

**Digital Czech Republic v. 2.0**  
**The Way to the Digital Economy**



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## 1. Executive summary

The rational use of information and communications technology (“ICT”)<sup>1</sup> increases productivity and competitiveness. Businesses that use ICT achieve considerable savings on costs and other benefits, e.g. an increase in revenues from local and global markets, particularly by quickly responding to current demand, the ability to extend their portfolios and to efficiently increase qualitative parameters. Modern technology gives every citizen the chance to boost his or her productivity and improve communication with friends, family and colleagues. ICT is specific in that its development is closely tied to the needs of society and reacts quickly to those needs.

High-speed access to the Internet is part of the fundamental infrastructure of society, just like motorways, rail corridors and energy distribution networks. Business plans cannot be implemented without this basic infrastructure, proving the fact that a high-quality, fast and reliable Internet connection is a crucial condition without which foreign investors could not imagine investing in the Czech Republic.

The Czech Republic’s competitiveness within the EU and the global economy is not sustainable in the long term without advanced Internet infrastructure. Being a knowledge-oriented society, the Czech Republic must use this basic infrastructure to increase employment and boost exports. A reasonably priced and sufficiently fast access to the Internet is crucial for the majority of the Czech population in order to access information, audio-visual content or as a means of learning or communicating. At the same time, it also contributes to the development of e-government or the pursuit of the vision of the digital citizenship.

In recent years, the difference between rural and urban areas has narrowed as regards the subjective need for high-speed access to the Internet. Nowadays, most people would find it hard to imagine life without the Internet, regardless of the size and location of the place where they live.

On January 19, 2011, the Czech government – being aware of the fundamental importance of Internet infrastructure for the future of the Czech Republic – passed Resolution No. 50 adopting the State Policy in Electronic Communications – Digital Czech Republic, which amongst other things highlighted the fact that electronic communications, with its networks and services, speed up and improve communication, benefiting the economic, cultural and social development of the society as a whole.

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<sup>1</sup> Information and communications technology includes all technology used for communication and for working with information. Nowadays, this technology runs horizontally throughout society and forms the basis for the digital economy.

The original Digital Czech Republic document was aimed primarily at assessing the current availability and development of those selected aspects of electronic communications with the greatest potential for growth in the Czech Republic. It also served to propose the tools necessary to achieve realistic goals, involving the narrowing of the digital divide between urban and rural areas when it comes to the deployment of infrastructure for high-speed Internet access.

This governmental resolution – among other things – obliged the minister of Industry and Trade to draw up a report on the implementation of the objectives of the State Policy. However, owing to the constant and dynamic development of the digital economy services – on both the national and international level – it seemed appropriate to present at the same time an update of this State Policy.

This updated State Policy “Digital Czech Republic v. 2.0 – The Way to the Digital Economy” is designed to harness the synergy that ICT offers. In order for the Policy to stand up to international comparison and improve the state’s rapport with ICT, it must now include proposed measures to resolve the fragmented nature of coordination of the implementation of the government policy and measures associated with ICT aimed at boosting the competitiveness of the Czech Republic. This is also in compliance with the International Competitiveness Strategy.

All the countries of Europe are creating conditions for investment in high-speed optical networks. If the Czech Republic does not want to fall behind its European and global partners as regards its competitiveness, it has to be successful in stimulating commercial investment in Internet infrastructure and make efficient use of public funds.

The Digital Agenda for Europe<sup>2</sup> emphasised the joint consensus that trust and security are the fundamental preconditions for the widespread expansion of ICT, and thus also for achieving the goals of the Europe 2020 strategy<sup>3</sup> based on “intelligent growth”. Therefore, for the sake of completeness, it is worth emphasising the need to ensure that ICT infrastructure is secure and durable by focusing on prevention, readiness and awareness. Efficient and coordinated mechanisms also have to be put in place to respond to new and ever more sophisticated forms of cybercrime.

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<sup>2</sup> The Digital Agenda for Europe that was released on May 19, 2010, is the first in a series of Europe 2020 flagship strategies. It focuses on the role and use of ICT with the aim of eliminating various electronic barriers in Europe. This strategy in particular strives to see the employment of ICT for solving the global problems society faces, such as climate change and population ageing. The new European strategy follows on from the i2010 initiative – European Information Society for Growth and Employment; however, unlike this initiative, due to its horizontal nature it permeates practically every aspect of life. The Digital Agenda assumes the adoption of approx. 100 measures, 31 of which are of a legislative nature. The aim of these measures is to create a unified digital market without barriers between member states.

<sup>3</sup> COM(2010) 2020 of March 3rd 2010.

**The government's main aims by 2020 as specified in this document are:**

- a) to strengthen the digital economy by adopting a different regulatory approach with an emphasis on self-regulatory mechanisms owing to the specific nature of the Internet environment, which in fact has no boundaries and thus cannot be viewed in the same light as the traditional economy;
- b) to support the development of high-speed Internet networks allowing – in compliance with the aims of the Digital Agenda – transmission speeds of 30 Mbit/s by 2020 for all inhabitants and 100 Mbit/s for at least half of all households;
- c) to make efficient use of the radio spectrum to the benefit of the end users, which is the purpose of the Radio Spectrum Management Strategy;
- d) to increase the availability of ICT for all, regardless of locality, social status or disability, and to support lifelong education with the aim of boosting digital literacy;
- e) to ensure freedom of access to the Internet,
- f) to provide citizens with access to information generated by the public sector via the Internet;
- g) to support the legal offer of audio-visual services and to ensure a balance between the freedom to do business and the freedom to distribute and receive information and the protection of personal data,
- h) to guarantee that citizens may freely receive public-service programs via terrestrial broadcasting.

This document is not intended to modify the rules governing research and development in ICT; however, the government states that this is one of the key areas as regards the shaping of the Czech Republic's competitive edge. It is all the more alarming that, according to figures from 2010, the sum invested in research and development by the ICT processing industry is equivalent to a mere 6 % of the amount spent on research and development in the automotive industry.<sup>4</sup>

The monitoring, coordination and assessment of the implementation of the Digital Czech Republic v. 2.0 will be entrusted to the Government Council for Competitiveness and the Information Society in cooperation with the Ministry of Industry and Trade (which will take over the coordination of the Digital Agenda)<sup>5</sup>. Every year – on the basis of a report drawn up by the Ministry of Industry and Trade – the government will assess all measures adopted with the aim of updating them where necessary.

The objectives of the Digital Czech Republic v. 2.0 will be attained by the implementation of 17 measures. These measures, particularly in relation to infrastructure for high-speed Internet access, are pro-growth and pro-investment in nature and they are in compliance with the strategic documents of the Organisation for Economic Co-operation and Development (OECD) and the EU. The

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<sup>4</sup> CSO, Statistika & My (Statistics and Us), No. 3/2012, Digital Agenda of August 26, 2010, KOM(2010) 245.

<sup>5</sup> Government Resolution No. 585 of July 25, 2012.

economic and other impacts will be assessed as part of the preparations for the implementation of the individual measures.

## 2. Implementation of the measures of the State Policy in Electronic Communications – Digital Czech Republic – a state of play

The aim of the State Policy in Electronic Communications – Digital Czech Republic, which the government approved by its Resolution No. 50 of January 19, 2011, was to assess the current state of play regarding the availability and development of selected aspects of the electronic communications in the Czech Republic with the greatest potential for growth. Its aim was furthermore to propose the necessary means of meeting the real objectives designed to narrow the digital divide in the development of infrastructure for high-speed access to the Internet between densely and sparsely populated areas.

One positive effect of the adoption of this government policy was the fact that after six years the government declared a pro-active stance towards the development of high-speed Internet access. The government also took a positive approach to improving the competitiveness in the electronic-communications sector. For the state, which is both, the regulator and also the largest consumer of these services, this was one of the first steps towards making purposeful use of the potential of information and communications technology.

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**The Government aims to develop high-speed access to the Internet and the market environment in electronic communications**

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The tasks set forth in the aforementioned government resolution are carried out on a continual basis, according to their nature (see the implementation status in Table 1). Although the tasks are cross-cutting in their nature, the Ministry of Industry and Trade was entrusted with their implementation, which has led to certain difficulties as regards meeting the stated goals. The prevailing departmentalism and the fragmented nature of the subject matter hamper the implementation of certain specific measures and the lack of coordination in the area of the digital agenda reduces the benefits to be gained from introducing ICT in the Czech Republic. These problems also have an adverse impact on the Czech Republic's bargaining power vis-à-vis the European Union during the negotiations on newly introduced European legislation and its capability to assert its positions in these negotiations.

In the implementation of the tasks it had been assigned, the Ministry of Industry and Trade first focused on those tasks that have a direct impact on the electronic-communications sector. A summary is given in Table 1.

Task	Coordinator	Co-coordinator	Status
Prepare a proposal for the creation of a registry of passive infrastructure	MIT	CTO	Not implemented. Owing to the complexity of the matter, MIT is now assessing the results of a public consultation on the proposal for a registry of passive infrastructure.

<b>Prepare the development criteria for the allocation of radio frequencies in the band 790 – 862 MHz</b>	MIT	CTO	Implemented. The development criteria were included in the call for tenders published by the Czech Telecommunication Office on July 12, 2012.
<b>Prepare methodological guidelines to unify the practical application of certain provisions of the Electronic Communications Act and the Building Act</b>	MIT	MRD	Not implemented. MIT suspended the preparation of the methodological guidelines due to on-going work on an amendment to the Building Act in Parliament.
<b>Prepare an analysis of the possible ways to reduce the fees for frequency usage</b>	MIT	CTO	Implemented. The analysis served as the basis for the amendment of Government Regulation No. 154/2005 Coll., on the determination of the amount and method of calculation of the fees for using radio frequencies and numbers, as amended by Government Regulation No. 175/2012 Coll.
<b>Set up and make operational an information portal</b>	MIT		Not implemented. At the moment, this information portal is being integrated into the structure of BusinessInfo.cz.
<b>Appoint a body for the supervision of the implementation of the State Policy</b>	MIT		Implemented. After a change to the statute of the Government Council for Competitiveness and the Information Society and the widening of the scope of the State Policy – Digital Czech Republic, the Government Council for Competitiveness and the Information Society was charged with the supervision of the implementation of the State Policy.
<b>Prepare a proposal for the efficient use of financial resources from structural funds for the construction of electronic-communications networks</b>	MIT	MRD	Partially implemented – an ongoing task. The construction of infrastructure for high-speed Internet access is included in the draft operational program as part of the document entitled “Materials for the Preparation of the Partnership Agreement for the 2014-2020 Programming Period - Definition of Operational Programs and Subsequent Steps in Preparing the Czech Republic for the Efficient Use of European Funds”, compiled by MRD.
<b>Support IPv6/DNSSEC</b>	MIT	All ministries and central government administration authorities	Partially implemented – an ongoing task.

**Table 1 – A summary of the tasks and their implementation status.**

**The Ministry of Industry and Trade will complete its pending tasks as set out by Government Resolution No. 50 of January 19, 2011, with the aim of meeting the objectives of the Digital Agenda in relation to high-speed Internet access, i.e. the development of high-speed Internet networks enabling transmission speeds of 30**



**Mbit/s by 2020 for all inhabitants and 100 Mbit/s for at least half of all households. The Ministry of Industry and Trade will be assessing the impact of the implementation of the original and updated State Policy and its effects on the competitiveness of the Czech Republic.**

Beyond the scope of the tasks listed in Table 1, a copyright subgroup was created as part of the Ministry of Industry and Trade working group for the implementation of the Digital Czech Republic. The role of this subgroup is to discuss the issue of copyright infringements on the Internet, specifically the experience in enforcing intellectual property rights in the Internet environment, and to table suggestions and proposals for legislative and non-legislative changes which could improve the situation. When discussing draft amendments to legislation or other measures, the subgroup also assesses whether their adoption will ensure a fair balance between the protection of intellectual property rights on the one hand, and the freedom to do business, the protection of personal data and the freedom to receive and distribute information on the other hand. The Ministry of Culture is in charge of the copyright subgroup.

While implementing and promoting the individual tasks of the Digital Czech Republic, the Ministry of Industry and Trade identified weak spots concerning the narrowly defined concept of the State Policy. As stated above, the prevailing departmentalism and the fragmented nature of the subject matter make it more difficult to implement the individual measures and the lack of coordination in the area of the digital agenda at the governmental level reduces the positive benefits of introducing ICT into the everyday lives of entrepreneurs and citizens in the Czech Republic. Moreover, the Czech Republic is currently missing an active approach in the coordination of the implementation of the objectives of the Digital Agenda for Europe at the national level.

By passing Resolution No. 585 of July 25, 2012, the government adopted a change to the statute of the Government Council for Competitiveness and the Information Society and a new mechanism governing the changing of its members. Part of this governmental advisory body will be a new “Digital Agenda” working committee with the objective of coordinating the preparation of measures contained in the information-society strategies, including the coordination of related issues such as the structural funds and the Digital Agenda for Europe. This gives the Ministry of Industry and Trade, which is responsible for key legal acts relating to the information society and the development of the digital environment – like the Electronic Communications Act and the Information Society Services Act – and is responsible for implementing the industrial policy of the government and the International Competitiveness Strategy, a partner that is better placed to coordinate the implementation of the objectives defined in the updated State Policy – Digital Czech Republic v. 2.0. The Ministry of Industry and Trade thus takes over the coordination of the Digital Agenda. The new mechanism of coordination will ensure a supra-departmental approach to the implementation of the principles approved by the government. The relevant coordination unit of the Ministry of Industry and Trade will be responsible for preparing the materials for the meetings of the Government

Council for Competitiveness and the Information Society concerning the Digital Agenda. The Government Council – taking account of the supradepartmental approach – will subsequently present its outcomes to the government. This mechanism will link up the individual measures of the Digital Agenda lying in the responsibility of the various departments (for example tax, tackling corruption, healthcare reform, education, research and development, transport, energy) and will make sure that they are properly implemented in compliance with the common principles approved by the government.

