic Sanctions". Half of the survey participants think that intellectual property is protected less than other forms of property in Lithuania. Twenty nine per cent state that they are treated equally. Weaker protection was emphasized more by small business and trading companies. Difference in protection of intellectual and other type of property was not identified more often by industry and big enterprises.

The majority (52 percent) think that intellectual property shall be protected at the same level as other types of property. Special (higher) attention for its protection would be given by 20

percent of those polled.
*References: Lithuanian Free Market Institute, www.freema.org; Lithuanian Free Market Institute http://www.lrinka.lt/Projektai/index.phtml, 2003.*

Unlicensed software used to be a big problem for public administration institutions (especially antivirus and word processing). To solve it is one of the directions of the information society policy. In 2001 the Information Society Development Committee launched a project, the goal of which is to license the software, used by public administration institutions until 2004. The Committee collects applications from the institutions and purchases needed software on the tender basis. According to ISD Committee, the number of applications of 2003, in comparison to 2002, is decreasing. However, bearing in mind initial situation and the amount of money spent for purchasing SW for public administration institutions, the problem remains unsolved. Different ways how to proceed are being analysed by the Committee (centralised or un-centralised purchasing). One of the provisions related is open source promotion activities, as for example, within a pilot project Open Office that was installed in the Ministry of Environment, a department in the Ministry of Education and Ministry of Interior.

### IV.5.1. Conclusions

- The level of pirated software, though being comparably high, is gradually decreasing and public opinion is changing towards recognition of the intellectual property as respectful equally with the other types of property;
- Pirated software in public administration institutions remains a problem;
- The level of pirated products, despite public opinion, depends also on the level of income and most of all, on the level of prices for the intellectual products considered by people to be reasonable. Bearing in mind that the level of income in Lithuania and in the developed countries differ much more than prices of intellectual products in the respective markets, the existing level of pirating is expectable;
- Strict punishment actions to combat piracy evoke a strong resisting reaction and can non-proportionally damage small businesses.

## IV.6. Privatisation and de-regulation of other services

Private ownership makes about 72 percent in Lithuania today *(Government of the Republic of Lithuania, www.euro.lt, 2002).* Privatisation and economic restructuring are being continued. The privatisation of Lithuania's commercial banks ended in March 2002 with the sale of a 76.01-percent state-owned stake in the Lithuanian Agricultural Bank to the German "Norddeutsche Landesbank Girozentrale." Today all banking, lease and insurance market is private. Financial sector market is an open market - restrictions for foreign capital have been abolished several years ago.

The restructuring of the energy sector is underway. In May, 2002 thirty-four percent of the Lithuanian Gas company was sold to a strategic investor - a consortium of the German "Ruhrgas" and "E.ON Energie." Another 34 percent of the Lithuanian Gas is to be sold to a gas supplier, very likely to the Russian "Gazprom." The "Lithuanian Energy" split into five enterprises. The separated companies, including the "Eastern Distribution Network," the "Western Distribution Network" and the "Mazeikiai electrical power plant," are now scheduled for sale. Privatisation is expected to increase the efficiency of the energy sector, but newly adopted laws on electrical energy and natural gas set out a number of market constraints that may obstruct the accomplishment of this goal. For instance, the laws envisage licensing of all activities in the electrical energy and natural gas markets and territorial restrictions on the construction of electrical energy distribution networks and natural gas

distribution systems. However, in the future the price of electricity will depend on integration of Lithuanian energy system into the Western European one. Lithuania and Poland have jointly asked for the EU support to building a power bridge between these countries. Some restrictions for foreign capital (in general or non-transatlantic community) have been applied in some privatisation cases of energy enterprises.

The 2003 privatisation programme also includes the Lithuanian Airlines, the shipping companies "Klaipedos Transporto Laivynas" and "Lietuvos jurų laivininkyste," established in June 2002 after reorganisation of the privatised "Lisco." Reform of Lithuanian Railway is foreseen by a number of policy documents and legal acts, but is hasn't been started yet. The plan is to separate the operator from the infrastructure, which will remain state owned. Private operators would be allowed to use the infrastructure and to compete. This reform most likely will be promised and started, but there is a very little probability that any significant changes will be carried out in the short and mid-term future. Road haulage transport is entirely private and due to big share of transit, actually operates according to the EU and international regulations.

### IV.6.1. Conclusions

- Privatisation and deregulation are most important preconditions for the growth of competitiveness, development of new products and services as well as its quality;
- Privatisation process in Lithuania is rather successful, though there still are entities to be privatised;
- Deregulation is going much slower, often becoming re-regulation (like in case of telecommunications), which is a wasted opportunity for the development of the sector and growth of the living standards.

