Lithuanian Human Development REPORT 2002-2003

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Knowledge, information, technology and human development

United Nations Development Programme
Social Policy Unit
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All over the world unprecedented gains in advancing human development and eradicating poverty have come from technological innovation. The market is undoubtedly a powerful engine of technological progress, but the roles of knowledge, creativity and trust - the pillars of human development - have grown tremendously in the information society. Many people in Lithuania hope that new technologies will lead to a healthier, richer and more secure life. However, it is only when new technologies are used thoughtfully, as means, not ends, and with an understanding of the people who use them, that their needs and interests promote human development, social cohesion and a better standard of living for all.

The Lithuanian Human Development Report 2002 - 2003 Knowledge, Information, Technology and Human Development is the eighth such publication since 1995. The publication of this report has been financially supported by the United Nations Development Programme, the founder of the national human development initiative, and by the Open Society Fund in Lithuania.

This report is about ordinary people caught up in the information society and the new challenges and gains they face in everyday life. It is also about forging new social policies.

I believe that this report will help policy makers and Lithuanian society to encourage the building of an inclusive information society in Lithuania.

As in the past, this year's report offers views from independent experts that do not necessarily coincide with the official position of the government.

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The cover page design shows a reproduction of the painting “Roþinis” by Saulius Vaitiekûnas.

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Executive summary*

The Lithuanian Human Development Report 2002-2003: Knowledge, Information, Technology and Human Development is the eighth national report to be commissioned by the United Nations Development Programme (UNDP) in Lithuania since 1995. In 2003 one more partner other than the UNDP has financially supported the publication of the report - the Open Society Fund in Lithuania.

The subject of this report is human development in an information society. The importance of knowledge continues to grow in Lithuanian society, already making a difference between prosperity and poverty. The report employs powerful analytical tools - the concept of sustainable human development and the concept of social exclusion - to analyse what impact an information society has on essential human choices and social inclusion.

The report conveys the message that the information society in Lithuania will remain a socially and economically divided if the human development priorities are not taken into consideration by policy makers and civil society at large. People, not technologies, should be regarded as the end of the process of development.

The report is innovative in its approach and is expected to contribute to the debate at the World Information Technology Forum to be held in Vilnius and in Geneva in 2003. Leading representatives of the telecommunications business, known politicians and representatives of the academic community have contributed to the conceptualisation in this report of building an information society.

Technology and new challenges for human development

Lithuania is standing on the threshold of challenges that open new horizons for human development. Globalisation infringes upon old traditions and structures and raises a potential threat to those societies that are unable to change their traditional systems and meet these new challenges. Lithuanian society should focus on ways to adjust itself to the new challenges rather than on the defence of old traditions and ways of life.

The economic situation is changing quickly with knowledge and human abilities taking on a larger and larger role as factors of production. One of the most important new challenges for Lithuania is to ensure long-term, knowledge-intensive economic growth, a clear basis for human development. People, not technology, determine future success. Investment in education and science needs to be increased and restructured to allow for maximum impact on the accumulation and utilisation of knowledge.

Building a knowledge society cannot be achieved without agreement and support from the wider layers of society and strong intellectual political willpower. Such an agreement was achieved by the country's political parties and non-governmental organisations adopting the priorities of economic and social development. The next step should be to strengthen intellectual political willpower.

Openness to innovation through the proliferation of new companies and the wide utilisation of scientific research are characteristic of economies based on medium-sized enterprises that are competitive on the international stage. Successful economies concentrate their resources in sectors that show signs of success. In Lithuania support for the strongest and most successful companies will lead to a situation where these companies will not only grow, but also establish new companies alongside them.

The foundations for success rest on a well-developed knowledge infrastructure. The proportion of pupils who enter higher education after secondary school in Lithuania is one of the highest in the world (78% in 2002). The quantity of funding allocated per student, however, is markedly lower than the EU average. Therefore, the quality of education in Lithuania is not of the highest standard.

R&D has a weak ability to transform scientific research into marketable products. The Lithuanian private business sector stands out for the limited amount of funds allocated to R&D and small number of patents compared with other European countries. According to World Economic Forum criteria, Lithuania cannot yet be placed in the category of innovation-generating countries.

The government must see to it that measures are in place to ensure that current business needs conform to the levels of scientific research and tertiary education. For these the government will need to improve its

* The executive summary has been prepared by the editors of the Lithuanian Human Development Report

management, organisational and business abilities. Not only do economies compete between themselves, but also there is also competition between state governing systems responsible for the creation and implementation of intellectual political willpower.

A knowledge economy nucleus ensures the rapid transformation of scientific findings into new products. World-renownedclusters need first of all to advance the infrastructure of knowledge. The factors to which the most attention has been paid in Lithuania up to now (namely, taxation and administrative regulations) are listed last according to their importance in promoting clusters and innovation at large.

The establishment of several knowledge economy nuclei in Lithuania would act not only as a catalyst changing the relationships between science and business, but also be bait for attracting foreign investment and reducing unemployment. The Sunrise Valley Knowledge Economy Forum, a high-technology cluster established on the initiative of Vilnius University and Vilnius municipality, has the opportunity to become an international 'trademark' for a modern Lithuania.

The information society beyond technology and access: social exclusion

Information and communications technology (ICT) influences a country's mode of production and social relationships, while social mechanisms reciprocally determine its penetration and use. In this respect it is important to know what impact ICT has on human development and particularly on the process of social exclusion. However, there is no well-grounded or unanimously acknowledged concept of an information society. In Lithuania, studies, official documents and the media depict a globalising, but ultimately simplistic model of an information society based on technological determinism and progressivism. The current conceptualisation and debate about the development of the information society is focused on the supply and accessibility of ICT and pays scant attention to those social factors that hinder and drive demand for ICT.

The problem of access to information technology is acute in Lithuania. The total tele-density (fixed and mobile telecommunications per 100 population) reached 73.9% in 2002. In the countries of the EU total tele-densityexceeds 100%. In the first half of 2002, 12% of households in Lithuania and 36% in the EU had a PC. In the cities 19%, in the towns 11% and in rural areas less than 5% of households had a computer. In August 2002, 21% of Lithuania's population had used the Internet at least once over the previous six months. Meanwhile, Lithuania has the most expensive Internet access of three Baltic states.

The key question in conceptualising an information society remains the relationship between its technological and social components. Between the two polars of 'technological determinism' and 'social shaping' there are several approaches to an information society.

Despite the fact that ICT offers huge opportunities for communication and employment and despite the ICT industry being interested in encouraging social inclusion through access to information and communications infrastructure, the rise of digitalisation is being accompanied by rising inequality and social exclusion throughout the world. Under the pressure of skills and knowledge, social exclusion in the information society has acquired the features of 'social disqualification'. To traditional criteria of social inclusion like professional and socio-relational integration is being added informational integration.

As the importance of knowledge, intelligence and creativity in the information society increases, the 'irrelevance' of people and entire communities that fail to meet these demands also grows. An increase in the role of knowledge automatically links the competitiveness of individuals, companies and entire countries to strengthening an important component of human development - education - and expanding its role in social exclusion and inclusion. Since skills for using information are becoming vital both at work and in everyday life the very concept of education is undergoing drastic change since training based on the concept of 'a profession for life' is losing its meaning while 'life-longlearning' is growing in importance.

The global employment trend is towards the individualisation of work and flexible and unstable patterns of employment. Labour is becoming self-reflective; in some ways labour creates its own object of study and an increasing share of work consists of self-innovation.

The traditional forms of human communication and association are being challenged by online virtual communities. In Lithuanian discourse the Internet as a contextualised social phenomenon has not yet been examined.

The concept of community in the information society has evolved substantially and become far more complex. The importance of community in the information society is often emphasised in connection with growing social exclusion and a lack of trust. On the one hand, information technology, particularly the Internet, is fundamentally enabling and inclusive. However, trust - a crucial prerequisite for social inclusion - has always been a problem for Internet users.

Social relationships based on locality and good neighbourliness remain important for social cohesion. In this respect the contribution of ICT to strengthening and empowering neighbourhoods is also impor-

tant, particularly in deprived areas.

Rural areas and small towns in Lithuania are becoming increasingly disconnected from the benefits of improvements in living standards and the use of ICT. A sociological survey of the inhabitants of the town of Didþiasalis allowed for the following conclusions. The level of poverty and unemployment in deprived areas is significantly higher than the national average.

In Didþiasalis 37% of respondents had not completed secondary school. To acquire computer literacy was the wish of 16% of respondents, but only 15% of these respondents had had the opportunity to do so. No one said they had access to the Internet at home or elsewhere, while 12% wanted to use the Internet. Only 1% of households had a computer at home.

The results of the survey allow for the assumption that if people from deprived areas were given computers (or free Internet Public Access Points) and taught how to use the Internet without other feasible community-building measures, they would neither become included nor essentially improve their motivation or their competitiveness. This follows on from the fact that knowledge is socially distributed and one needs the peer support of shared experiences and examples to make the information work, perform and be communicated. In an environment of low motivation and unwillingness to take steps in the improvement of individual - let alone community or neighbourhood - situations, the introduction of ICT should be accompanied by active measures beyond training how to use the Internet or a computer.

The economy: new challenges

In 2002, by accomplishing major economic reforms Lithuania was invited to become a member of the European Union (EU).

However, GDP per capita in purchasing power parity in 2001 reached only 38% of the EU average - one of the lowest among the candidate countries - while unemployment stood at 11%. But the role of the service sector, which is generating a new quality of life, is growing rapidly. Today, Lithuania's service sector is producing 60.5% GDP, whereas the EU average is 70.5%.

The rapid growth in GDP, which between 2001 and 2002 exceeded by nearly six times the EU average, and an increase in labour productivity provided evidence that the reformed economy was creating strong preconditions for a growth in national income. The main concern for Lithuania is to how to translate this growth into benefits and new opportunities for as many people as possible.

The national economic strategy has proclaimed that the main development priority is the knowledge economy. A rapid growth in national income will only be achieved and sustained if more economic activities are directed at the effective use of accrued intellectual resources. These will allow for the development of high-tech products and the provision of knowledge-intensive services with high value added, which ensure competitiveness in the current global economic environment. The current economic development is linked more to knowledge, institutions and culture. It is not possible to create greater economic value by repeatedly manufacturing more and more of the same goods. An increase in value added is closely related to finding new, more effective means of using material resources. In the knowledge economy creativity has a growing impact on the pace and results of economic development. To benefit from the process of innovation is impossible without a drastic change in living and working conditions. Success, however, depends not only on economic activities, where the main factors are information and creativity, but also on the effective dissemination and use of information.

One of the priorities of modern economic policy should therefore be culture - the spiritual foundation for creative development. The increased contribution of culture to the economy can create greater material well-being. For creative self-expression is vital amid the modern institutional infrastructure and economic policy.

In 2002, the knowledge sector increased by 3% compared to 1998 and its contribution reached 28% of GDP. In Lithuania the contribution of the knowledge economy to employment was larger than it was to the creation of new products. The total number of employees in the knowledge economy sector reached 32.9% of all employed people in the EU in 2001, while in Lithuania the figure was 44.5%. On the one hand, such a high number of people employed in the hi-tech sector shows how important the knowledge economy is to the labour market. But it also means that the labour productivity in this sector is not particularly high, given the small proportion of high value-added activities in the economy.

The increased contribution of the knowledge economy to GDP was determined by a rapid growth in hi-tech industry, communications and financial services. Over a five-year period the proportion of advanced technology in the structure of GDP increased by nearly 17%, whereas auxiliary financial activities and communications almost doubled. However, the role of advanced technology-based industries in the economy remained modest and in 2002 accounted for only 1.06% of GDP.

Over a five-year period, the contribution of research and development to the economy has fallen by

nearly 35%, whereas the growth in education, health and social security is not enough to meet the demands of the rapidly growing economy and may pose a threat to long-term economic progress. Obviously this did not create favourable preconditions for the accumulation of intellectual capital. Because to educate a 'competitive personality' fit for the knowledge economy more funds are required. In the long run even slower growth in intellectual capital could determine significant changes in the standard of living and bridge the gap between Lithuania and the EU.

Lithuania lags behind the EU in developing knowledge-intensive economic activities. The provision of business and financial services to the population constitutes only 6% of the average indicator characteristic to the European market. Advanced technology is being severely underused in Lithuanian agriculture. The proportion of the processing industry is bigger in the Lithuanian economy than any other candidate country and the production of low value-added products prevails there. One of the reasons for the slow growth in the knowledge-intensive sector, despite its relatively low market share, was that the Lithuanian economy was less open compared with other candidate and EU member states.

Investment in qualifications, skills and training by Lithuanian companies and employees was one of the lowest among EU member states and candidate countries. The only businesses investing less in labour force efficiency were those in Romania. The fact that both employers and employees pay so little attention to the acquisition of new knowledge is one of the main reasons why Lithuania is lagging behind in the implementation of information technology in production and services.

Such indifference to the acquisition of knowledge by businesses can be attributed to the economic policy of the government. The policy, favourable for accumulating capital, actually decreased the need for innovation and had a negative impact on the state budget income - and in turn on investment into public services. From the beginning of 2002, fiscal measures for promoting capital investment were renounced.

Due to the integration into the EU and the modernisation of the economy, the Lithuanian state financial system is facing new medium-term and long-term challenges. For the period 2004-2006, Lithuania is expected to receive 1.73 billion EUR from different EU funds and programmes. The long-term results and the effectiveness of the utilisation of these large funds will depend on government spending policy and its priorities. In 2002 great attention was paid to fiscal reform to ensure that the mechanism for the distribution of state finances between competing programmes was effective and conducive to the selection and support of programmes and projects, speeding up the creation of a modern economy.

An institutional and legal framework that is well developed and free from corruption is crucial for individual freedom as well as for the effective use of financial resources and the implementation of new ideas. The effective use of EU structural funds is conditional on the establishment of trustworthy principles and criteria for evaluating the demand for funding. Such criteria are methodologically difficult to set up for programmes in the social sector. A competent management and administration will have a decisive impact on the capacity to attract EU structural funds to the social sector. However, there is a lack of good managerial skills in the social sector.

Integration with the countries of the EU, which have already accumulated high intellectual capital and are rapidly developing their own knowledge economies, will speed up similar processes Lithuania. The participation of regions and various social groups in this process will depend on the priorities of government spending and the efficiency of institutions responsible for raising public awareness and information dissemination.

Employment in an information society

The development of an information society fosters deep, qualitative changes in employment. Changes in the professional structure of the labour force are related to the growth in the number of users of information technology. At the start of 2002 computer technology was used by 84.4% of manufacturing industry and service sector companies. In financial intermediation, postal and distance communication, computer technology can be found in all companies. In other sectors this indicator is dependent upon the number of employees in the company. Nearly all of the largest companies (250 or more employees) use computer technology and the Internet (among smaller companies only 61%).

In 1991 for every 100 people of working age 89 were employed. Ten years later, in 2000, the number of people employed had fallen to 74. Of those who became unemployed, women constituted two thirds (68%).

According to Labour Exchange data of 1 January 2003, unemployment in Lithuania stood at 10.95%, nearly one-and-a-half times higher than Latvia (7.6%) and twice as high as Estonia (5.4%). At the beginning of 2003, youth unemployment stood at 13.4%. Every second young person registered with the Labour Exchange has no qualifications and only one in 10 has completed specialised secondary or tertiary education. The proportion of the unemployed without vocational training constitutes nearly half of the total number of unemployed, while only 20% of available job

vacancies do not require qualifications. With an increasing number of unqualified people among the registered unemployed, the number of long-term unemployed is growing. In 2002 the long-term unemployed accounted for 27.4% of the total unemployed.

In 1990, for every 1,000 people working in industry, 1,268 people worked in services and 634 worked in agriculture. In 1997 the ratio had become, respectively, 2,546 and 1,091 and in 2001, 2,696 and 829. There still remains a markedly high proportion of those employed in agriculture (17%).

Education is an important prerequisite of sustainable employment in an information society since it determines the ability to use information and information technologies. According to the population census of 2001, 126 people per 1,000 population who are aged 10 or older had a tertiary education. Compared to the census of 1989, this indicator had increased by more than 30 percentage points.

One of the main factors driving the increase in the overall level of education of the population is the growth in enrolment at all educational levels (except vocational schools) and the growing number of people engaged in continuous education and distance learning. Between 1996 and 2001 the number of students in tertiary education institutions nearly doubled. During the past five years enrolment in university learning programmes related to mathematics, statistics and computer studies has tripled.

In 1995 Lithuania became a part of the international PHARE distance-learning programme and the Lithuanian Distance Learning Centre was established for the implementation of this programme. The decision was made to pursue an avenue of decentralised distance learning supported by an initiative from research and development and educational institutions.

The implementation of a state programme on the development of distance learning (LieDM) started in 1998. In the LieDM network five distance-learning programmes are presented that provide a secondary level of university education. The LieDM network Internet portal (www.LieDM.lt) is designed to provide information about distance learning and opportunities about different forms of learning. This portal is the first step towards creating a 'common learning market'. In implementing the European Union's TEN (Trans-European Tele-Education Network) project, the Lithuanian distance-learning network is being integrated into the European network, which operates using satellite links.

From the situation of distance learning in Lithuania one can conclude that traditional forms of correspondence and distance learning are changing and being replaced by courses supported by information and communications technology that allows learning to be brought into the office and the home. The conditions and infrastructure necessary for the development of distance learning have been set up. The development of distance learning has been incorporated into the strategy for the development of the information society. State institutions pay attention to this and allocate funds (according to their possibilities). International financial and technical assistance to distance learning is very important for its development and is used effectively. The further development of distance learning will be financed by EU structural funds.

However, distance-learning infrastructure is better developed than the opportunity to use it, particularly with regard to the implementation of the principles of lifelong learning. There is a lack of understanding in society about the importance of learning for solving many personal problems, while higher education institutions pay insufficient attention to the promotion of lifelong learning. The existing legal framework is undeveloped and does not enhance distance learning. The state budget is unable to finance distance learning adequately, while small town and rural residents very often cannot afford to study. In this context support from employers is very important. According to existing legal norms, however, expenditure on learning is equalised with salaries and taxed respectively, which is not conducive to financing the learning and training of employees. It would be logical to equalise investment in people at least with investment in manufacturing.

Despite the large number of courses and distance learning programmes on offer it is not sufficient to meet demand. The process of preparing distance learning programmes as well as their delivery should be enhanced.

A complementary component of computer literacy and related skills is knowledge of a foreign language, primarily English. According to the population census of 2001, 40% of the population knew one language in addition to their native language, 25% knew two, 5% knew three languages and 27% did not know any other language. The most popular foreign language is Russian, which is known by 60% of those who knew foreign languages. In second place is English, which every fifth urban inhabitant and every tenth rural inhabitant knows.

In the fourth quarter of 2002 the average gross wage for an official (white collar worker) stood at 1,329.6 LTL, which was 1.6 times higher than for a labourer (805.9 LTL). The national average at that time was 1,145.1 LTL.

Wage differentiation between economic sectors is greater than by employee category. Paradoxically, in those sectors where there is a concentration of significant intellectual potential (healthcare, education)

wages are 10-30% lower than the national average. Wages slightly exceed the national average - by 5 % - in research and development. The highest wages are in financial intermediation and public administration where the average monthly wage exceeds the national average by two and one-and-a-half times, respectively. The lowest wages are in economic sectors dominated by women, such as health care and education.

The average wage for women stands at 90% of the gross average national wage while for men it has reached 111.3%. In the last few years the average wage for women has grown more rapidly than for men, but it still stands at only 81% of the salary for men. Gender-related wage differences can be explained by the following reasons: men are engaged in paid work for longer periods and occupy the most responsible and accountable positions; direct discrimination against women; and lower salaries for more female-dominated professions.

Despite the scarcity of gender-related statistics, it can be said that there is a large gender disproportion in the IT sector. More than two thirds of those employed in computer technology in 2002 were men. They in fact constitute a majority in nearly every IT-related profession, apart from graphic design and technical teaching. Significant gender disparities in IT are rooted in the disproportionate enrolment that exists in tertiary education institutions. The number of girls studying computer technology is less than one third and in engineering one fifth.

According to the population census of 2001, approximately 120,000-130,000 people had emigrated. Between 1995 and 2000 there was a notable change in the composition of emigrants by education. The number of people with a tertiary education decreased by 21.4%, while the proportion of those with a specialised secondary and secondary education rose from 57.9% to 66.4%. It can be stated that the 'brain drain' from Lithuania had slowed by 2002.

Window to the Future: how private initiative can promote the development of an information society in Lithuania

Window to the Future is an information society development initiative launched by private companies and focused on the promotion of the Internet in Lithuania. The initiative is gaining strong momentum, because cooperation with local and central governments as well as the inclusion of local communities has been so effective.

Low Internet penetration and the growing digital divide are considered to be serious impediments to the development of an information society in Lithuania. Lithuania is facing not so much a communications infrastructure shortage as a situation where the Internet is unaffordable for people with low education and low income and where many people lack the awareness and motivation to use it.

Window to the Future - a joint private-public initiative in Lithuania - was launched at the beginning of 2002 by the country's two biggest telecommunications companies, Lietuvos Telekomas and the mobile operator Omnitel, the two biggest banks, Hansa-LTB and Vilniaus Bankas, and two IT companies, Sonex and Alna.

Since the beginning of the project, 1.2 million LTL (350,000 EUR) has been invested and 70 Public Internet Access Points installed in different parts of the country. The PIAP project was enthusiastically welcomed by local communities and has become very popular in the regions of Lithuania. Out of the country's 60 municipalities, 51 are already involved in the project. The municipalities are not the only recipients; they are also responsible for the project's implementation.

Window to the Future's snowballing private/public cooperation approach could be applied in other countries facing the challenges of developing an information society.

Research and development: potential and application

The long-term growth of the economy, its competitiveness and openness to innovation are linked directly to research and development (R&D). The following shortcomings of Lithuanian R&D reduce its capacity to promote innovation: a wide gap between R&D and business; unsatisfactory R&D qualitative and quantitative results (publications, patents); dominant state funding in combination with insufficient funding and backward funding principles; a large number of narrowly specialised institutes; the steady ageing of researchers and the 'brain drain'.

In 2001 there were 14,980 people employed in R&D, of whom 61% worked in the higher education sector, 32% in the state research sector and 6% in the business sector. Researchers constituted 68% of the total number of R&D employees, of whom 4,960 had a doctoral or higher degree. Only 70 (1.4%) researchers with a doctoral degree were employed in business. This attests to the poor potential of R&D for promoting innovation in industry.

Less than 4% of businesses created new technology together with R&D institutes in 1999. The majority of this technology was created together with foreign researchers (23%), by acquiring licences (10%) or by co-operating with other companies (9%). The prevalent attitude of Lithuanian businesses is that the national R&D sector is not capable of creating new, interna-

tionally competitive products.

Currently more than 60% of scientists in Lithuania are older than 50 and 25% are older than 60. In the past eight years the number of scientists has been falling. This can be associated with the relatively low earnings and social status of a scientist and the pattern of immigration. In the near future the problem of the immigration of scientists may deepen as new, accessible and more attractive workplaces for them are available in the EU.

According to recognised indicators of R&D success (publications, the frequency of their quotation and the number of patents and licenses), the productivity level of Lithuanian scientists is nearly 10 times lower than that of their colleagues in developed countries. The number of applications for patents received by the State Patent Bureau has consistently been decreasing - from134 in 1998 to 68 in 2001.

Expenditure on R&D stood at 0.68% of GDP in 2001 - significantly lower than the EU average (1.9%) and similar to other EU candidate countries. Annual R&D expenditure in Lithuania is approximately 17 USD per capita, whereas in the United States it is 681 USD and in Italy 222 USD.

More than 70% of all R&D expenditure comes from the state budget, while for the countries of the EU this figure does not exceed 34% and stands at 56% for candidate countries. The biggest proportion of budget funding has been channelled directly to institutions not programmes. The proportion of budget funds allocated, based on competition or programme principles, is very insignificant. This differs markedly from the practices of other countries, where a significant proportion of funding is allocated based on programme principles (22% on average in EU).

Business contributes a comparatively small and continuously decreasing part of the total funds to R&D (0.07% of GDP in 2001). In the EU in 2000 the business sector spent 1.28% of GDP on average on R&D, while other candidate countries spent on average 0.32% of GDP.

One problem characteristic to both European and Lithuanian state R&D is the lack of a well-developed infrastructure for the application of research results and their commercialisation. In Lithuania different scientific and technological parks are rapidly being established in order to support companies working in the field of applied R&D.

The largest part of R&D expenditure goes on fundamental research, although this proportion is constantly decreasing. Growth in capital expenditure indicates that funds have started to be allocated to strengthening R&D facilities and equipment, which is a positive phenomenon.

The adoption of R&D priorities has a positive impact on the overall development of the whole system. However, the number of R&D priorities did not match Lithuania's scientific potential and was too large.

One of the reasons why there is no balanced or well-groundedR&D policy in Lithuania is that responsibility for its formation and implementation is dispersed throughout numerous state bodies. An important positive trend in R&D in Lithuania is its growing participation in international scientific programmes.

Health care

According to the main indicators of morbidity and mortality, Lithuania's health situation is much worse than it is for the countries of the EU. To improve this situation fundamental changes in the health care system are required.

So far, radical reforms in the health care system have failed to materialise. Due to the absence of a well-grounded, long-term programme of restructuring there have been frequent changes in health care policy and priorities and a severe lack of finances.

An inadequately large emphasis placed on inpatient treatment has been one of the factors behind the low efficiency of the health care system at large. Regardless of the fact that over the past 10 years the number of hospital beds per 100,000 has fallen by nearly 25%, Lithuania still occupies the leading position in this indicator in Europe. There were 925 beds per 100,000 population (596 per 100,000 in the EU on average) in Lithuania in 2001. Cases of hospitalisation per 100 population in Lithuania are markedly higher than in the EU (24 and 18.5 per 100 population, respectively).

Many hospitals work ineffectively, especially those in small towns. A large part of the funding allocated to the health care sector every year is used to maintain and finance the actual hospitals and their personnel. There is no doubt, therefore, that closing some of the hospitals, merging them with other medical institutions or changing their profiles to nursing homes or similar status would result in additional financial resources being freed up and made available. However between 1991 and 1999 only three hospitals were closed down.

Over the past few years there has been, and continues to be, a relatively rapid advancement of new technologies in the health care system. However, modern technology is concentrated in district (central) or university hospitals. Meanwhile, the situation in the majority of national hospitals is poor.

There is an acute shortage of computerised workplaces in the majority of health care institutions and a large proportion of the existing equipment is obsolete. Regardless of the fact that nearly all of the country's medical institutions have 24-hour access to the Internet, there still remain a very small number of compute-

rised workplaces connected to the Internet (due to the high cost). Furthermore, nearly one third of the medical institutions that do have an Internet link have a relatively slow service (connection through telephone network, working on a dial-up principle), which does not allow for the effective and quick transfer of data or visual information (e.g., photographs). Approximately half of all medical practitioners use computers. However, their level of computer literacy is of a relatively low standard and often limited to writing up or recording medical histories, electronic mail and so on. The situation is much worse among nursing staff.

Even though the completion of various medical documents takes a lot of GPs' time, the computerisation of these activities is still not widespread.

The development of a standard electronic patient history would create a foundation for the development of a patient database for each individual medical institution and for an overall database for the health care system. The majority of existing electronic databases are based on unlicensed programmes. Most medical institutions do not have an internal computer network system (Intranet). So the patient's information does not 'travel' with the patient. The exchange of information by electronic means is further complicated by the fact that to date there are no national medical data (text or graphic) exchange standards; questions on the safety of electronic information and the confidentiality of information have not been addressed.

The problem of the computerisation of medical institutions was partially addressed by the creation of a computer network by the State Patients Accounts (SPA). The SPA distributed about 600 computers to medical institutions and implemented the computer programme SVEIDRA.

More and more information of a medical nature can be found in Lithuanian websites (http://medicina.lt, http://sveikata.osf.lt/). It is also possible to find a portal of links to medical information sites (more than 1,000 links) at http://www.medicine.lt/. However only a small number of health care institutions have their own Internet websites and those that do lack information of an interactive nature.

More and more educational information oriented to students and medical practitioners can be found in the websites of Vilnius Medical University and Kaunas Medical University.

Telemedicine can be a very useful tool applied to distance learning for medical personnel. Opportunities related to telemedicine are significantly underused. Apart from the insufficient technical base and weak channels of communication, there is a lack of standards that regulate tele-consultation use in health care. There are no national medical data exchange standards, viable telemedicine development strategies or adequate funding.

Yet in 1994 the Seimas approved the Law on the Health Care System, which identified a lower threshold for state expenditure on health care at 5% of GDP. However, funds allocated to the health care sector have never reached this figure (the closest figure of 4.8% of GDP was reached in 1998). Since 1999 state expenditure on the health care sector relative to GDP has been falling consistently.

Human development in an information society

Human development is a process for enlarging people's choices. In principle these choices can be infinite and can change over time. But at all levels of development the three most essential are for people to lead a long and healthy life, to acquire knowledge and to have access to those resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.

The modern international system of measuring human development includes the following indicators:

- The HDI, constructed annually since 1990, measures average achievements in basic human development and produces a country ranking.
- The gender-related development index (GDI) and the gender empowerment measure (GEM), introduced in the Global Report 1995, are composite measures reflecting gender inequalities in human development. The GDI measures achievements in the same dimensions as the HDI does. The GEM measures gender inequality in economic and political opportunities.
- The human poverty index (HPI), introduced by the Global Report 1997, measures deprivations in the same dimensions as HDI measures achievements;
- The technology achievement index, a new measure of countries' ability to participate in the network age, was introduced by Global Report 2001: Making New Technologies Work for Human Development.
- The Millennium Development Goal (MDG) indicators are introduced by Global Report 2003.

Standard of living in information society

In Lihuania compared to the previous year real disposable per capita income in the cities grew by 3.6%, while in rural areas the growth rate was 1.4%. Average consumer expenditure grew by 0.9% compared to 2001. Monetary expenditure increased by 1.7% and in kind expenditure declined by 3.2%.

Possession of two key objects for access to information technology, a PC and a mobile phone, has increased significantly since 2000 (from six PCs per 100 households to 12 and from one PC per 100 household in rural areas to six). However, despite the rapid incre-

ase in the computerisation of households the gap between rural and urban areas remains wide - a prerequisite to a deep digital divide. The widest gap in PC ownership and access to the Internet is between cities and rural areas; 19% of households in the cities have a computer while only 6% do in rural areas.

In 2002 the consumer expenditure of 10% of the richest households was 8.2 times larger that that of the 10% of the poorest households.

The inhabitants of rural areas suffered the highest poverty (29%), while only 7% of city inhabitants and 15% of people in towns were below the poverty line.

Conclusions

Creativity and knowledge have become powerful engines of socio-economicdevelopment. Although Lithuania has not reached the average EU indicators for the use of information technologies or contribution of knowledge intensive sectors to GDP, the growth in these fields is impressive.

Despite the fact that ICT offers huge opportunities for communication and employment and that the IT industry is interested in encouraging social inclusion through access to information and communications infrastructure, the rise of digitalisation is being accompanied by rising inequality and social exclusion throughout the world. Lithuania is not an exception to this process. Under pressure from skills and knowledge, social exclusion in the information society has acquired features of 'social disqualification'. To the traditional criteria of social inclusion is added access to information in a broad sense including the knowledge necessary for understanding it and its use at work and in everyday life.

As the importance of knowledge, intelligence and creativity in the information society increases the 'irrelevance' of people and entire communities that fail to meet these demands intensifies. Rural areas and small towns in Lithuania are becoming increasingly disconnected from the benefits of improvements in living standards and the use of ICT.

Information technology brings together a wide range of different people who would otherwise never have met. However, like any other mean of communication, they introduce a new dialectic of social inclusion and exclusion into human relationships. In Lithuanian discourse and research, information technology at large and the Internet in particular as a contextualised social phenomenon have not yet been researched.

From the editors

The Lithuanian Human Development Report 2002-2003: Knowledge, Information, Technology and Human Development is the eighth national report to be commissioned by the United Nations Development Programme in Lithuania since 1995. For the first time, one more partner besides the UNDP has financially supported its publication - the Open Society Fund in Lithuania.

As in previous years, the report has been prepared by a team of independent scholars and experts from Lithuania. The views expressed by them here do not necessarily represent the views of the Lithuanian government or the UNDP.

The analysis of human development topics covered is based on official statistics, expert estimates and data obtained from sociological surveys. The report drew on World Bank study on the prospects for a knowledge economy in Lithuania.

The information society - in a broad sense embracing access to and the application of information and communication technologies (ICT), but also going beyond them - has not yet been the subject of much debate and research in Lithuania. Meanwhile, in the countries of the European Union (EU), debate about the information society has shifted from technology-related concerns to the social aspects of ongoing changes. The goals of 'digitalising' and 'computerising' society have given room to 'equality' and 'inclusiveness'. The information society is increasingly seen by Europeans as being inclusive and enabling.

The subject of this report is human development in an information society. The importance of knowledge continues to grow in Lithuanian society, already making a difference between prosperity and poverty. The report employs powerful analytical tools - the concept of sustainable human development and the concept of social exclusion - to analyse what impact the information society has on essential human choices and social inclusion.

The report is a continuous publication that robustly adheres to the sustainable human development concept formulated by the UNDP in 1990. However, this report is innovative in its approach and is expected to contribute to the debate at the World Information Technology Forum to be held in Vilnius and in Geneva in 2003. Leading representatives of the telecommunications business, politicians and representatives from the academic community have contributed to the conceptualisation of building an information society in three dimensions: new challenges for human development in the knowledge society; research and development for sustainable human development; and public and private initiative in building an inclusive information society.

The report conveys the message that the information society in Lithuania will remain a socially and economically divided one if the human development priorities are not taken

On 8 December 1999 the European Commission launched an initiative called *'eEurope: an information society for all'*, which aimed at bringing the benefits of an information society within the reach of all Europeans.

The *key objectives* of the eEurope Initiative are:

- Bringing every citizen, home and school, every business and administration, online and into the digital age.
- Creating a digitally literate Europe, supported by an entrepreneurial culture, ready to finance and develop new ideas.
- Ensuring that the whole process is socially inclusive, building consumer trust and strengthening social cohesion.

To achieve these objectives the commission proposed 10 priority areas for action:

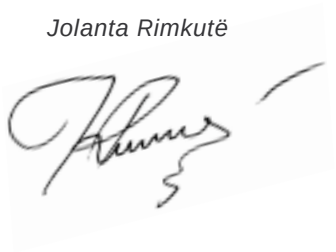
- Bringing European youth into the digital age
- Cheaper Internet access
- Accelerating e-commerce
- Fast Internet for researchers and students
- Smart cards for electronic access
- Risk capital for hi-tech SMEs
- 'eParticipation' for the disabled
- Healthcare online
- Intelligent transport
- Government online

into consideration by policy makers and civil society at large. People, not technologies, should be regarded as the end of the process of development.

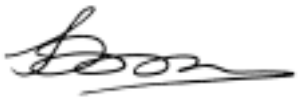
Although the report is more 'policy-oriented', as usual it targets a wide audience - readers interested in the problems of society and human development.

We hope that this report will broaden awareness in society about the human development dimension of the information society and not only stimulate scientific research on social development but also encourage targeted decisions and action from policy makers.

Jolanta Rimkutë



Irina Voloschuk



Technology and new challenges for human development

Andrius Kubilius

Technology and new challenges for human development

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Human development and globalisation

Nowadays Lithuania is standing on the threshold of challenges that open new horizons for human development. Lithuania is to become a member of both NATO and the European Union, which will strengthen its position as an active participant in global economic, social and cultural processes.