**Measure No. 1:**

**The Government Council for Competitiveness and the Information Society, together with the Ministry of Industry and Trade, will assume the role of the coordinating authority for the Digital Agenda. An integral aspect of this coordination is the consultation mechanism with all relevant bodies and the expert public that may be potentially affected by certain measures.**

Given the existing framework for the coordination mechanisms in the Czech Republic, the Digital Czech Republic v. 2.0 is the best possible response to European strategic documents concerning the internal digital market and the Digital Agenda as a whole. Once this document has been adopted by the government, the Government Council for Competitiveness and the Information Society, in cooperation with the Ministry of Industry and Trade, all relevant bodies and the expert public, that may be potentially affected by particular measures, will submit a report to the government elaborating on the areas listed below, with the aim of further boosting the competitiveness of the Czech Republic and its attractiveness for foreign investors. The report will in particular cover the following areas:

- a) a single digital market,
- b) interoperability,
- c) trust in and security of digital services, also with regard to the Czech priorities in negotiating new EU legislation relating to the personal data protection,
- d) research and innovation, including the support for the establishment of long-term joint ICT research projects or centres on an international level,
- e) skills and inclusion,
- f) employment in ICT with the aim of devising adequate responses to the current structure of the ICT labour market as well as regulation modifying the labour-law environment, reflecting on the change of work organisation, the employment culture and career opportunities with the aim of – among other objectives – increasing the appeal and the availability of flexible forms of employment,
- g) employing the benefits of ICT for society, including the drafting of an overall strategy for an integrated solution for ICT investment management for the state administration and procedures for the introduction of shared service centres,
- h) international aspects of the Digital Agenda.

**Measure No. 2:**

**The Government Council for Competitiveness and the Information Society – with the aim of maximising the international competitiveness of the Czech Republic – will produce a report covering in particular the following areas:**

- a) a single digital market,**
- b) interoperability,**
- c) trust in and security of digital services, also with regard to the Czech priorities in negotiating new EU legislation relating to the personal data protection,**
- d) research and innovation, including the support for the establishment of long-term joint ICT research projects or centres on an international level,**
- e) skills and inclusion,**
- f) employment in ICT with the aim of devising adequate responses to the current structure of the ICT labour market as well as regulation modifying the labour-law environment, reflecting on the change of work organisation, the employment culture and career opportunities with the aim of – among other objectives – increasing the appeal and the availability of flexible forms of employment,**
- g) employing the benefits of ICT for society, including the drafting of an overall strategy for an integrated solution for ICT investment management for the state administration and procedures for the introduction of shared service centres,**
- h) international aspects of the Digital Agenda.**

### 3. Current trends of usage of electronic communications and ICT in the Czech Republic

A basic summary of the statistics concerning current trends of electronic-communications and ICT usage in the Czech Republic is given in the appendix to this document. It is based on the results of a survey published by the Czech Statistical Office, the Czech Telecommunication Office (“Information on the development of the electronic communications market, focusing on 2011 and selected indicators from the first half of 2012”) as well as the results of a survey carried out by the Ministry of Agriculture in 2011. The following general conclusions may be drawn from these surveys:

- There is a steady decline in the number of fixed telephone lines.
- The Czech Republic is still lagging behind the EU average as regards the number of households with Internet access.
- 96 % of businesses with ten or more employees have permanent access to the Internet (businesses make particular use of Internet banking, VoIP, education and training for employees, etc.).
- Digital literacy is crucial for the development of a society based on knowledge and information and therefore ICT should permeate all aspects of education.
- The use of ICT in the healthcare sector is currently limited to its internal needs; the range of Internet services for patients is still very limited.

According to a survey carried out by the Ministry of Agriculture and using data supplied by the Czech Telecommunication Office, entitled “The current state of coverage and use of high-speed Internet, with a focus on small municipalities with up to 499 inhabitants”, the following conclusions can be drawn:

- The population of small municipalities is as interested in the use of the Internet as the rest of the population; people living in small villages use the Internet in the same way that the inhabitants of large cities do; it has also become an integral part of their lives.
- Although the gap between rural areas and cities as regards the availability of high-speed Internet access is getting narrower, small villages experience less competition and fewer Internet providers; there are more households with slow connections, which decrease the convenience or even altogether prevent the use of certain services, such as video on demand.
- Most inhabitants nowadays find it hard to imagine a life without access to the Internet.
- In general, both urban and rural areas have real demand for faster and higher-quality Internet access, even at a slightly higher price.

#### 4. Infrastructure for high-speed access to the Internet

Although the electronic communications sector prospered relatively well during the global financial crisis (due to, for example, long-term contracts, new service packages and particularly the fact that communications services are increasingly seen as an unavoidable expense), we cannot ignore the fact that the electronic communications sector is now at a crossroads. Investment and the transition to new generation access (NGA) networks have resulted in a breakthrough which will have an impact on the dynamics of competition and the structure of the market.

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When considering regulatory instruments to support competitiveness, the Czech Telecommunication Office has to take into account the potential impact the choice of NGA network topology will have on the competition, particularly in cases where there is no adequate alternative infrastructure.

The fact remains, however, that the pace at which NGA networks are being developed in the Czech Republic is still very slow<sup>6</sup>. Past regulation by the state and the Czech Telecommunication Office did not provide large operators with sufficient motivation to invest in high-speed networks. From the viewpoint of some investors, however, unpredictable ex ante regulation can be considered as an investment risk. It is clear that investment in fixed optical networks in sparsely populated areas will require the involvement of the state, a fact which could also provide additional motivation for private investment. The mechanism governing state involvement, however, needs to be set up after a careful analysis and public consultation with all those affected, so that public investment does not eventually become a limiting factor for competition.

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The European and national regulatory frameworks relating to state aid also have to be respected. Nevertheless, on the basis of experience from abroad, it is clear that pure market mechanisms cannot result in blanket coverage of the Czech Republic. When regulating the market to improve the competitive environment, the independent regulator, which is the Czech Telecommunication Office, has to take into account the possible impact of the proposed regulation on the competition, regarding the topology of chosen NGA networks, particularly in cases where there is no

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Measures to support the building of communication infrastructure and to assure effective competition need to be complemented by broader initiatives on the demand side.

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<sup>6</sup> See for example Digital Agenda scoreboard – Czech Republic – 2011 Telecommunication Market and Regulatory Developments of June 18, 2012.

adequate alternative infrastructure.<sup>7</sup> It also has to apply measures to prevent investors from being discouraged from investing in NGA networks.

Boosting competition and innovation plays a key role in making services accessible to consumers and businesses at acceptable prices while at the same time assuring the corresponding quality of service. Liberalised telecommunications markets around the world have matured to a certain extent. However, the development of these markets has now reached a turning point, as in the coming decades the shift towards NGA networks may drastically transform the structure of the market. It is therefore essential to support investment, innovation and competition at all levels of the value chain across the industry. Current developments may also be characterised by the gradual redistribution of revenues amongst access providers (operators) and services providers independent of operators (“OTT”, over-the-top services).

Measures aimed at supporting the construction of communication infrastructure and assuring effective competition must be accompanied by broader initiatives to support demand, which will motivate consumers and businesses to use communications services, create new business models and incorporate them into their day-to-day life. Major businesses in particular have to play an active role (particularly in the field of audio-visual services), as well as the state (especially in modern government administration services).

Measures aimed at supporting demand have to generate greater user interest in high-speed Internet access enabled by higher transmission speeds and should strengthen the skills and the trust in the use of this modern technology.

#### 4.1. Development of NGA networks

The basic type of Internet connection is the so-called “fixed-point” access. However, ever-increasing user mobility is creating greater demand for high-speed mobile Internet access. Despite the many advantages that radio communications systems offer for access networks, it is crucial in the present situation to take into account their limitations, particularly as regards capacity. In view of the technology currently in use, the government considers **optical-fibre cable technology** a suitable solution enabling fully-fledged high-speed access to the Internet for most localities in the Czech Republic, the major advantages of this technology being its higher transmission capacity and transmission speed than in radio-based systems (due to physical reasons), as well as its long-term viability.

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It makes sense to promote opportunities enabling effective co-financing of the construction work from public funds as a possible additional mechanism for creating the necessary incentives for private investment

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<sup>7</sup> Proposals for regulation of new generation optical access networks by construction scenario, ČTÚ, [http://www.ctu.cz/cs/download/aktualni\\_informace/navrhy\\_regulace-nga\\_scenare\\_09-2010.pdf](http://www.ctu.cz/cs/download/aktualni_informace/navrhy_regulace-nga_scenare_09-2010.pdf).

Judging from international experience, infrastructure based on optical fibres is robust enough to accommodate the expected increase in capacity required by applications in the future. In terms of data throughput, technology based on an optical connection may be symmetrical on both sides, making it ideal for cloud services, distance work and other similar applications. Although the government believes that optical-fibre cable technology is promising in the long run, all legislation and public-sector regulation of electronic communications networks always have to be technologically neutral.

On the basis of available figures from the Czech Telecommunication Office and the Czech Statistical Office, the Ministry of Industry and Trade modelled the availability of high-speed Internet access via optical networks with a speed of at least 30 Mbit/s (see Table 2). This table shows that the penetration of optical networks in the Czech Republic is very low. Moreover, in the Czech Republic, the former monopoly operator and other major players in the market do not invest in these networks, as they do in other EU countries. This means that the development of optical networks tends to be the domain of local operators, who started as community providers of wireless Internet access in medium-sized municipalities. Nowadays, a role is also played by cable television providers, who enable some customers to achieve speeds in excess of 100 Mbit/s. Particularly problematic, however, are small municipalities and localities with a low concentration of inhabitants, as the return on investments for the private sector is nowhere near that of localities with a high concentration of inhabitants (typically housing estates).

BASE LINE basic indicators excluding the capital Praha	Number of municipalities							
	Total	Municipalities according to the number of inhabitants						
		up to 199	200-499	500-999	1000-1999	2000-4999	5000-9999	10000 and more
Czech Republic - number of municipalities	6 249	1 524	1 975	1 356	723	400	140	131
Czech Republic - number of inhabitants	9 275 612	189 334	645 742	953 015	1 009 475	1 219 378	960 042	4 298 626
Czech Republic - number of households	3 068 385	64 732	179 976	289 841	311 408	398 343	324 983	1 499 102
Number of households without access to the BB network (in per cent)		100%	100%	100%	100%	95%	90%	80%
Number of municipalities without access to BB bone-network (in per		67%	47%	25%	5%	0%	0%	0%

**Table 2: Availability of high-speed Internet access via optical networks with speeds of at least 30 Mbit/s, source: MIT, CTO, CSO**

This implies that it is meaningful to support the efficient employment of co-financing the construction work from public funds as a possible additional mechanism to provide the necessary incentives for private investment in high-speed Internet infrastructure and for the creation of projects which would probably never be implemented without this support. The employment of public funds has to be preceded by an analysis of the current coverage, ruling out unauthorised state aid. Furthermore, the employment of public funds has to be in compliance with the Community Guidelines on the use of state aid in relation to the rapid introduction of broadband networks, as drawn up by the European Commission. This analysis also

has to specify the importance of the projects in a given region and assess the required extent of the capacity build-up.

With regard to the ever increasing volume of data demanded by households and businesses<sup>8</sup> and in compliance with the objectives of the Digital Agenda, the government supports the development of high-speed Internet networks allowing for transmission speeds of 30 Mbit/s by 2020 for all inhabitants and 100 Mbit/s for at least half of all households.

As some of the key measures for the development of NGA networks are already contained in the original version of the State Policy in Electronic Communications – Digital Czech Republic, all pending tasks of this Policy remain valid and to be implemented, in particular the creation of a registry of passive infrastructure and the **completion of the preparation of an operational program, which will – among other things – include the support for the deployment of infrastructure for high-speed Internet access. The part of this operational program dealing with ICT has to comply with the proposed ex ante conditionalities as defined in the draft EU legislation for the new programming period<sup>9</sup>. The criteria contained in the general regulation for the meeting of the ex ante conditionalities will be respected and will be met when preparing the conditions for the respective operational program.** Among those criteria are in particular a regularly updated plan for investment in infrastructure by means of bundling and mapping infrastructure and services, investment models fostering competition and ensuring access to open, reasonably priced, high-quality and progressive infrastructure and services and, last but not least, measures to support private investment. In order to ensure synergy in the use of public and private investment, the preparation of the relevant operational program and proposals for specific measures will be consulted with ICT-industry representatives in accordance with the principles of open government.

Besides using public funds for the construction of NGA networks, the state should also reduce the administrative and financial burden associated with obtaining building permits, planning approvals and rights of way.

The Government Council for Competitiveness and the Information Society will discuss further measures required for the development of NGA networks. The Ministry of Industry and Trade will be assessing the impact of the implementation of this State Policy on the competitiveness of the Czech Republic. Measures aimed at the reduction of the administrative burden related to construction must be based on the experience of the relevant entrepreneurs. Therefore, a thorough analysis of the current situation based on information from these entrepreneurs will be followed by a public consultation aimed at unifying the objectives of these measures, the formulation of theses and the subsequent elaboration of individual aspects by more focused working groups.

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<sup>8</sup> Mobile data traffic in O2 networks worldwide increased 18-fold in 2008 – 2009; in AT&T networks mobile data traffic has increased by 5000 % in the last 3 years. Source: OECD, 2012, Laying the Foundation for Internet Economy.

<sup>9</sup> KOM(2011) 615 of October 6, 2011.



For the sake of completeness, attention should be drawn to relevant European legislation, i.e. the draft regulation on the Connecting Europe Facility (CEF) of October 28, 2011, COM(2011) 665, and the related draft regulation on guidelines for trans-European telecommunications networks and repealing Decision No 1336/97/EC of October 19, 2011, COM(2011) 657. The Connecting Europe Facility is one of the most important new aspects of the future 2014–2020 programming period. This facility should provide investment worth up to 50 billion EUR, focusing on the improvement of European transport and energy networks and digital information and telecommunications networks. Both draft regulations were still in the legislative process at the time when this document was being prepared.

**Measure No. 3:**

**The Government Council for Competitiveness and the Information Society will propose further measures to support the construction of NGA networks, focusing on the use of public funds, simplifying the administration involved in the construction and reducing fees associated with rights of way. After holding a public consultation, it will present its proposals to the government for adoption.**

#### **4.2. Radio spectrum**

The efficient use of the radio spectrum is essential to ensure it is purposefully used for the benefit of the digital society, the introduction of high-speed wireless services, and for economic recovery and growth, including the creation of highly specialised jobs aimed at strengthening the digital economy and the long-term competitiveness of the Czech Republic.