## IV.7. SWOT analysis-IS

| **Strengths** | **Weaknesses** |
|---|---|
| • Big share of private property, ongoing privatisation;<br>• Almost finished privatisation of ICT market;<br>• Liberalised telecommunication market<br>• Strong competition in mobile telecommunication market;<br>• Finished transmission of *acquis*. | • Lack of skills and understanding due to the new and fast-changing subject;<br>• Out-dated system of public administration, narrow institutional interests<br>• Unstable regulatory environment;<br>• Overregulation of telecommunications;<br>• Wide-spread believe in ability to solve all problems by administrative measures, disregard to market laws;<br>• Inexperienced regulatory bodies, if their policies are right. |
| **Opportunities** | **Threats** |
| • To redesign public administration and to cut bureaucracy using the EU know-how, financial support and spirit of changes;<br>• While drafting new laws to leave behind administrative and intrusive regulation systems and to implement | • To delay the reform of public administration and other structural reforms, to make it formal or pursuing improper goals;<br>• To increase centralisation of registers and to suppress any competition in the field of data supply; |

| | |
|---|---|
| rules that support innovations, a variety of services and investments in telecommunications, data distribution, Internet services, eSignature services, etc.;<br>• . Inexperienced regulatory bodies, if their policies are faulty. | • To start one or several of periodically appearing initiatives of new commercial projects, based on public funds. |

*All the factors in the above SWOT are estimated by the authors to be the most relevant to IST-related developments in the country.*

# V. DIAGNOSIS

## 1. Macro-economic and demographic background

Lithuania has created strong foundations of a market economy and achieved a strong and steady economic growth, accompanied by relatively modest fiscal deficits, low inflation and a stable currency. Inflation continues to be very low, largely due to intense competition and a strict fiscal policy. A rule-bound monitory policy and completed privatisation of the banking sector has facilitated competition and enhanced credibility of financial services and has driven down interest rates. This created better conditions for doing business, including new ICT start ups.

The fiscal deficit is likely to increase under the pressure of co-financing required by Structural funds, Lithuania's contributions to the EU budget and leftist government spending, but it is likely to remain within 3 percent. Today Lithuania complies with all Maastricht criteria set for the EU members that wish to join the EMU. In 2003 Lithuania has become a member of NATO and in 2004 it joined the European Union.

As the economy is small, strong export and investment growth have been major factors of the country's economic progress. A rising domestic market and continued export and investment growth are expected to sustain a robust economic development. This can be well observed in ICT service as well as in some ICT industries. Continued privatisation and restructuring (mainly in the fields of energy and transport) as well as EU membership (first of all, the common market and lowered investment risk) are seen as additional sources of Lithuania's long-term economic growth.[1] Productivity grew rapidly (on average by 6.3 percent in the period 1991-2001). This was also affected by fairly stagnant wages, which have started to pick up in the last two years. Rising wages and commercial lending as well as falling price of money have promoted private consumption and investments, including computers, mobile telephony, the Internet and other ICT goods and services.

Table 16.: **Main Macro Economic Indicators**

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004* |
|---|---|---|---|---|---|---|---|---|---|
| **PPP GDP per Capita, €** | 6 170 | 6 850 | 7 380 | 7 310 | 8 080 | 8 730 | 9 570 | 10 630 | 11 610 |
| **GDP Growth, %** | 4.7 | 7.0 | 7.3 | -1.8 | 4.0 | 6.5 | 6.7 | 9.7 | 7.0 |
| **Inflation, %** | 13 | 8.4 | 2.4 | 0.3 | 1.4 | 2.0 | -1.0 | -1.3 | 2.7 |
| **Budget Deficit, %** | | 1.0 | 1.3 | 0.3 | 1.6 | 1.5 | 2.2 | 1.7 | 2.6 |
| **Current Account Deficit, %** | 9.2 | 10.2 | 12.2 | 11.2 | 6.0 | 4.8 | 5.2 | 6.9 | 7.8 |
| **Unemployment, %** | 16.4 | 14.1 | 13.3 | 14.1 | 15.4 | 17.0 | 13.8 | 12.4 | 11.3** |

** Prognosis, ** Second quarter.*
*References: Statistics Lithuania, Bank of Lithuania, Ministry of Finance, Eurostat.*

[1] The European Committee under the Government of Lithuania estimates that a successful integration will contribute approximately 1.14 percentage point to the country's GDP growth per year.

The present macroeconomic background in Lithuania is favourable. The risks of deterioration exist but can be managed if desired (except for strong negative external factors). Political stability could decrease slightly, but not to such an extent as to create serious threats for economic activities.

Lithuanian **population** is aging and this trend is likely to persist in the future. Lithuania has a non-proportionally (first of all, in terms of economic output) large rural population, which has been rather stable so far. The domestic mobility of work force is low. Migration saldo is negative. The "brain drain" process, including that of ICT specialists, is widely observed and is not likely to diminish in the future. The average welfare of the population is rising, although statistics report a reduction of income from self-employment. Social differentiation is rather high as income and consumption patterns in urban and rural areas differ significantly, affecting also the access to and the use of ICT. Yet, the diversity of goods and services consumed by households is increasing.

The demographic framework is exercising an additional pressure on all social sectors (particularly on the pension and health care systems) and ultimately on the budget. This has prevented a decrease of labour costs.[2] Demographic trends are also changing the pattern of employment as more and more people tend to work on a flexible schedule and employers increasingly need flexible work force. This is a new challenge for labour regulation and education policy.

