ELECTRONIC INFORMATION AND INFORMATION SOCIETY IN ESTONIA
Aspects of accessability and usage of electronic research information in Estonia and other transition countries.

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A front page news item in the Estonian daily *Päevaleht* on one April day ran as follows: „The Estonian IT Prize was not given this year". The leaders of Estonian information technology firms found for the first time in several years that none of the submitted e-ideas were worth the Prize. The development halted in 2002, they sadly said. The article continued that last spring, the BBC was almost on the verge of producing a TV programme in Estonia titled „e-Estonia. The Lost Opportunity", but at the last moment they had decided that the Eurovision concert held in Tallinn was more interesting.

Let me start my presentation on a slightly more general level and try to find the context for the phenomenon I am going to discuss.

What is the much-talked-about information society and what is it based upon? It is already written in school textbooks that information and the ability to use it are the signs of success of the present time. Nowadays, information and the ability to use it are much more valuable than natural resources, large industrial enterprises or a thick wallet. Such a development is setting the biggest challenge of all times to Estonia and other so-called transition countries – to secure themselves a definite place under the sun, using for it the biggest renewable asset – human capital. In the course of less than a few generations the world economy and the labour market have consistently started to value knowledge and skills. Thus, in the period 1925-1985 the number of employees directly engaged in production activities has decreased from 75% to 30% and the number of jobs of skilled workers, services and knowledge workers increased from 25% to 70% in the labour market of developed countries. Technology, in the last decades high technology and during the last decade information and communication technology (ICT), have played a big role in that process.

The most important difference between the information society and the industrial society should be seen in the growth of the role of intellectual values in the material objects traded and in the explosive growth of the market of non-tangible values in the world. At present, the predominant part of added value is created from the management of human capital rather than financial capital or natural resources. Together with the development of communication technology and globally liberising market economy also global market and global competition have come into existence.

The new growth theory developed by Paul Romer, professor of the University of Stanford, and his colleagues, has become the Bible of the information society, proving that economic growth is based on knowledge. The new growth theory is extremely optimistic, confirming the long-term continuation of economic growth together with the further development of knowledge and technology, even dividing it into growth cycles.

The applications of ICT alone do not yield remarkable results if the former social mechanisms are left to function. Success is possible only with radical reforms. In the greater part of East Europe, the radical reforms carried out after the collapse of the Soviet empire have become a norm. Such reforms are more problematic in those countries that have not undergone strong social collisions. For example, authors have related the growing difference between the countries of North and Latin America just to the inability of the southern regions to reform their societies.

Openness is a crucial factor in development. When the societies choose closedness, they will decline rapidly. When nations are by themselves, the world will be fragmented into isolated blocks. Traditionalism and conventionalism will grow, having their stagnating effect on economy, bringing along a decrease in

revenues and also poverty. Growing conflicts and prejudices will create even more closed national states and enforce the formation of blocks and separation.

In many repots about Estonia the openness (incl. open market) is mentioned at first.

Naturally, development schemes are not always wholly positive or negative - the emerging patterns are usually much more complicated than the above-mentioned ones. Changes in society are always of complex nature - one or the other sphere cannot be developed separatedly from others, or some development indicators cannot be overestimated.
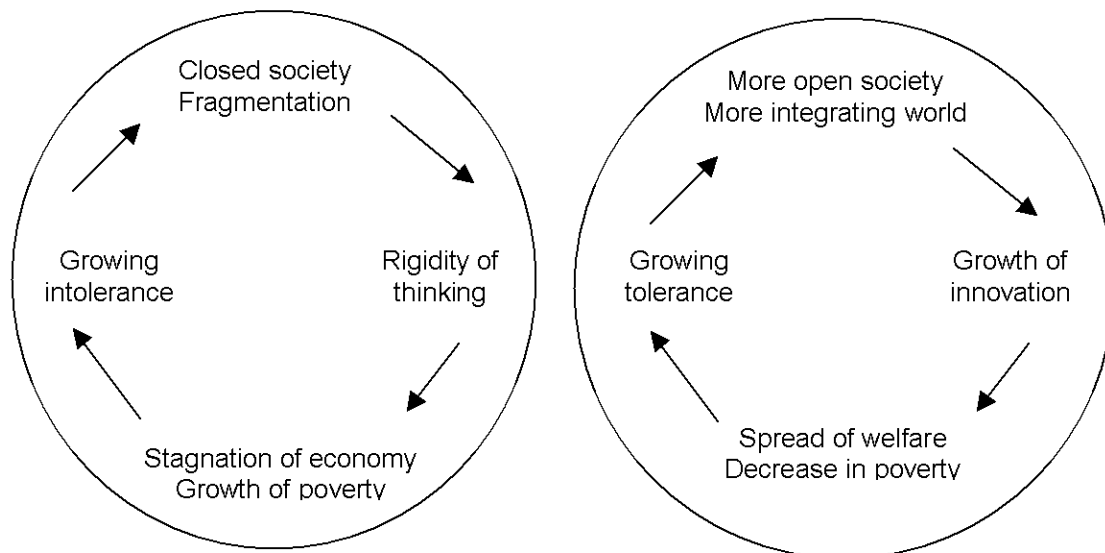
Estonian experience