The radio spectrum is a non-consumable yet not unlimited natural resource. It is the main channel for the basic electronic communications sector and services, including high-speed communications via wireless mobile and fixed networks and satellites, for television and radio broadcasting services, transport, radiolocation and applications such as warning devices, remote controls, hearing aids, aids to facilitate orientation for the visually impaired, microphones, and medical equipment. It is a valuable resource, the efficient use of which also supports public services, such as national security and security services, including civil defence, as well as scientific fields like meteorology, remote Earth exploration, radio astronomy and space exploration. Regulatory measures in the field of the radio spectrum therefore bear economic, security, healthcare and social consequences, as well as consequences in the area of the public interest, culture, science, the environment and technology.

After freeing up the frequencies of the former analogue television (the so-called “digital dividend”), the Czech Telecommunication Office prepared the terms for the auctioning of this freed-up part of the radio spectrum with the aim of boosting competition in the market and the range of new, modern services, particularly mobile high-speed Internet access, and creating favourable conditions to assure

significant technological innovation. By passing Resolution No. 78 of January 26, 2011, the government approved the Czech Telecommunication Office's plans to:

- designate frequencies in the digital dividend band for the provision of high-speed electronic communications services, from January 1, 2012,
- hold a tender in the form of a joint auction (for frequencies in the digital dividend band as well as in the bands 1800 MHz and 2600 MHz),
- to free up frequencies in the band 790–862 MHz as part of the completion of the transition to terrestrial digital television broadcasting while also ensuring the protection for digital television broadcasting and other services in adjacent frequency bands.

The success of this auction is the prerequisite for the further development of the information and telecommunications services in the Czech Republic. Therefore, by passing Resolution No. 499, of July 4, 2012, the government took account of the information about the tender and nominated the Chairman of the Council of the Czech Telecommunication Office to announce and implement the tender.

Just as the developments regarding the classic fixed telecommunications networks led to the natural unification of the technical elements for the purpose of ensuring network interoperability, the development of radio communications has resulted in the rise in importance of the process of standardising and harmonising the use of the radio spectrum and of the question of its strategic management.

This process culminated as the result of the increasing number of radio communications services and their applications, together with the phenomenon of radio interference. The usage of the radio spectrum has expanded beyond the boundaries of the radio communications sector and its experts and nowadays forms the basic means of developing other sectors as well.

The regulator has to be responsive to the rapid developments concerning the usage of the spectrum. In the future it will be necessary to ensure the transition from regulation based on a rigid and detailed specification of the conditions governing the allocation of frequencies to regulation making the use of radio spectrum flexible and fit for the market.

The use of radio frequencies has long required international unification and that was one of the reasons for the establishment of the International Telecommunication Union (in 1865 to 1934 called the International Telegraph Union). Subsequent developments in the production of radio equipment led to the emergence of supranational standardisation institutions. The importance of supranational institutions gradually increased as the market in radio equipment developed and took on an increasingly global dimension as a services market. This has led to the supranational unification of the technical and regulatory conditions governing the usage of the radio spectrum. The benefit of this is an innovative global competitive environment of equipment manufacturers and significant economies of scale, making advanced radio equipment widely available.

However, these developments will not automatically ensure the interests of the state and the optimisation of the usage of the radio spectrum for economic and social development. The government therefore cannot give up on the creation of its Radio Spectrum Management Strategy, aimed at the purposeful and efficient usage of the radio spectrum to cover national needs and objectives. This strategy also has to include the general conditions governing the access to the radio spectrum (authorisation system), i.e. the basic prerequisites for the efficient use of the spectrum.

The state thus clearly has a role to play and should manage the radio spectrum on the basis of a spectrum management strategy at the national level. The management should always be in compliance with the strategy and should provide feedback on the progress in the implementation of the strategy, with the possibility of making corrections if and where necessary.

Spectrum management must also take account of other measures aimed at supporting other segments of the market in order to achieve the objectives of this policy.

The government of the Czech Republic considers the following steps to be taken as fundamental elements of the spectrum management strategy:

- Taking stock of the current use of the spectrum and the adoption of subsequent measures, including the refarming of frequency bands, to free up enough of the spectrum for high-speed Internet access.
- Using the spectrum for public-security and rescue services with the aim of quantifying the use of the spectrum in the public interest and rendering it more efficient.
- Devising a suitable means for the authorisation of spectrum users and supporting a flexible approach to the allocation of the radio spectrum.
- The further deployment and support of high-speed Internet networks, which has to go hand in hand with the support of competition in the market.
- The introduction of means for impersonal communication (e.g. machine to machine communication – M2M) with the aim of promoting the use of new technology and innovative services.
- Promoting the sharing of the usage of the radio spectrum with the aim of improving and maximising the use of the individual frequency bands, including the bands currently designated for military use.
- Promoting the principles of the marketability of the spectrum with the aim of supporting the secondary marketability of as much of the spectrum as possible.
- Creating favourable conditions for the further technological development of terrestrial digital television and radio broadcasting.
- Devising a suitable way of charging for the use of radio frequencies in compliance with the objectives of this policy.

The resulting document must be consistent with the binding strategic document adopted at EU level – the Decision No 243/2012/EU of the European Parliament and

of the Council of March 14, 2012, establishing a multiannual radio spectrum policy program.

**Measure No. 4:**

**The Czech Telecommunication Office will prepare and issue a Radio Spectrum Management Strategy. In the context of the political course and objectives as laid out in this State Policy and in compliance with the international and EU documents concerning harmonization, this strategy will create the basis for achieving the objectives of the Digital Agenda and the Digital Czech Republic.**

### 4.3. Digital television broadcasting

On November 11, 2011, the Czech Republic formally completed the transition from terrestrial analogue television broadcasting to digital television broadcasting. This process was successfully implemented in compliance with the schedule recommended by the European Union, although the initial conditions were very complicated and several special regulations had to be adopted. A positive role in this process was played in particular by a working group of the government – the National Coordination Group for Digital Broadcasting in the Czech Republic, headed by the National Coordinator Zdeněk Duspiva. This working group was abolished on August 31, 2012, as it had fulfilled its purpose.

Digital television has provided viewers with an extended range of programs and has also improved the reception quality thanks to the DVB-T digital broadcasting system. Digitisation has given content providers full liberalisation of a market which has long been restricted.

The way in which television signals are transmitted via satellite and cable networks

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Digital television has provided viewers with an extended range of programs and has also improved the reception quality thanks to the DVB-T digital broadcasting system.  
● ● ●

has changed in a similar vein, as these networks have also been almost fully digitised. The digitisation of terrestrial broadcasting has already resulted in the first expected savings in the frequency spectrum (the so-called “digital dividend”) and thus a part of the spectrum – in the band 790 – 862 MHz – has already been reallocated for the use in the build-up of mobile high-speed networks (see the section devoted to the radio spectrum).

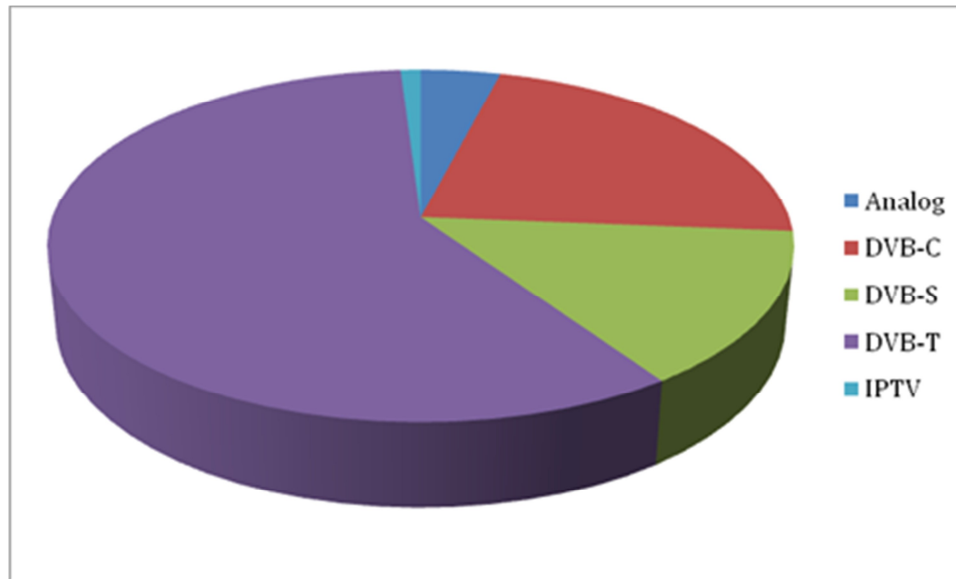
With the transition from terrestrial analogue to digital television broadcasting, the way in which households use television platforms has also changed. Although there has been a significant increase in satellite reception, terrestrial broadcasting still retains a strong place, not only for the main TV set in the

household, but particularly for the second and other sets.

• • •

The viewer cannot be exposed to further pressure to invest in receiver devices for the next phase of the development of digital television so soon after the transition to digital television.

• • •



**Graph No. 1: Structure of television broadcasting platforms in the Czech Republic in 2012; source: Final Report of the National Coordination Group for Digital Broadcasting**

Terrestrial digital television broadcasting networks are one of the principle platforms through which television broadcasts are transmitted to the viewer. The capacity of terrestrial networks is limited due to the limitations of the frequency spectrum that is needed for the transmission. This is why it is essential to make the use of the spectrum as efficient as possible. From the viewpoint of the viewer, the terrestrial platform is the oldest, most common, most economical and still the most widely used means of receiving television broadcasting. Its main advantages are:

- An almost blanket signal coverage,
- Its employment for informing the public during states of emergency,
- The reception by fixed antenna, but to a limited extent also the possibility of mobile reception,
- The offer of regional and local content,
- The free availability of content free of charge,
- The technical and economic accessibility to the viewer.

In order to protect the justified interests of the viewer and to assure non-discriminatory conditions, it is essential to make all technological advantages available to terrestrial broadcasting, putting it on an equal footing with the other platforms. With the emergence of new, more efficient transmission and compression methods, it is to be expected that the use of this platform will become less costly for television broadcasting operators, as the transition to efficient methods of terrestrial digital television broadcasting will increase significantly the utility value of these networks, while it is not expected that there will be any major increase in investment and operating costs related to the construction and operation of these

networks. This should result in higher-quality broadcasting and a greater variety of content.

**Measure No. 5:**

**In relation to the strategy of the spectrum that's currently being drafted, the Czech Telecommunication Office will review the use of the spectrum in the band 470 – 790 MHz with the aim of harmonising the interests and needs of television networks and high-speed Internet-access networks. This will ensure the continuing availability of the existing range of television broadcasting and its development, as well as saving the spectrum for further use, particularly for high-speed access networks.**

In order to achieve this objective, it is essential to appropriately harmonise the spectrum at the national and international level without putting the needs of existing broadcasting and transfer services at a risk.

Owing to the need for an intensive development of high-speed access to the Internet, it is assumed that the corresponding rapid development of the networks will generate an acute demand for freeing up another suitable radio spectrum in the television band (700 MHz, channels 49 – 60). Although the government prefers to make the greatest possible use of this spectrum for high-speed mobile access networks, an alternative solution could be the introduction of the technology known as cognitive radio or context-sensitive smart radio. This technology allows for the most efficient use of the spectrum by enabling the shared access to the spectrum for high-speed Internet providers and television broadcasting services.

● ● ●  
Other trends in television broadcasting include the introduction of HDTV, greatly increasing the variety of services provided, for example interactive services, 3DTV, minority programs and particularly the ever more popular hybrid systems, which combine the advantages of radio and television broadcasting networks with high-speed Internet access.  
● ● ●

The further development of digital television broadcasting will be influenced by several factors. Due to the growing popularity of widescreen television sets, better image quality and other broadcasting parameters are becoming essential. Most viewers perceive a high video and audio quality as the basic features of television broadcasting that can not be compromised. This naturally results in increasing demand for high-quality broadcasts, i.e. high-definition television (HDTV).

Long-term trends show that HDTV television screen resolution (1920x1080 DPI) will become the standard expected and demanded by viewers in the near future. There is no doubt that the increasing quality of television broadcasting is one of the positive social benefits. Other trends in television broadcasting are a far greater variety of provided services, including interactive services, 3DTV, minority

programs and particularly the increasingly popular hybrid broadcasting systems combining the advantages of radio and television broadcasting networks and high-speed Internet access. A sharp rise in video-on-demand (VoD) services, which modern television sets connected to the Internet offer, is to be expected. Attractive content and services will be offered in an interoperable and homogeneous environment resulting from the fusion of the broadcasting and Internet networks. The boundaries between modern digital devices are gradually disappearing; digital services are converging and will become generally available on any device, be it a smart phone, a tablet, a personal computer, a digital radio receiver or a HDTV set.

The viewer will have access to content via various networks depending on his immediate needs and ways of using it. Presently, for example, the law distinguishes between traditional television broadcasting and audio-visual media services on demand, which may be characterised as the non-linear distribution of television content, where the viewer chooses from a catalogue what and when s/he wants to watch. It may be assumed that both of these forms of distribution will converge and that the viewer will only need one receiver in the future; this will require the amendment of the relevant media legal framework.

The demand for HDTV and other advanced formats (3DTV, etc.) obviously entails the need for greater transfer capacity in digital broadcasting networks. This need can be met by making transmission more efficient, i.e. by using the spectrum more efficiently without having to allocate additional spectrum bands. Technological developments in recent years, in particular the development of the DVB-T2 broadcasting format, have made the usage of the frequency spectrum far more efficient in terrestrial television broadcasting systems. The use of the DVB-T2 broadcasting format is currently the only way of further developing the terrestrial broadcasting networks. The satellite platform – for example – already uses the DVB-S2 system as a standard which has enabled the virtually unlimited distribution of HDTV.

Verification tests in the Czech Republic have shown that the efficiency gains in the usage of the spectrum resulting from the introduction of the DVB-T2 standard have reached 50 to 85 % (an increase in network data throughput from 19.9 Mbit/s for DVB-T to approx. 37 Mbit/s for DVB-T2). Further savings in the use of the spectrum can be achieved by a significant reduction of the number of frequency channels for DVB-T2 networks, made possible by the creation of extensive single-frequency networks.

Another necessary step towards making television broadcasting more efficient is the use of advanced compression algorithms to process video and audio for television broadcasting.