A high unemployment rate, especially among the low-skilled, has been a cause of concern for several years. It has been largely the result of ongoing restructuring and currently, with the major restructuring projects (except for the Ignalina Nuclear Power Plant and Lithuanian Railway) completed, is now steadily diminishing.[3] Unemployment is also being pushed down by a steady economic growth. However, a skill gap remains a major weakness of the Lithuanian labour force, especially in the ICT industry, and this issues is not being properly addressed by public policy. Labour taxes, labour market regulations and general business conditions are other factors upholding a high level of unemployment and discouraging a risk-taking, innovative entrepreneurship. Although Lithuania has a proportional system of income taxation, a high personal income tax and a lack of a "ceiling" on social insurance contributions result in high costs of qualified labour. The introduction of progressive income taxation is envisaged in the program of the present administration, although plans to implement it in the near future have been recently revoked. A mandatory minimum wage is a clear obstacle to employment for the low-skilled. And yet, it is likely to be increased further.[4] Business conditions are not favourable enough for self-employment, while this type of employment would be natural for the Lithuanian economic and demographic structure. Favourable business conditions are especially important in countries which lack entrepreneurship, cooperation and risk-taking traditions.

[2] In Lithuania the general tax level is comparably low, 33.3 % GDP in 2003, but labour is taxed quite heavily as social security contributions are 34 percent, while the personal income tax is 33 percent.

[3] A reform of the Lithuanian Railway is foreseen in a number of policy documents and legal acts. It would entail large-scale dismissals. However, the implementation of this reform on a needed scale and in the near future is very unlikely.

[4] The surveys show that people, especially in rural areas, are willing to work for less than the minimum wage.

Given the skill gap, difficulties that employers face in finding the right employees, high unemployment and a high level of passive unemployment, policy should be targeted towards the improvement of labour supply rather than job creation. Some public discussion on the topic is evolving, so some positive changes can be expected, but not in the near future.

Labour supply can also be enhanced by more flexible labour regulations and modernisation of the educational system. Immigration policy, which is passive and in general restrictive today, could help to solve some problems of an aging population. Without changes in policy, unemployment will remain a serious concern in the near future.

Positive **export** trends are reflected in an accelerating pace of growth in almost all commodity groups, with refined oil products, textile and apparel, wood and furniture being the leading sectors. Labour-intensive relatively low-technology industries prevail in the export structure and will have to increase the use of ICT in order to increase productivity. Given that 42 percent of Lithuanian exports go to the European Union (2003), exports will continue to expand as the terms of trade with the EU improve: customs procedures are being further simplified, companies continue to strengthen their trading links in the European Union and export markets are expected to recover.[5] Productivity and efficiency growth in manufacturing will contribute to export expansion in all markets.

ICT industries – mainly production of electronic components, electrical and optical equipment – made up 8.7 percent of all industrial output and 10.6 percent of exports in 2000. The success of other export-oriented sectors depends on the size, the level of competition and the value of the currency (for countries other than the EU) of their sales markets plus their own productivity growth.

Major risks for export development are related to the situation in the export markets and competitiveness of Lithuanian producers. The former is an external factor and it has not been encouraging so far, while the latter presents a challenge for both Lithuanian public policy and enterprises alike. The volumes of Lithuanian export are also sensitive to the trade regimes with Eastern markets, first of all with Russia and Ukraine.[6] The Russian market is also interesting for ICT industries, especially services. Trade regimes will become slightly more restrictive after Lithuania joins the EU.[7] The Lithuanian government is likely to pay significant attention to economic relationships with Russia. However, they will depend on Russia's accession into the WTO, its internal reforms and progress in adopting EU's *acquis* in trade-related areas. The Kaliningrad factor can also play a role of a catalyst in promoting more active EU-Russia relationships.

Export to Russia and other countries of the US dollar zone have been affected mostly by a sliding dollar.[8] This has had a rather profound negative effect on the Lithuanian food industry and consequently on agriculture, which ultimately causes social problems and exerts a pressure on the state budget.

[5] A decline of exports to the EU countries from 49 percent to 42 percent in 2003 has largely been due to a change of the dealer of the Mazeikiai oil refinery production from the UK to Switzerland.

[6] Ukraine accounted for 2.6 percent of total Lithuanian exports and for 1.6 percent of total imports in 2002, Russia made up 12.1 and 21.4 percent respectively *(Statistics Lithuania, 2003/1, p.97)*.

[7] Changes in the Lithuanian trade regime with Ukraine will be particularly prominent as the existing FTA will be denounced.

[8] According to Statistics Lithuania, the US constituted 2.8 percent of Lithuania's total exports in 2003.

The vulnerability of the Russian market is impeding Lithuanian exports and general economic relations with this country which otherwise could be much broader. However, Lithuanian business people know and have faced a number of times the risks, both political and economic. Therefore they should not be regarded as not being addressed.

It can be predicted that wholesale and retail trade, construction, transport, storage and communications will constitute a growing share of GDP. Likewise, a sizeable growth is projected for financial intermediation, which will be reinforced by the pension reform.[9] It is envisaged that the initial effect of the Structural Funds will boost the construction sector, with a lesser impact on industry and education.[10]

Improving credit conditions, co-financing of investment projects from the European Union and the need to maintain competitiveness at a high level are likely to sustain positive prospects of investment growth. Considerable investments are envisaged in all industries, including the oil refining, food, textile and apparel, wood and furniture and chemical industries as well as the ICT services. The EU Structural Funds are expected to have a marked influence on investment growth. According to the Ministry of Finance, a major effect of financial assistance from the European Union on investments is envisaged in 2005, when real gross capital formation is expected to grow up to 10 percent. By the end of 2006 a share of gross capital formation is predicted to amount to 23 percent of GDP *(Ministry of Finance, http://www.finmin.lt/finmin/index.jsp)*.