The world is changing rapidly. Borders are becoming and will continue to become less and less important while people, knowledge, goods and services are becoming more and more global. Globalisation is spreading throughout the world economy and enormous advances in technology promise immense opportunities for all of us - if only we could manage to conform to these new opportunities and use them.

Globalisation infringes upon old traditions and structures and raises a potential threat to those societies that are unable to change their traditional systems and meet the new challenges. Our objective today is to ensure that the opportunities offered by globalisation be used constructively. This means that our society should focus on ways to adjust itself to new challenges rather than on the defence of old traditions and ways of life. New trends in the global economy are confronted by old social, economic and political structures adapted to the industrial age. Industrial society is being replaced rapidly by the knowledge society. In Lithuania, this process of change is even deeper because of its 'socialist' inheritance from half a century of Soviet domination.

The economic situation is changing astonishingly quickly with knowledge taking on a larger and larger role in economic development, with human abilities becoming the most important factors of production. People, not technology, will determine future success. This will require many more opportunities to be created for the development of personal abilities. In labour relations individual agreements rather than collective agreements will be the crucial factor. The increase in personal abilities will also be a determining factor in reforming education. Investment in education and science needs to be increased and restructured so that it will allow for maximum impact on the accumulation and utilisation of knowledge. Creative personal initiative in the broader sense is an important value for a global society and all opportunities should be created to encourage it. Change is a guarantee for progress and social security.

Human development and knowledge

One of the most important new challenges for Lithuania is to ensure long-term, knowledge-intensive economic growth, a clear basis for human development. The majority of social, cultural and human problems are rooted in the fact that the state is not economically capable of addressing them, while people have fewer opportunities to improve their well-being. The basis for long-term dynamic economic growth is closely related to the intense accumulation and utilisation of knowledge. This basis should be created now and the continuing extensive economic growth should not distract the government from this goal since it has exhausted its long-term opportunities and will not ensure high competitiveness in the near future. For building the foundations for growth and competitiveness the 'new' Lithuanian market economy, created in the first decade of its independence, should effectively utilise all new opportunities offered by the European Union.

In the past few years understanding about the strategic challenges facing Lithuanian society and the economy has improved. In 2000, the White Book on Science and Technology was prepared and in 2002 the Seimas (Parliament) endorsed a long-term development strategy, the essence of which is best outlined by the statement that "a knowledge-driven economy is becoming the primary objective for Lithuania." The EU has set the goal of creating a

Will membership in the European Union solve all our economic problems?

For some, it may appear that all economic problems will automatically be resolved under EU membership conditions. In order to show that this will not be so, we would like to present two examples from the recent history of the European Union.

Greece became a member of the EU in 1981. At that time its per capita GDP stood at nearly 68% of the EU average. After 19 years of membership in the EU this proportion has remained virtually unchanged - and in fact even fell during the first year regardless of massive support from the EU. There is also a great deal to learn from the example of Ireland, which became an EU member in 1973. At that time its per capita GDP was 60% of the EU average. Some 15 years later this percentage had increased by only seven percentage points. The situation had changed drastically some 12 years after that, following the signing of Ireland's first national agreement on the revival of its economy. Ireland then made a surprising leap and by 2000 its per capita GDP had reached 115% of the EU average. Unemployment in Greece stands at 12%, whereas in Ireland it has fallen to 5.5%.

These examples show that the most important factors that will determine the pace of socio-economic progress in Lithuania when it becomes a member of the EU, apart from the effective use of EU funds, are the efforts, commitment and intellectual political willpower aimed at building a knowledge society and economy.

knowledge society over the next decade. By 2015 Lithuania can have achieved a similar level in this field. However, building a knowledge society is a difficult task that cannot be achieved without agreement and support from the wider layers of society and strong intellectual political willpower. The first step towards wider agreement in society was made in 2002, when a national agreement on the priorities of economic and social development was signed between the country's political parties and non-governmental organisations. The next step should be to strengthen intellectual political willpower.

From building a market to generating success

Having more-or-less successfully achieved the important objective of the withdrawal of the government from economic regulation and opening up the way for personal initiatives, it is time to focus on policy that promotes the development of a knowledge society. In countries with a high standard of living, medium-sized enterprises competitive on the internaional stage,

As the American economist B. Arthur stated, that in establishing a knowledge economy a government needs to behave like a good gardener who should plant the seeds from which champions can grow and care for them once they have sprouted. Success will then give way to new successes.

capable of achieving a high level of labour productivity and of creating new products and services, form the foundation of the economy. Openness to innovation through the 'proliferation' of new companies and the wide utilisation of scientific research are characteristic of economies based on such enterprises. Successful economies concentrate their resources in sectors that show signs of success.

So an important step after building a market towards successful development is to target support at Lithuania's strongest and most successful companies, which will not only grow and strengthen over time, but also establish companies alongside them that will have even greater opportunities to grow.

It must be noted that with the development of a knowledge society and the increase in the standard of living, those companies whose success today depends on the utilisation of a cheap labour force will lose their competitive advantage. Companies open to innovation and focused on the creation of new products and services will grow rapidly and develop.

Have we created the foundations for success?

Innovation is a key factor for success in business and human development. Those countries that have achieved the highest socio-economic progress in the past few years have based their success on innovation.

It is often highlighted that in Lithuania research and development (R&D) is well developed and tertiary education is of a high level. It seems, therefore, that we now have all the pre-conditions for a knowledge economy. Does Lithuania really have the foundations for success that rest on well-developed knowledge infrastructure?

Enrolment in all levels of education is growing. The proportion of pupils who enter higher education after secondary school in Lithuania is one of the highest in the world (78% in 2002). The quantity of funding allocated to one student, however, is markedly lower than the EU average. So this means that the quality of education in Lithuania is not of the highest standard. This is noted not only by the students themselves, but also by employers concerned that universities are not preparing specialists at the necessary

level. This means that starting already from education the foundations for the development of a knowledge economy are not sufficient.

Lithuania's infrastructure does not meet the demands of a knowledge economy. R&D has a weak ability to transform scientific research into marketable products. Lithuania is one of those countries that allocates limited funds to R&D (from both the state budget and private funding). The Lithuanian private business sector stands out for its small amount of funds allocated to R&D compared with other European countries. This means that in Lithuania there is very little R&D oriented towards market needs and very few businesses can utilise such research. This situation is also evident from the small number of patents. According to World Economic Forum criteria, Lithuania cannot be assigned to innovation-generating countries. In other words it cannot sustain its economic growth on account of new products created by Lithuanian scientists alone. A large number of high-tech industries (particularly in the fields of biotechnology and lasers) are established based on schools of scientific research that were created in Lithuania over 20 years ago. In the years following independence it has not been possible, as yet, to create something similar. We need to focus on the long-term future, when Lithuania's economic development may be driven by new products created by Lithuanian scientists.

In the past few years progress in restructuring the R&D system in Lithuania has been slow and difficult. This has been noted by World Bank experts in their study on the prospects for a knowledge economy in Lithuania. The study critically evaluates the 'pillars' of a knowledge economy: education, innovation, an e-society and economic conditions. It is acknowledged that schools of science are relatively weak and the system of life-long learning is underdeveloped, while universities are shut off from the market. R&D is insufficiently funded and resources are allocated to institutions not to programmes. The R&D infrastructure is ineffectively dispersed to 'produce' a sufficient number of patents and international publications, which is why business is reluctant to invest in it. In addition, information society infrastructure is underdeveloped and the government is insufficiently effective in implementing policy aimed at developing a knowledge economy. So numerous promising strategies may remain on paper while life will go its own way.

The government needs to be concerned that measures are in place to ensure that current business needs conform to the levels of scientific research. An environment needs to be created that will promote new findings and convert them more rapidly into competitive goods. Schools of tertiary education need to be significantly more 'sensitive' to the needs of businesses and the market.

For these the government will need to change its management, organisational and business abilities. Not only do economies compete between themselves, but also there is competition between state governing systems responsible for the creation and implementation of intellectual political willpower.

How to win against the global competition where there is no local success?

The noted contemporary economist M. Porter, who created at Harvard University a world country-competitiveness school, states that those countries that want to compete successfully on an international level cannot limit themselves to attracting investment for the provision of local goods and services by utilising a cheap labour force or other local resources, or by offering exceptional conditions and tax exemptions. Such measures reduce the competitiveness of local companies on international markets, making them incapable of sustaining decent earnings and ensuring a high standard of living. Successful and prosperous countries are those that have managed to create favourable conditions for innovation. When speaking about conditions that determine the productivity and competitiveness of businesses, Porter presents the 'diamond theory', whereby the four corners of the 'productivity diamond' are infrastructure, a demanding consumer, a competitive environment and a 'cluster' environment.

Pursuing the 'diamond' path of development, a government must incorporate the following points in its economic programmes:

- The creation of stable macroeconomic conditions
- Taking responsibility for the quality of infrastructure (including an e-society, the quality of education and knowledge accumulation and transfer systems)
- The implementation of strict competition rules
- The development of knowledge-economy nucleus-clusters beyond science-technology parks, incubators and so on
- Support for sustainable modernisation processes for the economy.

Another known economist, F. Drucker, emphasises the importance of an enterprise culture and management for innovation through their impact on the dynamic relocation of resources from less perspective to more innovative and effective businesses. In Lithuania there has so far been little discussion about the importance of enterprise culture and the ways in which to achieve it. However a lack of enterprise culture may be to blame for difficulties in the development of small and medium-sized businesses and their insufficient openness to innovation.

How should knowledge be translated into the well being of the people?

The development of a knowledge economy where knowledge creates high value added depends strongly on the ability of scientific communities to generate or import knowledge as well as transfer it through communications between R&D, education, business and society at large. In this respect links within R&D and between R&D and higher education are particularly important. So far in Lithuania these links are relatively weak, while sectors within R&D do prefer to act separately, not really understanding the potential benefits of cooperation.

A classic example of the knowledge economy cluster is Silicon Valley in California, USA. It began its existence some 50 years ago. Stanford University together with companies such as Eastman Kodak, General Electric, Intel, Fairchild, Lockheed and Hewlett-Packard rooted their activities in Silicon Valley. Turnover in Silicon Valley typically grows by 35% a year. According to the United Nations Development Programme Human Development Report, the largest number of knowledge economy clusters are in the USA, but they also successfully operate not only in Western Europe and Japan but also in Brazil, India, Malaysia, Israel and even Tunisia. The IT clusters of India, Tunisia and Costa Rica are successfully incorporated in the world's cluster maps.

Clusters are not only characteristic of successful new technology development but also of competitive businesses like film production in Hollywood, or growing flowers in Holland.

The experience of the countries of the EU shows that strong relationships between business, science and tertiary education institutions and openness to innovation are achieved by the so-called knowledge economy nucleus, which ensures the rapid transformation of scientific findings into new products. The most innovative economies of the world focus on the development of international clusters in their own countries and direct their industrial policy toward cluster analysis and promotion.

The US-based Milken Institute has conducted research into the conditions necessary for the development of clusters:

- Close ties with world-standard research and educational centres
- Close relationship between business, research centre and risk capital
- A trained and educated labour force
- Light technology daughter-company 'proliferation' from closely related high-tech industries
- Access to risk capital
- Good environment, low crime rate
- A suitable cost of living
- Comfortable situation in which to do business - small taxes and administrative limitations.

It must be noted that factors to which the most attention has been paid in Lithuania up to now (namely, taxation and administrative regulations) are listed last according to their importance in promoting clusters and innovation at large. World-renowned clusters need first of all advanced the infrastructure of knowledge.

The establishment of several knowledge economy nuclei in Lithuania would act not only as a catalyst changing the relationships between science and business, but also be bait to attract foreign investment and reduce unemployment. The Sunrise Valley Knowledge Economy Forum, a high-technology cluster established on the initiative of Vilnius University and Vilnius municipality on Sauletekio Avenue near the university, has the opportunity to become an international 'trademark' for a modern Lithuania.

From strategy to action

Strategic steps to success taken towards the foundations for human development are closely related to a knowledge society and innovation. Today it is impossible to imagine a knowledge infrastructure without a world-standard information infrastructure, without knowledge of foreign languages and a universal Internet push, which would ensure that one could receive, utilise and generate knowledge. Knowledge is becoming one of the most important engines and resources for progress and well-being. This inexhaustible resource can and must be abundant in Lithuania as a guarantee for success and sustainable human development. We need to be ambitious, effective, have the ability to come to agreement, cooperate and most importantly to be dynamic.

Information society beyond technology and access: social exclusion

Jolanta Rimkutė, Irina Voloschuk

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Discourse about the information society in Lithuania

There have been many attempts to associate the changes that occurred in post-war democratic societies[1] with the emergence of a 'brand new' type of society. Pseudo new societies were labelled a 'mass society', a 'consumer society', a 'leisure society', a 'post-industrialsociety' or a 'service society'. Most of the changes had varied impacts on socio-economicrelationships, many of which were not deep enough to bring about a new type of society (like the Industrial Revolution caused the emergence of capitalism). In the process of socio-economic change that society is now experiencing great importance is attached to information and information technology. So a 'newly emerging' society is being labelled as a 'wired' or 'network society', a 'knowledge society', a 'learning society', an 'interactive society' and an 'information society'. The variety of titles reflects on the one hand the fact that ongoing changes are complex and multidimensional and, on the other, that there are no well-grounded or unanimously acknowledged concepts of an information society. In Lithuanian discourse the term information technology is used to cover everything from the mobile phone to the personal computer, from satellite broadcasting to colour TVs.

Doubtless information and communication technology (ICT) influences the mode of production and social relationships as social mechanisms reciprocally determine its penetration and use. In this respect it is important to know what impact ICT has on human development and particularly on the process of social exclusion that is gaining momentum all over Europe and striking countries in transition, which experience the double pressure of profound change in going from totalitarian to democratic societies and the transformations related to globalisation and ICT.

The notion 'information society' was introduced to describe the type of society in which information and knowledge have unprecedented importance for the economy and everyday life due to the expansion of information and communications technology and the rapid developments in information processing and transmission. One must perceive the economy and society at large essentially in terms of the production, processing and circulation of information since information has become the most important factor of pro-

Different views of the information economy

A type of economy can be defined by the nature of activities occupying the majority of the employed. In this respect, we can talk in terms of an information economy as one used to speak of an agrarian economy when the majority of workers were employed in agriculture and about an industrial economy when manufacturing took over from agriculture.

According to the OECD definition, all employed people who produce, process and distribute information or who maintain the apparatus for its preparation are information workers. With this very broad definition, functionally heterogeneous occupations can be subsumed under information work. However, their relationships to producing, processing and diffusing information are extremely different. In this light, the meaning of what an information economy means is problematic.

However, on the other hand, one can understand the economy as being informational because the competitiveness of its central actors (companies, regions, nations) depends on their ability to generate and process electronic information.

1 Totalitarian societies like the 'socialist' society of the former Soviet Union were too closed and frozen to experience these changes to the extent democratic societies did.

duction. Such a perspective leads to thinking about the information society as surpassing industrial society, as the advent of something completely different.

In actual fact all societies are to a different extent information societies in that the majority of tasks to which human labour is applied inherently involve information processing in terms of communication, perception and the transformation of information.

In Lithuania, studies, official documents and the media depict a globalising but ultimately simplistic model of an information society based on technological determinism and progressivism. This means that two assumptions dominate discourse about the information society: ICT is inherently good in itself for both the economy and social relationships; ICT is the main driving force for social change. Current conceptualisation and the debate about the development of the information society is focused on the supply and accessibility of ICT and pays scant attention to those social factors that hinder and drive the demand for ICT and the development of the information society at large.

This situation is very much justifiable because the problem of access to information technologies in a broad sense (affordability of hardware, skills to use ICT, the rural-urban gap in access) is very acute for Lithuania.

Although the use of information technology is growing rapidly, insufficient access to telecommunications has a broad impact on the efforts to build an e-inclusive information society. According to the Department of Statistics, the total tele-density (fixed and mobile) reached 73.9% in 2002. In the countries of the EU total tele-density exceeds 100%. In 2001, for example, total tele-density in Finland was 132%, in the United Kingdom 136% and in Sweden 151%.

According to EUROSTAT and the Department of Statistics (Household Budget Survey conducted in the first half of 2002), 12% of households in Lithuania and 36% in the EU have a PC. In the cities 19% of households have computers, while in the towns 11% and in rural areas less than 5% of households were computerised. According to a survey conducted by SIC Gallup Media in June-August 2002, 21% of Lithuania's population had used the Internet at least once over the last six months, twice as much as the 10% at the end of 2001. The same indicator in Latvia and Estonia stood at 16% and 41%, respectively. Seventeen percent of the Lithuanian population went online at least once a month and 13% accessed the Internet at least once a week. The tariffs charged for Internet access are an important determinant of the demand for Internet services in Lithuania. According to the World Bank, Lithuania has the most expensive Internet access of three Baltic states.

However, an unconditional attitude to the supply of technology to building an information society may be misleading since it underestimates the human development dimension of ICT (what qualitative social change and/or impediments for sustainable human development and social cohesion are related to ICT).

Data, information and knowledge: understanding the difference

The concept of data is "what comes directly from the censors, reporting on the measured level of some variables". They are "events or entities represented in some symbolic form and capable of being processed" (Earl, 1996: 38).

Only when data have been organised do they become information. We can define information as "data that have been organised or given structure - that is, placed in context - and thus endowed with meaning" (Glazer, 1991). Information therefore includes the process of interpreting data.

It takes knowledge to produce information. It is important to understand knowledge as an active process; it involves the ability to interpret data. It is not just the content of a database (Miles, 1995: 16). Knowledge exists in different forms. Earl (1996) suggests differentiating between three aspects of knowledge: science (which may include accepted law, theory and procedure), judgement (which may include policy rules, probabilistic parameters and heuristics) and experience (which is no more than transactional, historical and observational data to be subjected to scientific analysis or judgement preference and also to be a basis for building new science and judgement). Experience can be characterised as potential knowledge, judgement as workable knowledge and science as accepted knowledge. (Miles, 1995: 16)

Defining information technology

Generally speaking, information technologies have developed out of the convergence of the (microelectronic) computer with telecommunications. This has removed the long-standing distinction between the processing of information and knowledge and its communication.

As a medium that connects machines and people with each other, IT can function as tools, automation technologies, control devices or organisational technologies

For a better understanding of current changes and for strengthening the national capacity to eliminate their detrimental effects on human development and utilise their potential for social cohesion, one must not confuse the process of the digitalisation of society with the information society and should examine the social implications and reciprocity between 'technological' and 'social' more thoroughly.

Information society: concepts and approaches

Unlike policy makers, who have accepted a more or less technology-biased approach to conceptualising the information society across Europe, researchers are not that unanimous in their attitudes. The key question in conceptualising an information society remains the relationship between its technological and social components. Between the two polars of 'technological determinism' and 'social shaping' there are several approaches to an information society.

The technological push approach (technological determinism)

The management crisis initiated by the Industrial Revolution was, according to Beninger (1986), a decisive impetus for the spread of information and communications technology. So the origins of the information society are rooted primarily in the interests of industry. The 'technological push approach' is often based on a concept of 'heartland technology' (technology employed across many production processes). Modern ICT is seen as the latest revolutionary heartland technology. Associated with the wide diffusion of heartland technology are fundamental socio-economic changes, methods of production, new products, new organisation forms and work regulations or new skills (Miles and Robins, 1994: 9).

Technological determinism not only assumes that technology is socially exogenous and follows its intrinsic logic, but it also presupposes that the technological artefacts determine the social consequences of their application.

The information society as a 'knowledge society' and a 'learning society'

In a knowledge society, information is not seen as a technological concept, but is used to highlight the links between information and knowledge and subsequent changes in the economy and society. Three key developments characteristic of a 'knowledge society are:

- an increase in the volume and importance of knowledge in a broad sense;
- the development of the computer as a 'knowledge-based machine';
- the emergence of 'knowledge industry'.

The knowledge society is characterised by the fact that all of its functional systems are bound to a knowledge in their basic manner of operation. A knowledge society is not only characterised by the fact that its members enjoy, on average, a longer and more professional education and that more products are knowledge-intensive,but by the fact that the importance of knowledge changes the traditional division of labour and the concept of education from a 'once-for-life qualification' to life-long learning.

Learning is the direct link between knowledge generation and application. In a learning society, learning takes place not only on an individual level but also through interrelated learning of all types of organisations, from large enterprises to municipalities, small businesses and governmental bodies. In such a society, learning becomes a social construction (Brown and Duguid, 1991: 47). More than ever the learning process involves an interaction and collective dimension. It is therefore having a previously unseen impact on social cohesion beyond better income earning opportunities.

Information technology as a social process (the social shaping approach)

The development of information technology according to this approach is shaped by social, ecological and political factors. "Technologies are social constructions, the outcome of negotiations between relevant social groups. In any innovative effort, actors form alliances. If the technology fits within the technological frame of its wider community of users, it might acquire momentum. In this way, successful technologies give the appearance of autonomy" (Wyatt 1998: 17).

Social actors that control resources have the power to influence existing norms and rules (Walsham, 1993: 61). Economic interests aimed at creating and exploiting a new ICT market are calling for a redefinition not only of the rules regulating broadcasting and telecommunications but even human rights and responsibilities across Europe.

Civil rights were a product of the 18th century; political rights emerged in the 19th century and social rights are a 20th century phenomenon. The information society 'gave birth' to intellectual rights.

In an information society the role of intellectual products as a source of wealth increases while it becomes more and more difficult to protect intellectual property. Not only is it easier to copy, but the copies can be made available anywhere and everywhere in the global market. At present in Lithuania, for most individuals, intellectual property rights are relatively unimportant. But the situation is changing steadily as

National context for the implementation of an 'e-Europe' in Lithuania

The first political steps towards an information society were made yet in 1991. It is symptomatic that among the first political programmes formulated immediately after the restoration of state independence was the programme, which emphasised the importance of building an information infrastructure as the foundation of an information society. Later, in 1993, the government approved a new programme on public communication and informatics, which was revised in 1996 and was in force until 2000.

An important political and legal prerequisite that made possible the future of Lithuania's commitment to the principles of an e-Europe was the Constitution of the Republic of Lithuania and other laws that laid down the core principles of a democratic information society:

• *Freedom of access to information.* Constitution of the Republic of Lithuania Article 25: The Law on the Provision of Information to the Public, 2 July 1996 (No.I-1418); Provision of Information to the Public Act, Amendment of December 2000;

• *Privacy and data protection.* Constitution of the Republic of Lithuania Article 22; Act on the Legal Protection of Personal Data (No 63-1374, 1996, amended in 1998); Revision of Act on the Legal Protection of Personal Data of the Republic of Lithuania;

Important political initiatives that strengthened Lithuania's commitment to an e-Europe:

• The Memorandum on the Development of an Information Society in Lithuania of Parliamentary Parties and Association INFOBALT was signed in 1999. The main idea of the memorandum was to ensure sustainable political support to an information society irrespective of changes in the Seimas (Parliament) and government by consolidating the views of the key political parties on an IT strategy. More than 20 organisations have since joined the memorandum.

• The Declaration of Rights to the Internet (2000) is a guideline for Internet initiatives in line with an e-Europe The main points of the Declaration are that the state must ensure the right of every citizen to use cheap and speedy Internet services and that the right to the Internet is the best guarantee of success in the new economy (http://www.infobalt.lt).

Lithuania was therefore politically prepared for e-Europe initiatives and accepted them readily. The government has declared the development of an inclusive information society a top priority and one of the key factors of country's well-being. The Lithuanian Long-Term Economic Development Strategy, approved in 2001, proclaimed the goal of making information and communications a dominant economic sector (25% of GDP) by the year 2015. In 2001 the Lithuanian ICT market, the biggest in the Baltic countries, grew by 11.5 % compared to 2000, according to European IT Observatory 2002.

The ideas of 'e-Europe - an Information Society for All' have permeated conceptual and strategic documents alike on the information society and key IT projects. The following political documents and projects serve as a vehicle for the promotion and implementation of e-Europe principles and initiatives in Lithuania:

• documents of a conceptual and strategic nature: White Paper on Science and Technology; Conceptual Framework of the Development of a National Information Society in Lithuania, February 2001; Concept of e-Commerce (June 2001); Action Plan for an Information Society in Lithuania in 2001-2004 (August 2001);

• the most important IT projects that commenced between 2001 and 2002: customs computerisation; an online tax administration system; national ID cards, or smart cards; the improvement of health administration through IT; the networking of banks, financial institutions and banking clearance systems; an education and research network; the integration of all national registers; land records and cadastrial maps; knowledge parks and incubation centres; B2B & B2C commerce - the launch of e-banking; and the Lithuanian Libraries Integral Information System.

The direct implementation of the e-Europe initiative started in mid-2000 across the following priorities: the competence of the Lithuanian population in IT; the computerisation of schools; the modernisation of the science and education system; the promotion of e-business; the establishment of e-government. The computerisation of schools was one of the most consistent and successful measures related to the implementation of an e-Europe The Ministry of Education and Science drafted a strategy for the implementation of advanced information technology in education supported by another long-term project, the Integration of Lithuania's Academic and Research Computer Network LITNET in the European Academic Network TEN 155 (LITNET-GEANT). In 2001, the government specified for the first time a special budget line for financing information society development directly from the state budget.

From the standpoint of the inclusiveness of an information society it is important that the implementation of an IT strategy through annual detailed action plans, prepared by the Information Society Development Committee is based on consultations with go-

There was only one computer per 100 secondary school pupils in 1996, but by 2001 this figure had grown to 2.5. The overall picture is better for pupils from grades 10 to 12, where there are 10 computers per 100 pupils. In the academic year 2000-2001, 33.9% of secondary schools in Lithuania had access to the Internet. In 2001-2002 there were 8.7 and 7.8 computers per 100 university and college students, respectively.

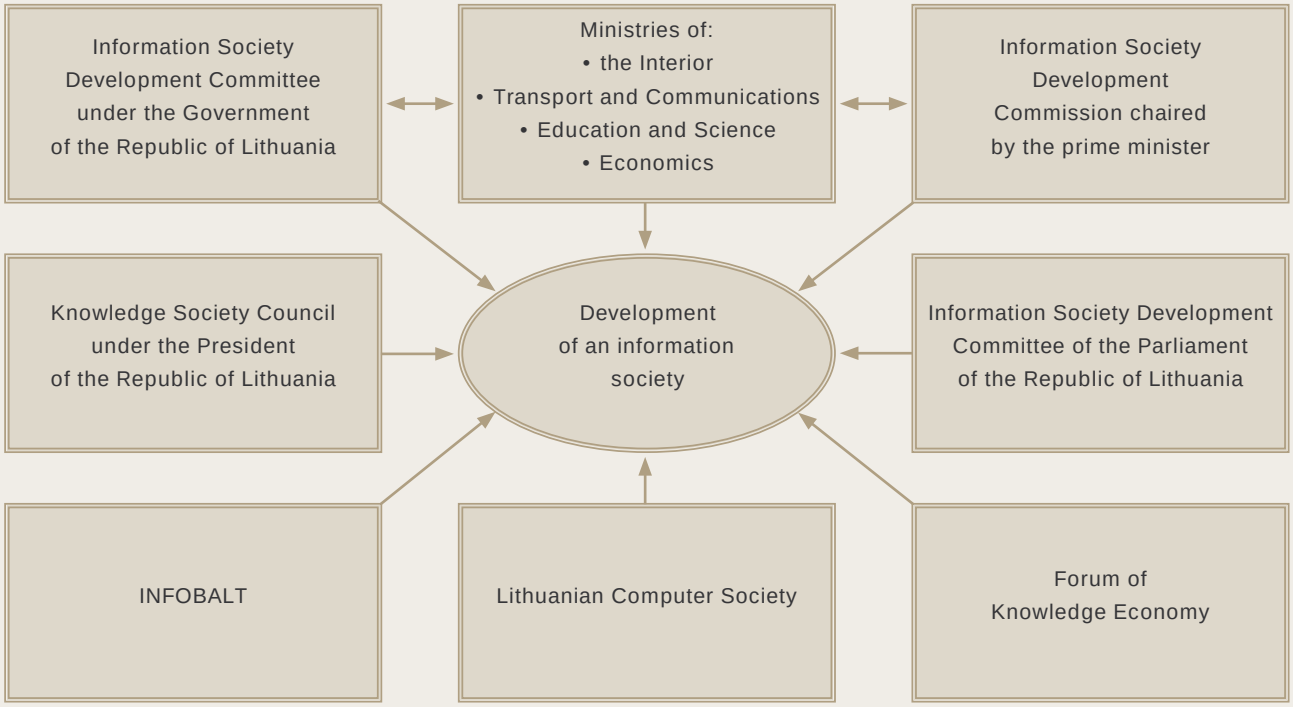
There are two main obstacles to the advancement of IT in education - the lack of computer literacy among teachers (particularly in basic and secondary school) and the limited access to computers and the Internet. For schools in rural areas and small towns the situation is much worse in both terms. Only about 70% of teachers in rural areas and small towns have had a higher education, compared to 98% in the cities.

vernmental institutions and NGOs (INFOBALT, the Chamber of Commerce Association for Small- and Medium-Sized Enterprises, local governments and municipalities).

An institutional framework for the development of an information society was tailored to best fit the implementation of an e-Europe in the sense that it is well structured in terms of responsibilities and the 'representation' of different actors and that it contains a 'follow-up' and 'feedback' mechanism.

There are several key institutions in the process of the development of an information society. The Knowledge Society Council under the office of the president is a consultative body that provides proposals on state knowledge policy formation and implementation. The Parliamentary Information Society Development Committee is an institution that prepares and discusses legal acts regulating information society issues, conducts the parliamentarian control of the usage of state resources and investment projects and provides related proposals. The Governmental Information Society Development Commission chaired by the prime minister is in charge of the co-ordination of IT strategy and programmes. The Information Society Development Committee under the Lithuanian government focuses its activities on four main problems: population competence, e-government, e-business and support for cultural inheritance.

Development of an information society



society becomes more and more information-dependent

The right to information is developing now beyond its traditional aspect of the right to access to official (mostly government) information to a much wider range of information from different sources (the producers of goods and services, NGOs, civil movements). Given the volume and diversity of information, not all people have the skills or the contextual knowledge needed to analyse and interpret the information they need to function effectively within society and not feel socially excluded (for example, the side effects of food additives or the availability of bank loans). In today's information society access to information is impossible without information services and advice services that will help individuals to interpret the most basic of information. The key requirement is independence - the services must be seen to be independent and beyond influence by the providers of the products and services they review.

Although in post-Soviet societies attitudes towards censorship are particularly negative compared to democratic countries that had no totalitarian 'traditions' of censorship, today both Western European and transitional societies are experiencing the need to protect themselves from obnoxious information. In other words, the information society challenges the axiom that censorship is inherently wrong and even the very concept of freedom of information.

The concept of 'cultural ecology' is one that is gaining ground. It recognises the damage that can be done by a dominant culture given the global reach of the modern media. Recently the European Parliament attempted to limit the amount of non-European programming that can be shown in cinemas and on television. For small societies (like Lithuania) preserving the 'cultural ecology' while entering the global information society is very important.

The expansion of information-related rights should be balanced both by state and non-state information providers and by individual responsibilities. There are many areas where real demands for information will remain unsatisfied if we rely solely on market forces. The government is required, therefore, not only to respond to requests for information promptly, but also to collect and process information that is in the public interest. This will enable human development choices and social cohesion in society. In Lithuania, for the time being, the state's responsibilities for supporting the information sector are biased more towards budgetary and legal support of the ICT sector.

As information becomes more and more important within society the accuracy and reliability of information will also grow in importance and consequently increase pressure on information providers to take responsibility for the information they publish.

The individual responsibility to be well informed - ignorance of the law, for example, has never been an argument in defence against a prosecution - should be substantially expanded with greater emphasis on the individual's responsibility for his/her awareness. And as more and more information services come into existence, so it will become more difficult for individuals to avoid the responsibility for using information.

Information overload

In 1956 hard disk drive storage was priced at $10,000 per megabyte. In 2001 a megabyte cost roughly half a cent, a fall in price of two million times in less than 50 years (Kay, 2001). But the availability of more information hasn't been without problems. It has led to the erosion of traditionally trusted positions in society. In this environment of overwhelming information and choice, we need some method of navigating our way through.

'Technological frames' and 'technological practices'

However modern, ICTs are not mere social constructions that can be reduced to a set of social relationships. Concepts of 'technological frames' and 'technological practices' include a variety of different aspects that influence the interaction of actors involved in the innovation processes. The concept of technological practices is of particular interest as it draws attention not only to relationships between the 'social' and the 'technical', but also includes a cultural dimension. The concept of technological practice also entails processes of 'learning by doing'. The continuous reproduction of new technological practices then leads to the institutionalisation of new technological, organisational and cultural structures.

Social change in the information society: social exclusion

The notion of social exclusion is no less complex and multidimensional than the concept of an information society. The conceptualisation of social exclusion is highly sensitive to the following assumptions: exclusion from what, by whom and why (what are the range of factors of exclusion that are beyond individual control?).

The approach to social exclusion taken by this article considers social exclusion as involuntary alienation from essential human development choices, lack of empowerment and weak social links to family, friends and society at large.

The mechanisms of social exclusion are deeply roo-

ted in the process of societal development and so they vary in different models of society. From the variety of factors linked to social exclusion, in this article we will focus on those related to the transition to an information society.

Global experience shows that the digitalisation of society essentially follows the basic rules of a market economy. Not only is knowledge accumulated, but individual, global and corporate economic interests under the pressure of competition determine the dynamics and procedures to adapt to new ICT.

Although ICT does not essentially alter the basis of traditional market democracy and consequently the key factors of social exclusion characteristic to industrial society, it influences social relationships and the mechanisms of cohesion. For example, an increase in the role of knowledge automatically links the competitiveness of individuals, firms and entire countries to strengthening an important component of human development - education - and expands its role in social exclusion and inclusion. Since skills for using information become vital both at work and in everyday life the very concept of education undergoes drastic change since training based on the concept of 'a profession for life' loses its meaning while 'life-long learning' grows in importance. The traditional forms of human communication and association are being challenged by online virtual communities. The Internet, both as a network and as an interactive tool, brings together a wide range of different people who would otherwise never have met. However, like any other mean of communication the Internet introduces a new dialectic of social inclusion and exclusion into human relationships. In Lithuanian discourse and research the Internet as a contextualised social phenomenon has not yet been approached and researched.

Lithuania: a triple transition from socialism via 'Fordism' to information society?

The contemporary societies of Lithuania and the EU emerged from different backgrounds. Today they are increasingly influenced by the same global factors and 'informatisation'. The difference is that democratic and open societies have been evolving in the global environment for centuries while societies in transition entered the global world only a decade ago and the pressure of change has been far more severe.

Without going too deeply into the mechanisms of societal development in the former Soviet Union, since the majority of totalitarian societies share the same features, we will mention only the key pillars that determined the main processes of inclusion and exclusion.

Lithuanian society was characterised during the Soviet period by: the equitable distribution of income (restricted by ceiling and floor), high-income security (in terms of its stability); uniform consumption; full employment (unemployed being considered a criminal offence); and universally accessible free education. Information was assigned a special role in Soviet society. It was an object of strict control and censorship. Access to it irrespective of carriers was limited (short-wave transmission from the West was filtered through interfering devices). Consequently, the use of information technology was regulated. Up to 1990 one needed special permission to use a Xerox (and, even later, send a fax). Individual well-being and security depended on loyalty to the regime (rather than on education, abilities, entrepreneurship or creativity). This minimal responsibility for the self, cultivated by the omnipotent state, restricted capable people in their choices. It also relieved those who were less capable of self-expression in the sense of inferiority.

