



SIBIS

Czech Republic

Country Report No.2

No.2



Information Society
Technologies



European Commission

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 Czech Republic 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. Those chapters focus on an analysis of ICT infrastructure and security issues, e-society and social inclusion, the 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 Czech Republic 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).

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- a) research
- b) consultations, data mining and data analyses

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1. Executive Summary

The national topic report is one of the results of the SIBIS project (Statistical Indicators Benchmarking the Information Society), funded by the European Commission under the 'Information Society Technology' Program, running from January 2001 to June 2003. The overall goal of SIBIS is to develop and pilot indicators for monitoring the progress towards the information society, taking account of the 'e-Europe action lines'.

The report is based on the General Public Survey carried out in fifteen **EU Member States, the US and Switzerland** in 2002 and in ten **Newly Associated States (NAS)** in 2003. The national topic report presents an overview of contemporary and most comprehensive indicators of the information society for all EU Member States and Newly Associated States (NAS). The main analysis is focused on the Czech Republic. Some further analyses are dedicated to the comparison of the position of the Czech Republic with the other countries.

Accordingly, since the main target audiences are policy makers and NSI's (National Statistical Institutes), the SIBIS project seeks to have an impact on both, the policy makers and the people working on the development of official IS statistics. The questions and the subsequent indicators developed by SIBIS should be considered by those institutions as an input for their yearly surveys.

This report focuses on several main areas: ICT infrastructure and Security, E-Society and Social Inclusion, E-education and Lifelong learning, E-economy and e-commerce, E-Work and E-Government.

Computerization of the Czech society and development of the information society is a characteristic feature of the 1990s. These processes were implemented spontaneously and decentralized in various spheres of society. The government first started to tackle the issue of the information society in 1998, and since then this issue has been continuously addressed by successive Czech governments. They have made an attempt to create appropriate legislative and structural conditions. The first government document systematically dealing with information society issues was the **State Information Policy** produced in May 1999, although this field had already been partially touched on in a strategic document entitled '**The Main Principles of Telecommunication Policy**' (1994, new version in 1999).

Consequently, the state central policy may appear to have stimulated development in this sector, but in reality has barely managed to keep abreast in terms of legislation with the actual state of affairs. The last institutional step of the Czech state concerning the information society and the eEurope+ initiative to date was the establishment of a separate **Ministry of Information Technologies** as of January 2003. However, from a general point of view, private initiatives and a spontaneous development at the level of state administrative institutions and local government seem to play an even more positive role than the centralized state support of the information society. The target of **eEurope+** has been incorporated in the Czech Republic into the updated **Action Plan of the State Information Policy**. Currently (since January 1, 2003), the newly established Ministry of Information Technologies (www.micr.cz) is acting as the main coordinator of activities leading towards the information society.

In addition to the Ministry of Information Technologies, each government and self-governing authority is responsible for the implementation of ICT within its operations. The Ministry of the Interior (www.mvcr.cz), which is responsible for many public administration information systems and services, has one of the key functions in the implementation of e-government

plans. The Ministry of the Interior coordinates the development of public information systems at the regional and municipal level, too.

In cooperation with other public administration bodies, the **Czech Statistical Office**¹ was charged with the monitoring of the eEurope+ indicators. As a response to the new task, the **Unit of New Technologies Statistics** was established with the Czech Statistical Office (CZSO) in January 2001. This Unit was responsible for securing, realizing and coordinating the Information Society Statistics (ISSs) within the CZSO. In January 2003, the Unit of New Technologies Statistics was merged with the Unit of Research and Development Statistics and on the very same day, a new unit (hereinafter referred to as the Unit) - Unit of Research, Development and Information Society Statistics – was established. The Unit is generally in charge of securing, implementing and coordinating the Information Society Statistics. To carry out this endeavor, the Unit cooperates with other CZSO units and also with some statistical departments of the Czech ministries, the international statistical organizations, and plans to deal with some reliable private research agencies in the future.² The Unit has set up the matrix of indicators for the measurement of the information society and partly of the New Economy. These indicators are mainly relating to information and communication technologies.³

The CZSO implemented several pilot programs for measuring the ICT usage and e-commerce in the principal sectors (households, enterprises and government).

1. Measuring the ICT producing sector. The collection of data about the ICT producing sector is based on official statistics gathered from different statistical sources of the CZSO such as general enterprise statistics, sector-specific statistics and foreign trade statistics.

2. Measuring the ICT usage in households and by individuals. This pilot survey about the ICT usage and e-commerce in households at the CZSO was launched in October 2002 on the sample of 850 households make up by 1,750 individuals. The survey was administered as a supplement to a sub-sample of the Labor Force Survey. The survey covers the following core ICT indicators: Access to selected ICTs, Use of computers and the Internet, Purpose and nature of activities on the Internet, Internet commerce details. The questionnaire was created according to the Eurostat Household Survey Questionnaire on ICT usage and comprises nearly all mandatory and some optional questions.

3. Measuring ICT diffusion and e-commerce in the business sector. This pilot survey was launched in June 2002 on the sample of 4,000 enterprises. The survey is based on the Eurostat's Enterprise Survey on ICT usage of 2002. This pilot survey brings the first reliable data about the core indicators relating to the measurement of the diffusion and impacts of ICT together with the measurement of electronic commerce in enterprises for reference years 2000 and 2001. The key areas of the survey are the following: General information about ICT, Use of the Internet, E-commerce via the Internet, Barriers in e-commerce, Investment and current expenditures on ICT, IT employment and training.

4. Measuring ICT diffusion in the government sector. The first pilot survey for public administration, including central government, 14 regions and municipalities, is launched for the reference year 2002. It is carried out as a supplement to the public administration survey on the voluntary base. The present list of indicators includes: Use and number of PCs, e-mails and the Internet, Web sites and E-procurement.

The following part of the Executive Summary is focused on the main results of the SIBIS

¹ Passage about CZSO is based on the material Mana Martin, Information Society Statistics, Czech Statistics Office.

² See the scheme 1 'Securing information for IS/NE statistics at the Czech Statistical Office' in the annex.

³ See the scheme 2 'Matrix of indicators for the Information Society and New Economy Statistics'

GPS.

The topic of **telecommunications and access** is a physical cornerstone of the information society. In the past decade, equipment of population with hardware, software and corresponding skills has been changing significantly. Indicators in this research focused on issues of access and usage, which at their most basic can be described in a binary form – users either have access to a particular service or not. Hence the Czech Republic belongs to the leading countries in the information and communication technologies (ICT) sector among the Central and East European EU candidate countries and the development of these technologies (personal computers, Internet, mobile phones), as well as the deployment of the technology, has been rapid. The Czech Republic spends more on information and communication technologies (ICT) as a percentage of GDP than the average EU country. There are approx. 5,000 IT-graduates every year.

Comparing the general knowledge of the Internet, the Czech Republic is in the fourth position from among NAS states. More than 90% of respondents have already heard about the Internet. In the usage of the Internet, the Czech Republic is in the third place from 10 NAS states. Almost 60% of respondents use the Internet in Estonia, 45% in Slovenia, and 40% in the Czech Republic.

Experience with the Internet has been to a large extent connected with the past years. During the one or two previous years, 14% of Czech respondents have made their experience with the Internet and 16% of Czech respondents made their experience in the time period of 'more than two years ago'.

The most frequent type of Internet connection used at home in the Czech Republic is narrow-band. The share of Czech respondents using the Internet from different places is similar. About 9% of Czech respondents use the Internet only at home and the same amount of respondents uses the Internet from work. About 7% of respondents use the Internet even at home and at work and 8% use the Internet somewhere else.

The mobile phone market, where three operators compete and local Internet providers offer their services to commercial institutions, has recorded a high development in the past ten years (one reason is the fact that this sector was not excessively regulated by the state and the market has been liberalized since its inception). The Czech Republic and Slovenia are the leading countries in the ownership of mobile phones. In these countries, 76% of the population own a mobile phone. The younger the age groups are, the more mobile phone users there are. The Czech Republic is in the seventh position (74% of telephone owners) if we make a comparison of NAS states according to the ownership of telephones (fixed line). There are only three NAS states that have fewer telephones than the Czech Republic.

Information **security** is increasingly recognized as a vital element for ensuring wide participation in the information society. The success of the information society strongly depends upon the trust and confidence of individuals in the security of the information infrastructure. The Czechs have become more sensitive to personal information after the adoption of the Act on the Protection of Personal Data (101/1999). About 62% of regular Czech Internet users feel concerned about privacy and confidentiality and 56% of respondents feels concerned about data security.

We can assume that the lack of access and disadvantage usage of PC and Internet can confirm differences already existing in the society. From this point of view, it is very necessary to analyze access and usage patterns of the PC and Internet. In the Czech society, we can identify several main factors that influence **e-inclusion**. These factors are income, education, age and disability.

About 52% of Czech occasional and non-Internet users think that 'the Internet is not for them'. About 82% of Czech occasional and non-Internet users say that the Internet requires advanced computer skills. In the Czech Republic, 24% of users would feel socially excluded without the Internet. Existence of a long-term disease proved to be a barrier in the Internet usage. About 38% of 'respondents without the existence of health limiting conditions' use the Internet and only 14% of respondents 'with the existence of a long-term disease' use the Internet.

The capacity of modern communication tools such as Internet services (as structural part of digital literacy) is one of the most important prerequisites for the development and usage of **e-education**, especially in the area of efficient lifelong learning. More than one third of the Czech population is confident in at least one Internet service.

In the defined time period (past 4 weeks), almost 30% of labor force participated in some learning. About 15% of the Czech labor force used organized forms of education. As it corresponds to the general position of the Czech Republic, even in the institutionalized forms of **lifelong learning**, the position of our country is between the average of EU countries and the average of NAS countries. Almost every fourth (22%) Czech employee is self educated for the reason of his/her self-improvement. Online e-learning was used by 5% of the Czech labor force and no more than 3% used offline electronic means. In general, these two kinds of e-learning were used by 8% of labor force in the past 4 weeks.

We can expect that school and organized forms of lifelong learning will be more and more supplemented with educational activities of an individual, reacting flexibly to the professional and life positions and the educational needs that are connected with this position. This approach will correspond to the imperative of the knowledge-based society.

The development of **e-economy and e-commerce** is at its early stage in the Czech Republic as well as in Europe. Only a small part of the Czech population (8%) took part in some type of e-commerce transaction (i.e. they have ordered some product or service, conducted on-line banking or bought financial products during the four weeks preceding the survey). E-commerce may involve only part of Internet users. Perception of on-line e-commerce services must be treated in relation with the general economical context of the economy in transition and with perception of legal framework for B2C e-commerce development, i.e. lack of trustworthiness of e-commerce services.

Beside the low figures for home-based **teleworking** usage, we can see the great interest of the Czech employed population in at least one type of telework. The interest is greater in the Czech Republic than in NAS-10 and EU-15. Approximately 70% of the employed population declared the interest in at least one type of telework and small portion of employed population declared that it is not interested in any type of telework. The interest in telework depends on professional stratification, too. A similar situation of teleworking is for SOHO. Self-employed Tele-workers in SOHOs do not perceive that tele-mediated communication with clients and work partners opens up new possibilities for improving business performance.

If we focus on the sphere of **e-government** in the Czech Republic, we have to realize that there are currently just few e-governmental services available (for example road tax, download of declaration of taxes, request for unemployment benefits) in the Czech Republic. In consequence of this fact, we can very often concentrate just on the preference of the preferred type of e-government services (classically or electronically) in our data analyze but not on the real amount of users of these services.

From the set of e-government services, 50% of regular Internet users prefer e-government services without an immediate contact with a government authority. E-government services

with some necessary deeper contact with a government authority are preferred by about 30% of regular Internet users. A low preference is typical for e-government services like tax declaration/filing the income return and declaration to the police – around 20% of regular Internet users. In the Czech Republic, like in EU-15, it appears that preference for e-government services decreases as interaction impinges more upon the privacy of the individual. The current situation regarding the preferred way of interacting with the government is under influence of tradition and low confidence in modern communication tools used for such type of interaction between citizen and government authorities.

Statistics and data of different quality and extent about ICT already exist. What we need now is to harmonize the Czech statistics on the Information Society with the EU and OECD standards and to gather information and data needed for the evaluation of the Czech information policy, international comparison and obtaining the considered necessary figures concerning the Information Society for the Czech firms and public at large.

The importance of the ICTs continues to grow. ICTs changes and influences all spheres of society: economy, education, business, government, as well as more personal sphere: skills, way of communication, and lifestyle. This poses a challenge to policy makers that wish to foster the benefits of the ICTs to economy and society. Responding to this challenge requires reliable and comprehensive information on the importance of the ICTs. In this process, SIBIS could be very helpful if it managed to execute the intended idea - creation of indicators, following implementation and usage in separate countries. Implementation of this process would give a unique source of data.

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

The contemporary society is undergoing fundamental changes in its character. These changes are connected to a great extent with the degree to which society comes under the influence of information technologies. There is a lack of suitable indicators, which focus on this new phenomenon. Indicators that display these changes have to be found and described so that the processes connected with the transformation of society can be understood and followed.

SIBIS aims at developing such indicators: the main goal of SIBIS is to develop and pilot indicators for benchmarking progress towards the Information Society, taking full account of e-Europe and e-Europe+ in all 15 EC Member states and most NAS countries. These indicators should be easily employable for informing policy and practice. The target audience of this report consists of policy makers, statistical offices at all levels (supranational and national), industry leaders and research experts throughout Europe.

The national topic report is one of the results of the SIBIS project and is based on a General Public Survey carried out in the fifteen EU countries, the USA and Switzerland in 2002 and in the ten Newly Associated States (NAS) in 2003. The report uses the most important and comprehensive indicators of the Information Society. The main analysis focuses on the Czech Republic. Some analyses seek to compare the position of the Czech Republic with that of other countries.

A large amount of research dealing with the issue of ICT has been carried out in the Czech Republic. Most research has focused on partial phenomena (e.g., access, e-commerce, mobile usage). The problem with this research is that it offers an insufficient possibility for

comparison and for the interconnection of the various types of research that have been carried. Mostly this has been market research and public opinion polls with low theoretical methodological background. The findings were most often for marketing purposes, serving commercial interests. There is a lack of research that would focus on ICT in general and on connecting the disparate parts of this phenomenon.

The following topics are covered in the report: ICT infrastructure and Security, E-society and social inclusion, E-education and Life-long learning, E-economy and e-commerce, E-work and E-government.

ICT infrastructure and Security

In SIBIS this topic covers the wide range of devices by which users access electronic 'information', e.g. telephones, computers, televisions, multimedia kiosks and other hybrid devices. For the purposes of SIBIS the term 'telecommunications' is interpreted in a broad sense, including all the networks (cable, data, sound, image) over which all types of information (voice, data, sound, image) are carried.' Access' can be defined as the ability to retrieve data, graphics, sound, text etc. whenever on-line.

Different organisations have been conducting research in this sphere: the Czech Telecommunication Office gives the basic statistics about telecommunications, and the Czech Statistics Office has carried out several pieces of research on ICT. Research on ICT usage in enterprises since 2000: research on ICT usage in households and government has been going on since 2002. Publication of data from this research will be released in the fourth quarter of 2003. A further source of data on Internet-related issues are the surveys of the agencies (GfK, TNSF, STEM/MARK), mostly GPS. These surveys are mostly unpublished or only partially published as press information.

E-Society and Social Inclusion

Computer literacy is starting to play the same role as writing and reading once did. We can assume that lack of access and disadvantages in terms of using PCs and the Internet will confirm already existing social divisions. From this point of view it is very necessary to analyse PC and Internet access and usage patterns. One of the sub-groups of the population which is in danger of e-exclusion is disabled people. It is not usually possible to measure directly social inclusion. But we can identify this item by analysis of the data (influence of age, gender, income, long-term illness, education on Internet use, accessibility of web pages for disabled and so on). Data on identifying the vulnerable can be found at the Ministry of Information, the Ministry of Labour and Social Affairs, the Czech Statistics Office and Eurostat.

E-education and Life-long learning

The educational system is a key point as the Information Society is seen as a knowledge economy. This system will have to adapt to a knowledge economy in terms of organisational setting, infrastructure and partnerships, pedagogy, curricula and teachers' qualifications. Individuals are in the process of adapting to a business environment where skills and knowledge play a much more central role in overall economic performance. For SIBIS purposes education is understood as a formally institutionalised process of knowledge transfer and knowledge development, as opposed to informal learning arrangements taking place through various community of practise arrangements, on-the-job training and peer learning. The Institute for Information on Education provides statistics and surveys on schools in the Czech Republic and indicators on official educational policy. The Institute cooperates with Eurydice (the international source for statistics).

E-Economy and e-commerce

E-commerce is a part of the wider process of the overall digitalisation of the economy. The SIBIS project has adopted the definition endorsed by OECD in April 2002, which defines e-commerce as the implementation of electronic transactions, by placing or receiving orders over electronic networks (broad definition) or the Internet (narrow definition). Payment and delivery may be carried out on or offline.

E-Work

SIBIS defines work as aimed productive activity. The sphere of work has been influenced by the implementation of ICT as have other parts of society. ICTs have led to profound changes over the last two decades in the organisation of work at a micro-level as well as in labour markets at the macro-level. The adaptation of statistical systems to these changes is an enormous task. The Czech Statistic Office provides a quarterly Survey on the workforce; a supplement on ICT has formed part of this survey since 2002.

E-Government

Generally, e-government designates any transaction that involves the government and that is carried out, even partially, using electronic means. E-government should play an important function in mediating government actions and its role will continue to grow as communication technologies become more widespread. Currently there are only a few e-governmental services available (for example road tax, the downloading of tax declarations, request for social relief in the Czech Republic. In consequence of this fact data focused on these services are very limited.

We can see several main reasons why the project SIBIS+ is of importance in the Czech Republic. Information and research findings are decentralized and can only be found in different institutions, research subjects, and departments. This information, especially in the form of systematic and consistent data sets, is not easily available. Because of the prestige that SIBIS enjoys we were able to talk with different organisations about the results of research and create a more general view concerning the level of implementation of new ICT in the Czech Republic. An international project with comparative research offers us a relatively objective answer to the question: 'How far on is Czech society in the creation of an Information society in comparison with other countries?' But we have to note that the picture is based only on certain indicators that describe merely the basic technological infrastructure and its use as a basis for the creation of an information society.

The greatest importance of SIBIS can be expected in the future. Two main processes affecting our society can be seen in the present and in the future, namely the creation of an integrated Europe and a new European identity and the creation of an Information society. So that both processes might be mutually connected and supportive it is important to influence and direct them in the demanding conditions of a changing Europe. For this purpose adequate knowledge is absolutely essential. In this process SIBIS can play an important role. The creation of indicators and their subsequent implementation and use in different countries will give a unique source of data.

2.3. Overview of the Report

The report is organised in nine chapters, preface and annexes. The first three chapters are designed to give the reader an idea of the main outcomes (Executive Summary), the context (Introduction) and the research topic and indicators that have been developed. The core of the report is the analysis of the indicators, provided in Chapters 4 - 9. Important findings are presented in the body of the document and additional data are shown in the annexes.

Chapter 4 focuses on 'ICT infrastructure and Security'. This chapter gives a general overview of the development of the infrastructure connected with IT. Another theme of this chapter is security since this is sometimes considered as a possible barrier to Internet use. Chapter 5 on 'E-Society and Social Inclusion' describes barriers to Internet use and the position of the Internet in society according to different demographic characteristics. Chapter 6 on 'E-education and Life-long learning' considers the role that e-education has in today's society and the types of life-long learning. Chapter 7 on 'E-Economy and e-commerce' focuses on the use of e-commerce and the popularity of different types of e-services. The last chapter, chapter 8, on 'E-Work' deals with such topics as ways of working, teleworking, mobile teleworking, tele-collaboration.

The annex of the report consists mostly of external data which document trends observed in the analysis of the data gathered within the SIBIS framework.

3. General Information about the Country

The Czech Republic is situated in the middle of Europe and is the hub of several major areas including Western and Eastern Europe, and the Balkans. The country also shares its longest border with the strongest economic power in Europe, the Federal Republic of Germany. In order of size, the Czech Republic ranks 21st, following Hungary, Portugal and Austria, ahead of Ireland, Lithuania and Latvia. The number of inhabitants places the Czech Republic 14th in Europe after Hungary, Portugal and Byelorussia, ahead of Greece and Belgium.

Apart from the Czechs, Moravians, Silesians, Slovaks, Germans, Polish, Romans and other nationalities also inhabit this culturally diverse country.

The new Czechoslovak Republic was declared on October 28th, 1918 with Allied support; Prague became the capital and the popular Tomas Garrigue Masaryk became the first president. After World War II, Czechoslovakia fell within the Soviet sphere of influence. In 1968, an invasion by Warsaw Pact troops ended the efforts of the country's leaders to liberalize Communist party rule and create 'socialism with a human face.' Anti-Soviet demonstrations the following year ushered in a period of harsh repression.

With the collapse of Soviet authority in 1989, Czechoslovakia regained its freedom through a peaceful 'Velvet Revolution'. On 1 January 1993, the country underwent a 'velvet divorce', splitting into its two national components, the Czech Republic and Slovakia. The Czech Republic is a democratic republic: there are two legislative chambers - the Chamber of Deputies and the Senate. Now a member of NATO, the Czech Republic has moved toward integration in world markets, a development that poses both opportunities and risks. In December 2002, the Czech Republic was invited to join the European Union (EU). It is expected that the Czech Republic will accede to the EU in 2004.

Basically one of the most stable and prosperous of the post-Communist states, the Czech Republic has been recovering from recession since mid-1999. The performance of the Czech economy in recent years has been influenced by the 1997 currency crisis and the subsequent restrictive macroeconomic stabilisation package. These macroeconomic developments resulted in negative growth in 1997-99 but, combined with an impressive array of structural reforms, they have served to promote a significant and healthy restructuring of the economy. Growth in 2000-02 was led by exports to the EU, especially Germany, and foreign investment, while domestic demand is reviving. Uncomfortably high fiscal and current account deficits could be future problems.

Inflation is moderate. The EU put the Czech Republic just behind Poland and Hungary in preparations for accession, which will give further impetus and direction to structural reform. Moves to complete banking, telecommunications, and energy privatisation will encourage additional foreign investment, while intensified restructuring among large enterprises and banks and improvements in the financial sector should strengthen output growth.