However, the effect of Structural Funds will depend on (1) administrative capacities, (2) the quality of projects, and (3) sector efficiency. Administrative capacities for the management of Structural Funds inflows are being strengthened and a number of consultancy firms are ready to provide services for applicants. However, there are still serious doubts about administrative capacities as well as abilities of SME and especially the rural population to use them properly. The third factor – sector efficiency – remains a most crucial one in the field of human capital improvement (social care, employment policy, health care and education). There are no plans or intensions to use Structural Funds for fundamental changes, so there is a threat that additional funds, if injected into inefficient systems, will sustain or even deepen the existing weaknesses. For example, a continuous increase of university enrolment with the same amount of financing decreases the quality of education, so additional funds without the replacement of the present principles will only sustain this flawed trend. Therefore the success of absorbing Structural Funds cannot be separated from domestic policies in the respective fields.

Considerably low interest rates on loans have created favourable conditions for **investment** funding from borrowed funds. The loan portfolio has increased sizeably in recent years and credit volumes are likely to grow at a steady pace in the near future. Intensifying investment processes have also been reflected in a remarkable growth of lease of investment goods, including computers, ICT services, and construction volumes. However, more sophisticated crediting mechanisms are used on a rather small scale. A number of venture funds are operating in Lithuania (most of them of foreign capital), but their investment policy is rather

[9] The pension reform has started in 2004. It allows participants in the present pay-as-you-go system to direct 2.5 percentage points of their social security contributions to private pension funds.

[10] The Lithuanian General Programming Document envisages that 40.1 percent of structural funds will be used for the development of the socio-economic infrastructure, 25.8 percent will be allocated to industry, 18.6 percent to the development of human recourses and 15.6 percent for rural development and fishery.

conservative. The equity market is marked by a relatively low liquidity and capitalisation, although some developments are expected due to the expected rise of pension funds.[11]

The bulk of ICT investment goes to the telecommunications sector. ICT investments in financial intermediation and trade rank second and third. Industry seems to be investing less in ICT products. Large parts of investment are allocated for acquiring computer equipment and software (around 70 percent of all expenditures), which indicates a shift to more complex business operations modes and methods of activities.

In 2003 "European Investment Monitor" by "Ernst & Young" included Lithuania in the top twenty territories in terms of investment attractiveness. Lithuania has moved by nine positions to the number fifteenth. This is attributed to an improving investment climate, including a strong and credible banking sector offering favourable terms of crediting. Other factors include relatively low labour costs, a low profit tax (a general tax rate of 15 percent and 13 percent for SME), low inflation and expanding relationships with foreign companies.

Despite a formal recognition of a market economy in Lithuania, there are several **unreformed sectors** that are impeding the country's economic development and income growth as well as the introduction of ICT in such sectors as agriculture, pension and health care systems, railway and public administration. The restructuring of the energy sector is underway. Privatisation of the Lithuanian Gas company and transportation enterprises is being continued. In this context non-restructured railways are one of the biggest challenges. These reforms would pose a challenge for any government for several reasons: they all are costly, they need sophisticated solutions and, most importantly, they are socially sensitive. Governments tend to avoid them, but the harm of delayed reforms is getting more and more evident to the voters over time and some steps have to be undertaken. The pace of the pension reform to date shows that only moderate changes can be forecasted.

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| Structural reforms are badly needed, but there is little likelihood that they will be implemented to a needed extent. Pension reform has started in 2004. The direction is good but the reform is too slow. Changes in agriculture will be limited to compliance with CAP. Public administration, health care and railway reforms will be promised or carried out at minimum scale, but significant changes are unlikely in the short or mid-term. |

The Ignalina nuclear power plant (INPP) and Mazeikiai oil refinery[12] are inherently inefficient as they were constructed for the large SU market, although in 2003 the oil refinery generated profits. Lithuania has pledged to dismantle the nuclear power plant with financial assistance from the EU. The closure of INPP will increase unemployment in the region and can drive up the price of energy.[13] However, the future price of electricity will depend on the integration of the Lithuanian energy system into the Western European network. Lithuania and Poland have jointly asked for EU support for building a power bridge between these countries. The Mazeikiai oil refinery not too long ago was taken over by a Russian company JUKOS, which has the EU market as its export target and significant plans for restructuring the plant.

[11] At the end of 2003, ten pension funds were registered in Lithuania.

[12] The production of the Mazeikiai oil refinery accounts for more than 20 percent of the country's export on average and about as much of the country's total industrial output *(Ministry of Economy, Statistics Lithuania, 2002).*

[13] INPP produces about 75% of energy in the country.

The present favourable macroeconomic situation provides a good opportunity to reduce the **budget** deficit and even to balance the budget, as proclaimed by the government. However, in the expected 2004 fiscal deficit is 2.6 percent. Only comprehensive structural reforms could justify a budget deficit and a growing state debt, but such reforms have been delayed so far. Failure to adhere to the adopted principle of programme budgeting precludes an efficient allocation of budget resources and obstructs the reform of public administration. This is especially relevant for a successful absorption of EU funds.

**2. Public policies**

Lithuania has a rather stable **political environment**. Although changes in government have been more frequent than parliamentary elections, national policies have remained rather stable. For a long time this was due to widely agreed strategic priorities of the country, mainly accession into the EU and NATO. After those goals have been achieved, a wider diversity of different political interests are seen. Public discussion on "Lithuania's interests in the European Union" is underway. Bearing in mind scant communication with the business community and predominant institutional interests, a common independent position and its smooth implementation are hardly feasible.

