21. INFORMATION SOCIETY

The information society statistics aim is, on one hand, to provide data on the production and supply of advanced information and communication technologies, including data on investments, external trade, qualified human resources in this field and, on the other hand, on the penetration, rate, and forms of these technologies and systems utilisation in enterprises, households, public administration, education, and health.

*The term of **information and communication technologies** (hereinafter as the ICT) shall generally mean technologies as mobile phones, computers, and the Internet and systems, activities and processes connected to them, which contribute to the imaging, processing, storage and transmission of information and data in an electronic form.*

Data given in this Chapter were acquired, in most cases, from regular statistical surveys of the CZSO, that is, first of all, from annual surveys on the ICT use in respective sectors of the society and, furthermore, from statistics of the Czech Telecommunication Office, Institute of Health Information and Statistics of the Czech Republic, and on the Ministry of Education, Youth and Sports.

Notes on Tables

*Table **21**-1 and **21**-2 **Telecommunication and Internet infrastructure***

Data are taken from data sources of the Czech Telecommunication Office, except for the number of registered domains.

*A **subscriber to publicly accessible services of electronic communications** shall mean a person, which has concluded a contract on the use of such services with a provider. Data in the tables include solely services provided in the retail segment, i.e. services provided to end users.*

*A **subscriber's PSTN station** is a set of technical means defined by an active end point of the public switched telephone network and unambiguously determined by the telephone exchange ending. The subscribers' stations are further classified as **residential telephone lines** and **business telephone lines**. **Public telephone boxes** or **slot machines** are also counted as subscribers' stations.*

*A **subscriber's Voice over Internet Protocol (VoIP) telephone station** shall mean voice service provided by means of the VoIP technology also called IP (Internet Protocol) telephony, which enables voice transmission over packet-switched data networks and signal transmission by means of Internet Protocol (IP) packets. Voice services by means of the VoIP technology are an alternative to voice services provided by means of the traditional public switched telephone network. The number of subscriber's VoIP stations corresponds to the number of active geographic numbers, i.e. the number of telephone numbers used by the subscribers.*

*A **subscriber's telephone station of a public fixed telephone network** includes public accessible telephone services provided by means of public switched telephone network (PSTN) lines (formerly called main telephone stations) and by means of VoIP lines.*

*The **SIM card** is a subscriber's identification card serving for the identification of the subscriber in the public mobile telephone network. They involve both **prepaid SIM cards**, when the customer does not conclude any contract with the provider and only prepays a certain amount, which the provider deduces payments for services provided from, and **tariff SIM cards**, also called **post-paid SIM cards**, when customers have concluded an agreement with the operator, on the basis of which they pay for services according to monthly invoices.*

*Only SIM cards, which were used at least once in the last three month for originating and terminating of calls, sending of SMS, MMS, or for data services, are considered to be the **active** prepaid SIM cards.*

*The **broadband Internet access** is a **permanently** available access to the Internet with nominal speed ≥ 256 kb/s towards the subscriber (download). The service subscriber can be both natural and legal person, which has a contract concluded with a service provider. The number of subscribers to this service is measured on the basis of the number of access points where subscribers are provided with the service for one of below mentioned technologies employed for the Internet access. In majority of cases the number corresponds to the number of agreements concluded for the services providing in the retail segment.*

*The broadband Internet access by means of **Digital Subscriber Line (DSL)** technology enables broadband connectivity by means of the metallic line (telephone line). At present, the most frequently used types of this connection are ADSL and VDSL, which feature asymmetric connection when the speed of data transmission to the user (downloaded) is higher than that of data sent from the user towards the Internet (uploaded).*

*The broadband Internet access by means of a **cable television network (CATV)** in which the number of Internet accesses is expressed as the number of **cable modems** by means of which subscribers are provided with broadband Internet access.*

*The broadband Internet access by means of **optical fibre (FTTx)** includes optical connections of the type of Fibre to the Home (FTTH), when the optical fibre takes the optical connectivity to the dwelling, and Fibre to the Building (FTTB), when the optical fibre takes the optical connectivity to the building only and indoor the connection is distributed by other means (by a radio network or over a fixed local network, for instance).*

Fibre to the x (FTTx) *is a general name of all types of the broadband network architecture that applies optical fibre.*

The broadband ***wireless*** *Internet access includes the connection by means of* ***a*** *radio line both in licensed frequency bands (in common use by technologies of Fixed Wireless Access (FWA) and in frequency bands with no licence required (most frequently based on the Wireless Fidelity (Wi-Fi) technology).*