**Measure No. 6:**

**The Czech Telecommunication Office will ensure that the current technical framework for terrestrial digital television broadcasting will be maintained in the form of a national D-book, which contains the minimum requirements for the**

**technical specifications of terrestrial broadcasting television receivers sold in the Czech Republic. At the same time, the Czech Telecommunication Office will in a convenient way publish these minimum requirements for the technical specifications of television receivers capable of receiving the DVB-T2 signal and in a compression format of at least H.264/MPEG4 with MPEG2 DVB-T backward compatibility, with the aim of increasing the awareness about the further development and consumer protection.**

It is clear that the gradual transition to DVB-T2 systems and advanced compression formats has to be handled in an even more sensitive way than the transition from analogue to digital television. One of the essential prerequisites for the successful transition to the new technology is the certainty on the part of television manufacturers, distributors and last but not least the consumers that the specifications of television sets distributed on the Czech market correspond to the parameters of the digital television broadcasting networks. Therefore it is essential to stipulate the minimum technical specifications for television sets on the national level, in line with technological developments within the EU. The transition to the new broadcasting system will involve costs to be borne by the consumer – the viewer – as s/he will have to buy a new television set or a set-top box. It is therefore crucial that both technological transitions (the introduction of DVB-T2 broadcasting and H264/MPEG-4 AVC compression) are carried out at the same time in order to make sure that consumers are not burdened by two separate transitions. Moreover, viewers cannot be asked to further invest in receiver technology for the next development stages of digital television so soon after the transition to digital television.

All stages of the transition to advanced television-content distribution systems have to be voluntary and part of the natural lifecycle of technology replacement of devices and accelerated by a higher quality of the broadcasting with a wider choice of related services, greater diversity of content and a robust communication with the public to ensure that the benefits will be understood and will outweigh the acquisition costs of the new receivers, which must be minimised.

The gradual transition will in particular rest with the discretion of the broadcasters and the operators of broadcasting networks. The strategic review of the plan for the use of the spectrum for television broadcasting will be carried out on the international level predominantly throughout 2013 and 2014. At the time of the elaboration of this document, preparations were being made for multilateral talks on setting up the appropriate working groups. This, however, does not prevent the setting up of conditions for the launch of parallel DVB-T2 broadcasting networks, if the television operators agree on it with the electronic communications network operators.

For the sake of completeness, the government has to highlight the role of the Czech Television in this process, which is legally obliged to engage in new fields of broadcasting technology and services. It may be observed that the Czech Television is handling this task well and has been at the forefront of innovation and the



application of new means of content distribution, as confirmed by the annual report of the Czech Television Council, which serves to assert the right of the public to control the activities of the Czech Television.

As no plan has yet been adopted at the governmental level for defining the framework for an update of the media legal framework, particularly in the field of radio and television broadcasting, or public services media, the Czech Telecommunication Office will base its Radio Spectrum Management Strategy on the current legal framework, taking into account future technological trends and the progress with respect to the international negotiations, while considering the need to ensure and develop public services in radio and television broadcasting. It is assumed that mutual cooperation between various departments, regulatory authorities and other institutions in charge of content or transmission aspects related to this matter will be crucial for achieving the stated goals.

#### **4.4. Digital radio broadcasting**

At present, terrestrial analogue FM radio broadcasting at very high frequencies (87.5 – 108 MHz) is the most important platform for providing radio services, partly due to its blanket coverage, the operation of regional stations, ease of access, adequate broadcasting and reception quality and, last but not least, due to the options offered by mobile reception. Given the great popularity of radio broadcasting it has become a crucial part of the European and Czech economy. Radio stations, thousands of editors, advertising agencies, technicians and manufacturers of broadcasting and receiving equipment profit from the existence of radio broadcasting. Radio broadcasting is the cheapest and most efficient means of disseminating the latest and important information and brings culture to millions of listeners every day. Of course, we must not overlook the fact that basically every mobile phone with more than just the very basic features contains an FM radio receiver and thus – owing to the scope of mobile phone penetration – the traditional analogue broadcasting is becoming increasingly available. The limited usable radio spectrum and the great demand for radio services hamper the further development of radio broadcasting through this traditional platform. This situation is restricting existing and future radio broadcasters and does not allow them to expand broadcasting as regards the coverage of territory and content. The development of broadcasting plurality, community radio and an expansion of the potential of radio platforms cannot be achieved without further developing the technological basis used for broadcasting. It is also essential to define the goals of the strategic development of radio broadcasting for existing broadcasters and network operators with regard to future operation and investment in existing analogue VHF networks.

Radio broadcasting must not remain a mere analogue medium in the digital world. The further development of radio broadcasting services is only possible with the gradual digitisation of terrestrial radio broadcasting. Just like satellite and cable radio broadcasting, which were digitised at the same time as television broadcasting,

terrestrial radio broadcasting has to be digitized, being irreplaceable due to the exceptional features it offers:

- Almost universal signal coverage.
- Can be used to keep the public informed in states of emergency.
- Can be received on a fixed antenna, but also on the move or via a mobile set.
- Can offer regional and local content.
- A wide range of receivers.
- Freely accessible content free of charge.
- Technical and economic accessibility for listeners.
- Support for broadcasters.
- Well accepted over the years by the listeners.

The importance of terrestrial radio broadcasting for the further development of radio broadcasting is beyond doubt. Therefore, digital terrestrial radio broadcasting has to be gradually developed and expanded and in the future has to fully replace analogue radio broadcasting, freeing up the very-high frequency band of 87.5 – 108 MHz used by analogue radio broadcasting in the process.

The further development of the digital terrestrial broadcasting requires a considerable increase in the diversity of provided services, including differentiated and minority programs, community broadcasting, data services and specialized services (e.g. sophisticated traffic information systems) and particularly the increasingly popular hybrid broadcasting systems which combine the advantages of radio broadcasting networks with high-speed Internet connection. Another significant incentive for the expansion of digital radio broadcasting is the increase in the quality of provided services. Attractive content and services will be offered in an interoperable and homogeneous environment created by the merging of broadcasting and Internet networks. As mentioned above, the boundaries between modern digital devices are gradually disappearing and digital radio broadcasting is no exception; digital services are converging and radio broadcasting is becoming generally accessible on any device, be it smart phones, tablets, personal computers or a digital radio receiver at home or in the car. The radio broadcasting of the future is therefore digital, multiplatform-based and hybrid in nature. Listeners will listen to the radio on a multitude of different receivers with screens, which will provide them with additional information, images and multimedia content. In order to achieve this, hybrid radio broadcasting will be transmitted via radio broadcasting networks and the Internet networks, two forms of technology that will complement one another.

It is indisputable that analogue radio broadcasting will be replaced by digital broadcasting and for this reason it seems appropriate to have in place at least a framework for the transition to digital radio broadcasting, even though this is not a “transition” in the sense of the transition to digital television, as according to the Czech Telecommunication Office, digital radio can now use the vacated III. TV band and the L band and both systems can work in parallel for a relatively long time. The

current legislation (Article II, point 1 of Act No. 196/2009 Coll.) states that *“Licensed radio broadcasting operators, broadcasting on the basis of a licence granted by the Council for Radio and Television Broadcasting (“Council”) before this ruling entered into force and who have declared in writing that they will support the transition to terrestrial digital radio broadcasting and will cease analogue broadcasting on the basis of the government resolution on the transition to terrestrial digital radio broadcasting, are entitled to apply to the Council in writing to request the issue of a transformation licence, allowing them to broadcast until October 10, 2025.”*

Owing to the long time required for the completion of the voluntary transition to digital radio broadcasting and the need for the two systems to run concurrently for some time, it is essential to create favourable conditions for the development of digital radio transmission systems as soon as possible and to systematically support the introduction of these systems to ensure that by 2025 the transition process will be at a stage allowing for the phase-out of VHF analogue broadcasting.

Although no single date for the phasing out of analogue VHF radio broadcasting (87.5 – 108 MHz) has been set yet on the international or European level, its existence should not be prolonged unnecessarily, particularly due to the limited range of services it offers and the lack of a perspective for its further development<sup>10</sup>. In order to achieve these aims, however, it is in the first place essential to stimulate the interest of the public and broadcasting operators.

Examples of other European countries which have already made progress in introducing digital terrestrial radio broadcasting show that the process requires a lot of organisational, economic and communication effort to be invested if it is to succeed. It requires a joint approach of the government, radio broadcasters, operators, hardware manufacturers, providers of additional content, the automotive industry and others in order to create a platform enabling the plurality of content, better quality of reception, the provision of additional services, savings in the spectrum, a reduction in energy consumption and the acceptance of the new standard by listeners and the society in general.

On the one hand, it seems to be desirable to start a dialogue on the development and the promotion of DAB/DAB+ digital radio broadcasting with the radio broadcasters, operators of electronic communications networks, manufacturers and specialists from the automotive industry involved in supporting this technology. On the other hand, the Ministry of Culture states that:

*“Most radio broadcasting operators should acquire the transformation licence, which obliges them to support the transition to terrestrial digital radio broadcasting, by 2016. For this reason the Ministry of Culture considers the initiation of a dialogue with the radio broadcasting operators on the development and promotion of*

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<sup>10</sup> Some EU states have already specified or are discussing a preliminary date for phasing out VHF analogue radio broadcasting (e.g. Great Britain in 2015 – Digital Radio Action Plan v.7; Germany in 2015 – draft Telecommunications Act; Norway in 2017–2019), while most other states have drafted a strategy for the digitisation of radio, even if they have not yet come up with a schedule to clear the VHF band.

*DAB/DAB+ digital radio before 2016 to be inappropriate. If the state explicitly obliged the radio broadcasting operators by law to support digital radio broadcasting by granting them a transformation licence, it should not try to enforce this support either directly or indirectly before most radio broadcasting operators have obtained this transformation licence.”*

In relation to this matter, the Ministry of Culture further states that:

*“In Europe, the process of the digitisation of radio broadcasting is based on the innovative work carried out by manufacturers, electronic communications network operators and broadcasters, without state intervention. Thus there is no reason why the state should take responsibility for the transition to digital radio broadcasting on behalf of commercial entities, when there is nothing preventing them from making their own decisions concerning the digital distribution of their programmes or the phasing out of analogue broadcasting.”*

Nevertheless, the government is fully aware of the fact that a late response to technological progress always leads to greater expenses on the part of the state, businesses and users, and it will therefore use the existing means to further deepen the dialogue on the development and promotion of digital radio broadcasting.

For the sake of completeness, it is important to mention the role of the Czech Radio in this context. The Czech Radio is bound by law to engage in activities in the field of new forms of broadcasting technology and services. The Czech Radio can be praised for keeping up to this task and being at the forefront of innovation and the application of new distribution channels for its programs using the existing technology and in compliance with current legal framework, as confirmed by the annual report of the Czech Radio Council, which serves to assert the public’s right to control the activities of the Czech Radio.

#### **4.5. Net neutrality**

The introduction of the concept of net neutrality is related to the need to keep the Internet open. It stipulates that providers of access to the Internet must not impose any restrictions or traffic management related to content, point of connection, type of platform or device used to connect to the Internet. Restrictions of any forms of communication when accessing the Internet are unacceptable.

The term “net neutrality” is a general principle stating that “all electronic communications passing through the network are processed in the same way”. Processed in the same way means that electronic communications are processed regardless of:

- the content transmitted,
- the application used,
- the service used,

- the communication device used,
- the location of the sender or recipient.

In order to satisfy the needs of Internet end users, various deviations from this general principle are likely to increasingly appear in the future. Some may be helpful in improving the quality of services, for example certain types of justified traffic prioritisation with the purpose of minimising time lag (e.g. video conferencing, television broadcasting, voice over IP and video on demand, etc.), or network optimisation to ensure the efficient use of available capacities, etc. However, there may also be deviations with an adverse impact on certain services, for example the blocking of services, which operators see as a threat to their current business model (so-called OTT, or “Over-the-Top” services). Deviations with a clearly adverse impact or of an anti-competitive nature have to be minimised.

Electronic communications networks use functions which ensure that the network is able to provide adequate transfer capacity to ensure support for individual services. These functions include traffic management. The proper application of traffic management in certain points and certain layers of the network may help to improve the quality of the services provided. Traffic management is essential for the provision of high and guaranteed quality services.

Traffic management may be applied either regardless of transmitted content, type of application or service, type of connection or specific user, or conversely with regard to these aspects. The application of traffic management does not necessarily need to result in a deviation from the principle of net neutrality. However, situations where traffic management would be used to block a specific application, for example, would constitute a breach of the general principle of net neutrality in providing Internet access.

The provision of services via electronic communications networks can be characterised as two categories of Internet access. These categories differ in the way transfer capacity is limited:

- “best effort” access,
- “managed-services” access.

“Best effort” access means that the standard to which data flows are processed is not guaranteed (neither by prioritizing, nor by the guaranteed supply of certain data), which does not automatically mean that the quality of data processing has to be low. This type of access takes in all data traffic but after traffic capacity has been used up, some data will not be sent, resulting in an overall decline in the quality of the service.

Managed services access is generally designed to provide certain guaranteed transmission properties that can be defined on a contractual basis. In technical terms, the methods used are called *traffic management* and *access restriction*. The application of access restriction is an important element distinguishing managed

networks from “best effort” networks. In managed access networks, the customer may be rejected, whereas “best effort” networks try to serve the customer even in situations when the network capacity limit has been reached; in such a case the quality of the service will be lower.

The requirement to maintain the principle of net neutrality even for managed services access networks calls for the implementation of both categories of Internet access independently of one another.

The use of traffic management in electronic communications networks may have both positive and negative impact on the quality of services provided<sup>11</sup>. Therefore, at the present and in the future, the Czech Telecommunication Office needs to be proactive in defining – on the basis of the Electronic Communications Act – what will be considered a reasonable and justified traffic management, in particular by taking into account the European regulatory approach.

In order to be able to assess the impact of individual deviations on the data transmission, the Czech Telecommunication Office will require an adequate set of source materials to analyse any situation that might arise. The Czech Telecommunication Office has to use its powers to resolve any problems.

The Czech Telecommunication Office must therefore continually assess the need for possible interventions and the use of suitable technical and working procedures allowing for the evaluation of the introduction of traffic management and the assessment of its impact on the overall quality of services provided on the Internet. It also has to inquire into whether the Internet providers’ general trading terms correspond to the standard of services actually provided.