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| Though policy changes (especially changes in the rhetoric) can be forecasted on separate issues, EU policies will be copied without a proper adjustment to domestic conditions, therefore the consequences will mostly depend on EU policies themselves. Participation in the EU decision-making will most likely lack clear priorities or rational conclusions from lessons learned. |

A lack of **administrative capacities**, as repeatedly mentioned by the European Commission, results in inefficient public administration at all levels. For business and individuals it means high additional costs and disincentives to act (bureaucracy and incentives for corruption). Creating a flexible, modern, efficient and consumer-oriented system of public administration is an uphill task that requires knowledge and political will, plus authority to implement it. Foreign and local experts can help with the know-how, while political will is difficult to foresee. Even if political will to alter the current system of public administration is in place, resistance within the system might be too strong. Therefore the most realistic way of reforming the system would be evolutional: reforms of separate institutions, the replacement of elderly personnel, education and training. A proper implementation of eGovernment could facilitate this process. This scenario would take a longer period of time and would lead to less optimal solutions, but an entirely new scenario is hardly possible.

**The general business environment**, albeit improving mainly due to the country's maturing democracy and market economy, has still much room for improvement. The legislative process is fast and lacks a proper dialogue with society. Legislation itself is cumbersome and ambiguous and legal provisions are open to interpretation. This harms especially small firms which cannot afford legal consultancy services. Unclear and fast-changing legislation is the most frequent complaint on the part of business people.

There are many intrusive provisions directly limiting freedom of economic activities and contracts. The establishment and the closure of a company are costly and complicated, as are the procedures for land acquisition and construction. Despite the existence of different state support programmes for small business, recent changes in tax legislation have markedly worsened their business conditions. Sole proprietors are also discriminated in the social

security system as they have no right to receive social allowances regardless of the amount of income generated from business.

Restrictions on labour contracts, working time and place and remuneration are limiting employment opportunities for socially vulnerable groups (such as students, recent graduates and the low-skilled) and for freelancers, including researchers and IT specialists. They are also reducing the supply of cheaper flexible workforce for starting businesses. This especially harms the ICT sector, as the flexibility of staffing, working hours and working place is necessary here. This also prevents young people from gaining work experience, which is a major cause of their unemployment.

An expanded role of collective agreements and especially trade unions, which come mainly from EU legislation and international conventions, are alien for the Lithuanian society and therefore they do not perform their intended functions but pursue narrow interests and complicate agreements between employers and employees.

As IST businesses are fast-changing and knowledge-intensive, a favourable general business climate and conditions for small business is a top prerequisite for information society to develop. If this precondition alone is in place, consumer demand would make IST develop irrespective of other factors.

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| General business conditions can be improved if a political will exists. They can be improved gradually even by muddling through with sector legislation. The effects could be observed in a comparably short term. |

**Investments in R&D and technology innovation** processes in Lithuania are sluggish (according to statistics, R&D expenditures were 0.67 percent of GDP in 2001). The reasons for this are manifold. First of all, companies have other priorities both in terms of funding and implementation schedules. It is cheaper and faster to buy and introduce technologies than to create them. In order to expand, companies had (and in many cases still have) to solve more imperative issues, such as sizing down the personnel, enhancing employee qualifications, modernising management, reconstructing buildings to meet growing energy prices, etc. On the other hand, there are no ready R&D solutions. Universities and state research institutions that are the main potential R&D suppliers are not market-oriented. Private research institutions are exceptions or are working on shorter projects or areas of wider application (such as economic, political or legal analysis). Third, R&D expenditures are not tax-deductible therefore companies which actually invest in R&D do not show it explicitly in their financial accounting. Fourth, the state does not have any clear policy regarding R&D investments. Presently budget allocations for this purpose are distributed on an institutional basis. Such allocations are inefficient. Proposals have been made to select a number of priority sectors and to channel public funds towards them. Although selected sectors would benefit in a short run, in the long term this would distort the allocation of resources and motivations on the market, reduce the diversity of economic activity and create preconditions for favouritism and corruption. If the state invests in R&D, it should do it on the basis of competitive projects that would be evaluated by formal criteria and could be initiated by any market agents.

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| In order to improve the efficiency of R&D, institutional funding should be replaced with project financing on competitive bidding. Due to a very strong lobby and public influence of |

the present academia, such changes are hardly possible. Public funding will most likely be concentrated on the so-called "priority sectors."
Tax disadvantages for private R&D can be removed by changes in tax legislation. The threat of possible tax evasion can preclude the implementation of such policy measures on a full scale, although some partial solutions (for example, a closed list of existing cases or products) are quite probable.

Such forms of state support for business or innovations as technology parks, business incubators or clusters can be viable if they are business-led. In Lithuania business incubators have not produced a success story yet. Clusters and technology parks are still being started by state or municipal initiatives.[14] They are not a demand driven result but represent a consequence of activities of specific interest groups and reflect ineffective use of public funds. The results can be positive only if a real business interest takes over the lead.