Starting position. The situation in the early 1990s, when Estonia began formulating its ICT policy, can be characterised as follows:
* the whole infrastructure was outdated and inadequate;
* the consumer of ICT was not accustomed to filtering or selecting among the small amount of data available;
* former models of activities, services and financing did not work;
* Estonian secondary and higher education and science (including academic computer science) were of relatively good level;
* wider public was interested and remarkably ready for changes.
* "good neighbours" - Finland is culturaly and geographicaly close to Estonia

By the late 1990s, the greatest change had taken place in the sphere of education. In the framework of the national Tiger Leap programme, all elementary and secondary schools were computerised, having one computer per 50 pupils. The majority of schools had access to the Internet. The duration of this uncommonly well targeted, co-ordinated and financed programme was three years, it was mainly aimed at computerisation and the creation of infrastructure. Its effect on the content of education was relatively small. But still, the programme acted as a kind of a catalyst for the whole public sector, expressing the opinion that „if ten-year-old schoolboys know and use computers, we cannot be worse than they". 'Tiger Leap' became an everyday expression. The state information policy was also quite effective. Informatics Council and Informatics Fund were created in 1992, the first documents concerning information policy were formed at the same time. The State Information Systems Department was established at the State Chancellery in 1993, and the allocation of investments into information technology was started by the state. The talk of the end of the 1990s was not so much about the shortage of funds and the lack of computer workplaces, but about the related legal problems, concerning databases, security standards, digital signature, etc., and about the problems of changing the organisation of work.

More important changes in the public sector.

We could say that by now, almost all workplaces requiring computers have been computerised. Internet connection or dial-up connection has become a norm. About 80% of state agencies and about half of local governments host their own web page.

The situation in the private sector is more varied. Since many information services are based on information accessible on the Internet, a rule has emerged that if you cannot be found on the Internet, you do not exist. The services offered by larger firms and especially by banks meet the EU standards.

The number of home computers and private connections to the Internet grows most rapidly. The latter has also been favoured by the fact that due to competition among operators, the price of Internet connection has fallen. Most popular are different communication services, including Internet banking, which is used by two thirds of Internet users.

The whole of information technology is grounded in the infrastructure. The development of Estonian ICT environment has been progressive. In addition to the various private sector ICT services, which are based on modern data communication networks and tools, government established and state-financed ICT structures have also rapidly developed their information technology possibilities, and the nomenclature, scope and quality of services.

The Estonian Educational and Research Network (EENet), which was established by the Ministry of Education in 1993, provides educational, research and cultural institutions with data communication services. The state backbone network connects all Estonian county centres and several nodes.

But the main part of the ICT infrastructure has been developed by the private sector, e.g. AS Eesti Telefon (Estonian Telephone Company Ltd.). At the end of November 2002, ET completed the building of a new national data communication backbone network, which is up to 160 Gbps. ET's transmission network of the optical line connects all county centres and bigger cities on the ring topology principle. This enables to automatically redirect the network traffic without any interruption of data communication in case of a breakdown.