For the economy as a whole, productivity rose by about 4% in 2000, well above the increase in real wages. Thus, the pick-up in inflation, from 2 to 4 per cent, mainly reflected external factors (including higher oil prices) and the reversal of one-off factors that had repressed it in 1999. However, nominal wage growth accelerated to 9.3 per cent in the first quarter of 2001 and by May inflation had reached 5 per cent. Despite the strengthening of output, ongoing restructuring meant that employment fell in 2000 before picking up in the first quarter of 2001. Notwithstanding these developments, the seasonally adjusted standardised unemployment rate decreased during the course of 2000 reaching 8.2 per cent in the first quarter of 2001, mainly because of state-subsidised early-retirement programmes that shrank the labour force. Increasingly, unemployment is taking on structural characteristics. It is concentrated geographically and among the less well educated, while the incidence of long-term joblessness now exceeds 50 percent.

Table 1: General information for Czech Republic

Area	78,960 square km			
Population	10.272 million			
Exchange rate	€ 1 = CZK 31.600 (on the date 31.12.2002)			
	Year			
Economy	2000	2001	2002	2003
- GDP growth	3,3%	3,3%	2,0%	
- Inflation	3,9%	4,7%	1,8%	0,5%
- Unemployment	8,8%	8,9%	9,8%	9,6%

Table 2: Ratings for the Czech Republic

Index	Rank	Source
Information Society Index 2000	27 of 55 countries	IDC
Networked Readiness Index 2002-2003	28 of 82 countries	World Economic Forum
Technological Achievement Index 2001	0,465	UNDP
Global IT IQ ranking 2002	35 out of 83 countries	Brainbench
E-readiness ranking 2002	27 of 60 countries (score: 6.45 out of 10)	Economist Intelligence Unit and Pyramid Research
Growth Competitiveness Index 2002	40 of 80 countries	World Economic Forum

4. ICT Infrastructure and Security

4.1. Telecommunications and Access

Telecommunications play an important role in the Information society. For the purposes of SIBIS the term 'telecommunications' is interpreted in a broad sense, including all the networks (cable, data, sound, image) over which all types of information (voice, data, sound, image) are carried. 'Access' can be defined as the ability to retrieve data, graphics, sound, text etc. whether on-line. In SIBIS this topic covers the wide range of devices by which users access electronic 'information', e.g. telephones, computers, televisions, multimedia kiosks and other hybrid devices. Satisfactory access to telecommunications equipment is the basic condition for the transformation of certain services into an electronic form (e.g., e-education, e-work, e-government, etc.).

The development of the telecommunications sector has been rapid in recent years. Data from the Czech Statistics Office documents this development⁴. The number of telephone lines increased from 24 per 100 inhabitants in 1995 to 105 per 100 inhabitants in 2001. The number of mobile subscriptions increased from 0.5 per 100 inhabitants in 1995 to 68 per 100 inhabitants in 2001.

In the Czech Republic the fastest growth in usage has been experienced by mobile operators. According to SIBIS GPS 93% of young people under 24 have a mobile phone in 2003. The high incidence of mobile use can be documented by two items of research carried out respectively in 2000 and 2002.⁵ 69% of respondents in the age group 24 - 30 years used a mobile in 2000. This figure increased to 94% of respondents in this age group in 2002. We can see that age plays a crucial role in mobile phone use. Mobile phone use is much less frequent among older age groups.

This rapid development can be observed in Internet use as well. This trend is shown by the results of several pieces of research carried out between 1995 and 2002.⁶ We focused on the age group 15 - 30 because this group is most connected to, influenced by, and familiar with the Internet. In 1995 there were 4 % of respondents from the 15 - 18 age group who had access to the Internet, 13 % from the 19 - 23 age group and 16% from the 24 -30 age group. In the year 2002 there were 80 % of respondents from the 15 - 18 age group who had access to the Internet, 74 % from the 19 - 23 age group and 68% from the 24 -30 age group.

The following chart displays information about ownership of basic electronic devices. Access to these devices is one of the basic conditions for taking part in the Information society. The Czech Republic and Slovenia are the leading countries in the ownership of mobile phones. In these countries 76% of population owns a mobile phone.

⁴ Annex Chart 1 'Development of mobile and telephone usage in the Czech Republic', Source: CZSO

⁵ Annex Chart 2 'Usage of mobile phones in the age groups in the Czech Republic', Source: Sak, Saková, The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague 2003

⁶ Annex Chart 3 'Internet access in the age groups in the Czech Republic', Source: Sak, Saková, The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague 2003

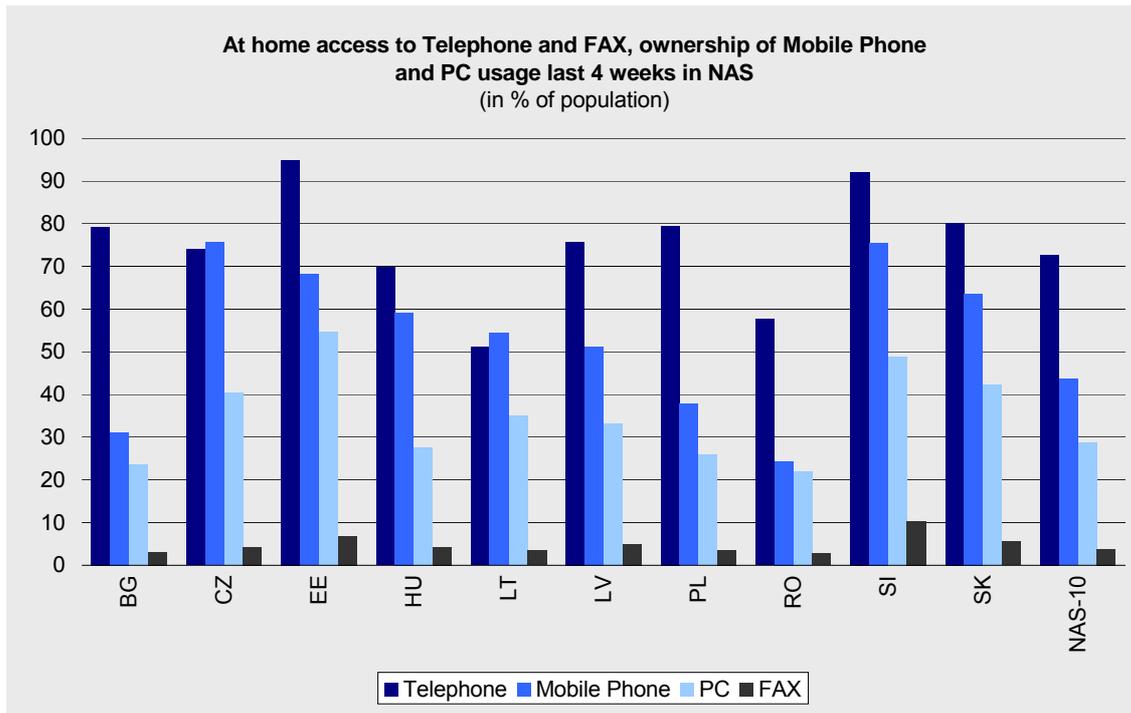


Figure 1: At home access to Telephone and FAX, ownership of Mobile Phone and PC usage last 4 weeks in NAS

Base: all respondents, weighted column percentages

Questions: A19 a, b, c

Source: SIBIS 2003, GPS - NAS

Who are the mobile phone users in the Czech Republic? The younger the age group the more mobile phone users there are. There are more mobile phone owners in higher income groups. If we compare mobile ownership according to household size there are more mobile owners in households with children: 87% of respondents from households with children under 6 and 83% of respondents from households with children older than 6 own a mobile phone. Only 51% of respondents from one-person households own a mobile phone.

The Czech Republic is in seventh position (74% of telephone owners) if we rank NAS states according to telephone ownership. Who are the people who do not own a telephone? Several factors play an important role in telephone ownership. The first is the size of locality. 36% of respondents who live in localities with a population of less than 1,000 do not own a telephone; on the contrary only 16% of those who live in localities with a population greater than 100,000 do not have a phone. The next factor is household size and structure. 35% of respondents from one person households do not own a telephone. 34% of respondents from households with children under 6 do not have a telephone. The smallest number of respondents without a phone is in the two-person household without children. Just 23% of respondents in this group do not own a telephone.

There are only three NAS states that have fewer telephones than Czech Republic. This fact is influenced by the politics of the Czech telecommunication provider - Czech Telecom. Last year Czech Telecom introduced a new pricing policy. This policy was unsatisfactory for some customers. The monthly flat fee went up. This led to many contracts with Czech Telecom being cancelled. People had been accustomed to a lower basic monthly flat fee. The bill depended on the amount of time spent phoning. But in the new contract the monthly flat fee went up and included some free credit. Some customers decided to use a mobile phone instead of a fixed-line telephone.

Fax ownership ranges between 3% and 10% in NAS countries. 4% of the population of the Czech Republic own a fax. The Internet is a big competitor for the fax machine and often acts as a substitute for it.

Comparing general knowledge about the Internet, the Czech Republic is in fourth position among NAS states. More than 90% of respondents have already heard about the Internet. Over the past few years there have been different events that try to introduce the Internet to the public. One such event is the 'March the Internet month' initiative, which started in 1998. During each subsequent March different conferences, workshops, meetings and events have taken place. This initiative tries to present the multi-faceted nature of the Internet. Topics such as e-education, e-government, e-commerce, Internet access for disabled people, the impact of the Internet and many others have emerge at the various conferences. 275 of the Czech public libraries offered the public an introduction to the Internet.

Only about 9% of respondents in the Czech Republic have never heard about the Internet. There is no significant difference in knowledge of the Internet according to gender. 8% of men and 10% of women have not heard about the Internet. Knowledge of the Internet is heavily age-dependent. Only 1% of respondents in the youngest age group up to 24 do not know about the Internet. But 54% of respondents in the oldest age group - 65 and over - do not know about the Internet.

Home access differs according to type and place of work. For those who are self-employed the Internet probably serves as one of the means of communication which allows them to work at home. Thus, 38% of self-employed respondents have home Internet access, as compared to only 22% of those in paid employment. Differences according to the type of work are as follows: 38% of those employed in the professions have home Internet access, falling to 28% for other non-manual employees, and only 11% for manual workers. For those not in full-time employment, 12% of those temporarily not working have home Internet access, only 4% of those who are retired, but 41% of students.

Home Internet access correlates with age, the younger the age group the more likely home access is. In the cohort up to 24, 33% have home access, falling to 24% of those aged 25-49, 12% of those aged 50-64 and only 5% of the over-65s.

When analysed according to the population of the locality where the respondent lives, the data shows that the highest proportion of home Internet access is amongst those in the largest population areas. Thus 28% of those living in localities with populations greater than 100,000 have home Internet access. For those in localities whose populations are between 20,001 and 100,000, the figure is 17%, and for those who live in localities with populations less than 1,000, it is 11%.

The most frequent type of home Internet connection in the Czech Republic is narrowband⁷. 10% of respondents use this type of access. The relatively higher number of respondents (in comparison with most other NAS states) who did not know what type of access they had may be due to the fact that one type of connection used in the Czech Republic was not mentioned by the questioner, namely Internet via cable. If the results of the question about the type of connection are compared with previous research, where respondents were asked about the type of access in the form of an open question, we can however confirm that a high number of respondents do not know what sort of Internet connection they have.

⁷ Annex Chart 4 'Internet access bandwidth at home', Source: SIBIS GPS

Narrowband connection is frequently criticised for its high price and slowness by many users in the Czech country. On the other hand, for some respondents it is the only possible type of connection because in some places other means (for example, cable) are not available or the basic price is too high. Dial-up connection is said to be expensive (price for the connected time) but the advantage is that one can decide whether to use the connection or not and the user can influence the expenditure. On the other hand if a flat amount is paid for the Internet, the same sum has to be paid every month.

If people are asked about the main barrier to Internet use, price is declared to be the main barrier. There is a general public awareness that the price for the Internet is high, but when people are asked how much it actually costs they are unable to give prices.

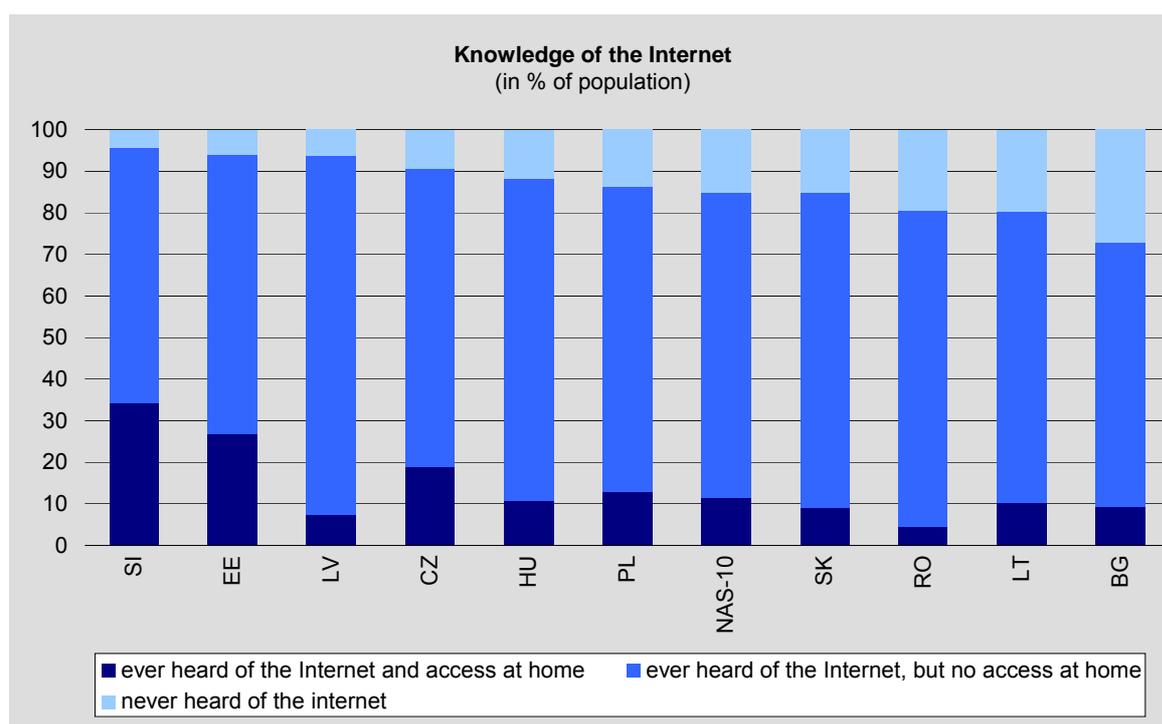


Figure 2 Knowledge of the Internet

Base: all respondents, weighted column percentages

Questions: A5a, A5b

Source: SIBIS 2003, GPS - NAS

In Internet use the Czech Republic is in third place among the NAS-10 states. Almost 60% of respondents use the Internet in Estonia, 45% in Slovenia and 40% in the Czech Republic. All countries have a higher rate of regular Internet users than occasional Internet users. The rate of regular Internet users ranges between 13% and 52% in the various NAS-10 states. Regular Internet user is defined as a user who has used the Internet during the last 4 weeks. The rate of occasional Internet users in NAS-10 states varies less, ranging between 4% and 9%. An occasional Internet user is defined as a user who has used the Internet during the last year.⁸

Internet experience is largely a recent phenomenon. 14% of the Czech respondents had their first encounter with the Internet in the past two years, and 16% had their first experience with the Internet 'more than two years ago'.⁹

⁸ Annex Chart 5 'Internet usage in NAS', Source: SIBIS GPS

⁹ Annex Chart 6 'Experience of online usage', Source: SIBIS GPS

The proportion of Czech respondents using the Internet from different places is similar. About 9% of Czech respondents use the Internet only at home and the same amount of respondents use the Internet from work. 7% of respondents use the Internet both at home and at work and 8% use the Internet somewhere else. Compared to other NAS states (except Estonia and Slovenia) the Czech Republic has a higher rate of people using the Internet only at home and of people using the Internet at home and at work.

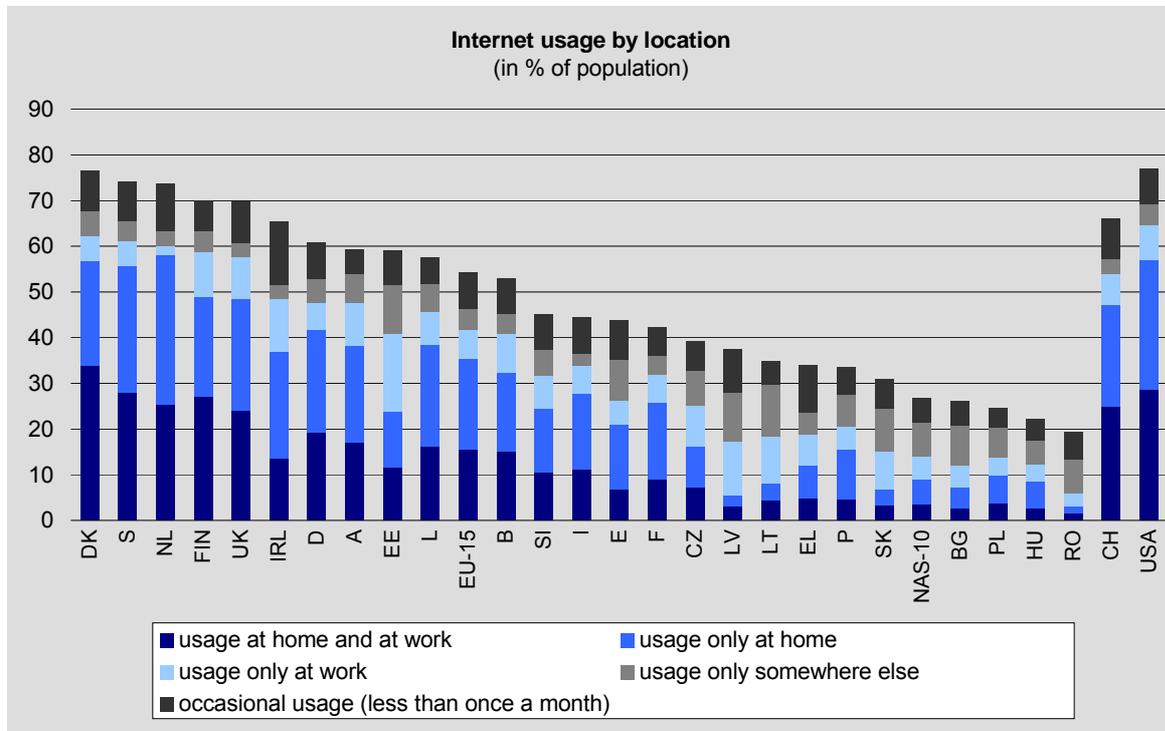


Figure 3 Internet usage by location

Base: all respondents, weighted column percentages

Question: A9

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

We can look at the figures from a similar question from a different piece of research (2000). The question of 'use at home and at work' was not asked there, and that must be taken into account. However, according to this research 15% of respondents used the Internet at home and 10% at work in the year 2000.¹⁰

The Czech Statistics Office has published figures about the number of Internet users. According to these, there were 1,256,664 Internet users and 11,595 computers permanently connected to the Internet in the year 2001.¹¹

When talking about Internet access, another interesting indicator is the amount of time spent on the Internet. This indicator shows us not only if the people use the Internet but it also enables us to differentiate between lengths of time dedicated to the Internet. Time spent on the Internet can depend on many factors: the whole amount of respondent's time, accessibility, price and speed of the Internet connection, etc. The most frequent category of Internet use in all countries is *medium (between 1 and 5 hrs/week)*. The exception is the USA where most people are in the *high (over 6 hrs/week)* category.¹²

If we focus on the specific possibilities of the Internet, the use of e-mail is the favourite

¹⁰ Annex Chart 7 'Places of Internet usage', Source: Sak, Saková, The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague 2003

¹¹ Annex Table 1 'Telecommunications: basic information Czech Statistical Office', Source: CZSO

¹² Annex Chart 8 'Intensity of online usage', Source: SIBIS GPS

service used on the Internet. The number of people using e-mail in the Czech Republic is the third highest from among the NAS countries. 25% of the Czech respondents use e-mail. In first position from NAS countries in this category is Slovenia and in second place Estonia.

Only 3% of the Czech respondents use e-mail with high intensity. (That is, these people are in contact with between all and three-quarters of their friends or relatives by e-mail). Most of the respondents -13% - use the e-mail with mid-communication intensity (That is, they are in contact by e-mail with a quarter to a half of their friends or relatives). 9% of Czech respondents use the Internet with low communication intensity (That is, they are in contact with only a few or none of their friends or relatives by e-mail).