The operators have to make available a transparent description of how both categories of Internet access services are provided. “Best effort” services and managed services can be provided simultaneously and may even share the same infrastructure. End users (and also content, application or service providers) should be able to choose the type of system that best suits their needs. Customers, however, have to be provided with transparent and clearly distinguishable information about both categories of Internet access services.

The Czech Telecommunication Office will assess the transparency of information taking into account the relevant decisions, recommendations, instructions and positions issued by the authorities of the European Union and BEREC (Body of European Regulators for Electronic Communications), which was set up at the EU level by Regulation No. 1211/2009, as well as the results of the public consultation<sup>12</sup>, which form the basis for further regulatory proposals.

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<sup>11</sup> Therefore, in 2011 and 2012 BEREC carried out an extensive investigation amongst European operators using a questionnaire entitled “Questionnaire on traffic management”, with the aim of determining whether traffic management measures are overused.

<sup>12</sup> In 2012 the European Commission held a public consultation entitled “Consultation on specific aspects of transparency, traffic management and switching in an Open Internet”.

In a competitive market, in which customers are provided with adequate and transparent information, operators or providers offering Internet access that will reduce the quality of certain services in a way that has an adverse effect on the interests of users should face the risk of losing customers. However, in a situation where Internet operators and providers routinely impair quality and harm consumers' interests by applying the "best effort" principle although they claim to be providing managed services, the Czech Telecommunication Office has to intervene and set the requirements for minimum service quality, if the self-regulation of the market proves to be inadequate.

On the basis of an assessment of the monitoring of Internet access services provision, the Czech Telecommunication Office will judge whether consumers' interests have been harmed and, if necessary, will introduce regulatory measures.

As stated above, the Czech Telecommunication Office will base its actions on the applicable legal framework (particularly § 71 of the Electronic Communications Act), as well as on the appropriate decisions, recommendations, instructions and positions issued by the EU authorities and BEREC.

At the EU level, the government of the Czech Republic will promote net neutrality in such a way as to ensure the competitiveness of the European ICT industry and prevent any development that could put the European ICT industry at a disadvantage vis-à-vis other regions of the world.

**Measure No. 7:**

**Based on its findings in the market, in compliance with the effective legal regulation as provided by the Electronic Communications Act and in accordance with the position of BEREC and the European Commission, the Czech Telecommunication Office will issue general guidelines and recommendations regarding the use of traffic management as well as suitable measuring tools and evaluation procedures to determine whether or not Internet providers comply with the stipulated quality requirements.**

#### **4.6. Introduction of the IPv6 protocol**

Internet transmission protocols identify each device connected to the Internet via Internet protocol addresses (IP addresses), which have to be globally unique in order for the Internet to operate smoothly. Nowadays, two versions of Internet protocol are in use. The older and still widely used IPv4 technology (e.g. 217.32.201.43) and the new IPv6 technology (e.g. 2001:0db8:0:0:0:0:1428:57ab), which provides an array of advantages, for example a virtually unlimited IP address capacity or enhanced security.

In 2011, the international organisation IANA (Internet Assigned Numbers Authority) allocated the last free address blocks of the existing IPv4 Internet communications protocol. The last free blocks in Europe are being allocated at the moment. In the near future, there will be an acute shortage of free IP addresses necessary for connecting people and devices to the Internet<sup>13</sup>. This situation may have a dramatic impact on the further development of the digital economy, as it may make it harder for new firms to enter the market, including innovative small and medium-sized businesses or new telecommunications operators, who will not have enough free addresses for their customers. The further development of the communications infrastructure, services and the connection of new users is only possible by introducing the new IPv6 protocol and finding a convenient solution to the issue of the coexistence of the IPv6 with the existing IPv4 protocol. On the basis of materials submitted by the Ministry of Industry and Trade, the government of the Czech Republic adopted Resolution No. 727 of June 8, 2009, aimed at ensuring the timely implementation of the IPv6 protocol in public administration.

This resolution obliges the ministers and the heads of the central government administration authorities to ensure:

- The compatibility of network elements with IPv6 in the framework of the periodical renewal of these elements from June 30, 2009, onwards.
- The access to the web pages and publicly accessible e-Government services via IPv4 as well as IPv6, by December 31, 2010.

This resolution also recommends that regional governors and the Mayor of Prague take the same steps.

Based on a survey conducted by the IPv6 Observatory ([www.ipv6observatory.eu](http://www.ipv6observatory.eu)) for the European Commission, the Czech Republic has for a long time been in the lead with support for IPv6 at above 15 % on the web pages under scrutiny.

Nevertheless, although the government resolution mentioned above obliged ministries and other central government bodies to ensure the support for IPv6 in the electronic services they provide, a survey carried out as of August 31, 2012, showed that only 42.9 % of ministries and 50 % of central government administration authorities had complied with this obligation by that date. At the regional level, support for the new protocol was only at 7.1% of the regional authorities. The situation does not get any better in cities and municipalities, with only 9.3% of 205 cities and municipalities with extended powers ready for the new version of the protocol. Experience has shown that companies hosting web presentations may play a positive role in supporting IPv6. This cooperation, together with awareness-raising activities to mark World IPv6 Day on June 6, 2012, has helped to establish IPv6 with

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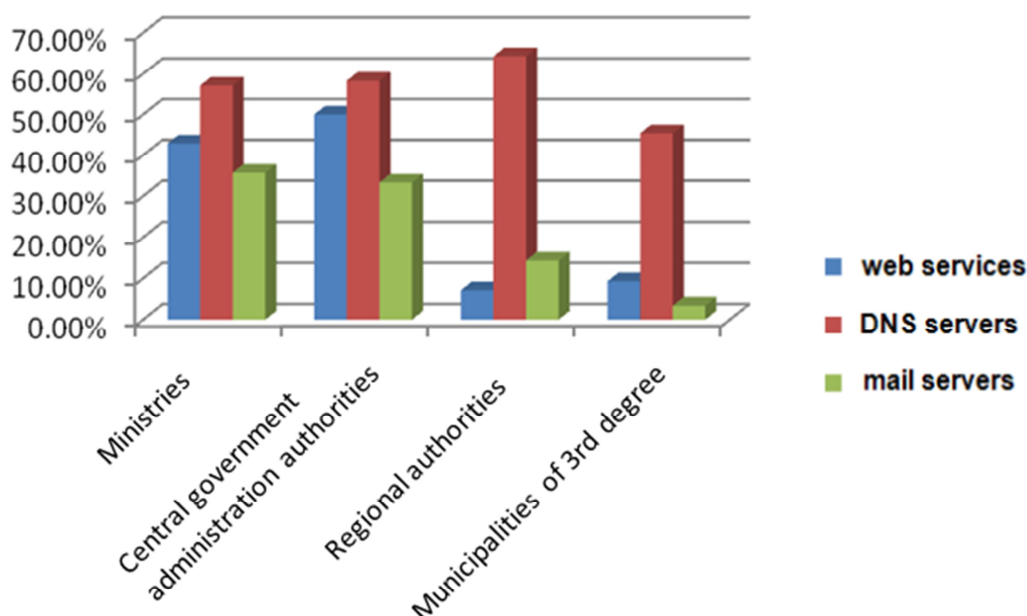
<sup>13</sup> IPv4 theoretically allows the allocation of a maximum of 4 294 967 296 individual IP addresses. As soon as in the 1990s - in the light of newly emerging technologies, such as the Internet of things - this started to be seen as inadequate and therefore the preparations for the introduction of a new version, the IPv6, were launched.



the central government bodies as well as in towns and cities, successful examples of which are Frenštát pod Radhoštěm, Hodonín, Jihlava, Kladno, Milevsko, Neratovice, Přelouč, Slaný, Valašské Klobouky, Vsetín and Vyškov.

Surveys of IPv6 support also highlight an inadequate support for e-mail servers amongst these institutions. The e-mail servers of the authorities of six cities, two regional authorities and three central government administration authorities are fully compatible with IPv6. The analysis also shows the state of readiness of the DNS servers of the various authorities, which is one of the criteria for ensuring the accessibility of web services via IPv6.

Another key factor for the practical implementation and a full launch of IPv6 is the support not only on the server side, but also by the telecommunications infrastructure. In particular for public administration authorities, the support for IPv6 by the PACI (Public Administration Communications Infrastructure) is crucial, including the CSP (Central Service Point).



**Graph No. 2: Readiness of the various elements of government information systems for IPv6, source: CZ.NIC 2012**

In order to support IPv6 in public administration, in 2011 the Ministry of Industry and Trade, together with the Ministry of the Interior and CZ.NIC, became involved in a European project called GEN6 (“Governments enabled with IPv6”)<sup>14</sup>, which contributes to awareness raising by organizing practical courses on the implementation of IPv6 and provides technical support for government officials. The project also includes the regular monitoring of the readiness of public administration for IPv6.

<sup>14</sup> [www.gen6.eu](http://www.gen6.eu)

**Measure No. 8:**

**The Ministry of Industry and Trade will continue to enforce compliance with the obligations stipulated by Government Resolution No. 727, of June 8, 2009, and to support the transition to IPv6 and assist in its successful implementation at the public-administration level.**

#### 4.7. Enhancing confidence in the use of the Internet – DNSSEC

One of the key factors for the development of the digital economy is user confidence in the Internet. For many users, cyber-attacks, the abuse of credit cards and the theft of personal data are barriers preventing the full use of the possibilities that the Internet nowadays has to offer. Confidence in Internet use plays a crucial role, particularly in electronic commerce (e-Commerce) and using e-Government services. For this reason it is necessary to seek ways of protecting users against cyber-attacks and also giving them certainty that the web site they are accessing is not faked.

One of the most important aspects of the Internet is the domain-name system (DNS). This system allows the efficient maintenance and administration of a decentralised database of domain names and their conversion to IP addresses so that users do not need to remember long numerical addresses but can simply enter an Internet address in their browser, for example [www.mpo.cz](http://www.mpo.cz). In practice, this means that whenever a user enters the name address of a particular Internet service (web site, email address, etc.), that name address needs to be converted via DNS to a numerical address (IP address); the computer then turns to this numerical address in order to connect to the service the user wants to use.

However, with the growing importance of the Internet, the DNS system is increasingly becoming an attractive target for hackers. One reason for this is that the system is basically outdated. At the time when it was created, it was not designed to face the security threats that exist today. One possible type of attack is based on using a faked IP address. In this way the user, without being aware of it, visits a completely different site and does not connect to the service he intended to. This situation may occur while using electronic banking systems as well as electronic public-administration systems (e.g. data boxes). This type of attack may be remotely reminiscent of so-called “phishing”<sup>15</sup>, but is much more sophisticated and dangerous for the user because despite of the page that’s being viewed is faked, the right address is shown in the browser. An even more sophisticated system was used last year by cyber attackers who hacked a certification authority and subsequently claimed to be a reputable company.

One way of preventing this from happening and allowing the user to be sure he’s viewing the right page is the DNSSEC technology. The Czech Republic is playing a leading role in the introduction of this technology, not only in Europe, but world-wide, and nowadays more than 35% of “.cz” domains are DNSSEC-certified. DNSSEC

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<sup>15</sup> A fraudulent technique based on sending in particular e-mail messages inviting the recipient to enter personal information on a fake website which looks almost identical to the official site.

is used for protecting the web pages of a wide range of e-shops and public-administration bodies, e.g. the Czech Telecommunication Office or the Security Information Service. Last but not least, leading Internet providers, including key players in the market, have begun to support the DNSSEC technology.

Owing to the importance of DNSSEC for increasing users' confidence in the Internet, the Ministry of Industry and Trade supports - just as is the case with IPv6 - the expansion of this technology in public administration and in the use of its electronic services.

**Measure No. 9:**

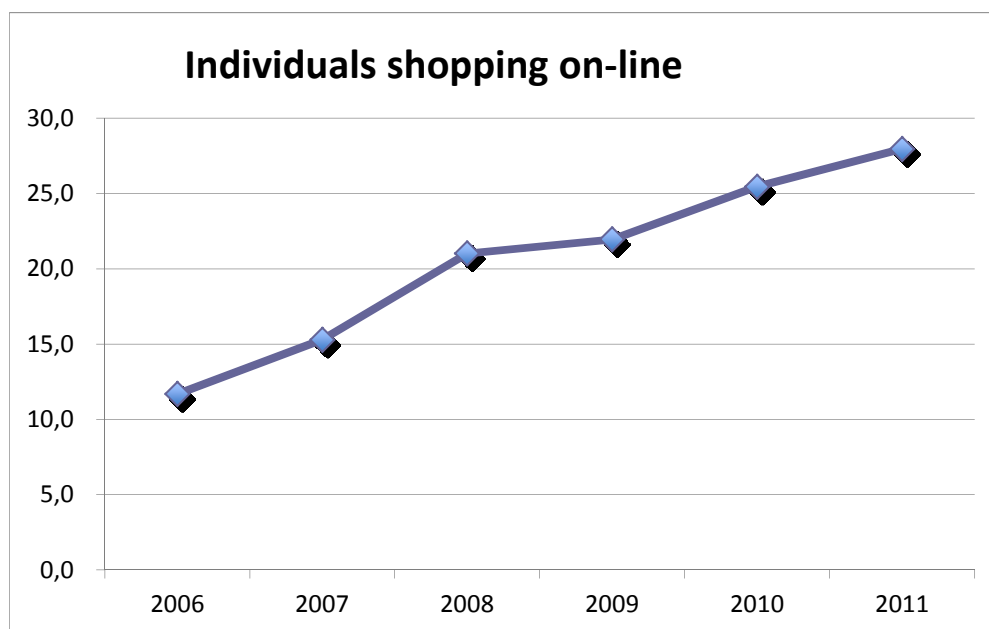
**The Ministry of Industry and Trade will submit for approval by the government its material aimed at supporting the expansion of DNSSEC technology in public administration and in the use of its electronic services.**

## 5. The Internet as the backbone of the digital economy

The development of e-Commerce and on-line services has a tremendous potential as regards its economic, social and pro-market impact. According to the European Commission, for each job lost outside the Internet domain, the Internet economy creates 2.6 jobs and offers a better choice for consumers, including those in rural or isolated areas.<sup>16</sup>

The gains resulting from lower prices on the Internet and the wide range of goods and services available are valued at 11.7 billion EUR, which is the equivalent of 0.12% of the European GDP. If e-Commerce accounted for 15% of all retail and if the barriers on the internal market were eliminated, the gains for consumers could amount to 204 billion EUR, i.e. 1.7% of the European GDP.

