



SIBIS

Estonia

Country Report No.3

No.3

Preface

This report represents an important deliverable of the project 'Statistical Indicators Benchmarking the Information Society' (SIBIS), running from January 2001 to September 2003 and funded by the European Commission under the 'Information Society Technology' Programme. The overall goal of SIBIS is to develop and pilot indicators for monitoring progress towards the Information Society, taking account of the 'e-Europe action lines'. On this basis SIBIS focuses on nine topics of interest, i.e. Telecommunications and Access, Internet for R&D, Security and Trust, Education, Work-Employment and Skills, Social Inclusion, e-Commerce, e-Government and e-Health. This report is part of an extension of the SIBIS project 'SIBIS+: Statistical Indicators for Benchmarking the Information Society in the NAS: The eEurope+ Indicators'. The objective of SIBIS+ is to geographically expand the SIBIS activities from the EU Member States to the Newly Associated States.

Within this part of the SIBIS+ project a General Population Survey (GPS) was conducted in January 2003 on five of the nine topics: Telecommunications and Access, Social Inclusion, Education, Work-Employment and Skills and e-Government. Although limited in their scope, some questions have been asked for two other topics, Security and Trust and e-Commerce, as well. This report analyses the outcomes with respect to Estonia comparing it to the other NAS but also to EU15 countries, Switzerland and the USA, for which the same survey was already carried out in 2002. The document has two main objectives, namely, to be a support tool for views shared by experts in the area and, at the same time, to define indicators for quantifying some of the most critical indicators related to the five topics.

The report is organised in ten chapters. The first three chapters are designed to give the reader an idea of the main outcomes (Executive Summary) and the context (introduction to the country and the topics). The core of the report is the analysis of indicators, provided in chapters 4 to 9. These chapters focus on an analysis of ICT infrastructure and security issues, e-society and social inclusion, e-economy, e-education, e-work and e-government. Important findings are presented in the body of the document and additional data is shown in the annex.

The intended audience are policy makers and statistical offices at all levels (national, and supranational), industry leaders and researchers in the domains and those involved and interested in benchmarking the domains throughout Europe and the world. Those institutions should consider the questions and the subsequent indicators developed by SIBIS as an input for their yearly surveys. The project includes a series of workshops with such institutions in the countries represented by the SIBIS consortium. The report should also be of interest to the European Commission (in particular DG INFSO) and to government officials dealing with information society programs.

Within SIBIS+, another report (WP2) has been developed during 2002/2003. This report was aimed at setting the scene on the topics, identifying existing indicators for the several topics that already exist in Estonia and defining the gaps in the statistical coverage.

SIBIS is led by Empirica (Germany), and includes the following project partners: RAND Europe (The Netherlands), Technopolis Ltd. (United Kingdom), Databank Consulting (Italy), Danish Technological Institute (Denmark), Work Research Centre Ltd. (Ireland), Fachhochschule Solothurn Nordwestschweiz (Switzerland), University of Ljubljana (Slovenia), ASM Market Research and Analysis Centre (Poland), Budapest University of Economic Sciences and Public Administration (Hungary), Faculty of Management of the Comenius University Bratislava (Slovakia), "Dunarea de Jos" University (Romania), Institute of Economics at the Bulgarian Academy of Sciences (Bulgaria), Estonian Institute of Economics at Tallinn Technical University (Estonia), Social Policy Unit (Sozialinnen Politicus

Group) (Lithuania), Computer Science Institute of the University of Latvia (Latvia), SC&C Ltd. Statistical Consultations and Computing (Czech Republic).

The Estonian Institute of Economics was founded in 1947. Until September 1995, it was a research institute at the Estonian Academy of Sciences. Then, for three years it worked as an independent institute in the domain of the Ministry of Education. In December 1997, the Institute was merged with Tallinn Technical University as an independent research institute. The most important research works over the last ten years were concerned with a comprehensive assessment of Estonian economy, analysis of the transition process, management of economic development and contribution of the New Economy to Estonia's economic growth.

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1. Executive Summary

1.1 Introduction to Estonia and the topics

Estonia is adjusting to widespread implementation of ICT in different areas of life and economic growth based on technological innovation. According to the information of the Statistical Office of Estonia on the stock of personal computers, 22% of households have a computer at home and 58% of households have a mobile phone (IS indicators, 2002). The number of Internet hosts and Internet users per 100 of population is rather high. This explains the high interest in using ICT and the intensive use of computers in communication services. The SIBIS survey results show that ICT penetration in Estonia has been relatively successful, which in a number of indicators has picked the country up to the leading position among CEE candidate countries; in some indicators Estonia is surpassing the EU average and a number of member states. A reason for the rather high Internet penetration in Estonia lies in the variety of IST services as well as in programmes and projects that promote Internet-based knowledge, and trained users. The liberalisation of telecommunication markets since 2000 is a worth mentioning factor for successful ICT penetration in society.

The basis for development of ICT services in Estonia was created in the private sector through banks, communications sector and trade. The main services are: Internet banking, Internet shopping, on-line tourism, mobile services, creation of transport logistics system to support value added network, improving on-line access, websites concerning job offers, mobile positioning system, etc.

The public sector offers a number of services to citizens and businesses, and is creating a favourable data communication environment for public sector and other stakeholders: for example, the modernisation programme (X-road) of national databases with the aim to change national databases into a common public, service-rendering resource. According to the Public Information Act adopted in 2001, public institutions have to provide information required by citizens. This has forced all public institutions to develop their Internet homepages to make public information available pursuant to the law.

Public services for the citizens include: implementation of the citizen portal, income tax declaration, job search services, social security contributions, personal documents via the Internet, search for books in public libraries, health related services, services to enhance the population's participation in the state's decision-making processes, etc.

Activities to build a data communication environment for different public sector services, for citizens and for private businesses include: services for the public disclosure of documents in an integral and common server, Records Management Programme (RMP) of government agencies, creating an Internet-based working environment for central and local governments, development of an integral information system of legislation, creating an information system for digital legislative proceedings, e-services of National Land Information Systems, etc.

The abovementioned activities have supported the penetration of ICT into the Estonian economy. SIBIS General Population Survey (GPS) made it possible to estimate the results of these activities on the basis of a number of indicators developed under the SIBIS project.

1.2 Results of the SIBIS General Population Survey (GPS)

Internet access and intensity of use is increasing in Estonia, but a significant segment of the population does not have Internet access.

The results of the SIBIS survey show that currently more than half of the Estonian population aged 15 years and older has access to and use the Internet on a regular or occasional basis (59%). 52% of the population used the Internet in the 4 weeks prior to the survey. This is

more than twice as high as in CEE candidate countries on average (21%) and 6% higher than EU countries' average (46%), but less than in Switzerland (57%) and US (70%). Although one-quarter of the population has Internet access at home, a large proportion of the population uses the Internet only at work (17%) or somewhere else (11%). This suggests a strong interest in the use of Internet but limited possibilities to own a personal computer. 67% of population does not have Internet access at home. However, there still remains a significant segment of the population who do not access the Internet at all (41%).

People in the age groups 'up to 24' and '25 to 49' are better provided with broadband and 'mid'band Internet connections, which is supplemented by leased lines. Older people have much less possibilities to use Internet at home.

By intensity of on-line usage at home, Estonia is taking a leading position among CEE candidate countries and the fourth place among EU and CEE countries together. This is confirmed by the fact that 18% of the population is on-line over 6 hours per week and 24% 1-5 hours per week compared with respectively 13% and 22% in EU countries on average (6 and 11% in CEE countries on average). However, on-line usage in Estonia lags far behind the US level where 32% of the population is on-line over 6 hours and 30% 1-5 hours per week.

Knowledge about the Internet and on-line tenure is also considerable among Estonians

By knowledge about the Internet, Estonia takes the second place among CEE countries after Slovenia, only 4% in Slovenia and 6% in Estonia have never heard about the Internet compared with 15% in CEE candidate countries on average.

35% of the population has more than two years experience on-line, compared with 30% in EU, 13% in CEE candidate countries and 38% in Switzerland. But this indicator is about twice lower than in US (61%). Despite the good on-line experience the intensity of e-mail usage is more frequently reported by respondents as medium or low communication intensity (communicating with half or a quarter of their friends and relatives via e-mail). Only 5% of the population mentioned that they communicate with two-quarters of their friends and relatives by e-mail.

Mobile phone usage is growing intensively, giving competence for on-line services; SMS usage is the highest in Estonia and is popular among youth.

SIBIS survey showed that 68% of the population have personal mobile phones in Estonia, which is only 1% less than in EU on average (69%), but more than in CEE candidate countries (44%), Switzerland (67%) and US (56%). Mobile usage is high among age groups 'up to 24' and '25 to 49'. M-services have gained popularity in Estonia, such as car parking by mobile phone, purchase of public transport and other tickets, get information from business register, check bank accounts, in security systems. M-payments are tested as an alternative to card payments in smaller shops by the Estonian banks.

There is a high SMS usage in Estonia (52% of mobile owners), which is even higher than in EU (40%), Switzerland (47%) and US (13%). The reason for this may be explained by its lower cost compared with mobile phone calls, but also a number of various public events directed at using mobile phones (e.g. games, TV-shows, conferences), which became popular in the country, especially among youth. For example, one can send SMS to TV show and win something.

e-security: privacy is a lesser concern in Estonia than in other countries

Among the EU and CEE candidate countries, Estonia is one of those with a lower level of concerns about data security and privacy/confidentiality after Bulgaria and Hungary. Only 9% of regular Internet users are highly concerned about data security in Estonia, compared with 24% in CEE and 26% in EU countries on average, 20% in Switzerland and 40% in US. The situation is similar regarding concerns about privacy and confidentiality. The main reason of

this can be connected with the type of eCommerce that determines the level of security concerns. Currently, a large part of eCommerce is connected with financial services in Estonia, which are assessed trustworthy by businesses and citizens. As a result, only a small number of respondents were stopped on-line shopping because of security concerns.

The e-Business environment is still not supporting population purchasing on-line, the strongest advantages of Estonia in e-commerce is widespread Internet banking.

On average, only 15% of the population in Estonia purchase products on-line, including 60% regular users. This is the highest level among CEE candidate countries, but remains lower than in EU countries (19%), and US (44%) By age groups, the most dynamic group of eCommerce users is the '25 to 49' age segment.

Relatively modest eCommerce usage can be explained by on-line tenure – the length of on-line usage and experience. 12% of eCommerce users in Estonia had used on-line more than 2 years, which is four times more than in CEE candidate countries on average but some 2% less than in EU countries, one-third less than in Switzerland and three times less than in US.

One of the strongest advantages of Estonia in e-commerce is widespread Internet banking. SIBIS GPS shows that conducting on-line banking or buying financial products is used by 34% of the citizens in Estonia compared with 2% in CEE candidate countries and 12.5% in EU countries.

Skills to communicate via Internet are increasing

According to the SIBIS GPS data, 44% of the Estonian population regard themselves as highly or fairly confident in communicating with others via the Internet (i.e. feeling confident in using e-mail). It is almost the same percentage as in EU countries (46%). In CEE candidate countries, only 20% of the population feel themselves confident in using Internet for communication.

The youth group (aged 15 to 24) shows a similar pattern, though with much higher level of confidence. Digital literacy among the youth in Estonia and Slovenia has the highest COQS index¹ value (1,4) among CEE candidate countries. The same countries have also the highest index value for total population (0,7), which is close to EU average (0,8). The relative differences between the COQS index scores among the youth and the rest of the population in Estonia are much smaller than the CEE average.

According to the SIBIS GPS data, only 14% of the labour force participated in lifelong learning in the last 4 weeks. 28% of the Estonian labour force participated in self-directed training and 13% used eLearning. All these numbers are much higher than in other candidate countries on average.

Digital divide is caused by old age, poor skills and poverty

The socio-demographic characteristics of the Estonian population segments which do not use information technology are similar to those of other countries. There are different barriers that prevent non-users from reaching the Internet. The skill gap appears to be the most relevant barrier: 42% of the respondents in Estonia agree completely with this statement and 33% agree somewhat. 32% of the respondents mentioned psychosocial barriers in using Internet. There are no significant differences in using IT products and services by gender.

SIBIS results indicate that IT use declines with age. Younger people in the age groups 'up to 24' and '25 to 49' show higher adoption rates for at-home Internet connections and they are

¹ The digital literacy index (COQS) is a measure that combines four types of skills in using the Internet: communicating with others (by e-mail and other on-line methods), obtaining (or downloading) and installing software on a computer, questioning the source of information on the Internet and searching for the required information using search engines. The COQS index combines these items (based on self-assessment) with a range from 0 to 3, with '0' representing the lowest digital literacy score.

most active mobile phone and SMS users. From the young (up to 24) close to 90% are regular PC users in Estonia. Among older people (over 65) there are only 4% of Internet users but almost ¼ of them are mobile phone owners in Estonia. Compared with CEE countries, all indicators are much higher in Estonia.

Those who have activity restrictions due to long-standing illness or disability are less likely to use the Internet, even though 28% of Estonian people who have long standing illness are using Internet. This number is practically the same as in EU-15 and much higher than in other CEE countries.

In Estonia, which has undergone rapid changes in all fields, the issue of digital divide has not enjoyed much attention. Experts believe that the digital divide issues are closely related to income levels and other social problems in society. The digital divide is rather caused by old age, poor skills and poverty. Digital Divide Index² value (50) is not far from the EU-15 average and has the best result among CEE countries. The lowest is gender gap and the highest educational divide. The education gap in Estonia is two times lower than in CEE.

Teleworking is growing in Estonia

Taking all types of telework together (home-based and mobile telework as well as self-employed teleworkers in SOHOs), 12% of the working population in Estonia can be classified as teleworkers. Compared with CEE countries, we can see that in Estonia there are relatively more teleworkers than in other countries. The degree of interest in telework is considerable. 72% are interested in at least one of the forms of telework, 40% of the labour force express interest in permanent telework. This is much higher than in CEE candidate countries on average and even a little bit higher than in EU-15 average. In Estonia there were no significant differences between men and women in the prevalence of telework and the same proportion of teleworkers is to be found in each age group.

Teleco-operation (communicating with external business contacts via e-mail, video-conferencing or electronic data transfer) is widely used in Estonia with an average of almost 31% of the employed population. It is twice as high as in CEE candidate countries.

During recent years, work stress is widespread in Estonia with 27% of all employed stating they find their work stressful 'often' and an additional 60% feeling this way 'sometimes'. This is one reason why only 15% of all employed people are very satisfied with their work and 44% somewhat satisfied. It is much lower than in EU-15 countries but similar to CEE candidate countries. 72% of employed persons agreed strongly or somewhat with the statement that nowadays many employees have concerns about whether their job is secure. Older age groups are more worried about job security than younger ones and women more than men.

e-Government activities increase supplying services for citizens

On the basis of SIBIS survey, the preference of Estonians for interacting with government through the Internet is rather modest on average (out of 7 services under study), lagging with this behind the average of CEE candidate countries. At the same time there are a number of other services are provided by public sector of Estonia (e.g. special information systems for citizen's use), which were not included in the SIBIS questionnaire. There are a number of new services, where the government is on the way to open on-line opportunities for citizens.

On-line income tax declaration rates have a higher preference in Estonia, followed by job search and library book search. This is different from the CEE and EU average, where library and book search were mentioned in the first place followed by job search and change of address etc. The least preferred is the declaration to the police in Estonia, also in CEE and EU countries.

² The Digital Divide Index (DIDIX) is a compound index that comprises four indices: gender, age, education and income. The lower the Index value, the more severe is the divide.

At the same time, the availability of government services in Estonia is higher than in CEE candidate countries on average in almost all government services except for car registration and in four other types of services compared with EU average. The highest difference is in the availability of income tax declaration service: the availability of this service is 4.8 times higher in Estonia compared with CEE average and 2.8 times higher compared with EU average. Services with higher availability have also been used more frequently in Estonia, e.g. income tax declaration and personal documentation in the Internet. There is a rare need for some other services like change of address and declaration to the police in the case of theft, which explains their low usage.

1.3 The SIBIS added-value to the state-of-the-art

The survey under the SIBIS project has produced new methods and data contributing to the European effort to measure and benchmark the Information Society (IS). A number of new indicators are used to track the evolution of IS development and its impacts, which have not been available up today from other sources. SIBIS has developed and tested these indicators in a systematic manner, starting from the assessment of the state-of-the-art in IS benchmarking, collecting and analysing available indicators, and developing those reflecting better the aspects of the IS, focused in the eEuropean context. It is worth to emphasize the possibility created by SIBIS project to compare the IS development issues on the basis of the same set of indicators at the same point in time in EU, CEE candidate countries, Switzerland and US.

SIBIS project on indicator development and testing has helped to better understand what aspects of the IS should be benchmarked and how to do this in the best way. The methodological contribution is worth mentioning for future research on IS developments.

1. Ideas for future research

It will be needful to investigate the business sector environment in Estonia and in other CEE candidate countries, which helps better to understand the development of IS in these countries and compare with the state-of-the-art in EU countries.

Regular monitoring of IS development on the basis of the methodology elaborated under SIBIS project will be needful by countries to produce comparable information.

2. Conclusions

In conclusion, in a number of indicators of the Information Society, Estonia is ahead of the average of CEE candidate countries and in some of them takes the leading position (e.g. experience and intensity of on-line usage) among CEE countries. In on-line usage, Estonia is already reaching the EU level and also ahead of a number of EU countries (e.g. Internet and SMS usage, interest in telework). However, in most of the indicators, Estonia still lags behind the EU average level, and the level of Switzerland and US. The respondents of SIBIS survey in Estonia have strongly reported that without the Internet they feel themselves socially excluded.