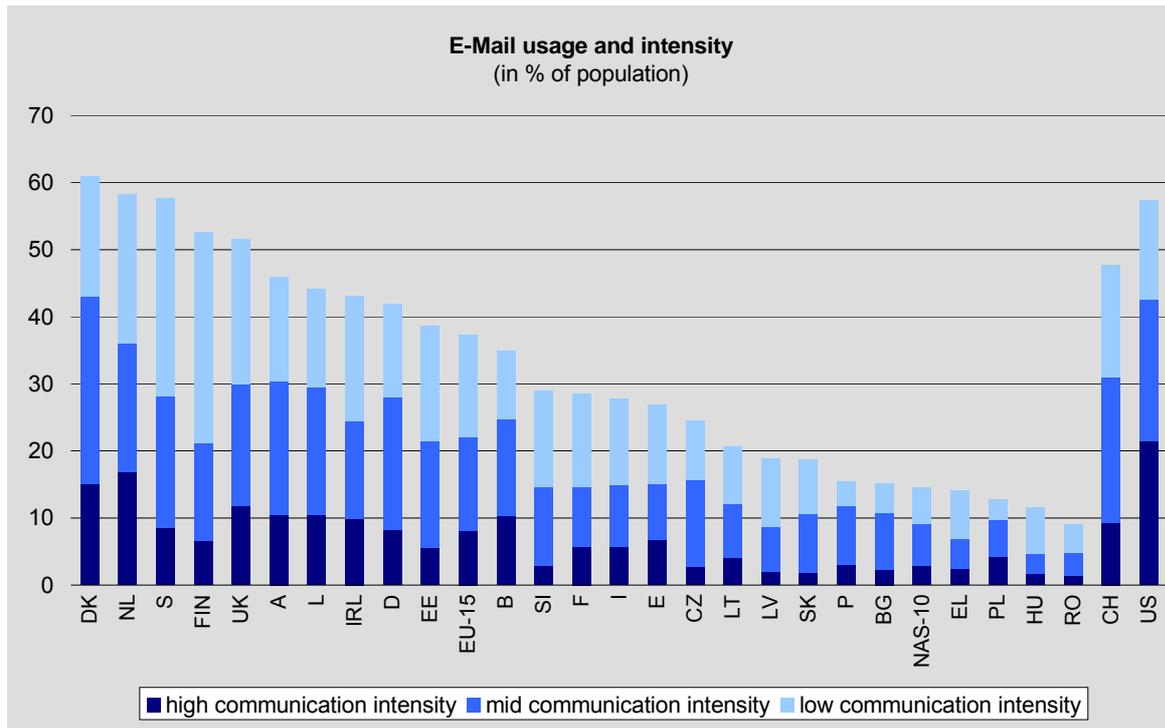


Figure 4 E-Mail usage and intensity

Base: all respondents, weighted column percentages

Questions: A3, A4a

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

The mobile market and mobile operators have been very successful and have experienced rapid development in the past few years.¹³ Mobile phone use is very high in the Czech Republic. There are about 43% of mobile owners in the NAS and 76% in the Czech Republic. Mobile phone ownership correlates with age: the younger the age group, the more mobile owners. We can say that the youngest and the oldest age group display the greatest differences. The youngest group uses the mobile phone most of all groups and also uses more of the possibilities it offers. In the oldest age group there is the smallest percentage of mobile users and the use of advanced mobile phone services is lower.

93% of Czech respondents in the age group up to 24 and 85% of respondents in the 25 - 49 age group own a mobile phone. There are just 5% of mobile owners in the over-65 age group. SMS is a much favoured and frequently used service. There are two main reasons for this. Some customers sometimes prefer this service because of the price. The message can be delivered at lower cost than the price of a call. Another reason is the confidentiality of SMS. An SMS does not disturb so much as a phone call. It can be read whenever the recipient is able to do so. SMS use correlates with age. The highest proportion of SMS users

¹³ Annex Table 1 'Telecommunications: basic information Czech Statistical Office', Source: CZSO

are found in the youngest age group. 92% of mobile owners from the age group up to 24 use SMS but only 30% of the oldest age group.¹⁴

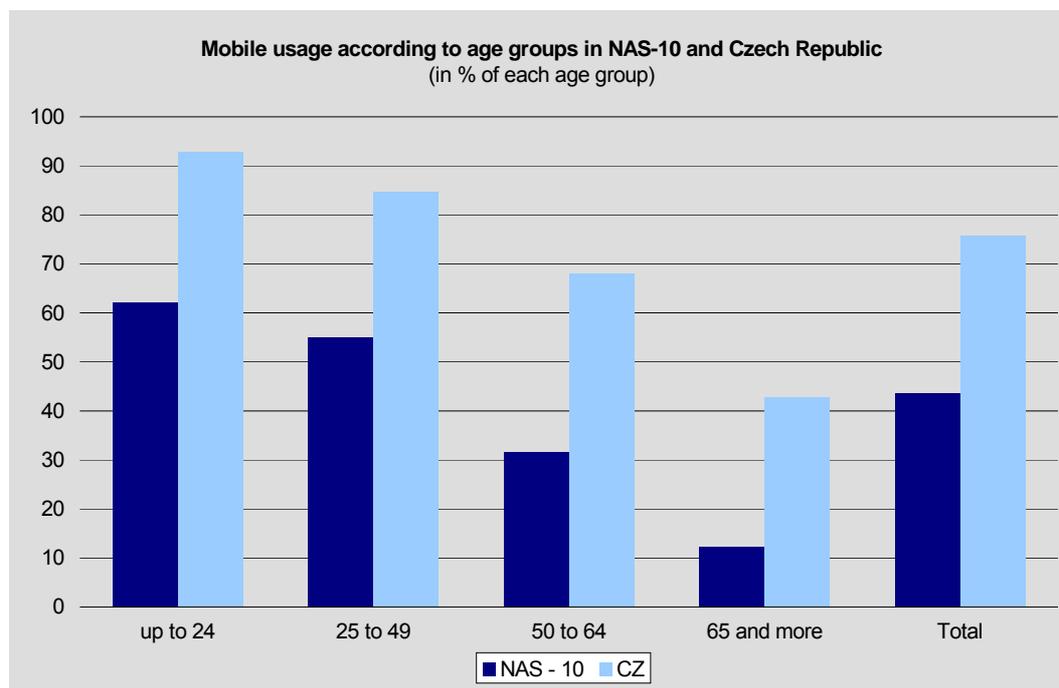


Figure 5 Mobile usage according to age groups in NAS-10 and Czech Republic

Base: mobile phone owners, weighted column percentages

Questions: A19c, A27

Source: SIBIS 2003, GPS - NAS

4.2. Security

The perception of security in connection with personal data and information security changed after 2000. An Act on the protection of personal data (101/1999) came into effect in June 2000. (See more details at The Office for Personal Data Protection <<http://www.uouu.cz/eng>>). In connection with the acceptance of this act there was a widespread public debate. Czech people have started to be more sensitive with regard to personal information. This overall situation has influenced the perception of security on the Internet. 62% of regular Czech Internet users (someone who has used the Internet during the last 4 weeks) feel concerned about privacy and confidentiality and 56% of respondents feel concerned about data security.¹⁵ 37% of Czech Internet users state that they would report violations of their on-line security, privacy and confidentiality to an independent third party. For 57% it would be easier to report it if it could be done anonymously.

6% of Internet users are 'very often' aware of the security features of websites when using the Internet for online shopping and 22% of Internet users 'sometimes'. The Chart shows us that shopping online is not as common in the NAS as it is in the EU countries. 16% of regular Internet users in the NAS have been shopping online and 6% of regular Internet users in the NAS have been put off buying online. 40% of regular Internet users have been shopping online and 28% have been put off buying online in EU. We can see that Internet users in NAS are less afraid of Internet shopping than users in EU.

¹⁴ Annex Chart 8 'SMSs use according to age groups in NAS-10 and the Czech Republic', Source: SIBIS GPS

¹⁵ Annex Chart 9 'Concerns regarding online security', Source: SIBIS GPS

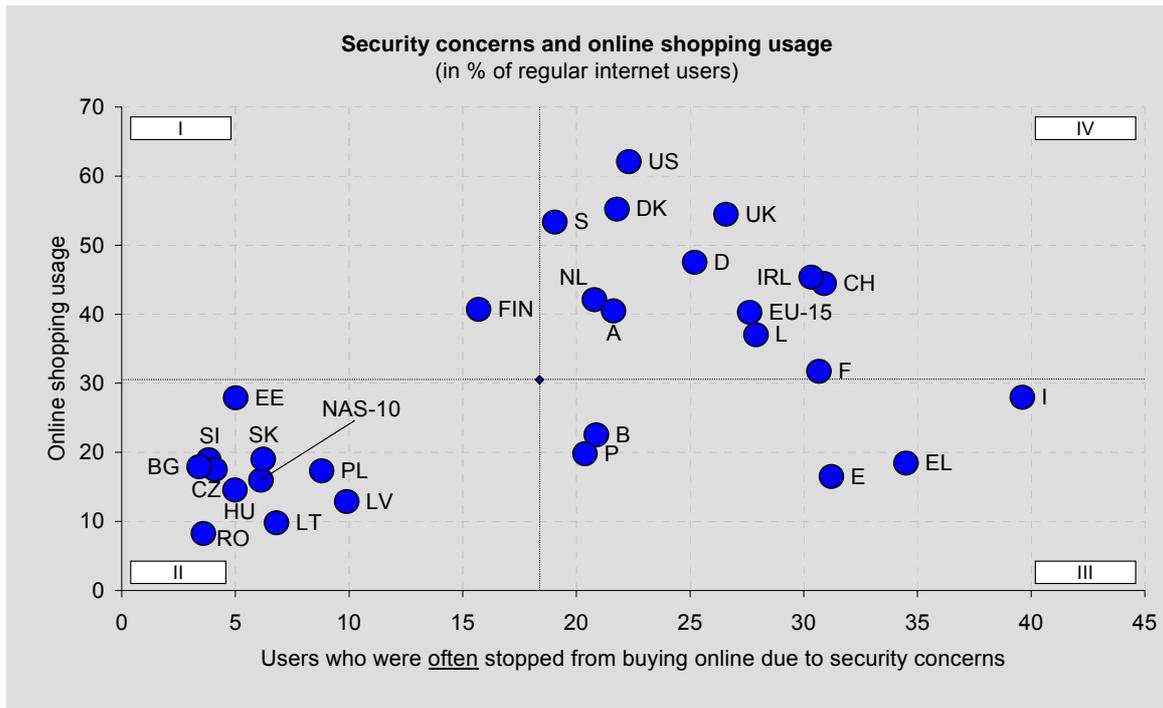


Figure 6 Security concerns and online shopping usage
 Base: regular Internet users, weighted column percentages
 Questions: B2 B, J2
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

5. E-Society and Social Inclusion

Work with information and its classification have a significant position among human skills. PCs and the Internet are powerful tools in the process of gathering and analysing information. Computer literacy is beginning to play the same role as writing and reading did in the past. It can be assumed that lack of access and disadvantages in using PCs and Internet use will confirm already existing social divisions. From this point of view it is very necessary to analyse PC and Internet access and usage patterns.

In the Czech society we can identify several main factors that influence e-inclusion. These factors are age, income, education, size of locality, disability and gender. Some of these factors have already been described in the chapter on ICT Infrastructure and Security. At the beginning of the development of the information society the group of people using e-technologies was small. This knowledge was an advantage but did not divide society. Nowadays we cannot talk about the computer-literate group as a minority. The situation has changed. For certain groups computer literacy and inclusion of IT into their career is standard and people who do not have these skills are disadvantaged or even excluded.

Those who have stopped using the Internet form a fairly insignificant part of the population. The numbers range between 1% and 7% of respondents in all countries. The category of those who once used the Internet but now no longer do is more frequent than that of those who used to, but no longer have home access but still use the Internet. The Czech Republic has the smallest rate of former users (1%).¹⁶ The amount (in % of occasional and non-Internet users) of respondents saying: 'The Internet is not for me' differs between the EU and the NAS. In the EU there are more occasional and non-Internet users who think that the 'Internet is not for them'. 67% of respondents in the EU-15 but only 44% of respondents in the NAS 10 share this opinion.

From these results we could form the hypothesis that among the NAS occasional and non-Internet users there are more respondents who would be interested in the Internet but who for some reason either have not used it or only rarely.

¹⁶ Annex Chart 11 'Internet usage drop-outs', Source: SIBIS, GPS

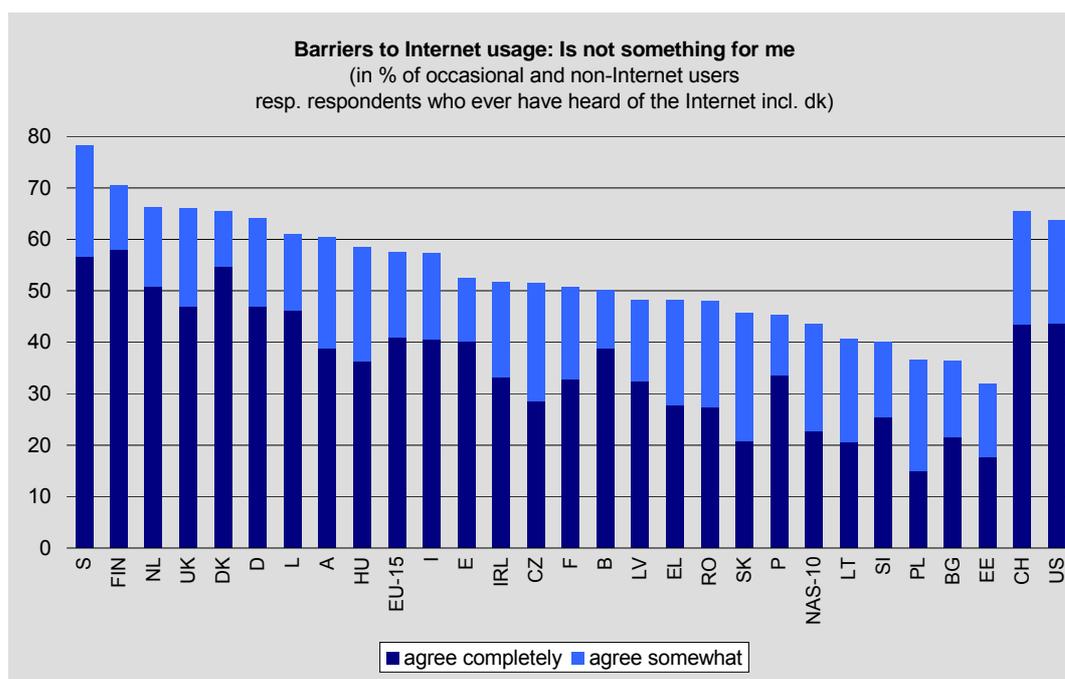


Figure 7 Barriers to Internet usage: Is not something for me

Bases: EU-15 countries: occasional and non-Internet users; NAS 10 countries: respondents who ever have heard of the Internet (incl. don't know); weighted column percentages

Question: A18F

Source: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

For most occasional and non-Internet users the Internet is connected with advanced computer skills. In the Czech Republic 82% of respondents say that the Internet requires advanced computer skills. In the NAS-10 almost 70% of respondents state this opinion.¹⁷

The rate of all Internet users who would feel excluded without access to the Internet ranges between 13% and 52% in the different countries. The highest rate of respondents who would feel socially excluded without the Internet is in the NAS (Lithuania - 51%, Estonia - 45%, Bulgaria - 43%). In the Czech Republic 24% of users would feel socially excluded. In the EU fewer respondents (20%) 'would feel socially excluded' without the Internet than in the NAS (31%). It is interesting that fewer respondents in the EU would feel excluded without Internet if we note that the Internet is more widespread in the EU. Because of the higher penetration we might expect that the Internet would be more appreciated in EU as a basic service that should be available. We can form other hypothesis: In the EU the Internet is no longer understood as a scarce commodity so the lack of access is not understood as an exclusion. The Internet does not attract so much attention. It is possible that in the NAS the Internet is still perceived as something unique, a scarce commodity and therefore access to it is a question of status.

¹⁷ Annex Chart 12 'Barriers to Internet usage', Source: SIBIS, GPS

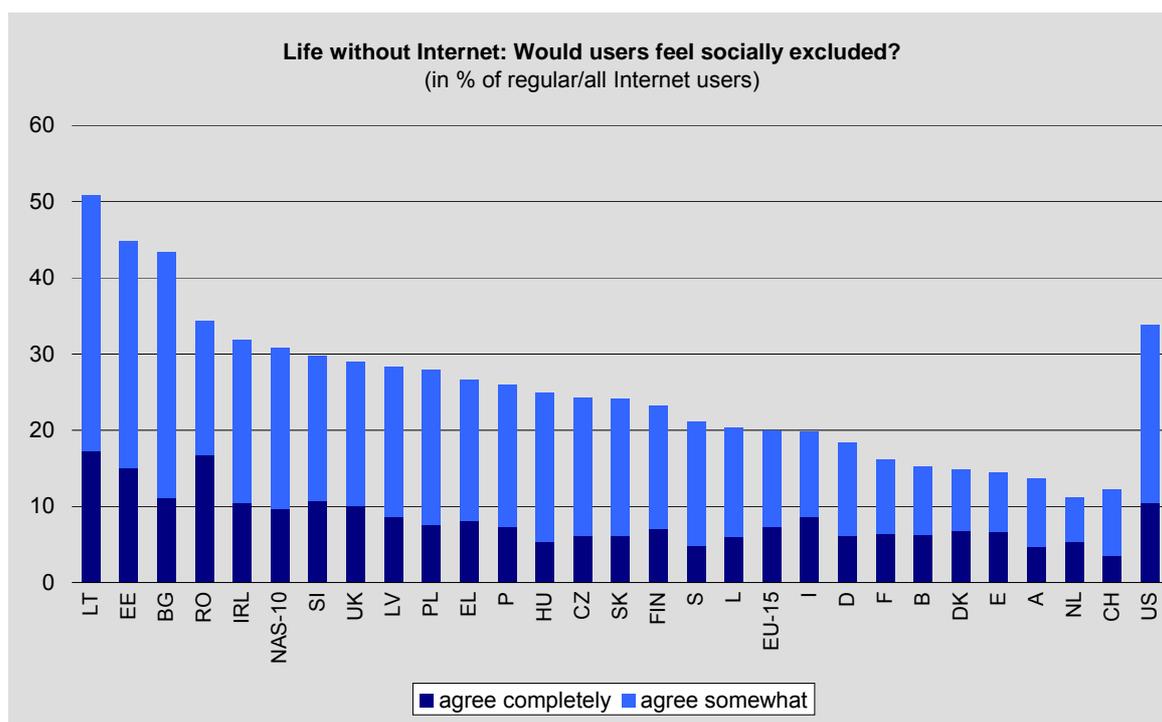


Figure 8 Life without Internet: Would users feel socially excluded

Base: EU-15 countries: regular Internet users, NAS-10 countries: all Internet users, weighted column percentages

Questions: B5b

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

The following chart shows the influence of long-term illness on Internet use. As we can see the differences are great. In the NAS 26% of 'respondents who have no health-limiting conditions' use the Internet but only 7% of respondents 'with long-term illness'. In the EU 50% of 'respondents who have no health-limiting conditions' state that they use the Internet against only 29% of respondents 'with long-term illness'. The situation in the Czech Republic is similar. 38% of 'respondents who have no health-limiting conditions' use the Internet against only 14% of respondents 'with long-term illness' use the Internet.

The question does not allow us to differentiate between types of illness. But we can say from our experience that some types of disability are very limiting in terms of computer and Internet use. Among the main problems we can mention the following: in most cases such illness leads to a lower income and this fact influences the financial accessibility of the Internet. Illness influences the level of education and skills acquired. Some disabled people are unable to use the Internet or their use of it is limited because of their physical handicap. Mobility problems are barriers in the use of normal computers. But computers can be adjusted to the needs of disabled people. Group of disabled citizens belongs to the lower income group and the tools enabling the disabled to work with computers are expensive as well as sometimes not even available.

On the other hand for some disabled who managed to overcome the barriers, the Internet begins to be a crucial item in their life. The Internet enables these people to communicate with the outside world in a way that would otherwise not be possible for them.

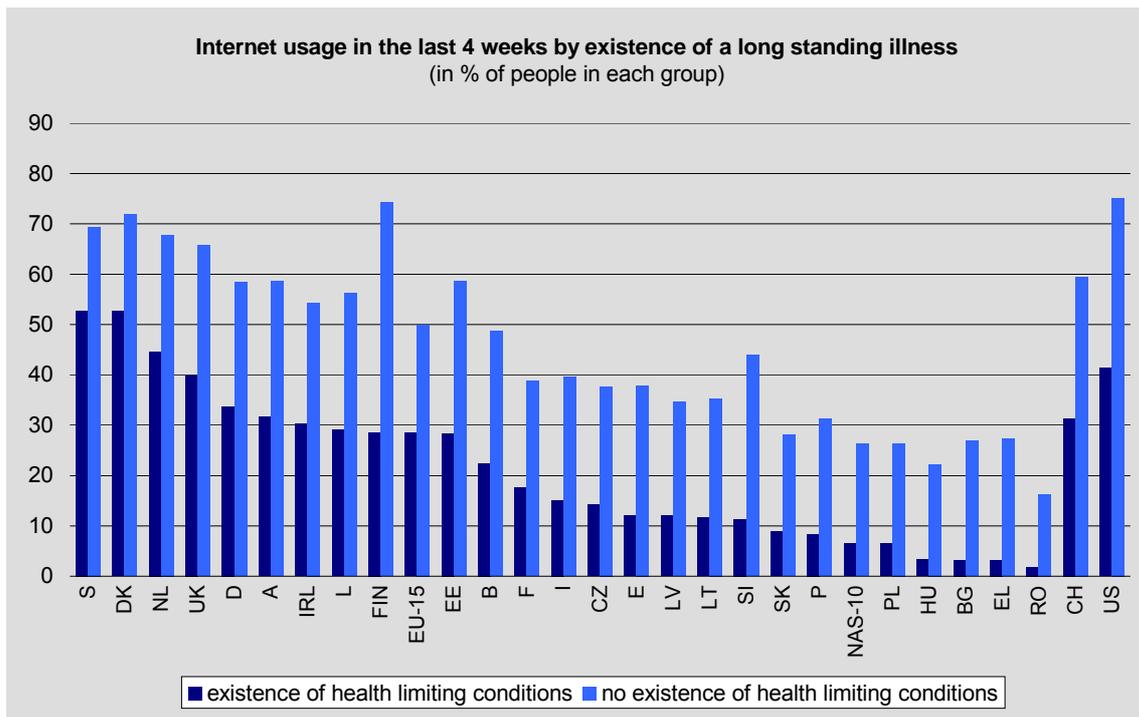


Figure 9 Internet usage in the last 4 weeks by existence of a long standing illness

Base: respondents with health-limiting conditions and without health-limiting conditions; weighted column percentages

Questions: A7, Z14

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

6. E-Education and Lifelong learning

The ability to manage modern communication tools such as Internet services (as a structural part of digital literacy) is one of the most important prerequisites for the development and use of e-education, especially in the area of effective lifelong learning. More than one third of the Czech population is confident in at least one Internet service.¹⁸ It appears that this phenomenon correlates strongly to age. Younger groups are more confident in more Internet services than older people. Greater confidence is linked to the use of Internet search engines and e-mail rather than to active participation in creating web pages.

The transformation of Czech society has touched all spheres of life. We can say that the school and educational system have been in a state of on-going transformation for the past thirteen years. These changes affect a person at the institutional level, as well as the individual dimension: value system, attitudes and real education.

The following charts illustrate several variants of lifelong learning. The first chart (Participation in lifelong learning) compares the percentage of the labour force in different countries, who in the preceding four weeks had taken part in a lifelong learning course. The next chart (Self-directed learning) traces, amongst the same group, the number of respondents who have educated themselves (c14). The third chart synthesizes both forms - participation in lifelong learning courses and self-education (c2,c14a).