Fixed Wireless Access ***(FWA)*** *is the description of fixed wireless access by means of a radio connection. It is characteristic by the permanent and fixed placing of the end point device. Sometimes this alternative is also called Wireless Local Loop (WLL).*

WiFi *is the broadband connection by means of a radio network using technologies compliant with the standard IEEE 802.11. This type of connection is sometimes called Wireless Local Access Network (WLAN) as well.*

The broadband ***mobile Internet access*** *includes the connection by means of mobile telephone networks within standard voice and data services (****temporary / ad hoc access****) or offered as separated from voice services with potential of* ***permanent*** *accessibility (****dedicated access****). This access is implemented by means of SIM cards or data cards/modems compliant with the standards of Code Division Multiple Access (CDMA), or Universal Mobile Telecommunication System (UMTS), or Long Term Evolution (LTE). The number of standard (temporary) Internet accesses by means of a mobile network is expressed as the number of active SIM cards which use ad-hoc service of internet access. The number of permanent Internet accesses by means of a mobile network is expressed as the number of active SIM cards or data cards which use the permanent (dedicated) service of Internet access.*

CDMA 2000 *and* ***UMTS*** *are standards of the ITU-2000 for 3rd generation (3G) of mobile networks enabling high-speed data transmission, including the Internet access.*

A ***domain*** *(an* ***Internet domain*** *or also a* ***domain name****) is a unique name (identifier) of a computer or a computer network connected to the Internet. The domain of second level, i.e. a domain name is registered at a registrar authorized to administer respective top level domains as .cz or .com, for instance.*

Table ***21****-3 and* ***21****-4* ***ICT specialists***

The occupations of ICT specialists are subdivided into two major groups while their classification is based on the Classification of Occupations (CZ-ISCO) the corresponding national classification in the Czech Republic developed on the basis of the International Standard Classification of Occupations (ISCO-08) developed by the International Labour Organisation (ILO). The ICT specialists are assigned to the classes, groups, and subgroups of the CZ-ISO based on recommendations of Eurostat and the ILO as follows:

ICT professionals

25 Information and communications technology professionals
251 Software and applications developers and analysts
252 Database and network professionals
133 Information and communications technology service managers
2152 Electronics engineers
2153 Telecommunications engineers
2434 Information and communications technology sales professionals

ICT technicians

35 Information and communications technicians
351 Information and communications technology operations and user support technicians
352 Telecommunications and broadcasting technicians
7422 Information and communications technology installers and servicers

The data on the ***numbers of ICT professionals*** *(Table* ***21****-3) come from the Labour Force Sample Survey (LFSS) of the CZSO (table presents average annual data for given years). Data since 2011 are not fully comparable with data for the previous years because of transition to the ICT professionals' definition by the CZ--ISCO in 2011. Detailed data on the LFSS are available in Chapter* ***10*** *Labour Market, Part B.*

Data on ***wages of the ICT specialists*** *(Table* ***21****-4) come from the structural wage statistics and are available in a comparable time series since the reference year of 2011 and have been grossed up to the population of the total employed in the Czech Republic. Detailed data on the structural wage statistics broken down according to the Classification of Occupations can be found in Chapter* ***10*** *Labour Market, Part A, exactly in notes on Tables* ***10****-4 and* ***10****-5.*

Tables ***21****-5 and* ***21****-6* ***Investments into ICT equipment and software***

Investments into ICT equipment and software in the tables shall mean the gross fixed capital formation (P.51), which includes acquisitions fixed assets (P.511) and expenses for transition of non-produced assets into ownership (P.512) classified to the groups of the Classification of Products by Activity (CZ-CPA) as follows:

ICT equipment

26.2 Computers and peripheral equipment;

26.3 Communication equipment; and

26.4 Consumer electronics

Software

58.2 Software publishing services;

62.0 Computer programming, consultancy and related services; and

63.1 Data processing, hosting and related services; web portals.

In 2014 the calculation of ICT investments was changed within the revision of national accounts according to a new international standard of ESA 2010. This change, which brought an important increase in investments in this field, was implemented back in the whole time series observed.

This means mainly that expenditure on small property as smartphones, notebooks, or tablets, which are used in the production process for a period longer than one year, is included into investments (small property capitalisation). According to the previous standard for national accounts of the ESA 1995 this expenditure was taken as production consumption. The calculation of the own development software capitalisation was also made more precise within the national accounts revision.