Under insignificant income stratification, Soviet society was divided according to 'socio-occupational qualities' of which 'nomenclature' stood out by its privileged position. The dominant factors of social exclusion characteristic of Soviet society were associated with disloyalty to the regime and a weak relationship to the state, the main employer, protector and provider.

The 'Fordist' model of society shaped life until the seventies in Western Europe. Three pillars characterised human development under Fordism: safe and sustainable employment (full-time salaries dominated); collective bargaining under the auspices of the welfare state; universal social protection and insurance against major social risks (unemployment, poverty, loss of a breadwinner, old age, disability and so on).

Collective bargaining, unions and the welfare state have become its main mechanisms for resolving conflicts, framing needs and social demands and ensuring cohesion and solidarity in society. Social inclusion in this model was associated with full time employment and a stable link with the welfare state based on reciprocity (taxes and social contributions in exchange for social benefits).

From the late 1970s onwards, Fordism entered a crisis due to the destabilisation of two pillars. New technology (ICT plays a crucial role in this process) has changed labour relations and the nature of employment and traditional forms of human communication and the welfare state has lost its power in ensuring social security and cohesion. ICT changes the very source of wealth creation and the governing factors in production. Information and knowledge are growing in importance both as factors of production and social cohesion.

In Lithuania, as in any other country in transition, during the change from Soviet-style socialism to a market democracy the abrupt shift towards personal

responsibility for one's own well-being coincided with sharpening competition, weak social protection and exposure to many previously unseen social risks, such as unemployment and homelessness. ICT-induced pressures were added to these, which included the demand for widespread retraining and the acquisition of new skills, the spread of precarious employment, information overload and the erosion of the community. So Lithuanian society, in which a transition to Fordism has barely been completed, has to develop new forms of identity and democracy and adapt to new information-related challenges.

Features of social exclusion in the information society

"Despite the fact that ICT offers huge opportunities for communication and employment and that the IT industry is interested in encouraging social inclusion through access to information and communications infrastructure, the rise of digitalisation is being accompanied by rising inequality and social exclusion throughout the world." (Castells, 1998, p. 70)

While in countries in transition low access to ICT could be partially blamed for social exclusion, in the countries of the EU where access is much better social exclusion remains an acute problem. This means that there are other social exclusion factors beyond telecommunications access that must be addressed.

Under the pressure of skills and knowledge - a lack of skills to interpret information and insufficient social skills to make a decision - social exclusion in the information society has acquired features of 'social disqualification' (Paugam, 1996). To the traditional criteria of social inclusion like professional and socio-relational integration is added informational integration. (Castel, 1995)

Self identity in a network society

According to the theoretician of the information society Manuel Castell, "...our societies are increasingly structured around the bipolar opposition of the Net and the Self". The Net stands for the new organisational formations based on the pervasive use of networked communications media. Network patterns are characteristic of the most advanced economic sectors, highly competitive corporations, social movements and local communities. The Self symbolises the activities through which people try to reaffirm their identities under conditions of structural change. New social formations emerge around primary identities, which may be sexual, religious, ethnic, territorial or national in focus. These identities are often seen as biologically or socially unchangeable, contrasting with the fast-paced change of social landscapes. In the interplay of the Net and the Self the conditions of human life and experience around the world are deeply reconfigured."

Manuel Castell, 1996, p. 3, The Information Age: Economy, Society and Culture' (1996, 1997 and 1998).

For the first time in history, social inclusion has become an economic goal. Computer, telecommunications and media companies have demonstrated a commitment to expanding access to ICT. In Lithuania a good example of private involvement is Window to the Future, an information society development initiative launched by private companies and focusing on the promotion of the Internet in Lithuania.

The changing nature of work and labour relations

The global employment trend is towards the individualisation of work and flexible and unstable patterns of employment. Three aspects are of particular importance in the Lithuanian context: the growing importance of information-related work, the increasing reflexivity of work, increase in precarious employment and the shift from collective bargaining to the individual.

Studies show that labour is increasingly determined by activities like information acquisition, processing and information-based decision-making. According to a survey of manufacturing industry and the service sector conducted by the Department of Statistics (June-August 2002), 84.4% of enterprises used computers in January 2002 (80.2% at the beginning of 2001). Connections to the Internet increased from 58.6% in 2001 to 65.5% in 2002.

In the case of information work, the quality of the product is more dependent on the network of social relationships. Under increasing systemic integration labour becomes self-reflective, in some way labour creates its own object of study and an increasing share of work consists of self-innovation.

The dominant opinion is that by nature information-related work is creative and demands high skills. However, one should not confuse the transmission of data with the interpretation of information. Processing and transmitting data belong to 'routine' work and are less demanding and less knowledge-based. So the as yet 'unseen' process of polarisation with increasingly knowledge-based jobs on the one hand and more repetitive and less information and knowledge-intensive work on the other is going on in ICT-related work. Some researchers argue that the application of new technology is leading to the 're-skilling' of upper-level and middle-level professions and the 'de-skilling' of lower-level occupations engaged in routine work. (Baran, 1989: 697)

Working from home

Freelance teleworkers usually have lower earnings than would prevail in equivalent office-based work and suffer from extreme unevenness in the flow of work. However, most freelance teleworkers claim to have actively chosen this way of working because it offers autonomy, control and the freedom 'to be your own boss'. Yet in reality, because of the unpredictability of their situation and their relatively low earnings, they have less control over the disposition of their own time than equivalent office-based workers. They are, for instance, unable to plan holidays.

Researchers have tended to find social isolation, precariousness and ignorance of legal and social security rights amongst this group.

(Phizacklea and Wolkowitz, 1995; Huws, 1994)

By 2000, US employees were receiving on average 195 e-mails per day, only five more than UK employees. According to BBC News Online, "A study at America's North-western University found business negotiations conducted electronically ran into more difficulties than those that began with a getting-to-know-you phone chat." The benefits of email for one-to-many communication are evident, but a superabundance of emails cannot be beneficial for a working environment, as messages are lost or ignored under pressure of time. A recent study reported, moreover, that the number of recipients in the 'cc' box of an email inversely correlates with the likelihood of a response: the more receivers, the lower the likelihood.

New Scientist, 20 July 2002

Teleworking is not yet widespread in Lithuania. No data exist on the number of teleworkers (home, mobile, self-employed). In the EU 13% of the working population could be classified as teleworkers. In the US, 25% of the population have some kind of 'teleworkplace'. In Lithuania in general this kind of employment is perceived positively as a type of employment that offers new income-earning opportunities and freedoms. However, in countries where teleworking is more widespread considerable problems arise with social exclusion and unsafe employment. Individuals working permanently from home report feelings of social isolation that cause stress.

The same goes for the use of the Internet in the workplace. So far Internet penetration in Lithuania has not crossed the threshold when its side effects on the quality of a job are felt, so it is unconditionally considered as a positive phenomenon in itself. However, researchers from Europe and the USA have discovered that the effect of the Internet on social inclusion in the workplace is multifaceted and should be researched and managed more thoroughly.

Skills, training and education in the information society

In Europe the concept of skills is gradually shifting towards the broader concept of competence, which stresses the ability to handle complex and changing situations. In this context the concept of a single, lifelong profession is no longer relevant today.

Continuous vocational training, particularly its interactive and self-directed forms, in the workplace and modular training - according to demand, specific modules are taught and a certificate is given for each modular course - is gaining momentum across Europe. In Lithuania the supply of these forms of training is much lower than the demand. Approximately 5% of the labour force in Lithuania participated in adult vocational training in 2002. The average figure for the EU is about 40%.

Communities in the information society: deprived neighbourhoods

The concept of community in the information society has evolved substantially and become far more complex. It may refer to the inhabitants of an apartment block or a small village, to people who work for the same company or to people who communicate via the Internet and have never seen each other. The importance of community in the information society is often emphasised in connection with growing social exclusion and a lack of trust.

On the one hand, information technology, particularly the Internet, is fundamentally enabling and inclusive. The network does not differentiate between people depending on their income, gender or age; anybody

Social skills

It is argued that social skills are becoming as important as theoretical knowledge in the information society. Social skills include a flexible attitude towards new tasks, autonomy in decision-making and willingness to shoulder responsibility, self-confidence in defending one's own ideas within the working group, the ability to express one's own views and thoughts, tolerance of the arguments of others and willingness to co-operate and to support others if necessary to look for compromise in conflict situations.

Social exclusion and dropping out of school

Dropouts from secondary school are a group of the population vulnerable to life-long social exclusion and poverty particularly in a knowledge society where demand for manual and unskilled labour is rapidly diminishing.

The decision to leave school is taken by children and teenagers who are underage and therefore who do not carry full responsibility for themselves. Their well-being is completely dependent on family and society. These people have the least possible control over factors that will shape their future life chances.

The acuteness of the problem of early school-leaversis recognised in the EU. In Lisbon in March 2000 the Council of Europe adopted a special goal to halve the number of people aged between 18 and 24 who had only a basic education and would not continue their studies by 2010.

In Lithuania children are obliged to acquire a basic education and study until they are 16, unlike the EU where those who are under 24 with an education lower than secondary (ISCED second level) and who do not continue to study are regarded as dropouts.

Between 1991 and 2001 about 65,200 pupils dropped out of day school, 46,300 left vocational school, 34,200 left college and 73,100 students dropped out of higher (tertiary) education. However, there is no data on how many pupils and students later returned to educational institutions.

Of the 15-16 age group only 65.5% completed school in 2000 (78.5% in 1998). The coefficient of the completion of basic school (a proportion of those enrolled in the first grade who complete school) was 0.77. In the EU this coefficient was 0.9. A low coefficient of basic school completion is closely related to pupils dropping out and repeating courses.

The majority of pupils who do not attend school are in the 6th to 8th grades, between 13 and 16 years of age. Not all of them left school voluntarily; some were expelled. School leaving may be related to teenage problems, when motivation for learning is weak and communication with contemporaries grows in importance. Between the first and fourth grades many pupils have to repeat their courses and this increases the risk of their dropping out of school later. According to the report “Lietuvos švietimas 2000“, 5.5% of children aged 10 years old, 7.1% of 11-year-olds and 6.2% of children who are 12 did not attend school in the 1999/2000 academic year. On average about a third of those who did not attend school during the last four years were disabled.

According to a population census conducted in April 2001, 5,256 children between the ages of 7 and 16 did not attend school (1.1% of the total number of children from this age group). Of all dropouts, 60% were boys, 1,288 (25%) were disabled and 3,206 (61%) were from urban areas.

Between the 1995/1996 and 2001/2002 academic years 38,300 pupils stayed in the same grade for two or three years. More than half were in basic school. However, the number of ‘repeaters’ declined from 8,100 in 1995/1996 to 3,500 in 2001/2002.

The majority of repeaters from primary school (about 1,000 annually) stay for a second go in the first grade. This causes great trauma to a child who at that time usually has positive motivation to study. Many dropouts are officially enrolled even though they do not attend school for a long time.

Research shows that a lack of motivation to study dominates among the reasons why pupils stop attending school and this reason is growing steadily in importance. Respectively, 38.2% of dropouts in 1997, 38.9% in 1998 and 43.7% in 1999 left school because of this reason. Other reasons are, in order of importance, parents’ prohibition to attend school, living in a problematic or asocial family and vagrancy.

Data as well as the methods of their collection and processing differ at the Department of Statistics and the Ministry of Education and Science. In actual fact there are no exact data on the number of dropouts in Lithuania. The situation may improve when personal codes are introduced for all children under 16.

Special research should be conducted into the possibilities of using ICT in the prevention of dropping out of school.

Violeta Rimkeviciene

SPU project: Social Exclusion and Poverty During Transition, 2002-2003

can contribute or co-operate. However, trust - a crucial prerequisite to social inclusion - has always been a problem for Internet users. It’s hard to trust people you don’t know and can’t see. So far, because of insufficient Internet penetration, neither the nature of existing virtual communities nor the influence of the Internet on forms of human association have ever been researched in Lithuania. Although global experience and research shows that some virtual communities can compete with real ones, certain virtual communication may be conducive to social exclusion and damage self-identity.

Social relationships based on locality and neighbourhood remain important for social cohesion. In

Social inclusion and online communities

The Internet is forming different types of community including commercial communities, local communities, professional communities, communities of interest and non-subject-specific communities. (Putnam, 1998)

However, there ought to be considerable caution in noting the successful examples of online communities. The success is limited. As Malcom Forbes of Brixton Online explains, examples are still "patchy and in the main down to the activities of social entrepreneurial individuals."

There have been a number of studies and surveys on the impact of the Internet on cohesion in communities. In 'Cities Online: urban development and the Internet', John B. Horrigan considered a selection of projects in five cities across the US that aimed to increase access to the Internet. He observed that, "In most cases, the Internet's effect is primarily catalytic. By prompting people to come together to plan how to use it, its presence stimulates social networks and lays the groundwork for building new social capital." (Horrigan, 2001)

this respect the contribution of ICT to strengthening and empowering neighbourhoods is also important particularly in deprived areas.

As the importance of knowledge, intelligence and creativity in the information society increases the 'irrelevance' of people and entire communities that fail to meet these demands also grows. The "social exclusion and economic irrelevance of segments of society, areas of cities, of regions and entire countries" become the Fourth World of the information era. (Castells, p.447)

The increased territorial concentration of deprivation is now evident in the EU. Prosperity and ICT do not necessarily penetrate deprived areas. The longer such areas remain out of targeted policy actions the more difficult it will be for general economic policy to reach them. This partly explains why the concentration of poverty into certain areas and social exclusion are growing.

However, despite the increasing spatial concentration of poverty - rural areas and small towns are becoming increasingly disconnected from the benefits of improvements in living standards and the use of ICT - social exclusion in deprived areas is a problem that has been relatively little studied in Lithuania.

A sociological survey aimed at understanding area-related factors of social exclusion and individual perceptions and expectations of inhabitants of deprived areas was conducted in 2002 within the project Social Exclusion and Poverty During Transition, implemented by the Social Policy Unit. The results of this survey provide a 'social context' for a deprived area and may be useful in understanding the role of ICT in strengthening deprived communities.

The town of Didþiasalis was selected as a pilot area where the main human development indicators were significantly worse than the national average.

The core assumptions of the Didþiasalis sociological survey suggest that area-related factors contribute to deprivation and the social exclusion of an entire community. And the long-term concentration of deprivation causes a snowball effect in acquiring further problems, like poor services and facilities, high unemployment, welfare dependency, suicide and substance abuse.

The sociological survey allowed for the following conclusions:

• *Deprived areas 'attract' people with low incomes, education and motivation.* The majority of respondents had arrived in Didþiasalis. Among them people of working age dominated and men accounted for almost 60%. The main reason for moving to Didþiasalis was the loss of an apartment or the hope of finding a cheaper place to live (67%). An absolute majority of the newcomers were unemployed (78%), of whom four-fifths were without job for more than two years. However, among those unemployed who were born in Didþiasalis, 30% were long-term unemployed.

• *The level of poverty in deprived areas is significantly higher than the national average.* Forty-six percent of families had an average monthly income per household member lower than the state-supported income (135 LTL in 2002), 36% of households had 110 LTL or less, 10% between 111 and 135 LTL. Meanwhile, 70% of respondents were in debt to the providers of utilities (gas, water, electricity). According to the nationwide Household Budget Survey 2001, households with an income of between 100 and 200 LTL account for approximately 15% of all households, while only 6.5% of all households have a disposable per capita income of less than 135 LTL.

• *High unemployment (significantly higher than the national average) and the prevalence of long-term unemployment are closely related to the lack of any employment opportunities in deprived areas.* Unemployment stands at 47% in Didþiasalis. The national average was 11% in 2002. Seventy-six percent of the unemployed had failed to find any job, while only 9% did not work because they could not find an appropriate job. Fifty-four percent of the unemployed of working age said they would agree to work for 100-400 LTL per month, while according to the nationwide Labour

One of the views of deprived neighbourhoods is the 'broken windows' theory of Wilson and Kelling (1982), which attributes a loss of social control to the gradual growth in 'incivilities' - that is, the lack of informal social control through neighbourhood instability and poor services leads to people tolerating broken windows and other minor damage. This results in a disorderly environment from which more law abiding people withdraw.

Force Survey approximately 8% of all the unemployed would agree to work for a salary lower than the minimum (430 LTL).

• *Deprived areas are populated by people with lower education than the national average.* In Didþiasalis 37% of respondents had not completed secondary school.

• *Those who want to continue their education or get new qualifications or a profession have no opportunity to do so because of lack of money and the absence of such opportunities.* Of all respondents 48% wanted to study, but 84% had no opportunity to do so, most often (54%) due to lack of money. More than 80% of respondents who wanted members of their households to study and get qualifications had no opportunity to do so.

• *The immense potential of information technology for employment, education and communication - 'e-inclusion' - is severely under-utilised in deprived areas.* To acquire computer literacy was the wish of 16% of respondents, but only 15% of these had the opportunity to do so. No one said they had access to the Internet at home or elsewhere, while 12% wanted to use the Internet. Only 1% of households had a computer at home; the national average is 10-12%, according to the Household Budget Survey. Seventy percent of respondents with a household income lower than 300 LTL wanted a telephone, but could not afford it.

• *Poverty and social exclusion reproduce themselves in deprived areas through a lack of educational opportunities for children and young people.*

Thirty percent of respondents said that they did not want their household members (often children) to study. However, of the 70% who wanted this, 68% lacked the opportunity to do it.

• *People from deprived areas have less sustainable and secure incomes.* The proportion of income related to employment in Didþiasalis compared with the national average was 22% and 44%, respectively. The proportion of dependents per household was 9.1%, according to the Household Budget Survey, while for Didþiasalis households it stood at 24%.

• *The majority of people from deprived areas do not want to take active steps to improve their socio-economic situation.* Seventy-fivepercent of local inhabitants and 80% of newcomers did not believe in a better future and the absolute majority of respondents were not ready to take steps to improve their situation (for example, 50% did not want to study). The majority believed in the vague, 'populist' measures proclaimed by politicians or the government.

The results of the survey allow for the assumption that if people from deprived areas were given computers (or free Internet Public Access Points) and taught how to use the Internet without other feasible community building measures they would neither become included nor essentially improve their motivation or their competitiveness. This follows from the fact that knowledge is socially distributed and one needs the peer support of shared experiences and examples to make the information work, to perform and to communicate. In an environment of low motivation and unwillingness to take active steps in the improvement of individual (let alone community or neighbourhood) situations, the introduction of ICT should be accompanied by active measures beyond training how to use the Internet or a computer.

Online communication or even communities cannot create something new if real communities do not exist; the Internet's impact on social cohesion within communities will continue to be limited.

The precondition of the success of ICT in deprived communities is first demand then supply. ICTs should be used as a means, not an end, and with an understanding of the people who use them, their needs and interests.

The information society in Lithuania will remain a socially and economically divided if the human development dimension of ongoing changes is not taken into consideration by policy makers and civil society at large. People, not technologies, should be regarded as the end of the process of development.

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Economy: new challenges

Margarita Starkevièiûtë

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The year 2002 was very significant for Lithuania. By accomplishing major economic reforms, the country was invited to become a member of the European Union (EU). This invitation was a recognition that Lithuania had successfully reformed its economy and that it is ready now to compete in the developed EU market. Nevertheless, this relatively rapid reform process that took only a decade was extremely costly in human development and social terms. The successful economic achievements have been overshadowed by high structural unemployment, a low average wage, meagre pensions, the diminished quality of social and educational services and increasing regional and social inequality. GDP per capita in purchasing power parity in 2001 reached only 38% of the EU average in Lithuania - one of the lowest among the candidate countries - while unemployment stood at 11%.

Since other candidate countries faced similar social problems, it can be concluded that all of the above was an unavoidable outcome of drastic economic reforms during which an outdated economic system and management structure was dismantled. Time is required for the positive effects of economic reform to appear. Therefore the different social groups do not immediately feel the benefits.

The rapid growth in GDP, which between 2001 and 2002 exceeded by nearly six times the EU average, and an increase in labour productivity provided evidence that the reformed economy was creating strong preconditions for the growth of national income. The main concern for Lithuania is how to translate this growth into benefits and new opportunities for as many people as possible and ensure growth in the quality of life and its speedier convergence with EU standards.

The national economic strategy has proclaimed that the main development priority is the knowledge economy. Lithuania, a small country not richly endowed with natural resources, can develop its economy in three main directions - firstly by processing its own products (agriculture, fisheries, forestry). Secondly, it can process imported raw materials or transport products that are produced abroad - that is, sell its labour force (textiles, furniture manufacturing, oil refining and transport). The first two directions create opportunities to consistently generate a mediocre income. The return on this type of economic activity globally is not high and is decreasing with time, as there is growing competition from a cheaper labour force in Asia.

A rapid growth in national income will only be achieved if more economic activities are directed to the third path - the effective use of accrued intellectual resources. These will allow for the development of high-tech products and the provision of knowledge-intensive services with high value added, which ensure competitiveness in the current global economic environment. This direction differs from traditional economic activities in that the utilisation of resources inevitably causes their depletion in a 'traditional' economy, whereas a knowledge economy creates unlimited opportunities to share information resources with others and at the same time increase its own knowledge. Moreover, the development of a knowledge economy gradually penetrates all economic sectors.

The experience of less prosperous countries in the EU shows that effectively used EU support for the development of a knowledge economy has enabled them to reduce poverty and provide productive employment to many young people who had been unable to find their place in the labour market.

GDP per capita in purchasing power parity in 2001 reached only 38% of the EU average in Lithuania - one of the lowest among the candidate countries.

The role of the knowledge economy in human development

In the opinion of researchers, current economic development is linked less to construction and production than

to the level of education, which in the wider context encompasses knowledge, institutions and culture. In other words, it is not labour and capital, but ideas and innovations that are the main factors of economic growth in the current information society. It is not possible to create greater economic value by repeatedly manufacturing more and more of the same goods. An increase in the value added is closely related to finding new, more effective means of using material resources.

To benefit from the process of innovation and take advantage of its achievements and discoveries is impossible without a drastic change in living and working conditions. These changes can be quite painful. For example, due to such rapid change the skills of workers could quickly become obsolete and a company may face bankruptcy and employees become redundant. In this case the loss of a job may be the result not of personal faults but rather the side effect of a process of deep change. Encouraging an economic environment favourable to innovation and the implementation of new ideas can mitigate negative side effects in the process of innovation.

To benefit from the process of innovation is impossible without a drastic change in living and working conditions.

The concept of the knowledge economy is often identified with information technology and education. Its success, however, depends not only on economic activities, where the main factors are information and creativity, but also on the effective dissemination and use of information.

Researchers have noted that in the knowledge economy creativity has a growing impact on the pace and results of economic development. If a country is lacking in resources, creativity helps to find ways for their effective use or substitute. The power of creativity reduces shortages.

In the knowledge economy creativity has a growing impact on the pace and results of development.

However, for modern businesses it is still more important to acquire information and knowledge than to consider how to use it in the best way. A problem arises in that often the same information is simultaneously, or even earlier, made available to competitors. In this way only those who are creative and inventive in using the advantages of the information society, who have newer ideas and vivid creative potential, will be ahead of their competitors.

In the future the most competitive knowledge economies will be created by those countries that will be able to encourage and help unveil the creative potential of their populations. One of the priorities of modern economic policy should therefore be culture - the spiritual foundation for creative development. The role of the service sector, which generates a new quality of life, is growing rapidly and only a society with a highly developed culture is able to develop such services. Today, the Lithuanian service sector is producing 60.5% of GDP, whereas the EU average is 70.5%.

In 2002, the knowledge sector increased by 3% compared to 1998 and its contribution reached 28% of GDP.

There are two main reasons for this process. Firstly, technological and social advancement increases the demand for services:

In 2001, 38.4% of the total workforce was employed in high-tech industry and knowledge intensive sectors.

- In the majority of EU countries personal income is rapidly increasing. When Lithuania becomes a member of the EU it is expected that the income of its population should grow faster and this in turn will mean that more money will be allocated to leisure;
- The development of transport infrastructure allows for increased mobility, so people will be able to reach holiday and recreational destinations quicker and cheaper;
- With the new technologies having an effect on the characteristics of labour activities in the countries of the EU, the number of working days has decreased and weekends have become longer. The traditional ways of organising work are being replaced by more flexible approaches

Labour productivity in the knowledge economy, 2002

	Value added per hour (LTL) 2000	2001	2002	Average monthly growth rate (%)
Manufacture of chemicals, chemical products and fibres	37.00	43.17	55.16	21.5
Others, not assigned to any manufacture category of apparatus and equipment	12.57	19.92	23.70	33.30
Manufacture of electrical and optical instruments	22.92	23.80	25.62	5.4
Manufacture of internal combustion transport engines and trailers	19.84	22.52	26.25	15.00
Post and telecommunications	50.80	59.72	71.34	18.50
Financial mediation	39.96	42.88	49.97	11.00
Insurance	25.54	26.65	49.97	7.5
Research and development	2.90	2.61	2.47	- 7.5
Education	11.03	11.22	11.51	2.10
Health care and social security	8.63	9.67	9.56	5.2
Leisure, culture, sport	9.51	13.28	13.81	12.6

and the number of people not working a full working day is increasing;

• Life expectancy is growing and older people have more free time.

The second set of reasons is related to the fact that changes in the way of life demand new standards of quality for services:

• Due to the increase in the rhythm of life, people's choices are limited more by a lack of time than by a lack of money. This means people strive to spend their free time more intensively and in more interesting ways;

• The different ways in which people can spend their leisure time has increased. People are more informed and electronic mass media open up opportunities for a wider range of activities, and this in turn impacts on a demand for high-quality services.

So an increased contribution of culture to the economy can create a greater material well-being. For creative self-expression is vital to modern institutional infrastructure, and economic policy due to which an effectively functioning market would allow for innovation. The aim of modern economic policy is, therefore, not the creation of working places, but rather the development of infrastructure conducive to the accumulation of knowledge and creative potential - an important prerequisite for the development of a business sector and the entire nation.

The increased contribution of the knowledge economy to GDP was determined by a rapid growth in high-tech industry, communications and financial services.

Over a five-year period, the contribution of research and development to the economy has fallen by nearly 35%.

A 'knowledge friendly' environment means that accents in economic development have to be shifted from the repair of roads and the construction of industrial objects to the provision of computer servers and telecommunications and the promotion of market institutions conducive to new ideas. In 2002, traditional business companies prevailed in the Lithuanian economy. However, the knowledge sector increased by 3% compared to 1998 and its contribution reached 28% of GDP.

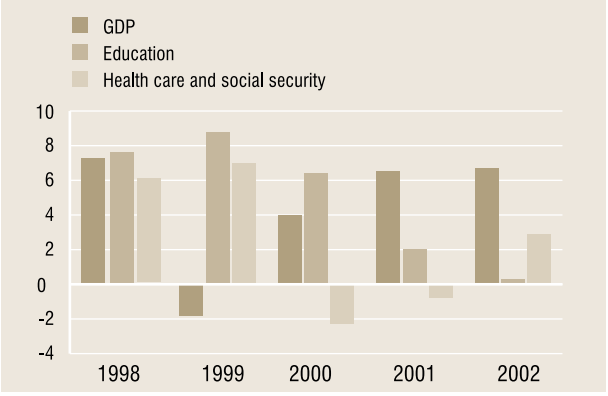
In today's information society it is difficult to be excluded from the changes that are taking place as all economic subjects are interrelated through information exchange networks, so it is also necessary to maintain certain common standards. With the increasing range of information technology companies and their activities, enterprises that had once been leaders in the market have slowly been forced out of their well-recognised positions. In striving to maintain their influence and position they have been forced to become more competitive and also more rapidly apply innovations. This type of competition between old and new economies, as well as the new threats imposed on the country's industrial elite in the competition for state support, has acted as a stimulus for technological advancement.

In Lithuania the contribution of the knowledge economy to employment was larger than to the creation of new products. In 2001, 38.4% of the total workforce

Technology and knowledge-intensive economic sectors relative to GDP (%)

	1998	2002	Change
Manufacture of office machinery and computers	0.03	0.04	14.9
Manufacture of radio, television and communication equipment and apparatus	0.54	0.72	33.60
Manufacture of medical precision and optical instruments, watches and clocks	0.34	0.30	- 11.40
Total of all technology sectors	0.91	1.06	16.50
Manufacture of chemicals, chemical products and artificial fibres	1.22	0.92	- 24.10
Others, not assigned to any manufacture category of apparatus and equipment	0.70	0.79	12.10
Others, not assigned to any manufacture category of electrical apparatus and equipment	0.42	0.42	0.00
Manufacture of internal combustion transport engines and trailers	0.04	0.05	22.90
Manufacture of other types of transport equipment	0.53	0.55	3.90
Average of total technology sectors	2.91	2.73	- 6.20
Water transport	0.43	0.42	- 1.10
Air transport	0.15	0.17	11.30
Post and telecommunications	2.30	3.99	90.50
Central banking	1.55	1.73	11.60
Insurance	0.35	0.30	- 13.20
Activities auxiliary to financial intermediation	0.07	0.07	0.10
Real estate transactions	4.09	4.19	2.50
Rental of machinery and equipment without operator	0.07	0.15	116.50
Computers and other related activities	0.32	0.52	62.60
Research and development	0.08	0.05	- 34.90
Other business activities	1.93	2.40	24.60
Education	5.47	5.54	1.40
Health and social welfare services	3.49	3.08	- 11.70
Leisure, cultural and sporting activities	0.86	1.07	24.30
Knowledge - intensive sectors	21.16	23.68	11.90

Real growth in GDP, education, health care and social security expenditure (%)



Social infrastructure and trust - that is, social capital - can help to realise human capital. Communities with high levels of social capital tend to achieve better results than communities that are fragmented and suffer from social exclusion.

The fact is that governments cannot directly increase social capital, but they can create favourable conditions for investment into its development. For example, in the fields of education and training it is possible to pay more attention to the development of communication skills, which play a significant role in the development of trust and confidence among people and on the level of economic activity.

Source: The New Economy: Beyond the Hype, OECD. 2001. p.59

was employed in high-tech industry and knowledge intensive sectors. On the one hand, such a high number of people employed in the high-tech sector shows how important the knowledge economy is to the labour market. On the other hand, this also means that the labour productivity in this sector is not particularly high, given the small proportion of high value-added activities in the economy.

In EU countries the number of employed in the knowledge economy sector is 40.5% of the total employed. Of these, 7.6% (the largest number, in Germany, is 11.2%) were employed in high and mid-level technology manufacturing, compare to 3.8% in Lithuania. The total number of employees in the knowledge economy sector reached 32.9% of all employed people in the EU in 2001, while in Lithuania the figure was 44.5%.

The increased contribution of the knowledge economy to GDP was determined by a rapid growth in high-tech industry, communications and financial services. Over a five-year period the proportion of advanced technology in the structure of GDP increased by nearly 17%, whereas auxiliary financial activities and communications almost doubled. However, the role of advanced technology-based industries in the economy remained modest and in 2002 accounted for only 1.06% of GDP.

It is not only positive structural changes, such as the growth in telecommunications, air transport and other services, that can be noticed with the expansion of knowledge-intensive services, but also factors that hinder opportunities for the growth of the country's intellectual potential. Over a five-year period, the contribution of research and development to the economy has fallen by nearly 35%, whereas the growth in education, health and social security is not enough to meet the demand of the rapidly growing economy and may pose a threat to long-term economic progress. Particularly unfavourable circumstances have developed in health care and education, where the overall scope of services provided for the period between 1998 and 2002 grew at a slower rate that the economy did (by 2.5% and 3.0% annually on average). Obviously this did not create favourable preconditions for the accumulation of 'intellectual capital'.

To educate a 'competitive personality' fit for the knowledge economy more funds are required. The use of more complex educational technology, the increased flow of information and the need to provide specialised knowledge and ensure cultural development make the learning process more expensive. Moreover, standards for the quality and provision of social services, which influence the behaviour and creativity of individuals, have risen.

In the long run even slower growth in intellectual capital could determine significant changes in the standard of living and bridge the gap between Lithuania and the EU. An accumulation of intellectual capital is more important for economic growth than an increase in physical capital.

Potential for the development of the knowledge economy

Comparing the value added per capita by economic activity in Lithuania with the EU average, it is easy to notice that the lowest potential for growth is in agriculture, hunting and fisheries where value added has already reached 54% of the per capita EU indicator. However, such high value added has been achieved due to extensive factors while the productivity of these economic activities stands at only 15% of the EU average. One could claim that advanced technologies are being severely underused in Lithuanian agriculture and that their application would increase productivity. However, this may reduce the number of people employed in agriculture - a sector that employs 17 % of the labour force. If a vocational training system was properly organised, young people employed in agriculture could later be re-employed in high-tech industry or services.

In manufacturing and energy value added per capita does not reach 25% of the EU average. The pro-

Value added per capita by economic activity, 2001*

Economic activity	Value added per capita, EUR		Lithuania relative to EU average (%)
	Lithuania	EU average	
Agriculture, hunting, fisheries	243	454	54
Manufacture and energy	985	4,750	21
Construction	212	1,154	18
Trade, transport and telecommunications	1,006	4,653	22
Business and financial service	361	5,837	6
Other services	669	4,655	14

**Source: Statistics in Focus. Theme 2. Eurostat: 41/2002, p.6*

GDP and value added, average annual growth rate by economic activity in 1995 prices (%), 1998-2001 *

Country	GDP	Agriculture, hunting, fisheries	Industry and energy	Construction	Trade, transport, communications	Business, financial services	Other services
EU	2.7	0.4	2.2	1.4	4.0	3.9	1.5
Estonia	4.0	- 2.6	4.5	5.9	6.7	4.9	1.1
Lithuania	3.9	- 4.6	6.2	- 2.6	5.0	5.4	1.3
Latvia	5.5	0.4	2.9	9.8	7.4	9.3	2.0
Poland	3.5	- 2.3	3.3	0.9	5.2	4.2	1.5

**Source: Statistics in focus. Theme 2. Eurostat, 41/2002, p.5*

portion of the processing industry is bigger in the Lithuanian economy than any other candidate country, production of low value-added products prevails there. By increasing the production of high value-added, knowledge-intensive goods, Lithuania has the opportunity to generate a higher per capita income in its processing industry and to converge with EU indicators.

Lithuania lags behind the EU in developing 'knowledge-intensive' economic activities. The provision of business and financial services to the population constitutes only 6% of the average indicator characteristic to the European market. Between 1998 and 2001, the average annual rate of growth for business and financial services exceeded the EU average by 1.5%, whereas in the social sector it lagged behind the EU growth average. Although the contribution of services to GDP has markedly increased, from 28% in 1990 to 60.5% in 2002, Lithuania is still behind the EU average. This means there is great potential for growth, particularly in knowledge-intensive services.

All EU candidate countries share the same problems related to economic structure, although the service sector is developing rapidly. Lithuania surpasses its neighbours in growth in manufacturing and has become a leader in the field of traditional economic activities.

Investment in qualifications, and training by Lithuanian companies and employees was one of the lowest among EU member states and candidate countries.

The fastest growth in services was in Latvia, which exceeded the EU average rate by two times. In Estonia similar indicators were also better than in Lithuania.