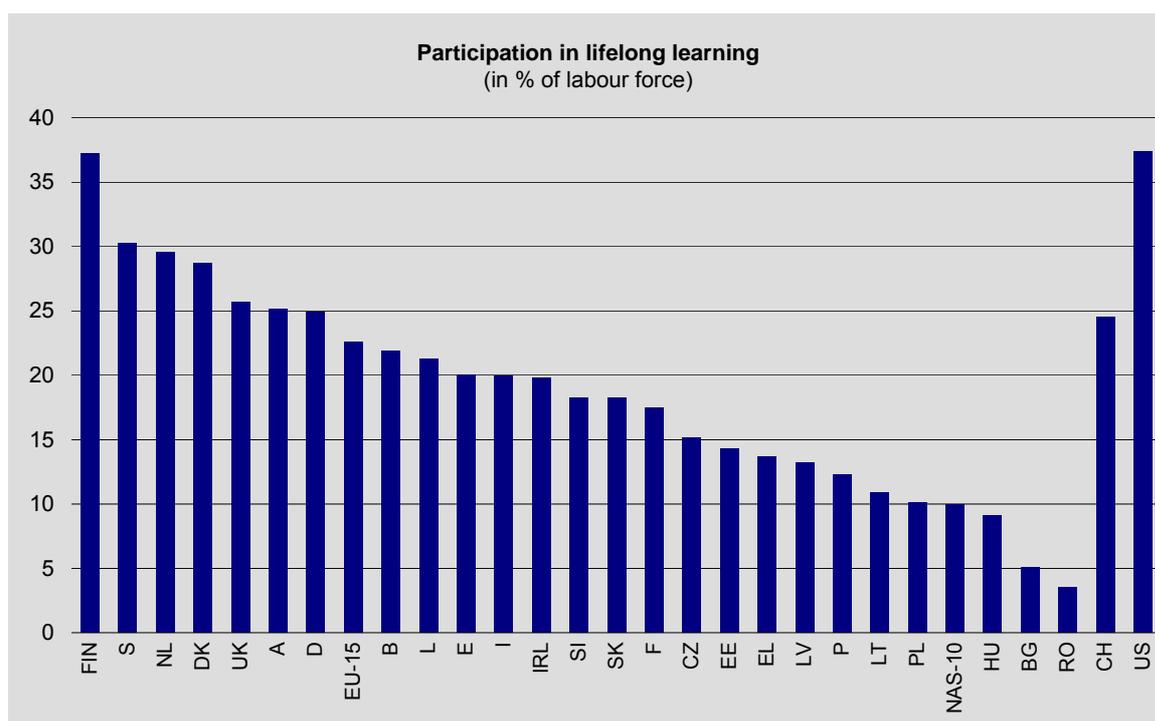


Figure 10 Participation in lifelong learning

Base: labour force, weighted column percentages

Questions: C2, C9b

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

Within the given time period 15% of the Czech labour force had used organized forms of education. As is generally the case with the Czech Republic, the position of our country in the institutionalised forms of lifelong learning is between the average of EU countries and the average of NAS countries. The placement of the Czech Republic next to France indicates

¹⁸ Annex Chart 13 'Skills at communication via the Internet', Source: SIBIS, GPS

that, despite the difficulties involved in transforming society and the educational system, the situation in the Czech Republic cannot be characterized as hugely different in comparison with developed EU countries. There is a significant difference between the Czech Republic and Finland, although this is not unique to the Czech Republic, as Finland is advanced compared to all countries.

Almost one in four (22%) of the Czech labour force have educated themselves with a view to their self-improvement. This is again between the average of the EU and NAS countries. In the last thirteen years a large proportion of the population has had to retrain and change profession because of the economic transformation. This would not have been managed without a marked rate of self-education. Interest in gaining qualifications and educational growth is also visible from other research and phenomena. In general, book reading is declining and the study of vocational literature growing.¹⁹

We can expect that school and organized forms of lifelong learning will be more and more supplemented with an individual's own educational activities, reacting flexibly to his or her professional and life situation and the educational needs that are connected with it. This approach will correspond with the imperatives of a knowledge-based society.

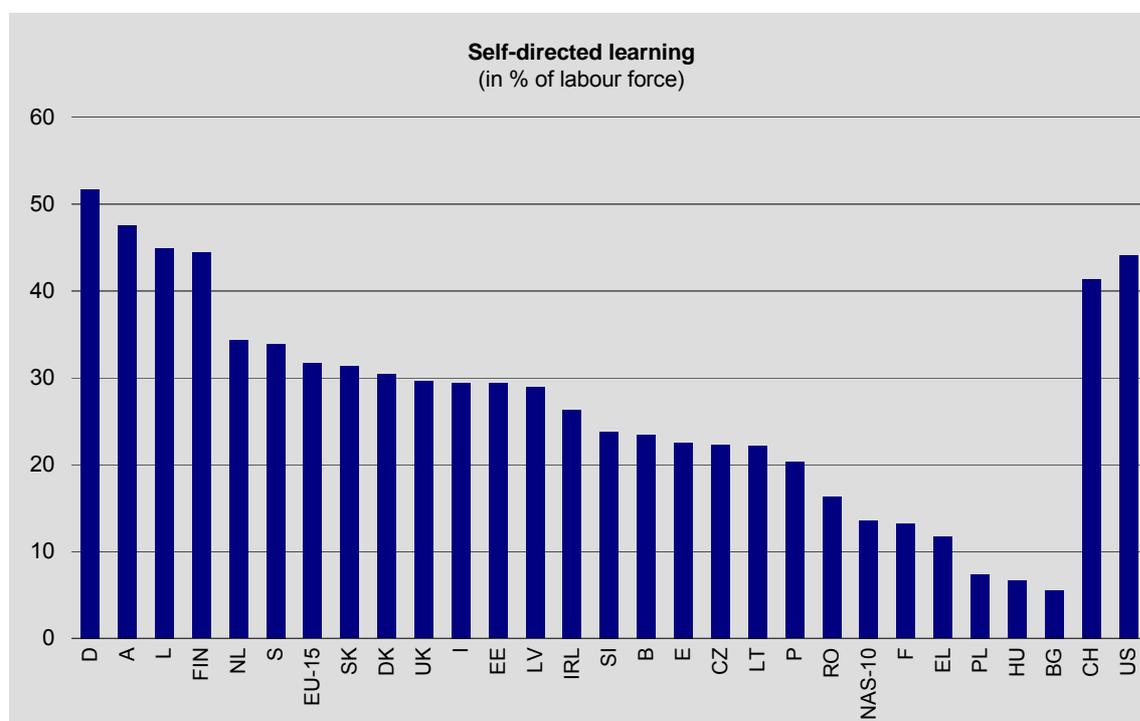


Figure 11 – Self-directed learning

Base: labour force, weighted column percentages

Questions: C14a, C14b

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

¹⁹ Sak, Saková, The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague 2003

Almost 30% of respondents took part in organised lifelong learning or self-education, which is not a small figure. This percentage of respondents involved in education places the Czech Republic between the average of the EU countries and NAS countries. This position does not correspond with the traditional historical position of out-of-school education. It is possible to expect growth of lifelong learning activities in the coming years.



Figure 12 Participation in any learning last 4 weeks

Base: labour force, weighted column percentages

Questions: C2, C9b, C14a, C14b

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

E-learning on the online level was used by 5% of the Czech labour force and no more than 3% used offline electronic means.²⁰ In view of the fact that the data is concerned with those who are economically active, students, who are most advanced in PC and Internet use and whose educational needs and activities are above standard, are not included in this sample.²¹ This concerns more or less all countries.

However there are also other factors which cause the differences between countries. Those who use e-learning belong to the most computer-literate part of the population. The economically active part of this group is formed from older part of this sub-group and in a way represents the result of educational processes including the acquiring of new information technologies in the previous period. The higher the level of acquiring new information technologies, the higher is the difference between the actual rate of those who are economically active and using e-learning and the potentiality of e-learning that will be saturated in the following period when the computer-literate group of contemporary students enter the labour market.

This process proceeds and will proceed spontaneously in connection with informatization. The acquisition of computer skills and the use of PCs and the Internet have its own logic. Specific skills in manipulating the functions of the PC and Internet are necessary for acquiring further skills. Education by means of new technologies is the next step. The

²⁰ Annex Chart 14 'Usage of e-learning', Source: SIBIS GPS

²¹ Sak, Saková: The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague 2003

individual is not self-sufficient in the use of new technologies for educational purposes but depends on the creation of corresponding educational programmes. A certain e-learning educational culture is being constructed. The use of e-learning is a result of the activity of individuals and this e-learning culture in different countries.

According to research that creates a time series the use of the PC for educational purposes developed in the second half of the nineties along with the creation of educational programs especially for students of secondary schools and universities.²² The Internet was incorporated into educational tools with the phase delay caused by the level of Internet development. At the beginning of e-learning young Czechs were most interested in e-learning focused on language teaching.

Presently PCs and the Internet are massively used as supporting tools for the educational process in secondary schools and universities. A PC and the Internet for private educational needs and for the needs of study in schools belong to the standard equipment of the contemporary Czech student.

We can formulate a hypothesis that an educational system (in general, not only in the Czech Republic) will have to adapt to a knowledge economy both in terms of organizational settings, infrastructures and partnerships, pedagogy, curricula and teachers' qualifications. Users of education at all levels and ages will need to develop, moving from an instruction-based understanding of education to a paradigm where the individual will most likely be expected to take a much larger co-responsibility for identifying and continuously developing his/her skill basis in a variety of ways and settings.

In a business context we can see that companies and institutions are in the process of adapting to a business environment where skills and knowledge play a much more central role in overall economic performance and efficiency.

²² Sak, Saková: The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague

7. E-Economy and e-Commerce

E-Economy and e-commerce are in the early stages of development both in the Czech Republic and in the rest of Europe. It is clear from the following figures that e-commerce may involve only a part of the population of Internet users. Of the services used by the Czech Internet users sub-group in the last 12 months preceding the survey:

- 72% had found information about a product,
- 34% searched for some health-related information,
- 21% had looked for a job.
- 16% had ordered a product or a service,
- 8% had conducted on-line banking or to buy some financial product,

The relevant task for description and explanation is the identification of the basic socio-demographic and socio-economic characteristics differentiating the e-commerce buyer (and their typical behaviour) from the average Internet user.

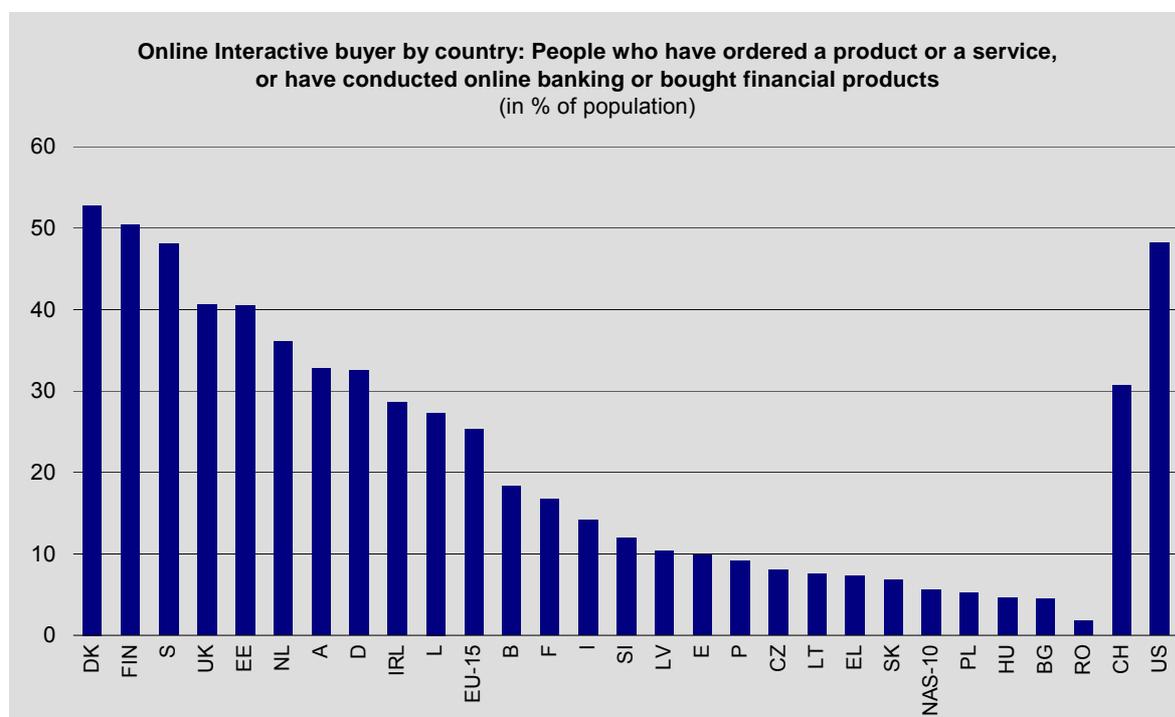


Figure 13 Online Interactive buyer by country: People who have ordered a product or a service, or have conducted online banking or bought financial products

Base: all respondents, weighted column percentages

Question: B1

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

The low level of regular or occasional e-commerce users among the Czech population (around 5%) is due to the small number of e-commerce transaction services available. A core factor for figures regarding e-commerce users is the perception of the level of security and the trustworthiness of the current e-commerce services. This perception must be examined in relation to the general economical context (one of transition), and along with that the further perception of the legal framework for B2C e-commerce development. The conclusion is that the lack of trust in the virtual market is probably a relevant barrier to the use of e-commerce at this stage in its development in the Czech Republic. E-commerce use in the Czech Republic is more typical for the youngest age group. This activity is typical for the developing net-generation, that is those who started to use the Internet early on and tend to be predominantly young, male, well-educated, with middle to high income. Age remains

the single most important differentiating factor between online e-commerce users and the general population in the Czech Republic.

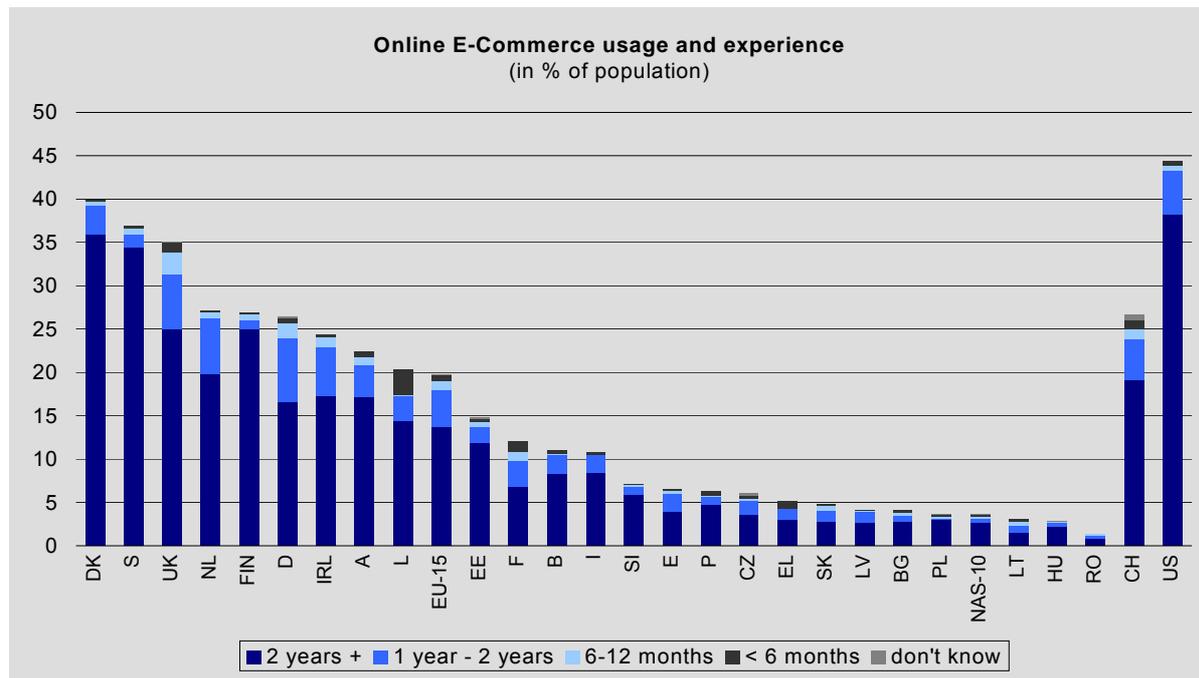


Figure 14 Online E-Commerce usage and experience

Base: all respondents, weighted column percentages

Questions: B1, A10

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

The current stage of e-commerce development in the Czech Republic is based on the historically low level of the mail order market during the past 40 years in comparison with the rest of Europe. This market, which is similar to the B2C commerce, has no tradition in the Czech Republic. A possible hypothesis would run thus: figures from 'On-line E-commerce usage and experience' indicate slow e-commerce development over the last years (there are few new e-commerce customers). The majority of e-commerce users have more than 2 years' experience. The slowdown of e-commerce development is related to the worldwide trend of uncertainty over communication-related business, especially in the area of B2C 'Business to Customer' services, tools and platforms. Everything must be seen in the context of a slowdown in the whole information and communications industry. Another concurrent hypothesis can be formulated: in the Czech Republic e-commerce buyers are found more frequently among the more sophisticated Internet users than is the case in the EU countries. Sophisticated users tend to be Internet users spending a longer time online, with more than 2 years experience. What is needed here is further information as to the relevant socio-demographic and socio-economic characteristics for differentiating the sub-group of regular or occasional e-commerce users from the average Internet user. As reflected in the *OECD Scorecard*, the development of e-commerce in the Czech Republic has been very slow. While many Czech companies use the Internet, for 75% of companies typically such use extends no further than to web presentations and e-mail. Few firms process orders online and allow for paying electronically.

B2C commerce occurs even less frequently, stymied by both a low use of credit cards and expensive Internet access, with dial-up access prices being the second highest among OECD countries. The dramatic growth in mobile phone usage, however, may provide a practical communication mode for B2C e-Commerce. Over the past 2 years, as part of the State Information Policy, the Czech Government has prepared some initiatives in the area of e-commerce. These initiatives form, indeed, one of the core components of the State Information Policy. The White Book of e-Commerce in the Czech Republic (2002) was

prepared within the policy's framework. It includes some basic means for effective e-commerce development, for example:

- The state will encourage in particular the enactment of the legislative and technical-organisational prerequisites required for securing a high measure of credibility for acts and transactions carried out in electronic form,
- Within the scope of harmonization with the EU the state will gradually introduce, in harmony with EU approaches, legislative measures that will eliminate existing barriers to the development of electronic commerce, such as in commercial, customs, tax and accounting legislation and practice
- The State will support the systematic and goal-oriented cooperation of public administration bodies, special interest groups and the business sector, aimed at the application of advanced information technologies and the principles of electronic commerce to the area of public information services and will seek to use all available means and forms for strengthening public awareness and education in the given area, building on experience to date at home and abroad (the EU, OECD)
- The State will assess a set of short-term as well as long-term supporting measures aimed at strengthening the infrastructural base for electronic commerce and supporting the utilization of E-commerce by all commercial entities
- Within the scope of the current state administration the state will apply to the greatest possible extent E-commerce principles and procedures, both in a wider sense (electronic exchange of data and documents within the administration) and in the sense of actual electronic commercial transactions in contact with non-governmental entities (banks, public procurement).

8. E-Work

Issues related to the Information Society such as new ways of working enabled by ICT, telework, mobile teleworking, tele-collaboration and other possibilities play an important role in the harmonic development of such a society.

8.1. Work Organisation

A flexible environment is typical for the Information Society. If we look at the development of flexibility, the dimensions taken into consideration are working time, the place of work, the type of contract and the work content, namely the skills that are applied in the production process.

Working time flexibility is an important prerequisite for the complex utilisation of e-work. Work organisation gives employees more discretion over the organisation of work wherever this can be combined with the requirements of the real business, or even supporting business objectives. In the Czech Republic only a small part of the employed population can adapt their starting and finishing times according to personal preferences. It generally depends on the occupational structure.