European e-Commerce is on the rise, despite the current economic crisis. It plays an important role in the B2B model – 27% of European businesses buy on-line and 13% sell on-line. Nevertheless, it only makes up 3.4% of retail in the 27 EU member states, reaching the highest share in the United Kingdom (7.7%)<sup>17</sup>. The development of e-Commerce is very inconsistent across the EU, with clear differences between the countries of the north and the south. The United Kingdom, France and Germany combined account for 70% of e-Commerce in the EU. The level of cross-border on-line retail is even lower. Only 9% of European consumers shopped on-line in another EU member state in 2010.<sup>18</sup>



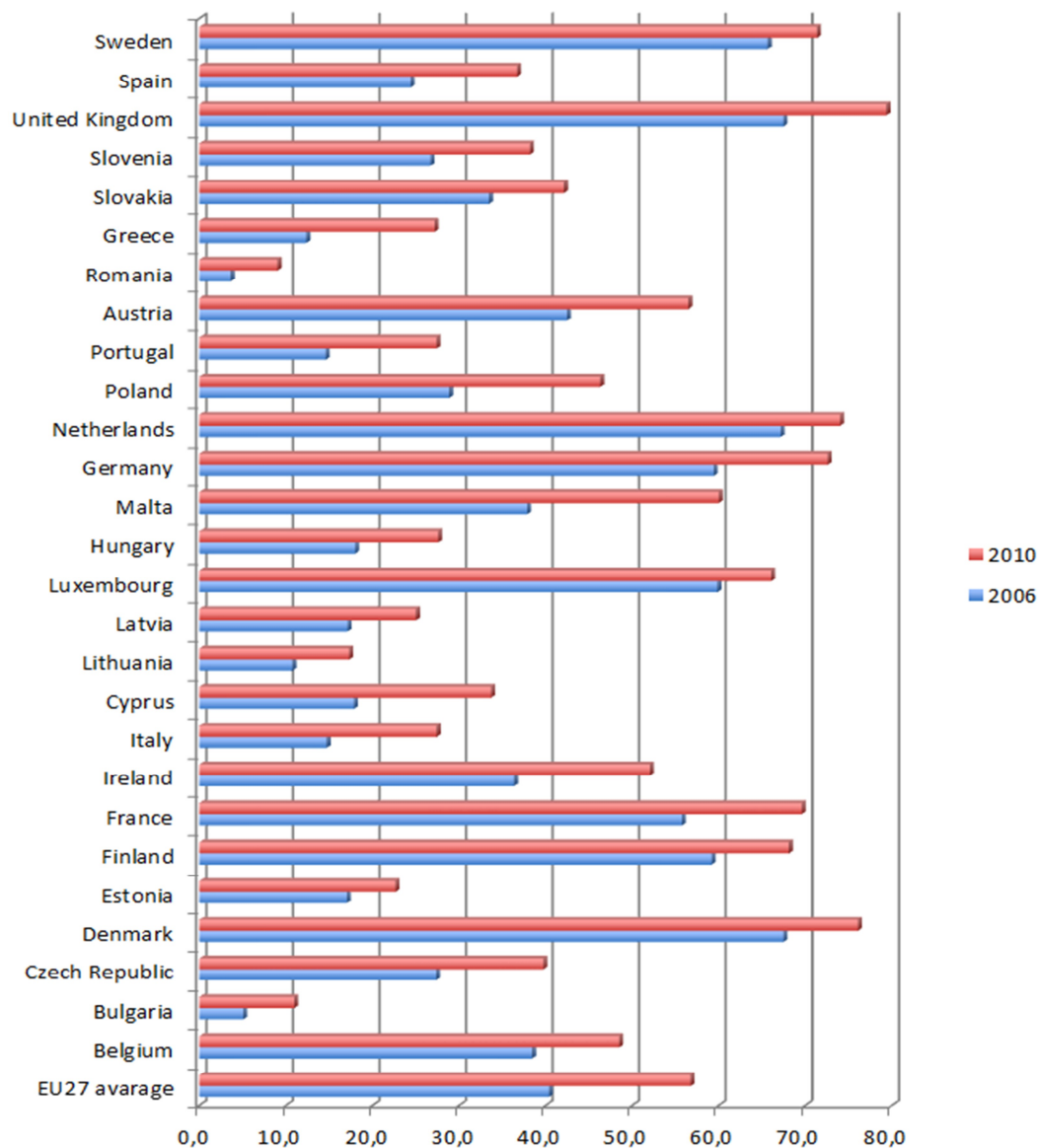
**Graph No. 3: Individuals shopping on-line in the Czech Republic; the figure on the y axis gives the percentage of the total number of individuals aged 16 or above. Source: CSO**

<sup>16</sup><http://europa.eu/rapid/pressReleasesAction.do?reference=IP/12/10&format=HTML&aged=1&language=CS&guiLanguage=en>.

<sup>17</sup> Euromonitor International, 2010.

<sup>18</sup> Eurostat, Information Society Statistics, 2010.

Nevertheless, despite the modest growth in e-Commerce, the EU is still lagging behind South Korea, Japan and the USA. For a comparison, 66% of U.S. Internet users shop on-line. In South Korea the figure even amounts to 94%.<sup>19</sup> At the same time, only 57% of Internet users shop on-line in the EU.<sup>20</sup> Yet the pace at which e-Commerce is growing is presently higher in the EU than it is in the USA.



**Graph No. 4: A comparison of the rise in on-line shopping in EU countries in the 2nd quarter of 2006 and the 2nd quarter of 2010; the figure on the x axis gives the percentage of the total number of individuals aged 16–74 in individual countries. Source: Eurostat 2011, CSO**

The development of e-Commerce has led to significant changes in a number of sectors. These include travel agencies (in 2008, 39% of sales were made on-line), the sale of electronics and cultural works (22%), financial services, gambling and sport

<sup>19</sup> Forrester Research Inc, The Global eCommerce Adoption Cycle, 15. 01. 2010 (using 2009 data).

<sup>20</sup> Eurostata, Data in Focus 50/2010: Internet Usage in 2010 – Households and Individuals, 14. 12. 2010.

betting. On-line shopping for clothing is on the rise as well (10%), while on-line shopping for foodstuffs is still relatively lagging behind (7%)<sup>21</sup>.

It is very difficult to quantify on-line sales of audio-visual works. Much of the consumption of on-line music is still on the margins of legality. It is therefore crucial to develop an interesting, high-quality and legal range of works on offer. The findings of a public consultation held by the European Commission on the future of e-Commerce in the internal market have confirmed the fact that consumers adopt different views on the changes in regulation depending on the country they live in and on content type (electronic books, music, films, cultural and sports events). The on-line music market is four times bigger in the USA than it is in Europe, even though it is now growing faster in Europe<sup>22</sup>.

On the supply side, the ecosystem of the digital economy and the information society in the Czech Republic consists of the ICT industry, ICT trade, ICT services and the content and media sector. In order to ensure the future competitiveness of the Czech Republic, it is essential that the Czech Republic does not only support “assembly plants” (since 2002, the Czech Republic has exported far more ICT goods than cars, for example)<sup>23</sup>; it has to support also ICT services and services with added value. In the ICT sector these are, for example, data-storage services, innovative Internet or technology startup communities, software companies, companies developing nanotechnology and space technology developers.

• • •  
The Czech Republic must not remain a mere "assembly plant".  
• • •

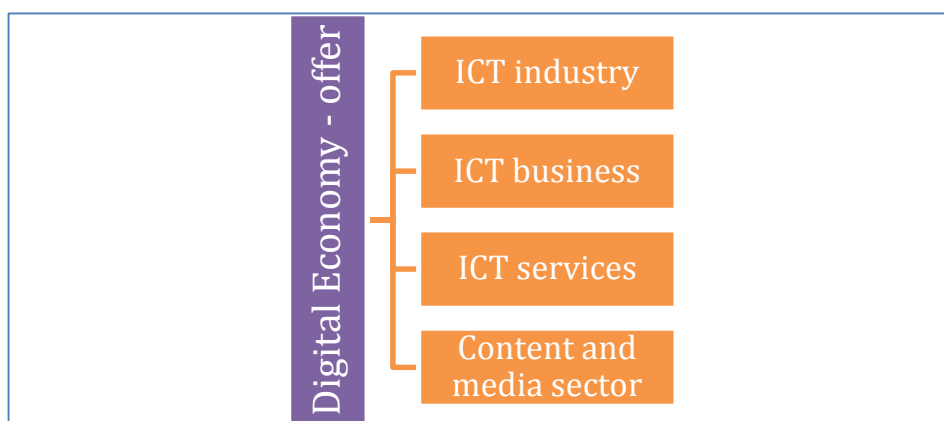


Fig. No. 1 The ecosystem of the digital economy – the supply side

The danger of the Czech Republic, being a kind of an “ICT assembly plant” lies in the fact that it is only a question of time before lose some of its competitive edge and

<sup>21</sup> Forrester consulting, May 2009, Study on "A Single Market for Information Society".

<sup>22</sup> Statement of the European Economic and Social Committee on the Digital Agenda for Europe.

<sup>23</sup> From the viewpoint of the structure of Czech imports and exports, it is a problem that the bulk of imported ICT goods comprises a wide variety of parts and components of unfinished products, while the country exports complete finished products; therefore, there is no doubt that large quantities of products are assembled in the country and then exported on with minimal added value.

the assembly will be shifted, for example, to a country in Asia. The Czech Republic should therefore focus on the support for the establishment of development centres for the creation of new products and procedures increasing the added value of ICT products. It is all the more alarming considering the fact that - according to figures from 2010 - the sum invested by the ICT processing industry in research and development is equivalent to a mere 6% of the amount spent on research and development in the automotive industry. The Czech Republic is therefore an important exporter of ICT products, but the firms and businesses that make these products in this country spend very little on research and development. Nevertheless, the sum spent on ICT research and development in the Czech Republic amounted to 3.6 billion CZK in 2010. This money may be regarded as benefiting the whole Czech economy, as ICT services generate a high added value.<sup>24</sup>

The demand side is represented by the households, companies and public administration. Although there have been countless studies confirming the benefits of ICT, it would be convenient if the Czech Statistical Office would continually assess the economic and social impacts of the use of ICT (e-inclusion, the digital divide, e-Business) and changes in the relationship between the public administration, the public and the entrepreneurs (e-government) in the conditions of the Czech Republic. This measure is in compliance with the OECD Ministerial Declaration from Seoul, in which ministers pledged *“to improve statistical systems used to measure changes in access to the Internet and associated ICT networks and how they are used by citizens, businesses and institutions, in order to acquire reliable statistics on the increase in the use of and the impact of the Internet on the economy and social welfare”*.<sup>25</sup>

High-speed access to the Internet has also allowed the development of the information society and ICT services as shared services. The terms shared services and cloud computing, which are often being equated, are nowadays used to cover a wide range of the benefits offered by modern technology and innovative ways of using it, including economic effects resulting in much-needed savings.

A characteristic feature of shared services is that they can be used instantly, without having to build, own or operate the necessary technological platform or wait for it to be put into operation. They can also come much cheaper due to their quantitative effect; unlike outsourcing, where a particular solution is only used by a single client and on that client's initiative, shared services may be offered and provided to multiple users simultaneously. Shared services have many advantages for their users. Besides the incurred savings and the overall positive economic aspects, they also include cost cutting as expenses are narrowed down to operation costs with no investment needed. This makes it easier to predict and plan. Last but not least, shared services are easily scalable and can be added or removed as required.

Best suited for shared-services-based ICT solutions are such agendas, applications or activities that are universal in nature and can be used by the greatest possible

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<sup>24</sup> CSO, Statistika & My (Statistics and Us), No. 3/2012.

<sup>25</sup> <http://www.oecd.org/Internet/consumerpolicy/40839436.pdf>.

number of customers, for example accounting, HR management, file and record management, the agendas of municipalities with extended powers, etc.

Although the effective legislation does not prevent the use of shared services (cloud computing) in the commercial sphere, its use tends to be restricted in practice by the internal regulations and guidelines of the organisation that wants to use shared services. However, it is important to ensure that contractual relations between the providers and the users of shared services are properly set up, covering a broad range of questions like the treatment of personal data and the division of responsibility between the provider and the customer. For public authorities that use public funds, contracts for shared services are classified as public-service contracts. The applicable legal framework for requesting such services therefore is the Public Procurement Act.

Cloud computing may be characterised as the provision of information-society services or software applications stored on remote servers via the Internet, where users can access them using an Internet browser or software client from practically any place.

The potential advantages of cloud computing are a reduction in costs, improved services and the creation of new business opportunities. Cloud computing could become one of the main branches of ICT services, as for telecommunications and technology companies it is a major entrepreneurial opportunity. Customers comprising entrepreneurs and public-administration bodies may use this technology to cut costs and make the most of the state-of-the-art services without having to install and maintain their own applications and computer hardware.

Cloud computing technology has great potential; however, there are also major risks to its further efficient development. This technology is based on the Internet and is thus fully dependent on it, meaning that the stability and resistance of this infrastructure becomes a crucial concern.

Technical failure, cyber-attacks or political rulings may cause Internet connection outages, thus highlighting its instability and in particular the dependence of the users on the Internet. Another major shortcoming caused by various factors is the security of data in a situation when it is transferred far away from the point of origin. The main challenge is thus to ensure the constant access to data whose instant availability may be of critical or even vital importance for cloud computing users. The global nature of cloud computing has also raised questions about the transfer of data between the client and the provider or within the provider's infrastructure with regard to the protection of personal data or copyright.

Despite all these risks, cloud computing has significant advantages for businesses, such as cutting initial investment, shorter implementation times and employee mobility.



Another form of technology that will become very important in the future is radio-frequency identification (RFID). The present and future application of this technology could greatly improve a wide range of business processes in the public and private sectors and could be of considerable benefit to private individuals and entrepreneurs. In technical terms, RFID technology uses electromagnetic waves to communicate with RFID tags, allowing it to read the unique identification numbers of RFID tags or other information stored on them. RFID tags allow the allocation of a unique identifier and other information to any object, creature or even person; this information can be read using a wireless device.