The Digital Divide Index for Estonia is highest by education and lowest by gender. Still not enough attention has been paid to the problems connected with digital divide, i.e. the socio-economic differences of individuals, households, enterprises, geographical regions and their dissimilar possibilities to use ICT. However, this topic has been lately under discussion in various debates and seminars, a respective survey was conducted. In addition, a number of projects, supported by public and private sector, have provided services to citizens to expand internet access to non-users and creating learning opportunities as well as to motivate using computers and the Internet.

2. Introduction

2.1 Background

Statistical Indicators Benchmarking the Information Society (SIBIS) is a project funded under the 'Information Society Programme' of the European Commission (IST-2000-26276). SIBIS, which runs from January 2001 to September 2003, has taken up the challenge of developing innovative information society indicators to take account of the rapidly changing nature of modern societies and to enable the benchmarking of progress in European Union (EU) Member States. The indicators have been tested and piloted in a representative survey held in 2002 in all EU Member States, Switzerland and the United States. As a result, nine Topic Reports assessing the current state of the European information society and benchmarking individual countries have been published in 2003. The topics covered by SIBIS include: *telecommunications and access, Internet for research and development, security and trust, education, work- employment and skills, social inclusion, e-Commerce, e-Government and e-Health.*

In 2003 the SIBIS project has been extended with the SIBIS+ initiative. The objective of SIBIS+ is to geographically expand the SIBIS activities from the EU Member States to the following Newly Associated States (NAS): Slovenia, Poland, Slovakia, Hungary, Czech Republic, Bulgaria, Romania, Estonia, Lithuania, Latvia. This parallels the extension of eEurope to eEurope+, an Action Plan by and for the candidate countries.

This report analyses the results of the surveys conducted in the ten NAS countries in 2003. In order to produce comparable results, the survey questions have been extracted from the surveys conducted in the EU member states in 2002.

2.2 Country and Topic Areas

Information Society development has become one of the main priorities in Estonia's political agenda, focusing on supporting fast economic growth, making government and businesses more effective, faster, and cheaper. The first national information technology development programme was prepared in 1994, which was supplemented with the Principles of Estonian Information Policy³ in 1998. The latter is a source document for IS development in Estonia.

The framework of the Estonian information policy was concentrated on the following four fields: modernisation of legislation, assistance in the development of the private sector, development of communication between the state and the citizens, and acknowledgement of problems related to information society. In the current report five key topics are covered: telecommunications & access; education; work/skills/employment; social inclusion; and e-government. These topics are prioritised also in the policy documents of Estonia. The IS indicators are provided and the research has been conducted by Statistical Office of Estonia, TSN Emor Ltd, Estonian Informatics Centre, PRAXIS Centre for Political Studies, Tallinn Technical University and other institutions. Currently, the coordination of IT development in the public administration is in the area of the government of the Ministry of Economic Affairs and Communications.

The overall development of Estonian telecommunications policy is oriented towards liberalisation. Estonia's society has been characterised by high readiness for the implementation of contemporary technologies and experimenting with new solutions. So far, the development of information society in Estonia has been concentrated on the

³ <http://www.eik.ee/english/policy/princip.htm>, came into force on 29.05.1998; RTI 1998, 47, 700

development of telecommunication infrastructures and providing the Internet availability (Estonian National Development Plan, 1002).

Estonia has a quite advanced telecommunication infrastructure. In each part of the country, business and private customers have access to telephone network and ISDN today. The major and some smaller cable TV networks have started to offer Internet access. The main competitor for fast Internet access is ADSL technology. At the same time, the number of IT-users in Estonia has reached a certain level of saturation and the increase in the number of Internet users has stopped. Therefore, we can expect the digital gap between the users and non-users of information technology to become wider (Estonian National Development Plan, 2002). To overcome this situation, Estonia must become more expedient and effective than before (e.g. develop training system, motivate non-users, find new IT solutions).

Government initiated ICT policies are directed mainly to IT education, activities related to e-government and access to public IT based services. The main goal in Estonia is to create new, user-friendly IT solutions for e-government, e-education, e-health care, e-economy etc. that would motivate people to use information technology and will provide access for people living in less favourable conditions. This needs to be supported by the development of education and training systems, and enterprises' technological competitiveness.

People's awareness of the information society in Estonia has grown rapidly as a result of co-operation between different organisations and of organising several large-scale activities. In the public sector, the Ministry of Education is active in developing the IT base of Estonian schools through the Tiger Leap Foundation.

Estonian National Co-ordination Office for awareness and IS implementation (national ISPO) is the Estonian Informatics Centre. It was established in 1997 under the administration of the State Chancellery to solve the main IT problems common for several state organisations and to arrange the work of the state information systems.

Political awareness is supported by a number of public sector programmes (e-government, e-county, e-citizen, e-business etc) as well as private sector projects. The latest project [Look@World](#), which was started in April 2002, provides free of charge basic computer and Internet training for 100 thousand persons (eEurope+ Progress report, 2002).

Information Society development in Estonia has become one of the main priorities in the policy agenda, focusing on supporting fast economic growth, making the government and businesses more effective, faster and cheaper. Basic ICT infrastructure is already today widely available. At the same time, there is constant focus on offering possibilities for all social groups and regions. Many projects are dedicated to this issue. Preconditions for Estonia's fast development have been (eEurope+ Progress report, 2002):

- positive attitude of citizens toward new technology,
- well educated population,
- strong influence of Finland and Sweden,
- good ICT infrastructure and highly developed e-banking systems,
- inherent flexibility of the small country,
- strong political will to use ICT as a tool for accelerating development,
- stable co-ordination mechanism at the government level and stable IT-budget as a part of the state budget (IT-budget has been for many years around 1% of the state budget).

The SIBIS project makes a significant contribution helping to assess the actual situation in ICT awareness, availability and usage by citizens, their skills and knowledge in Estonia and in comparison with other countries. Therefore, the project results are very important being the first systematic approach to the specific topics and analysing comparable indicators in EU, CEE candidate countries, Switzerland and US.

2.3 Overview of the Report

Statistical Indicators Benchmarking the Information Society (SIBIS) is an Information Society Technology (IST) Programme Project which is focused on measuring and benchmarking the Information Society in EU and CEE candidate countries. Producing new methods and a broader set of indicators helps to better understand different aspects of Information Society (IS) and how IS affects individuals, groups, firms, industries, and economies. In this report, SIBIS presents data corresponding to the indicators requested by the Commission for benchmarking eEurope 2005. The indicators were tested and applied in benchmarking surveys in EU, CEE candidate countries, Switzerland and USA. For assessment of the state-of-the-art in IS benchmarking, the report is presenting key highlights from the General Population Survey (GPS) carried out in December-January 2003 in CEE candidate countries including Estonia with a total of 1001 respondents in the sample.

The results of the benchmarking survey have been presented on the main aspects of the Information Society in Estonia and other CEE candidate countries:

- ICT Infrastructure and Security
- E-Society and Social Inclusion
- E-Education and Life-long-learning
- E-Economy and e-Commerce
- E-Work
- E-Government

The report presents a portrait of the IS in Estonia in comparison with other countries under investigation. The report gives general information about Estonia, first. Then it includes the main topics' analysis based on the results of the General Population Survey (GPS) and the existing statistical data. Each section introduces briefly the state-of-the-art of IS development in Estonia and its comparison with other CEE candidate countries, EU, Switzerland and US where available.

3. General Information about Estonia

Area	45,226 square km.	
Population	1.31 million at the beginning of 2002	
Currency and exchange rate	Eesti Kroon (EEK) 1 kroon = 100 sents. Pegged to the Euro under currency board arrangement at rate 1 EUR = 15.6466 EEK	
Language:	Estonian. Other languages such as English, Russian and Finnish are also widely spoken	
Major Natural Resources:	Timber, oil shale, phosphorite, peat, clay, limestone, sand, dolomite, arable land, sea mud	
Capital	Tallinn	
Economy	2001	2002
GDP real growth, %	5.4	5.8
Consumer prices (growth, %)	5.8	3.6
Unemployment rate (ILO, %)	12.6	10.3

Estonia's economic success has been built on stable currency, liberal foreign trade regime, liberalisation of prices, abolition of state subsidies, fast privatisation and effective bankruptcy legislation. As a result, Estonia has advanced fast in terms of stabilisation and restructuring of its economy and has been rewarded with high levels of foreign direct investment.

Ratings:

Index	Rank	Source
Global IT IQ ranking 2002	24 of 100 countries	Brainbench
Network Readiness Index 2001-2002	23 of 75 countries (score 4.73 out of 10)	Center for International Development, Harvard University

4. ICT Infrastructure and Security

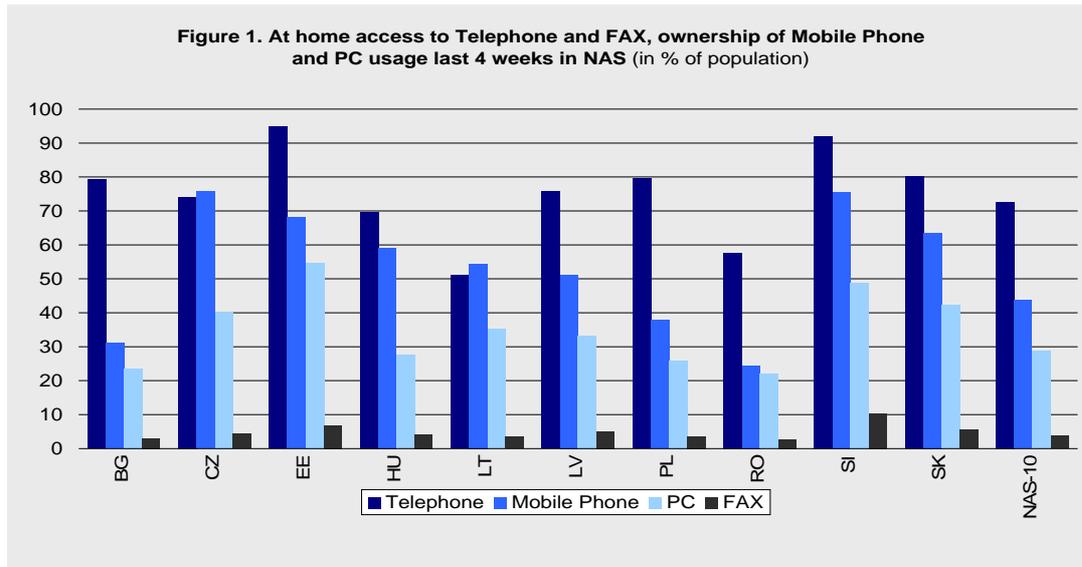
4.1 Telecommunications and Access

Information and communication technology is broadly used in different spheres of life in Estonia. Compared with both the transitional and developed countries, Estonia has been characterised as a considerably successful country when it comes to the implementation of information technology (McConnell International, 2001). The analysis of survey results under the SIBIS project allows deeper estimations of all relevant indicators on Telecommunications, Access and Usage of ICT. It contains an analysis of indicators such as network access (telephone lines, ISPs, bandwidth), use of e-mail, Internet access and use, effects of Internet use, barriers to using the Internet, access to mobile phone and effects of mobile phone use.

Data from the GPS show that home access to the network (ICT equipment) in Estonia is higher than the average of Central and Eastern European (CEE) candidate countries (Figure 1). Currently more than half of the population aged 15 years and older has access to and use the Internet on a regular or occasional basis (59%). 52% of the population used the Internet in the 4 weeks prior to the survey. This is more than twice as high as in CEE candidate countries on average (21%) and 6% higher than in EU countries on average (46%), but less than in Switzerland (57%) and US (70%). At the same time, 67% of the population in Estonia does not have Internet access at home, which places Estonia the second after Slovenia among CEE candidate countries, where 62% of the population does not have the Internet access at home. The situation is even worse in other CEE candidate countries. The use of information technology possibilities at home is small in Estonia compared with EU countries (where 56% of the population does not have Internet access at home), Switzerland (40%) and US (37%). Besides, there still remains a significant segment of the population in Estonia who do not access the Internet at all (41% of population).

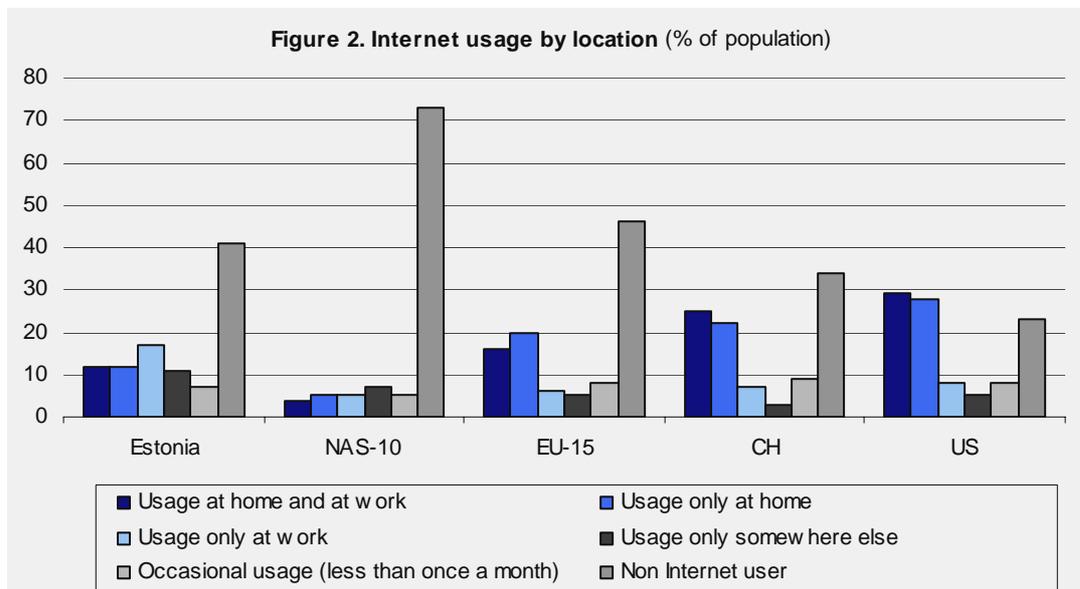
68% of the population have personal mobile phones in Estonia, which is only 1% less than in EU on average (69%), but more than in CEE candidate countries (44%), Switzerland (67%) and US (56%).

The research carried out by TSN Emor and PRAXIS Center for Policy Studies from January to July 2002 shows that one-third of the current non-users understand the opportunities offered by the Internet and want to take advantage of them, but are limited by a lack of skills and access (Kalvet, 2002). Two-thirds of the non-users (40% of the adult population) do not consciously think of the Internet as of an interesting and useful tool; more practical services and an awareness campaign are thus needed for them. The latter group depends on daily routine and already shaped-out habits - it is hard for them to accept the Internet as a new channel of information and management of public affairs.



Base: All respondents, weighted column percentages
 Questions: A1, A19
 Source: SIBIS 2003, GPS-NAS

By location a large part of the population in Estonia is using the Internet at work, which shows that information and communication technology is actively used in private businesses as well as in public administration. All state and local government agencies have been provided with computers; in most government agencies 100% of the needs for computer workplaces have been covered. All government agencies have also leased line Internet connections and it has been regarded necessary to provide about 87% of computers in government agencies with Internet connection (Estonian Informatics Centre). All local government agencies have leased line Internet connections (built within the *Kõla Tee* project).

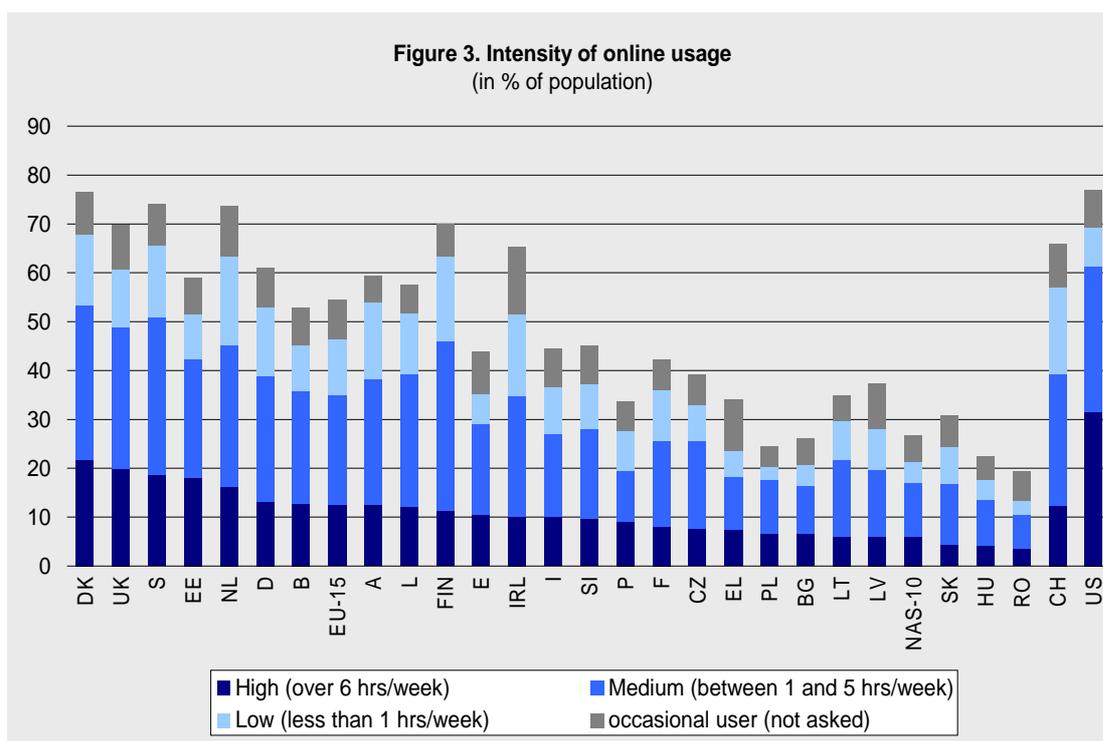


Base: All respondents, weighted column percentages
 Question: A9
 Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Internet usage in Estonia is higher in all locations under study compared with CEE candidate countries on average (Figure 2). Internet usage at home and at work together in Estonia is almost the same as in EU countries on average (41% and 42% respectively), but less than in Switzerland (54%) and US (65%). At the same time, Internet access from 'other locations'

than at home/at work is higher in Estonia (11%) than in EU on average (5%). This suggests a strong interest in Internet use, but limited possibilities to own a personal computer.