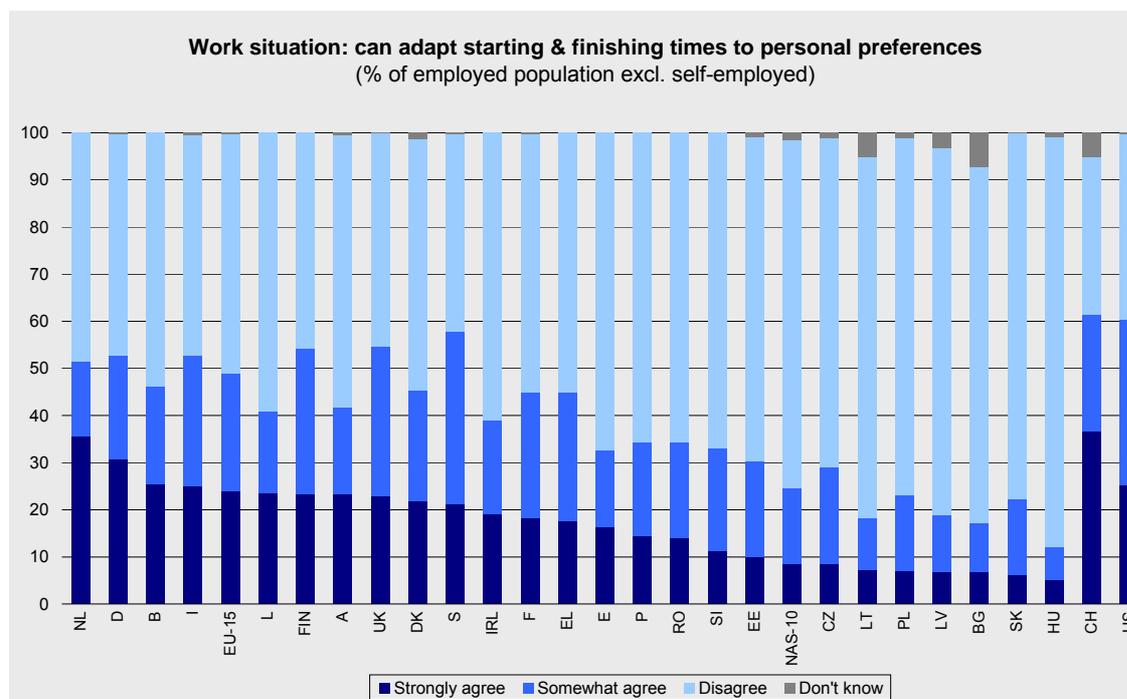


Figure 15 Work situation: can adapt starting & finishing times to personal preferences

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

Questions: H2

Sources: SIBIS 2002, GPS, SIBIS 2003, GPS – NAS

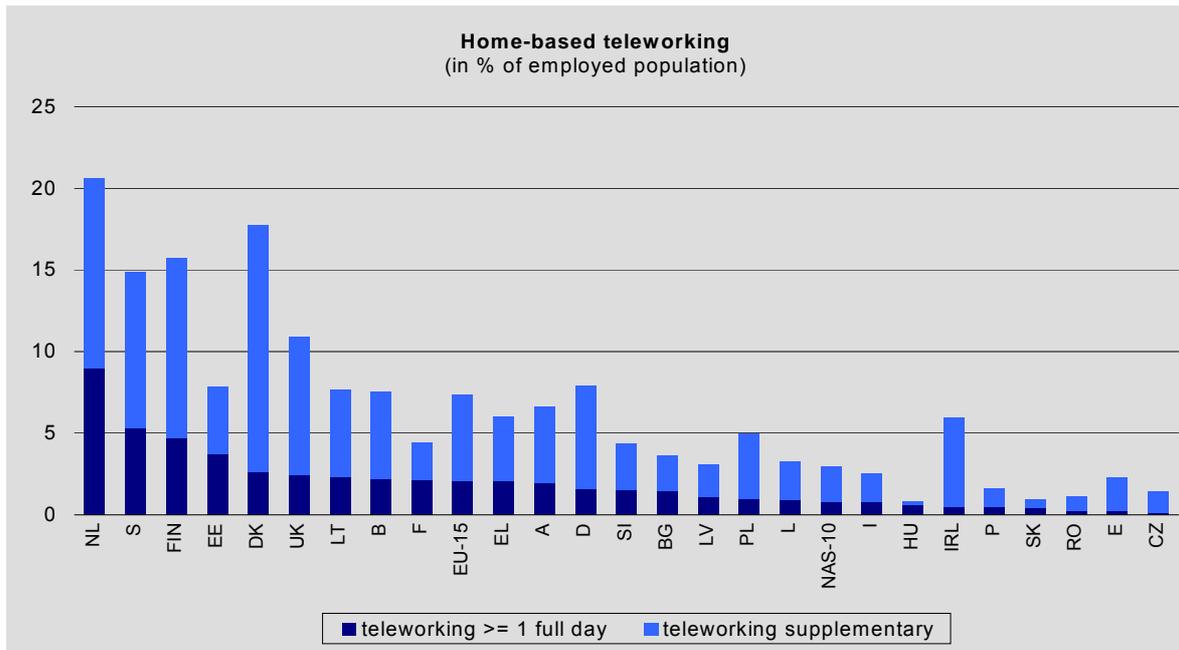


Figure 16 Home-based teleworking
 Base: all persons employed, weighted column percentages
 Questions: E1, E3, E4
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

This figures and the position of the Czech Republic within the NAS-10 is a surprise in relation to the broad expansion of fixed phone lines and mobile phones. The explanation is based on the occupational structure of the employed population, and maybe also on the work organisation in Czech enterprise and the related 'sceptical' attitude to the feasibility of teleworking.

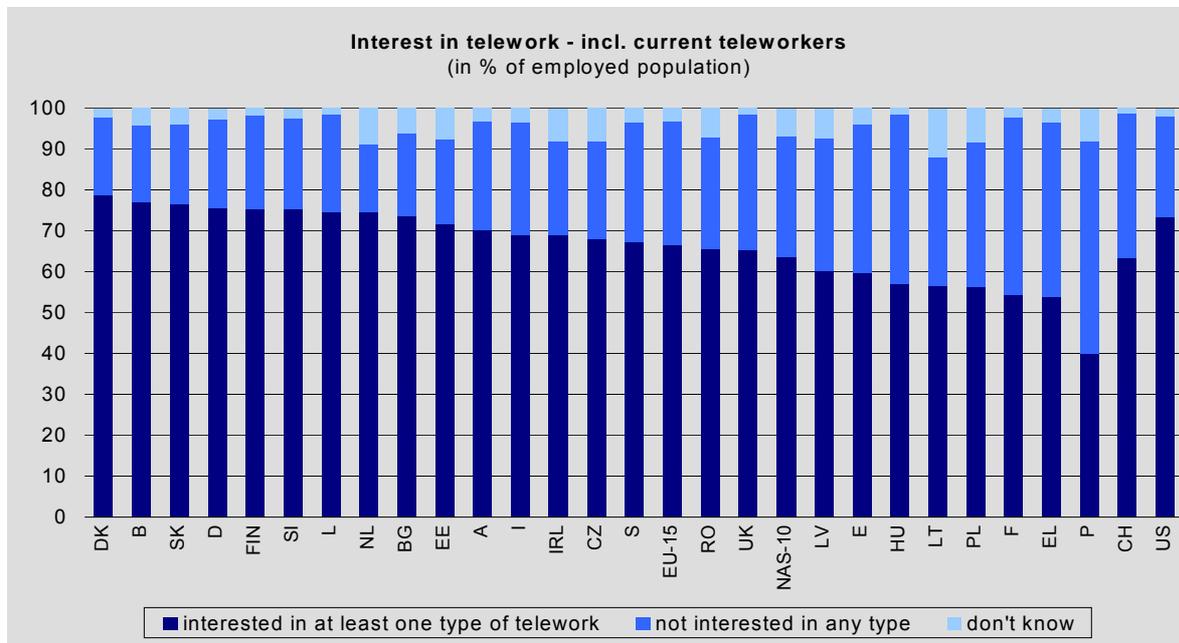


Figure 17 Interest in telework – incl. current teleworkers
 Base: all persons employed, weighted column percentages
 Question: E8
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

Alongside the surprising position (in relation to the telecommunications infrastructure) of the Czech Republic in home-based teleworking we can see the great interest of the Czech employed population for at least one type of telework. The interest is greater in the Czech

Republic than in the NAS-10 and EU-15. Approximately 70% of the employed population declared an interest in at least one type of telework and the proportion of the employed population that is not interested in any type of telework is small. Interest in telework is also dependent on professional status.

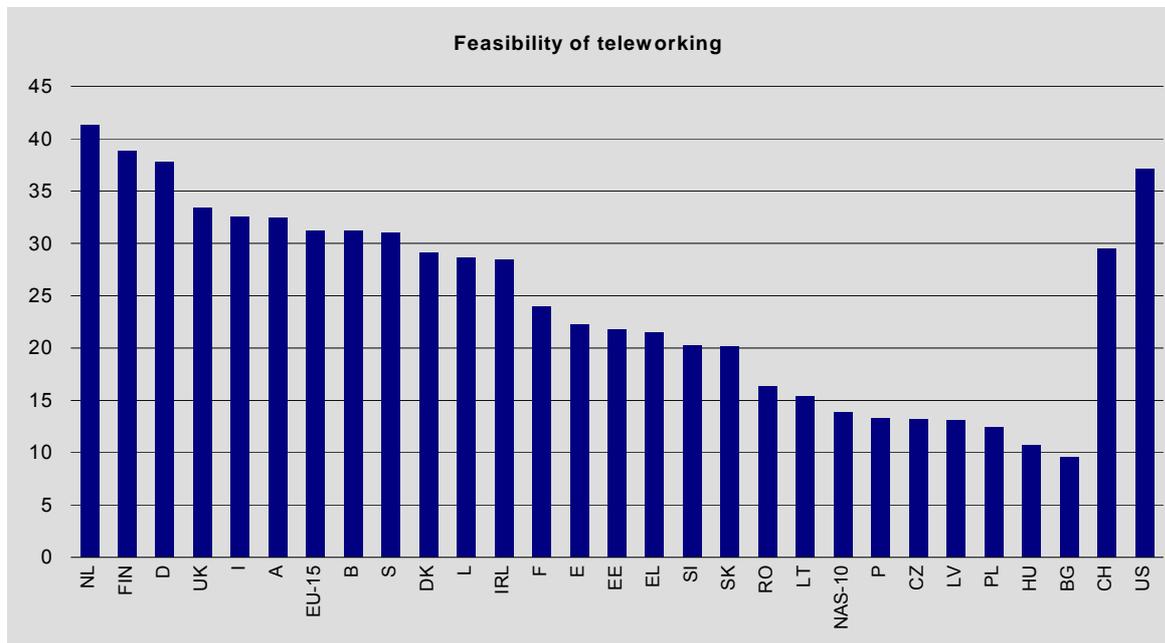


Figure 18 Feasibility of teleworking
 Base: all persons employed, weighted column percentages
 Questions: E9a
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS – NAS

The employed population is sceptical as to the feasibility of telework in the Czech Republic. We can generate the hypothesis that a more optimistic view is typical for young employees.

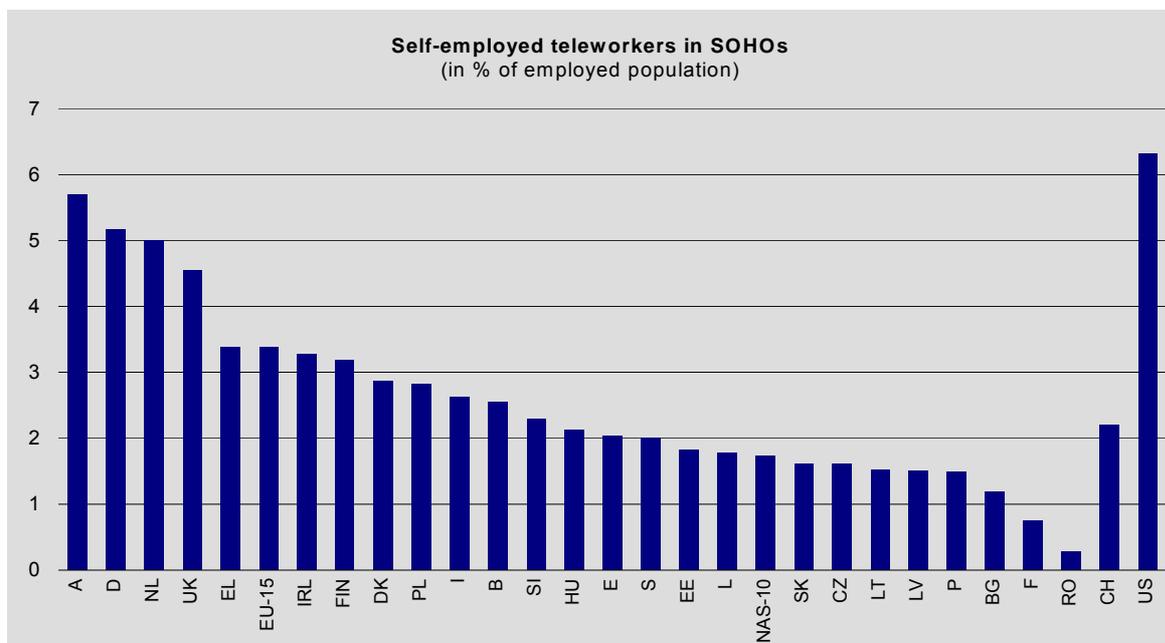


Figure 19 Self-employed teleworkers in SOHOs
 Bases: all persons employed, weighted column percentages
 Questions: IN2, IN4, IN21, A1, E1, G1
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

This figure is another surprise in the area of teleworking (in relation to the telecommunications infrastructure and its use) . The figure (1-2%) for the Czech SOHO (Small Office Home Office) is below the average for the NAS-10. The explanation for this fact lies in the structure of self-employed units and the area of their business activities (segment of business). Another condition (and explanation too) is the low level of acceptance of ICT as an efficient tool for business improvement. Self-employed Tele-workers in SOHOs do not perceive that tele-mediated communication with clients and work partners opens up new possibilities for improving business performance.

9. E-Government

E-Government represents a core component of the many governmental activities, programs and projects in the area of information society development. In GPS-NAS the research was oriented to indicators monitoring the 'government to citizen' (G2C) category of e-government and addressing the demand-side of e-government, for example citizens' perception of e-government services in general.

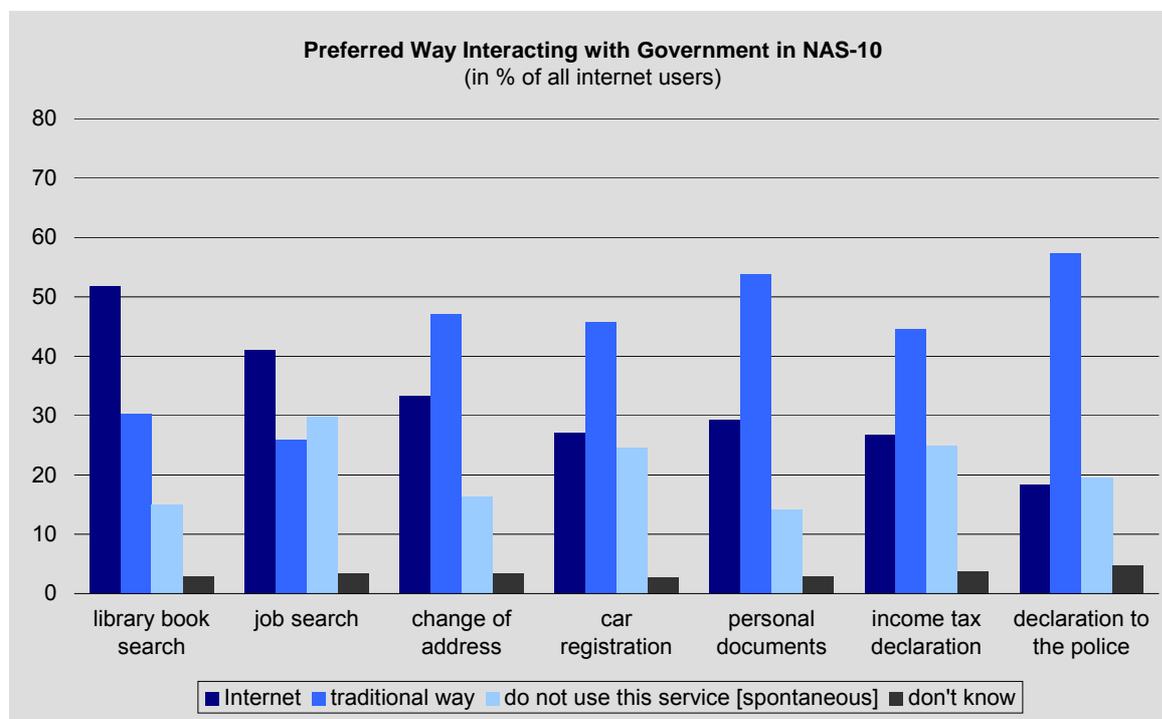


Figure 20 Preferred way interacting with Government in NAS-10

Base: all Internet users, weighted column percentages

Questions: K1A-G

Source: SIBIS 2003, GPS - NAS

From the set of e-government services 50% of regular Internet users prefer e-government services without immediate contact with government authority. E-government services with some necessary further contact with government authority are preferred by around 30% of regular Internet users. A low preference is typical for e-government services such as tax declaration/filing in income tax returns and statements to the police - around 20% of regular Internet users.

In EU-15 countries there is the following order of services (% of online preference, regular Internet users):

- Library book search (EU-15 = 73%, NAS-10 = 55%)
- Job search (EU-15 = 58%, NAS-10 = 42%)
- Change of address ((EU-15 = 42%, NAS-10 = 35%)
- Car registration (EU-15 = 38%, NAS-10 = 28%)
- Personal documents (EU-15 = 35%, NAS-10 = 30%)
- Income tax declaration (EU-15 = 28%, NAS-10= 28%)
- Statements to the police (EU-15 = 17%, NAS-10= 19%)

In EU-15 it appears that preference for e-government services decreases as interaction impinges more upon the privacy of the individual. It is interesting to compare the NAS-10 and EU-15 especially for income tax declaration and statements to the police, where preference is on the same level for both GPS. For other services preference in the EU-15 is greater than in the NAS-10.

We can formulate the hypothesis that preference for e-government services depends on the type of service and kind of transaction between citizen and government authority. General confidence is higher for the information type of e-government services than for the transaction type. We suspect that the preferred way of interaction with the Government depends on the frequency of the particular life event that is related to this government service. Citizens anticipate better value added for e-government services with high frequency of utilisation and will prefer this type of interaction with public services.

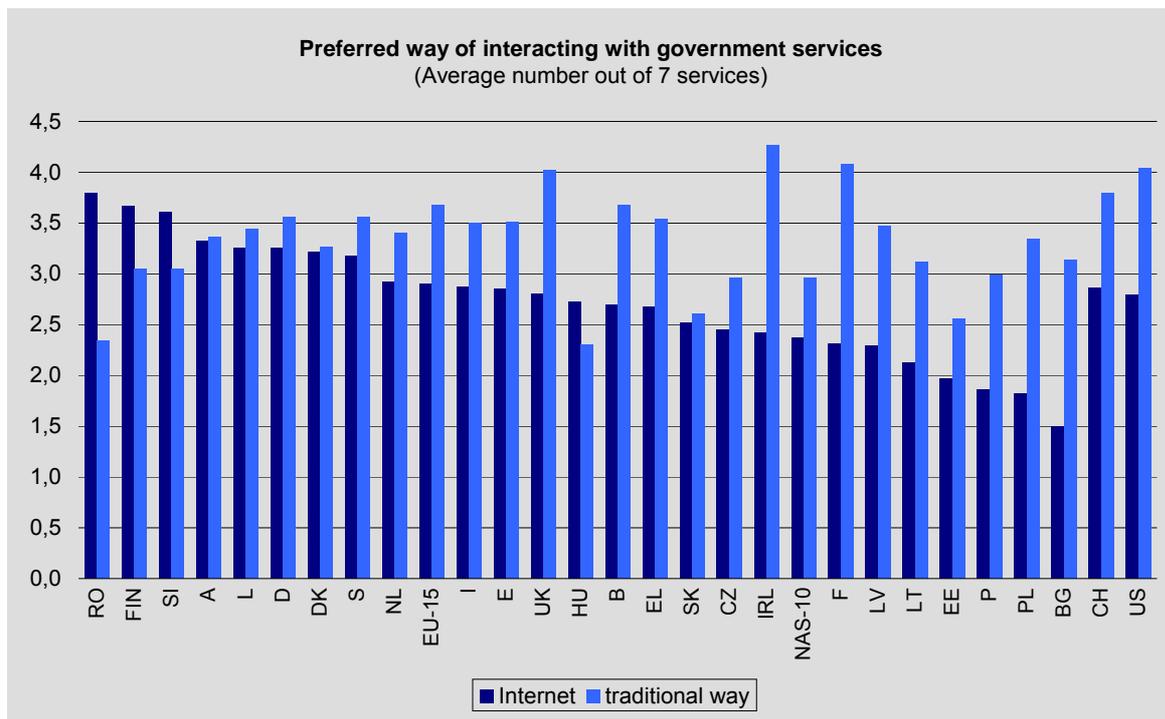


Figure 21 Preferred way of interacting with government services

Bases: regular Internet users, weighted average numbers of services

Questions: K1A-G

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

It is clear that the success of e-government - the preferred way of interacting with government services - depends ultimately on its use. The current situation regarding the preferred way of interacting with government is influenced by tradition and the low level of trust in the modern communication tools used for such types of interaction between the citizen and government authority.

Figures for Czech Internet users are typically located in the middle between those for the EU-15 and NAS-10. Thus:

- 56% of regular Czech Internet users prefer to use the Internet for searching for books
- 48% of regular Czech Internet users prefer to use the Internet for job searches
- 30% of regular Czech Internet users prefer to use the Internet for car registration
- 26% of regular Czech Internet users prefer to use the Internet for requesting a passport, driver's licence, birth certificate or other documents (this is lower than the NAS-10 average).

There are some exceptions. First countries have completely different structures regarding preference of tax declaration/filing in income tax returns. The explanation can be found in history. For the NAS-10 this type of service is very new, with citizens having approximately 10-12 years of experience, compared to many years of experience in the EU-15.

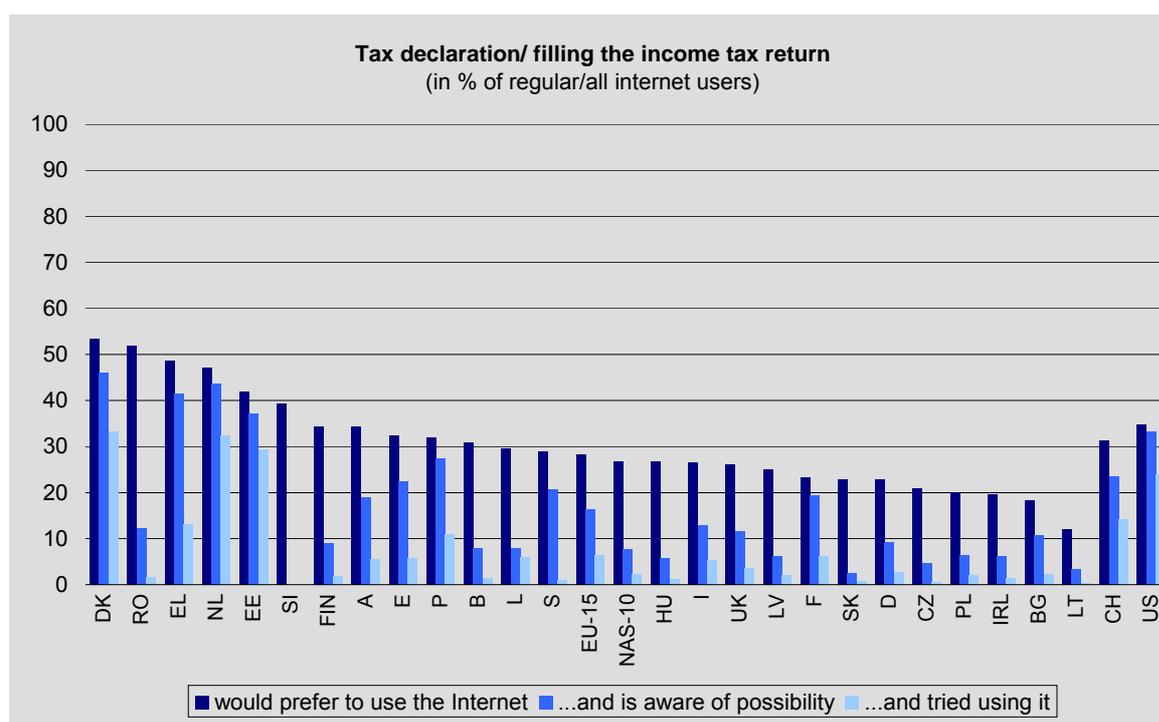


Figure 22 Tax declaration/filling the income tax return

Bases: EU-15 countries: regular Internet users, NAS-10 countries: all Internet users, weighted column percentages

Questions: K1A

Sources: SIBIS 2002, GPS, SIBIS 2003, GPS – NAS

For tax declaration/filing in income tax return 21% of regular Czech Internet users prefer to use the Internet. For statements to the police only 19% of regular Czech Internet users prefer to use the Internet. We can use the same explanation - the historical experience of the citizen - for the structure of the figures and the differences between the NAS-10 and EU15.²³ For announcement of change of address 32% of regular Czech Internet users prefer to use

²³ Annex Chart 15 'Declaration to the Police', Source: SIBIS, GPS

the Internet.²⁴

The base of e-government development is very simple - electronic delivery of services increases the quality of electronic government information. Citizens access to public information and electronic transaction services is one of the basic e-government components (others are Government to Business and Government to Government, i.e. interaction within the central government but also between government agencies (regional representatives of ministries) and decentralised public authorities (regional and local authorities). Many administrative areas are concerned with e-government development: land registry, taxes, passports, welfare and social service, revenue, etc.).