RFID tags are not merely “electronic labels” or “electronic barcodes”. Linking this technology up to databases or communications networks such as the Internet provides an incredibly effective way of delivering new services and applications in every type of environment. It may also stimulate a massive development of Internet applications and enable what is referred to as the “Internet of things”. RFID is considered to be the stepping stone to a new phase in the development of the information society, where the Internet no longer just links up computers and terminal communications devices, but potentially everything around us in our daily lives.

RFID will become increasingly available and will thus become a part of various aspects of people’s lives, such as logistics, healthcare, public transportation, retail particularly to increase product safety and to allow harmful products to be quickly removed from the market, as well as in entertainment, work, road-toll management, luggage clearance and travel documents.

Furthermore, RFID technology allows for the processing of data, including personal data, at short distances without the need for physical contact or a visible interaction between the reader or writer and the tag, so that this interaction can take place without the individual in question being aware of it.

Owing to the potential of this technology to be omnipresent and practically invisible, when introducing RFID, special attention should be devoted to the protection of privacy and personal data. Therefore, before the general application of this technology, security components should be built into it to protect the privacy and personal data and information of individuals. Assessment of the potential impact on privacy and data protection carried out by the operator in advance of the launch of RFID applications (PIA – Privacy Impact Assessment) provides the information needed for the appropriate protective measures. These measures should be continually monitored and reviewed for the entire lifespan of the RFID application.

The government being aware of the fact that the digital economy knows no national or EU market, but only a global market - will advocate the creation of rules at EU level aimed at strengthening the competitiveness of the EU in this area.

**Measure No. 10:**

**The Ministry of Industry and Trade will monitor and assess the impact of the use of new forms of ICT technology and will support self-regulatory mechanisms, as the primary aim of the government should not be to regulate every new form of technology. It will also in particular review questions related to security and reliability, the protection of privacy, the security of critical infrastructure (cyber security), ethics, interoperability, management and technical standards. A regular dialogue between the state administration and the private sector is essential.**

In order to maximise the benefits of the Internet for the Czech economy it is essential that the government respects the specific characteristics and the special role of this modern-day phenomenon in society and that it follows certain principles.

**The key principles are particularly the following:**

- a) Respect for the freedom of the Internet;**
- b) Minimising the burden for Internet businesses – any Czech regulation will only affect Czech business undermining their competitiveness on the global market;**
- c) A free and non-discriminatory use of information generated by the public administration to increase the motivation for using the Internet;**
- d) Increasing the level of digital literacy and developing electronic skills of the population;**
- e) Increasing the availability of ICT for all, regardless of locality or social status;**
- f) Simple, transparent and non-discriminatory rules governing the management of the Internet;**
- g) The development of a legal and cross-border range of on-line products and services;**
- h) Making information available to service providers and improving consumer protection, including a more efficient dispute settlement and resolution system;**
- i) A reliable, trustworthy and efficient payment and delivery system;**
- j) Support for efficient self-regulatory mechanisms and their prioritization over legal regulation.**

## 5.1. Support for legal digital content

The development of the Internet is seen as the start of a new era of commerce in goods and services distinctive for its independence of a tangible medium. Music, film and books can be downloaded and used remotely, without having to visit a shop or wait for their delivery. Viewers can also watch cultural and sports events on-line via the Internet without having to go to for example a theatre or stadium. Moreover, traditional television broadcasting, where the viewer has to watch a specific program at a specific time, is being replaced by modern audio-visual media services on demand, which allows the user to watch the content he wants at a time of his choosing.

Music was the first digital product to become available on the Internet. Technological development increased network infrastructure speed, making it possible to watch video on-line. Nowadays, e-books are also downloaded on electronic readers, tablets or smart phones. This has resulted in the introduction of new business models, including on-line payment systems.

Although the new distribution channels for digital content have raised great expectations amongst consumers, the level of availability of legal digital content varies from country to country and does not match the expansion of high-speed Internet access. The unavailability of legal digital content encourages piracy, i.e. the illegal distribution of copyrighted content without the consent of the copyright holder. On the other hand, neither the music nor the film industry in the Czech Republic has managed to come up with a suitable commercial model that would provide users with easy access to reasonably priced legal on-line content.

The creation of a “National digital film/music distribution platform” could be one of the possible solutions to this problem in the Czech Republic. This system would issue certificates to commercial servers that provide video/music on demand. This certification would require the provision of these services to users in the Czech Republic.

The system would be based on the principle that the holder of the copyright (the author, artist, student, etc.) would place his work on the national platform, making it thereby available to everyone. The copyright holder would decide whether access to his work would be subject to a fee or free of charge. If he opted for offering his work for free, the platform would allow users to make a voluntary contribution to the author, for example by SMS or payment card. The system would be based on a voluntary basis; however, if the creation of the work had been granted the support from public funds (e.g. through a cinematography fund), it should be made compulsory to place such a work on the national platform (for a fee or free of charge, at the discretion of the copyright holder). Naturally, it would only be compulsory to make the work available if the work has been created digitally.

The same would also apply for electronic books.

It is possible to claim that until modern, competitive business models for the legal distribution of a broad range of digital content - adapted to new forms of information and communication technology - can be put in place in the Czech Republic, repressive measures by the state aimed at “protecting and appreciating” the copyright, particularly by criminalizing young people, are unacceptable. The government is convinced that the broad availability of legal digital content - in particular for a fair price - will result in the loss of much of the appeal of illegal content use.

The Czech Republic must not succumb to the pressure aimed at making legislative changes calculated to benefit a specific group of entrepreneurs to the detriment of consumers, whose interests are often ignored and who are ultimately seen as potential fraudsters.

Newly adopted regulation on copyright protection has to strike a fair balance between the copyright protection on the one hand and the freedom to do business, the protection of personal data and the freedom to acquire and share information on the other hand.

As this is a socially sensitive issue which also touches on the issue of human rights aspects, it seems that a broader discussion platform is needed. Therefore a working group should be set up to oversee the application of copyright in the digital environment (“working group”). This working group will be created by transforming the copyright subgroup created for the implementation of those objectives of the original Digital Czech Republic document concerning the protection of intellectual property on the Internet and will follow up on its previous activities and results. Its agenda will be expanded to encompass issues related to the support for legal digital content in the Czech Republic. The ultimate aim of the working group should be to find ways of ensuring the broadest possible on-line access to copyright-protected content while maintaining an appropriate balance between the interests of copyright holders on the one hand and the interests of the broader society on the other hand, which may be defined as making this content available to the benefit of not only the consumers as end users, but also the relevant branches of the entertainment industry and other parties involved in this process. A key task in achieving the aims of this working group will be to initiate and discuss measures particularly intended to:

- a) Increase the legal certainty of authors and other copyright holders that their personal and particularly property rights are well protected in the Internet environment.
- b) Enable and facilitate a reasonably priced and non-discriminatory on-line public access to the widest possible range of digitised copyright-protected content, and
- c) Support, simplify and develop in a desirable way the doing of business in the area of on-line content distribution.

To ensure that the results achieved by the working group are effective, other departments, government institutions and affected non-governmental subjects will be invited to participate if needed, along with those already engaged in the activities of the working group.

**Measure No. 11:**

**The Ministry of Culture will set up and be in charge of a working group for the application of copyright in the digital environment.**

## 5.2. Freedom of the Internet

The international, European and national standards guarantee the freedom of speech as one of the forms of the freedom of expression, regardless of the channels used, including the Internet.

In 2003, the World Summit on the Information Society (WSIS) adopted the Declaration of Principles Reaffirming the Universality, Indivisibility, Interdependence and Interrelation of All Human Rights and Fundamental Freedoms. This declaration also makes specific reference to the importance of the right to freedom of expression for the information society:

*“As the basis of the information society and as stated in Article 19 of the Universal Declaration of Human Rights, we emphasise that everyone has the right to freedom of opinion and expression, and that this right includes the freedom to remain free of obstacles to their opinions and to seek, receive and impart information and ideas through any media and regardless of state borders. Communication is a fundamental social process, a fundamental human need, and the basis for all forms of social organisation. It is the centrepiece of the information society. Everyone should have the opportunity to be a part of the information society and no one should be excluded from the benefits offered by the information society.”*

Blocking the Internet is one way of restricting the freedom of expression, or the freedom to receive and share information. Blocking the Internet may be characterised as the introduction of technical measures aimed at preventing access to products provided via the Internet, particularly access to web sites or services. Blocking the Internet can also be understood as preventing access only to certain content - usually in the public interest - or to specific and socially controversial on-line services (e.g. gambling).

For simplicity's sake, blocking the Internet can be categorised as follows:

- a) Preventing access to the Internet,
- b) Preventing access to certain Internet sites or services.

As the Czech Republic is a modern democratic state with the rule of law, which guarantees the right to freely distribute and receive information, it is clearly not possible to prevent anyone from accessing the Internet.

The tendency to block certain web sites or services with a specific content in the public interest is not a novelty. It is applied in particular in cases of child pornography, the war on terrorism, the promotion of extremism, the breach of copyright or on-line gambling. The Internet environment is typical for its lack of ties to a specific locality or the jurisdiction of a particular state. Measures aimed at combating specific on-line content or services can therefore only be realistically and effectively applied within one jurisdiction. If the source of distribution of on-line content or services moves outside the jurisdiction of a particular state, it becomes considerably more difficult or even impossible to enforce these measures.

In practice, some states have adopted the practice of producing lists of web sites that allegedly contain illegal content and Internet providers in those states are obliged to block access to these sites, regardless of whether or not legal content is hosted as well. The government of the Czech Republic regards this to be a dangerous trend, as it could result in the restriction of fundamental human rights (the right to information, the protection of private and family life). Illegal content on a specific web site is usually hard to identify without having at hand additional information, particularly in the case of copyrighted content. Decisions on whether certain website content is illegal or not, therefore cannot be simply and effectively automated using a computer algorithm.

Moreover, end users can easily get around the blocking, as the Internet is based on a system which does not distinguish the political divisions on a map known to us as state borders. In addition, it is not too hard for the operators of illegal web sites to outsmart blocking techniques that use lists of banned sites. The introduction of Internet blocking would also prompt the creation of counteracting systems automatically moving content from one site to another as soon as blocking of the site is detected.

No one certainly questions the fact that the distribution of child pornography should be strictly prohibited and prosecuted. However, the freedom of expression and freedom as such will have to be sacrificed if a “censorship” infrastructure needed to block the Internet is to be created. In this context, it seems acceptable to allow for the self-regulation of Internet providers, who would autonomously block access to sites hosting obviously socially dangerous content, such as child pornography. Nevertheless, even in such a case, the “black lists” of banned web pages have to be compiled by someone else than the Internet providers - someone who is independent and trustworthy enough to take on such a role. An effective solution seems to be raising the level of awareness, particularly amongst parents and teachers, as they are the ones to apply what is called “parental control”.

In order to be clear on this point, it is understood that a court-imposed penalty in compliance with criminal law, for example the banning of a business operation, which may result in the removal of a particular website, cannot be considered as blocking the Internet.

It should be added, for the sake of completeness, that the EU Court of Justice acknowledged the importance of the freedom to do business in the digital environment in one of its important rulings, namely in the case “Scarlet” (case C-70/10, Scarlet vs. SABAM, 24. 11. 2011) and case “Sabam” (case C-360/10, SABAM vs. Netlog, 16. 2. 2012). The court declared that forcing Internet or hosting-services providers to install filtering systems in the interest of preventing the breach of intellectual property rights constitutes a violation of the provider’s right to freely do business and the right of consumers to enjoy the protection of personal data and the acquisition and distribution of information. These court rulings underline the importance of respecting all basic rights. Any future regulation has to make sure that it is compatible with all these rights.

Cyber security is another important issue as society in general is becoming increasingly dependent on information and communications technology and on a stable Internet connection. The threat and risk of a failure of key infrastructure that is essential for the running of the state has become so intense that there is a need to put in place preventive measures at the national, European<sup>26</sup> and international level<sup>27</sup>.

By passing Resolution No. 382 of May 30, 2012, for example, the government approved a draft consultation document for a law on cyber security, which reads as follows:

*“The proposed amendment does not directly infringe the right of a person to informational self-determination, as it does primarily not encroach on the content-related aspects of communication, nor does it grant the state any direct power to intervene in the day-to-day life of the information society – the law does not grant the government any right to interfere in users’ privacy or their ability to communicate.”*

*“A person’s right to informational self-determination is treated as the primary value that must be protected by the law. Security cannot be seen as a value in itself, if it is not clear what exactly is to be secured. In this case the law has a clearly defined teleology aimed at securing the Czech cyberspace, i.e. ensuring the operation of*

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<sup>26</sup> Regulation (EC) No. 460/2004 of the European Parliament and of the Council of 10 March 2004 establishing the European Network and Information Security Agency, as amended by Regulation No. 1007/2008 and on Regulation (EC) No. 1077/2011, establishing the European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice, European Commission Communication on the Protection of Critical Information Infrastructure, entitled “Achievements and next steps: towards global cyber-security” of March 31, 2011, Council of Europe Convention No. 185 on cyber crime, Council of Europe Convention No. 196 on the prevention of terrorism, Parliamentary Assembly Recommendation No. 1565 (2007) on how to prevent cyber crime against the state in in member and observer states.

<sup>27</sup> OSCE, Special Report on the issues of support and protection of the right to freedom of expression No. A/HRC/17/27, UN, OSCE Ministerial Council Decision No. 3/2004 on the fight to prevent the use of the Internet for the purposes of terrorism of December 7, 2004, G8 action plan for the combating of “high-tech” crime.

*services of the information society, both public and private. It is these services, i.e. their availability, reliability and security that - with the growing importance of the information society - allow the free application of the right of each individual to informational self-determination.”*

The draft consultation document and the legislation which is currently being drawn up based on this document allow for the adoption of specific and temporary measures serving the public interest in the case of an impending security threat to services and networks or selected information systems crucial for the existence of the state. The adoption of proportional measures in compliance with the Constitution, the Charter of Fundamental Rights and Freedoms and the relevant law in response to cyber-security incidents and which are aimed at increasing the security of the electronic communications networks, cannot be considered to be the blocking of the Internet, as it does not immediately interfere with content, i.e. the right to informational self-determination.