One of the reasons for the slow growth in the knowledge-intensive sector, despite its relatively low market share, was that the Lithuanian economy was less opened compared with other candidate and EU member states. New knowledge in one company increases knowledge in other companies, since it is not possible to limit its dissemination. Therefore, the openness of companies and economies at large, through increased capability to interact and trade, allows many people to exchange new knowledge, which can become a catalyst for innovation. In 2001, the Estonian and Maltese economies were the most oriented towards external communication according to the open trade indicator which exceeded 70% in both cases. Slovakia and the Czech Republic followed them, while Lithuanian foreign trade was not so active, its open trade indicator being 50%.

The development of new high-tech and knowledge intensive products depends on a more effective labour force, which itself is a 'product' of new education technology. In striving not to fall behind in such technologically advanced economies, companies constantly organise upgrading courses that provide workers with new knowledge and teach them how to use information in the workplace and generate new ideas. The knowledge economy places great demands on the quality of investment in people, which is understood broadly beyond training as life-long education and the formation of individuality. To strengthen employees' motivation it is important to allow them to feel that their qualifications and further training are valued beyond remuneration by informing them about their input into the overall results of the company.

Investment in qualifications, skills and training by Lithuanian companies and employees was one of the lowest among EU member states and candidate countries. The only businesses investing less in labour force efficiency were those in Romania. According to Eurostat, in 1999 the amount of money spent on qualification upgrades in Lithuania was less than 1% of total labour cost. In Latvia it surpassed 1% and it reached nearly 2% in Estonia. Denmark was the leader among EU countries, according to this indicator, where the figure was 3.0% of total labour cost.

In Lithuania, the sector that assigned the most funding to the training of employees was financial mediation (1.6% of total labour costs), followed by real estate and the rental business (1.1%), processing industry and trade (0.6% and 0.5%, respectively). In social security, employees were allocated only 0.2% of the total labour cost to training and upgrading.

The fact that both employers and employees pay so little attention to the acquisition of new knowledge is one of the main reasons why Lithuania is lagging behind in the implementation of information technology in production and services.

Research undertaken by World Economic Forum specialists on the use of information technology in 82 countries indicated that Lithuanian businesses are less prepared to use IT than the government or the

population as a whole. According to preparedness to use IT and actual use of IT, Lithuanian business was in 53rd and 78th place, respectively, out of the 82 countries, while the population occupied 41st and 39th and the government 35th and 43rd.

Such indifference to the acquisition of knowledge by businesses can be attributed to the economic policy of the government. The strategy aimed at maintaining economic growth during the transition period, which was implemented by all successive governments, focused on the promotion of private investment through generous fiscal policy and adequate legislation and privatisation. Such decisions were validated by the opinion that there was a lack of capital and private investment could become the main driving force for economic growth.

The policy, favourable for accumulating capital, actually decreased the need for innovation and had a negative impact on the state budget income and in turn on investment into public services. In other words physical capital accumulation occurred at the expense of the growth of intellectual capital. This policy, moreover, did not promote the search for unused reserves such as the better utilisation of existing capacities, a more effective use of resources and the transition to management practices that were oriented towards a knowledge-based economy. In the end, this was not conducive to the flow of resources from sectors with lower productivity to highly productive knowledge-intensivesectors.

If companies had felt the 'starvation' of investment, they would have had to look for other ways of development. Managers would need to search for new markets, focus on how to sell goods and services better and seek ways for the effective utilisation of the labour force. New enterprises would be established in highly effective economic sectors, the level of skills would increase and international business management and accounting practices would be more widely introduced as one of the preconditions for competing in international markets.

From the beginning of 2002, fiscal measures for promoting capital investment were renounced. As a result of this decision the positive effects were first felt in the financial market, due to an increase in the demand for loans and other financial services. In a one-year period the amount of loans issued by banks increased by 22% - the most rapid bank loan portfolio growth in eight years. The growth in the loan portfolio was also influenced by other factors.

However, tax and tariff barriers can hinder the participation of business and the general population in the economy as well as the acquisition of new knowledge. A weakly developed financial sector and capital market means that the offer of cheap capital to finance innovation and the establishment of new companies is not sufficient. This is especially of major concern since new companies are most often established in the knowledge economy sectors.

The implementation of new economic strategies: long-and short-term challenges

Due to the integration into the EU and modernisation of the economy, the Lithuanian state financial system is facing new medium-term and long-term challenges. According to the preliminary distribution of funds by the European Commission for the period 2004-2006, Lithuania is expected to receive 1.73 billion EUR. A total of 607 million EUR will be channelled through the EU's structural funds and the Cohesion Fund, while 303 million EUR will come through PHARE, ISPA and SAPARD. The long-term results and the effectiveness of the utilisation of these large funds will depend on government spending policy and its priorities. Lithuania had the opportunity to evaluate the impact of changes in government spending policy on the economy during the transition from a centralised to a market economy, when the role of the state in the economy diminished and the functions of the government underwent drastic changes.

In 2002 great attention was paid to fiscal reform to ensure that the mechanism for the distribution of state finances between competing programmes was effective and conducive to the selection and support of programmes and projects, speeding up the creation of a modern economy. This was not easy to achieve, as the traditions of government spending were focused on addressing short-term objectives and very often fiscal priorities were changed in accordance with the government's political programmes or in seeking consensus in the Seimas (Parliament).

In the Single Programming Document, which defines the directions for the application of EU structural funds, one of the priorities is to support the knowledge economy through the allocation of bigger state funds to social infrastructure, in order to promote edu-

Analysis of the results of the economic development of 100 countries between 1960 and 1995 shows that GDP growth is adversely related to the proportion of a government's consumption (expenditure on education and national defence) in GDP. However, it is positively linked to the aggregate indicator that reflects the 'quality' of the legal system and the attainment of education expressed in the average number of years of schooling, for example.

cation and knowledge accumulation. However, the experience of fiscal policy gained during the transition period reveals that the outcome depends on the effectiveness of investment and administrative competence rather than on their size.

An institutional and legal framework that is well developed and free from corruption is crucial for individual freedom as well as for the effective use of financial resources and the implementation of new ideas. Well functioning private or governmental institutions are also important for a successful business as they reduce costs associated with services and the collection of information. On the other hand, the effective use of EU structural funds is conditional on the establishment of trustworthy principles and criteria for evaluating the demand for funding. Such criteria are methodologically difficult to set up for programmes in the social sector. Moreover, evaluation is often conducted by employees who are inclined to defend their professional interests. Competent management and administration will have a decisive impact on the capacity to attract EU structural funds to the social sector. However, there is a lack of good managerial skills in the social sector. Although social expenditure did not increase much between 1998 and 2001, the number of managerial staff grew.

An institutional and legal framework that is well developed and free from corruption is crucial for individual freedom as well as for the effective use of financial resources and the implementation of new ideas.

As human capital is the main growth factor in the knowledge economy, territorial gaps in economic development are to a large extent related to the difference in the development of social infrastructure, which is in turn closely related to the accumulation and use of human capital. Moreover, uneven economic development is conducive to social polarisation and erects barriers on the path that information and knowledge are moving along between different social groups.

High territorial differentiation and social polarisation evolves the potential threat that population groups from highly developed regions would benefit from EU structural funds because they possess the information and skills necessary for the preparation of project documentation and applications for funding, while the inhabitants of small towns and rural areas who lack information and knowledge will remain in a disadvantageous position.

Integration with the countries of the EU, which have already accumulated high intellectual capital and are rapidly developing their own knowledge economies, will speed up similar processes in Lithuania. The participation of regions and various social groups in this process will depend on the priorities of government spending and the efficiency of institutions responsible for raising public awareness and information dissemination.

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Employment in the information society

Vida Kanopienė

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The development of an information society fosters deep, qualitative changes in employment. Through telecommunication technologies have appeared completely new qualifications, workplaces, types of work (such as teleworking) and entire economic sectors. Essentially, information technology (IT) is changing the very content of work raising higher and more complicated requirements for professional mobility, flexibility and motivation. On the other hand, as a result of IT, individuals can more easily and quickly integrate into the labour market and actively participate in social life.

The development of an information society fosters deep, qualitative changes in employment.

Employment: general trends

In 1991 for every 100 people of working age 89 were employed. Ten years later, in 2000, the number of people employed had fallen to 74. Of those who became unemployed, women constituted two thirds (68%). The proportion of women in the total number of the employed decreased from 53.8 to 50.3% in 2002. The most drastic changes in the employment of women occurred between 1991 and 1995 when one in every five women left the labour market. Meanwhile, the employment of men fell by only 6.6%.

According to Labour Exchange data from 1 January 2003 unemployment in Lithuania was 10.95%, nearly one-and-a-half times higher than in Latvia (7.6%) and twice as high as in Estonia (5.4%). A particularly significant problem is the enormous territorial differences in unemployment. For example, at the end of the fourth quarter of 2002 the highest level of unemployment was in Druskininkai (26.2%), while the lowest was in Trakai and Kedainai (4.4% for both regions). An unemployment rate higher than 20% remained in seven municipalities, while rural inhabitants constituted 40% of all the registered unemployed.

According to Labour Exchange data of 1 January 2003 unemployment in Lithuania was 10.95%, nearly one-and-a-half times higher than in Latvia (7.6%) and twice as high as in Estonia (5.4%).

Average annual unemployment level (%)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003*
Total	1.3	4.4	3.8	6.1	7.1	5.9	6.4	8.4	11.5	12.5	11.3	10.9
Women	-	5.0	3.8	6.4	7.7	6.3	6.6	8.2	10.5	11.9	11.3	11.0
Men	-	3.7	3.8	5.8	6.6	5.6	6.2	8.5	12.2	13.2	11.4	10.8

**Data as at 1 January*

On 1 March 1999 the Law on Equal Gender Opportunities came into effect aimed at ensuring the practical implementation of equal rights for women and men as stipulated by the Constitution of the Republic of Lithuania. Prior to this law many employers openly expressed a discriminative attitude towards women. An analysis of all 3,531 job advertisements placed in the biggest daily newspaper Lietuvos Rytas during the first half of 1996 revealed that 10% of them directly indicated the preferred gender of the employee, while two thirds stated this requirement indirectly, using nouns with masculine gender endings. Men were usually offered positions of higher responsibility related to team management that required high qualifications, computer skills and the use of information technology, whereas women were invited to work as secretaries, shop assistants and accountants.

The fact that the majority of employers 'think' within traditional gender stereotypes was also evident from a sociological survey of employers carried out in 1997. The majority of respondents stated that males have greater mathematical talent, that they are able to think more rationally and that they are better suited to management and leadership positions.

V.Kanopienė, Moterø diskriminacija darbo rinkoje. Vilnius, 1998

Unemployment level by district, 2002

Employed, unemployed and inactive population	1998	1999	2000	2001	2002
			Average, thousands*		
Employed	1,597.6	1,598.4	1,517.9	1,460.6	1,405.9
Women	774.3	786.3	758.1	735.4	698.1
Men	823.3	812.0	759.8	725.2	707.8
Unemployed	244.9	263.3	275.7	299.2	224.4
Women	107.7	113.0	116.7	121.3	103.3
Men	137.2	150.3	159.0	177.9	121.1
Economically inactive	1,144.7	1,143.7	1,173.5	1,225.9	1,185.0
Women	724.7	717.3	722.5	750.3	727.9
Men	420.0	426.4	451.0	475.6	457.1
			%		
Employment level**	62.3	62.3	59.8	57.7	59.6
Women	58.6	59.6	57.9	56.4	57.1
Men	66.2	65.2	61.9	59.0	62.3
Unemployment level	13.3	14.1	15.4	17.0	13.8
Women	12.2	12.6	13.3	14.2	12.9
Men	14.3	15.6	17.3	19.7	14.6
Proportion of women among the employed	48.5	49.2	49.9	50.3	49.7
Proportion of women among the economically inactive	63.3	62.7	61.6	61.2	61.4
Proportion of women among the unemployed	44.0	42.9	42.3	40.5	46.0

**Labour Force Survey data*
***People aged 15-64 years*

Lithuanian labour legislation considers young people a group eligible for additional support in the labour market. Special measures aimed at integrating young people into the labour market have a very important place in the national employment programme. Two thirds of young people who are looking for a job for the first time are getting involved in active labour market programmes. More than two thirds of vocational, university and non-university graduates participate in special professional career planning programmes. New programmes are being aimed at the consultation and professional orientation of young people. A programme called 'first steps' is designed for young people without an employment record and a 'talent bank' has been tailored for unemployed people who have not completed university or specialised secondary education. However, beside such significant achievements several unresolved problems remain. The Labour Exchange database on the Internet is not accessible to all potential users and it is difficult for young people in rural areas to take advantage of professional consultation services. The results of the sociological surveys indicate that 25% of young unemployed people have no knowledge of vocational training opportunities.

At the end of 1993 only every tenth registered unemployed person was over 50, whereas in 2002 it was already every fifth. This trend could to a large extent be ascribed to the prolonged retirement age. Both statistical data and the results of sociological surveys show that people of an older age lose their jobs more quickly and that it is considerably harder for them to find work again. Employers often prefer people aged 35 years old or younger and this requirement is often applied to women. It must be noted that Lithuanian legislation prohibits discrimination related to gender, but there is no mention of discrimination due to age.

The Law on Unemployment Benefits states that people who have five years left before pension age are eligible for additional support on the labour market. Amendments to the law of December 2001 foresee that unemployed people who have less than two years left before pension age are eligible for unemployment benefit for the entire pre-pension period.

Unemployment by gender and age

Labour Exchange data do not reveal a large-scale 'withdrawal' of women from the labour market. Although men dominate among the unemployed, nearly two thirds of economically inactive people are women. After unsuccessful attempts at job hunting many women end up as housewives. Such a decision is often prompted by the hidden gender discrimination that exists in the labour market.

As in the majority of the countries of the EU, unemployment among young people (aged between 16 and 25 years) in Lithuania is higher compared to other age groups. At the beginning of 2003, youth unemployment stood at 13.4%, which is 2.5 percentage points higher than the national average. However, the proportion of people aged between 15 and 25 among the registered unemployed is decreasing constantly. Between 1993 and 2002 it fell from 23.4 to 12.1%. In 2002 alone the average annual level of youth unemployment fell by almost 20%. Every second young person registered with the labour exchange has no qualifications and only one in ten has completed specialised secondary or tertiary education. The majority of young unemployed people are not only po-

Unemployed by education* (%)

Education	1992	1993	1995	1997	1999	2000
Total	100.0	100.0	100.0	100.0	100.0	100.0
Tertiary - university	12.0	8.0	6.7	6.9	4.6	4.5
Higher non - university and specialised secondary	18.0	18.0	19.0	17.8	16.2	16.1
Vocational	48.0	48.4	47.9	37.7	45.1	45.7
None	22.0	25.6	26.4	37.5	34.1	33.7

** Labour Exchange data*

Employed and unemployed by education (%)

		1998	1999	2000	2001
Employed:	Tertiary - university	19.9	20.2	20.9	19.9
	Non - university (college)	23.6	24.9	25.0	29.5
	Specialised secondary, vocational	38.8	37.8	37.0	35.3
	Elementary, elementary with vocational	13.8	13.4	12.6	12.6
	Primary or no primary	3.9	3.6	3.7	2.7
Unemployed:	Tertiary - university	6.9	7.9	7.2	6.7
	Non - university (college)	0.1	20.6	21.7	22.1
	Specialised secondary, vocational	48.1	47.4	45.3	48.2
	Elementary, elementary with vocational	21.8	22.0	23.6	21.3
	Primary or no primary	3.1	2.1	2.1	1.7

At the beginning of 2003, youth unemployment stood at 13.4%.

The proportion of the unemployed without vocational training constitutes nearly half of the total number of unemployed, while only 20% of job vacancies do not require qualifications.

The Ministry of Social Security and Labour and the Lithuanian Labour Exchange are the main bodies responsible for the preparation and implementation of programmes aimed at reducing unemployment and integrating groups vulnerable to unemployment into the labour market. Active labour market policies strengthen the motivation and competitiveness of the unemployed in the labour market through unemployment prevention, re-qualification and business development schemes like 'work clubs'. Employment measures target different groups among the unemployed and special employment needs. Unemployment benefits belong to passive labour market policy measures.

About 25% of funds allocated for employment measures go towards vocational training programmes in which approximately 20% of registered unemployed participate. The number of participants in these programmes grew rapidly at a rate of almost 1.5 times each year between 2000 and 2002. Almost half of those who take part in vocational training are below the age of 25. According to a sociological survey, 60% of those who have completed labour market vocational training courses are employed immediately, 80% after three months.

orly prepared to compete in the labour market, they often lack motivation to work.

Aggregate indicators of employment and the level of economic activity among young people depend on the proportion of daytime pupils and students among them. Between 1996 and 2001 the total number of people continuing education after secondary school increased by 1.8 times. The level of employment for the 15-19 age group fell by 8.7% (from 12.9% to 4.2%) between 1998 and 2002 and by 9.1% (from 55.1 to 46.0%) for the 20-24 age group.

Labour demand and supply

In 1992 the proportion of unemployed people with higher education accounted for 12% of the total registered unemployed, while 78% of available job vacancies were related to manual or low qualified labour. Later the proportion of educated professionals among the unemployed fell steadily and reached 4.5% in 2000. The proportion of the unemployed without vocational training grew from 22% to 33.7%. Today, the proportion of the unemployed without vocational training constitutes nearly half of the total number of unemployed, while only 20% of available job vacancies - mainly short-term jobs in agriculture and construction - do not require qualifications.

With an increasing number of unqualified people among the registered unemployed, the number of long-term unemployed is growing. In 2002 the long-term unemployed accounted for 27.4% of the total unemployed. Nearly half are without vocational training and one third have a lower than secondary education. The number of long-term unemployed with low education and qualifications is growing rapidly compared with other long-term unemployed groups and on 1 January 2003 exceeded 58,000 people. According to the labour force survey for the first quarter of 2002, men of older age and rural inhabitants aged between 25 and 49 are the least successful in jobseeking.

There is a wide gap between the level of education of the employed and unemployed. According to the labour force survey, 50% of the employed have university, non-university or specialised secondary education and between 14% and 16% have either elementary or lower education. However, among the unemployed proportions of those who have the highest and lowest levels of education are relatively close (29% and 23%, respectively).

Average annual changes in employment by economic sector/activity

	Total employed thousands		Change (%)		Employment structure(%)		
	1990 - 1996	1997 - 2001	1990 - 1996	1997 - 2001	1990	1996	2001
Total	**-193.7**	**-147.4**	**-10.5**	**-8.8**	**100.0**	**100.0**	**100.0**
Agriculture	40.9	- 102.5	11.4	- 29.5	19.4	24.1	17.1
Industry	- 232.1	- 20.1	- 41.0	- 6.0	30.5	20.2	20.7
(of which) Mining, quarrying	- 2.7	- 0.4	- 43.5	- 10.8	0.3	0.2	0.2
Processing industry	- 244.0	- 16.8	- 45.8	- 5.8	28.7	17.5	17.9
Electricity, gas, water supply	14.6	- 2.9	52.7	- 7.0	1.5	2.5	2.6
Construction	- 89.9	- 19.3	- 43.0	- 16.3	11.3	7.2	6.5
Services	87.4	- 4.0	12.2	- 0.5	38.8	48.5	55.7
(of which) Retail and wholesale trade	75.6	- 12.6	55.6	- 5.1	7.3	12.7	15.4
Hotels and restaurants	1.7	1.4	10.4	5.3	0.9	1.1	1.8
Transport, warehouses and communication	- 10.2	- 3.6	- 9.7	- 3.8	5.7	5.7	6.1
Financial intermediation	6.30	- 1.8	58.9	- 10.7	0.6	1.0	1.0
Real estate, rental and commercial activities	7.9	7.4	18.0	13.9	2.4	3.1	4.0
Pubic management and defence; Mandatory social insurance	20.1	7.5	42.0	10.8	2.6	4.1	5.0
Education	14.0	16.3	10.5	10.9	7.2	8.9	10.9
Health and social work	3.7	0.2	3.7	0.2	5.3	6.2	7.0
Other services	- 31.7	- 25.5	- 25.2	- 25.9	6.8	5.7	4.2

Changes in the professional structure of the labour force are related to the growth in the number of users of information technology.

Employment patterns

In developed western economies employment has undergone the following stages of evolution: a post-agricultural period (1920-1970), when there was a rapid decrease in employment in agriculture, and a post-in-

In 2000, 9,802 people were employed in the 47 largest IT companies in Lithuania. Seventy percent of these companies were concentrated in Vilnius and the remainder in Kaunas (12), Klaipeda (1) and Panevezys (1) [*Verslo Þinios,* 24 October 2000). In the following two years the number of employed people in companies trading in information technologies alone nearly tripled, to reach 25,000 people (*Verslo Þinios,* 22 October 2002]. Special research data indicate that about 20% of professionals in the information technology sector are programmers, 14% are technical assistants, between 14 and 16% are managers of departments or projects and about 10% are information systems operators and computer network specialists.

E.Sysojevas. Atlyginimai IT sektoriuje: svajonës ir tikrovë. Naujoji komunikacija, 2002, Nr. 12 (112).

Employment by profession

Profession	Employment structure (%)					
	1997	1998	1999	2000	2001	2001 relative to 1997 (%)
Total	100.0	100.0	100.0	100.0	100.0	93.0
Lawyers, senior officials and managers	11.0	10.6	9.6	8.2	7.4	62.5
Specialists	12.0	13.0	14.0	14.3	15.5	119.8
Junior specialists and technical staff	8.1	7.3	7.4	7.7	9.0	103.8
Junior employees	5.9	5.2	4.5	4.8	4.3	68.2
Service provision and trade personnel	10.5	10.2	11.6	12.5	13.0	115.1
Qualified agricultural and fishery workers	14.6	15.6	15.7	16.1	14.1	89.5
Qualified workers, trades	17.6	16.9	16.5	16.6	17.6	93.0
Equipment, machine operators and assemblers	9.8	10.0	9.7	9.5	10.2	96.4
Unqualified workers	10.5	11.0	10.9	10.2	8.7	76.8
Armed forces	0.1	0.1	0.2	0.1	0.3	262.5

dustrial period (1970-1990), characterised by a marked increase in employment in the service industry. Employment in Lithuania has gone through these stages simultaneously, inconsistently and more intensely. In 1990, for every 1,000 people working in industry, 1,268 people worked in services and 634 worked in agriculture. In 1997 the ratio had become, respectively, 2,546 and 1,091 and in 2001, 2,696 and 829. Thus, regardless of similarities in employment trends (a gradual reduction employed in industry and a rise in services), in Lithuania there still remain a markedly higher proportion of those employed in agriculture (17%). For example, between 1998 and 2000 in the countries of the G7 the number of those employed in the agrarian sector ranged from 6% (Italy) to 2% (France and United Kingdom) of the male labour force and from 6% (Japan) to 1% (United States, United Kingdom, France) of the female labour force.

According to the population census of 2001, 126 people per 1,000 population who are aged 10 or older had a tertiary education.

Education is one of the most important factors of sustainable employment in an information society.

The newest and most rapidly developing field of activity is related to telecommunications and information technology. So far, this sector is not distinguished by official employment classification and the Department of Statistics does not provide regular information about the number of employed IT specialists, nor about their professional breakdown.

It is possible to evaluate the impact of the IT sector on employment indirectly by analysing its impact on changes in employment structure by occupation/profession groups. Labour force survey data indicate that between 1997 and 2001 there was an increase in the number of professionals (119.8%), service and trade workers (115.1%) and junior specialists and technicians (103.8%). In other profession groups (except for the armed forces) the number of the employed fell. This process was most intensive in those spheres of activity that do not require higher education or qualifications, such as agriculture.

Changes in the professional structure of the labour force are related to the growth in the number of users of information technology. According to the Department of Statistics, at the start of 2002 computer technology was used by 84.4% of manufacturing industry and service sector companies. In some eco-

Employees using information technology by size of company*

Size of company	Computers per 10 employees	Employees using computers at work (%)	Employees using the Internet at work (%)
10 - 49 employees	2.5	28.8	25.6
50 - 249 employees	1.8	21.9	17.4
250 or more employees	1.8	20.8	14.2
Total average	2.0	23.3	20.0

** Calculated according to the average number of employees, number of computers and number of employees using computers and Internet services.*

Use of information technology by governmental institution employees*

Institution	Computers per 10 employees	Employees using computers at work (%)	Employees using the Internet at work (%)
Governmental institutions	4.3	59.6	40.4
Government and all subordinate institutions	7.0	74.1	70.7
Ministries	11.0	91.4	84.7
President's Office	8.0	-	49.0
Parliament (Seimas)	8.0	-	75.0
District Administrations	4.1	49.3	37.0

** Calculated according to the average number of employees, number of computers and number of employees using computers and Internet services.*

Education per 1,000 population aged 10 and older

Level of Education	1959	1970	1979	1989	2001
Tertiary	16	35	61	97	126
Specialised secondary	39	58	103	195	193
Secondary	41	78	147	231	272
Elementary	136	197	231	169	150
Primary	378	371	317	236	208

Education per 1,000 population aged 10 and older, 2001

Level of Education	Women	Men	City Inhabitants	Rural Inhabitants
Tertiary	135	115	161	55
Specialised secondary	209	175	211	156
Secondary	261	284	286	242
Elementary	125	178	132	187
Primary	213	203	172	284

nomic sectors, such as financial intermediation and postal and distance communication, computer technology can be found in all companies. In other sectors this indicator is dependent upon the number of employees in the company. With any increase in the number of employees in a company, the level of computerisation rises. Nearly all of the largest companies (250 or more employees) use computer technology, whereas in smaller companies (up to 50 employees) more than a third in textiles, leather, timber, non-metal products and more than a quarter of hotels and restaurants, transport and storage organisations do not have this technology at all. The majority of larger companies also regularly use the Internet (among smaller companies only 61%).

It must be noted that according to levels of the utilization of computer technology, industry is substantially lagging behind governmental institutions, where the provision of computers and the proportion of those working with computers and using the Internet is several times higher.

World Bank research of the 10 countries seeking EU membership revealed that the development of the information society in these countries according to a set of indicators (such as the level of the computerisation of households and schools, number of Internet mobile communications users) lags behind the member states. This means that candidate countries like Lithuania have the potential to increase their competitiveness. This is related primarily to the highly qualified labour force and to the 'power' of science and technology.

Education as an important prerequisite of sustainable employment in an information society

According to the population census of 2001, 126 people per 1,000 population who are aged 10 or older had a tertiary education. Compared to the census of 1989, this indicator had increased by more than 30 percentage points. In the 1990s the number of people with a secondary education increased rapidly while the number of people with a specialised secondary (college) education remained virtually unchanged.

Some four decades ago every second Lithuanian had a primary or elementary education, while only one in 60 had a tertiary education. Today every eighth

According to a nationwide sociological survey carried out by the company Vilmorus (2000.12.1-4, 2001.02.15-19), people with a higher education value much more positively the impact of the information society on the economy and on the increase in the standard of living; 87% of those who have a tertiary education, 74% of people with a specialised secondary or secondary education and 58% with incomplete secondary education state that the impact is very strong or strong.

Sixty-five percent of people with a tertiary education, 37% with special secondary or secondary education and 22% with an incomplete secondary education work in computerised work places. However, not all of them know how to use a computer - respectively, 62%, 27% and 18%. An even smaller number of people have a computer at home: 33% with a tertiary education, 10% with a specialised secondary or secondary education and 7% with an incomplete secondary education. The ability to use the Internet also depends on the level of education; 49.2% of respondents with a tertiary education are able to use the Internet and do so every day or at least several times per week. The proportion of people who are able to use the Internet among those with a specialised secondary education is 21% and with secondary 29% - of whom a third use the Internet quite often (every day or at least several times per week). Of the opinion that part of their work could be done at home using a computer and the Internet are 55% of Internet users with a tertiary education and 30.9% with a special secondary education or secondary education.

The national information society development strategy outlines long-term guidelines for the knowledge society and related socio-economic reforms for the period from 2000 to 2011. Among the priorities is to encourage lifelong learning that combines seeking new knowledge with maintaining qualification and competitiveness in the national and international world labour markets. An important prerequisite for lifelong learning is access to distance learning. So it is necessary to consistently apply government distance learning and adult education programmes. In addition, it will be necessary to prepare continuous education programmes for farmers and rural inhabitants, to develop mechanisms for the recognition of informal education.

It is planned to differentiate requirements for entering training programmes for young people and adults who are currently working. It will be possible to accredit these programmes by reforming existing correspondence studies into new generation technology distance learning programmes.

As an important condition for the implementation of a national strategy on the development of the information society, international-level computer literacy requirements for government and municipal officials, teachers and public employees will be introduced.

person has a tertiary education diploma. The proportion of people with only the lowest level of education (primary or elementary) has decreased by nearly a third. So there remains a great difference in the level of education between rural and city dwellers. And as in the Soviet period, women notably exceed the level of education of men.

The majority of people with the highest education (85.5% with university and 73.6% with specialised secondary) live in the cities. Twenty-five percent of the population in Vilnius and 20% in Kaunas have a higher (university) education. Only 14% of people with a university and 25% with a specialised secondary education live in the countryside.

Education is one of the most important factors of sustainable employment in an information society. A good quality, high-level education determines the ability to use information and information technologies productively.

One of the main factors driving the increase in the overall level of education of the population is the growth in enrolment at all educational levels (except for vocational schools) and the growing number of people engaged in continuous education. The proportion of students continuing their education between 1992 and 2000 increased for those who graduated from basic school from 93.9% to 99.7% and for secondary school from 64.5% to 85.2%. In 1992, 55.6% of pupils continued their studies past basic school and every third enrolled in a tertiary institution after completing secondary school. In 2000 these figures increased to 85.8% and 55.3%, respectively . So more and more young people are seeking a university education, which can be attested by the fact that between 1996 and 2001 the number of students in tertiary education institutions increased by nearly two times.

The lowest wages are in economic sectors dominated by women, such as health care and education.

The changes in the enrolment by learning programme show that some of them are less popular as new programmes and professions emerge. For example, between the academic years 1996/1997 and 2001/2002, the number of people studying engineering in tertiary institutions decreased by more than a third, in agriculture, forestry and fisheries by 20% and in humanitarian professions by 10%. However, over the same period the number studying architecture and construction, law and information technology increased by several times. One of the most dynamically developing fields of study is related to computer technology. During the past five years enrolment in university learning programmes related to mathematics, statistics and computer studies has tripled.

The rate of increase in computer equipment prevalence - the number of computers increases each year by 30,000-40,000 and the number of computer users by 50,000-60,000 - indicates that computer literacy is becoming one of the key qualifications for the majority of professions. A complementary component of

Average monthly wage by gender and economic sector (%), second quarter of 2001

Economic sector	Average monthly wage of women, relative to men	Average monthly wage of women, relative to the national average	Proportion of women among the employed
Total	81.7	90.4	52.7
Agriculture, hunting and forestry	91.1	65.6	31.3
Processing industry	77.5	97.2	48.2
(of which) textiles	82.3	89.8	81.2
Electricity, gas and water supply	83.1	116.6	24.2
Construction	92.0	83.8	13.9
Retail and wholesale trade	79.2	83.7	52.1
Hotels and restaurants	92.1	67.9	70.7
Transport warehouses, communications	83.4	102.4	34.7
Financial intermediation	63.2	172.9	63.8
Real estate, rental and commercial activities	87.8	93.8	46.8
Computers and related activities	77.2	93.1	54.0
Research and development	88.2	130.2	46.7
Public administration and defence, social insurance	94.9	89.5	76.8
Education	70.0	89.9	57.3
(of which) specialised secondary education	83.3	76.7	83.3
Health care and social security	92.5	80.0	48.4

The international human resources company CVO Group carried out research in Lithuania by anonymously interviewing people who visited the company's website. This revealed that the size of the salary of people working in the information technology field depended on the following factors:

- type of company (salaries are 1.5 to two times higher for almost all employees in international companies than local companies);
- place of residence (the highest wages for professionals are in Vilnius, followed by Kaunas and Klaipeda);
- the level of education (professionals with tertiary education in all economic sectors earn on average one-and-a-half times more than the average for the sector).

By position the largest monthly net wage (3,050 LTL) is received by project managers and programmers (2,100 LTL) and network specialists, engineers, information system operators and analysts (1,640-1,780 LTL).

E. Sysojevas. Salaries in the IT sector: dreams and reality. Naujoji komunikacija, 2002, No. 12 (112).

DISTANCE LEARNING IN LITHUANIA

Aleksandras Targamadzë

Lithuania's first distance learning institute Kalbaneum, later known as Saviðvieta (self-education), began to provide correspondence learning courses in 1931. It offered dozens of programmes in basic education, pedagogical studies, accountancy, statistics, language courses and subjects. The Young Farmers School provided distance learning courses related to farming from the beginning of 1940, but it operated only for a short period. In 1944, when the Soviet Union occupied Lithuania, it ceased its activities.

After the war distance learning courses were developed in higher education and technical institutes as external learning studies based on the principle of correspondence and periodical sessions, in seeking a higher education diploma. There were no informal education courses.

The restoration of Lithuania's independence following the collapse of the Soviet Union gave a new impulse for the development of distance learning. In 1995 Lithuania became a part of the international PHARE distance-learning programme and the Lithuanian Distance Learning Centre was established for the implementation of this programme. New distance learning centres at Kaunas Technological University and Vilnius University, as well as study support centres at Vilnius Gedimino Technological University, Vilnius Higher Electronics School and Kaunas Higher Technology School were then set up and the first six distance learning courses were formulated.

In 1996 the Ministry of Education and Science established the Distance Learning Council responsible for the development of distance learning. Two studies were prepared (related to questions of distance learning and the development of learning technology) together with a concept for the development of distance learning in Lithuania. A decision was made to pursue the avenue of decentralised distance learning supported by an initiative from research and development (R&D) and educational institutions.

Informal and distance learning is regulated by the country's laws on informal adult education and higher education adopted, respectively, in 1998 and 2000.

Projects and initiatives. The implementation of a state programme on the development of distance learning (LieDM) started in 1998. In 2001 it was integrated into the programme Information Technology for Science and Education 2001-2006 (ITMis). Distance learning in the LieDM network is undertaken with the assistance of modern information technology, combining Internet learning and video conferences, expansion of the network of distance learning classes and centres and the installation of multimedia laboratories and video studios. A videoconference studio has been established at Kaunas Technological and Vilnius universities and a similar centre is being set up at Vilnius Gedimino Technical University. Classes with a video conference approach have been established at the Kaunas Technological, Klaipeda, Siauliai, Vilnius Gedimino Technical, Vilnius and Vytauto the Great universities, Kaunas Technological University, Panevezys Institute, Alytus, Marijampole and Utena colleges, Kedainai Jonuso Radvilos Higher Education School and Maþeikiai and Visaginas polytechnic schools.

The LieDM network creates the right conditions for people to maintain and advance their qualifications. It improves the conditions for life-long learning, widens the range of educational services and creates equal opportunities for everybody to study, regardless of their place of residence, gender, nationality, social status or physical state. It also creates the conditions, through the national distance-learning network, to benefit from distance-learning networks abroad. The LieDM network is designed to advance the qualifications of civil servants and specialists, to help the unemployed and potential unemployed to re-qualify and advance their qualifications and people with disabilities to learn and finally to simplify exchanges between higher education (tertiary education) lecturers and students.

In implementing the European Union's TEN (Trans European Tele-Education Network) project, the Lithuanian distance-learning network is being integrated into the European network, which operates using satellite links. The TEN network creates the technical opportunities necessary for accepting learning courses provided by the distance learning method. For the period 2000-2001 over 200 Lithuanian students took advantage of the TEN network's organised courses and received international certificates.