Taking into account the weekly average time spent on-line at home, the intensity of on-line usage is relatively high in Estonia: 42% of the population is using the Internet 1-6 hours per week, which is higher than in CEE candidate countries (17%), EU countries (35%) and Switzerland (39%), but still lags behind the on-line usage intensity in US (62%) (Figure 3). In Estonia, 18% of the population is using on-line over 6 hours and 24% 1-5 hours per week. By intensity of on-line usage, Estonia is occupying the third place among all countries under study after Denmark, UK and Sweden. This explains relatively small share of non-Internet users in Estonia (41% of population) among CEE candidate countries and lower from 6 of the EU countries (lower than in Denmark, Ireland, Netherlands, Finland, Sweden and UK) and similar to Austria (41%).

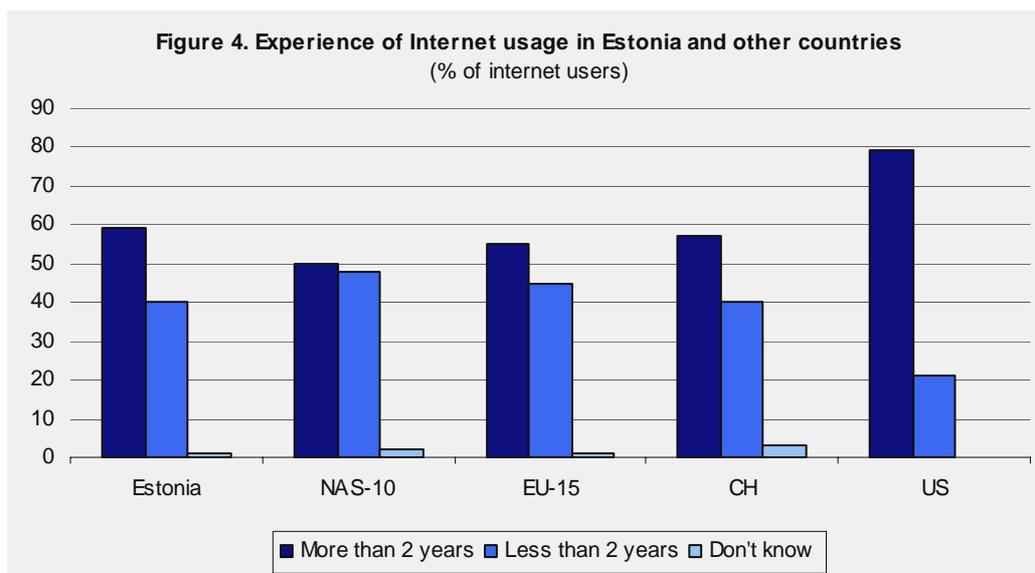


Base: All respondents, weighted column percentages

Question: A9

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

By knowledge about the Internet, Estonia takes the second place among CEE countries after Slovenia, only 4% in Slovenia and 6% in Estonia have never heard about the Internet compared with 15% in CEE candidate countries on average. Experience of on-line usage is also relatively high in Estonia, where 35% of the population have two years or longer experience, compared with 30% in EU, 13% in CEE countries and 38% in Switzerland. (Figure 4). But this indicator is much lower than in US (61%).

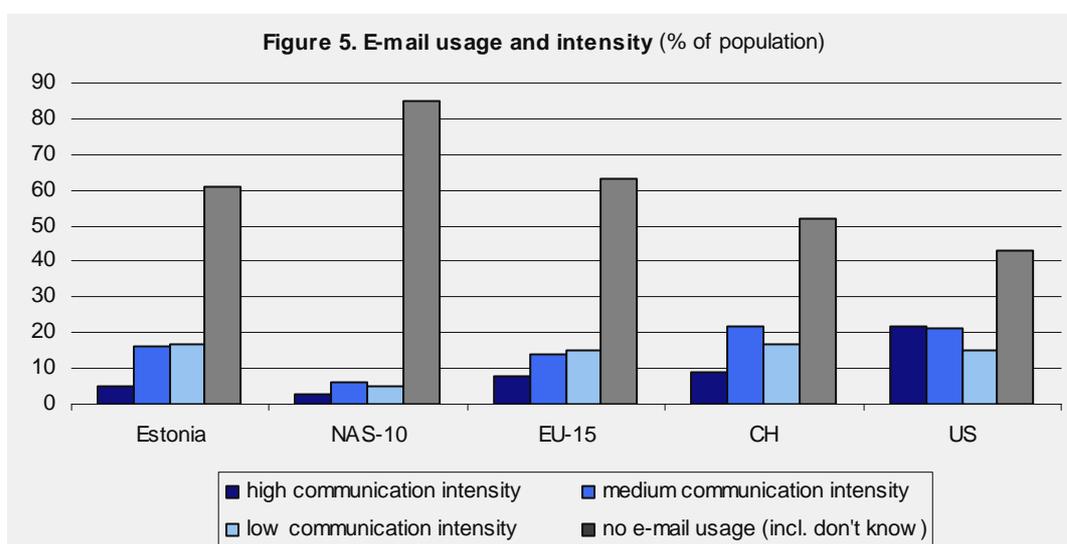


Base: Internet users, weighted column percentages

Question: A7, A8, A10

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

High on-line usage is a prerequisite for intensive e-mail usage, which in Estonia is approaching the average level of EU countries (Figure 5). Respondents were asked to indicate their degree of using e-mail networks in communication with friends and relatives. E-mail usage intensity is high when people communicate with more than 75% of their friends and relatives via e-mail, medium when people communicate with 50% of friends and relatives via e-mail, etc. In Estonia, low and medium communication intensity is reported more frequently by respondents. This indicates also few Internet connections, for example, at home among friends and relatives.



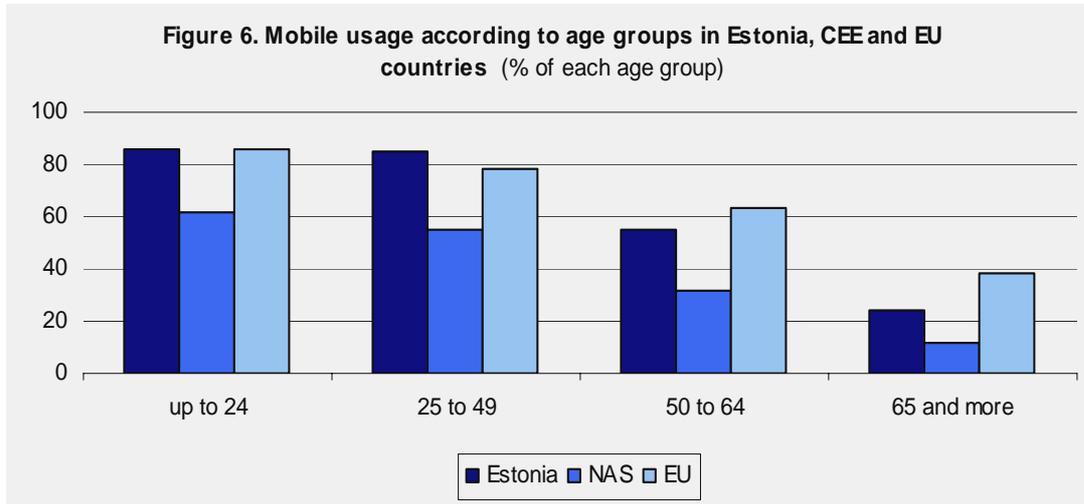
Base: All respondents, weighted column percentages

Question: A3, A4a

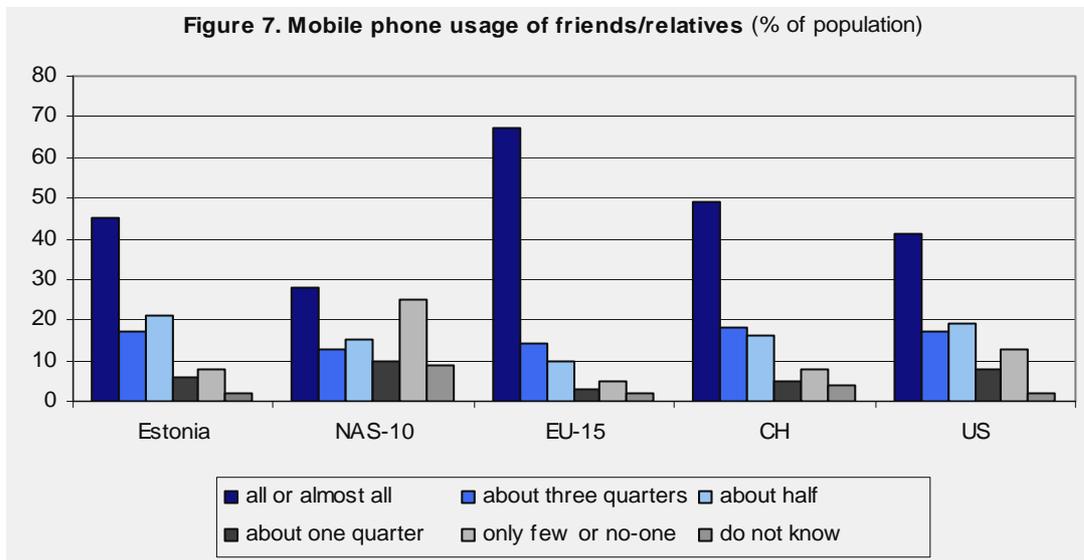
Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

When respondents of the survey were asked to assess the Internet, then the assessment of skills requirements and time consumption were more emphasised in Estonia, probably because of bigger experience in using the Internet. At the same time, difficulties to get access to and higher share of non-users is mentioned more frequently in CEE candidate countries than in Estonia.

Mobile phone usage is also relatively high in Estonia (Figure 6). The survey analysis shows intensive mobile usage among young and those from 25 to 49 years old people. The mobile phones usage rate in these age groups is almost equal with the average level of EU countries, but in older age groups remains still behind the EU level. A relatively large number of friends and relatives of the respondents are using also mobile phones in Estonia, but much less than in EU countries on average, where friends of 91% of the respondents had mobile phones (in Estonia 83%) (Figure 7).



Base: Mobile phone owners, weighted column percentages
 Question: A19c
 Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

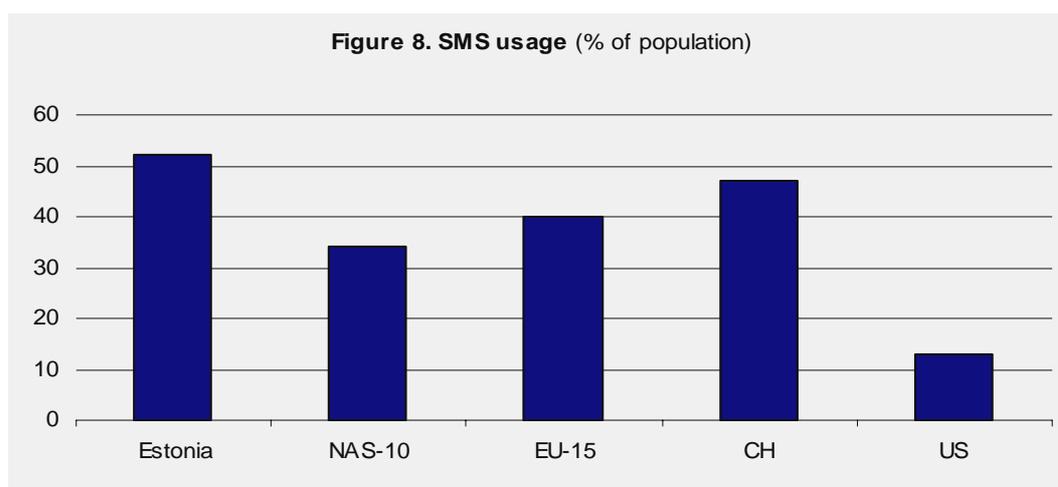


Base: all respondents, weighted column percentages
 Question: A20
 Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Intensive usage of mobile phones in Estonia is supported by a number of services available by mobile phone such as mobile parking services (parking of cars using mobile telephone), which have become extremely popular in Tallinn and some other towns recently. They contribute almost 50% of parking payments. M-parking was the first on a long list of services implemented through mobile phones. There are a number of other services offered, such as purchasing of public transport and other tickets, buy drinks, get information from the business

register, check their bank accounts by mobile phone etc. The Bank of Estonia launched an m-payments pilot project in 2002. M-payments are tested as an alternative to card payments in smaller shops (Adamson, Kaarli, 2001). Mobile phones are also used for positioning (emergence) calls, in security systems including the systems for positioning stolen cars.

There is a high SMS usage in Estonia, which is even higher than in EU, Switzerland and US (Figure 8). The reason for this activity may be its lower cost compared with mobile phone calls, but also a number of different public events directed for using mobile phones (e.g. games, TV-shows, conference), which became popular in the country, especially among youth. This is confirmed by a high share of young people up to 24 years, but also those from 25 to 49 years old, who have most intensively used mobile phones. The intensive use of mobile phones and SMS was motivated by owners in connection job and business contacts.



Base: all respondents, weighted column percentages

Question: A27

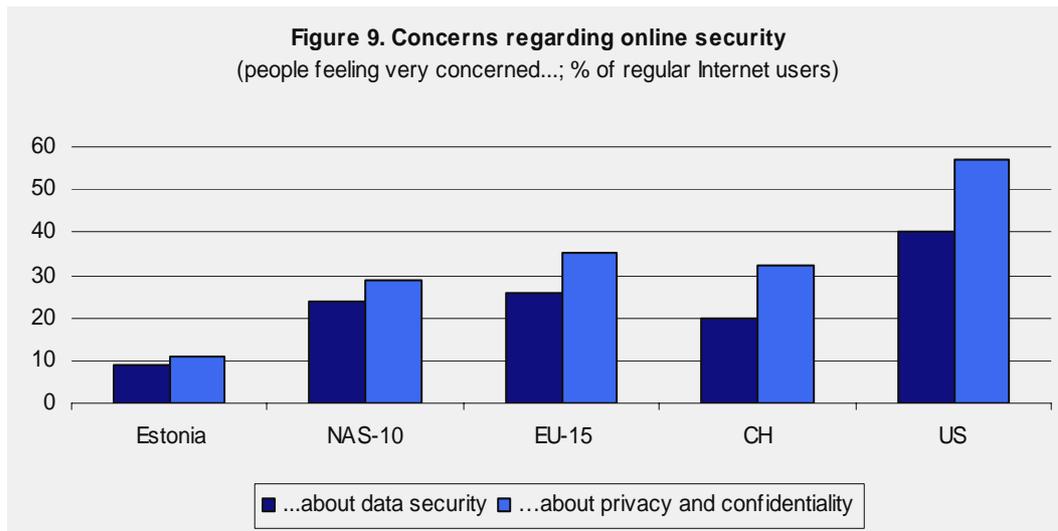
Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Thus, the relatively low number of computers at home in Estonia is compensated by the intensive use of the Internet at work, in Public Internet Access Points and elsewhere. Active supply of different services via mobile phone has increased the usage of ICT among Estonians.

4.2 Security

There are a large number of factors influencing concerns regarding on-line security. These include the level of trust in the country, and the level of awareness of issues surrounding data protection and privacy, but also the amount of negative experiences.

Among the EU and CEE candidate countries, Estonia is one of those with the lower level of concerns about data security and privacy/confidentiality after Bulgaria and Hungary. Only 9% of regular Internet users are very concerned about data security in Estonia, compared with 24% in CEE and 26% in EU countries on average, 20% in Switzerland and 40% in US (Figure 9). The situation is similar regarding concerns about privacy and confidentiality.