The future.
The preparation of Estonian information policy framework for the next four years is concentrated on the following four fields:

- modernization of legislation,
- assistance in developing the private sector,
- development of communication between the state and the citizen, and
- acknowledgement of problems related to information society.

Every year the information policy framework has been developed further and the Government has been defining general priorities for implementing information policy, which in 2002/2003 are as follows:
* development of services for citizens, business sector and public administration, especially the elaboration of ID-card applications, proceeding also from the list of e-government services defined in the eEurope+ Action Plan;
* improvement of skills and access of social groups in unequal position for using electronically provided services;
* elaboration and introduction of systems for digital document management and archival processing;
* development of the system and infrastructure of state registers, including the development of systems that ensure the maintenance of databases and the introduction of the data exchange layer (project "X-road") of information systems;
* better provision of schools with computers to achieve the ultimate goal - one computer per 20 students;
* launching of Tiger University programme to support the development of information and communication technology (ICT) infrastructure and academic ICT staff, and the infrastructure for post-graduate training.

„The Strategy of Estonian Research and Development Activities for 2002-2006: The Knowledge-Based Estonia" is the most important document affecting Estonian science and higher education in the near future. This is the only document mentioning research libraries and the databases and e-journals they purchase in the overall ICT context.

The purchase of electronic databases has since 1998 been coordinated by the Estonian Library Network Consortium, which was created in 1996 to implement the unified information system and develop a joint library catalogue. The status of the Consortium as a NGO has made the universities and different Governments slightly cautious of the organisation and made the ELNET Consortium again and again prove its usefulness. However, to co-ordinate different group interests, such a status as an independent organisation has its merits. We can say that the ELNET has been successful in its activities.

In 2003, for the first time, the state budget allocated the ELNET Consortium finances for purchasing scientific information, including electronic databases. This means the central financing of the purchase of databases. Compared with the countries of the eIFL Consortium, this is rather an exception than a rule. eIFL is a relatively loosely-knit association of the libraries or library consortia of about 40 transition states. Pooling funds from library budgets for joint purchases has helped to rise awareness of actual needs. However, the experience of the Nordic countries has shown that central financing at least on some level is a factor guaranteeing stability.