A study entitled Distance Learning Development in Lithuania was undertaken in 2001 while funding the ITMiS programme. The ITMiS programme is developing distance learning in the following directions:

- LieDM network expansion and development;
- the presentation of distance learning courses and study programmes, as well as the organisation of events within the LieDM network;
- the creation of distance learning courses;
- maintenance of the LieDM network's Internet portal;
- the training of network personnel;
- information dissemination about LieDM.

Distance learning courses have been developed and provided through participation in PHARE, Socrates, Leondardo da Vinci, Framework, UNESCO and other international projects. Currently, as a result of financial support from different sources, more than 100 courses have been prepared in Lithuania through the Internet and lecturers are ready to supervise distance-learning courses. Each year in implementing the ITMiS programme a competition is advertised for the creation of long-distance learning courses. By way of competition the preparation and development of 15 to 17 new courses is supported.

In 2002 the PHARE 2000 project, aimed at creating a basis for distance learning for vocational education, commenced. This project plans to establish vocational distance learning classes for employees in four districts (Marijampole, Klaipeda, Taurage and Utena), to prepare distance learning courses and implement a pilot training course.

In the LieDM network five distance-learning programmes are presented that provide a secondary level of university education. Kaunas Technological University provides a programme designed for vocational school teachers and an Information Technology masters learning programme. Vilnius University provides an International Communications Masters study programme, while Vilnius Gedimino Technological University provides Real Estate Evaluation and Construction Economics and Business Masters learning programmes. Additional learning programmes are also being developed. Already prepared and presented for registration at the Ministry of Education and Science is the inter-university masters learning programme Open and Distance Learning. This programme, with the help of the LieDM network, will be provided as a distance-learning programme by Kaunas Technological University, Vilnius University and Vilnius Gedimino Technological University. The learning programme is designed to prepare specialists in the organisation of distance learning, as well as the promotion of the utilisation of information technology during the teaching process.

Schools of higher education by way of the network implement academic exchanges and lecturers conduct lectures for several universities simultaneously. External learning (distance learning) students are able with the aid of the network to receive consultations. The creators of distance learning courses are consulted and prepared. Each year dozens of different courses are provided to society, such as the basics of computer literacy, the utilisation of information technology, educology, economic and commercial basics and so on. Furthermore, each year in the network there are dozens of conferences, seminars and other events, some of which include the participation of foreign countries.

The LieDM network Internet portal (www.LieDM.lt) is designed to provide information about distance learning, opportunities about different forms of learning and about the LieDM network and the institutions that make up the network. This portal is the first step towards creating a 'common learning market'. Through the portal anyone can become acquainted with institutions providing distance learning courses and study programmes.

In order to increase the interactive component of distance learning Kaunas Technological University has created a videoconference maintenance system (IMS) that empowers the lecturer, during lecture time, to maintain contact with distance students. During the video conference lecturers are able to observe the participation and level of activity of distance learning students, answer their questions during the lecture or upon its completion, send students slides and overheads from the lecture, make on-the-spot tests and check their level of knowledge, as well as observe results and draw on the help of an assistant in order to improve the effectiveness of the lectures. The IMS allows students to ask questions without interrupting the lecture, look at slides and overheads from the lecture on the screens of their personal computers and exchange text messages with the other users of the system.

In 1998 Kaunas Technological University initiated an integrated scientific research project called 'Distance learning methodology research/real time regime' (MetDM), which was implemented by five Lithuanian schools of higher education and the Lithuanian Science and Study Network LITNET. The Lithuanian State Science and Studies Foundation provided the financial support.

Conclusive remarks. In summing up the situation of distance learning in Lithuania one can conclude that traditional forms of correspondence and distance learning are changing and being replaced by courses supported by information and communications technology that allows learning to be brought into the office and the home. The conditions and infrastructure necessary for the development of distance learning have been set up. The development of distance learning has been incorporated into the strategy for the development of the information society and state institutions pay attention to it and allocate funds (according to their possibilities). International financial and technical assistance to distance learning is very important for its development and is used effectively. The further development of distance learning will be financed from EU structural funds.

However, there are several problems related to distance learning. Its infrastructure is better developed than the opportunity to use it, particularly with regard to the implementation of the principles of lifelong learning. There is a lack of understanding in society about the importance of learning for solving many personal problems while higher education institutions pay insufficient attention to the promotion of lifelong learning.

The existing legal framework is undeveloped and does not enhance distance learning. The state budget is unable to finance distance learning adequately while small town and rural residents very often cannot afford to study. In this context support from employers is very important. According to existing legal norms, however, expenditure on learning is equalised with salaries and taxed respectively, which is not conducive to financing the learning and training of employees. It would be logical to equalise investment in people at least with investment in manufacturing.

Despite the large number of courses and distance learning programmes on offer it is not sufficient to meet demand. The process of preparing distance learning programmes as well as their delivery should be enhanced.

computer literacy and related skills is knowledge of a foreign language, primarily English. The language barrier can be an important obstacle to the use of information technology, as a larger number of programmes and Internet sites are available in English.

Information about the command of foreign languages by level of skill was collected for the first time during the population census of 2001. In the Soviet period the population census focused on the knowledge of native and other languages within the Soviet Union - primarily knowledge of the Russian language. In 2001, 40% of the population knew one language in addition to their native language, 25% knew two, 5% knew three languages and 27% did not know any other language. The most popular foreign language is Russian, which is known by 60% of those who knew foreign languages. In second place according to popularity is English, which every fifth urban inhabitant and every tenth rural inhabitant knows.

The ability to speak English depends on age. Every second person aged between 15 and 19, 40% of people aged 20 to 24 and 25% of people between 25 and 29 speaks English. The command of English is only 11% among people who are 30 or older.

Wages and earnings

There is a significant wage differentiation between economic sectors. In agriculture and construction, dominated by poorly qualified workers, the average gross monthly wage is the lowest among economic sectors. Paradoxically, those sectors where there is a concentration of significant intellectual potential (healthcare, education) wages are 10-30% lower than the national average. Wages slightly exceed the national average - by 5 percentage points - in research and development. The highest wages are in financial intermediation and public administration where the average monthly wage exceeds the national average by two and one-and-a-half times, respectively.

The lowest wages are in economic sectors dominated by women, such as health care and education. In economic sectors where the majority of employees are men, women also earn significantly less, regardless of the very clear differentiation between gender and salary, for example financial intermediation.

Wage differentiation by economic sector is greater than by employee category. In the fourth quarter of 2002 the average gross wage for an official (white collar worker) stood at 1,329.6 LTL, which was 1.6 times higher than for a labourer (805.9 LTL). The national average at that time was 1,145.1 LTL. The Department of Statistics does not present information about wage differentiation by profession and it is impossible to compare how employers value employees with marketable qualifications in different economic sectors. Based on special research data, it can be stated that the average net monthly wage for the worst and best paid worker in the IT sector is, respectively, 1.2 and three times the average salary for an official.

Gender-related wage differences. The average wage for women stands at 90% of the gross average national wage while for men it reached 111.3% of the national average. In the past few years the average wage for women has grown more rapidly than for men, but it still stands at only 81% of the wage for men (data from the

The average wage for women stands at 90% of the gross average national wage while for men it reached 111.3 %.

In 1995 research showed that between 1990 and 1993, due to the decline in funding for research and development and absence of a consistent and long-term policy on science in Lithuania, the number of academics and scientists in fundamental and applied scientific institutions fell by, respectively, 1.4 and three times. The largest fall in number of employees was in engineering and technical research institutions (36% between 1988 and 1994) and the social and humanitarian sciences (35%). The slightest fall was in the natural sciences (17%).

One in seven scientists and researchers emigrated during the same period. Most emigrated to Russia (22.3%), the USA (19.1%), Germany (8.5%) and Scandinavia (7.4%). About half continued their research work abroad while 17% accepted less qualified or non-qualified positions. About 43% of those who emigrated had a doctoral or higher academic degree.

Interviews with scholars, scientists and researchers revealed that more than 80% wanted to work abroad for a period of one year or more, but only if their work overseas was directly linked with their work in Lithuania.

Mobility of scientists in Lithuania. Internal and external brain drain. Vilnius: Lithuanian Institute of Philosophy and Sociology, 1996.

In the opinion of experts, a fall in the number of positions and the stabilisation of salaries in the IT sector in the United States and other western countries, plus an increase in earnings for highly qualified professionals in Lithuania are among the main factors behind the decline in the emigration of IT professionals. The drain of specialists from Lithuania is decreasing.

Lietuvos Rytas, 25 February 2002.

fourth quarter of 2002). The gap is even wider within many economic sectors and professions. For example, the average wage for female officials is 68.5% of the average for male officials. In economic sectors where the majority of employees are men, such as financial intermediation, women earn significantly more than women do on average, regardless of the clear gender differentiation within the sector.

Significant gender disparities in IT are rooted in the disproportionate enrolment that exists in tertiary education institutions.

Gender-related wage differences can be explained by the following reasons: men are engaged in paid work for longer periods than women; the vertical segregation of the labour market (men occupy the most responsible and accountable positions and more quickly climb the 'career ladder'); direct discrimination against women; and lower salaries for more female-dominated professions (much research carried out in developed countries has identified that women are paid significantly less for similar jobs or jobs of comparative value).

In January 2003 a demographic analysis of students was carried out at three higher schools in Vilnius that prepare IT professionals.

The Vilnius University Mathematics and Informatics faculty has three main and two masters programmes related to information technology. There are 1,054 students in the main programme, of which 194 (18.4%) are girls. In the masters programme there are 127 students and 20 of these are girls (15.7%). In total, there are 1,958 students at the Mathematics and Informatics Faculty; 36% are girls. At Vilnius Gedimino Technical University information technology is taught at the electronics and fundamental science faculties. In the Fundamental Science Faculty, 26.7% of the 940 students are girls. In the main programme 23.4% of 721 students are girls, while in the masters programme 37% of 219 students are girls. In the Faculty of Electronics 41 of the 932 students (4.4%) are girls. The situation at the Vilnius Pedagogical Institute is a little different. Information technology professionals are taught at the faculties of physics and technology and mathematics and informatics. In the main programme of the Physics and Technology Faculty there are 493 students, 196 (39.7%) of whom are girls, while 35 of the 64 masters students are girls (54.6%). In the Faculty of Mathematics and Informatics girls dominate in both the main and masters programmes, accounting for 66.1% of the enrolment of the main programme (517 students) and 69.5% of the masters (23 students).

One of the reasons why girls rarely choose IT-related programmes is linked to traditional gender stereotypes about the abilities of men and women, the social roles and behaviour of whom are formed in childhood in the family and at school. Surveys of elementary school teachers and pupils carried out in 1999 revealed that both teachers and pupils are more inclined to assign certain professions and responsibilities to one or other gender. Male professions are considered to be those that belong to technical (engineering, programming) and managerial fields and female professions are found in care and service provision.

Lytiðkumas ir ðvietimas: paþiûrø, stereotipø ir ugdymo tyrinio tyrimai. Vilnius: Moterø informacijos centras, 2001.

Sociological surveys have revealed that girls use computer technology less often than boys studying the same educational programme. A survey of Vilnius University day students carried out in 2000 showed that 4.2% of boys and 21.3% of girls do not use the Internet.

V. Kanopiene, D. Tureikyte. Vilnius University Students' Attitudes to Studies. Philosophy, sociology, 2002, no. 1, p. 72-72.

Internet and e-mail use by gender, 2000

	Girls		Boys	
	Total	%	Total	%
Use of Internet				
Regular	236.0	15.4	288.0	38.7
Often	422.0	27.5	233.0	31.3
Occasional	549.0	35.7	189.0	25.4
Not at all	327.0	21.3	31.0	4.2
No response	3.0	0.1	3.0	0.4
Use of e-mail				
Regular	507.0	33.0	373.0	50.1
Often	277.0	18.0	125.0	16.8
Frequent	267.0	17.1	129.0	17.3
Not at all	482.0	31.4	115.0	15.5
No response	4.0	0.2	2.0	0.3

Research carried out in January 2003 by the Lithuanian Women's Centre, a non-governmental organisation, showed that of the 77 women's organisations in the country only 13 (17%) had their own Internet website and that 49 (69%) used e-mail. Only the largest women's NGOs have their own websites and communicate regularly with international partners. Information technology is often not accessible to small women's organisations due to the high costs involved.

Lijana Stundþienë

Labour force migration

According to official statistics, the total number of people who have emigrated since 1991 is not large. But the population census of 2001 revealed that there could be approximately 120,000-130,000 of them. During the early stages of economic reforms (1991 to 1994) people with a higher education or incomplete higher education were more likely to emigrate, accounting for 30.2% of the total number of emigrants to the west. The main reason for the emigration of highly qualified professionals from Lithuania was the prospect of much larger salaries.

Between 1995 and 2000 there was a notable change in the composition of emigrants by education. The number of people with a tertiary education decreased by 21.4%, while the proportion of those with a specialised secondary and secondary education rose from 57.9 to 66.4%. It can be stated that the 'brain drain' from Lithuania had slowed by 2002.

Gender disparities and IT

Despite the scarcity of gender-related statistics, it can be said that there is a large gender disproportion in the IT sector. The research carried out by the international personnel selection company CVO Group in 2002 indicated that more than two thirds of those employed in computer technology were men. They in fact constitute a majority in nearly every IT-related profession, apart from graphic design and technical teaching.

Significant gender disparities in IT are rooted in the disproportionate enrolment that exists in tertiary education institutions. For many years in a row, women have continued to dominate certain fields of education like teaching and pedagogical studies (78-80%), humanitarian studies (78-81%) and medicine (73-80%). The number of girls studying computer technology is less than one third and engineering one fifth.

The patriarchal opinion of society at large about a woman's role in the family and the community does not encourage girls to strive for a professional career and is one of the reasons for gender discrimination in the labour market. Women are quite often directly 'pushed out' of certain professions, for example those related to computers and information technology, by the prevalence of the stereotype that 'technical' is a male concern. However, the majority of women are IT users. Job advertisements for many positions placed in daily newspapers now contain computer skills, many of which do not require a special computer technology diploma, as an important requirement.

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Window to the Future:
how private initiative can promote the development of an information society in Lithuania

Antanas Zabulis

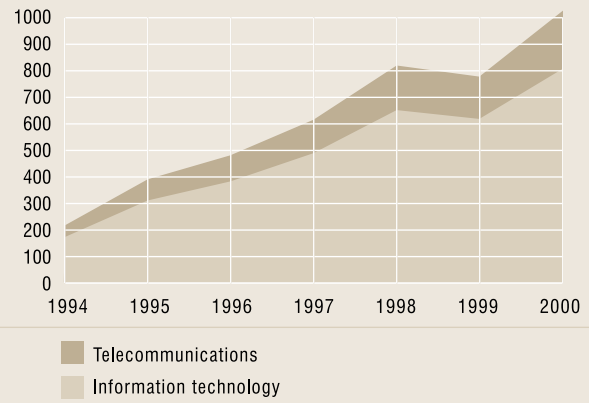
LANGAS Į ATEITĮ

Window to the Future: how private initiative can promote the development of an information society in Lithuania

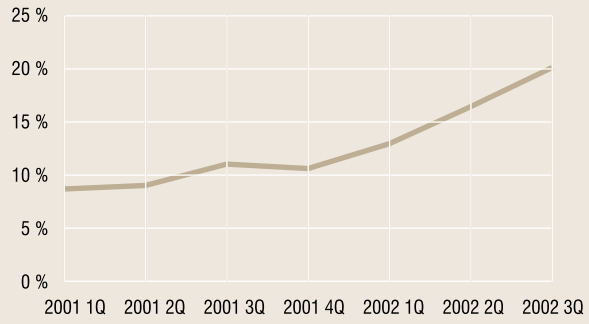
Antanas Zabulis

Window to the Future is an information society development initiative launched by private companies and focused on the promotion of the Internet in Lithuania. The initiative is gaining strong momentum because cooperation with local and central governments as well as the inclusion of local communities has been so effective. The initiative shows how one of the most important indicators of an information society - Internet penetration - couldbe improved significantly over a short time period by the initiative and means of the private sector through cooperation among different market players and between the private and public sectors.

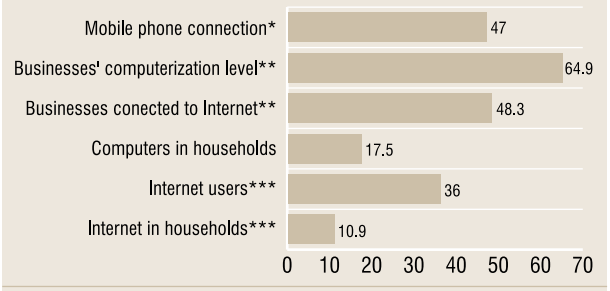
Growth of the Lithuanian ICT market (USD million)



Internet penetration in Lithuania



IT Indicators in Vilnius (%), 2002



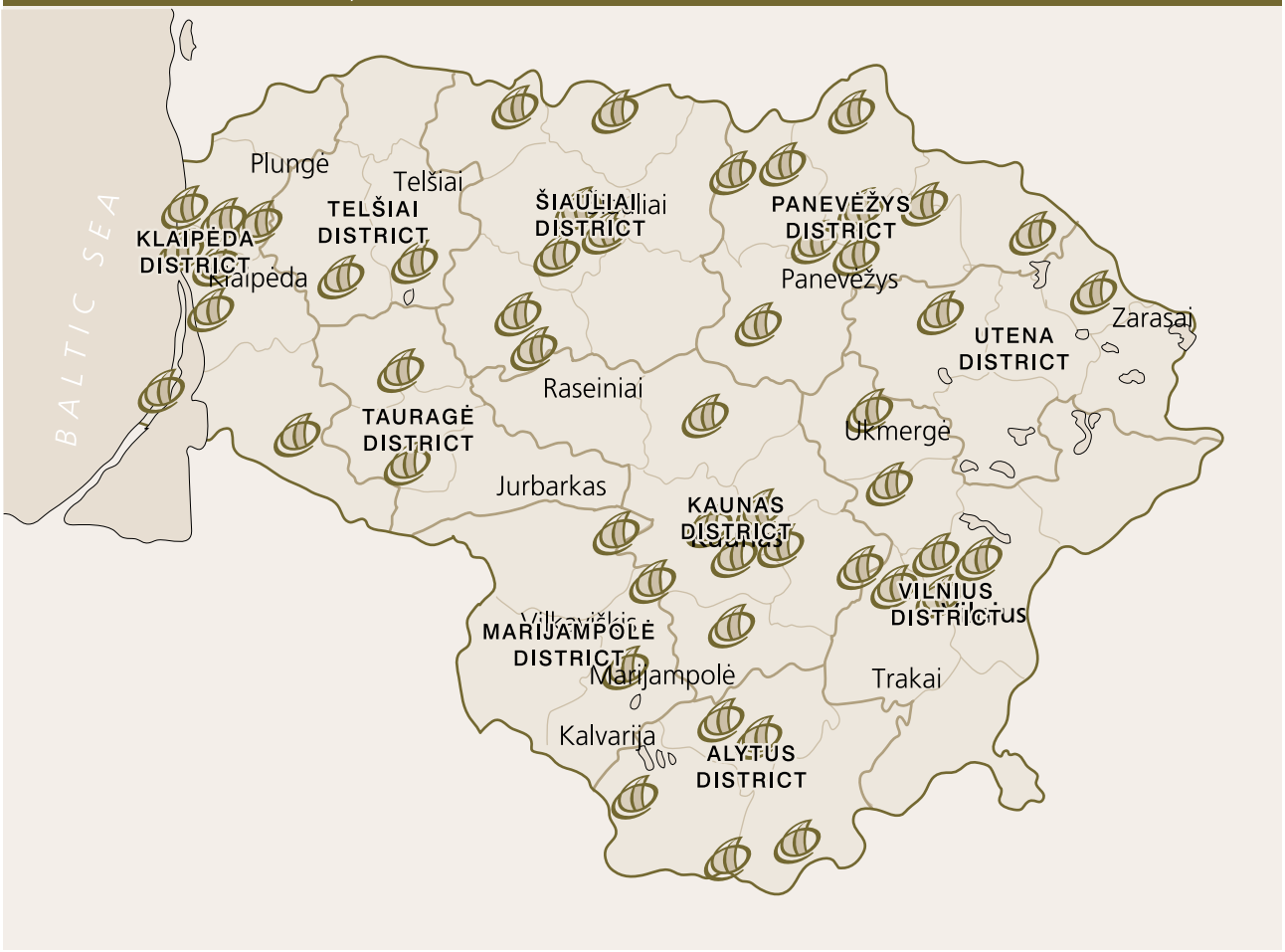
* Share of inhabitants (%)
** Share of the number of enterprises (%)
*** Share of inhabitants of 15 years and older (%)

Low Internet penetration and the growing digital divide are considered to be serious impediments to the development of an information society in Lithuania. At the beginning of 2001 Internet penetration in Lithuania was lower than 10% and this created a void in consumption in the information society service chain. Policy decision makers and enterprises alike recognised this shortage as a serious risk for their future undertakings.

Communications infrastructure constraints have already been removed or will be removed soon. It is clear that Lithuania is facing not so much a communications infrastructure shortage, but rather a situation where the Internet is unaffordable for people with a low education and low income and where many people lack the awareness and motivation to use it.

Seeing the difficulties that state institutions have experienced in trying to turn political commitments to develop an information society into effective measures, the private sector decided to act. Since the very conception of the idea of this project it was obvious that one company would not be able to create an environment favourable for an information society by improving only one indicator (Internet penetration). It was understood that coordinated and continuous efforts from different actors were needed. All actors - private, public and NGOs - played their roles: preparing the background, planning and making actual investments, propagating the idea of the project and securing its sustainability.

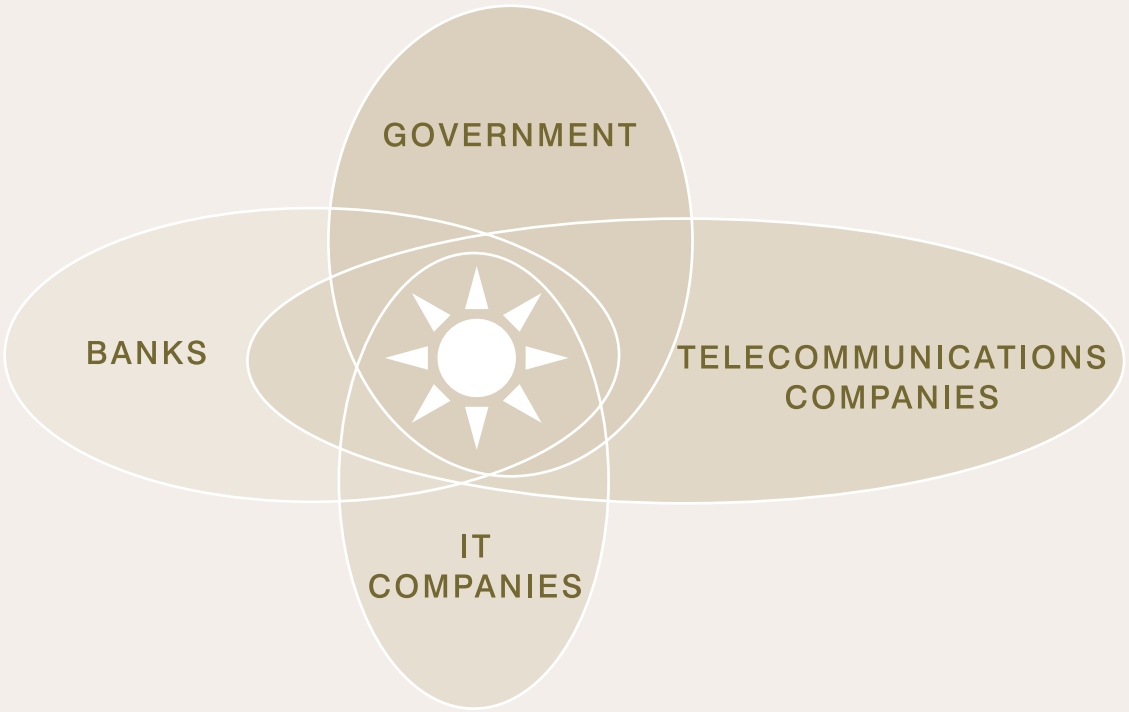
PUBLIC INTERNET ACCESS POINTS, 2002-2003



Window to the Future - a joint private-public initiative in Lithuania - was launched at the beginning of 2002 by the country's two biggest telecommunications companies, Lietuvos Telekomas and the mobile operator Omnitel, the two biggest banks, Hansa-LTB and Vilniaus Bankas, and two IT companies, Sonex and Alna. The goal of the project was to achieve an EU average level of Internet penetration in Lithuania in three years by means of:
1) establishing public Internet access points (PIAPs);
2) training new Internet users;
3) developing new relevant e-content

Since the beginning of the project, 1.2 million LTL (350,000 EUR) has been invested and 70 PIAPs installed in different parts of the country.
Out of the country's 60 municipalities, 51 are already involved in the project. The municipalities are the not only recipients - they are also responsible for the project's implementation. First of all, they are in charge of selecting the proper place for a public Internet access point. Secondly, the municipality or its appointed PIAP operator pays part of the 120 LTL (34 EUR) monthly Internet fee for the provider. In the case of a fixed line, their share is 50%, in the case of a wireless link, 13%. Among PIAP operators are 10 townships, 38 libraries, 11 cultural centres, four community centres, three museums and three hospitals.

WINDOW TO THE FUTURE: PARTICIPANTS



The PIAP project was enthusiastically welcomed by the local communities and became very popular in the regions of Lithuania. As a result, local governments and communities are promoting the rapid establishment of PIAPs and supporting their operations. The first usage results overcame all expectations. Up to 2,000 visitors are attending each PIAP every month. People register from early in the morning; almost all the time slots are booked several days ahead. Most local governments and communities have expressed great interest in the further development of new PIAPs. Some are already expanding their current capacities independently with additional computers and are even running local training programmes on Internet basics.

We hope that Window to the Future will be financially and institutionally sustainable since the growth in Internet penetration is important for central and local governments, information and communication technology businesses seeking new consumers and rapidly expanding their Internet services. Joint efforts by these actors could produce a synergy and change the situation significantly.

Window to the Future is open to new participants. It may bring about a snowball effect where new donors and initiatives emerge, eventually letting the project evolve into a self-developing movement. Initially, the central government only approved the project, but after half-a-year it joined Window to the Future as an equal partner. The Ministry of the Interior committed itself to financing the establishment of 300 PIAPs over three years for 5.2 million LTL (1.5 million EUR). An additional 300 will be established using over 3 million EUR in PHARE funds. It is planned that up to 1,000 PIAPs will be opened by 2005 using a combination of private, state and EU funds.

SNOWBALLING PUBLIC-PRIVATE COOPERATION

An agreement of cooperation with the Ministry of Education was signed to organise large-scale Internet training. Window to the Future will finance pilot Internet basic skills training for 20,000 trainees during 2003. It is planned that up to 300,000 people will be trained over the next two years.

More than 20 companies agreed to join Window to the Future in 2003. A new Open Society Fund Lithuania project will broaden the scale of the project to develop digital communities.

We can already state that the idea is turning into a large-scale movement that has started to thrive by itself. Window to the Future no longer belongs to its founders, but to the whole of society.

Window to the Future's snowballing private/public cooperation approach could be applied in other countries facing the challenges of developing an information society. The experience of setting up the project could also be useful for local and international companies that want to refocus their corporate philanthropy strategies toward social targets that indirectly improve the business environment.

Internet training: first steps

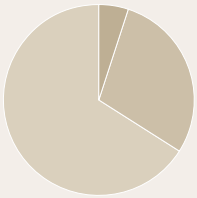
According to a survey conducted by SIC Gallup Media in 2003, two million adults in Lithuania do not use the Internet.

Internet training courses started on 24 July 2003, 7,902 trainees had already attended them.

TRAINEES BY:

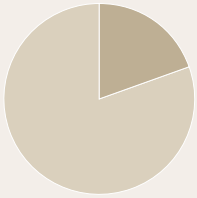
age

- 5 % 60 years and older
- 29 % 18–35 years
- 66 % 35–60 years



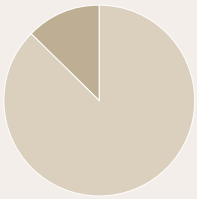
gender

- 19.53 % men
- 80.47 % women



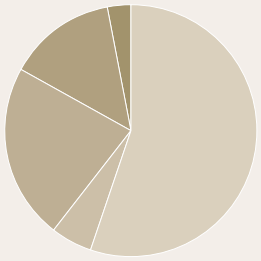
place of residence

- 87.35 % cities, towns
- 12.66 % rural areas



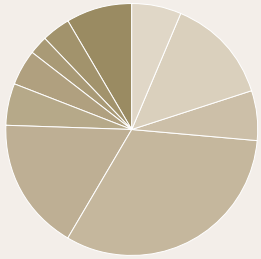
education

- 52.20 % tertiary
- 5.32 % incomplete tertiary
- 22.56 % specialised secondary
- 13.90 % secondary
- 3.02 % incomplete secondary



occupation

- 6.36 % manager
- 13.66 % specialist
- 6.39 % hired worker
- 32.07 % teacher
- 17.06 % employee
- 5.37 % worker
- 4.58 % student
- 2.39 % pensioner
- 3.67 % house keeper
- 8.46 % unemployed



Research and development: potential and application

Juozas Lazutka

Research and development: potential and application

Juozas Lazutka

The long-term growth of the economy, its competitiveness and openness to innovation are linked directly to research and development (R&D). However, modern science requires significant investment and small economies often cannot afford to support and develop all branches of science and R&D equally. After the restoration of Lithuania's state independence, it became crucially important to assess which branches of science possessed sufficient potential allowing for internationally competitive research and innovation, under the condition that adequate investment would be placed there. No less important is to evaluate the amount of funds that Lithuania allocates to R&D today and can allocate in the future.

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R&D: notions and definitions

Scientific research is systematic and creative work aimed at the accumulation and utilisation of knowledge, creativity and the search for new fields of applying knowledge. Research can be fundamental or applied. Fundamental research consists of experimental and/or theoretical activities aimed primarily at finding out about the essence of phenomena and reality without the intention of any concrete utilisation of the derived results. Applied scientific research is experimental and theoretical cognitive activity targeted at practical aims or objectives.

Experimental development is systematic activity supported by scientific research and practical experience aimed at creating new materials, technology, products and facilities, systems and services or the essential advancement of existing ones.

Key R&D personnel

A researcher has a tertiary education and implements scientific research or experimental development tasks.

A scientist is a researcher who carries out scientific research and holds an academic degree or pedagogical title.

Technicians or similar personnel have technical knowledge and experience in one or more branches of science to carry out their work. They implement scientific and technical tasks under the supervision of researchers or scientists.

R&D institutions

In 2002 around 175 institutions were engaged in research and development, of which there were 19 universities, 17 state research and tertiary education institutes and 17 research institutions, 10 university scientific research institutes and nearly 90 commercial companies. As a result of reforms in R&D the number of state-run institutions is falling. However, from the quantitative perspective, the R&D institutional network in Lithuania is well developed. The majority of the institutions are concentrated in Lithuania's five largest cities - Vilnius, Kaunas, Klaipëda, Šiauliai and Panevëþys.

Lithuanian state R&D institutions cover all fields of research, so they are usually narrowly specialised. The activities of those institutions attached to higher education institutes or departments are even more specialised. For example, the Science and Encyclopaedia Publishing Institute does not undertake any independent scientific activities. Such fragmentation of activities is not effective, since every institution requires administrative and auxiliary personnel of its own. It is obvious that the restructuring of the system of R&D institutions is essential for their effective functioning.

In 2002, in accordance with a government decision, ten state R&D institutions were reorganised into university institutes in an attempt to orientate them more towards university study needs. The after-effectsof these reforms are still not clear. Bearing in mind that the financial status and management models of these institutions have barely changed, it is highly unlikely that we can expect fundamental changes in their activities and outcomes. It is plausible, however, that the activities of these R&D institutions will improve through other factors such as a better psychological climate and sense of stability about the future after the reforms are finished.

R&D personnel: qualitative and quantitative aspects

In 2001 there were 14,980 people employed in R&D, of whom 9,206 (61%) worked in the higher education sector, 4,820 (32%) in the state research sector and 945 (6%) in the business sector. Researchers constituted 68% of the total number of R&D employees, of whom 4,960 had a doctoral or higher degree (habilitated doctor). Only 70 (1.4%) researchers with a doctoral degree were employed in business. This attests to the poor potential of R&D for promoting innovation in industry. The large number of R&D employees in higher education is common to the countries of the European Union. For example, more than 70% of R&D employees work in universities in Greece and about 55% work in Spanish universities. The EU average is somewhat lower, at 34%. It must be noted that universities in Europe conduct approximately 80% of all fundamental research.

The greatest number of scientists and researchers with a doctoral or higher degree work in biomedical science (27%). The smallest number are employed in the social and humanitarian sciences (16% each). The distribution of personnel between the other scientific or R&D branches is fairly even. Such an even distribution of scientists with academic degrees indicates that there are no clear state priorities regarding which branch of scientific research to develop. In the business sector the greatest number of R&D employees work in radio, TV and communications equipment manufacturing (29%), chemical manufacturing (14%) and machinery (12%).

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R&D personnel by branch*

	Researchers				Technicians and other similar personnel	
	Total		Scientists			
	2000	2001	2000	2001	2000	2001
Humanitarian sciences	2,188	1,985	895	787	280	155
Social sciences	1,832	1,956	825	824	163	130
Technical sciences	1,915	1,896	1,108	1,069	331	449
Physics	1,476	1,466	1,011	997	291	325
Biomedical science	2,350	2,319	1,494	1,383	875	824
Agrarian science	541	533	359	308	426	409
Natural sciences	804	792	546	515	201	175
Medical science	1,005	994	589	560	248	237

Without business sector

R&D by activity in business sector, 2001

		Researchers		Technicians and similar personnel		Other personnel	
	Total	Women	Men	Women	Men	Women	Men
Total	954	248	343	121	51	95	96
Mining and quarrying	21	2	3	5	-	1	10
Food and beverages	76	37	15	12	5	3	4
Textiles	91	41	6	30	5	7	2
Chemical industry	133	58	29	11	6	14	15
Manufacture of non - metal and mineral products	35	-	3	-	10	1	21
Manufacture of machinery and equipment	115	34	43	7	4	3	24
Manufacture of radio, television and communications equipment	274	56	133	25	4	48	8
Manufacture of medical precision and optical instruments	43	3	25	3	2	6	4
Electricity, gas and water supply	6	-	2	-	2	1	1
Scientific research and applied activities	119	7	62	27	12	6	5
Other activities	41	10	22	1	1	5	2

Scientists*

	1998		1999		2000		2001	
	Total	Women	Total	Women	Total	Women	Total	Women
Total	**5,588**	**1,828**	**5,663**	**1,866**	**5,333**	**1,822**	**5,060**	**1,802**
Habilitated doctor	794	113	833	116	795	110	741	102
Doctor	4,494	1,639	4,527	1,670	4,347	1,664	4,219	1,673
Professor (without academic degree)	69	7	72	11	41	-	12	1
Docent/lecturer (without academic degree)	231	69	231	69	150	48	88	26

*Without business sector

In the past eight years, the number of scientists has been falling (from 6,133 in 1995 to 5,060 scientists in 2001). This decrease occurred mainly on account of male scientists, while the number of female scientists has remained virtually unchanged. It is difficult to accurately define the reasons for this phenomenon without special research. They can be associated with the relatively low earnings and social status of a scientist and the pattern of immigration.