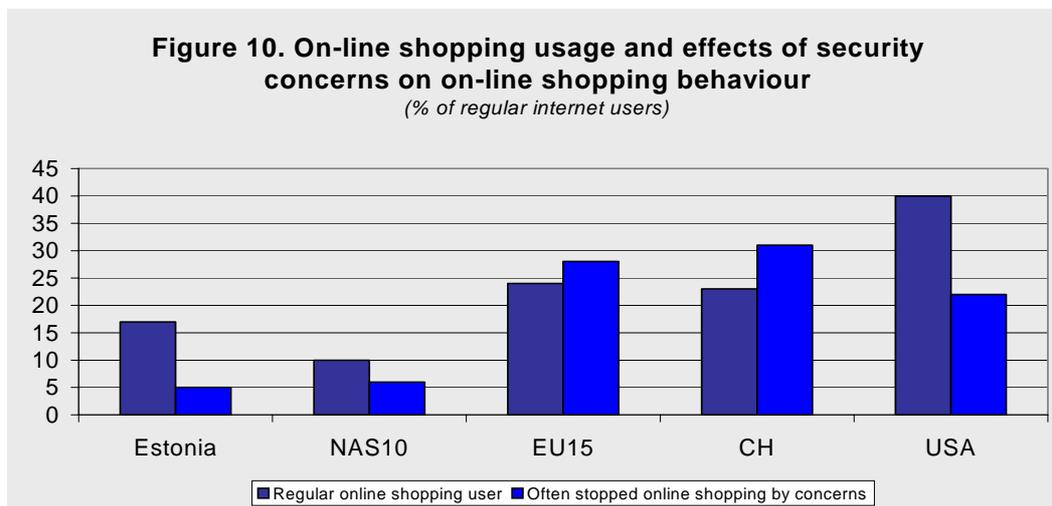


Base: Regular Internet users, weighted column percentages

Question: J1a, J1b

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

On-line shopping usage is the highest in Estonia among CEE candidate countries, including 17% of regular and 10% of occasional users. If to take into account regular on-line shopping users (17% in Estonia), then it is lower than in EU on average (24%), Switzerland (23%) and US (40%) (Figure 10). On-line shopping is relatively rarely stopped in Estonia because of security concerns. The reason can be connected with the type of eCommerce, which determines the level of security concerns. Currently a large part of eCommerce is connected with financial services in Estonia, which people believe that an Internet bank as a fully developed web-service is a trustworthy partner for managing one's business independently. At the same time, regarding public sector e-services, people are certain that much depends on the discretion of the public servants and that therefore, electronic services are not sufficiently reliable (Kalvet, 2002, The research by EMOR and PRAXIS).



Base: Regular Internet users, weighted column percentages

Question: J2, B1b

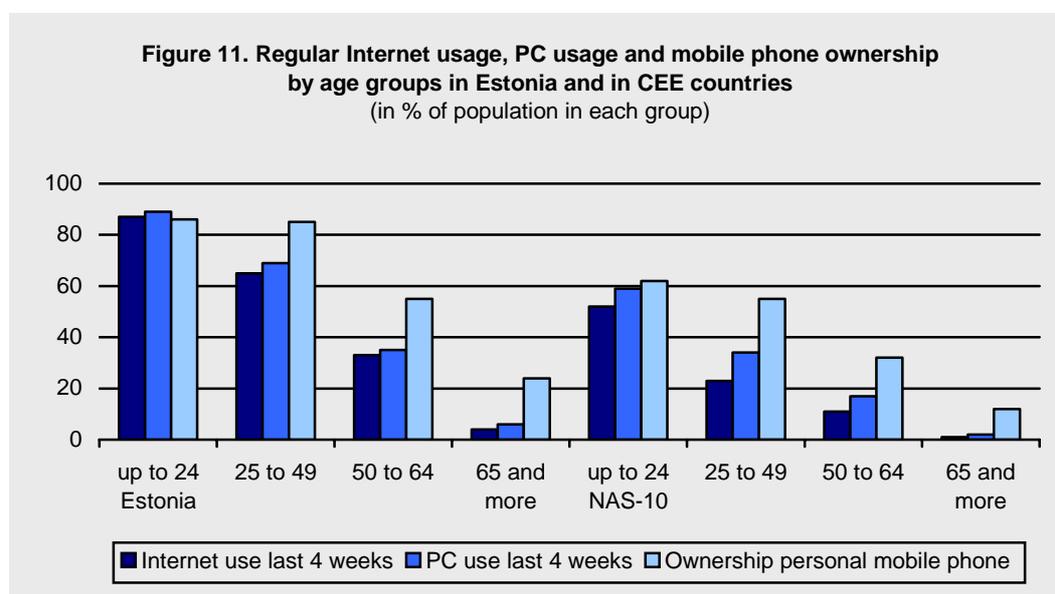
Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

5. e-Society and Social Inclusion

In Estonia, the growth in the number of Internet users is stabilising in a similar way to that of computer users. This means that certain groups of population do not use the Internet at all. There are different barriers that prevent non-users from reaching the Internet: motivational, access and skill barriers. The main barrier in Estonian society is the fact that the possibilities offered by the Internet are not associated with personal needs. It is believed that 'computers are not for me'. As the living standard is relatively low, quite many do not have computers at home. It has become a common view that computers are either for children for school assignments or for adults in their work (Kalkun M. Kalvet T, 2002).

The socio-demographic characteristics of the Estonian population segments that do not use information technology are similar to those of other countries. There are no big differences in using IT products and services by gender in Estonia. 55% of men and 54% of women are using a PC, and 53% of men and 51% of women access the Internet. There is a slightly bigger gap between mobile phone owners. 72% of men and 65% of women have mobile phones. The skills gap appears to be the most relevant reason why people do not use Internet. 42% of the respondents in Estonia agree completely with this statement and 33% agree somewhat. 32% of the respondents mentioned psychosocial barriers.

SIBIS survey results indicate that the use of IT declines with age. Younger people in the age groups 'up to 24' and '25 to 49' show higher adoption rates with at-home Internet connections and they are most active mobile phone and SMS users. From the young (up to 24) close to 90% are regular PC users in Estonia (Figure 11). Among older people (over 65) there are only 4% of Internet users but almost ¼ of them are mobile phone owners. Nevertheless, all indicators under study are much higher in Estonia compared to CEE candidate countries. Although SIBIS project did not include people below 15 years old, it is worth to mention here, that by survey of TSN Emor, 67% of the age group '6-14' are regular internet users and 88% of them have used the Internet once at least⁴.



Base: All respondents by age groups, weighted column percentages

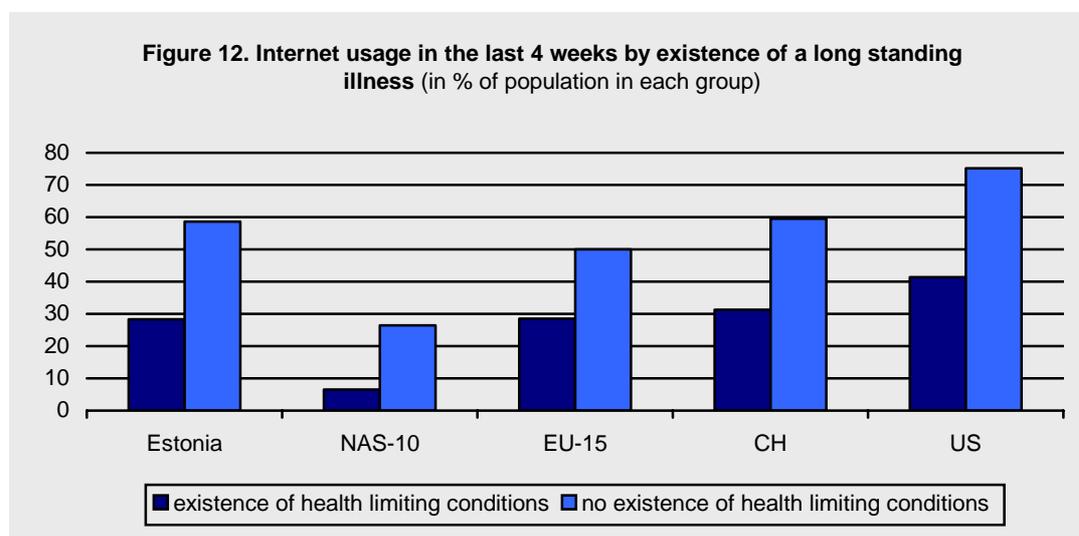
Question: A7, A1, A19c

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Those who have activity restrictions due to long-standing illness or disability are less likely to use the Internet, even though 28% of Estonian people who do have long standing illness are

⁴ Eesti Telefon news

using Internet (Figure 12). This number is practically the same as in European countries and much higher than the average of other CEE candidate countries (6.5%), but lower than in US (41%).

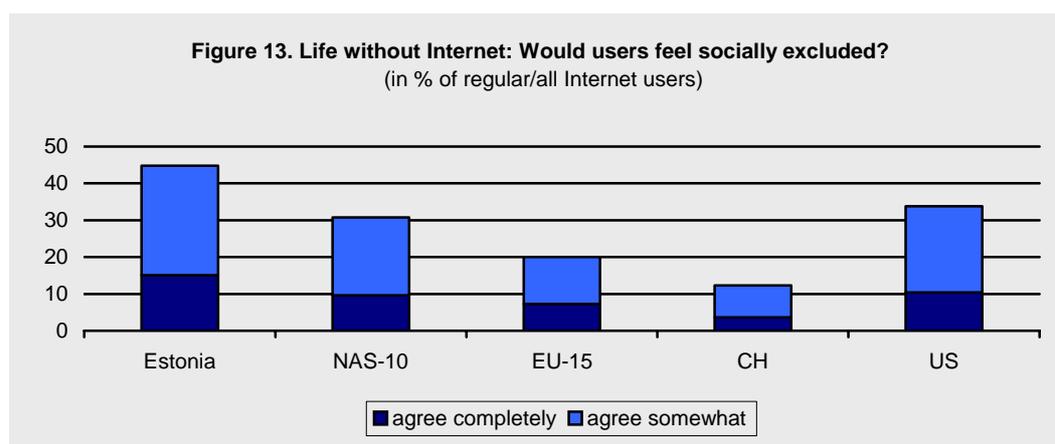


Bases: respondents with health-limiting conditions and without health-limiting conditions, weighted column percentages

Question: Z14, A7

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

In GPS survey, the current users of the Internet were asked: 'Please imagine our country were without the Internet for one month. What would it mean for your everyday life? Do you feel socially excluded?' The results showed that Estonians are used to use Internet and they cannot imagine everyday life without it. 43% of Internet users stated that in this case they feel themselves socially excluded (incl. answers agree and agree completely) (Figure 13). Only Lithuanians had a higher number (51%) of positive answers than Estonians compared to 31% on average in CEE candidate countries and 20% in EU countries. It means that for CEE candidate countries the access to Internet use is more important for getting information and for using other services than in EU countries on average and in US.



Base: Regular Internet users, weighted column percentages

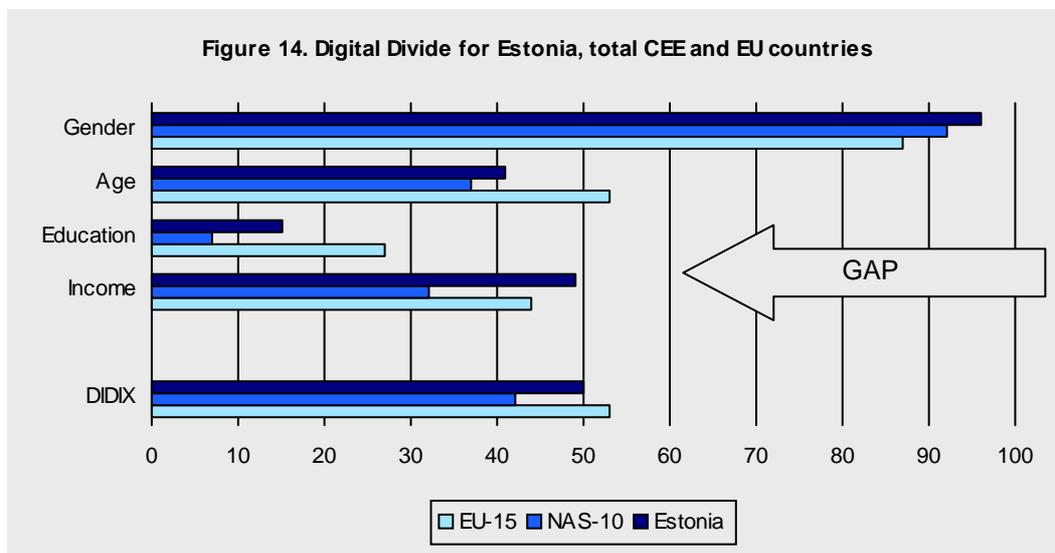
Question: B5b

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Although the digital divide is seen as a central and relevant problem of the information society, in Estonia who has undergone rapid changes in all fields, this issue has not enjoyed much attention. Estonian experts believe that the digital divide issues are very closely related to income levels and other social problems in society. As the main reasons behind the digital

divide are the great difference in incomes and the low purchasing power of the middle class, the varying availability of information and education, the low GDP, the price of Internet connections that remains high, the lack of active training programmes in the previous years and the lack of attractive communication services that would encourage people to obtain access quickly. The digital divide is rather caused by old age, poor skills and poverty. (Kalkun M. Kalvet T, 2002).

The Digital Divide Index (DIDIX) is a compound index that comprises four indices: gender, age, education and income. The lower the index value, the more severe is the divide. The lowest is the gender gap, especially in Estonia (Figure 14). The highest is the education divide. Low levels of formal education appear to be the most significant reason why people cannot participate in the Information Society. In Estonia, the education gap is two times lower than in CEE candidate countries, but higher than in EU-15. The Digital Divide Index value is not far from the EU-15 average and has the best result among CEE countries.



Base: All respondents, weighted column percentages

Question: IN1, IN3, Z19, Z21

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

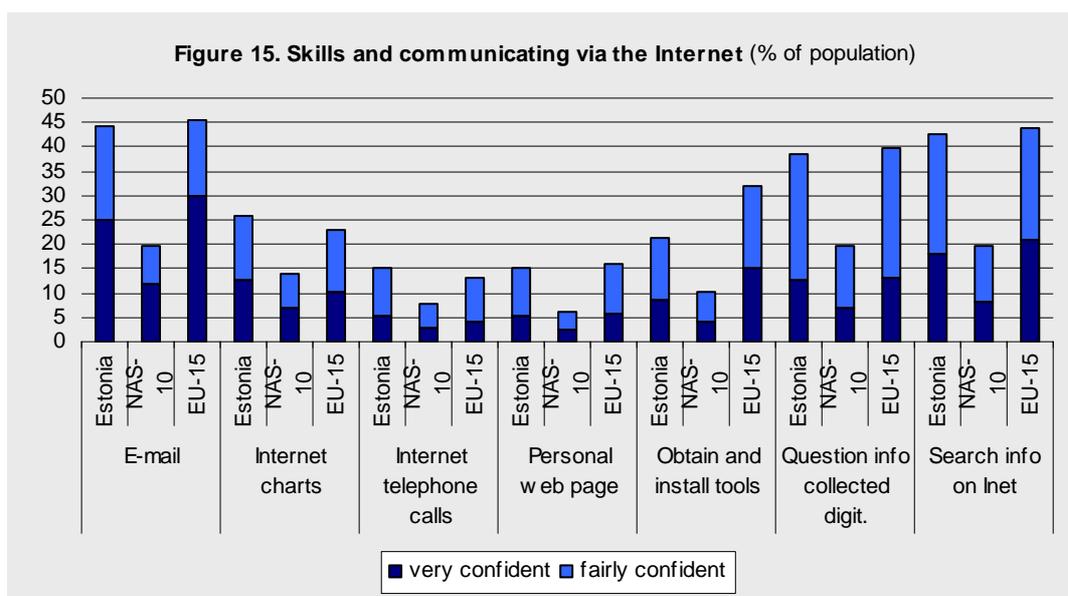
To guarantee the stable development of information society, it is important to tackle the problem of digital divide more than has been done until now.

6. e-Education and Life-long-learning

In the Information Society, the ability to operate over the Internet is essential for taking part in the societal processes of living, working and learning. Various forms of communication based on the Internet are possible. In SIBIS GPS, a question was asked about different personal skills in using the Internet. The answer categories were 'very confident', 'fairly confident', not confident, 'don't know'. On the basis of the SIBIS survey, 44% of the Estonian population regard themselves as very or fairly confident in communicating with others via the Internet (i.e. feeling confident in using e-mail) (Figure 15). It is almost the same level as in EU countries (46%). In CEE candidate countries, only 20% of the population feel themselves confident in using Internet.

People feel most confident in using e-mail and in searching information on the Internet. Only few people use Internet telephone calls and create personal web pages.

Digital literacy can be seen as an indication of readiness for qualified use of ICT. Looking at the youth group (aged 24 years and under), the same pattern is seen, although with much higher level of confidence. The differences between index scores among the youth and the rest of the population tend to be higher in countries with a low general level of digital literacy. In Estonia, the difference between age groups is smaller than in CEE candidate countries on average, but much higher than in US. Differences in gender gap are much smaller. In CEE candidate countries, the differences are even smaller than in EU countries.