Investments into computer and telecommunication equipment became a part of a newly created item of non-financial assets as ICT equipment (AN.1132). Computer software and databases (AN.1173) newly involve two sub-items as follows: Computer software (AN.11731) and Databases (AN.11732).

The data come from the annual national accounts statistics. Detailed information is available in Chapter ***5*** *National Accounts.*

Tables ***21****-7 to* ***21****-8* ***External trade in ICT goods and services***

Goods and services in the field of information and communication technology (hereinafter as the ***ICT goods and services****) are defined as goods or services, which core function is to implement or enable communications or information processing, including their electronic transmission and imaging (OECD 2009).*

The ***list of ICT goods,*** *that is used for the external trade statistics, is based on the Harmonised System Nomenclature (HS Nomenclature 2007), a classification of goods used for the international trade. ICT goods, for purposes of the external trade statistics, is divided into the five main categories as follows:*

communication equipment;

computers and peripheral equipment;

consumer electronics;

electronic components; and

miscellaneous ICT components and goods.

Detailed definitions of mains groups of the ICT goods are available on the CZSO web pages in the section Statistics – Information Technology – Information Economy under the link External Trade in the ICT Goods.

Data on exports and imports of the ICT goods *come from data outputs of the external trade statistics (External Trade Statistics Database of the CZSO). Detailed information is available in Chapter* ***11*** *External Trade.*

Due to substantial changes to definitions and content of respective items of the ICT goods in the HS Nomenclature 2007 compared to its previous version of 2002 (HS Nomenclature 2002) the data on external trade in ICT goods broken down by the aforementioned five categories before 2007 are not published in the Statistical Yearbook.

Data on exports and imports of the ICT services *come from the CZSO direct survey at respondents on exports and imports of services. Respective items of the ICT services are then defined according to the Classification of Services of 2009, which contains three-digit numerical codes of services based on the international classification of Extended Balance of Payment Services (EBOPS 2002). The ICT services are subdivided into two fundamental categories as follows:*

telecommunications services (code 247); and

computer and information services (codes 262, and 263).

Telecommunication services *include, first of all, transactions of Czech and foreign telecommunication operators for implemented international calls by means of fixed or mobile telephone networks. In the case of telecommunication services exports the phone call from abroad to the Czech Republic, it is a payment the Czech operator receives from the foreign operator for the arrangement of the international call. In the case of telecommunication services imports the phone call from the Czech Republic to abroad it is a payment the foreign operator receives from the Czech operator for the arrangement of the international call. Other telecommunication services involve payments for the access to the Internet, cable television, and to other computer networks, including providing of services as electronic mail, video conferences, or transmitting of audio-visual signal over the Internet, cable networks, or by means of satellites.*

Computer services *consist mainly of* ***consultancy services*** *in the fields of hardware and software of computers, including maintenance and repairs of both hardware and software and services related to data processing. These involve purchase and sale of tailor-made software and application (****original computer software****), including purchase and sale of ownership rights to such software or licence fees for the software use. Furthermore, it is also purchase and sale of* ***standard software*** *and applications supplied over the Internet, including purchase and sale of ownership rights to such software or licence fees for the software use. Computer services does not include purchase and sale of standard software packages supplied on physical media carriers (CD-ROMs, flash disks, etc.), or as a part of hardware (as Microsoft products, for instance), which are considered to be goods and are reported within external trade in goods. Purchase and sale of permanent licences for the use of standard software packages supplied on physical media carriers or as a part of hardware.*

Table ***21****-9* ***Basic indicators of enterprises of the information economy industries***

The ***information economy sector*** *is a new alternative grouping of economic activities defined within the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4 and according to the OECD standards for economic activities included both in the ICT sector and into the information and media one.*

The ***ICT sector*** *is defined as a combination of economic activities of manufacturing products (technology) or providing services primarily dedicated to processing, communication, and distribution of information electronically, including information commissioning, storage, transmission, and imaging.*

The ***information and media sector*** *is defined as a combination of economic activities producing, issuing, and/or distributing content primarily dedicated to inform, educate, and/or entertain people by means of mass media (communication means).*

The ***information economy sector*** *involves businesses, which dominating activities belong to the CZ-NACE groups and classes as follows:*

ICT manufacturing:

Group 26.1 – Manufacture of electronic components and boards;
Group 26.2 – Manufacture of computers and peripheral equipment;
Group 26.3 – Manufacture of communication equipment;
Group 26.4 – Manufacture of consumer electronics; and
Group 26.8 – Manufacture of magnetic and optical media.