Labour force is one of the biggest concerns in the country both in terms of unemployment as the major cause of poverty and labour supply for a growing and differentiating economy, therefore **education** is a crucial factor for the future of Lithuania. Unlike in many other countries, access to education is sufficient in Lithuania. Enrolment in tertiary education, however, is one of the biggest in the world and markedly exceeds the OECD average: in 2001 78 percent of secondary school graduates were enrolled in tertiary education in Lithuania, while the OECD average was 45 percent. A number of students per 1 000 inhabitants in Lithuania reached 43 in 2001, while the EU-15 average in 1999 made 33. Enrolment in tertiary education continues to increase. Financing of education is high as compared to total government expenditure and with other countries: 6.5 percent of GDP, as compared with the EU average of 5 percent and the OECD average of 5.2 percent (1999 data) *(Nacionalinis susitarimas)*. Public financing of higher education is very close to the OECD average, but it is comparably low on a per-pupil basis. This has definitely an impact on the major concerns of education – low efficiency and low quality.

The content of education has changed markedly since the Soviet times, but the methods of teaching remain for the most part the same. Although Lithuania did not participate in the PISA survey, it is obvious that a lack of functional education, observed in other candidate countries, is characteristic of Lithuania as well. Universities still fail to teach students how to learn, how to make decisions, how to cope with uncertainties and changing circumstances, how to work in a group and how to acquire other skills necessary for the new world economy and information society. These qualities cannot be acquired by simple administrative provision given that present teachers lack such abilities themselves or abstain from exercising new forms of teaching because the system does not accept them. In order to change the quality of education, teachers have to be motivated to invest in the quality of teaching. Such motivations can be created by financial and organisational means (there is also a strong cultural aspect, but it cannot be changed by an act of will). The same means have to be applied to achieve efficiency of the educational sector.

The financing of education has to be changed according to the following principles:
- Budget funding for education is linked to a pupil, but not the institution (voucher-based financing which is now being implemented in secondary education provides good conditions to improve cost efficiency);

[14] With the exception of Kaunas Technology park which at present reminds more of a business centre than a technology park.

- Budget funds are allocated according to the number of students, regardless of whether the school/university/college is public or private;
- Universities have the right to decide whom to employ, how to employ and how much to pay the teachers. (Having lecturers-practitioners for ICT education is essential.);
- Universities are accountable to society for budget allocations;
- Bureaucratic procedures to establish a private school are abolished;
- Universities and colleges are allowed to charge for education additionally to the fixed state-subsidy per student.

These principles would increase the variety and create competition in higher education and would force administrations to enhance the quality of education, therefore the quality of staff, efficiency and respect of market needs. The chances of implementing these proposals are negligible with the present government and, most likely, with all left-wing governments. A right-wing government could introduce some of the principles, although political considerations would make the introduction of additional payment for studies a hard decision for any government. The influence of interest groups in academia who are satisfied with the present status is another obstacle.

Enhancing the quality of the educational system is a major precondition for the development of an information society. However, it is most likely that tertiary education will not be reformed radically. A gradual improvement of the quality and efficiency of education can be expected as a result of market pressures, a natural change of the staff, reforms and undertakings of individual departments and the expansion of the private educational sector. The potential of the market can be used for instilling changes in education: by creating equal conditions for private schools to emerge, the state would support a "top-down" reform that would be strongly resisted from within the system.

**Information society policy** is a rather young policy in Lithuania. Sound in rhetoric but scant in action, it is often driven by pure intellectual speculations, international benchmarking and interests groups. Despite an impressive number of documents, it is still not properly integrated into general public policy, which is the core reason of its weakness. The best evidence is that the specifics of IST (such as the possibility to use eSignature instead of the manual signature and the stamp, the possibility of part-time employment, flexible employees or employees working at home; taxation of IST products and services, and the like) is not reflected in major general legal acts, such as laws on labour regulations, taxation, accounting, etc. A lack of a stable institutional framework is one of the reasons of this fragmented IS policy, therefore the establishment of a new ministry has been proposed. However, there are no reasons to believe it will work any better than the existing ones. Furthermore, given the prevailing narrow institutional approach, a separate ministry could even complicate the integration of IST dimension into general economic policy. In general, IS policy in Lithuania is but formal and superficial as in most cases it stems not from inside demand and understanding but from international "benchmarking" as well as pressure from local business, NGO and ICT professionals. This pressure (via personalities in and around the administration) often makes IS policies too technocratic: underlining technology is viewed as a value in itself but not as a tool for achieving higher competitiveness and a higher standard of living.

eGovernment services are clearly lagging behind private eDevelopments, while the outmoded public administration system and narrow institutional interests tolerated on the governmental level are major reasons for this. Different political parties put different emphasis on IS policy. Presently the ruling leftist coalition (Social Democrats and Social Liberals) are exercising a

clearly passive IS policy. If any steps are taken, they are dictated by the EU agenda and by the private sector in some cases. If the right forces win the elections (in the autumn of 2004), a more active IS policy can be expected. The risks associated with passive policies include the under-representation of one important actor – the government – in the IST market and a lack of a legal framework for IS activity (the latter in Lithuania is not the case). The risks associated with active information society policy include distorted motivations and competition on the IST market as well as overregulation of IS activities.

A sector approach to IST policy can be determined by the newness of the IS phenomenon. Therefore, a better integration can be expected in the future. Yet, if performed deliberately, integrated IS policy can markedly facilitate IS development.