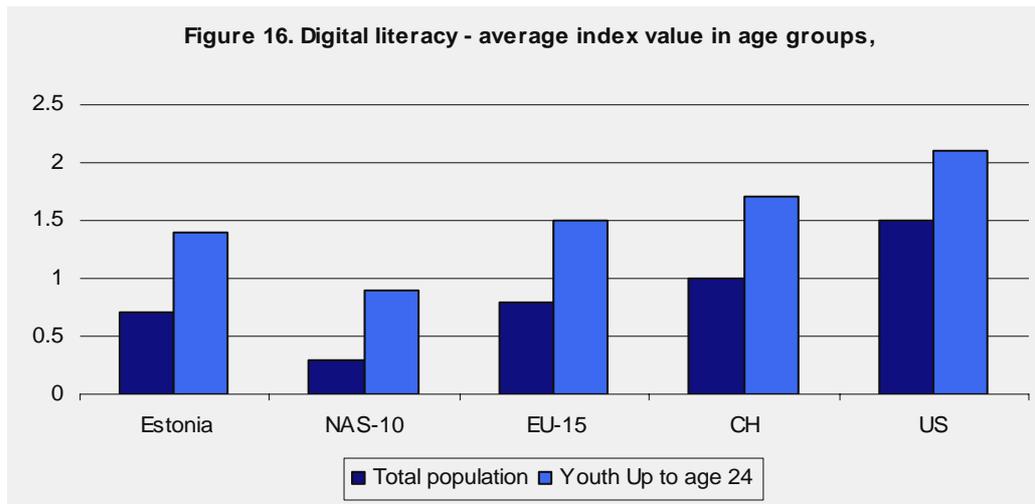


Base: All respondents, weighted column percentages

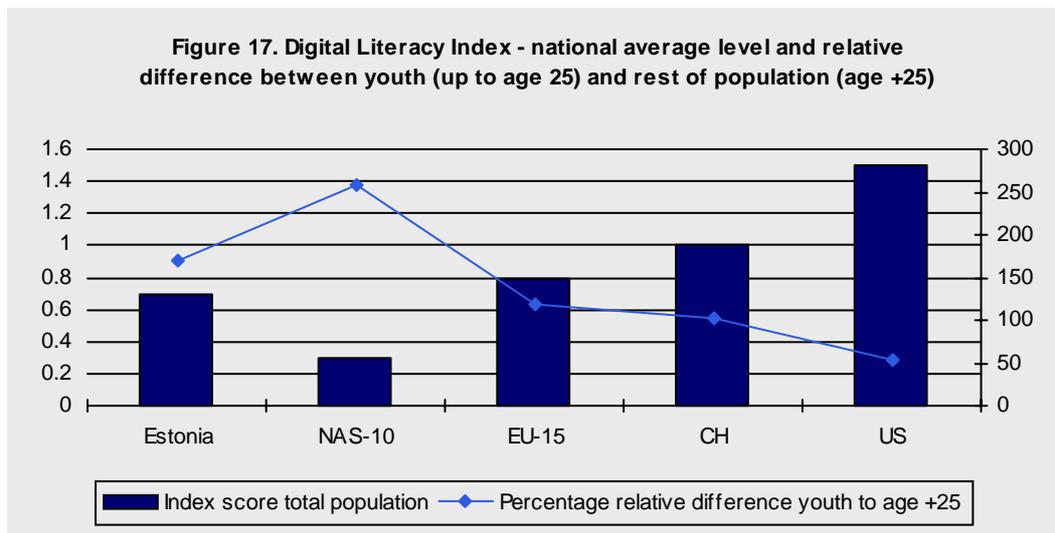
Question: D1c, D1d, D1f

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

The digital literacy index (COQS) is a measure that combines four types of skills in using the Internet: communicating with others (by e-mail and other on-line methods), obtaining (or downloading) and installing software on a computer, questioning the source of information on the Internet and searching for the required information using search engines. The COQS index combines these items (based on self-assessment) with a range from 0 to 3, with '0' representing the lowest digital literacy score. Digital literacy among the youth in Estonia and Slovenia has the highest COQS index value (1,4) among CEE candidate countries (Figure 16). The same countries have also the highest index value for total population (0,7) that is close to EU average (0,8) (Figure 17). The relative differences between the COQS index scores among the youth and the rest of the population in Estonia are much smaller than the CEE average.

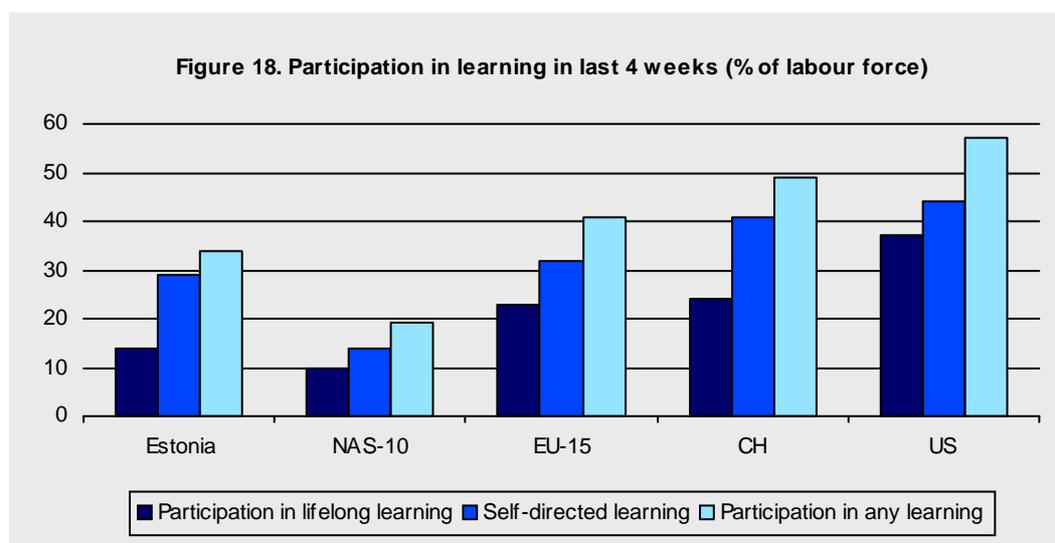


Base: All respondents, weighted column percentages
 Question: D1
 Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS



Base: All respondents, weighted column percentages
 Question: D1
 Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Lifelong learning puts great demands on learning systems and learning environments. Participation in life-long learning in CEE candidate countries is much lower than in European countries and US. According to the SIBIS GPS data, only 14% of the labour force participated in lifelong learning (the module focuses on work-related training) in the last 4 weeks (Figure 18). On the basis of Labour Force Survey, total participation in courses in 2002 (during last four weeks) of employed persons was even lower (2.8%) (Labour Force, 2003). The reason for such situation may be explained by the fact that in Estonia there is no comprehensive training system yet for adults who face changes in their job functions or who lose their job.



Base: Labour force, weighted column percentages

Question: C2, C9b

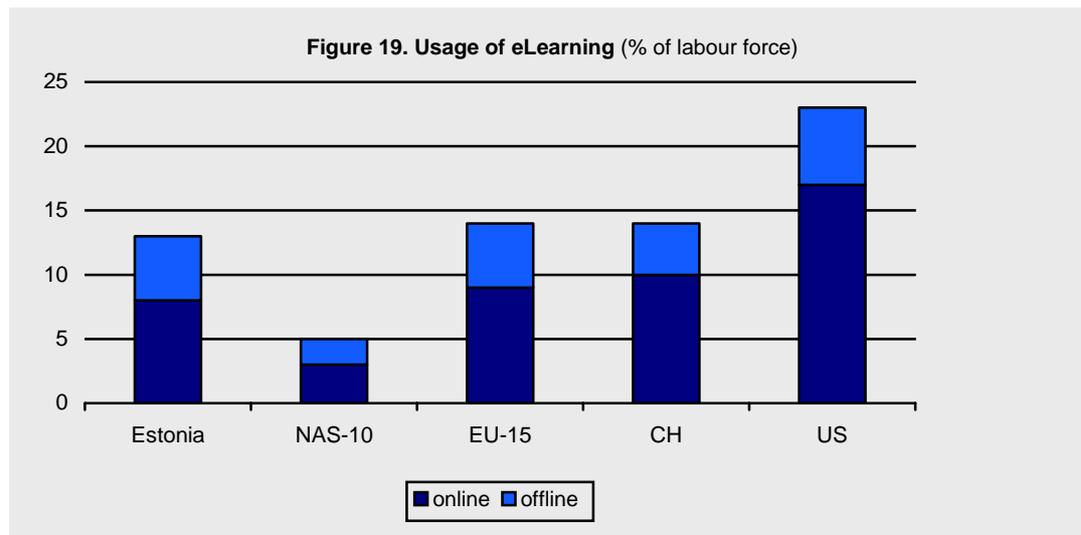
Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Apart from training that may have been provided by others, more people are engaged in some kind of self-directed learning related to their work or future plans. 28% of the Estonian labour force participated in self-directed training in the last four weeks. It is twice higher than in CEE candidate countries but only four percentage points lower than in EU countries. An example of training possibilities in Estonia may be an information system *Rajaleidja*⁵ (Pathfinder), which has been existing in Estonia since 1997 and which is dedicated to the field of career planning. It has introduced organised data about professions, studying and employment possibilities in order to reveal the wealth and diversity of career opportunities, and support people of different ages and backgrounds in finding and consciously constructing their own paths in life. This is also supporting learning among people.

ICT can make the provision of learning content and learning environments easier. We can distinguish two broad groups of eLearning technologies: offline and on-line eLearning. Offline learning comprises such as electronic learning programmes on CD-ROMs, computer programmes on diskettes, video tapes and on-line learning - applications transferred via the Internet or company/university- internal computer networks. Among students the use of eLearning is well advanced. The share of labour force that uses eLearning is 13% on average in Estonia compared to 5% in CEE candidate countries (Figure 19). An example of training firm is Trainator Ltd, which is operating in the Estonian education and training market. It has enlarged the knowledge base of people who are oriented towards lifelong learning using innovative learning methods. Trainator Ltd⁶ is offering different e-courses, dealing with composition of e-learning materials and instructions for e-courses, and also promoting e-learning culture.

⁵ http://rajaleidja.ee/pathfinder/about_pathfinder/index.htm

⁶ <http://edukas.ee/index.php?go=7&lang=eng>



Base: All respondents, weighted column percentages

Question: C18a, C18b, C19a, C19b

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

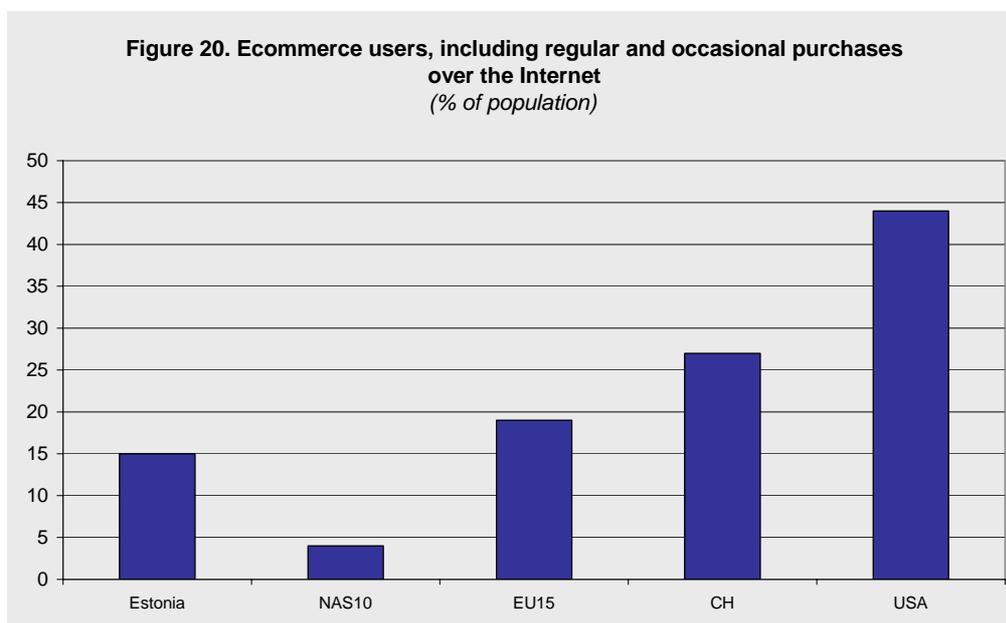
The other example in Estonia is website 'Miksike', which is popular among schoolchildren and teachers, giving more than 25,000 worksheets in HTML eWorksheets, which are aligned according to state educational standards and offers a set of collaborative learning services to facilitate learners in constructing their knowledge. Approximately 50% of Estonian schools are using 'Miksike'⁷ at least 2 times a week. This supports e-learning activities in schools. At the end of 2002, the number of pupils per computer in general education schools was 27 and in vocational schools 11 (<http://www.tiigrihype.ee>).

⁷ <http://elutuba.ee/introduction.htm>

7. e-Economy and e-Commerce

In this chapter the e-economy indicators are presented: e-commerce usage, e-banking usage and their relation to the Internet usage and experience.

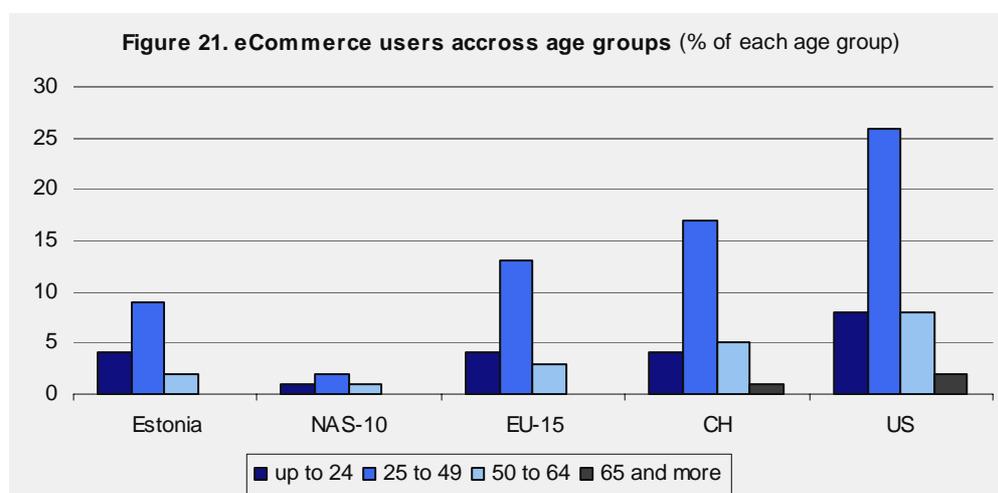
On average, only 15% of the population in Estonia purchase products on-line, including 60% regular users and the rest occasional users. This is the highest level among CEE candidate countries, but remains lower than in EU countries (19%), Switzerland (27%) and US (44%) (Figure 20). A number of occasional eCommerce users as well as a considerable share of Internet users among the population in Estonia is a good potential for increasing eCommerce users in the future. By age groups, the most dynamic group of eCommerce users is the '25 to 49' age segment (Figure 21). The age group 'up to 24' in Estonia is eCommerce user similarly to EU countries and Switzerland, but twice less than in US. Those who are retired have used eCommerce services five times less.



Base: All respondents, weighted column percentages

Question: B1, B2

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

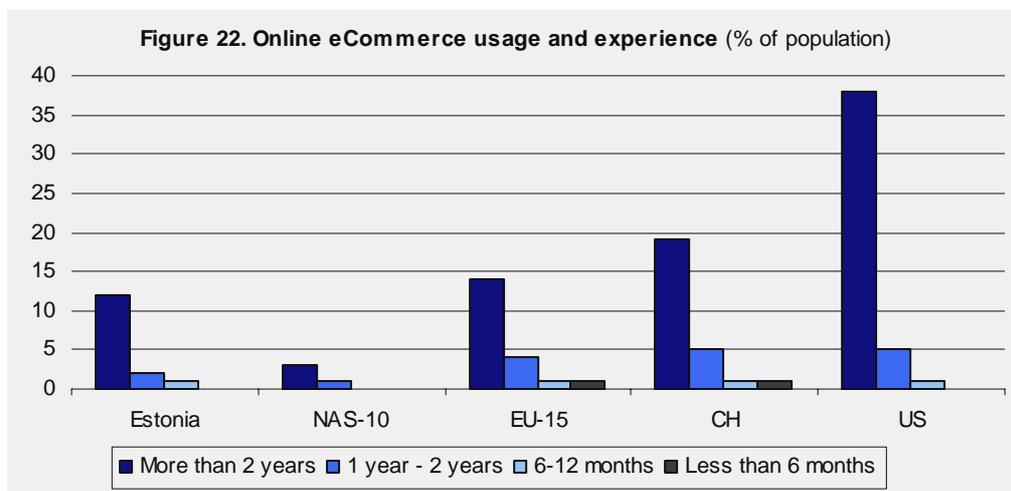


Base: All respondents, weighted column percentages

Question: B1, B2

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Relatively modest eCommerce usage can be explained by on-line tenure – the length of on-line usage and experience. 12% of eCommerce users in Estonia used on-line more than 2 years, which is four times more than in CEE candidate countries on average but some 2% less than in EU countries, a third less than in Switzerland and three times less than in US (Figure 22).

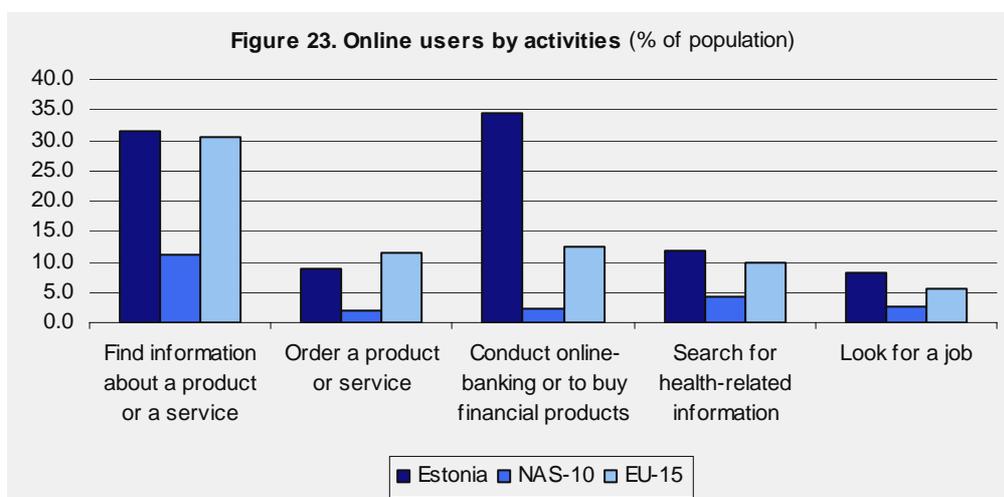


Base: All respondents, weighted column percentages

Question: B1, A10

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

31.5% of the Estonians are using internet for finding information about a product and service, which is at the same level with the citizens in EU countries, but only 9% of them order product or services via on-line (Figure 23). As a result, the total annual turnover of the traditional e-commerce is rather moderate in Estonia (between EUR 1.3 and 2 million in 2000) (IS indicators, 2003). One of the strongest advantages of Estonia in e-commerce is widespread Internet banking. SIBIS GPS shows that conducting on-line banking or buying financial products is used by 34% of citizens in Estonia compared with 2% in CEE candidate countries and 12.5% in EU countries. By the end of 2002, there were around 650 thousand Internet bank users in Estonia (1,4 million of population) (Bank of Estonia, 2003). Electronically initiated payments are responsible for approximately 90% of their total number. Broad Internet penetration enabled to reduce the number of bank offices and tellers, electronic payments squeezed out the use of cash in circulation and reduced the share of black market.