Trade in ICT:

Group 46.5 – Wholesale of information and communication equipment.

Telecommunication activities:

Group 61.1 – Wired telecommunications activities;
Group 61.2 – Wireless telecommunications activities;
Group 61.3 – Satellite telecommunications activities; and
Group 61.9 – Other telecommunications activities.

IT services:

Group 58.2 – Software publishing;
Class 62.01 – Computer programming activities;
Class 62.02 – Computer consultancy activities;
Class 62.03 – Computer facilities management activities;
Class 62.09 – Other information technology and computer service activities;
Group 63.1 – Data processing, hosting and related activities; web portals; and
Group 95.1 – Repair of computers and communication equipment.

Information and media activities:

Group 58.1 – Publishing of books, periodicals and other publishing activities;
Group 59.1 – Motion picture, video and television programme activities;
Group 59.2 – Sound recording and music publishing activities;
Group 60.1 – Radio broadcasting;
Group 60.2 – Television programming and broadcasting activities; and
Group 63.9 – Other information service activities.

Indicators in these tables were obtained from the annual structural survey of business entities from selected production industries providing a detailed range of final data, which are available at a longer time delay. Detailed information on the publishing of the data from the annual structural survey of business entities from selected production industries is available in Chapter ***15*** *Industry.*

*Definitions of employment indicators are given in Chapter **10** Labour Market. The methodological content of financial indicators is defined in Chapter **15** Industry, and definitions of sales indicators are in Chapter **18** Trade, Hotels, Restaurants, and Tourism.*

*Tables **21**-10 to **21**-13 **ICT and their utilisation in enterprises***

*The data are based on the **annual survey on the ICT utilisation in the business sector**. This survey is carried out on a selected sample of approx. seven thousand enterprises with 10+ employees in selected economic activities. Results are then grossed up to the whole population of the enterprises monitored.*

*The **reference period** shall mean January of a given year (January 2016, for instance). In the case of e-commerce and the Internet usage in relation to public administration (Table **21**-11 to **21**-13) the data relate to the whole given year (as to 2015, for instance).*

***Enterprises with an internal computer network** shall mean enterprises using an internal computer network interconnecting at least two computers for the purpose of sharing of information, files, internal emails, and applications within the enterprise.*

***Enterprises with websites** shall mean enterprises using the web pages, which content they may affect themselves for the purposes of official presentation and offering of products and/or services. These also include web pages shared with other legal person. These do not include web pages on information servers (portals).*

*The **complete electronic submissions for public administration** shall mean submissions which are dealt with any need for **a** paper-based form of documents and a personal visit to an authority or office of public administration.*

***Electronic commerce** (e-commerce) shall mean purchases or sales (placing or accepting orders) via the Internet or other computer networks through websites or the electronic data interchange (EDI), regardless the method of payment or delivery. Purchases (sales) implemented on the basis of orders prepared from information obtained on the Internet but placed in a traditional way (by phone, fax, or written order) or by electronic mail are not included.*

*Tables **21**-14 to **21**-17 **Household consumption expenditure on ICT equipment and services and households with a fixed line and a mobile phone***

*Tables give data from the sample survey of the **Household Budget Survey (HBS)**, which monitors private household economy and provides information on household expenditure and the structure of household consumption. Data on how households are equipped with fixed telephone lines and mobile phones as at the end of the reference year come from the same source as well. Detailed information on the HBS and interpreting of its outcomes can be found in Chapter **9** Household Income and Expenditure.*

*Tables **21**-18 to **21**-26 **ICT in households and its utilisation by individuals***

*The data are based on the **Sample Survey on the ICT Utilisation in Households and by Individuals**, which had been carried out within the LFSS since 2005 and since 2012 it has been performed within the Integrated Household Surveys (IHS). The survey is carried out using the Computer Assisted Personal Interviewing (CAPI) method on the sample of about 10 000 individuals aged 16+ years. In line with the LFSS and ISH methodologies, the results were imputed to the whole population of the Czech Republic.*

*Concerning data on **households** the existing status in the reference period (2nd quarter of a year monitored) is obtained; data for **individuals** are for the last three months before the survey implementation, except for data on the Internet use for shopping (Table **21**-24) and in relation to public administration (Table **21**-25) where data are for the reference period of 12 months before the survey implementation.*