Scientists by age (%), 2001

	under 30	30 - 39	40 - 49	50 - 59	60 and older
Total	**2**	**16**	**29**	**29**	**24**
Habilitated doctors	-	1	16	31	52
Doctors	2	19	32	28	19
Professors (without academic degree)	-	-	-	33	67
Docents/Lecturers (without academic degree)	-	2	24	35	39

Scientists and expenditure on R&D

	1995	1996	1997	1998	1999	2000	2001
Scientists	6,133	5,769	5,495	5,588	5,663	5,333	5,060
Expenditure on scientific research in relative to GDP (%)	0.48	0.52	0.57	0.57	0.52	0.60	0.68

The ageing of researchers and the "brain drain" problem

Currently more than 60% of scientists in Lithuania are older than 50 and 25% are older than 60. For the 'regeneration' of R&D personnel it is essential that 300-400 young scientists join the ranks annually. If all postgraduates studying today (approximately 2,000 between 1999 and 2001) defended their theses on time and were employed in the R&D sector this figure would be achieved. Meanwhile, approximately 200 postgraduates get a doctoral degree every year. Moreover, many scientists and researchers of all ages emigrate to Western Europe, the USA and Canada due to the low salaries in R&D, a large differentiation compared to the business sector, poorly equipped R&D infrastructure and slow career development. In the near future the problem of the immigration of scientists may deepen as the EU foresees that funding for scientific research should gradually increase to 3% of GDP. This means that new, accessible and more attractive workplaces for scientists will be created in the EU compared with Lithuania. The most effective solution to the problem of ageing and the brain drain may be linked to a better economic performance by Lithuania, which will allow for greater investment in R&D and which in turn will lead to higher salaries, improvement in equipment and subsequently to a rise in the social status of scientists and researchers.

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Funding of R&D

While the number of scientists is falling, expenditure on R&D is consistently growing (from 114.9 million LTL in 1995 to 326.8 million LTL in 2001). Expenditure on R&D stood at 0.68% of GDP in 2001 - significantly lower than the EU average (1.9%) and similar to other EU candidate countries. Bearing in mind the comparatively small GDP, the difference in the absolute size of expenditure for R&D between Lithuania and the countries of the EU is significant. Annual R&D expenditure in Lithuania is approximately 17 USD per capita, whereas in the United States it is 681 USD and in Italy 222 USD.

The greater part of R&D expenditure is assigned to state research and higher education institutions. In 1999 it reached 0.5% of GDP and only 0.02% of GDP in the business sector. However, expenditure on R&D in the business sector increased in 2001 to reach 0.2% of GDP. More than 70% of all R&D expenditure comes from the state budget, while for the countries of the EU this figure does not exceed 34% and stands at 56% for candidate countries. However, these estimates and comparisons may not strictly be correct, because there are no tax exemptions for R&D in Lithuania unlike the countries of the EU and it is doubtful that enterprises and companies 'reveal' all their R&D expenditure.

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Along with insufficient funding of R&D, of equal concern is the quality of funding, which so far does not meet the requirements of a market

Expenditure by R&D sector (% of GDP)

	1997	1998	1999	2000	2001
Total	0.57	0.57	0.52	0.60	0.68
Higher education	0.21	0.22	0.20	0.20	0.21
State sector	0.32	0.34	0.30	0.30	0.27
Business	0.04	0.01	0.01	0.13	0.20
State budget % of total R&D expenditure	72.0	74.4	72.4	57.9	53.3

R&D funding by source

	1995	1996	1997	1998	1999	2000	2001
Total (million LTL)	124.7	166.4	224.9	250.7	224.6	277.6	331.1
Of which (%):							
State budget	68.7	70.4	72.0	74.4	72.4	57.9	53.3
Customer *	24.7	22.2	17.6	17.2	14.7	12.1	9.7
Other	6.6	7.4	10.4	8.4	12.9	30.0	37.0

** Including budget institutions*

economy. The biggest proportion of budget funding has been channelled directly to universities, the size of the 'injection' directly depending on the number of students and employees and other criteria unrelated to the effectiveness of the R&D.

In 2003 an attempt was made to incorporate productivity indicators (such as, for example, the number of articles in internationally recognised journals or funds received from international scientific programmes) into the model of funding for state universities. This approach had serious shortcomings, however. Firstly, special coefficients were used in order to 'mitigate' the impact of the new method on the size of funding and new ways of distributing money did not essentially differ from earlier volumes. Secondly, institutions rather than groups of scientists competed between themselves for state funding. Higher education institutions were not obliged to use this methodology for the internal distribution of funding. The new method was not applied to state and university R&D institutes.

In actual fact, bidding is necessary for funds, which are allocated to scientific research through the Lithuanian State Science and Studies Foundation (although a majority of scientists have been dissatisfied with the quality of the bidding). The proportion of budget funds allocated, based on competition or programme principles, is very insignificant. This differs markedly from the practices of other countries, where a significant proportion of funding is allocated based on programme principles (22% on average in EU countries, 40% in Denmark, 41% in Finland, 33% in Sweden and 31% in Germany).

R&D funding by source reveals that business contributes a comparatively small and continuously decreasing part of the total funds to R&D (0.07% of GDP in 2001). The Lithuanian innovation sector differs in this respect from global practice since companies are the main driving force in innovation all over the world. In the EU in 2000 the business sector spent 1.28% of GDP on average on R&D, while other candidate countries spent on average 0.32% of GDP. About 6% of all R&D personnel are employed in the business sector. According to the Department of Statistics, less than 4% of businesses created new technology together with R&D institutes in 1999. The majority of this technology was created together with foreign researchers (23%), by acquiring licences (10%) or by co-operating with other companies (9%). The prevalent attitude of Lithuanian businesses is that the national R&D sector is not capable of creating new internationally commutative products or technology that could be successfully commercialised.

R&D: outcomes and efficiency

The main universally recognised indicators of R&D success are scientific publications, the frequency of their quotation and the number of patents and licenses. In Lithuania these indicators are very poor and markedly lag behind the developed countries. For example, the number of publications in world-recognised scientific journals in developed countries is approximately 0.5 publications per year per scientist, whereas in Lithuania the indicator is 0.065. This means that the productivity level of Lithuanian scientists is nearly 10 times lower than that of their colleagues in developed countries.

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The number of applications for patents received by the State Patent Bureau have consistently been decreasing - from134 in 1998 to 68 in 2001. In actual fact, between 1995 and 2001 there was a significant increase (nearly four times) in the number of applications to expand the validity of a European patent to Lithuania, mostly due to the intense activity of foreign companies in Lithuania. Lithuanian R&D institutions do not so far have one single European or American patent. This situation is related not only to the insufficient level of national R&D, but also to the legal aspects of intellectual property rights.

The reasons for the problems in patents are not unique to Lithuania. State R&D institutes in other European countries have the same problems to one degree or another. Even though the number of high-tech companies that emerge from R&D is growing in Europe, this growth is slower than in the USA. In the opinion of the European Commission this is the

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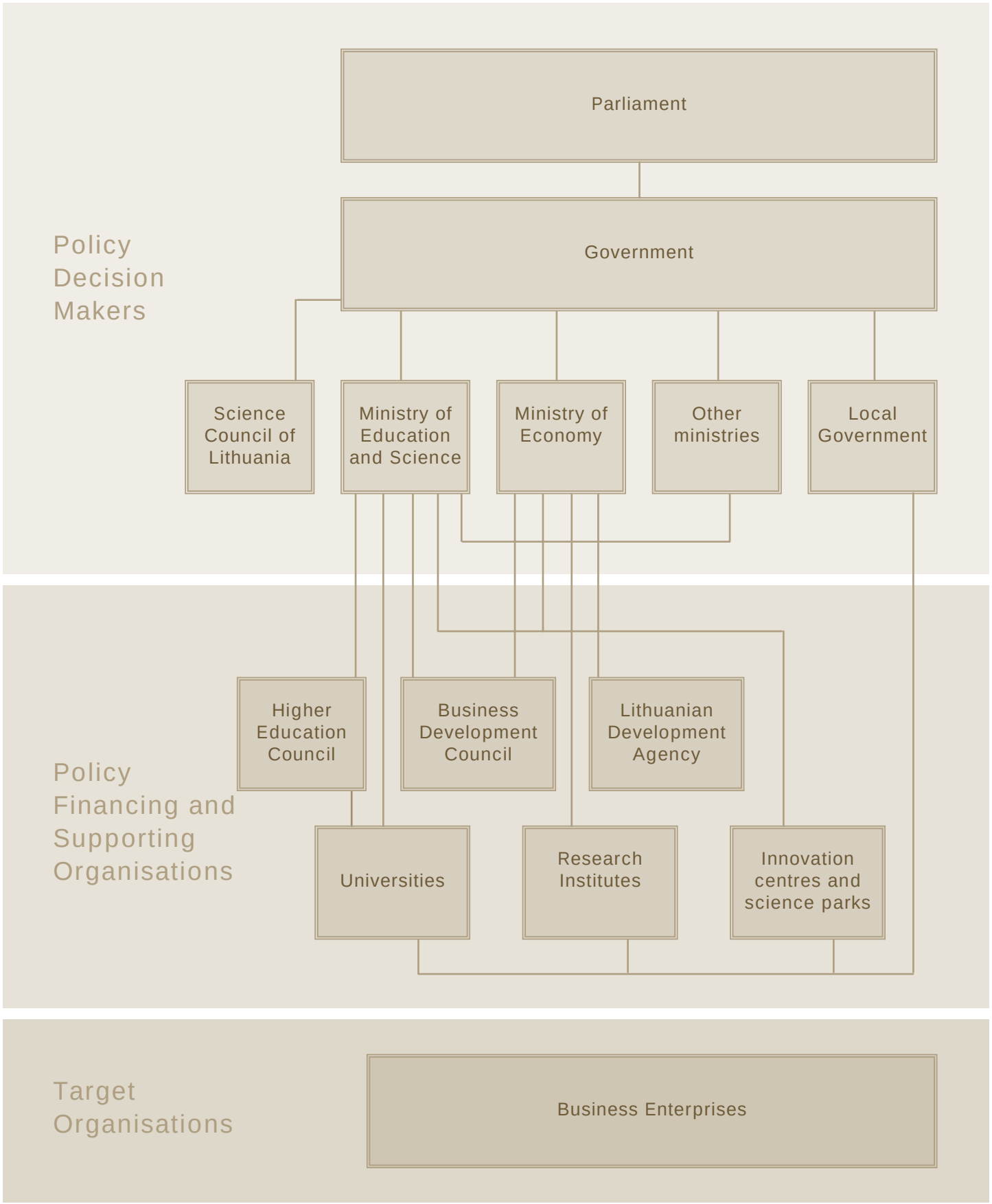
Patent applications and patents

	1995	1996	1997	1998	1999	2000	2001
Total number of patent applications	106	100	125	134	86	66	68
(of which by): legal persons	50	61	66	73	55	31	40
individuals	56	39	59	61	31	35	28
International submitters	27	78	77	71	71	60	55
Patents issued	294	535	243	165	160	148	128
Requests to extend the validity of a European patent to Lithuania	816	1,349	1,792	1,993	2,882	3,666	3,801

Institutional Setting for R&D in Lithuania*



** Aiming for a knowledge economy, World Bank, 2003*

Expenditure on R&D by type (%)					
	1997	1998	1999	2000	2001
Fundamental research	41.1	46.6	55.7	41.7	35.3
Applied research	44.1	43.3	34.5	36.3	29.8
Experimental development research	14.8	10.1	9.8	22.0	34.9
Expenditure on personnel (% of total)	74.6	77.3	80.6	66.4	57.1
Capital expenditure (% of total)	8.6	7.5	4.9	16.2	27.8

case because legislation on intellectual property rights in Europe often impedes the international spread of technology by R&D institutions financed from the state budget.

The second problem characteristic to both European and Lithuanian state R&D is the lack of a well-developed infrastructure for the application of research results and their commercialisation. In Lithuania different scientific and technological parks are rapidly being established in order to support companies working in the field of applied R&D and to promote the commercialisation of research results, as well as the development of relationships between R&D and the economy. The activities of these parks, however, are most often limited to consultations. Often researchers do not have sufficient understanding of the economic aspects of research and in particular the management of intellectual property. The majority of researchers view the commercialisation of their achievements with a lack of confidence partly due to the necessity to combine the economic requirements of the application of research results with the free advertising of these results in the scientific press. As was mentioned above the number of papers published in internationally recognised scientific journals is more important for scientists' careers and recognition than the economic application of the research results or their use in developing new technology.

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Expenditure on R&D by type of research

The largest part of R&D expenditure goes on fundamental research, although this proportion is constantly decreasing. Expenditure on applied research has been relatively stable in the last few years. But between 2000 and 2001 more funds were allocated to experimental development on account of a reduction in financing for applied research. Over the last few years there has also been a decrease in expenditure for personnel in the total expenditure on R&D while the capital expenditure has grown. Growth in capital expenditure indicates on the one hand that funds have started to be allocated to strengthening R&D facilities and equipment, which is a positive phenomenon. However, on the other hand this means that the already low salaries of scientists and researchers remain 'frozen'.

The comparatively large degree of attention on fundamental research should not be surprising if one takes into account the fact that the majority of researchers work in higher education. According to tradition in Europe, fundamental research is concentrated in universities. In the USA most fundamental research is carried out in the large, so-called scientific universities. It is in fact the fundamental research that makes these universities attractive to investors. Fundamental research financed by business is always carried out bearing in mind the possibility of its future application. In Europe, as well as in Lithuania, there is a trend towards a concentration of applied research and scientific services in universities, a process that brings universities closer to the business sector. However, in the opinion of the European Commission, this trend can undermine the capacity of universities to contribute to the process of accumulation

In 2002 the government confirmed the following priorities for fundamental and applied R&D for the period 2002 to 2006:
1. Improving the quality of life:
1.1 genomics and biotechnology in relation to people's health and agriculture;
1.2 quality, safe and ecologically clean food technologies;
1.3 changes in ecosystems and climate;
2. The formation of a knowledge society:
2.1 information society;
2.2 citizens and management in knowledge society;
2.3 protection of national identity in the global environment;
3. The development of nanotechnology:
3.1 nanostudies/education;
3.2 nanotechnologies;
3.3 development of multifunctional non-structuralmaterials;
4. Nuclear safety: Ignalina nuclear power plant and the utilisation of radioactive waste:
4.1 nuclear safety;
4.2 radioactive waste management technology;
5. The increase the international competitiveness of Lithuanian industry, such as biotechnology, lasers and information and other advanced technology development.

and dissemination of new knowledge. It is more optimal to develop applied research in R&D institutes and fundamental research in universities.

The small number of publications by Lithuanian scientists in internationally acknowledged scientific journals means that the fundamental research carried out in Lithuania does not always conform to the global concept of fundamental research. On the other hand, real fundamental research, in particular in physics or the biomedical sciences, is impossible without substantial investment, which Lithuania cannot afford for the time being. For this reason World Bank experts recommend that R&D in Lithuania should be more oriented towards applied research, which could potentially bring real economic benefit. Fundamental research, however, is essential, for quality education and applied research should be carried out in selective scientific directions potentially more conducive to new technology and innovation.

R&D development policy and its governance

The adoption of R&D priorities has a positive impact on the overall development of the whole system, since it becomes possible to identify branches of science and directions of fundamental and applied research that are internationally competitive and capable of a prompt response to demand from the business sector. In some directions (lasers, optics and medical equipment, biotechnology production) scientific competence, as well as a close relationship between science and business, creates the conditions necessary for the further advancement of high technology, innovation and the provision of advanced technology services.

It soon became clear, however, that the number of R&D priorities did not match Lithuania's scientific potential and was too large for it. The list of priorities includes, besides all the priorities from the Sixth Framework Programme of the European Community, some priorities that are not even mentioned in any EU documents, for example mechatronics.

The adoption of R&D priorities has a positive impact on the overall development of the whole system.

One of the reasons why there is no balanced or well-grounded R&D policy in Lithuania is that responsibility for its formation and implementation is dispersed throughout numerous state bodies, departments and institutions. The Lithuanian R&D system is comprised of institutions responsible for R&D implementation and the co-ordination and provision of expert and advisory services. At the government level the

Key R&D institutions and their basic responsibilities

R&D activities are co-ordinated by the Ministry of Education and Science, the Science and Technology Council, the Higher Education Council, Council and the Lithuanian Universities Rectors' Conference, the State Research Institute Directors' Conference and also some non-governmentalorganisations.

The Ministry of Education and Science is responsible for the preparation and implementation of government policy in the field of R&D, the co-ordination and initiation of international R&D programmes and the submission of proposals to establish, reorganise or liquidate scientific or study institutions.

The Science and Technology Council operates alongside the prime minister. It is responsible for innovation policy.

The Higher Education Council operates alongside the Ministry of Education and Science. Its main functions are to analyse and evaluate strategy for the development of Lithuania's higher education institutions and to prepare suggestions for the development and strengthening of the higher education system.

The Lithuanian Universities Rectors' Conference and the State Research Institute Directors' Conference are non-governmental organisations that co-ordinate relationships between R&D institutions and are experts on questions of R&D policy.

The Lithuanian State Science and Studies Foundation, the Lithuanian Science Council and the Lithuanian Academy of Sciences are expert and advisory institutions.

The Lithuanian State Science and Studies Foundation is a budget institution that implements special government programmes related to loans and financial support provision to students and postgraduates. It also organises the bidding for certain R&D programmes to be financed by the state budget.

The Lithuanian Science Council is an advisory body to the Seimas and the government on R&D policy. Its mandate and terms of reference are confirmed by the Seimas. The board consists of scientists and organisations representing economic and business sector interests, as well as representatives of state R&D institutions.

The Lithuanian Academy of Sciences is a budget institution that unites the most distinguished Lithuanian scientists and also foreign scientists whose activities are related to Lithuania. It brings together scientific experts in science and education, technology, economy and culture, social development, the environment, health care and other fields.

main responsibility for R&D and control over a large part of its funding is assigned to the Ministry of Education and Science. However, since 2002 the budgets for state universities have been directly allocated by the Seimas. In recent years the R&D role of the Ministry of Economy and other ministries has markedly increased through the promotion of innovation in industry. Such a dispersal of policy- and decision-making can be harmful for R&D on a national level, particularly in the long run.

In Lithuania, according to legislation on science and education, among the most influential institutions that have an impact on decision-making in R&D development are the Lithuanian Academy of Sciences, the Lithuanian Science and Technology Council and the Lithuanian Universities Rectors' Conference. These institutions represent different interest groups and have a significant influence on the Ministry of Education and Science - and almost no influence on the decisions of the Ministry of Economy.

Therefore, in order to have a viable R&D policy, it is important to strictly outline the range of institutions involved in policy formation as well as clearly distribute responsibilities and functions between them. One of the problems is that expert and advisory/consultative institutions do not take responsibility for the quality of their decisions.

Participation in international R&D programmes and initiatives

An important positive trend in R&D in Lithuania is its growing participation in international scientific programmes and expanding international co-operation generally. Lithuania joined the European research and cooperation programmes EUREKA and COST back in 1992. However, between 1992 and mid-1999 Lithuania managed to implement only four EUREKA projects. Now Lithuanian institutions have started to implement 12 more research projects, three of which are co-ordinated by Lithuanian partners. The most active participants of these programmes from the Lithuanian side are the Institute of Physics and Kaunas University of Technology. From 2000, Lithuanian R&D and higher education institutions participated in 24 projects within the COST programme.

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On 1 October 1999 Lithuania was the last of all the candidate countries to join the Fifth Framework Programme of the European Community (FP5). According to data from August 2002, Lithuanian institutions participated in 609 applications, of which 187 were successful in receiving funding. The most active in submitting their applications were Vilnius University, Kaunas University of Technology and Vilnius Gediminas Technical University, as well as some of the country's scientific institutes (the Lithuanian Energy Institute, the Institute of Ecology and the Institute of Biotechnology). The proportion of successful applications by Lithuanian scientists was 31% (of the total submitted by Lithuania), which is the highest among all the candidate countries participating in the FP5 programme. It is expected that Lithuanian scientists will receive 14.9 million EUR from the FP5 programme. The country's contribution was 12.067 million EUR, part of it covered by PHARE (4.124 million EUR).

Lithuania has also signed bilateral agreements on co-operationin R&D with many European and Asian countries and the United States of America in the fields of education, scientific research, technological development and culture.

The impact of R&D on innovation

The level of R&D development among EU countries and Lithuania is highly uneven. Evaluation shows that in some fields the indicators for Lithuania and the EU are similar. However, according to the main R&D indicators, such as total and business expenditure on R&D, the number of researchers in the business sector and the number of scientific publications, Lithuania lags behind the EU average. Underdeveloped R&D very much limits the advancement of knowledge society and innovation, which are significant factors of human development and economic growth.

A system of innovation is a very broad notion. Along with R&D institutions it includes private companies, representatives from risk capital and banks, various governmental and non-governmental organisations, foreign R&D partners and others. The effectiveness of an innovation system depends largely on the distribution of roles and responsibilities between the government, scientists and private business. Weak and sporadic links between science and business and insufficient co-operation between R&D institutions are characteristic of Lithuania's innovation system. Several examples of successful practices in biotechnology and laser technology are more the exception than the rule. Even the introduction of university scientific institutes in 2002 did not change or strengthen co-operation between R&D institutions, let alone the business sector.

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R&D in Lithuania and the EU				
Disparity	Indicator	Year	Lithuania	EU average
Total expenditure on R&D	% of GDP	1999	0.52	1.92
State expenditure on R&D	% of GDP	1999	0.50	0.73
Business expenditure on R&D	% of GDP	1999	0.02	1.2
Researchers (equivalent of full working day) per 1,000 labour force	-	1998	4.90	5.28
Researchers (equivalent of full working day) per 1,000 of labour force in business sector	-	1995	0.07	2.5
Number of scientific publications per million population	Unit	1998	130	609
Budget funding for R&D and higher education	% of GDP	1995	1.01	0.91

In comparison to the countries of the EU, Lithuania's R&D system is not flexible and is open to changes in priorities because nearly all funds are assigned to existing institutions and programmes. It is completely natural that they oppose any changes that may lead to the re-distribution of funds.

To sum up, the following shortcomings of Lithuanian R&D reduce its capacity to promote innovation: a wide gap between R&D and business; unsatisfactory R&D qualitative and quantitative results (publications, patents); dominant state funding in combination with insufficient funding and backward funding principles; a large number of narrowly specialised institutes; the steady ageing of researchers and the 'brain drain'.

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Health care

Arûnas Liubðys

Health care

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Overview of developments in the health care system

Since 1991, many important changes took place in the health care system that laid the foundations for future radical reforms. Among these were the legal framework and financial mechanisms necessary to run a qualitatively new health care system.

However, so far, radical reforms have failed to materialise. A well-grounded, long-term programme of restructuring the health care system has not been developed and frequent changes in health care policy and priorities have hindered the creation of an effective health care system. On the other hand, in striving to radically reform the health care system it would have been necessary to adopt a series of unpopular policy decisions (for example, to close a number of hospitals). Such decisions were mostly avoided in an attempt to preserve the stability of the health care system.

An inadequately large emphasis placed on inpatient treatment has been one of the factors behind the low efficiency of the health care system at large. Regardless of the fact that over the past 10 years the number of hospital beds per 100,000 has fallen by nearly 25%, Lithuania still occupies the leading position in this indicator in Europe. In 2001 in Lithuania there were 925 beds per 100,000 population (596 per 100,000 in the EU on average). Cases of hospitalisation per 100 population in Lithuania are markedly higher than in the EU (24 and 18.5 per 100 population, respectively). It must be noted that approximately 95% of the country's inhabitants live within a 25 km radius from the nearest multi-profile hospital and a 120 km radius from a territorial or university hospital. There have been long discussions over the years that the density of hospitals is clearly too large, yet in the period 1991 to 1999 only three hospitals were closed. In 1991 there were 187 hospitals, in 1999 there were 184.

An inadequately large emphasis placed on inpatient treatment has been one of the factors behind the low efficiency of the health care system at large.

Many hospitals work ineffectively, especially those in small towns. A large part of the funding allocated to the health care sector every year is used to maintain and finance the actual hospitals and their personnel. There is no doubt, therefore, that in closing some of the hospitals, merging them with other medical institutions or changing their profiles to nursing homes or similar status would result in additional financial resources being freed up and made available. These could then be used elsewhere more rationally and effectively. Closing hospitals is not only a medical problem, however, but also predominantly a social security and a political problem that should be addressed by the government. In closing a hospital in one place or another it would be necessary to strengthen the areas of primary health care and the ambulance service and to create a system of transferring patients to the nearest inpatient centre and so on.

Over the past few years there has been, and continues to be, a relatively rapid advancement of new technologies in the health care system. This has had a positive impact on the quality of medical services. The number of joint endoprothesis carried out in 2001 increased by nearly three times compared to 1998 and heart valve replacement operations were up by nearly 2.2 times. Between 1999 and 2001 the number of computerised tomographs made increased from 31,000 to 50,000, magnetic resonance from 1,500 to 3,000 and the number of haemodialysis procedures rose from 41,500 to 82,300. However, it must be noted that modern technology is con-

Modern technology is concentrated in central or university hospitals. Meanwhile the situation in the majority of national hospitals is poor.

The Lithuanian Health Programme, which was approved by the Parliament (Seimas) in July 1998, was the first strategic document that defined the health care priorities, aims and objectives for the next 10 years.

The advanced development of primary health care (PHC) is one of these priorities. In the last few years significant funds have been allocated to that end. Among the main achievements in the field of primary health care have been new funding and management mechanisms, the introduction of general practitioners (GPs) and a network of well-equipped clinics for them. The existing training and re-qualification network was expanded to meet new needs and to train GPs.

Nevertheless, the changes in the primary health care sector are too slow and insufficient. This is conditional upon a series of objective and subjective factors. There is still an insufficient number of GPs and a shortage of equipment and a lack of awareness about primary health care reforms in society.

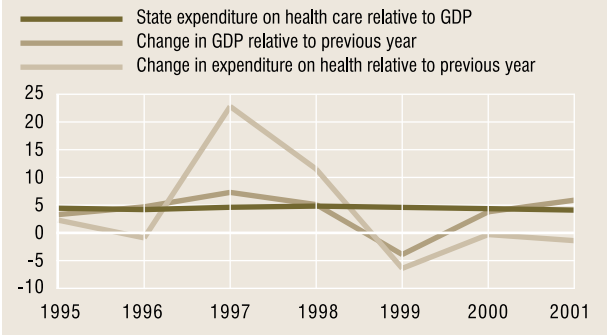
In developing the primary health care and family health care system in Lithuania the preliminary calculations indicated that approximately 2,000 GPs would be needed. In 2001 there were only 897 licensed GPs (2.6 per 100,000 population). Of late the situation is improving, particularly as there is a larger number of GPs practising privately.

The GP institution is suffering, because the GP speciality is not popular due to attitudes that have been developed over many years that the best doctor should be professional in a 'narrow' field. So many primary health care institutions are stagnant and work in the old style, whereby the patient is very frequently and easily referred to a specialist who assigns treatment and the patient only returns to the GP in order to have a sickness certificate completed and issued.

The lack of confidence in the qualifications of GPs could be also ascribed to the fact that the training of GPs only commenced in 1992 and some of them re-qualified from being therapists, paediatricians and other speciality medical practitioners.

In small towns and rural areas, the shortage of GPs is particularly severe, while the primary health care sector is the worst developed sector and the least accessible. As the accessibility and quality of outpatient treatment often does not satisfy demand, patients are often hospitalised. This in turn creates conditions for the ineffective use of health care resources. Polyclinics traditionally remain very separate from the inpatient hospital sector, both in terms of preparing a patient for hospitalisation and in terms of caring for patients once they have been discharged from hospital.

State expenditure on health care relative to GDP, (%)



centrated in district (central) or university hospitals. Meanwhile the situation in the majority of national hospitals is poor. A large proportion of the equipment necessary for undertaking tests, monitoring or treating patients (laboratory equipment, monitors, respiratory and anaesthesialogical equipment and so on) is often more than 10 years old. Much of it has been received as humanitarian aid. There is a shortage of spare parts and other components and funds are scarce for this purpose. Often new equipment is purchased sporadically. This is done while not taking into consideration the hospitals' development strategies (which in some cases do not exist), the scope of services they provide, whether a neighbouring hospital has similar or the same equipment and even the question of whether it is actually needed or not. This means that often funds allocated to health care are used with little impact on the quality of services provided.

Financing health care

Yet in 1994 the Seimas approved the Law on the Health Care System, which identified a lower threshold for state expenditure on health care as 5% of GDP. However, funds allocated to the health care sector have never reached this figure (the closest figure of 4.8% of GDP was reached in 1998). Since 1999 state expenditure on the health care sector relative to GDP has been falling consistently.

In 1997, with the introduction of the compulsory health insurance system, the Mandatory Health Insurance Fund (MHIF) became the main financial source for health care. The income of the MHIF comes from three main sources: personal income tax, (54.8% of the total in 2002), contributions and allocations from the state budget (23.2%) and contributions from the State Social Insurance Fund (SODRA) (20.6%). The State and Territorial Patient Accounts, through which the funding of health care institutions is carried out, plans the income of the Mandatory Health Insurance Fund based on forecasts by the Ministry of Finance. Due to an overly optimistic forecast the MHIF recei-

ved 500 million LTL less than was planned between 1998 and 2001, of which 54 million LTL did not come from SODRA and 120 million LTL did not come from the state budget. As a result, the debt of the State Patient Accounts to health care institutions and pharmacies grew.

There have been constant increases in expenditure on medications (including compensatory medications) over the last few years. In 2001 the Mandatory Health Insurance Fund did not cover 25% of the real expenditure for medications and medical devices.

Information technologies in health care

There is an acute shortage of computerised workplaces in the majority of health care institutions and a big proportion of the existing equipment is obsolete. Regardless of the fact that nearly all of the country's medical institutions have 24-hour access to the Internet, there still remain a very small number of computerised workplaces that are connected to the Internet (due to the high cost). Furthermore, nearly one third of the medical institutions that do have an Internet link have a relatively slow service (connection through telephone network, working on a dial-up principle), which does not allow for the effective and quick transfer of data or visual information (e.g., photographs). Several research studies have indicated that more than half of all medical practitioners can use or currently do use computers. However, their level of „computer literacy" is of a relatively low standard and often limited to writing up or recording medical histories, electronic mail and so on. The situation is much worse among nursing staff.

The problem of the computerisation of medical institutions was partially addressed by the creation of a computer network by the State Patients Accounts (SPA), aimed at collecting and accumulating information about the services provided by medical institutions. The SPA distributed about 600 computers to medical institutions and implemented the computer programme SVEIDRA. This newly created system has markedly improved the financial accounting of medical institutions, but was less successful in satisfying needs in the exchange of other information. Today there is a similar network, which links the SPA and Territorial Patient Accounts with pharmacies and aims at the exchange of information on subsidised medications. In addition the Territorial Patient Accounts have a separate computer link with the State Patient Accounts, which regularly transmits information about medications and the provision of services.

Even though the completion of various medical documents (like medical histories, outpatient cards, recipes) takes a lot of a GP's time, the computerisation of these activities and the introduction of electronic patient histories, their standardisation, financial documents and standard computer forms are still not widespread.

The development of a standard electronic patient history would create the foundation for the development of a patient database for each individual medical institution and for an overall database for the health care system. This would help to introduce the prompt exchange of information between different health care institutions. Nowadays, some Lithuanian medical institutions are in the process of developing or have already developed patient databases. However, these are usually designed to specifically meet the needs of that institution or in some cases the needs of a branch of the same institution. The majority of electronic databases are based on unlicensed programmes. Most medical institutions do not have an internal computer network system (Intranet). So the patient's information does not travel with the patient (e.g., in the polyclinic, if being referred from one specialist to another). The majority of information is collected in written format and is often duplicated.

Even though the completion of various medical documents takes a lot of a GP's time, the computerisation of these activities is still not widespread.

Due to the variety of programmes and the lack of their compatibility, the exchange of information collected in one institution by electronic means with another institution is often not possible. A similar situation arises when a patient is transferred to another institution and the latter does not have complete information about the patient's earlier treatment and the tests that were undertaken. In other cases the information arrives too late. The exchange of information by electronic means is further complicated by the fact that to date there are no national medical data (text or graphic) ex-

The main directions for health care reform

In January 2003 the Ministry of Health presented a project for the strategic restructuring of health care institutions to the government. The project identified three main directions for restructuring:

- Further development of outpatient services, with emphasis on primary health care;
- Optimisation of inpatient service and the development of alternative forms of activity;
- Development of medical nursing and long-term care services, with emphasis on services for the elderly.

Health

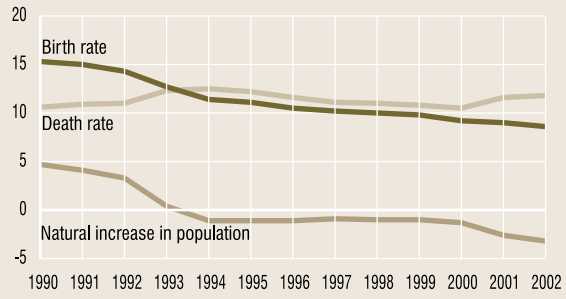
The demographic situation

In 2001 key demographic trends and patterns of mortality and morbidity remained very much the same as in previous years. The downward trend in the birth rate that commenced in 1991 became the most important factor behind the decline in population. The birth rate continued to fall in 2001. In 2000, there were 2,266 fewer births than in 1999 and in 2001 the gap was 2,603 from 2000. The total fertility rate (the number of live births per woman of childbirth age) fell from 2.02 to 1.29. Such a low fertility rate cannot ensure the replenishment of the population, for which the fertility rate should not fall below 2.1 (this means that every woman must at least give birth to two children).

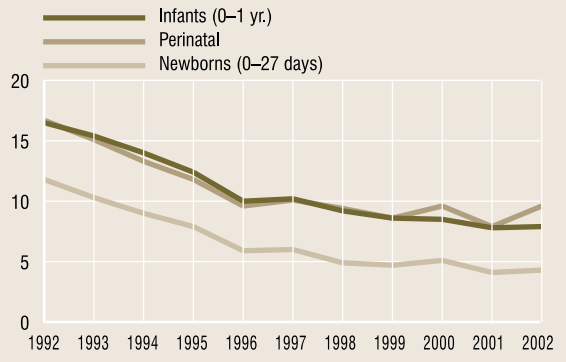
In 2001, the mortality trend remained unchanged compared to previous years. Mortality for the rural population was markedly higher (15.2 per 1,000 people) than for city inhabitants (9.8 per 1,000 people). The death rate among men was 30.5% higher than that for women.

Due to the increase in mortality, average life expectancy fell from 72.87 in 2000 to 71.7 years in 2001.

Demographic indicators per 1,000 population



Mortality of infants and newborns per 1,000 live births



The average life expectancy at birth for women was 77.4 years, whereas for men it was only 65.7 years. For the 25-29 age group, mortality among men was 4.9 times higher than for women.

In the countries of the EU, women live on average from three to five years longer than in Lithuania, while for men the difference in life expectancy is nearly 10 years. In recent years the mortality of children and infants has declined, mainly at the expense of a steady decrease in the mortality of newborns. Even though infant mortality in Lithuania is steadily declining, it still exceeds the EU average of 5.1 per 1,000 live births.

Patterns of mortality

The current pattern of mortality in Lithuania is typical of the majority of economically developed countries. The majority of cases of death can be attributed to cardiovascular diseases, malignant tumours and external causes.