There are two 'technological' conditions for effective e-government services development:

- Improvement of internal working procedures as a part of e-government projects
- The general development of 'customer-orientated' interactive service provision (authentication service, signature certifications, security tools, electronic forms, help desks and call centres, public e-mail and contact directories, job banks) and back office operations (transaction monitoring, information exchange, client feedback, etc.); in short, infrastructure and a common service set for e-government services.

From the point of view of content, for the development of e-government services we can focus on the relation between technological/organisation potential and the needs of the citizen. A citizen will prefer e-government services which are close to everyday needs, close to typical life situations and events (this scenario is used for government portal navigation design). We can form the hypothesis that the new generation with greater Internet experiences and confidence in modern communication will prefer e-government services more than today. At the moment it is about forming citizens' attitudes in relation to new ways of interacting with the government.

²⁴ Annex Chart 16 'Announcement of change of address', Source: SIBIS, GPS

10. Conclusions and recommendations

In terms of the ownership and use of new information and communication technologies either individually or in total, the Czech Republic ranks third among the NAS countries behind Estonia and Slovenia. This third place positions the Czech Republic somewhere in the middle of the NAS countries and the EU state average. However, in contrast to this position, the number of mobile phone owners is higher and the number of fixed telephone line owners is lower.

In the late nineties, PC ownership and availability increased rapidly, mainly among the youth population, and Internet access has grown with a phase shift over the past three years. As the SIBIS research shows, 40 percent of Czech respondents have had Internet access in 2003. Both Internet access and the use of other new technologies are strongly age dependent. As age increases so the number of users of new technology declines. Besides age, Internet access is also influenced by the size of the locality. Internet availability grows proportionally with the size of the locality. Cable access is only available in big cities. Smaller towns are left mainly with the dial-up alternative, which is by far the most common type of Internet connection. As the Czech respondents have indicated, the price of Internet connection is the main barrier hindering the spread of the Internet.

Computer literacy and the use of new information and communication technologies are the main prerequisites of life in information society or e-society. The fast introduction of new technologies into social life comes with the risk that some social groups will not be able to acquire the necessary skills and thus integrate the new technology into their lifestyles. Such groups face the threat of marginalisation from majority society and the main development stream of information society. In particular, the risk of marginalisation is increased by low education, age, and social or health handicaps. On the other hand, gender has no discriminatory effects in terms of computer literacy and gaining access to new technologies.

As age increases so the likelihood of acquiring skills in new technologies decreases. In professions that currently require new technological skills, parts of the older population are partially excluded from labour market competition. The younger generation as a whole has managed to absorb new technologies the best, but there are internal differences in computer literacy. Children from families of a low social and cultural status and of low income do not have the means of owning a PC. In terms of information technology, schools in the nineties lagged behind the spontaneous activities of providing computer literacy to the young, and socially disadvantaged groups of young people with fewer possibilities of acquiring skills and knowledge were left behind a digital barrier. Given that the aforementioned groups mostly do not further their education, this state may become permanent. In this case, new technologies consolidate and strengthen existing social barriers.

Physically handicapped people represent another group with poorer Internet access. Here we can see opposing trends given that new technologies enable the handicapped to work and integrate into society. The trend is supported by projects implemented by the state and other organisations. The Internet can divide people as well as bring them closer together, and often it provides a unique opportunity for handicapped people to become closer.

In a society that applies modern 'learning methods', life-long education has become an important part of the education system. Life-long education is accompanied by a new and revolutionary educational phenomenon, i.e. information and communication technologies providing a new form of e-education (e-learning). In terms of future education, computer literacy and the use of computer tools for education are gaining the same importance as writing and reading had in the past.

As the research indicates, 15 % of employees participated in traditional courses of life-long education over the monitored period. The Czech Republic is thus one of the average EU and NAS countries. The same ranking was achieved with respect to self-educating employees (22 %). Overall, 30 % of respondents further their education through formal methods or by self-education. Besides the traditional forms, the research detected the rise of e-learning, which was used by 8 % of respondents-employees, of which 5 % used electronic tools online and 3 % offline.

The relation between commerce and the Internet is a relatively new phenomenon in the Czech context, since the Internet has only spread widely in the last three years. Therefore, it is a second-degree innovation. The main communication innovation, i.e. the Internet, is followed by further innovative activities like commerce or e-economy. The faster integration of new technologies into the economic field and commerce is hindered by low confidence in the Czech entrepreneurial environment and among the public. Such distrust results from citizens' experience with the 'tunnelling' of funds, fraud, bad debts, prolonged court litigations, and similar phenomena.

The search for information about products and services is the most widespread form of Internet use. Despite the reserved attitude of the citizens, activities in other fields have also gradually expanded. Thanks to the permanent pressure exerted by banks, most banking operations and current account payment orders have been transferred to on-line banking. Quite a number of respondents that are active in the e-economy have two years experience, which indicates a possible slowdown of the application of new technologies in the economic sphere. This could be caused by the global deceleration of transformation into the e-economy.

Only a small part of the Czech population (8 %) ordered some sort of product or service, conducted on-line banking, or bought financial products during the four weeks previous to the survey. This is more than in NAS-10. Leaving the last four weeks aside and looking at the whole year, the numbers are more positive. In this group of Internet users,

- 72 % found information about a product,
- 34 % searched for health-related information,
- 21 % looked for a job,
- 16 % ordered a product or a service,
- 8 % conducted on-line banking or bought a financial product.

Barriers to e-commerce don't only exist among citizens, but also among companies. Companies use electronic mail widely and have their own websites, but electronic banking is rather rare.

Information society is characterised by the environment flexibility of providing broader space for decision-making and the activities of individuals. Looking at the development of flexibility, the main parameters to consider are working time, the work place, the type of contract, and the work content, i.e. the skills applied in the production process. E-work is one of the main areas to reap the benefits of the information society and to draw on the infrastructure of information and communication technologies. While the first phases of information society creation were mostly about investments for future benefits, e-work already applies the target parameters of information society in real terms. A comparison of the Czech Republic with other EU and NAS countries with respect to the individual parameters of environment flexibility indicates that the Czech Republic is lagging behind. Unlike EU workers, Czech citizens have significantly fewer possibilities to influence the start and finish of working hours and so to optimise their work time according to individual needs and conditions. The Czech Republic is not above average among the NAS countries either. So far, Internet-driven work from home hasn't spread widely across the Czech Republic. This feature of e-work

environmental flexibility is more underdeveloped than the hours of work. In the CR, work from home that is dependent on Internet connection is at a lower level than in average EU and NAS countries. The current state of e-work spread does not correspond to the level of the Czech information society infrastructure, although the interest of Czech employees as discovered by the SIBIS research is higher than in the EU and NAS countries. Underdevelopment in this field could be attributed to a certain psychological conservatism, but also to the fact that the legislation in force provides no support to such development trends.

E-government represents a core component of many governmental activities, programmes and projects in the area of the development of information society. In a comparison of the attitudes and opinions of citizens on e-government services in various countries, we encounter a different attitude to the introduction of individual e-government services as a whole. The Czech Republic has only started to implement e-government and many services are still at the preparatory phase. In this case, respondents were opining on phenomena with which they had no experience, while such services are already in use in other countries.

The main attribute of e-government is new interactive communication with state administration. Given that the SIBIS research was focused on Internet users, we only have the opinions of this group in terms of the methods of communication with state administration. In all NAS countries, more than 50 % of respondents preferred an interactive search for books as opposed to the 30 % in favour of traditional methods. Such a service already exists in reality and, for this reason, the responses have a different information value than for services that are as yet non-existent. E-government has two prerequisites - the service has to exist and the population has to have Internet access. Comparing the preferences of individual e-government services in the EU and NAS countries, there are dramatic differences in interactive service preferences as responses were only given by Internet users. Hence, the number of Internet users is decisive and determines the ratio of the population with positive attitudes to e-government. Attitudes to individual services aren't only determined by a model service form, but also by the actual experiences of the users. If there are continuous problems, mainly older people will prefer the traditional ways of communication. Attitudes to e-government and its services are age dependent. Young people are more willing to accept new electronic forms. In particular, university students will fast become familiar with e-government as university administrative issues and communications are widely handled on the Internet and through internal networks. Czech society suffers from excessive bureaucracy and citizens aren't always satisfied with civil servants' attitudes towards them. E-government provides a historic opportunity to deal with this traditional problem. E-government is an advanced service for the formative information society and the Czech Republic is still at the beginning. Therefore, experience with e-government implementation and functioning in other countries is very valuable.

Research Recommendations

Besides a mechanical comparison of phenomena (through indicators), taking into account how far individual countries have gone in building an information society also means comparing countries by the level of implementation of the information society; to make a development trajectory of information society, to define its points/phases and to determine the indicators of development; To place the countries on this development trajectory and compare them mechanically and in terms of their trajectory position; to examine the effect of information and communication technologies on children, students, and people in general; to analyse the level of Internet literacy and Internet use for the purposes of seminar papers. Students build such papers from various texts as they would a jigsaw. Thus they acquire new skills, but don't develop traditional skills and thought patterns. In terms of e-exclusion, the Rom population constitutes the main risk group. As this minority lives throughout Europe and computer literacy is important for the future, we recommend analysing the computer literacy of this ethnic group and the influencing factors.

11. Abbreviations and definitions

Accessibility (of the Information Society, non-technically defined) - Relates to the concept of taking into account the different needs of the 'end-users' with the overriding principle that all citizens should be participants in the Information Society. The concept is particularly relevant to the participation of people with disabilities and is related to the 'Design for All' concept.

ADSL - Asymmetrical Digital Subscriber Line

B2B eCommerce - Business-to-business eCommerce (electronic transactions)

B2c eCommerce - Business-to-consumer eCommerce (electronic transactions)

Bandwidth - The physical characteristic of a telecommunications system that indicates the speed at which information can be transferred. In analogue systems, it is measured in cycles per second (Hertz) and in digital systems in binary bits per second. (Bit/s).

Broadband - Broadband is generally defined as the capacity to transfer data at rates of 2Mbit/s (bits per second) or greater.

Dial-up - Describing the process of establishing a temporary connection via the switched telephone network.

Digital divide - This term is multidimensional in a sense that denotes the gap between individuals (citizens), groups of individuals, households, business establishments, geographic areas and countries with regard to access to and usage of information and communication technologies (ICTs), or the 'Information Society'. At micro level, the main focus is on the differential among citizens and / or particular groups of citizens and / or communities in relation to their closeness to, and subsequently, their potential to benefit from the Information Society. The most relevant digitally 'have nots' have already been identified: people with disabilities, people from generally disadvantaged background (e.g. unemployed), and people from ethnic minorities, with some overlapping between these categories. The majority of main underlying reasons behind digital divide at this level can be grouped under two broad headings – access and skills. The former relates to the level of country's socio-economic and infrastructure development and its access-enhancing policies, coupled with the individual's potential and motivation to access and participate in the Information Society. The latter relates to whether and to what degree are individuals equipped with relevant skills (i.e. skills in using various ICTs).

Digitally literate - A person who is IT skilled to a level that makes it possible for him/her to participate in work that involves the use of computers.

eCommerce - Electronic transactions in goods and services. Covers shopping, negotiation, contracting, purchase, payment, fulfilment, etc.

eEurope - On 8 December 1999 the European Commission has launched an initiative entitled 'eEurope: An Information Society for All', which proposes ambitious targets to bring the benefits of the Information Society within reach of all Europeans. The initiative focuses on ten priority areas, from education to transport and from healthcare to the disabled.

eGovernment - The use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.

eHealth - (Also, telemedicine) Maximising the services provided by the health system through the use of ICT.

eWork - The organisation and execution of work by actors in (partly or fully) virtual business communities. Alternatively, the term can also refer to specific new professions related to the internet and/or involving a high degree of ICT usage.

ICT (information and communication technology)

Integrated Services Digital Network (ISDN) - An international telecommunications standard for transmission of voice and data over dial-up lines running at 64 Kbps. It allows sharing of multiple devices on a single line (eg phone, computer, fax). Two B channels are for voice and data and one D channel is used for control as out of band signalling allowing special features. Basic Rate Interface (BRI or ISDN 2) provides two B channels at 64 Kbps each, and one D channel at 16 Kbps. Primary Rate Interface (PRI) provides two 32 Kbps B channels, plus a D channel at 16 Kbps.

Life-long learning - Learning all life in working life and spare time - not only at school, universities etc.

Narrowband - A service or connection allowing only a limited amount of information to be conveyed, such as for telephony. It compares with broadband which allows a considerable amount of information to be conveyed

Knowledge (-based) economy - That portion of the intangible economy engaged in the production, distribution and use of knowledge.

NAS - Newly Associated States

Short Message Service (SMS) - Is a wireless bearer service initially used in paging systems and now available on GSM. It is based on Time Division Multiple Access (TDMA) techniques and allows the exchange of short messages over digital control channels.

Social exclusion - The term relates to those individuals and groups of people whose quality of life and ability to fully participate in society is severely curtailed. For the purpose of simplicity and consistence it is defined as an opposite of social inclusion – it is visible in terms of distance / gap, it negates a sense of belonging / creates the sense of alienation, and it is a process that adversely affects particular groups / individuals in a society. In the real life, it is manifested when individuals and / or group(s) of people are experiencing (usually a combination of linked) problems such as unemployment, poor skills, low incomes, poor housing, high crime environments, bad health, at a higher than average rate. The normal cause and effect path does not apply to the concept of social exclusion: its causes are interconnected, and its effects themselves become causes of further exclusion; for example, poverty is both a key cause of social exclusion and its key effect. It is also defined as a process whereby any person becomes marginalised in society on the basis of ethnicity, gender, disability employment status or any other attribute.

Teleworking - Work carried out using the telematics infrastructure at a place other than that where the results of the work are needed. This definition covers home, mobile or 'telecottage'-based teleworkers employed by an organisation, independent workers and teleservice companies offering specific services to both firms and individuals.

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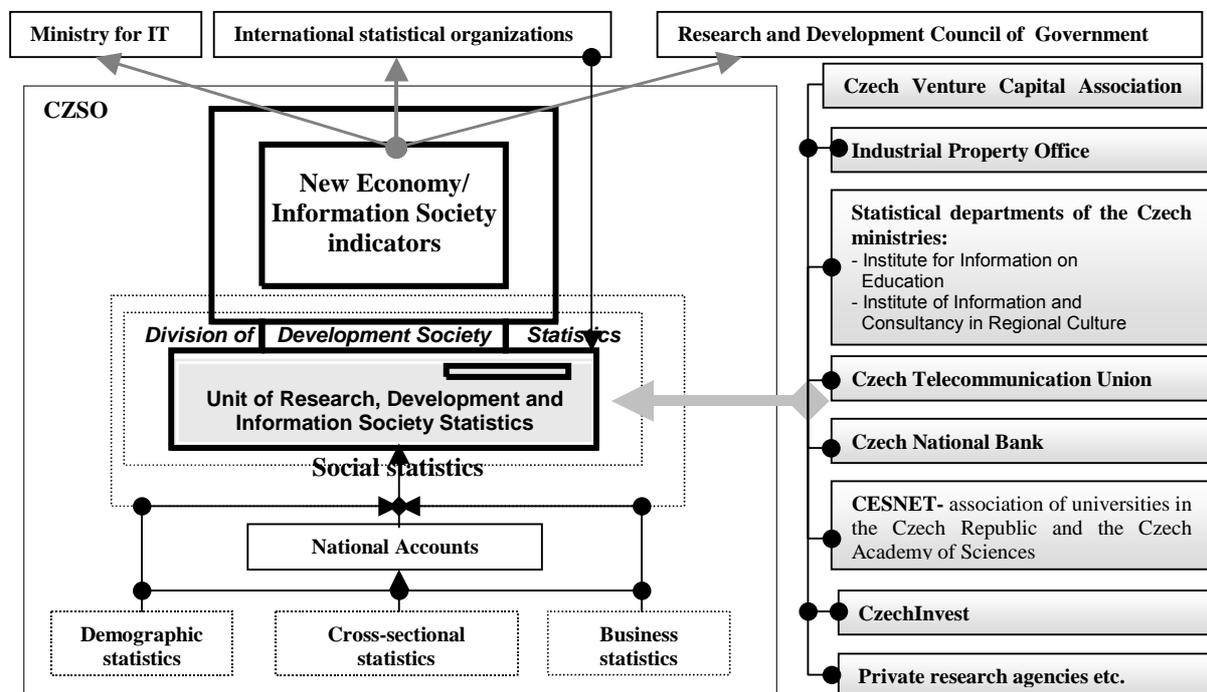
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13. ANNEX 1: Additional data and analyses

Scheme 1: Securing information for IS/NE statistics at the Czech Statistical Office



Source: CZSO

Scheme 2 Matrix of indicators for the Information Society and New Economy Statistics

CORE CATEGORIES FOR ICT INDICATORS					
		Stock	Diffusion	Usage	Impact
<i>Readiness and Intensity indicators ⇒ Digital divide</i>					
ACTOR MODEL	Individuals/ households	ICT infrastructure (Physical capital) ICT literacy (Human & knowledge capital)	ICT penetration into households ICT expenditure in households and by individuals	Frequency and way of using ICTs by households and individuals. Purpose and nature of activities on the Internet. E-commerce (B2C, C2C)	Economic and social impact of ICT usage on individuals and households
	Businesses	ICT infrastructure (Physical capital) IT skills and ICT specialists (Human capital) Information sector	ICT penetration into enterprises ICT investment and expenditures in enterprises	Frequency and way of using ICTs by enterprises. Purpose and nature of activities on the Internet. E-commerce (B2C, B2B)	Economic and social impact of ICT usage on enterprises Changes in business processes, organizing work, way of doing business etc.
	Government	ICT infrastructure (Physical capital) Content (Information capital)	ICT penetration into regions and municipalities ICT investment and expenditures in government	Frequency and way of using ICTs by authorities. Purpose and nature of activities on the Internet. E-procurement	Changes in the relations between government and individuals/enterprises E-government
	Education system	ICT infrastructure (Physical capital) Schools with ICT education programme ICT diplomas (Human & knowledge capital)	ICT penetration into schools and universities	ICT use by pupils/ students/ teachers	ICT investment in compulsory and higher education institutions Students following IT related courses Changes in system of education
COMPOSITE INDICATORS FOR THE NEW ECONOMY STATISTICS (New Economy Index of the Progressive Policy Institute, Technology achievement index of UN) <small>Combination of ICT indicators; Knowledge Society indicators; R&D, patents and innovation statistics, Social statistics etc.</small>					

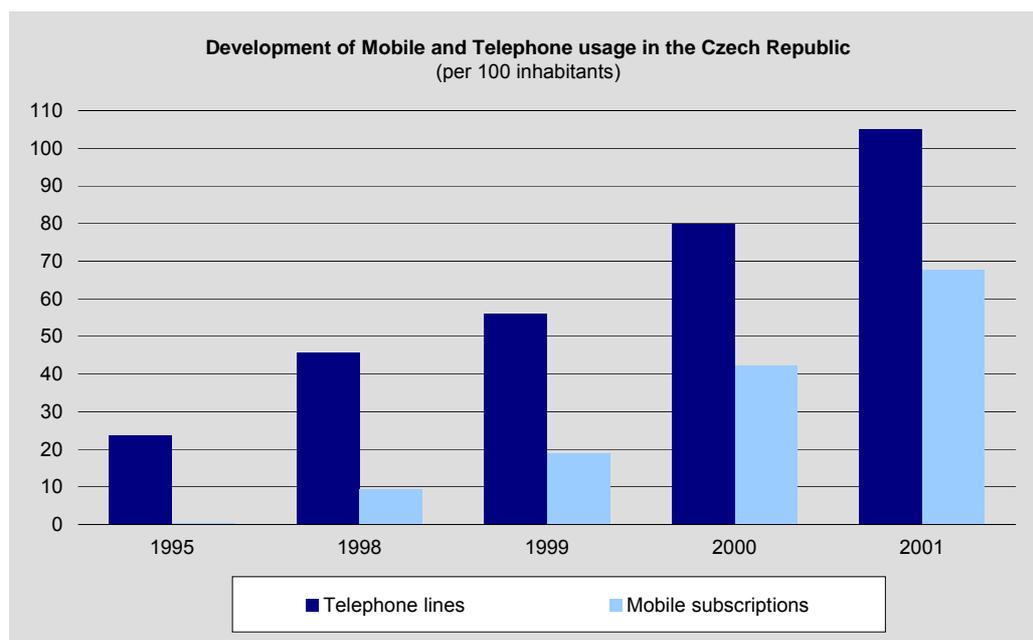


Figure 1 Development of Mobile and Telephone usage in the Czech Republic
Source: CZSO