Major Estonian libraries started the trials of on-line databases in 1998. Internet connection was still slow at that time, but sufficiently stable to favour on-line information over less-used CD-ROM databases. The user statistics of the EBSCO databases show increase in the use of electronic journals. In Estonia, 40 876 articles were downloaded/printed out in 1999; in 2000 the number was 101 319, and in 2001 – 128 226. In this aspect, Estonia can be compared to Finland – in Finland, 236 984 articles were downloaded from the EBSCO database in 1999, and 326 128 in 2000.
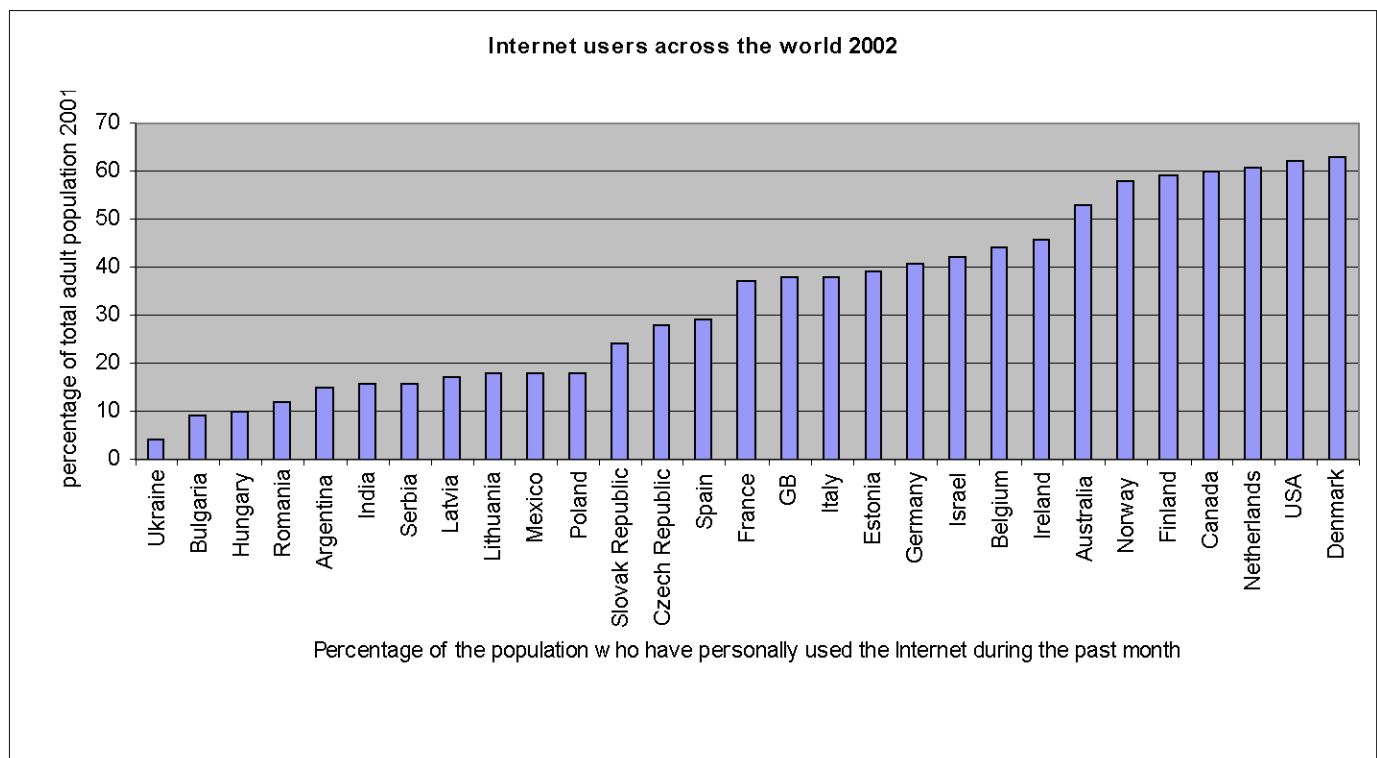
Naturally, the EBSCO database, containing a rather varied complex of journals mostly in the field of social sciences is not the only database purchased in Estonia. However, the range of its users is wide and it has been regularly purchased for four years, thus the example of EBSCO can be applied to illustrate the use of other databases.

Since the present year, the EBSCO database is accessible practically all over Estonia, and with some reservations we can say the habit of using electronic information has already been formed. The further increase in the use of electronic databases should be based on extensive user training.

EBSCO has been regularly purchased for four years with support of OSI in large number of transition countris, thus offering a good basis for characterising more general processes.

| oktober 1999 - mai 2002 | logins | searches | articles |

Bulgaria	22 959	148 487	113 072
Czeck Republic	52 002	316 990	176 773
Poland	100 710	539 804	549 730
Estonia	56 829	371 188	308 170
Latvia	14 229	88 802	74 860
Lithuania	49 735	295 601	261 312
Slovenia	29 001	144 901	88 522
Croatia	18 991	104 223	109 518
Russia	70 040	403 511	311 276
Ukraina	9 267	42 147	32 060

The use of Internet is one of the main indicators of ICT use in general. With reservations we can say that in the transition countries the use of databases is comparible of use of Internet and mostly depends of development level of ICT. The accessability and usage of electronic research information is part of complex processies.

Internet users across the world 2002

Percentage of the population who have personally used the Internet during the past month

Conclusion

Maintaining the level of innovation is not easy. Most of the Estonian Governments of the recent decade have really supported ICT. But even an occasional indifferent act can backfire. Whether such act can really be seen even by the editors of the BBC is questionable, but one never can know.

Obviously, the image of Estonian success in applying ICT is largely a myth, and the „high level" of Estonia is only relative. Still, when compared with other countries of the former Eastern block, our progress has been more rapid.

To achieve the level and efficiency comparable to Europe and America, we have still much work to do. We have to lay more stress on the development of the contents, on education and training of people and to rise the work culture, and to use more effectively the existing resources and update legislation. Here, our starting position is not so favourable, rather, we are lagging behind many others.

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