Base: All respondents, weighted column percentages

Question: B1, A10

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

8. e-Work

This chapter contains an analysis of indicators like home-based telework, intensity of home-based teleworking, interest in telework, perceived feasibility, mobile work (Intensity), mobile telework, co-operation with external contacts using ICTs, work-family balance, job quality and job satisfaction. The chapter is divided into two separate modules: 'work organisation' and 'structure and outcomes of employment'.

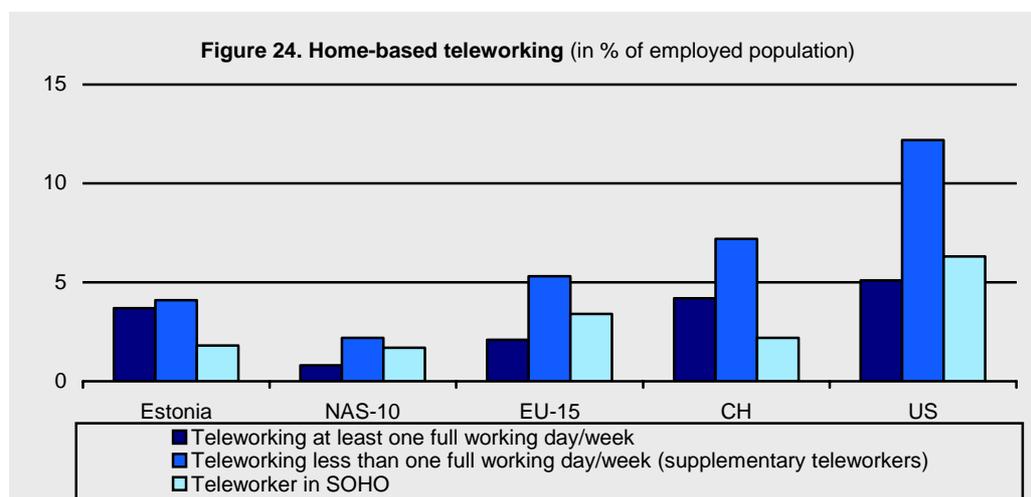
8.1 Work Organisation

Telework

Modern office technology, computers and mobile phones enable work to be done elsewhere than at the workplace. Telework occurs when paid workers carry out all, or part, of their work away from their normal places of activity, usually at home, using information and communication technologies

Home-based telework implies a relocation of the workplace, for part or whole of the working time, from the establishment site to the worker's home. SIBIS distinguishes between intensity of teleworking practice. Supplementary teleworkers work at home for less than one day per week, alternating teleworkers spend at least one full working day at home, and permanent teleworkers are those who spend almost all of their working time at home.

7.8% of all respondents in Estonia in paid work indicated they are teleworking (at least one full working day per week or less) from home presently, at least part of their working time. This is much higher than in CEE countries on average (3.0%) and even a little higher than the EU-15 average (7.4%), but more than two times less than in US (17.3%). The Working Life Barometer, carried out in Baltic countries in 2002, indicated the same result about Estonia (8%). According to the Working Life Barometer, teleworkers do an average of 31 hours' telework per month (Antila, Ylostalo, 2003).



Base: All persons employed, weighted column percentages

Question: E1, E3, E4

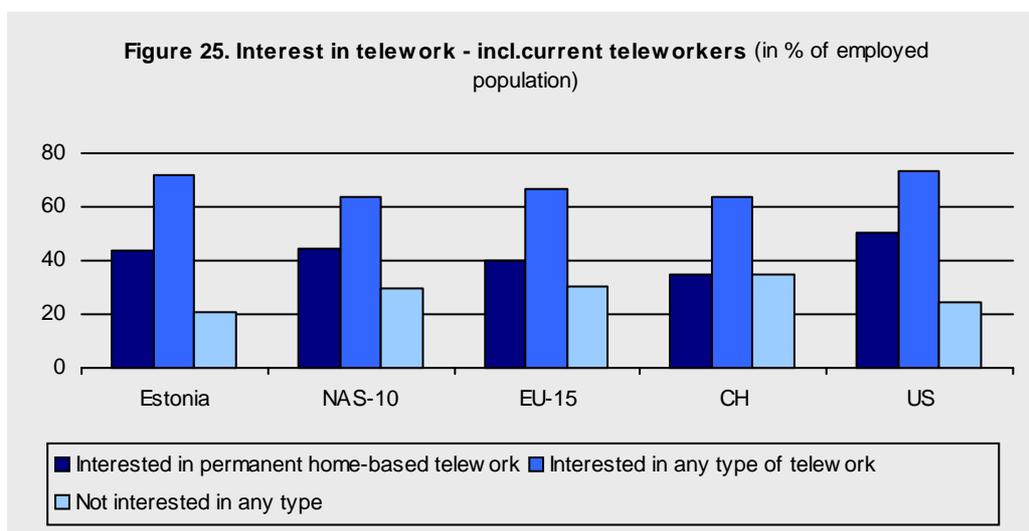
Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Self-employed teleworkers in SOHOs are freelancers and other self-employed persons who work in a so-called small office, home office (i.e. their workplace is at the same location as their home) and transfer work inputs and outputs by electronic means. They use on-line ICTs for interaction with clients, collaborators and suppliers. According to the GPS data, only 1.8% of the employees in Estonia are self-employed teleworkers in SOHOs.

Basically, home-based teleworkers can also spend a considerable share of their time on business trips, such as is the case of many salesman. The same applies to self-employed teleworkers in SOHOs. For this reason, the number of teleworkers per type cannot simply be added up to arrive at the total share of teleworkers, but overlaps between types have to be taken into account.

If to compare teleworking in CEE candidate countries, we can see that in Estonia there are relatively more teleworkers than in other countries. It is not surprising because the number of Internet users has been growing very fast. 45% of Estonian population aged 15-74 years used the Internet during the last three month in 2003 according to a survey conducted by Emor (<http://www.emor.ee>). More and more people spend some working time at home, but only comparatively few stay whole days at home. The supplementary telework is the most wide-spread form of home-based telework.

Based on GPS, the degree of interest in telework is considerable: almost 44% of the Estonian workforce expresses interest (ie. very interested and somewhat interested) in permanent telework and 72% are interested in at least one type of telework (Figure 25). In Estonia, the interest of doing telework is a little bigger than in European countries under investigation, but less than in US.



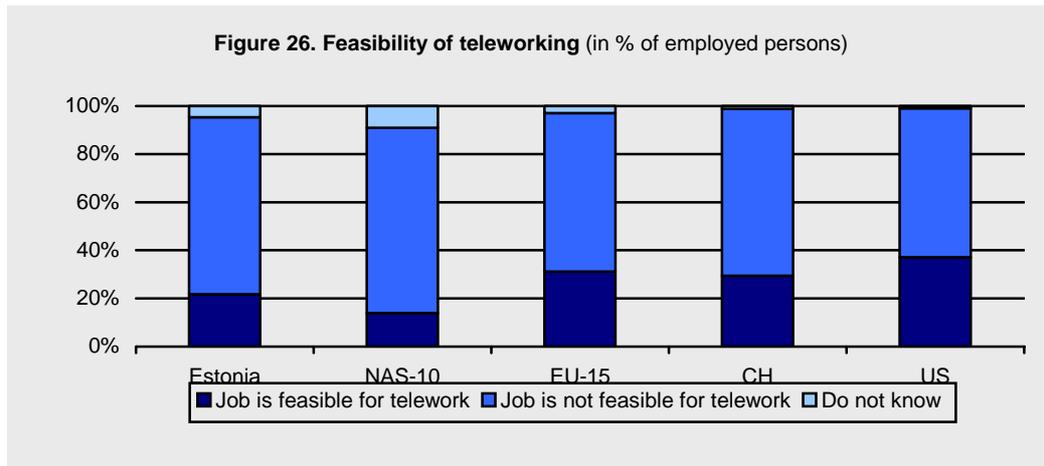
Base: All persons employed, weighted column percentages

Question: E1

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

The SIBIS GPS asked respondents whether they perceive their current job feasible for telework under the assumption that they would have to spend at least one full working day per week at home. Among CEE candidate countries, the feasibility of teleworking in Estonia is the highest but lower than in EU (Figure 26).

There are many reasons why a certain occupation might be considered not feasible for telework. For example, job requires face-to face contacts with customers, colleagues or other persons. The second reason is that job requires access to machines or other things which cannot be accessed from home.



Base: All persons employed, excluding students in NAS, weighted column percentages

Question: E9a

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

Doing paid work at home, whether it is telework by definition or not, has a strong link with the person's position in the work organisation. According to the Working Life Barometer, as many as two-thirds of the managers in Estonia did work at home in connection with their principal job. Those in the upper ranks of the personnel hierarchy have more autonomy in choosing the place and time of doing their tasks than other workers. The work of managers and specialists is often of such a nature that it is possible to do part of it outside the workplace. It can be assumed that the work carried home is fairly often the uncompensated type of overtime work (Antila, Ylöstalo, 2003)

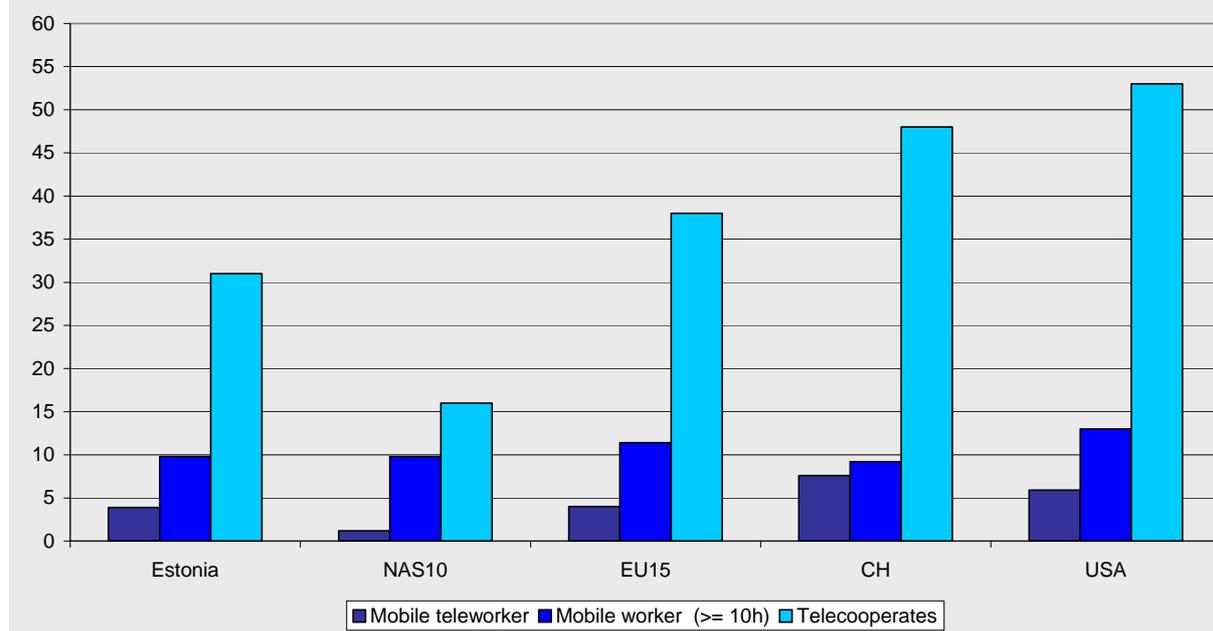
According to the SIBIS definition, **mobile teleworkers** are those who spend 10 hours per week or more away from their home and their main place of work, for example, on business trips, travelling or on customers' premises, and make use of on-line connections while doing so. Mobile teleworkers use on-line connections, especially e-mail, while travelling, allowing them to continue co-operation with staff members at the central site (as well as external business partners) and stay closely integrated in the production process. Other mobile workers are those who spend at least 10 hours away from home and main place of work, but are not teleworking.

In comparison with other CEE countries, the mobile teleworking is most spread in Estonia (Figure 27), where the percentage of mobile workers is only a little lower than the EU-15 average. The main purposes of mobile teleworkers to use on-line connections is sending and reading e-mail, but many of them also browse the Internet and connect to their company's internal computer system. 69% of mobile workers in Estonia are men.

Tele-cooperation is closely related to telework and is widely in use in Europe. For the SIBIS GPS, tele-cooperation was operationalised as communicating with external business contacts via e-mail, video-conferencing or electronic data transfer. External persons were described as 'customers, clients, suppliers, other business contacts, but also colleagues working at other locations of the same company.

Employed persons in Estonia tele-cooperate two times more than in CEE candidate countries on average (31% and 16% respectively). Women make a slightly more than half of them - 58%. Normally 47% of the employed persons doing tele-cooperation use e-mail at least once a day, 18% 10 or more times a day. In the EU, almost 38% of workers practise it at least 'sometimes', in Nordic countries even more than 50%. Tele-cooperation has boosted worker productivity by allowing flexible configurations of human capital without actually moving people from one place to the other.

Figure 27. Mobile teleworking and tele-cooperation
(% of employed population)



Base: All persons employed, weighted column percentages

Question: F1, F2, G1

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

The investigation 'Influence of the implementation of information technology, telecommunication and telework on employment' was carried out in Estonia by Ariko Marketing in 2002. The investigation showed that although there are good preconditions for using telework, very little is still known about this opportunity in Estonia. According to the investigation, during the last 10 years, telework has been used by 22% of the enterprises questioned. 3.5% of the adult population was engaged in telework in spring 2002. Telework is used mostly in sales work, customer services and accountancy. According to the survey, 60% of the teleworkers were men and in 85% of the cases, telework was performed at the initiative of the employer. From the point of view of workers, the advantages of telework are the peaceful working environment and an opportunity to share more flexibly work and rest time and hold several jobs. The respondents noted as a disadvantage the hazing of work and out-of-work time and a feeling of isolation.

8.2 Structure and Outcomes of Employment

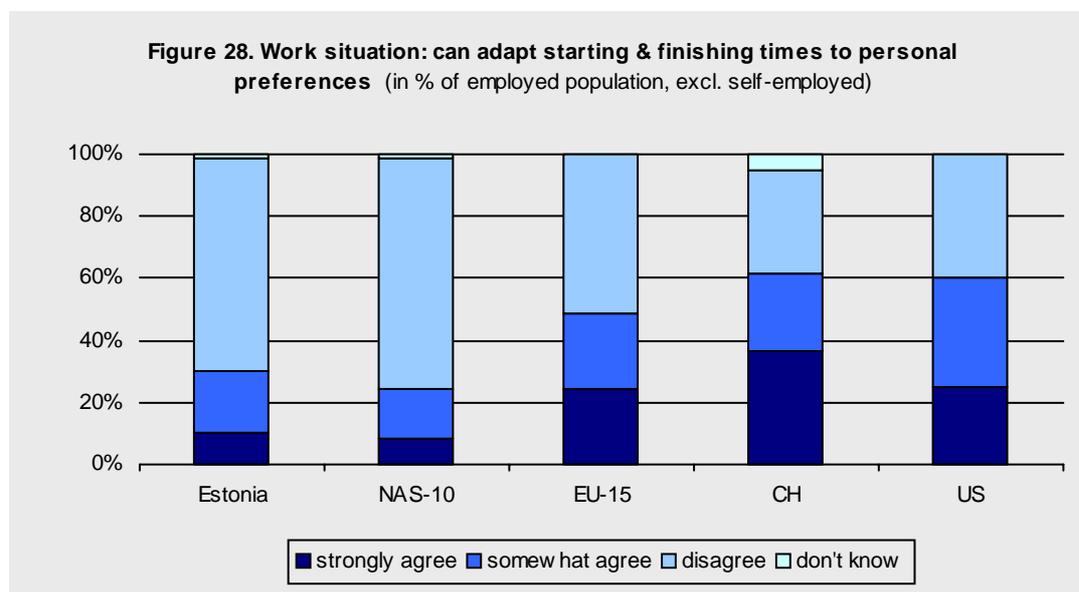
Adaptability of working time

Working time flexibility is an important element of strategies to give workers more discretion over the organisation of work. As a part of the SIBIS GPS module, questions about two characteristics were piloted (Figures 28 and 29).

Nearly 30% of all persons employed in Estonia agree (strongly agree, somewhat agree) with the statement that they can adapt their starting and finishing times to personal preferences, one-third of whom agree 'strongly'. In EU, nearly 50% of the employed persons can adapt their daily starting and finishing times, in CH and USA even around 60%. In CEE countries, only one-quarter or less can decide about their working times.

In Estonia, people working in management can most often adapt their working times. For example, 63% of the managers can decide about this, but only 25% of manual workers. If to compare men and women, then men can decide more often (44%) than women (39%) about

their starting and finishing working times. There is a difference also between private and public sector. In the private sector, people are freer to decide when to start working and when to finish (33%) than in the public sector (28%).