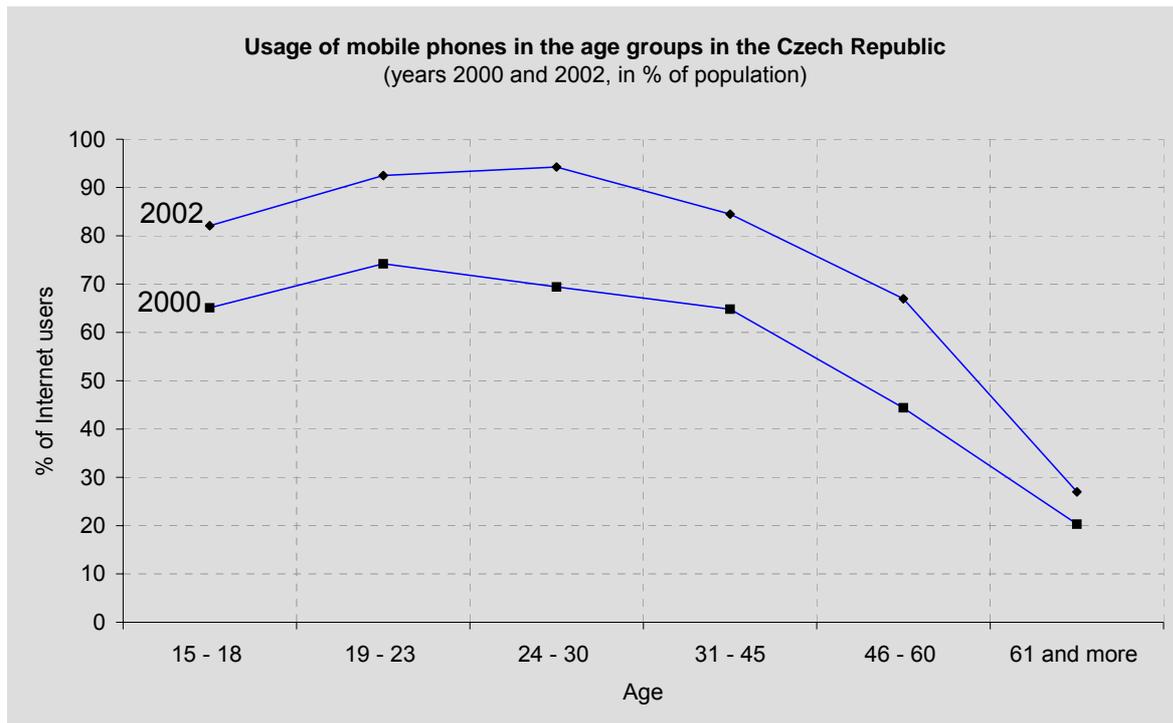


Figure 2 Usage of mobile phones in the age groups in the Czech Republic
 Source: Sak, Saková: *The Informatization of the Czech Society in the Context of Globalization and the European Integration*, Prague 2003

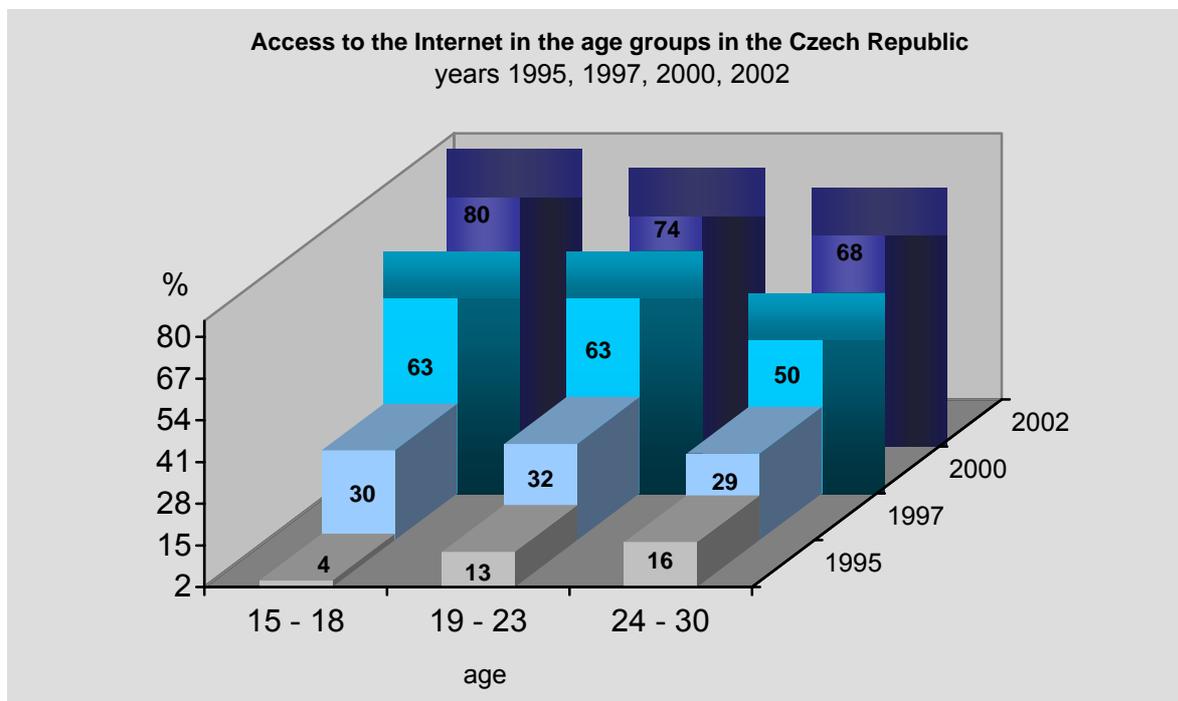


Figure 3 Access to the Internet in the age groups in the Czech Republic
 Source: Sak, Saková: *The Informatization of the Czech Society in the Context of Globalization and the European Integration*, Prague 2003

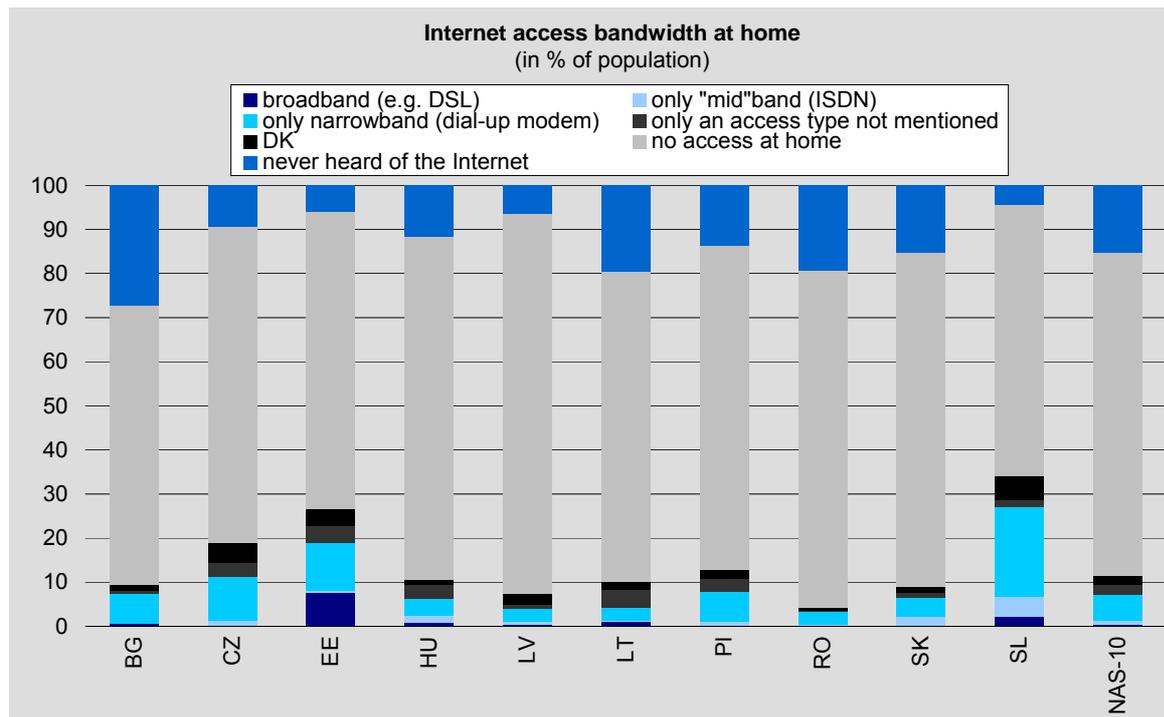


Figure 4 Internet access bandwidth at home
 Bases: all respondents, weighted column percentages
 Questions: A9
 Source: SIBIS 2003, GPS - NAS

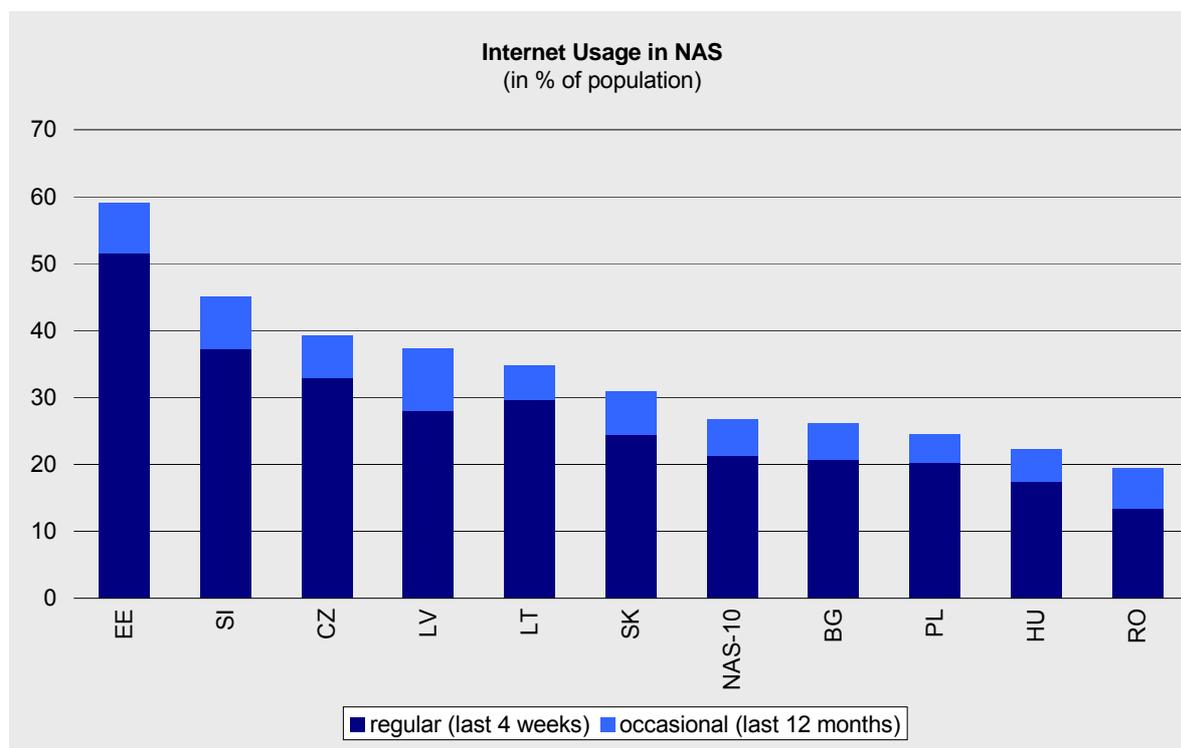


Figure 5 Internet Usage in NAS
 Bases: all respondents, weighted column percentages
 Questions: A7, A8
 Source: SIBIS 2003, GPS - NAS

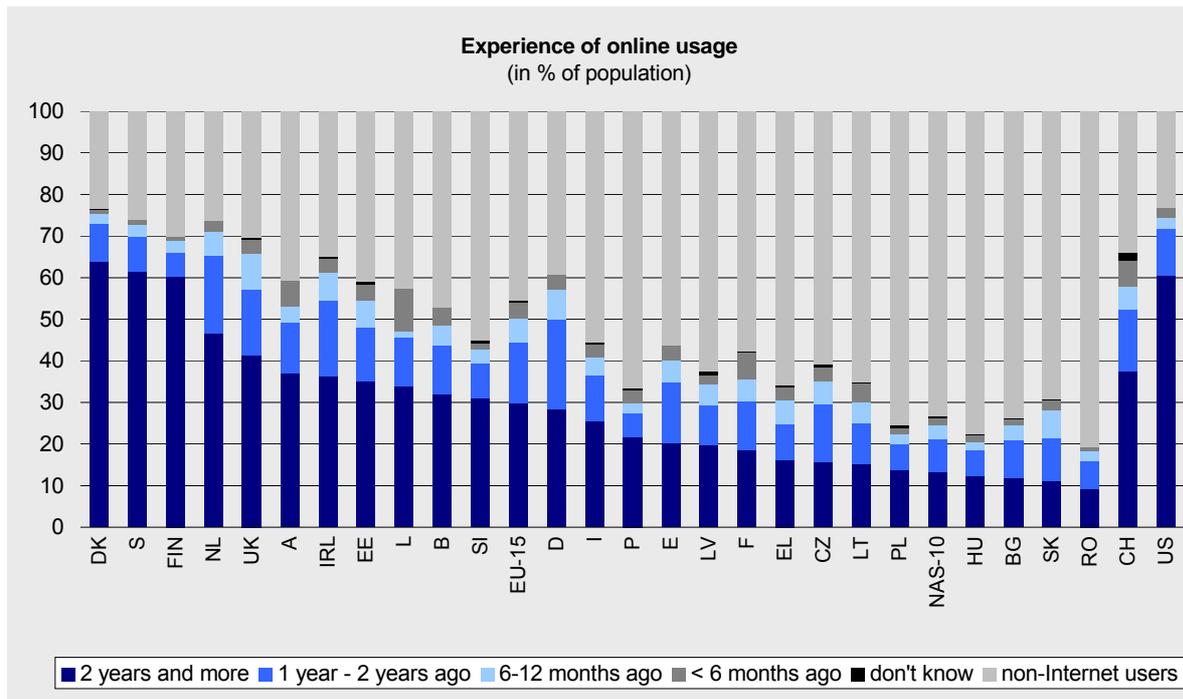


Figure 6 Experience of online usage
Base: all respondents, weighted column percentages
Question: A10
Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

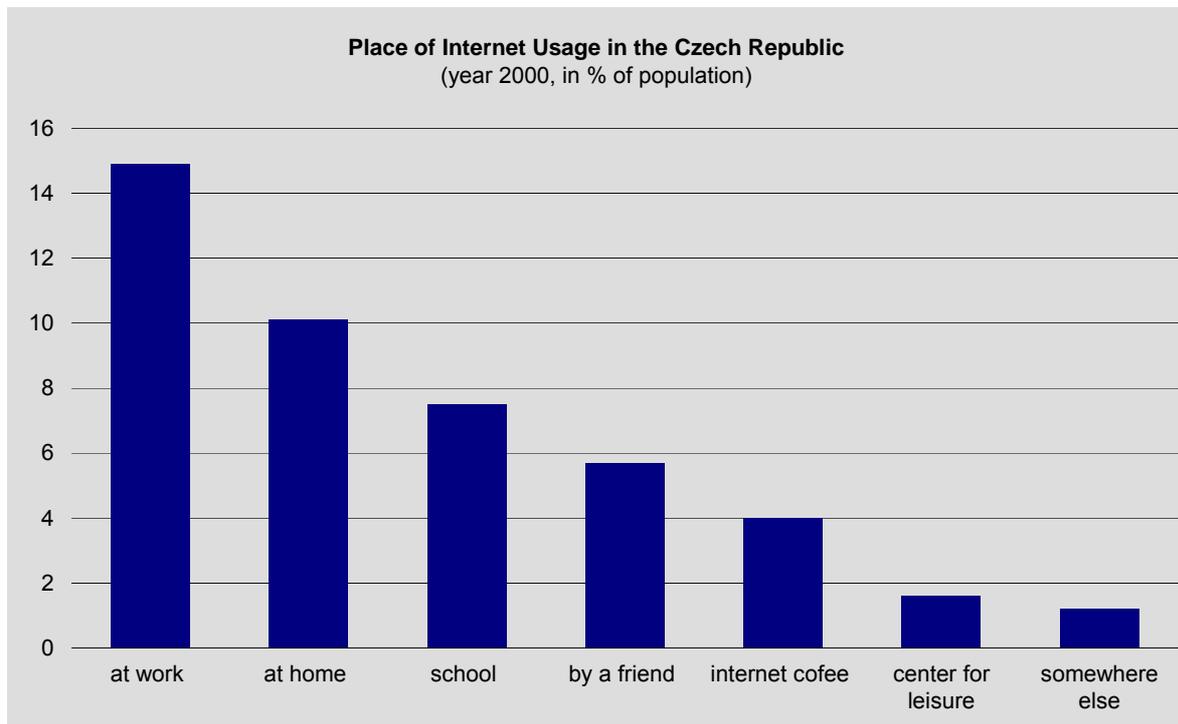


Figure 7 Place of Internet Usage in the Czech Republic
Source: Sak, Saková: The Informatization of the Czech Society in the Context of Globalization and the European Integration, Prague 2003

Table 1 Transport and communications

TRANSPORT AND COMMUNICATIONS					
Telecommunications: basic information					
Indicator	1995	1998	1999	2000	2001
Radio transmitters	165	169	168	169	162
TV transmitters	118	167	182	199	209
Digital radio and television broadcast transmitters	.	.	.	2	2
Long-distance transmission network					
Length of cable conductors					
Twisted pair (km)	1 284 922	1 203 275	1 084 888	1 012 632	902 005
Fibre (km)	82 719	626 868	720 673	752 143	964 866
Aerial cables (km of twisted pair)	3 513	1 615	1 622	1 309	0
Main telephone lines connected to					
Digital exchanges	479 499	2 429 736	2 938 136	3 318 876	3 681 441
Analog exchanges	1 915 573	1 311 756	868 001	552 775	179 402
<i>Telephones in public networks, total</i>	2 443 972	4 710 252	5 750 690	8 217 660	10 807 994
<i>Main telephone lines</i>					
<i>Residential</i>	1 563 519	2 584 162	2 686 979	2 662 790	2 631 613
<i>Business</i>	765 344	1 044 788	1 007 366	983 551	1 193 958
Telephone lines per 100 inhabitants	23,7	45,8	56,0	80,0	105,2
Mobile subscriptions, total	48 900	968 760	1 944 553	4 346 009	6 947 151
Mobile subscriptions per 100 inhabitants	0,5	9,4	18,9	42,3	67,6
Waiting list for main telephone lines, total	691 961	146 628	77 896	35 173	30 510
Residential	493 732	108 761	54 088	22 540	19 630
Public payphones, total	21 104	29 889	30 082	30 085	28 351
Card operated	9 767	18 230	18 629	18 828	17 487
Directly dialled telephone traffic (local, long-distance and international, thous. minutes)	9 772 299	12 175 670	11 785 169	10 586 332	12 300 346
Internet access services					
Number of users	.	81 240	199 365	418 448	1 256 664
Number of computers permanently connected to Internet	.	.	.	1 199	11 595

Source: Czech Statistical Office

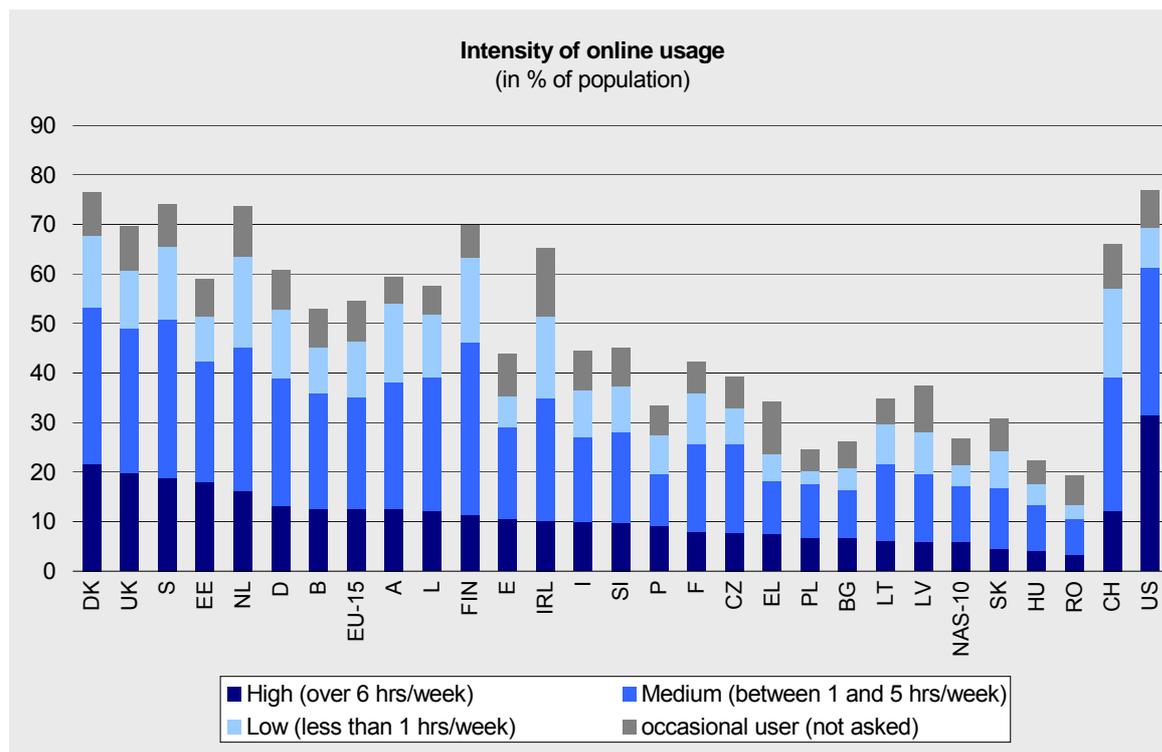


Figure 8 Intensity of online usage
 Bases: all respondents, weighted column percentages
 Question: A9
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