### 3. The Lithuanian Information and Communication Technologies Sector

The Lithuanian ICT sector used to have rather strong traditions which were mainly sustained by the demand of the military industry of the SU. After the restoration of independence a loss of former funding and institutional changes aggravated the situation. Many activities were closed and specialists quit for other areas (e.g. business). The present ICT market in Lithuania is based on services, while industry is rather modest (8.7 percent of total industry in 2000). The ICT sector has shown a remarkable growth in recent years and the trend is towards continued growth. This can be explained by an unsaturated domestic market and especially a low-level utilization of modern technologies in public institutions, rapidly growing investments into the Lithuanian finance, energy and telecommunications sectors, interest of foreign companies in Lithuanian ICT specialists and expanding export of IT solutions. The still growing domestic demand, qualified specialists and a possibility to invest into the Lithuanian ICT companies on relatively favourable conditions have been factors that have lately attracted considerable interest of foreign investors.

**Telecommunications** is one of the fastest growing (According to Infobalt, the mobile communication market rose by 74% in 2002, and then another 13.4% in the first part of 2003), innovative and expanding service sectors of the Lithuanian economy. It is also attracting the bulk of foreign investments, transmitting the Nordic type of corporate culture and practicing the so-called “socially responsible” behaviour in society (active in charity and projects of public concern). In terms of new business projects, the companies are rather conservative and not fond of big risky undertakings (such as 3G services).

Despite the granting of exceptional rights in terrestrial communications, privatisation of “Lietuvos Telekomas” was the most positive act in telecommunication policy. The last state-owned telecommunication operator – the Lithuanian Radio and Television Centre which performs a mixture of public and commercial functions – has to be sold in order to complete privatisation in this field.

The abolition of exceptional rights in providing fixed communication services has been another positive fact of telecommunication regulation. The fixed communication market was liberalized on 1 January, 2003. The establishment of a Communication Regulation Agency (CRA) as an independent regulator was another change in the institutional setup. Previously the Ministry of Communication, a political institution with relatively low professional capacities, was in charge of telecommunication policy and regulation. Expanding regulation, which is driving up the prices of services and distorting the market, is a negative trend. The law provides for extensive regulation (first of all, wide authority and powerful tools of CRA

to intervene in business), which is reinforced by the inclination of regulatory bodies to exercise their powers without adequate respect of market principles. There are efforts to adjust legislation to technological convergence by converging some regulations. But regulation remains separate and for some activities it is overlapping institutionally and procedurally (e.g., allocation of the spectrum). Intrusive regulation of telecommunications, both fixed and mobile, violates the interests of consumers as operators have to carry a heavier burden of regulation costs and the targets of regulations are not always desired by consumers. Initiatives and motivations to invest in these businesses are much suppressed. This has a crucial impact on information society, as the telecommunication sector is the most vital driving force of its development in Lithuania.

Major threats for a further successful development of this sector are threefold. First, overregulation reduces competition, flexibility and initiative, while regulatory costs push prices up. Second, the burden and implementation procedures of social obligations, such as universal services, distort competition and increase consumer prices. Third, competition without cooperation between operators could lead to price wars and worsen their financial conditions.

Regulations of telecommunications can be reduced if there is a political will. If this is postponed, a potential of present IST movers can be lost and the process will slow down.

**Information technologies** are also a fast-growing sector of the Lithuanian ICT market (according to Infobalt, IT output made 5.0% of GDP in 2000, 5.5% in 2001 and an estimated 6-7% in 2002). A markedly fast growth of this sector in recent years is related to large-scale investments into the country's economy and a rapidly expanding market of IT services. Although massive investments by telecommunication, banking, retail-sale and other big-scale consumers are completed, the demand from households, public institutions and small businesses is growing. Lithuanian IT companies have potential to expand significantly their export activities. The following factors make Lithuania IT companies attractive to international software developers: qualified, multilingual and cost-effective workforce; growing international experience and high quality of products and services; a well-developed telecommunications infrastructure; and a favourable geographic position in between the FSU, Scandinavian and Western European markets.

There are four major factors hindering the IT market. First, the level of piracy on the domestic market and the potential export markets in FSU are still unacceptable.[15] Second, there are insufficient capacities for competition in the EU and the world market as well as difficulties in consolidation of companies within the Baltic region. Third, consumption is falling in the export markets and there are cheaper competitors there. Finally, there are legal and administrative constraints to expanding eCommerce and other eServices. Legal constraints usually entail over-restrictive regulations, state monopolies (as in the case of register data distribution) or a lack of court practice (as in the case of eSignature). The IT market would also expand faster if eGovernment undertakings started to develop more rapidly. Still, the government and public consider IT as one of the priority sectors of the Lithuanian economy: one of the clusters ("the Sunrise valley" in Vilnius) is allocated for IT and telecommunications and the number of IT students in universities is increasing. However, the

[15] However, the level of pirated software in Lithuania is gradually decreasing and public opinion is changing towards recognition of intellectual property as any other types of property.

fact that the Lithuanian IT sector has no comparative advantages with respect to the other candidate countries is somehow ignored.

Consolidation of the IT companies and essential improvements in the educational system are major preconditions for the successful development of Lithuanian IT companies.