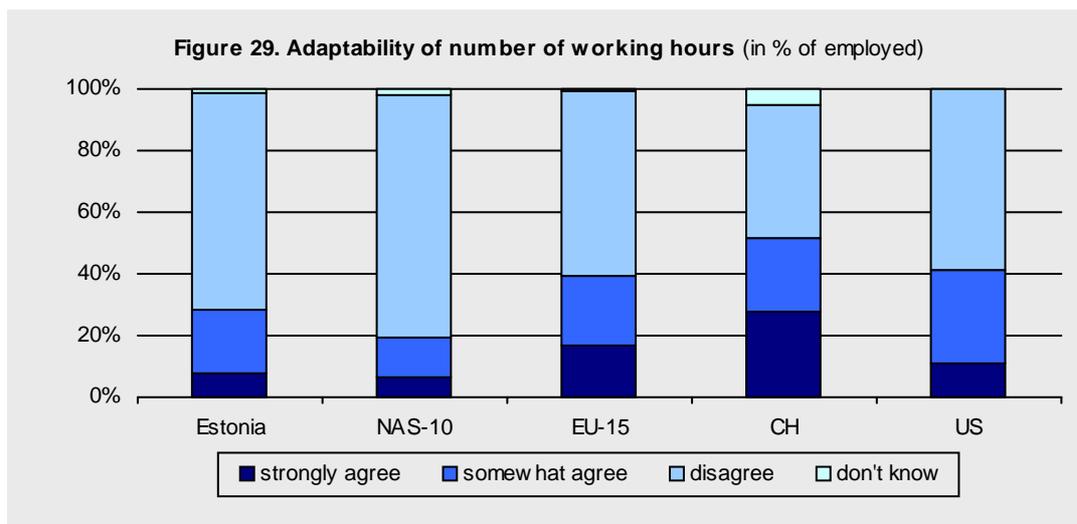
Base: All persons employed excluding self-employed, weighted column percentages

Question: H2e

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

About 28% of the Estonian workforce agree with the statement 'I can adapt the number of weekly working hours to my personal preferences', but only 8% agree 'strongly'. These figures are only slightly lower than the ones mentioned above for daily working times. In comparison with the EU average, the numbers are very low. Compared with other candidate countries, Estonian employed persons can adapt their hours of work to their individual preferences and requirements.

There are different ways to achieve working time flexibility, part-time contracts being one of them, and variability of weekly working hours within full-time working contracts another one. In Estonia, the share of part-time workers is very low. According to the Labour Force Survey, only 7-8% of the employed persons work part time. 73.4% of the employees have fixed start and end of a working day, 11,4% have annualised hours contract, 7.1% bank working time. Only 2.6% determines his/her work schedule and do not have formal boundaries (Statistical Office of Estonia, 2002).



Base: All persons employed excluding self-employed, weighted column percentages

Question: H2f

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

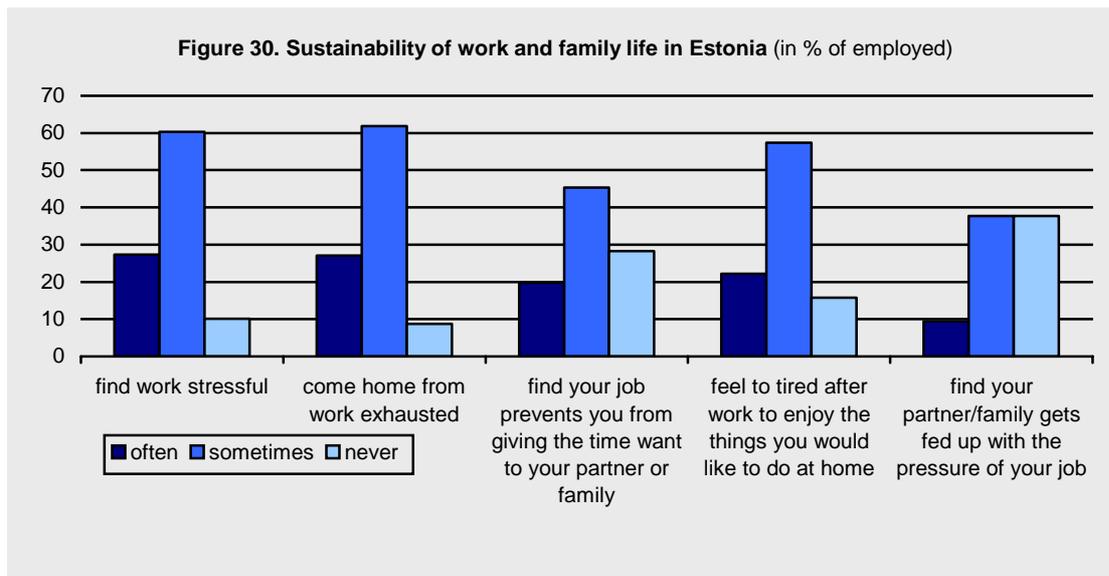
Importance of raising qualification

In a changing work situation it is important to keep learning new things continuously. 78% of men and women agreed with this statement in Estonia. 39% of women and 31% of men agreed strongly. The answer depends also on the position of the person. 94% of employed professionals and 91% of managers understood the importance of continuous learning, but only 58% of manual workers did so. Employed persons in public sector understood more often the necessity for learning (82%) than in private sector (74%). The higher the level of education, the greater the opportunities to compete in the labour market and the smaller the risk of becoming unemployed.

Nowadays, many employees have concerns about whether the job is secure. 72% of employed persons agreed with this statement. Older age groups are more worried about job security than younger and women more than men. Managers feel themselves more secure and manual workers less secure. It is obvious that people with lower education are more in danger of losing a job. Therefore, many people estimate the importance of raising one's qualification very high.

Work experience

During recent years, work stress has been widespread in Estonia with 27% of all employed stating they find their work stressful 'often' and an additional 60% 'sometimes' (Figure 30).



Base: All persons employed, weighted column percentages

Question: H1

Source: SIBIS 2003, GPS-NAS;

Work is stressful for both men and women, for women even slightly more. About one-fifth indicate that they 'often' find their job prevents them from saving time they want for their partner or family and that they often feel too tired after work to enjoy things they would like to do at home. Work is more stressful for people in age groups 25-49 and 50-64. In the public sector, even one-third find their job stressful, in private sector 22%. But in private sector, people are more exhausted when they come home. Only 10% of employed persons stated that their job is never stressful. For example, the corresponding number in EU-15 is 18% (SIBIS 2002, GPS).

Though the information technology development is a positive phenomenon for society, this involves acceleration of life and work speed, which in turn causes stress and leaves less time to one's family. Therefore, it is important to create a good working environment.

9. e-Government

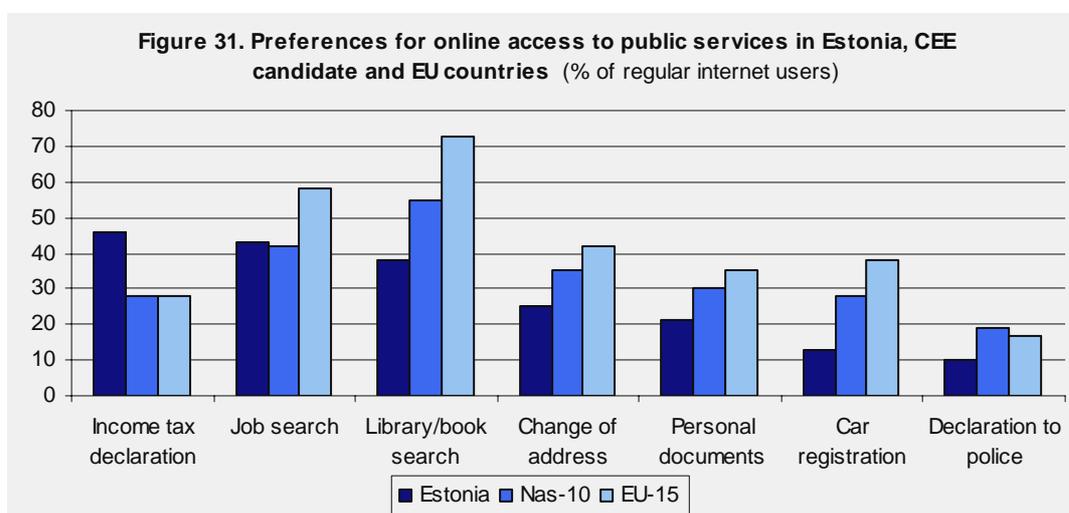
The chapter focuses on the preference, availability and usage of e-government services. Seven types of services are presented: income tax declaration, job search, search for books in libraries, requests for personal documents, change of address, car registration and declaration to the police.

For the analysis of citizens' preference for access to, usage and attitude toward e-government, citizens are asked whether they prefer to use the Internet to file their tax declaration; those who prefer to use the Internet for this service are asked whether this service is available on-line in the region where they live (as far as they know); if they believe that the service is available on-line, they are asked if they have ever tried to use this on-line tax declaration service. The same questions were asked in relation to other public services.

In general, citizens are not very willing to use government services in the Internet. But for those citizens who prefer to use the Internet the awareness of availability and usage of on-line services is relatively high in Estonia. Among respondents who indicated a preference for on-line government services, they were most aware of the same services they preferred and actually used. The preference for on-line or traditional access to government services varies across the services. Three services - income tax declaration, job and library book search - have been preferred by citizens in Estonia via the Internet compared with the access to services in a traditional way.

There are differences in preferences across countries. On-line income tax declaration rates have a higher preference in Estonia, followed by job search and library book search (Figure 31). This is different from the CEE and EU average, where library and book search were mentioned in the first place, followed by job search and change of address etc. The least preferred is the declaration to the police in Estonia, also in CEE and EU countries.

Since 2000, it is possible to fill on-line personal income tax declarations. A total of 140 thousand declarations (about one-third of total number of declarations) of taxable personal income and paid taxes were submitted to the Estonian Tax Board via the Internet in 2003 (Europemedia, 08/04/2003). Electronic filing of peoples' income tax returns is possible via the portals of five banks – Hansapank, Ühispank, Sampo pank, Nordea and Krediidipank. As of February 2002, ID-card owners can enter e-TaxBoard via the Tax Board's website⁸ (www.ma.ee). If the taxpayer has not concluded an agreement for using e-TaxBoard, it will be concluded electronically at the first entering with the ID-card. In 2003, less than 10 thousand personal income tax declarations were made using ID-cards (by approximately 200 thousand ID-card owners) and authentication over the Internet banks prevailed.



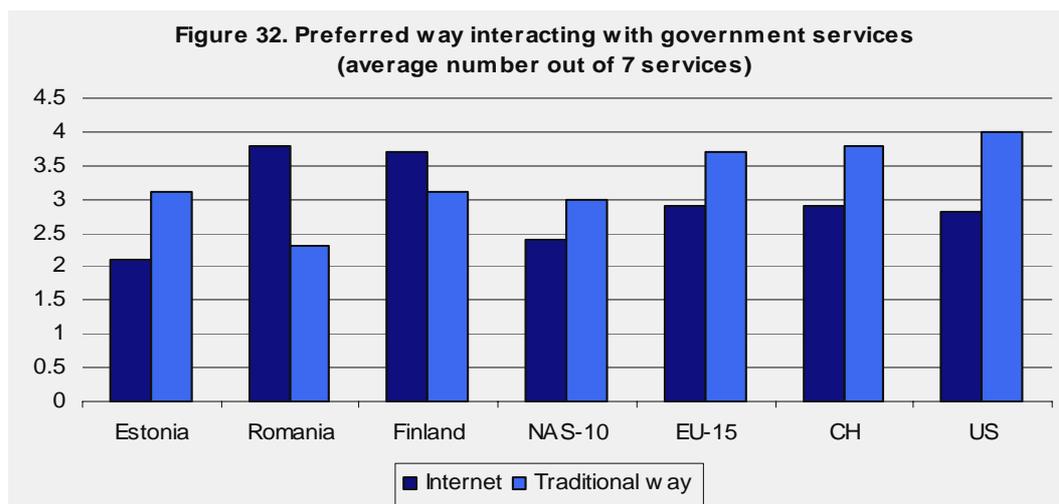
Base: Regular Internet users, weighted column percentages

Question: K1

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

On average, differences between country groups are not so big if to compare average number out of 7 government services preferred by citizens (Figure 32). Estonia takes the fourth place from the end among all countries under study and has lower than the average level of CEE candidate countries (SIBIS Pocket Book, 2002/03). At the same time, there are a number of services provided by public sector of Estonia (e.g. special information systems for citizens; government cabinet meetings) which were not included in the questionnaire of the current survey. There are a new services where the government is on the way to open on-line opportunities for citizens. This can be supported by further changes in legislation, implementation of digital signature, development of new solutions to public sector services, etc.

⁸ National Tax Board www.ma.ee



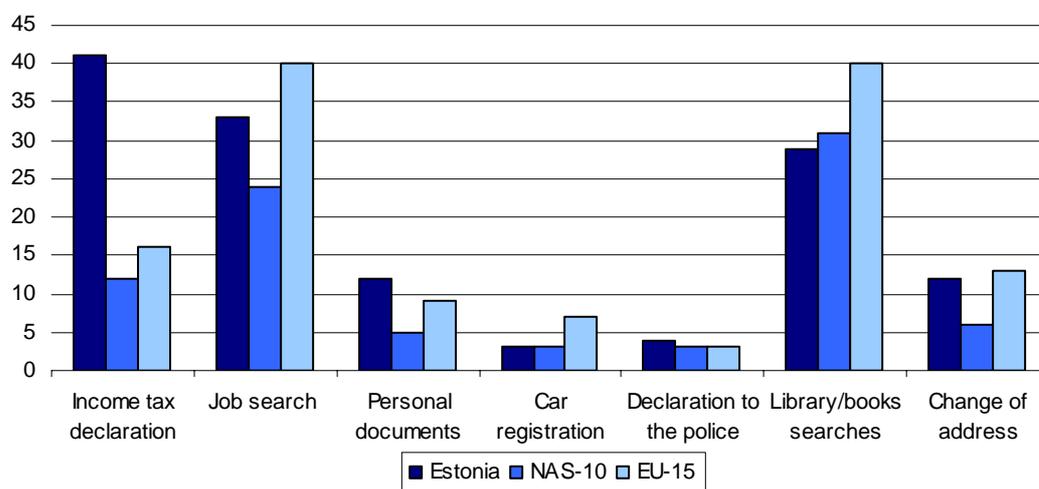
Base: Regular Internet users, weighted average number of services

Question: K1

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

The availability of government services in Estonia is higher than in CEE candidate countries on average in almost all government services except car registration and book searches, and in three types of services compared with EU average (Figure 33). The biggest difference is in the availability of income tax declaration service: the availability of this service is more than 3 times higher in Estonia compared with CEE average and 2.6 times compared with EU average. As a result, Estonia is on the third place among all EU and CEE candidate countries after Denmark, Netherlands and Spain (SIBIS Pocketbook, 2002/2003).

Figure 33. Online availability of government services
(% of regular internet users)



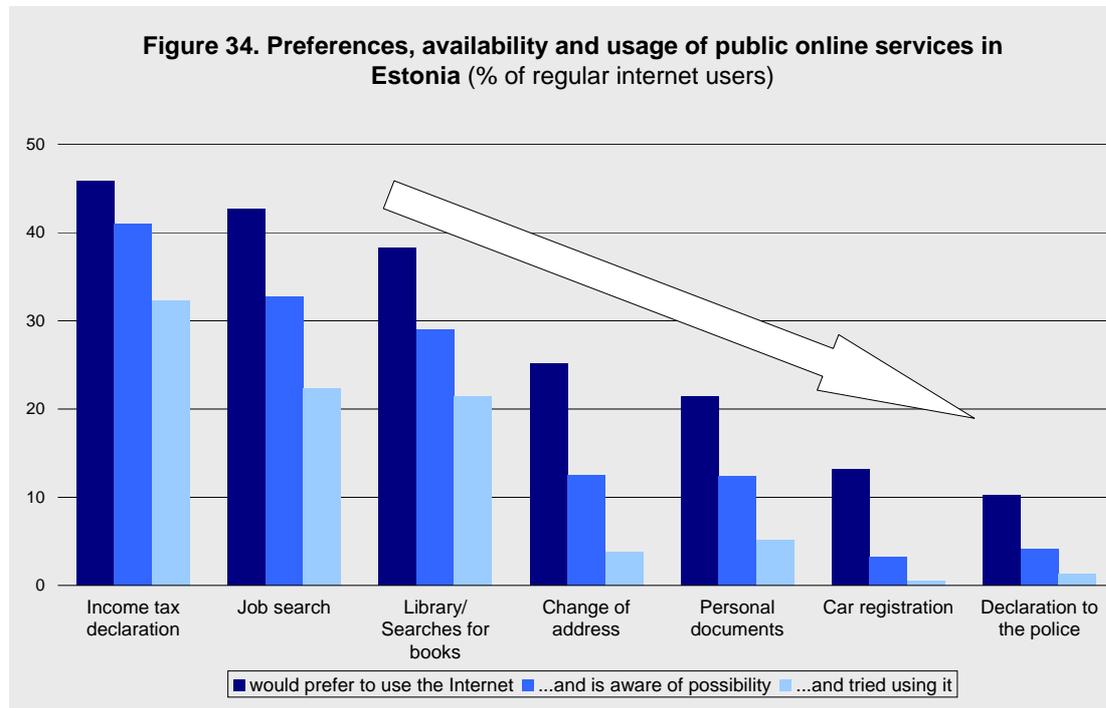
Base: Regular Internet users, weighted column percentages

Question: K2

Sources: SIBIS 2003, GPS-NAS; SIBIS 2002, GPS

The number of actual users of services is dependent on the supply of these services, where the government has on the way to open on-line opportunities for the citizens in Estonia. For example, the availability in car registration in Estonia is lower than in CEE candidate countries on average. Services for income tax declaration and job search have higher availability and they have been used more frequently in Estonia. There is a rare need for

some other services like change of address and declaration to the police in the case of theft, which explains their low usage (Figure 34).