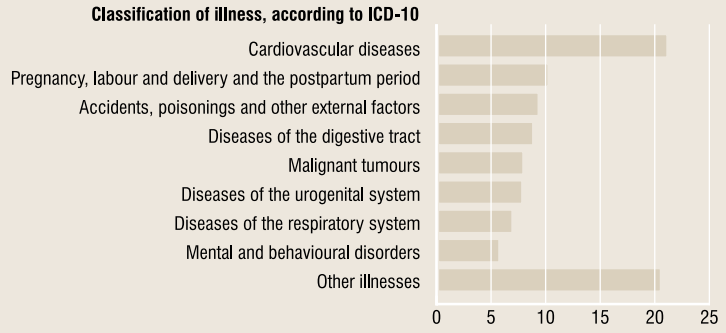
Men die 4.2 times more often from external causes, 5.6 times more often from tuberculosis and 2.5 times more often as a result of respiratory illnesses, whereas women die more often as a result of cardiovascular diseases.

In 2001, *cardiovascular diseases* were the cause of 45% of male deaths and 65% of female deaths. About 89% of those who died of cardiovascular diseases were 60 years or older.

Malignant tumours take second place among the causes of death. Approximately every fifth inhabitant of Lithuania dies as a result of a malignant tumour. Nearly 20% more people died as a result of a malignant tumour in 2001 than in 1990. Of the 7,796 people who died of cancer in 2001, 91% were older than 50. The mortality rate among men as a result of malignant tumours was 1.5 times higher than among women and it was 20% higher among rural inhabitants than among people living in the cities.

In 2001, 5,498 people died from *external causes*, which was 6.8% higher than in 2000. This constituted 20% of all deaths among men and 6% among women. Compared to the previous year, the number of deaths caused by road accidents rose by 10% and accounted for 847 cases in 2001. Mortality related to road accidents in Lithuania remained approximately three to four times higher than in Scandinavia. Accidents, traumas and poisonings were the cause of death of 79% of young men (aged 15-29) and nearly 52% of older men (aged 30-49). The mortality rate of women of the same age groups as a result of the same factors also constituted a relatively large number (respectively, 50% and 32%).

Pattern of morbidity of adults treated in hospitals (%), 2001



The *suicide* rate in Lithuania continues to be one of the highest in Europe and stood at 44.1 per 100,000 population in 2001. It is four times higher than the EU average. In 2001 1,535 people committed suicide - nearly 4% of the total number of deaths. On average, men are five times more likely than women to commit suicide and for the 25-34 age group the figure is 10 times. In the rural areas the suicide rate is twice as high as in the cities.

Morbidity: trends and pattern

In 2001, 811,628 patients were treated in hospitals, 139,696 (17.2%) of whom were children up to 14 years of age. The pattern of morbidity remains the same as in the last few years.

Both the incidence and prevalence of *malignant tumours* increased in 2001 compared to 2000. In 2001, compared to previous years, the number of people who were ill for the first time as a result of a malignant tumour and those with malignant tumours in total increased (14,060 and 62,160, respectively). The incidence of malignant tumours reached 403.1 per 100,000 population. The prevalence was 1,785 per 100,000 population. Even though the prevalence of cancer in women was higher than in men (2,163.3 and 1,367.0 per 100,000), the incidence among men was markedly higher than among women (425.0 and 383.5 per 100,000). The elderly are more inclined to have malignant tumours, so it can be predicted that with the increase in average life expectancy the spread of malignant tumours will also grow.

The incidence of active *tuberculosis* (excluding recurrent) of 63.9 per 100,000 people and the prevalence of 278.2 per 100,000 people did not significantly decrease from 2000 (respectively, 66.6 and 307.7). The incidence of tuberculosis in Lithuania is six times higher than the EU average (10.1 per 100,000 people).

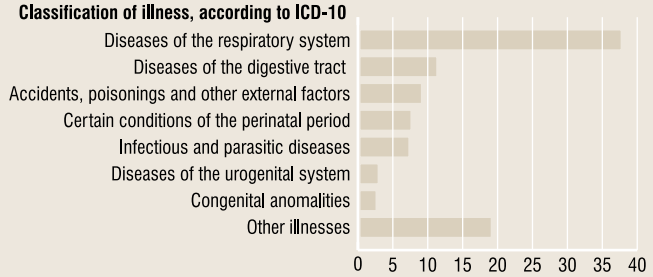
Over the last five years the incidence of *syphilis and gonorrhoea* has been steadily declining. If in 1997 there were 94.5 cases of syphilis and 49.2 cases of acute gonorrhoea per 100,000 population, by 2001 the figures had fallen to 25.9 and 20.0, respectively. However, in comparison to the countries of the EU, where there are only 1.07 cases of syphilis and 7.4 of gonorrhoea per 100,000, Lithuania has an unacceptably high incidence and prevalence of these dangerous sexually transmitted diseases.

There was an increase once again in the number of newly registered cases of *diseases of addiction* in 2001, from 88.0 per 100,000 people in 2000 to 94.5. The prevalence of diseases of addiction increased from 1,880.4 per 100,000 in 2000 to 2,005.9 in 2001. The number of drug addicts is growing rapidly . By 2001 the number of people suffering from drug and alcohol dependency had increased by 7.6 times (from 15.3 to 117.2 cases per 100,000 people) compared to 1991. Of great concern is the fact that younger people are using narcotics more often and are becoming addicted to them.

Cases of poisonings, traumas or external factors increased among adults and children in 2001, which respectively reached 111.0 and 109.9 per 1,000 inhabitants. According to these indicators, Lithuania exceeds the European Union average by more than 2.5 times.

According to the main indicators of morbidity and mortality, Lithuania's health situation is much worse than in the countries of the EU. To improve this situation fundamental changes in the health care system are required.

Pattern of morbidity of children* treated in hospitals (%), 2001



change standards; questions of the safety of electronic information and the confidentiality of information have not been addressed.

The lack of information technologies in Lithuania's health care system is to blame for the widespread use and circulation of data in handwritten form. Handwritten information is usually processed very slowly (most of the time is needed for inputting the information into a computer database). This means that medical institutions often do not receive feedback and expeditious summaries about their own or their colleagues' work or the most important quantitative and qualitative indicators.

More and more information of a medical nature can be found in Lithuanian websites. There are websites that present information about medical treatment, rehabilitation and other institutions, pharmacies, private practice doctors and so on (e.g., http://medicina.lt, http://sveikata.osf.lt/). It is also possible to find a portal of links to medical information sites (more than 1,000 links) at http://www.medicine.lt/. There is also a fair amount of information on different medical topics available in other Lithuanian websites. Unfortunately, only a small number of health care institutions have their own Internet websites and those that do lack information of an interactive nature.

It is possible to find on the Internet electronic versions of some of the Lithuanian medical journals, the most important legal acts and laws, the Lithuanian health programme and the yearly report of the National Health Committee. Today, doctors can find without great difficulty information on the Internet about medications that have been registered and are subsidised in Lithuania. However, the majority of these miss out detailed and objective information about the latest medications, their consumption and potential side effects. In the event that one can find such information, it is usually provided by pharmaceutical companies and therefore is not always objective.

More and more educational information oriented to students and medical practitioners can be found in the websites of Vilnius Medical University and Kaunas Medical University.

The term 'telemedicine' has been applied to computer equipment and various forms of telecommunications used in the medical field. Today, telemedicine is most often used and understood to be 'tele-consultations' or distance consultations to patients when the patient and the consulting medical practitioner are in different locations. Telemedicine can be a very useful tool applied to distance learning for medical personnel. It must be noted that surgical operations or other medical procedures that are transmitted from a distance are often incorrectly termed telemedicine. They are in fact teleconferences.

In order for telemedicine to be further developed there are several essential conditions. A medical institution needs to have modern computer equipment, sufficient channels of communication and equipment for conducting various tests for patients. Even common test images (e.g., electrocardiograms, x-rays and so on) can quite easily be converted to digital format with the aid of modern equipment and then transferred by computer from a distance. A relatively large component of diagnostic equipment, especially in university hospitals, is today already of a digital nature and has the capacity to save digital data (for example, magnetic radiation resonance, some ultrasound equipment and computer tomography).

However, today opportunities related to telemedicine are significantly underused. Apart from the insufficient technical base and weak channels of communication, there is a lack of standards that regulate tele-consultationuse in health care. There are no national medical data exchange standards, viable telemedicine development strategies or adequate funding. The problem of insufficient funding is aggravated by the absence of regulations governing payment from the health insurance fund for telemedicine services. Only the Vilnius and Kaunas university hospitals and some of the larger hospitals have telecommunications facilities, which they use rather sporadically.

More and more educational information oriented to students and medical practitioners can be found in the websites of Vilnius Medical University and Kaunas Medical University.

A more rapid introduction of information systems and technology into the health care system is without a doubt necessary and would be to the benefit of both patients and medical practitioners. However, in order for this to happen, a long-term strategy at the national level is necessary for this newly developed sphere of activity supported by concrete financial investments.

Regardless of the fact that there was regular discussion about the need for structural changes in the health care system in preparation for integration into the European Union, these changes have not yet occurred. Integration into a new quality EU health care system essentially requires reviewing the existing concept of 'health' and the health care system. Furthermore, upon having defined the new health care priorities, it is vitally important to establish and introduce advanced management and financial mechanisms for the whole system, conducive to the application of new technologies and the effective use of resources. Needless to say, real changes require real investments.

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Human development in an information society

Jolanta Rimkutė, Irina Voloschuk

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Concept of sustainable human development: brief overview of theoretical basics*

The sustainable human development concept. For many centuries people have viewed development as a means of improving the quality of life in a broad sense. The idea that development must be judged by the extent it promotes 'human good' goes back to Aristotle: "Wealth is evidently not the good we are seeking, for it is merely useful and for the sake of something else." Yet in the 17th century Sir William Petty, one of the first development economists (and the 'grandfather' of national income), distinguished such development factors as "common safety" and "every man's particular happiness".

The modern concept of human development is therefore not a new invention. It re-establishes a well-known, but for some time obscured, approach that embraces every aspect of society, not just the economy, putting people at the centre of development.

Human development values human life itself, but not because people can produce material goods. People are regarded as the end of the process of development and its means of existence. In actual fact, people-centred development means the development of the people, for the people, by the people. Enlarging people's choices ('choices' in preference to 'capabilities') conveys the idea of individuals taking charge of their own lives. Choice is wider than capability. It is understood not as choice among different models of cars, newspapers or houses, but as choice that is created by expanding human abilities - to be knowledgeable, to be healthy, to use the Internet and many other more-or-less essential abilities. Development enables people to build on their abilities in order to have more choice, but the choices people make are their own concern.

The following principles have been laid at the core of the concept of sustainable human development:

productivity - human development has two important aspects, the formation and the use of capabilities. The principle of productivity in this respect means enabling the environment (the environment in a broad sense - economic, political, social, natural) to allow people to achieve their maximum potential and use their acquired capabilities for productive purposes. This principle is obviously wider than simply investing in people (education, health, housing). Contrary to the human development approach, growth models regard productivity in terms of human capital as the means of development.

equality - in opportunities (not in results that depend on individual abilities), which implies that all people irrespective of gender, nationality, place of residence or age have equal opportunities to lead a productive and freely chosen life. This postulate is based on the universality of a claim to life for everyone.

empowerment - giving people gre-

The original definition of human development

Human development is a process for enlarging people's choices. In principle these choices can be infinite and can change over time. But at all levels of development the three most essential are for people to lead a long and healthy life, to acquire knowledge and to have access to those resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.

But human development does not end there. Additional choices, highly valued by many people, range from political, economic and social freedoms to opportunities for being creative and productive, and enjoying personal self-respect and guaranteed human rights

From the UNDP's 1990 Human Development Report

* Human Development: Concept and Trends, SPU / UNDP, Vilnius, 1999

ater opportunities (through education, employment, democracy) to participate in economic, social, cultural and political processes and to take part in decision making. Unlike welfare or basic needs approaches, which make people the passive recipients of benefits and basic social services, 'development by the people' in the human development paradigm envisages an active position.

sustainability - which in abroad sense refers to human opportunities (not just the renewal of natural resources and environmental protection). This principle implies that society should preserve its capacity to ensure well-being not only for the current generation but also for the generation to come. For example, the neglect of people's health and education, or the violation of their basic rights and freedoms may have no less a devastating effect on the lives of current and future generations than mining out natural resources or a mounting external debt.

Measuring human development*

Human development embraces many sides of development. On the one hand it is a conceptual advantage, but on the other it makes the measurability of human development problematic. In addition, human development contains crucial but not easily quantifiable factors related to empowerment, human rights and freedoms.

The UNDP has constructed a composite Human Development Index (HDI), which was used in the first-ever Human Development Report in 1990 (the Global Report) for the international ranking of countries. The basic idea behind the HDI was to incorporate social choices beside income into a single and relatively simple indicator. The HDI is calculated using the latest international data available at the time the Global Report is presented. The experience of HDI calculation reflects the continuous effort to improve data.

Life expectancy at birth was therefore chosen as a proxy for many important choices since longevity closely correlates with the quality of life (adequate nutrition, good health, education). In 1998, a revision was made by incorporating the demographic effect of HIV/AIDS and by taking into account extensive migration and demographic changes in Eastern Europe and the CIS, which have lead to substantial changes in life expectancy estimates for a number of countries. In 2003 the primary source of data for life expectancy at birth is the United Nations Population Division.

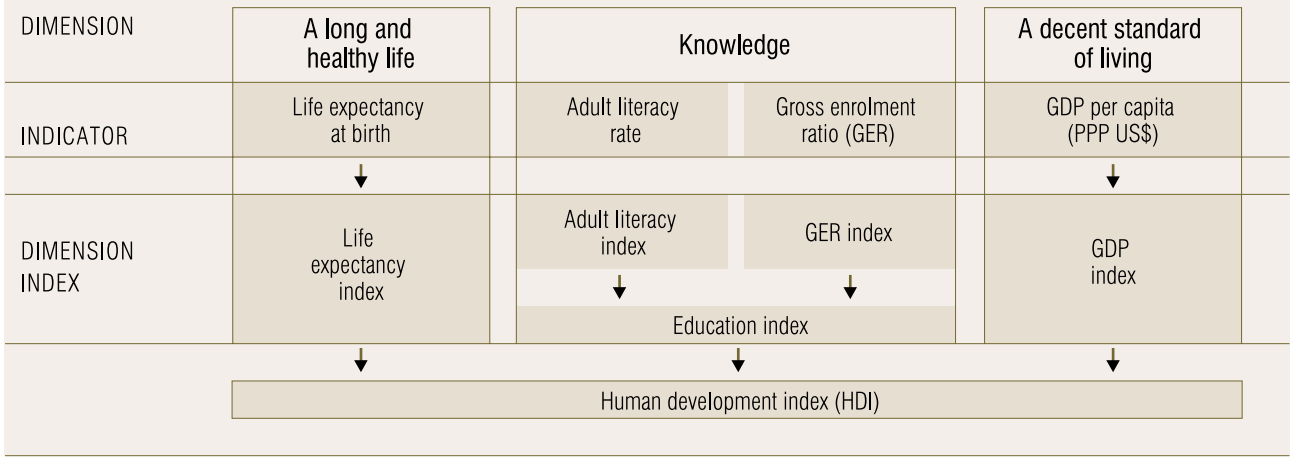
Adult literacy was chosen as a crude reflection of access to education (later, adult literacy was replaced by mean years of schooling). The adult literacy rates presented in Global Report 2000 are new estimates taken from UNESCO's February 2000 literacy assessment. In 2003 the primary source of data for adult literacy rate and a combined primary, secondary and tertiary gross enrolment ratio is the UNESCO Institute for Statistics.

As a measure of the standard of living and as an indicator of access to important economic choices, GDP per capita was chosen, adjusted for purchasing power parity (PPP US$). The World Bank provides the data. The base year for the PPP data is 1996. So data for the reference year are extrapolated using relative price movements over time between each country and the USA, the base country. In 2003 the primary source of data for GDP per capita (PPP US$) is the World Bank.

With the normalisation of the values of the variables that make up the HDI, its value ranges from 0 to 1. The HDI value for a country shows the distance it had to overcome to reach the maximum possible value of 1.

* UNDP Human Development Report 2001, 2002, 2003. Oxford University Press, New York, 2001, 2002, 2003;

Human Development Index (HDI)



What does the HDI 2003 reveal?

The base data for HDI-2003 serve the data of 2001. All countries are classified into three clusters: high human development (HDI above 0.800), medium human development (0.500-0799) and low human development (less than 0.500).

	Life expectancy at birth, years, 2001	Adult literacy rate %, age 15 and above, 2001	GDP per capita, PPP US$, 2001	HDI, value, 2001
High human development				
Norway (1)*	78.7	99.0	29,620	0.994
Iceland (2)	79.6	99.0	29,990	0.942
Sweden (3)	79.9	99.0	24,180	0.941
Australia (4)	79.0	99.0	25,370	0.939
Canada (8)	79.2	99.0	27,130	0.937
Slovenia (29)	75.9	99.6	17,130	0.881
Poland (35)	73.6	99.7	9,450	0.841
Hungary (38)	71.5	99.3	12,340	0.837
Estonia (41)	71.2	99.8	10,170	0.833
Lithuania (45)	72.3	99.6	8,470	0.824
Latvia (50)	70.5	99.8	7,730	0.811
Mexico (55 - last)	73.1	91.4	8,430	0.800
Medium human development				
Bulgaria (57)	70.9	98.5	6,890	0.795
Russian Federation (63)	66.6	99.6	7,100	0.779
Ukraine (75)	69.2	99.6	4,350	0.766
Georgia (88)	73.4	99.0	2,560	0.746
Togo (141 - last)	50.3	58.4	1,650	0.501
Low human development				
Cameron (142)	48.0	72.4	1,680	0.499
Sierra - Leone (175 - last)	34.5	36.0	470	0.275
OECD	**77.0**	**99.0**	**23,363**	**0.905**
Central & Eastern Europe & CIS	**69.3**	**99.3**	**6,598**	**0.787**
All developing countries	**64.4**	**74.5**	**3,850**	**0.655**
** HDI rank of country in brackets*				

Compared to the previous year, Lithuania's HDI rank improved from 49 to 45.

The main shortcoming of the HDI remains the fact that it does not take into account an important integral part of the human development concept - political freedom. Beside the conceptual and methodological complexities for measuring political freedom, the inclusion of such a component to the HDI provokes political opposition from governments in the developing and industrialised world. If industrialised countries are more concerned with the viability of a political freedom index, developing countries are afraid that any such indicator will be used to impose additional conditions for aid. A low human development ranking based only on income, literacy and longevity is usually explained by a lack of resources.

The UNDP tried to advance the dialogue with the construction of a Political Freedom Index (PFI). It was suggested that the following clusters be combined: political participation; the rule of law; and the freedom of expression. Each cluster was assessed using data obtained from respected international human rights organisations, such as Amnesty International, Freedom House, Human Rights Watch and the Inter-Parliamentary Union. On the basis of this data an illustrative PFI was designed, ranking 100 nations in 1994 (88 in 1991). With time, the methodology of the PFI should evolve. The human development concept is much broader than its quantitative measurement. Yet tools are needed to monitor progress in human development.

The UNDP maintains a methodology for the HDI, which is flexible and open to improvement. So far, the evolution of measuring human development is progressing.

The modern international system of measuring human development includes the following indicators:

• The HDI, constructed annually since 1990, measures average achievements in basic human development and produces a country ranking.

• The gender-related development index (GDI) and the gender empowerment measure (GEM), introduced in the Global Report 1995, are composite measures reflecting gender inequalities in human development. The GDI measures achievements in the same dimensions as the HDI does. The GEM measures gender inequality in economic and political opportunities.

• The human poverty index (HPI), introduced by the Global Report 1997, measures deprivations in the same dimensions as the HDI measures achievements;

• The technology achievement index, a new measure of countries' ability to participate in the network age, was introduced by the Global Report 2001: Making New Technologies Work for Human Development.

• The Millennium Development Goal (MDG) indicators are introduced by the Global Report 2003. The MDG represents the main human development indicators grouped by Millennium goals:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health

6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

The Millennium Indicators Database, compiled from international data series provided by responsible international data agencies, is being maintained (http://millenniumindicators.un.org).

Improving human development statistics

Because of a lack of reliable data in this report, 18 UN member countries are excluded from the HDI and consequently from the main indicator tables. Similarly the human poverty index (HPI) covers only 94 developing countries and 17 high-income OECD countries. The gender-related development index covers 144 countries and gender empowerment measures 70 countries.

A serious problem is the discrepancies that exist between national and international estimates. A vital part of the solution to the problem of gaps and deficiencies in statistical information is building sound statistical capacity in countries. One important way to build statistical capacity is to conduct and analyse a household budget survey. For Lithuania this problem is being solved as numerous projects on the harmonisation of national statistics with the statistics of the EU are implemented. The household budget survey and the labour force survey are adjusted to EUROSTAT requirements and are completely in line with similar surveys conducted in the EU.

The technology achievement index:
a new measure of countries' ability
to participate in the network age*

The Human Development Report 2001: Making New Technologies Work for Human Development introduced a new indicator, the Technology Achievement Index (TAI), which aims to assess how well a country is creating and diffusing technology and building a human skills base, thus reflecting the capacity to participate in the technological innovations of the network age. TAI measures achievements, not potential. This indicator is not a measure of which country is leading in global technology development, but focuses on how a country as a whole is participating in the creation and use of technology. For example, the United States, a global technology superpower, has many more inventions and Internet hosts than, say, Finland does. But it does not rank as highly in the index because in Finland the Internet is more widely diffused and is being done so to develop a technological skills base throughout the population.

A nation's technological achievements are larger and more complex than what this or any other index can capture. It is impossible to reflect the full range of technologies from agriculture to medicine. Moreover, many aspects of technology creation and diffusion and human skills are hard to quantify. So the TAI is constructed using the indicators, not direct measures, of a country's achievement in four dimensions. It provides a rough summary not a comprehensive measure of society's technological achievements and is intended to help policymakers define technology strategies.

Components of the index

The TAI focuses on four dimensions of technological capacity important for reaping the benefits of the network age irrespective of a country's level of development:

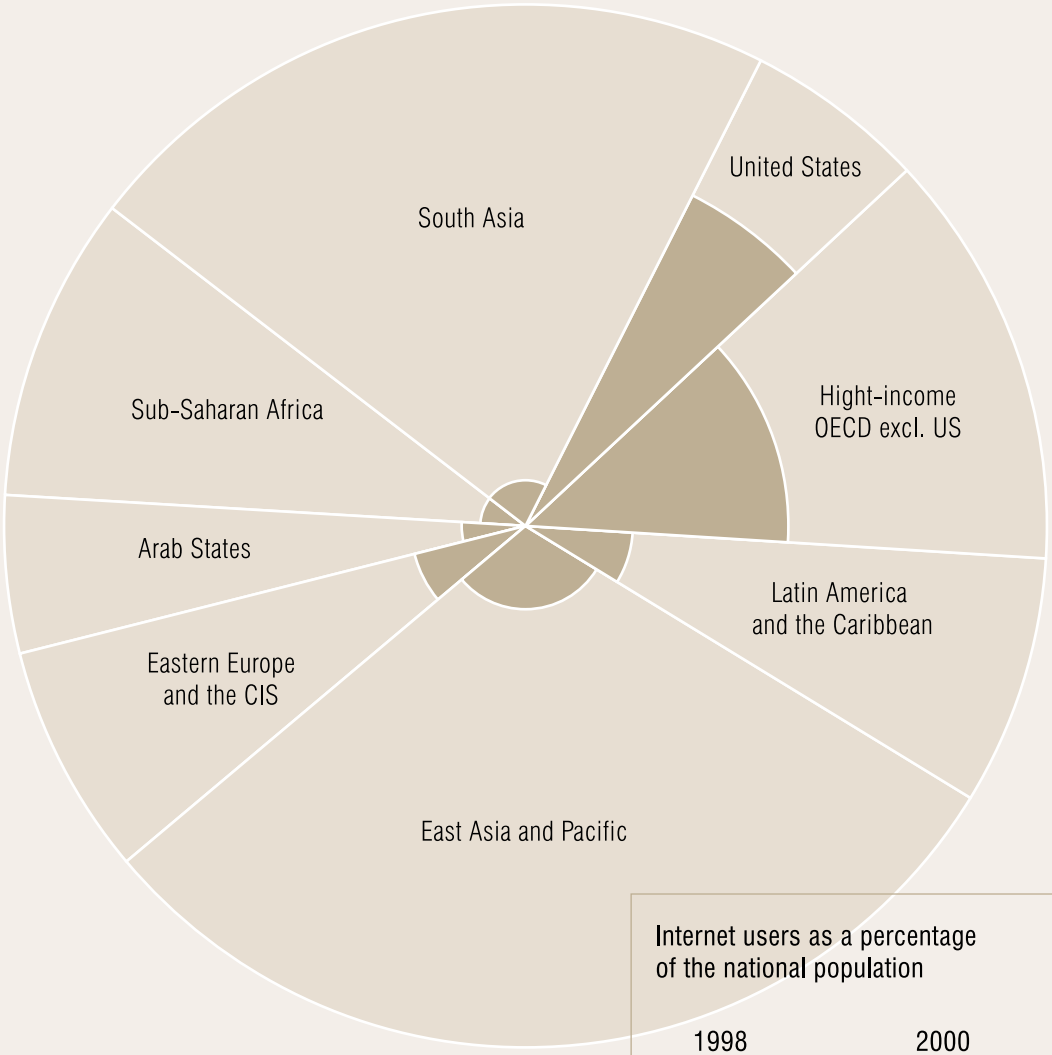
• *Creation of technology.* Not all countries need to be at the cutting edge of global technological development, but the capacity to innovate is relevant to all countries and constitutes the highest level of technological capacity. The global economy gives big rewards to the leaders and owners of new technology. Innovation occurs throughout society, in formal and informal settings, though the current trend is towards increasing the commercialisation and formalisation of the process of innovation. In the absence of perfect indicators and data series the TAI uses two indicators to capture the level of innovation in society. The first is the number patents granted per capita, to reflect the current level of invention activities. The second is receipts of royalty and license fees from abroad per capita, to reflect the stock of the successful innovations of the past that are still useful and have market value.

• *Diffusion of recent innovations.* All countries must adopt innovations to benefit from the opportunities of the network age. This is measured by the diffusion of the Internet - indispensable to participation - and by exports of high- and medium-technology products as a share of all exports.

• *Diffusion of old innovations.* Participation in the network age requires the diffusion of many old innovations. Technological progress is a cumulative process. Two indicators used here - telephones and electricity - are especially important because they are needed to use newer technologies and are also pervasive inputs to a multitude of human activities. Both indicators are expressed as logarithms and capped at the average OECD level, because they are important at the earlier stages of technological progress but not at the most advanced stages. Expressing the measure in logarithms ensures that as the level increases it contributes less to the index.

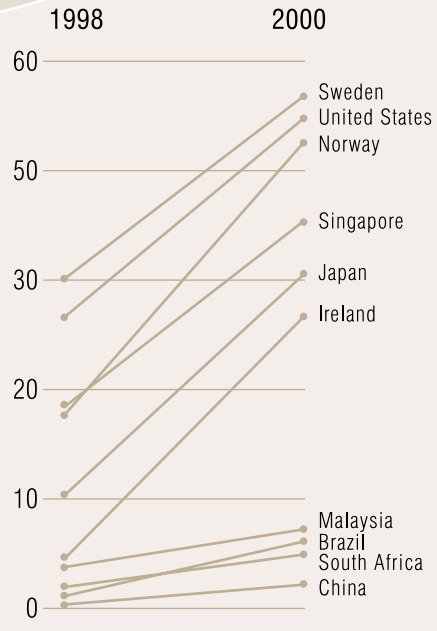
* UNDP Human Development Report 2001, Oxford University Press, New York, 2001;

UNEVEN DIFFUSION OF TECHNOLOGY - OLD AND NEW



	Internet users (as percentage of population)	
	1998	2000
United States	26.3	54.3
Hight-income OECD excl. US	6.9	28.2
Latin America and the Caribbean	0.8	3.2
East Asia and the Pacific	0.5	2.3
Eastern Europe and CIS	0.8	3.9
Arab States	0.2	0.6
Sub-Saharan Africa	0.1	0.4
South Asia	0.04	0.4
World	**2.4**	**6.7**

Internet users as a percentage of the national population



• *Human skills.* A critical mass of skills is indispensable to technological dynamism. Both the creators and users of new technology need skills. Today's technology requires adaptability - skills to master the constant flow of net innovations. The foundations of such an ability are provided by the basic education to develop cognitive skills and skills in science and mathematics. Two indicators are used to reflect the human skills needed to create and absorb innovations: the mean years of schooling and the gross enrolment ration of tertiary students enrolled in science, mathematics and engineering. Although it would be desirable to include indicators of vocational training, these data are not available.

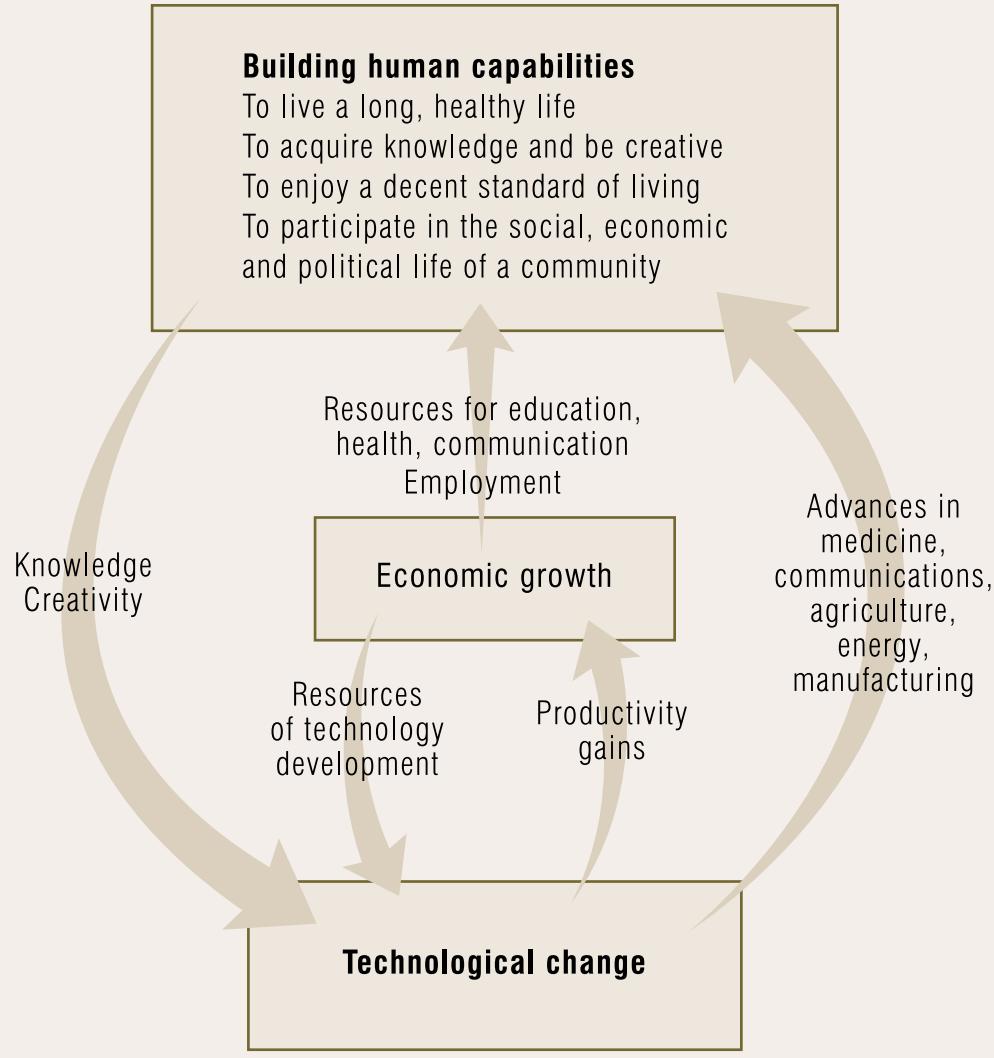
Data sources and limitations

The data used to construct TAI are from international series that are the most widely used in analyses of technology trends.

Limitations in the data series must be taken into account in interpreting TAI values and rankings. Some countries will have undervalued such innovations as those occurring in the informal sector. Moreover, national systems and traditions differ in scope and criteria. A high number of patents may reflect liberal intellectual property systems. Internet access is measured by Internet hosts because these data are more reliable and have better coverage than Internet user data at the country level.

TAI and human development

Although technological achievements are important for human development, the TAI measures only technological achievements. It does not reflect how well these achievements have been translated into human development. Still, the TAI shows a high correlation with the human development index and it correlates better with the HDI than with income.



TAI values and rankings

TAI estimates have been prepared for 72 countries for which data are available and of acceptable quality.

The results show three trends:

• great disparities between countries;

• diversity and dynamism in technological progress among developing countries;

• technology hubs imposed on countries at different levels of development;

Leaders (TAI above 0.50) - led by Finland, the United States, Sweden and Japan, this group is at the cutting edge of innovation.

Potential leaders (TAI 0.3-049) - most of these countries have invested in high levels of human skills and have diffused old technologies widely but innovate little. Most countries from this group have skills comparable to those in the top group.

Dynamic adapters (TAI 0.20-034) - these countries are dynamic in their use of new technology. Most are developing countries with significantly higher skills than the fourth group. They include Brazil, China, India, Indonesia, South Africa and Tunisia among others. Many of these countries have hi-tech industries and technology hubs, but the diffusion of old inventions is slow and incomplete.

Marginalised (TAI below 0.20) - technology diffusion and skill building have a long way to go in these countries. Large segments of the population have not benefited from the diffusion of old technology.

Standard of living in an information society*

Income.

In 2002, the household total (both monetary and in kind) monthly per capita disposable income was 421 LTL, of which monetary income stood at 85% of the total disposable income (359 LTL). Real growth in total disposable income (adjusted to inflation) was 2.6%, compared to 2001 and 8.9% compared to 1996.