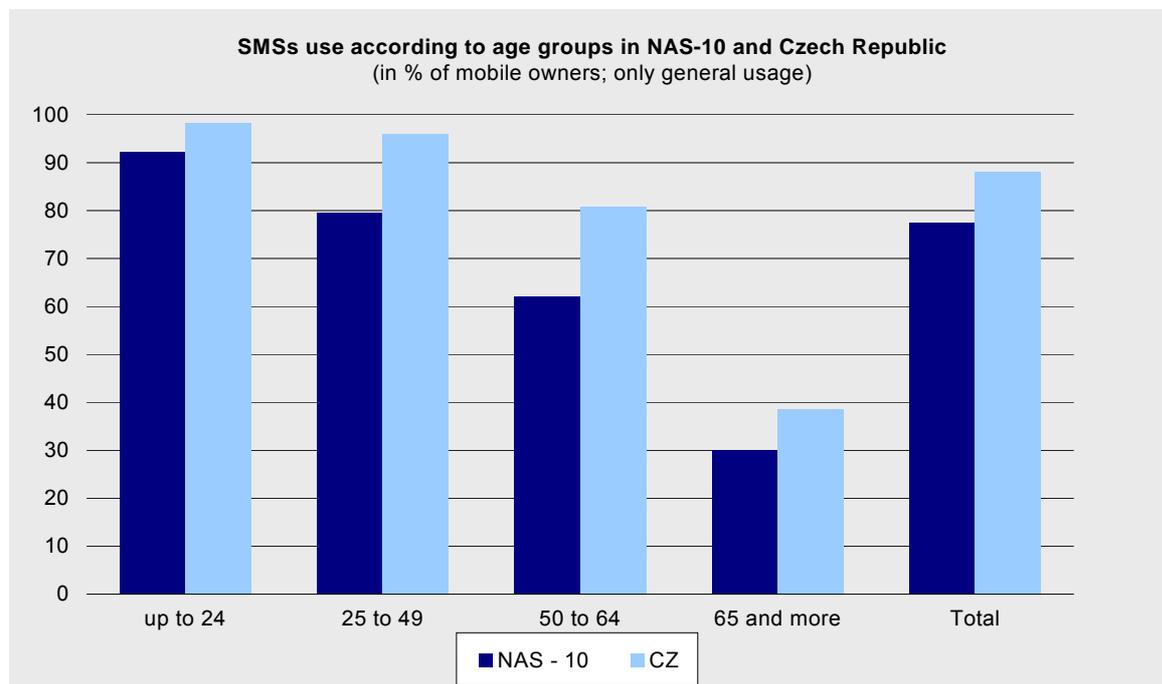


Figure 9 SMSs use according to age groups in NAS-10 and Czech Republic
 Bases: mobile phone owners, weighted column percentages
 Question: A27
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

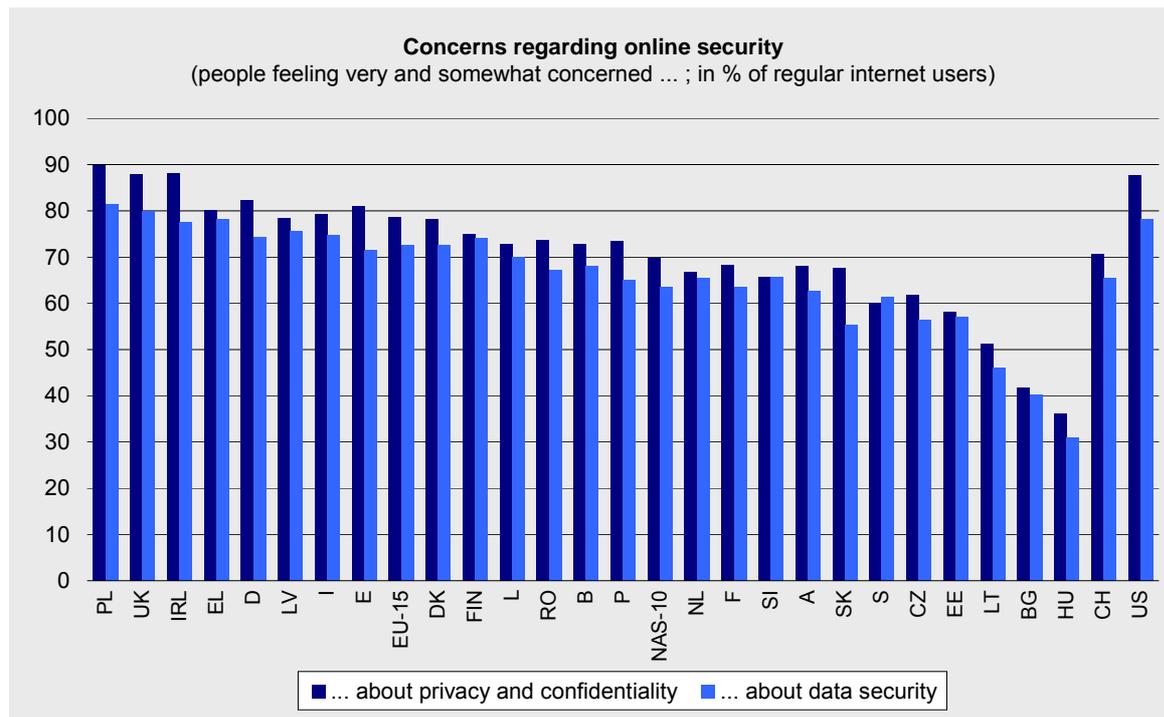


Figure 10 Concerns regarding online security
 Bases: regular Internet users, weighted column percentages
 Questions: J1a, J1b
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

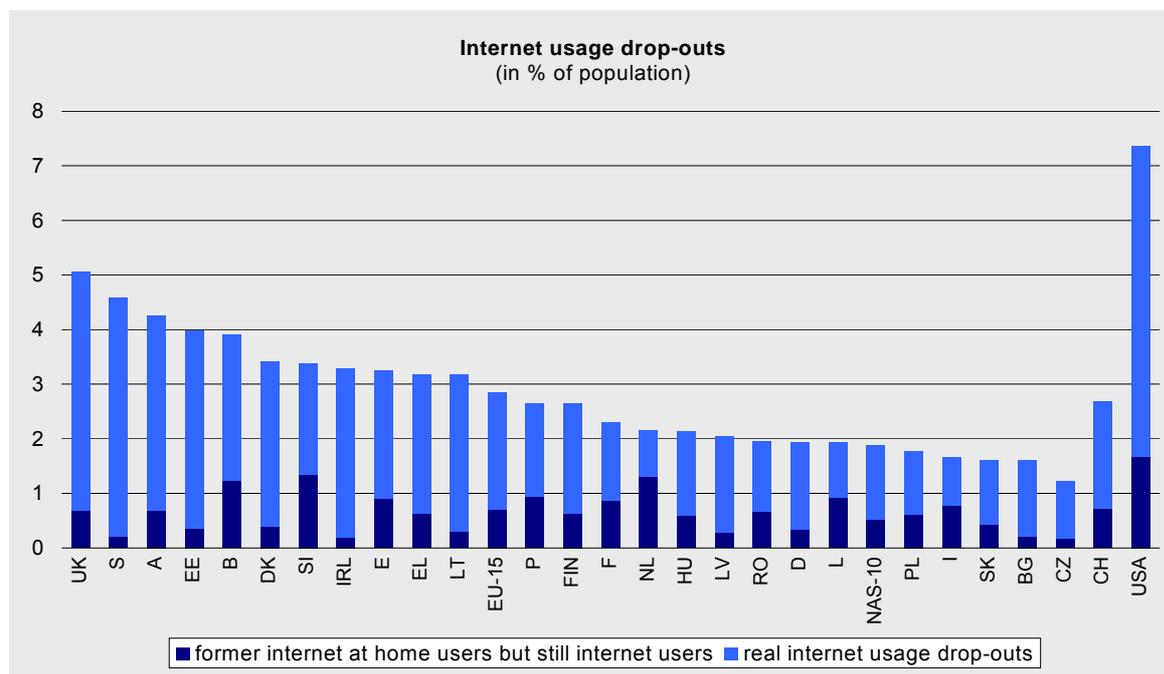


Figure 11 Internet usage drop-outs
 Bases: all respondents, weighted column percentages
 Questions: A6, A7, A8, A9
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

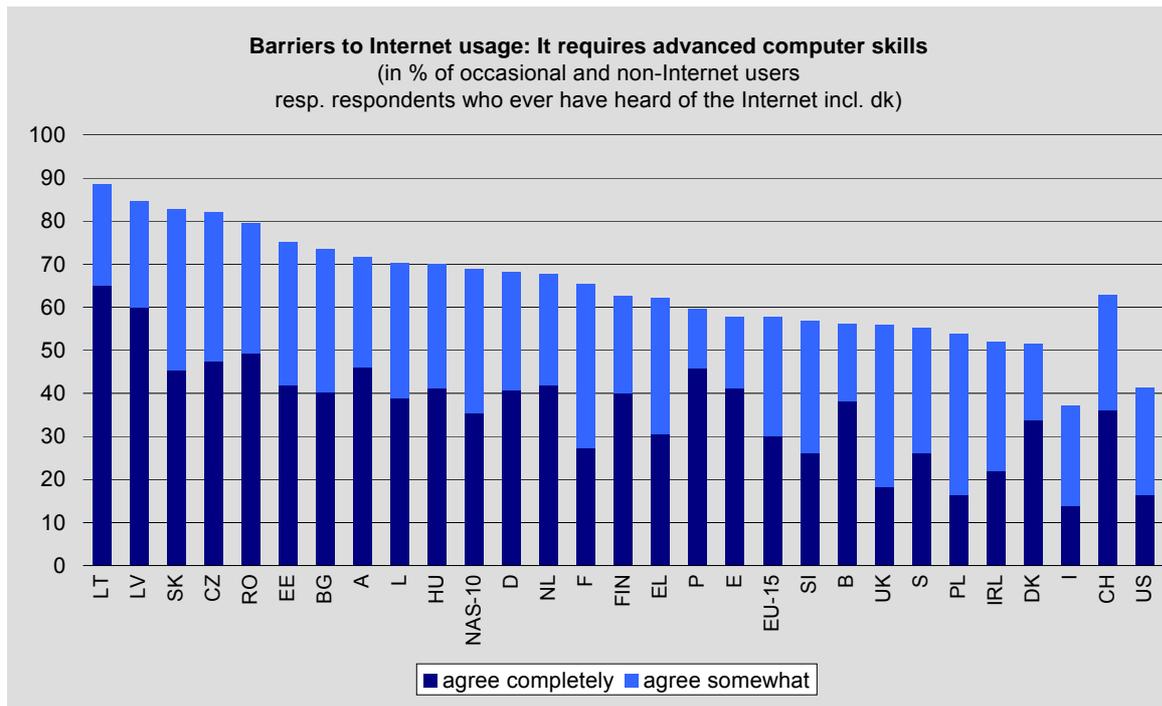


Figure 12 Barriers to Internet usage

Bases: EU-15 countries: occasional and non-Internet users; NAS 10 countries: respondents who ever have heard of the Internet (incl. don't know); weighted column percentages

Questions:

A18A

Source:

SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

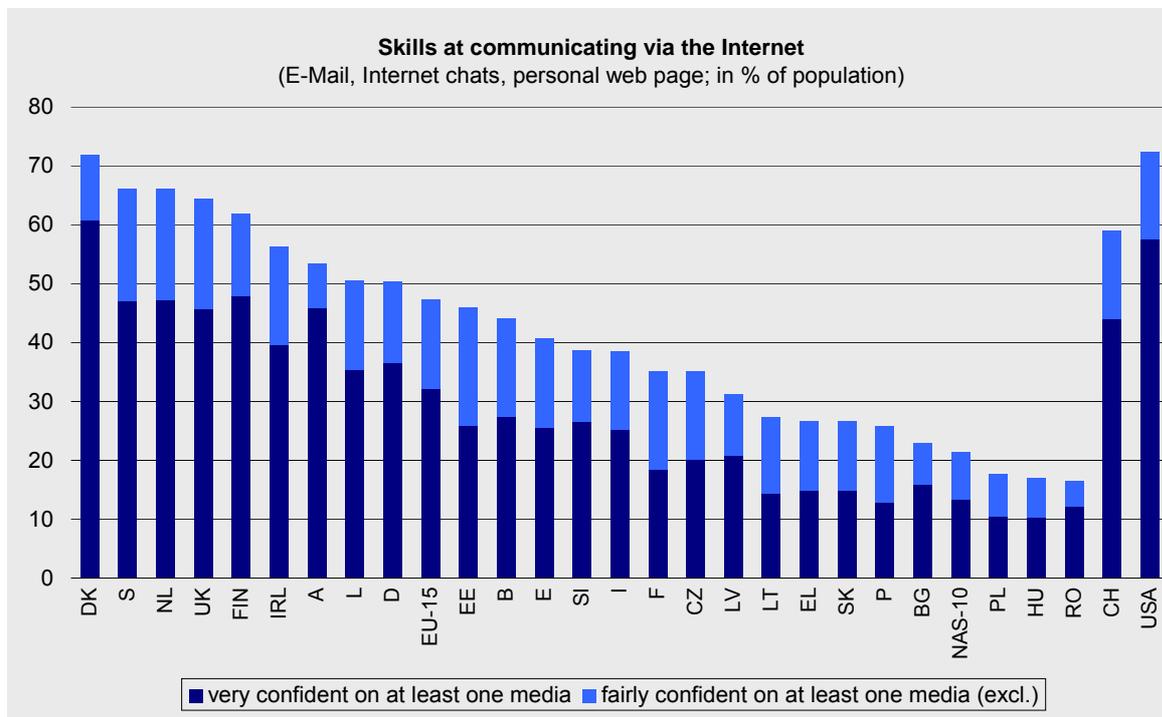


Figure 13 Skills at communicating via the Internet

Base: all respondents, weighted column percentages

Questions:

D1 C, D, F

Sources:

SIBIS 2002, GPS, SIBIS 2003, GPS-NAS

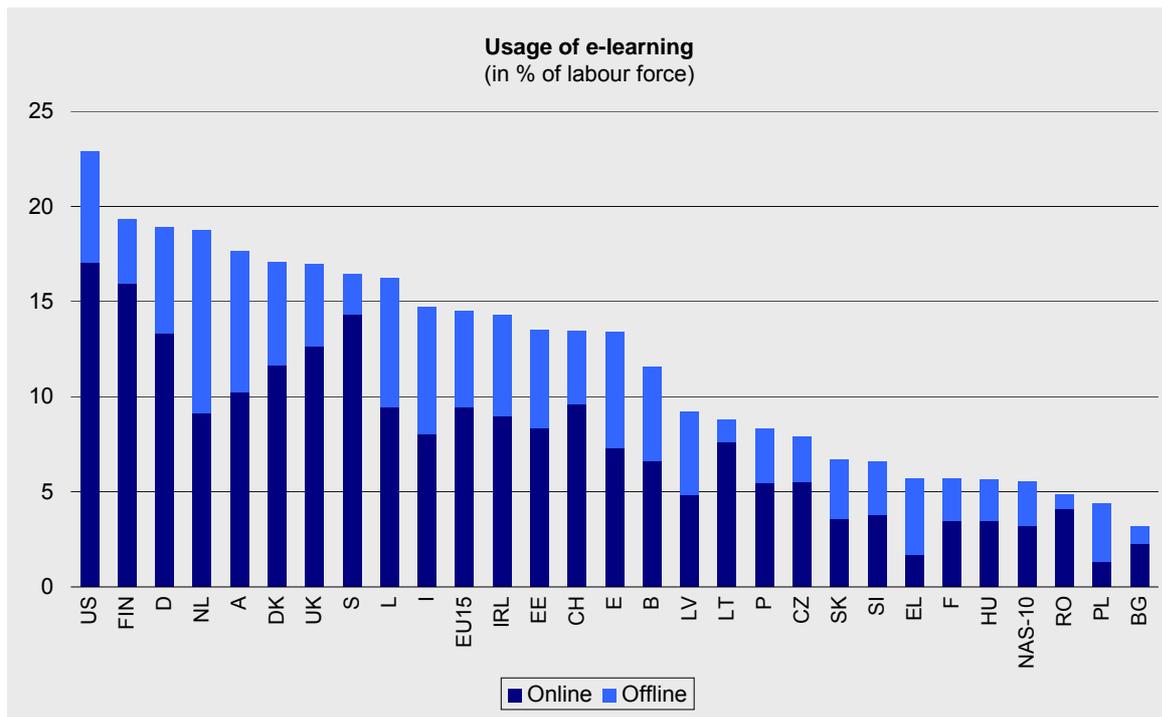


Figure 14 Usage of e-learning
 Base: labour force, weighted column percentages
 Questions: C19 A, C
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

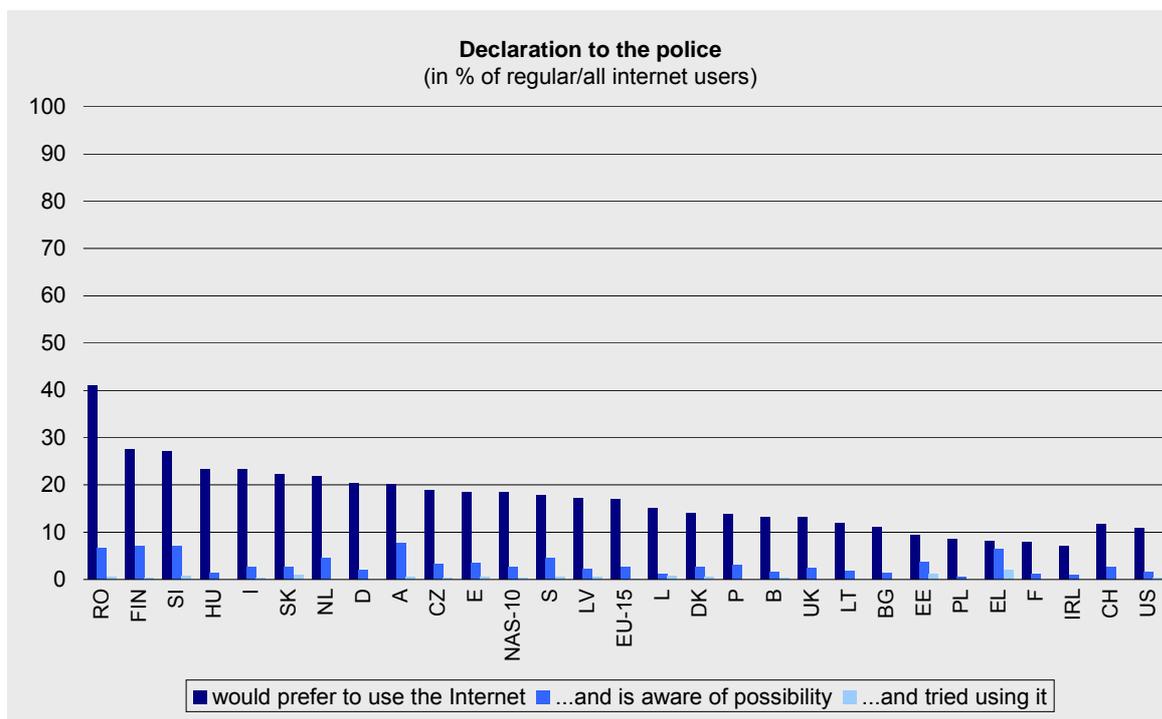


Figure 15 Declaration to the police
 Bases: EU-15 countries: regular Internet users, NAS-10 countries: all Internet users, weighted column percentages
 Question: K1E
 Sources: SIBIS 2002, GPS, SIBIS 2003, GPS - NAS

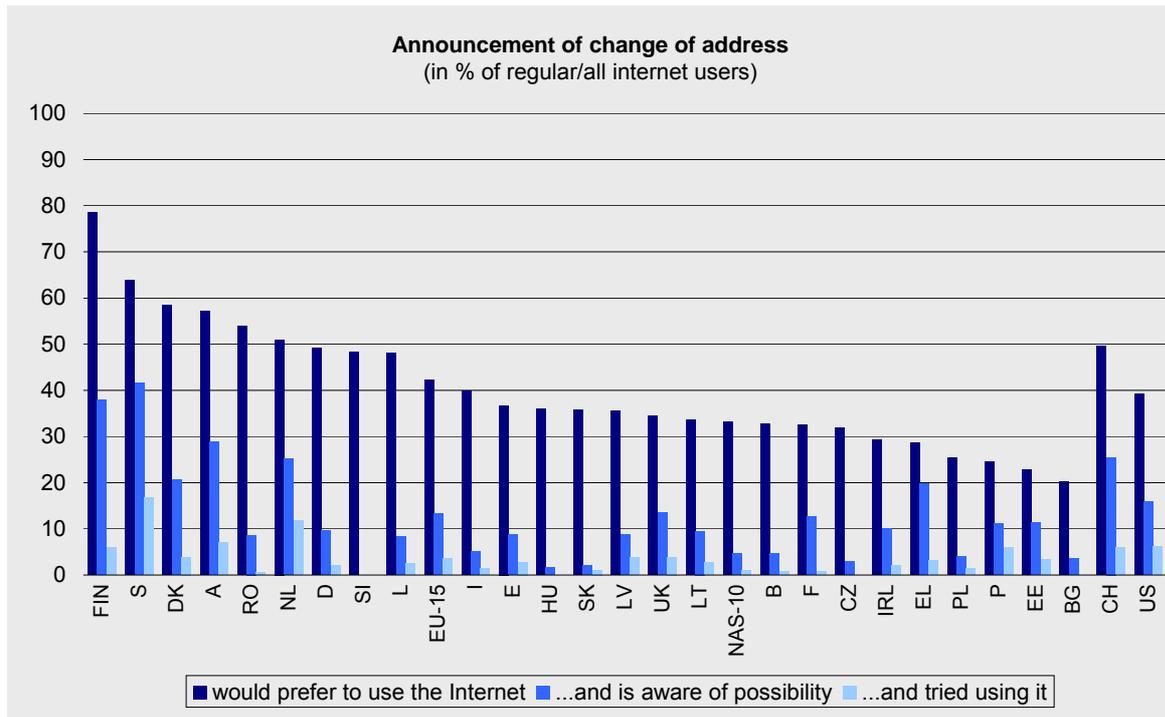


Figure 16 Announcement of change of address

Bases: EU-15 countries: regular Internet users, NAS-10 countries: all Internet users, weighted column percentages

Questions: K1G

Sources: SIBIS 2002, GPS, SIBIS 2003, GPS – NAS

14. ANNEX 2: Methodology

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

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