Base: Regular Internet users, weighted column percentages

Question: K1-K3

Sources: SIBIS 2003, GPS-NAS

The latest developments show that the establishment of e-government in Estonia is not oriented to supply some single services, but technological opportunities are being applied in the system, where everyone can take part in. The overall goal lies in the development and integration of the ICT infrastructures of the state and local governments into a common citizen-friendly service environment that would observe the principles and requirements of the development of democracy (IT in Public Administration, 2003).

10. Conclusions

The results of the SIBIS survey show that currently more than half of the adult population in Estonia has access to and use the Internet on a regular or occasional basis. This is higher than both the CEE and EU level, but remains lower than the level of Switzerland and US. One reason is the low number of computers at home, where two-thirds of the population do not have a computer at home. For this reason, computers are intensively used at work, in Public Internet Access Points (PIAPs) and at friends and acquaintances. The intensity of using a computer at home is high if to consider the hours spent in the Internet. This shows a high interest in the Internet use, but fewer possibilities to buy a computer home. More active Internet users are young people and those aged 25-49, less active older people. However, there still remain significant segments of the population who do not access the Internet at all, who are excluded from the Internet for various reasons (e.g. poor households, older people).

The share of broadband and 'mid'band users among the on-line population in Estonia is supplemented by leased lines, the share of which is increasing fast, supported by increasing competition among Internet service suppliers.

Considerably high mobile phone usage can be explained by a number of services actively supplied via the use of mobile phone, e.g. such as mobile parking services, purchasing of public transport and other tickets, get information from business register, check bank accounts, make m-payments etc. Intensive mobile phone usage is also connected with job needs and business contacts, and also by fun. Estonian exceeds by SMS usage intensity the level of CEE and European countries and the US, and its popularity can be explained by many public undertakings organised by the medium of mobile phones.

According to the GPS data, 46% of the Estonian population regard themselves as very or fairly confident in communicating with others via the Internet. Most confident feel people themselves in using e-mail and in searching information in the Internet. This is supported by a rather high experience among the Internet users. Digital literacy among the youth in Estonia and Slovenia has the highest COQS index value (1,4) among CEE candidate countries. The same countries have also the highest index value for total population (0,7) that is close to EU average (0,8). Participation in life-long learning, self-directed training and eLearning are much higher in Estonia than in other candidate countries on average.

Although the share of the population (15%) in Estonia who purchase products on-line is higher than in CEE candidate countries on average, this is still lower than in EU countries and US. However, the strongest advantage of Estonia is widespread Internet banking, which has created a wide range of possibilities for electronic transfers and which are trusted by both enterprises and citizens. This is a reason why Estonians are less concerned about data security and privacy /confidentiality compared with other countries under study (CEE, EU, Switzerland, US).

12% of the working population in Estonia can be classified as teleworkers. If to compare this number with CEE candidate countries, we can see that in Estonia there are more teleworkers than in other countries. The degree of interest in telework is considerable. 72% are interested in at least one form of telework. This is much higher than the CEE countries average and even slightly higher than the EU-15 average. Tele-cooperation (communicating with external business contacts via e-mail, video-conferencing or electronic data transfer) is widely used in Estonia with an average of almost 31% of the employed population. It is twice as high as in CEE candidate countries.

The preference of Estonians in communicating with the government through the Internet is rather modest on average (out of 7 services under study), lagging behind the average of CEE candidate countries. At the same time, the availability of some government services and their use is higher in Estonia than in other CEE countries. Especially high is the availability and intensive the use of income tax declaration. The availability of personal documents is the second service where the level of Estonia is higher than CEE and EU average. However,

there are some other services where the government has still not opened all on-line opportunities for citizens, e.g. car registration. And a number of citizens are not aware of e-government opportunities.

There are different barriers that prevent non-users from reaching the Internet. The skills gap appears to be the most relevant barrier. 75% of respondents in Estonia agree completely or somewhat with this statement. There are no big differences in using IT products and services by gender in Estonia, but SIBIS results indicate that the use of IT declines with age. Younger people in the age groups 'up to 24' and '25 to 49' show higher adoption rates for at-home Internet connections and they are most active mobile phone and SMS users. The Digital Divide Index value (50) is not far from the EU-15 average and has the best result among CEE candidate countries.

In conclusion, by a number of indicators of the Information Society, Estonia is ahead of the average of CEE candidate countries and by some of them takes the leading position. There are some areas where Estonia is reaching the EU average level and also ahead of a number of EU countries, e.g. in Internet and SMS usage. However, by a number of the indicators, Estonia still lags behind the EU average level (e.g. e-learning), which means there is still room for development. This will be supported by the development and integration of the ICT infrastructures of the state and local governments into a common citizen-friendly service environment that would observe the principles and requirements of the development of democracy.

11. References

- Adamson Ü., Kaarli K. 2001. Mobile Payments in the Baltic states. ePSO-Newsletter No. 9, September 2001, <http://epso.jrc.es/newsletter/vo109/7.html>
- Antila J., Ylöstalo P. 2002. Working Life Barometer in the Baltic Countries 2002. Ministry of Labour Finland. Helsinki 2003, p.272
- Adult Education. 2003. Statistical Office of Estonia. (<http://www.stat.ee>)
- Bank of Estonia data (<http://www.ee/epbe/statistika/itp.html.en>
- eEurope+ 2003**. Progress Report. Candidate Countries. e-Europe+ 1st Progress Report - Estonia. 2002. (www.riso.ee/et/eEurope+_1stprogressreportr.htm)
- E-policy Development in Transition Economies 2002. Estonia, www.eik.ee
- Estonian National Development Plan, 2002
- Europemedia, 08/04/2003
- International Telecommunication Union, <http://www.itu.int/ITU-D/ict/statistics/>
- IS indicators of Estonia, www.eik.ee ;
- Kalkun M., Kalvet T. (Eds)(2002) Report Estonian's Digital Divide and How to Bridge It. EMOR, PRAXIS, Tallinn (www.oef.org.ee/valjaanded/diglohe/digdivide_ee.pdf).
- Kalvet T. 2002. Digital Divide under Focus in Estonia: A Third of Internet Non-users wish to use Internet, but Lack Skills and Access, Tallinn, 2 October 2002; <http://www.praxis.ee>
- Labour Force 2001. 2002. Statistical Office of Estonia, Yearbook
- Labour Force 2002. 2003. Statistical Office of Estonia, Yearbook.
- McConnell International 2001. Ready?Net. Go! Partnership Leading the Global economy. Report; Rajaleidja, http://rajaleidja.ee/pathfinder/about_pathfinder/index.htm
- SIBIS Pocket Book 2002/03. Measuring the Information Society in the EU, the EU Accession Countries, Switzerland and the US. May 2003;
- Trainator Ltd**, <http://edukas.ee/index.php?go=7&lang=eng>
- Measuring the Information Society in the EU, the EU Accession Countries, Switzerland and the US, SIBIS Pocket Book 2002/03, (www.sibis-eu.org)
- Towards the Information Society in Europe and the US, SIBIS Benchmarking Highlights 2002, (www.sibis-eu.org)
- SIBIS WP2, Topic Research and Indicator Development Report, Annexes on Newly Associated States (NAS), empirica et al., (http://www.sibis-eu.org/sibis/files/D2-2/SIBIS_WP2_NAS_annex.pdf)
- SIBIS WP5, Topic report No.1 "Telecommunications & Access", Technopolis, UK, (www.sibis-eu.org)
- SIBIS WP5, Topic report No.3 "Security and Trust", RAND Europe, (www.sibis-eu.org)
- SIBIS WP5, Topic report No.4 "Education", Danish technological Institute, (www.sibis-eu.org).
- SIBIS WP5, Topic report No.5 "Work, employment and skills", empirica, Germany, (www.sibis-eu.org).
- SIBIS WP5, Topic report No.6 "Social Inclusion", Work Research Centre, (www.sibis-eu.org)
- SIBIS WP5, Topic report No.7 "E-Commerce", Databank Consulting (Italy), (www.sibis-eu.org).
- SIBIS WP5, Topic report No.8 "e-Government", RAND Europe, (www.sibis-eu.org)

12. ANNEX 1: Additional data and analyses

Table 1. Job satisfaction in Estonia (in %)

	Job satisfaction						
	very	somewhat	neither nor	somewhat	very	DK	total
	satisfied			dissatisfied			
Gender							
Male	14,7	46,3	27,6	8,5	1,8	1,1	100
Female	15,9	42,0	22,8	14,6	3,0	1,7	100
Position							
Employed professional	20,2	55,8	13,5	8,0	2,5		100
Management	30,6	44,4	13,9	8,3		2,8	100
Other non-manual employee	8,9	42,4	31,0	13,3	1,9	2,5	100
Manual worker	9,8	31,3	36,2	16,0	4,9	1,8	100
Type of organization/ company							
Private firm	12,3	40,9	30,8	11,3	3,1	1,6	100
Public sector	18,0	46,7	19,0	13,8	1,5	1,0	100

Base: All employed persons in Estonia (N=574, N=520, N=513)

13. ANNEX 2: Future research ideas

It will be needful to investigate the business sector environment in Estonia and in other CEE candidate countries, which helps better to understand the development of IS in these countries and compare with the state-of-the-art in EU countries.

Regular monitoring of IS development on the basis of the methodology elaborated under SIBIS project will be needful by countries to produce comparable information.

14. ANNEX 3: METHODOLOGY

14.1 Methodology of the GPS 2002 survey

The survey was conducted in April-May 2002 (interviews were carried out between 4th April and 18th May) in all 15 EU Member States plus Switzerland and the US, using computer-aided telephone interviews. The survey was co-ordinated and executed by INRA Deutschland GmbH, Mölln. The population for this study is all persons aged 15 and over living in private households in the respective countries and speaking the respective national language(s). 11,832 interviews were successfully completed. The average interview length per country varied between 10 (Greece) and 20 minutes (Sweden).

Sampling: Target households were selected at random in all countries, either by random dialling techniques such as permutation of final digits or by drawing a random sample from official sources. Mostly a geographical stratification was implemented beforehand. For the selection of the target person common random keys were applied in all countries except for the UK where quota was used. In two cases (Spain, the US), screening had to be directed towards male respondents towards the very end of the field in order to gain gender representativeness.

There were three adjustments necessary in order to provide reliable data:

- Transformation from household sample to person sample. As only one person per household is interviewed, the described sample procedure provides a household sample, i.e. each household of the base population has the same likelihood of being in the sample but not each person. With the weighting stage of the transformation the equal likelihood of households is replaced mathematically by the equal likelihood of the individuals. To this end, each data set is multiplied by the amount of people in the household aged 15 or over. This number is subsequently divided by the average household size in order to obtain the actual case number.
- Adjustment of unweighted sample structure to the official statistic. Because random samples are not evenly distributed across all population strata, the distribution of unweighted samples regularly and systematically deviate from the population distribution from official statistics. Through the mathematical weighting the sample distribution was adjusted to the official statistics. The national weighting factor, which results from the iterative weighting, was included in the data material.
- Adjustment of weighted sample structure to the EU-15 Member States population. This weighting factor was necessary to calculate total figures according to the whole population of the European Union Member States. Furthermore it is useful to compare the EU with the US. Population sizes of each Member State are weighted to reduce the distortion based on the sample sizes in each country.

NOTE: The GPS 2002 questionnaire is available online and can be obtained from the SIBIS website: <http://www.sibis-eu.org/sibis/statistics/questionnaires.htm>.

Sample characteristics GPS 2002

	Total		EU-15	
	unweighted	weighted	unweighted	weighted
Total sample	11832	11832	10306	10306
Country				
B	585	585	-	-
DK	501	501	-	-
D	1001	1001	-	-
EL	505	505	-	-
E	1015	1015	-	-
F	1000	1000	-	-
IRL	500	500	-	-
I	1000	1000	-	-
L	500	500	-	-
NL	530	530	-	-
A	500	500	-	-
P	500	500	-	-
FIN	669	669	-	-
S	500	500	-	-
UK	1000	1000	-	-
EU-15	-	-	10306	10306
CH	522	522	-	-
US	1004	1004	-	-
Age groups				
Up to 24	1964	2019	1731	1651
25 to 49	5511	5309	4817	4593
50 to 64	2515	2495	2191	2209
65 and more	1833	2000	1558	1839
Don't know	9	9	9	14
Terminal education age				
Up to 13	695	717	693	728
14	715	742	701	881
15 to 16	1794	1750	1641	1820
17 to 20	3587	3515	2997	2937
21 and more	3266	3275	2743	2495
Still studying	1687	1751	1463	1372
Don't know	88	81	77	73
Internet usage				
Total Internet use	6905	6908	5828	5610
Regular use (last 4 weeks)	5944	5948	4985	4781
Occasional use (last 12 months)	961	960	843	830
Non Internet use	5550	5643	4655	4548
Employment status				
Paid employment	4966	4853	4291	4133
Self-employed	935	941	809	799
Unemployed/ temporarily not working	701	683	621	631
In education	1687	1751	1463	1372
Retired or other not working	3441	3510	3034	3292
Don't know	102	94	88	80
Longstanding illness				
Existence of health limiting conditions	1898	1885	1645	1610
No existence of health limiting conditions	9868	9858	8607	8606
Don't know	66	90	54	90
Mobile phone usage				

Mobile phone owner	8202	8192	7301	7121
Teleworking				
Home based teleworkers	217	233	168	172
eHealth usage				
Searched for health-related info online	2712	2728	2149	2041
Searched and found health-related info online	2578	2592	2038	1916

14.2 Methodology of the GPS-NAS 2003 survey

The survey was conducted in January 2003 (interviews were carried out between 1st January and 31st January) in the 10 Newly Associated States Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia and Slovakia, using personal aided personal interviews (PAPI). The survey was co-ordinated and executed by NFO AISA Czech Republic, Prague. The population for this study is all persons aged 15 and over living in private households in the respective countries and speaking the respective national language(s). 10,379 interviews were successfully completed. The average interview length per country varied between 20 (Romania) and 40 minutes (Lithuania).

Sampling: Target households were selected at random in all countries, either by multistage stratified random-route sampling or by drawing a random sample from official sources. Mostly a geographical stratification was implemented beforehand. For the selection of the target person common random keys were applied in all countries, i.e. the next birthday method and the Kish method, except for Bulgaria where quota was used.

There were three adjustments necessary in order to provide reliable data:

- Transformation from household sample to person sample in Poland and Slovenia. As only one person per household is interviewed, the described sample procedure provides a household sample, i.e. each household of the base population has the same likelihood of being in the sample but not each person. With the weighting stage of the transformation the equal likelihood of households is replaced mathematically by the equal likelihood of the individuals. To this end, each data set is multiplied by the amount of people in the household aged 15 or over. This number is subsequently divided by the average household size in order to obtain the actual case number.
- Adjustment of unweighted sample structure to the official statistic. Because random samples are not evenly distributed across all population strata, the distribution of unweighted samples regularly and systematically deviate from the population distribution from official statistics. Through the mathematical weighting the sample distribution was adjusted to the official statistics. The national weighting factor, which results from the iterative weighting, was included in the data material.
- Adjustment of weighted sample structure to the NAS-10 countries population. This weighting factor was necessary to calculate total figures according to the whole population of the Newly Associated States. Furthermore it is useful to compare the NAS with the EU. Population sizes of each of the ten states are weighted to reduce the distortion based on the sample sizes in each country.

NOTE: The GPS-NAS 2003 questionnaire is available online and can be obtained from the SIBIS website: <http://www.sibis-eu.org/sibis/statistics/questionnaires.htm>.

Sample characteristics GPS-NAS 2003

	Total		NAS-10
	unweighted	weighted	weighted
Total sample	10379	10371	10379
Country			
BG	104	1008	-
CZ	1096	1096	-
EE	1001	1001	-

HU	1000	1000	-
LT	1017	1017	-
LV	1006	994	-
PL	1000	1000	-
RO	1054	1054	-
SI	102	1002	-
SK	1199	1199	-
NAS-10	-	-	10379
Age groups			
Up to 24	2036	1825	1736
25 to 49	4473	4604	4593
50 to 64	2402	2202	2234
65 and more	1468	1740	1816
Long standing illness			
Existence of health limiting conditions	2272	2386	2555
No existence of health limiting conditions	7961	7836	7688
Don't know	146	149	137
Terminal education age			
Up to 13	374	433	575
14	658	682	855
15 to 16	1099	1151	1099
17 to 20	4784	4816	4869
21 and more	1823	1833	1719
Still studying	1407	1213	1057
Never went to school	59	59	68
Don't know	175	184	138
Employment status			
Paid employment	4038	3999	3354
Self-employed	608	622	690
Unemployed/ temporarily not working	1272	1303	1506
In education	1407	1213	1057
Retired or other not working	3052	3231	3764
Don't know	2	3	9
Internet usage			
Never heard of the Internet (incl. don't know)	1349	1437	1506
Ever heard of the Internet	9030	8935	8773
Total Internet use	3700	3507	2773
Regular use (last 4 weeks)	3025	2852	2215
Occasional use (last 12 months)	675	655	559
Non Internet use	6679	6864	7606
Mobile phone usage			
Mobile phone owner	5763	5635	4534
Telework			
Home based teleworkers	162	162	120