As in the past there is a wide gap between the size, structure and rate of growth of disposable income of rural inhabitants and city dwellers. Monthly per capita household income in the cities was 473 LTL, in rural areas 33% lower (316 LTL). Monetary income accounted for 91% of urban inhabitants and only 69% of rural inhabitants. Compared to the previous year real dis-

Technology achievement index (with selected sub indexes)

	TAI	Patents granted to residents (per million people, 1998)	Receipts of royalties from abroad (US$ per 1,000 people, 1999)	Internet hosts (per 1,000 people, 2000)	High - and medium - technology exports (of total exports)
LEADERS					
1 Finland	0.744	187	125.6	200.2	50.7
2 United States	0.733	289	130.0	179.1	66.2
3 Sweden	0.703	271	156.6	125.8	59.7
4 Japan	0.698	994	64.4	49.0	80.8
5 Korea, Rep. of	0.666	779	9.8	4.8	66.7
6 Netherlands	0.630	189	151.2	136.0	50.9
7 United Kingdom	0.606	82	134.0	57.4	61.9
8 Canada	0.589	31	38.6	108.0	48.7
11 Germany	0.583	235	36.8	41.2	64.2
17 France	0.535	205	33.6	36.4	58.9
18 Israel	0.514	74	43.6	43.2	45.0
POTENTIAL LEADERS					
19 Spain	0.481	42	8.6	21.0	53.4
20 Italy	0.471	13	9.8	30.4	51.0
21 Czech Republic	0.465	28	4.2	25.0	51.7
22 Hungary	0.464	26	6.2	21.6	63.5
23 Slovenia	0.458	105	4.0	20.3	49.5
25 Slovakia	0.447	24	2.7	10.2	48.7
28 Bulgaria	0.411	23	...	3.7	30.0
29 Poland	0.407	30	0.6	11.4	36.2
35 Romania	0.371	71	0.2	2.7	25.3
DYNAMIC ADOPTERS					
38 Uruguay	0.343	2	0.0	19.6	13.3
39 South Africa	0.340	..	1.7	8.4	30.2
40 Thailand	0.337	1	0.3	1.6	48.9
41 Trinidad and Tobago	0.328	...	0.0	7.7	14.2
43 Brazil	0.311	2	0.8	7.2	32.9
57 Egypt	0.236	..	0.7	0.1	8.8
63 India	0.201	1	...	0.1	16.6
MARGINALISED					
64 Nicaragua	0.185	..	..	0.4	3.6
65 Pakistan	0.167	..	..	0.1	7.9
71 Sudan	0.071	..	0.0	0.0	0.4
72 Mozambique	0.066	..	..	..	12.2
OTHERS*					
Estonia	...	1	1.2	43.1	31.9
Latvia	...	71	4.3	13.4	12.4
Lithuania	...	27	...	7.5	29.2
Luxembourg	...	202	272.6	49.5	34.0
Russian Federation	....	131	0.3	3.5	16.0
Switzerland	...	183	...	82.7	63.6

**Other countries are presented in alphabetic order.*

* Based on the results of the Household Budget Survey 2002, conducted by the Department of Statistics

Aiming for sustainable human development in a knowledge economy*

Trust, collaboration and social cohesion in building a knowledge economy

Building a knowledge economy will require consensus and joint action among key society actors:
• the government, which will need to facilitate actions and integrate the aspirations of society as a whole;
• the business community, which is the driver of innovation in the economy and will need to play a more substantive role in working with the government to develop and implement policies for a knowledge economy, as well as direct activities in networking and promotion;
• education and research communities, which will increasingly become the providers of demand-driven learning and research services;
• civil society, both as a participant in and a source of demand for products and services in the knowledge economy.

Still, significant obstacles exist in the interactions among the key actors for Lithuania's knowledge economy. A legacy of mistrust, poor communication and lack of co-operation persists. Lithuanian experts have in-depth knowledge and understanding of the available policy options. But what seems to be missing is consensus and leadership, whether from the government or the business community, to move forward to a knowledge economy.

To succeed, a knowledge economy strategy needs to be implemented in an environment of:
• *Inclusiveness and partnerships.* A crucial first step is to build trust among a broad coalition of stakeholders, including the disadvantaged, the rural population, the business community and education and research institutions - with the government setting an example of good governance and taking leadership. As individuals become increasingly responsible for their lifelong learning, learners at all levels and from different income groups should have a voice in defining their learning demands and accessing learning opportunities. And as businesses become the main clients for science and research work, they will be key in shaping the science and technology agenda, supported by public resources.

• *Networking*. Much joint action will be required in moving forward. Fully inclusive networks involving diverse communities at all levels will increasingly become the drivers of a knowledge economy. Networking, supported by effective access to information and communications technology, will need to take place within and between municipalities and also with cities outside Lithuania, between research centres and enterprises and between learning communities in Lithuania and abroad.

Networking will need to develop at both the local and national levels, reaching across the Baltic states, the Nordic countries and the European Union. As networks expand, driven by communities of interest and supported by ever-improving access to information and communications technology, old boundaries (physical, political, psychological) will dissolve.

• *Changing mindsets.* Moving towards a knowledge economy also requires a change in mindsets. For individuals, a knowledge economy requires becoming increasingly independent, adaptable and responsible for one's actions. For businesses it requires the ability to systematically transform knowledge into products and services - and profits. For governments, it requires creating and supporting opportunities by challenging conventional policies and integrating partners to increase competitiveness. It also requires greater willingness and ability to share information with the public, emphasising public services over public control and supporting a national and inclusive dialogue that builds social cohesion and trust. Finally, the biggest challenge may be for the academic and research community - the harbour of knowledge in Lithuania - to rethink its role and approaches as it moves towards becoming a provider of knowledge services in response to demand, particularly from learners and from the business sector.

Lifelong learning for the knowledge economy

The following key issues need to be addressed to facilitate lifelong learning that allows Lithuanians to participate more fully in the knowledge economy in their country, in Europe and in the global community.
The linkages between learning and the knowledge economy are understood from three perspectives:
• a learner perspective, as opposed to an education institution perspective;
• an economic and labour market perspective, though not in isolation from social and cultural factors;
• a thematic education policy perspective, which examines learning and knowledge issues across different life stages, from early childhood to retirement, and learning systems - formal, non-formal (training in enterprises) and informal (life experiences).

** From: Lithuania Aiming for a Knowledge Economy. The World Bank Europe and Central Asia Region. http://www.worldbank.lt*

In many countries, including Lithuania, education systems are at a crossroads - facing increasing demand but with limited capacity and resources to improve access and quality. The increasing economic and human development importance of knowledge and innovation, the growing reliance on technology and rising demand for traditional as well as new skills signal that globalisation is not just a means of production but also a means of education. Recent research indicates a need to broaden the base of basic skills to include information, communication and language competence.

Such research also points to the need to introduce new skills and knowledge, including those that allow individuals to evaluate and use knowledge, to act autonomously in increasingly complex social and work environments and to join and function in socially heterogeneous groups (OECD 2001 b). All individuals need access to learning on a lifelong basis, which requires policies that facilitate more responsive learning systems.

With the global economy increasingly driven by knowledge, countries need educated populations able to create, adapt, use and disseminate it. Governments and economies must transform formal education systems and link them with non-formal systems, with the goal of creating an overall high-performance learning system. The key challenge for education is to provide individuals with access to necessary knowledge and skills. But other questions also arise. How should knowledge be imparted if the kind of knowledge in demand is constantly changing? How should the new demands on the education sector be managed? And how can countries mobilise the financial resources necessary to confront these enormous challenges?

Education systems in OECD countries have been adjusting to these changes more quickly than systems in developing countries, yet developing countries face even greater challenges.

First, they must overcome longstanding problems: expanding coverage to achieve universal access to basic education (a necessary but insufficient first step in providing skills for the knowledge economy), expanding secondary and tertiary education and implementing institutional reforms to strengthen the linkages between formal and non-formal education and the labour market. Second, developing countries need to raise the quality of education through changes to content, pedagogy and the use of modern technology, as well as cost-effectively expanding access to post-school learning for adult learners. How developing countries respond to these challenges will affect economic growth, human capital development and social cohesion.

The responsibility for managing learning in the knowledge economy needs to be increasingly demand-driven and based on individual needs, particularly as individuals move up the learning continuum. There is a need to empower individuals to manage their own learning, rather than placing full responsibility in the hands of education and training institutions. This paradigm shift reflects the need for individuals to have basic knowledge as well as knowledge of how to access, select and evaluate specialised knowledge - and to use it autonomously in the context of lifelong learning in a knowledge economy.

The skills gap

The skills gap seems to partly account for limited transition from unemployment to jobs. On average, the unemployed and especially the long-term unemployed have lower education attainment and lower skills than the employed.

The skills mismatch problem has two policy implications:

- the need for greater wage flexibility, especially at the lower end of the wage distribution, to encourage the creation of low-skilled jobs and improve the employment prospects of the poorly educated unemployed;
- the role of education and training systems in curbing the problem of low, narrow and inadequate skills - including changing the nature of vocational training in secondary education, examining the proportions of enrolments between colleges and universities and motivating individuals and enterprises to support non-formal training.

Selected knowledge economy indicators related to human development

Indicator	Lithuania	Europe and Central Asia	United States	Western Europe	G7
Unemployment Rate (%)	13.50	9.80	4.50	7.75	8.11
Human Development Index	0.80	0.79	0.93	0.93	0.93
Public Spending as % of GDP	5.20	4.86	4.70	6.08	4.99
Primary Student - Teacher Ratio	15.00	17.23	16.00	14.00	16.83
Secondary School Enrolment (%)	90.00	83.33	97.00	116.00	109.14
8th Grade Mathematics Achievement	482.00	510.89	502.00	530.00	517.40
8th Grade Science Achievement	488.00	519.67	515.00	545.00	525.80
Gross Tertiary Enrolment 1995 (%)	41.00	39.06	81.00	56.75	59.57
Adult Literacy (%)	99.50	97.56	99.00	98.83	99.00
Availability of Management Training	4.00	4.15	6.70	5.70	5.74
Prof/Technical % of Workforce	21.37	20.86	28.50	27.34	24.86
Extent of Staff Training	3.40	3.65	5.90	5.65	5.47
Computers per 1,000 people	4.09	4.09	6.24	5.87	5.69
Telephones per 1,000 people	5.77	5.52	6.55	6.39	6.40

Source: World Bank Institute, World Bank

Thematic education policy perspective

There are several areas where Lithuania deviates from the norm. For example, unemployment is significantly higher, mathematics and science scores for 8th graders are lower and management training and adult education are less widely available (table A2.3). These deviations indicate shortfalls in basic and tertiary education as well as potential problems in adult education for the current workforce. The latter deficiency contributes to long-term structural unemployment and a shortage of human capital to support the development of the knowledge economy.

New pedagogy and e-learning

Lithuania is aware of the need for new pedagogy and e-learning and is taking steps to address them in the formal education sector and in community settings.

The need to include information and communications technology skills in curriculums is generally accepted. But there is less agreement on the role of information and communications technology in new pedagogical processes and the actual teaching and learning process.

However, the advantages of information and communications technology in supporting changes in pedagogy and improvements in student learning do not come merely from the purchase and introduction of computers in the classroom. The OECD (2002) concludes that the effect of information and communications technology on learning has at least as much to do with factors independent of the technology as it has to do with the technology.

A policy for information and communications technology in education should foremost be an education policy. The introduction of information and communications technology must therefore be supported by, and supportive of, complementary reforms in the education system.

An information society for all?

The high Internet access cost in Lithuania could prove to be a significant impediment to demand and an obstacle to the development of a knowledge economy. A new business model for Internet access is required.

Peak tariffs for 30 hours a month of dial-up Internet access, 2001, (USD)

	PSTN* monthly access fee	PSTN usage charge	ISP charge	Total
Lithuania	4.30	0.70	63.00	68.00
Latvia	4.90	1.10	40.30	46.30
Estonia	4.40	0.80	unlimited access	5.20

**PSTN = public switched telephone network*

Source: International Telecommunications Union, World Telecommunications Development Report 2002.

Telephone access in the capital city and the rest of the country, 2000***

	Largest city*				
	Population as % of total	Telephones as % of total	Tele-density (fixed lines per 100 people)	Tele-density in rest of country (fixed lines per 100 people)**	Tele-density in entire country (fixed lines per 100 people)
Lithuania	15.8	21.0	42.7	30.7	32.2
Latvia	32.5	56.5	52.6	19.6	30.3
Estonia	36.4	42.3	42.2	32.9	36.3

** Vilnius in Lithuania, Riga in Latvia and Tallinn in Estonia*

***Calculated by subtracting the absolute number of fixed lines in the largest city (Y) from the total number of fixed lines in the country (X) and then calculating the residual tele-density (X minus Y divided by total population minus the population in the largest city, expressed per 100 people)*

****Source: International Telecommunications Union, World Telecommunications Development Report 2002*

Bridging the digital divide

An important element of the 'digital divide' is the distribution of access within the country. In Lithuania the rural-urban gap in access to information technology is huge.

Lithuania has 680 Internet users per 10,000 people, compared with 1,480 in Estonia, 720 in Latvia and almost 4,000 in the European Union. Only 3.2% of households in Lithuania have an Internet connection, compared with 36% in the European Union. And surveys have found that a third of Lithuanians have no idea what the Internet is or what it can do for society. They remain unaware of the many opportunities offered by ICT opportunities.

Large differences exist between the residents of cities and rural areas. In 2001, 23% of Vilnius inhabitants had a computer at home, compared with only 4% of the rural population. About 11% of the people in Vilnius had access to the Internet at home, while only 1.3% of the rural population did. User proficiency also varied: about 36% of people in Vilnius knew how to use the Internet, compared with only 8% of rural dwellers. For people in Kaunas, Klaipeda, Siauliai, Panevezys and Alytus the figures are between those in Vilnius and rural areas. A key issue in rural areas is the cost of access.

One way to assess this is to look at the size of the largest city relative to the rest of the country, the share of fixed lines in the largest city and the tele-density in the largest city, the rest of the country and countrywide. A comparison of these measures for the three Baltic states shows that Vilnius does not contribute to the same concentration of population in Lithuania as Riga does in Latvia or Tallinn in Estonia - it accounts for less than half the population share of the other two capitals. As in Latvia and Estonia, tele-density in the Lithuanian capital is higher than in the country overall and tele-density in the rest of the country is lower than in the largest city and in the country overall. By this indicator, Latvia appears to have a more serious rural access or digital divide problem. As more large cities are added to the capital, tele-den-

sity in the rest of the country is likely to fall dramatically, widening the urban-ruralgap in access. It is suggested that a thorough study be undertaken to determine rural tele-density in Lithuania.

The potential benefits of extending the access and use of ICT to poor people and regions are huge. These benefits include better information flows, better opportunities for job searching and job creation and communication and networking (including with governments) that can enhance the democratic process, improve government services and permit distance learning. Extending the access and use of ICT is a challenge. But it is also a great opportunity to involve marginalised groups in the move towards a knowledge-based economy and reduce social exclusion. A case can be made for properly designed subsidies to improve access to ICT, on grounds similar to those for subsidies for public education.

Experience has shown that successful efforts to extend the access and use of ITC depend on government (including local government), leadership and funding, public-private partnerships and strong NGOs and community organisations. Lithuania is well positioned in all these respects.

In June 2002 the Information Society Development Committee announced a major new initiative to provide public Internet access points throughout the country. This initiative is now being pursued as a public-privatepartnership with the Window to the Future programme (http://www.ivpk.lt/en/).

The Open Society Foundation (supported by the Soros Foundation) is developing a programme for ICT awareness and development in rural areas, concentrating on small towns and rural villages. Its programme sets out several key objectives: raising awareness about the need to extend the use of ICT in local communities and the social opportunities it offers, developing an environment supporting the use of ICT, evaluating the readiness of districts in Lithuania for the pilot project 'Digital Community' and initiating pilot projects in selected urban and rural districts aimed at overcoming the digital divide. The programme emphasises training and content development. The Open Society Foundation has a solid record and experience in community development work in many countries in Eastern Europe.

Local initiatives in building an information society for all

The municipal administrations of the six largest cities (Vilnius, Kaunas, Klaipeda, Panevezys, Siauliai and Alytus) seem to be well aware of the digital divide and are keen to help. Each of these cities has fringe communities living at the periphery and residents facing digital divide problems. In smaller cities and in rural areas local governments have limited financial and administrative capacity. One way to tackle the problem there would be to ask the Association of Lithuanian Municipalities (ALAL) to devise a mobile outreach programme with skilled users to visit each of the 64 municipalities smaller than the top six cities and consult with them on installing and maintaining public Internet access points in municipal buildings.

Many locations in Lithuania already have active community centres, multipurpose organisations that typically focus on solving urgent community problems such as alcoholism and child abuse. The centres usually depend on one or a few strongly motivated, salaried individuals. Without such individuals there is no viable community centre. Connecting these centres with one another and with the international community are about 20 NGO support centres, umbrella organisations supported by international donors. These support centres could play a useful role in helping communities to design, pilot and implement community support projects.

The Citizens Advisory Union, a Lithuanian NGO, has begun sharing knowledge about government processes with citizens. The NGO has trained 200 people all over the country to provide information to citizens about laws and government services, especially in low-income communities. The group has received 4,000 visits from people inquiring about issues ranging from labour laws to pensions information. With a free phone line provided by Lietuvos Telekomas, the group also conducts telephone consultations. The group has produced a CD-ROM about different government laws and services and distributed it to its 10 bureaus, where volunteers use it to provide information to visitors and callers.

The scarcity of content in the local language affects the demand for e-services and increases the gap between social groups - between the young and the elderly and between high-income (and English-speaking) and low-income groups.

Targeted support should be given to initiatives for creating local content and converting local knowledge into digital content. There are opportunities for local companies and organisations to participate in EU programmes aimed at creating local content, such as the e-Content Programme.

posable per capita income in the cities grew by 3.6%, while in rural areas the growth rate was 1.4%.

The main source of income is employment income (hired and non-hired job-related income), which accounted for 65% of the total disposable income. Twenty-five percent is pensions, benefits of a different nature and 10 so-called other sources of income like alimony and help from relatives. The proportion of employment income in total disposable income did not change compared to 2001. The source of income for rural and urban people differs significantly not to the benefit of rural inhabitants. If for city dwellers employment income stood at 67% of the total disposable income, for rural people the proportion was 59%. A much smaller part of the disposable income of urban people comes from pensions and benefits (23%) compared to rural people (31%).

The composition of a household has a big impact on the size of the household's income. Single-person households and couples without children enjoy the highest income. Households of couples or single parents with underage children have the lowest.

Per capita disposable income by occupation, LTL, 2002

Farmers	Hired employees	Self - employed, employers	Pensioners	Others
234.8	464.8	554.4	377.5	260.8

Monthly disposable per capita income by size of household, LTL, 2002

Single person	Single person with child(ren) under 18	Childless couple	Couple with child(ren) under 18	Other households with children under 18	Other households without children under 18
529.0	347.2	558.5	378.1	330.7	447.3

Consumption

Average per capita monthly consumer expenditure in 2002 was 415 LTL, of which monetary expenditure stood at 353 LTL. In the cities consumer expenditure was 462 LTL (monetary 417 LTL), in rural areas it was much lower, respectively 321 LTL total and 224 LTL monetary. Average consumer expenditure grew by 0.9% compared to 2001. Monetary expenditure increased by 1.7% and in kind expenditure declined by 3.2%.

Compared to 2001 expenditure on communications, utilities and health grew. For urban inhabitants expenditure on heating accounted for 72 LTL per household member per month (17% of total expenditure), rural inhabitants spend on heating 27 LTL (12% of total consumer expenditure). Per capita monthly expenditure on clothing and footwear for urban people was 29 LTL (7% of the total), for rural inhabitants 17 LTL (97% of total expenditure) and on health care rural inhabitants spend 22 LTL (5% of total expenditure) and in rural areas people spend 13 LTL (6% of the total).

An important indicator of the standard of living - expenditure on food (excluding expenditure related to dining in restaurants and cafes) stood at 40.7% of average consumer expenditure (decrease of 1.7 percentage points compared to 2001). In the countries of the EU the average expenditure on food does not exceed 15% of the total household consumer expenditure. Although rural and urban inhabitants spend the same amount of money on food (including in-kind expenditure), for urban inhabitants it accounted for 37% of the total expenditure and 53% for rural inhabitants. The richest households spend 27% of their total consumer expenditure on food, the poorest ones 64%.

Possession of two key objects for access to information technology, a PC and a mobile phone, has increased significantly since 2000 (from six PCs per 100 households to 12 and from one PC per 100 household in rural areas to six). However, despite the rapid increase in the computerisation of households the gap between rural and urban areas remains wide - a prerequisite to a deep digital divide. The widest gap in PC ownership and access to the Internet is between cities and rural areas; 19% of households in the cities have a computer while only 5% do in rural areas. Only 10% of households from the cities and 2% from rural areas have access to the Internet from home.

Lithuania is far behind the countries of the EU and many of candidate countries in the computerisation of households and use of the Internet.

According to the number of Internet users per 100 population, Lithuania is ahead only of Romania and Turkey.

Changes in monthly per capita disposable income

	Monthly per capita disposable income (LTL)				Disposable income in 2002 relative to 1996, 2001 (%)		Real disposable income in 2002 relative to 1996, 2001 (%)	
	1996	2000	2001	2002	1996	2001	1996	2001
All households								
Total income	326.7	415.4	409.5	421.3	129.0	102.9	108.9	102.6
Monetary income	253.0	349.4	345.5	359.5	142.1	104.0	120.0	103.7
Income in kind	73.7	66.0	64.0	61.9	84.0	96.7	70.9	96.4
Urban households								
Total income	352.7	464.9	455.5	473.3	134.2	103.9	113.3	103.6
Monetary income	295.3	416.4	408.6	428.5	145.1	104.9	122.6	104.6
Income in kind	57.5	48.5	46.8	44.8	77.9	95.7	65.8	95.4
Rural households								
Total income	268.9	311.0	310.9	316.2	117.6	101.7	99.3	101.4
Monetary income	159.0	208.3	210.2	219.7	138.2	104.5	116.7	104.2
Income in kind	109.9	102.7	100.7	96.5	87.8	95.8	74.1	95.5

Durables per 100 households, 2002

	Total	Urban areas	Of which five		Rural areas
			Large cities	Other cities	
Colour TVs	106	114	119	107	88
Black and white TVs	18	18	19	16	20
Video recorders	22	26	30	21	12
Tape players	45	48	49	47	37
Music centres	22	25	27	23	14
CD players	5	6	6	5	3
Mobile phones	57	66	72	58	37
Personal computers	12	15	19	10	6
Refrigerators	96	98	98	98	90
Freezers	14	7	4	11	29
Automatic washing machines	43	49	49	48	30
Vacuum cleaners	67	77	81	72	44
Microwaves	18	21	25	16	9
Automobiles	46	48	48	47	43

Increased competition among mobile operators has resulted in an accelerated growth of mobile service users, their number jumping to 27% of the population by the end of 2002. In the autumn of 2002 mobile communication penetration reached 40%, exceeding fixed telephone penetration, which dropped to 31%.

At a glance the mobile sector in Lithuania has made a substantial contribution to access (Internet and telecommunications) in a comparatively short time. However, the surge in mobile tele-densityhas had a disproportionately minor impact on Internet access. Mobile networks could have provided Internet access, but this is not yet widely available at affordable prices in Lithuania. So the fixed network plays a crucial role in access to the Internet.

In terms of access to telecommunications, subscribers to mobile networks are often also subscribers to the fixed network, which would imply lower average access in terms of the total population. On closer examination of statistical data provided by the Department of Statistics it becomes apparent that between 2000 and 2001 the number of fixed lines declined as the number of mobile customers increased. This could mean that customers are substituting mobile for fixed services, or that some customers are disconnecting their fixed telephones in response to tariff growth without acquiring mobile phones. Of particular concern is the fact that rural customers and people with lower incomes are among the 'telephone drop-outs', which increases the digital divide.

When total tele-density(fixed and mobile), the share of the population using the Internet and the urban-rural tele-densityratio (the ratio of tele-densityfor fixed telephones in the largest city to that in the rest of the country), are taken into account, Lithuania's position is comparable with the Baltic states. However, Lithuania has lower total tele-densityand Internet use and a bigger urban-ruralgap in access to telephones.

Personal computers per 100 population*

	1998	1999	2000	2001**
Bulgaria	2.4	2.7	4.4	4.9
Cyprus	14.2	19.4	22.4	25.0
Czech Republic	9.7	10.7	12.1	13.6
Estonia	11.3	13.5	15.3	17.5
Hungary	6.5	7.5	8.7	10.0
Latvia	6.1	8.2	14.0	15.3
Lithuania	5.4	5.9	6.5	7.1
Malta	15.9	17.9	20.5	23.1
Poland	4.9	6.2	6.9	8.5
Romania	2.1	2.7	3.2	3.6
Slovakia	6.5	10.9	13.7	14.8
Slovenia	21.2	25.1	27.5	27.5
Turkey	2.6	3.4	3.8	4.1
EU average	7.0	25.0	28.2	30.4

**EUROSTAT data*
***Beginning of the year*

Internet users per 100 population*

	1998	1999	2000	2001**
Bulgaria	1.8	2.8	5.3	7.5
Cyprus	9.1	13.1	17.9	22.1
Czech Republic	3.9	6.8	9.7	13.6
Estonia	10.3	13.9	27.2	30.1
Hungary	4.0	6.0	7.1	14.8
Latvia	3.3	4.3	6.2	7.2
Lithuania	1.9	2.8	6.1	6.8
Malta	6.6	7.7	13.1	25.4
Poland	4.1	5.4	7.2	9.8
Romania	2.2	2.7	3.6	4.5
Slovakia	9.3	11.1	12.0	16.7
Slovenia	10.1	12.6	15.1	30.0
Turkey	0.7	2.3	3.1	3.8
EU average	9.2	15.4	23.8	31.4

**EUROSTAT data*
***Beginning of the year*

Mobile phone users per 100 people*

	1998	1999	2000	2001**
Bulgaria	1.5	4.2	9.1	19.1
Cyprus	17.5	22.6	32.6	46.2
Czech Republic	9.4	19.0	42.2	65.9
Estonia	17.0	26.9	38.7	45.5
Hungary	10.6	16.2	30.7	49.8
Latvia	6.8	11.2	16.6	28.0
Lithuania	7.6	9.8	14.6	29.3
Malta	5.9	9.6	29.3	35.6
Poland	5.0	10.2	17.5	26.0
Romania	2.9	6.1	11.1	17.2
Slovakia	8.6	12.3	20.6	39.8
Slovenia	9.9	31.7	61.1	75.8
Turkey	5.5	12.5	24.7	30.2
EU average	24.1	40.0	63.4	72.4

**EUROSTAT data*
***Beginning of the year*

Poverty indicators, 2002

	1996	1997	1998	1999	2000	2001	2002
Relative poverty line (50% of current average per capita consumer expenditure, LTL)	226.2	248.6	276.7	274.6	260.0	264.8	265.8
Poverty level (%)	18.0	16.6	16.0	15.8	16.0	16.4	16.6
Relative poverty line (50% average per capita consumer expenditure in 1996, adjusted by price index, LTL)	226.2	246.4	258.9	261.0	263.6	267.0	267.9
Poverty level (%)	18.0	16.3	13.2	13.1	16.6	16.8	16.8

Opinions by household on their standard of living (%), 2002

	All households	Urban areas	Rural areas
How do you assess the standard of living of your household?			
"We are rich"	0	0	0
"We are well off"	1	1	1
"We are middle class"	68	68	69
"We are poor"	28	29	27
"We are very poor, paupers"	3	2	3
For the poor. For how long has the standard of living in your household remained low? (%)			
Less than a year	4	4	2
1 - 5 years	40	43	33
6 - 10 years	42	43	42
All the time	14	10	23
What per capita monthly income would be enough to become middle class under your present living conditions? (LTL)	737	833	543
What per capita monthly income would be enough to survive (make ends meet) (LTL)	338	384	243

Consumption inequality and poverty

In 2002 the consumer expenditure of 10% of the richest households was 8.2 times larger that that of the 10% of the poorest households. Expenditure on food differs by 3.4 times between the richest and the poorest households. The polarisation of consumption has not changed since 2001.

Poverty indicators confirm that the differentiation in the standard of living has not essentially changed compared to 2001. However, the poverty level according to the current relative poverty line has increased by 0.2 percentage points from 16.4 in 2001 to 16.6% in 2002. According to the relative poverty line adjusted by the price index, however, the poverty level has not changed and remains 16.8% below the poverty line.

As in the past, the inhabitants of rural areas suffered the highest poverty (29%), while only 7% of city inhabitants and 15% of people in towns were below the poverty line.

The subjective perception of the standard of living

The subjective perception of one's standard of living is an important 'complement' to add to statistical indicators since it indirectly reveals not only how one's expectations on the quality of life are met, but to some extent how wealth inequality influences individual perceptions of the standard of living. Only 1% of respondents attributed themselves to being well off and 28% said they were poor (almost two times more than official poverty level). The proportion of poor households fell slightly from 2001 (31%). The majority of respondents perceived themselves as middle class (68%). In 2000, 64% of respondents attributed themselves to the middle class and 34.6% considered themselves poor. In 2002, 53% of respondents thought that their standard of living had not changed over the last 12 months, 40% thought it had worsened and 7% said it had improved.

Despite the striking difference in income and consumer expenditure (both in size and in consumption pattern) between rural areas and the cities, the subjective perceptions of the standard of living are almost the same. Apart from the fact that life is cheaper in rural areas than in the cities, two assumptions could be made on why perceptions about the standard of living between rural and urban inhabitants virtually do not differ. First, the 'environment' and immediate surrounding have a strong impact on one's expectations about living conditions and life chances. Second, income polarisation has a stronger impact on personal perceptions of one's standard of living than the size of one's income (income polarisation in rural areas is less obvious than in the cities).

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Conclusions*

Lithuania has changed drastically since the restoration of state independence, but the world has also changed crucially. Creativity and knowledge have become powerful engines of socio-economic development. Although Lithuania has not reached the average EU indicators for the use of information technologies or contribution of knowledge intensive sectors to GDP, the growth in these fields is impressive.

However, it is noticeable that the ongoing changes in building an information society are often associated with the performance of knowledge-intensive economic sectors, the prevalence of information and communications technologies - primarily the personal computer and the Internet - and with the skills and money necessary for their purchase and use. Meanwhile, the huge possibilities that technologies can offer for empowerment, the enlargement of human choices, equality and greater social inclusion are rarely considered.

The ease with which policy makers and researchers under-represent, if not omit, the societal, human development dimension of the information society and innovation may be misleading. It diverts the attention of society from the immense impact of information technology and innovation on human development. This may have dire consequences for human development and cause a situation where technologies will become ends not means in the development process.

Despite the fact that ICT offers huge opportunities for communication and employment and that the IT industry is interested in encouraging social inclusion through access to information and communications infrastructure, the rise of digitalisation is being accompanied by rising inequality and social exclusion throughout the world. Lithuania is not an exception to this process. Under pressure from skills and knowledge, social exclusion in the information society has acquired features of 'social disqualification'. To the traditional criteria of social inclusion is added access to information in a broad sense including the knowledge necessary for understanding it and its use at work and in everyday life.

An increase in the role of knowledge automatically links the competitiveness of individuals, companies and entire countries to strengthening an important component of human development - education - and expanding its role in social exclusion and inclusion. In Lithuania, in 2002, the knowledge sector increased by 3% compared to 1998 and its contribution reached 28% of GDP, whereas the growth in education, health and social security is not enough to meet the demands of the rapidly growing knowledge economy and may pose a threat to human development and social inclusion.

Yet in 1994 the Seimas (Parliament) approved the Law on the Health Care System, which identified a lower threshold for state expenditure on health care at 5% of GDP. However, funds allocated to the health care sector have never reached this figure (the closest figure of 4.8% of GDP was reached in 1998). Since 1999 state expenditure on the health care sector relative to GDP has been falling consistently. There is an acute shortage of computerised workplaces in the majority of health care institutions in the country and a large proportion of the existing equipment is obsolete.

Investment in qualifications, skills and training by Lithuanian companies and employees was one of the lowest among EU member states and candidate countries. The only businesses investing less in labour force efficiency were those in Romania. Less than 4% of businesses created new technology together with R&D institutes. Today, more than 60% of scientists in Lithuania are older than 50 and 25% are older than 60.

As the importance of knowledge, intelligence and creativity in the information society increases, the 'irrelevance' of people and entire communities that fail to meet these demands intensifies. Rural areas and small towns in Lithuania are becoming increasingly disconnected from the benefits of improvements in living standards and the use of ICT.

At issue is whether an information society can offer people from disadvantaged communities the opportunity to produce and distribute information and improve access to culture and communications, reflecting their own visions of the world. Mere computerisation, telecommunications and relevant digital literacy can offer little to disadvantaged communities because knowledge is socially distributed and one needs the peer support of shared experiences and examples to make the information work, to perform and communi-

* The conclusions have been prepared by the editors of the Lithuanian Human Development Report

cate. In deprived communities an environment of low motivation and unwillingness to take active steps in the improvement of individual (let alone community or neighbourhood) situations, the introduction of ICT should be accompanied by active measures beyond training in how to use a computer or the Internet.

Information technology brings together a wide range of different people who would otherwise never have met. However, like any other mean of communication, they introduce a new dialectic of social inclusion and exclusion into human relationships. In Lithuanian discourse and research, information technology at large and the Internet in particular as a contextualised social phenomenon have not yet been researched.

Selected human development indicators*

Population (thousands), beginning of 2003

Total			Urban			Rural		
Total	Men	Women	Total	Men	Women	Total	Men	Women
3,462.5	1,617.3	1,845.2	2,317.2	1,063.3	1,253.9	1,145.3	5,54.0	591.3

Population dynamics (thousands), 2002

	Were born	Died	Natural increase	Arrived	Departed	Migration saldo
Total	30, 014	41, 072	- 11, 058	44, 144	46, 120	- 1,976
Urban	18, 697	23, 175	- 4,478	26, 328	30, 775	- 4,447
Rural	11, 317	17, 897	- 6,580	17, 816	15, 345	2,471

Morbidity, selected indicators per 100,000 population*

	1995	1996	1997	1998	1999	2000	2001
Malignant tumours	1,301.0	1,366.4	1,449.2	1,533.8	1,635.4	1,730.7	1,788.5
Incidence of active tuberculosis	58.5	65.7	78.0	79.6	72.6	66.6	63.9
Active tuberculosis	257.1	276.9	300.1	322.4	335.2	307.7	278.2

**Lithuanian Health Information Centre*

Suicide, per 100,000 population

Year	Total	Urban	Rural
1990	26.2	21.1	37.2
1991	30.8	22.5	48.8
1992	35.0	25.8	54.5
1993	42.7	34.5	59.9
1994	46.6	37.8	64.8
1995	46.7	38.3	64.0
1996	47.8	37.4	69.4
1997	45.6	35.6	66.5
1998	43.8	34.6	62.7
1999	44.0	33.1	66.4
2000	46.6	36.2	67.7
2001	44.1	34.8	62.8

Life expectancy at birth

	1990	1995	1996	1997	1998	1999	2000	2001	2002
Average	71.46	69.08	70.26	71.08	71.39	71.76	72.19	71.78	71.91
Men	66.44	63.27	64.64	65.48	66.00	66.36	66.77	65.95	66.21
Women	76.27	75.06	75.89	76.64	76.66	77.01	77.45	77.58	77.58

Employment and unemployment level (%)

	1997		2000		2001	
	Women	Men	Women	Men	Women	Men
Employment level	56.0	66.8	57.9	61.9	56.4	59.0
Unemployment level*	14.2	14.4	13.6	17.6	14.2	19.7

**Population between 15 and 64 years of age.*

* http://www.std.lt

Average gross monthly wage by economic sector, LTL

	Total		State sector		Private sector	
	Women	Men	Women	Men	Women	Men
1995 *	356	494	357	500	353	483
1996 **	534	709	546	756	487	619
1997**	685	920	680	970	694	857
1998**	886	1,152	909	1,234	842	1,058
1999**	968	1,182	1,020	1,322	881	1,066
2000	956	1,170	980	1,272	918	1,087
2001	962	1,181	989	1,288	925	1,109
** January.*						
*** April*						

Information technology in Lithuania and EU, 2001

	Lithuania	EU average
Regular Internet users (% of the population)	11.3	35.0
Households with computers (% of total households)	9.0	36.1
Students in IT - related professions (% of total students)	5.3	4.0
Online buyers (% of total Internet users)	3.0	44.0
Computers per 100 pupils	2.5	8.6
Computers per 100 population	7.1	30.4
Internet users per 100 population	6.8	31.4
Mobile phone users per 100 population	29.3	72.4
In 2002 13.1 % of the population used Internet regularly, 11.8 % of households had a computer.		

Parliament (Seimas)

	Number of MPs		%	
	Women	Men	Women	Men
VII Seimas (1992)	10	131	7.1	92.9
VIII Seimas (1996)	25	114	18.0	82.0
IX Seimas (2000)	15	126	10.6	89.4

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