***Households with computer** involve all households, which at the time of the survey stated, that at least one of the household members had an access to a personal computer at home. The household does not need to be in possession of the computer (it may be employer's computer, one borrowed from friends, etc.) yet this computer should be functional and located at home. A portable computer may not be permanently located at home, it may be in use at work or at school.*

*The **portable computer** shall mean a type of the personal computer which can be used at various places because it is lightweight (most often weights from 1 to 3 kilograms) and is small in size. The portable computer can be connected to the grid yet it works supplied from its own batteries. The most often used names for the portable computer are **notebook** or **laptop**, respectively. The **tablet**, a computer equipped with a touchscreen, is also considered a portable computer.*

***Households with the Internet** include all households, which at the time of survey stated, that at least one of the household members had an access to the Internet at home. It does not matter what type is the device used (desktop computer, portable computer, mobile phone, digital TV, game deck, or other device), or the way of connection.*

*The **broadband Internet access** shall mean an access to the Internet with nominal download speed ≥ 256 kb/s. A **method the household is connected to the Internet** includes merely the type of household connectivity delivered by the provider and not a method of potential sharing of this connectivity by multiple computers within one household.*

Households with children *shall mean households with unprovided children that are defined as children/persons till the terminated school attendance and then as persons studying further, yet to the age of 26 years, at the oldest. More can be found in Section 11 of the Act No 117/1995 Sb on state social support as amended.*

Households of pensioners *shall mean households which there are only persons 65+ years of age living in. These may be households of individuals or those in which there is a married couple living while both the spouses are older than 65 years of age.*

Individuals using the information and communication technologies *(users of the mobile phone, PC, or the Internet) are such individuals who have used such technologies at least once in the last three months anywhere (at home, work, school, etc.) and for whatever reason (private or work).*

The ***Internet use*** *shall mean any activity on the Internet carried out in an active manner, for instance, browsing of websites, downloading of files, using emails, from any location (household, school, work, etc.) for any purpose (private, work, etc.) both on computers (including portable ones) and mobile phones, smartphones, game decks, etc.*

Individuals using the Internet in the mobile phone *include persons who gave that they had used a mobile phone (smartphone) to access Internet services. It does not matter if the phone was private or employer's or borrowed and also it does not matter what type of connection was used to access the Internet (mobile networks, WiFi).*

Internet activities *monitored are activities on the Internet, which respondents carried out for* ***private purposes*** *in the last three months before the survey implementation date. Only the cases of an on-line purchase and the Internet use in the interaction with public administration have the reference period of twelve months before the survey implementation date.*

Individuals using social networks on the Internet *are those who were active in social networks in the last three months on discussion forums or chats, have connected to interest groups within the network, and made contacts. The social network is a service which enables its users to establish so-called profile (by filling in personal information, photographs, etc.) and then to group with other users (for example, on the basis of friendship in real life or common interest and hobbies) and to communicate by means of the network.*

A ***purchaser over the Internet*** *shall mean a person who in the last 12 months purchased or ordered any goods or services through an electronic way. The act of purchase shall mean purchase for private purpose. This does not include purchase for the employer, school, or other organisation. Goods or services ordered may not be paid over the Internet, goods or services may be delivered on-line (over the Internet) or off-line (mail, or in person). Mere decision on the purchase on the basis of information acquired through the Internet is not considered to be an Internet purchase. The same holds for purchases implemented on the basis of orders, which were placed by a classic, written, and sent e-mail.*

Educational attainment *in the case of the ICT utilisation by individuals is published for the age group 25+ years. There is a lot of student in the age 16–24 years, who have low educational attainment, yet they use ICT in a very intensive way. Thus if the age group 16–24 years is not included it enables to make a more accurate assessment of the educational attainment effect on the ICT use.*

A ***student*** *shall mean an individual who studies and simultaneously is economically inactive i.e. may be classified neither as the employed nor the unemployed person.*

Table ***21****-27* ***Personal computers in schools in 2015***

Data on ICT hardware and software in schools in the Czech Republic come from data sources of the Ministry of Education, Youth and Sport, which collects data on available IT infrastructure in basic, secondary, and higher professional schools.

Due to the methodology the total average numbers for the Czech Republic are lower than appropriate numbers of respective stages of schools. The reason is that in many school buildings classes are taught to multiple stages and/or types of schools and therefore the same computer is often available to and thus counted for pupils of several stages and/or types. Yet the computer is counted into the average of all school stages and/or types only once.

* * *

Further data can be found on the website of the Czech Statistical Office at:

- www.czso.cz/csu/czso/information_technologies