**4. Information society developments**

A massive use of IST is a new but rapidly spreading phenomenon in Lithuania. At the end of 2002 telecommunication penetration reached 30 percent for fixed and 45 percent for mobile phone services (the latter having increased another 10 percent by mid 2004), while internet penetration stood at 20 percent. **ICT penetration** is rising the most rapidly in business and households. Providers of telecommunication services are playing a major role in this respect, both by providing ICT services and by representing an advanced level of IST. Other sectors, such as financial services and trade, represent a general trend of growing ICT usage. The overall ICT penetration is lower in industrial sectors, although incoming foreign and domestic investments are changing the situation.

The public administration sector is lagging behind the private sector in terms of ICT usage. Almost all national institutions have their websites (except for lower-tier local administration), although the services offered on websites are only of the first and second level. The integration of the state registers is one of the major preconditions for **eGovernment** services (and for eBusiness to some extent). Despite a rather good understanding of the problem and a rather good quality of the conceptual framework, the integration process is doomed to be slow and costly due to institutional interests, an unreformed public administration system and a tendency towards technical and administrative centralisation (instead of soft integration). Market forces, if allowed to enter the register-data distribution market, could create competition for the State Register Centre, offer new and more flexible services to consumers and thus accelerate the process.

It is often claimed that a lack of eSignature services precludes the development of eGovernment. However, after a law on eSignature was amended and a new Civil Code entered into force, legal preconditions for eSignature services were created and eSignature services, albeit not based on PKI, became available on the market. Admittedly, a lack of court practice in applying the new civil code in general and provisions on eIssues in particular has created legal uncertainty. eSignatures with qualified certificates are required due to security concerns, but they have not been feasible yet from the economic point of view. Financing of this service from public funds would be inefficient and socially unjustified and would impede the development of a competitive eSignature market.

Health care is one of the least influenced sectors in terms of the advancement of information society technologies. Due to low levels of funding and an ineffective system of health care provision, general working conditions in medical institutions have not improved significantly. Recognizing the need for education on IST-related matters, the educational sector is faced with an absence of clear goals and concrete plans of IT implementation. The present infrastructure is sufficient to cope with computer illiteracy in schools, although computerization of schools is still recognized as an end in itself but not as a means for achieving broader goals, such as better quality of education. Wider outcomes of the process (such as influence on learning other subjects) are not analyzed and funding for these purposes is unstable and scant.

General ICT use will grow due to growing population income, further industrial modernisation, a growing number of public access Internet points, modernisation of some public institutions and falling prices of ICT products and services.

Presently the private sector is a leader of IS development in Lithuania. This is a very positive trend which can be interrupted if some politicians or institutions seek to demonstrate their ultimate leadership.

**Digital divide** is an issue in Lithuania. First of all, it is one aspect of general social divide in the society that is related to wide opportunity differences in rural and urban areas and for the educated and the non-educated (e.g., in 2002 disposable income in urban households was 1.5 times higher than in rural ones, while wage earnings were 2.9 times higher). Rural areas are disadvantaged in networking, as some kinds of networks (education, culture and telecommunication) are of lower density there. According to statistics, income of the rural population is 1.5 times lower than income of the urban population. This is an outcome of ineffective agricultural policy, which prevented agricultural workers from deciding on whether to stay in this sector and work for the market, to intentionally switch to other fields of activity or to rely on social support. As the country is small, urban settlements are evenly spread across the territory and the road access is good, all networks can be accessed within reasonable time and budget if necessary motivations are in place. Inertia and low income are the main limitations.

The creation of non-agricultural jobs in rural areas is slow. Some positive changes can be expected if infrastructural projects, foreseen in the Common Programming Document of Lithuania within a framework of the Structural funds, are reasonably implemented. The ICT infrastructure and education projects in rural areas are being carried out by Lithuanian NGOs (such as "Open Society Foundation," "Lithuanian Computer Society" and others), business, public private partnerships (such as an alliance "Window to the Future", established in 2001 by two biggest telecommunication companies as well as two biggest banks for achieving an average Internet penetration of the EU in Lithuania within three years), international organisations (such as the World Bank and UNDP) and separate individuals.

Bearing in mind increased competition in the telecommunication market, price decreases for voice as well as internet services can be forecasted.[16] In case of internet services, this will be felt first of all in cities, where cable TV is present. Therefore for a certain period of time price differences in different locations can even widen, but the general price level will be decreasing everywhere.[17] The introduction of universal services can be a new factor destabilizing the existing market. It can also harm the financial status of the operators appointed to provide universal services. As the World Bank indicates in its report, a universal service approach in a country with a fixed network density of 30 percent is risky. *(World Bank, March 2003).* A universal access approach would be more relevant and less harmful for the market.[18]

[16] According to preliminary CRA's estimates, telecommunication prices (including the internet) fell by 40 percent during first half year of 2003.

[17] This process is already underway. "Lietuvos Telekomas" has reduced markedly tariffs for calls from fixed to mobile phones. Mobile operators have made their pricing system more transparent and have lowered a number of prices.

[18] This approach focuses on providing access to ICT services through public points (telecentres) in rural and low-income urban areas on a commercial basis with a one-time subsidy minimised by biding for a defined level of services for a defined geographic territory and period.

Information society in Lithuania is progressing rather fast. The private sector has been the driving force behind this process (both in terms of ideas and investments). In general Lithuania is not a risk-taking society, but it has deep-rooted traditions of industriousness. Moreover, cultural habits of the society are changing rapidly due to intense communication with other countries and a change of generations. People's strong aspirations for a better life and self-expression are reinforcing this process.

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