**Measure No. 12:**  
**The Czech Republic will guarantee that it will not block Internet access or access to specific web sites or on-line services for anyone.**

### **5.3. Regulation of the Internet environment**

Users rely heavily on the Internet as the basic tool for their day-to-day life and work (communication, information, knowledge, business transactions, leisure time, etc.). This gives the Internet the nature of a public service. Consumers and businesses rightfully expect that Internet services will be accessible, available, secure, reliable and uninterrupted.

Internet developments also show that the Internet is becoming a crucial means of supporting democratic initiatives, offering new platforms for political discussion (e.g. Internet campaigns and electronic voting), a key channel for exercising the freedom of expression (e.g. blogging) and for developing commercial activities, as well as a mechanism for supporting digital literacy and sharing knowledge via e-learning.

The Internet has given people of all age groups a greater chance to communicate with people from all around the world and has thus made it easier to better learn about other cultures. The Internet has also increased the diversity of new sources of information, as people nowadays have access to a plethora of news reports from different parts of the world.

When tabling legislation or other regulatory measures, it is therefore necessary to take into account the specifics of the Internet and the digital environment. Draft legislation should therefore respect the principles presented in Section 5. Furthermore, it also should:



- a) Not stipulate obligations which cannot be enforced or applied in the Internet environment.
- b) Always include a secure form of electronic communication between the citizens and the public administration.
- c) If the obligation is made to publish information, assure that this is primarily done electronically via the Internet in a properly structured form and using the appropriate interface and formats.
- d) Not stipulate that individuals supplying digital content be subject to licence or other such requirements, or to general blocking or filtering measures by public authorities, or restrictions which extend beyond restrictions applied to traditional content-distribution channels.
- e) Not prevent the public from being actively involved in using and creating content on the Internet.
- f) Sources should be compatible and shared if institutional frameworks are put in place to protect the digital heritage and lasting cultural, scientific and other values.
- g) Not stipulate obligations for a group of entrepreneurs from one sector in favour of entrepreneurs from another sector (e.g. cross-subsidisation between different business sectors).
- h) Be drawn up in accordance with the updated Governmental Legislative Regulations so that whoever proposes a piece of legislation is obliged to include in the general part of the explanatory report an assessment analysis of the proposed legislation from the viewpoint of its impact on the development and the strengthening of the knowledge and the information society according to the aspects described above.
- i) Take into account the global character of the digital economy.

**Measure No. 13:**  
**The President of the Government Legislative Council will assess and, if necessary, will submit a proposal for an amendment to the Governmental Legislative Regulations to take account of the need to assess draft legislation with regard to the impact it will have on the digital economy, if such legislation is related to the digital economy, according to the principles stated in this State Policy.**

#### 5.4. Usage of public sector information

The institutions of the public sector generate, amass or hold large quantities of information and content, ranging from statistics and economic data, figures on the environment, to archive materials and collections of books or works of art. The digital revolution has greatly increased the value of this source for innovative products or services that use data as raw material. The wide range of information spanning many different fields, e.g. social, economic and geographical information, tourist information, business information, patents and education, has great but yet unexploited potential for new products and services and for increasing the efficiency of the public administration.

Digital content plays a crucial role in developing an information and knowledge-based society by - amongst other things - establishing new ways of accessing and acquiring knowledge. Public-sector information is important for digital products and services and - with the development of wireless services - will become an even more important source of information.

The government considers it important not to support exclusive contracts between entities in the public and the private sector but instead to adopt an approach based on licencing and fee-based models facilitating and maximising the use of public-sector information. It is also important to assess and clarify the mechanisms to be used for the creation and distribution of public information.

Private service providers should be governed by the same regulation as public institutions, which is why the government wants to grant private users access to public information under clearly predefined conditions governing the use of this information for commercial purposes.

For the sake of completeness, it should be emphasised that the EU is currently in the process of implementing its Open Access to Data for Europe strategy. This strategy is based on 3 key principles aimed at increasing performance throughout the EU:

- a) The European Commission will set an example by making available its information to the public using a new, free-of-charge data portal.
- b) The European Commission will create the same conditions for open-access to data throughout the EU.
- c) The European Commission will support the new measures by funding research aimed at improve data-processing technologies.

The European Commission has now tabled a proposal to revise Directive 2003/98/EC on the re-use of public sector information:

- By introducing a general rule that all documents made available by public-sector authorities may be re-used for any purpose, commercial or non-commercial, unless protected by third-party copyright.
- By stipulating that public authorities should not be allowed to charge more than the marginal costs for processing requests for data; in practice this means that most data will be provided free or almost free of charge, unless the fee charged is duly justified.
- By introducing the obligation to provide data in commonly used and machine-readable formats, with the aim of ensuring efficient re-use.
- By introducing regulatory supervision aimed at enforcing these principles.
- By massively extending the scope of application of the directive so that - for the first time - it includes libraries, museums and archives; the current regulation from 2003 will be used to encompass data from these institutions.

As part of the principle stipulating open and accessible public administration, public-administration institutions should also update their internal procedures, processes and regulations to ensure that all the relevant electronic elements used in public administration can be linked up to the web sites of these institutions, allowing citizens to basically follow the activities and outcomes of the work of these institutions on-line.

For the sake of completeness, it should be added that public-administration authorities are obliged to publish information in their information systems in such a way as to permit remote access to information relating to public administration which is published in a form that makes it accessible to persons with disabilities (§5, paragraph 2f) of Act No. 365/2000 Coll., on public administration information systems).

The Czech Republic has also proceeded in line with the principles of open public administration by signing up to the international initiative Open Government Partnership. The government passed Resolution No. 243 of April 4, 2012, to adopt the action plan for the Open Government Partnership. The implementation of the action plan was followed up by a Concept for the cataloguing of open data of the public administration of the Czech Republic, devised by the Office of the Government of the Czech Republic, the Ministry of the Interior and the Ministry for Regional Development.

Open data can in general be characterised as data published on the Internet in a manner that enables it to be freely used and further distributed by all users, provided that the author of the data is stated and that other users have the same rights to re-use and re-distribute the data. The principles of open data as described in the above-mentioned Concept are fully in compliance with the effort to make public administration open and accessible for citizens and to provide public-sector information in a manner that allows the use of its potential for the creation of new products and services.

The use of open data in public administration may thus be one way of achieving the objectives in relation to the use of public-sector information. In order to make the most of the potential of open data, it is necessary to assure that such published data is easy to find by its potential users. In compliance with the Concept, a catalogue of open data published by the various public-administration institutions should therefore be created.

**Measure No. 14:**

**As part of the development of the knowledge and information society, it is necessary to assure that everyone has general access via the Internet to all information generated by the public sector. Only the law may specify exceptions. It is also necessary to introduce fair and non-discriminatory conditions governing private-sector access to public-sector information. The Czech Republic is committed to ensuring an open public administration based on legislation and practical measures such as the provision of data in a machine-readable format.**

**Therefore, when preparing legislative measures related to the upcoming revision of Directive 2003/98/EC on the re-use of public-sector information, the Ministry of the Interior will analyse the scope of the information that public-sector authorities are obliged to publish under the various different laws (obliged subjects according to Act No. 106/1999 Coll., on Free Access to Information). If the analysis reveals that the scope of information that has to be published mandatorily is not adequate to achieving the aims of this material, the Ministry of the Interior will propose an amendment of the legislation to expand the scope of the mandatorily published information in order to comply with the principle of open and accessible public information.**

### **5.5. Protection of personal data**

Trust in modern technology is of primary importance for the growth of the digital economy. In today's modern world people often purchase goods or services and provide their credit card details without thinking about it. Millions of people publish photos, blog and post on social networks about their family, friends and colleagues, without even considering the protection of personal data. Personal data comprise all information about the private, professional and public life of an individual. This includes anything from names, photographs, e-mail addresses, bank details, profiles on social networks to medical information or a PC IP address. The use and exchange of personal data has become the driving force of the digital economy. Large marketing companies amass huge quantities of data, for example for use in behavioral advertising<sup>28</sup>.

The provisions of Article 7 and 8 of the EU Charter of Fundamental Rights and Freedoms recognize the right of each individual to privacy and family life and the right to the protection of personal data. The rules governing the protection of personal data define how data is to be properly processed. These rules take into account the freedom of expression and they introduce a special regime for the processing of personal data.

The main factor that allows individuals to know how their personal data is processed and to exercise their rights as guaranteed by Directive 95/46/EC is the provision of information (the principle of transparency). Service providers that act as data administrators must provide users with clear, understandable and accessible notifications concerning the protection of personal data in compliance with the requirements specified in Directive 95/46/EC. These requirements, however, are not always observed.

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<sup>28</sup> Behavioral advertising, or behavioral targeting, is a method used by on-line publishers and advertisers to increase the effectiveness of marketing campaigns. Information gathered on the behavior of individuals on the Internet (e.g. what sites they visit, what they search for) predetermines the kind of advertisement to be displayed to the individual. Behavioral marketing may be used alone or in combination with other forms of targeted advertising (e.g. geography, demographics, influences of the environment, etc.). This enables marketing specialists to target on-line advertisements at the users they are most suited to. For example a user who is often visiting sports web sites will be classified as a "sports fan" and will be sent sports-related advertisements.

While personal data do play an important role for the development of the internal digital market, the concerns of the users related to a possible misuse of personal data cannot be ignored.

On January 25, 2012, the European Commission proposed a comprehensive reform of EU data-protection regulation dating from 1995, with the aim of strengthening the right to privacy on the Internet and stimulating Europe's digital economy, as the ways in which data is collected, used and accessed have changed considerably as the result of technological progress and globalization. According to the European Commission, only a single and unified set of data-protection regulation has the potential of resolving the current fragmentation and associated administrative burden related to ensuring the protection of data. According to the European Commission, this initiative will help to boost consumer trust in on-line services and will provide the much-needed stimulus for growth, job creation and innovation in Europe.

Due to the very nature of the agenda, the Digital Czech Republic material cannot encompass the complexity of the issue of personal-data protection in the digital economy; nevertheless, one particularly important aspect of personal-data protection is the "right to be forgotten". A coordinating role in the protection of personal data is played by the Office for Personal Data Protection.

Everyone should have the right to have personal data that affect them deleted, i.e. they should have the "right to be forgotten", particularly in connection to the use of social networks. The social-network business model is generally based on the fact that users interact and create their profiles, enabling targeted advertising, which in turn becomes a source of income for social-network operators. It therefore seems fair that users who no longer want to use the services of a particular social network should have the right to see their personal data deleted and not further processed. This right is especially important in cases where users were active on the Internet during their childhood, without being fully aware of the risks involved in the processing of personal data, and later want to have this personal data deleted.

As mentioned above, at the time this document was being prepared, the EU was reviewing the legislation on the protection of personal data (Directive 95/46/EC). The position of the Czech Republic on the proposals for this review is traditionally contained in the appropriate framework position.

**Measure No. 15:**

**The Office for Personal Data Protection will monitor the development and application of new forms of technology and in case it detects any failure of the self-regulatory mechanisms it will propose solutions and will continue to raise the awareness among the public and strive to assure that individuals approach their personal data in a responsible way. If necessary, it will also propose a change of existing legislation.**

**Even though the protection of personal data is largely harmonized at the EU level,**

**when adopting any further measures, particularly legislative measures, the Czech Republic should always ensure a fair balance between the protection of personal data on the one hand and free enterprise and the free dissemination and access to information on the other hand. Also, when stipulating specific obligations it must take account of how effective and enforceable they are in the Internet environment.**

### **5.6. Digital literacy, electronic skills (e-skills)**

The world is moving from the industrial age to a global, connected economy based on knowledge and services. These developments unavoidably lead to a need for changes not only in the economy itself, but also in the institutions and systems which were in their days designed for a different era. It is therefore necessary to ensure that the updated version of the Digital Czech Republic deals not only with the undoubtedly important transformative power of new technology, but also with the equally important issue of education aimed at increasing digital literacy and developing electronic skills and lifelong learning - the core of a successful knowledge-based digital economy.

Digital literacy may be characterized as the ability to identify, classify, understand, evaluate, and analyze information when using digital technology. Digital literacy requires an active knowledge of technology and an understanding of how it is used. People who are “digitally literate” are able to communicate and work more efficiently, particularly with those who possess the same knowledge and skills as they do. Digital-literacy surveys are generally very broadly-based, with an emphasis on the efficient use of ICT, i.e. searching, using, summarizing, assessing, creating and communicating information. Digital literacy is thus more than just literacy, or the ability to use a computer. Digital literacy also involves knowledge of various digital devices, such as computer hardware and software, the Internet, and mobile telephones.

Electronic skills (e-skills) encompass a wide range of skills essential in the modern working environment. The successful innovation of information services and communications technology requires interdisciplinary and cognitive skills, as well as problem-solving capabilities, including the grasping of basic commercial and communication skills, but also the knowledge of foreign languages. Electronic skills should be viewed in a broader context, as basic skills acquired by all citizens. These skills should then be refined and improved on a life-long basis.

Digital literacy and electronic skills are inseparable and correspond to the holistic and non-discriminatory definition of involvement in the information society for all.

Integration into the information society requires that the following conditions are met:

- a) Accessibility of information and communications technology (a key aspect),
- b) The ability to use devices,

c) The mastering of technology, which requires training and skills in the field of information and communications technology allowing the use of all programs on various different platforms and devices,

d) Knowledge of the information required to critically assess the content of all media tools as part of active citizenship.

In this regard, there are some people who are excluded from the information society, particularly (but not generally) including senior citizens, the disabled, some caretakers, low-income groups and those with a lower level of education, in varying degrees. For example “senior citizens” also include educated Internet users who have used the Internet since it has first appeared and who in some countries represent a driving force in the economy. The modern state should strive to provide basic digital know-how for all citizens, regardless of their social status.

We may assume that integration in the information society is far from stable or linear. Technology is constantly developing, job certainty is declining, work is becoming more flexible and career paths more fragmented. Exclusion from the information society is often caused by a number of overlapping factors. The basis of integration is lifelong education and knowledge expansion.

The government is aware of this and by passing resolution No. 1250, dated October 5, 2009, it adopted a Draft Solution for the Coordination and Cooperation in the Field of E-skills in the Czech Republic and pledged to create a National E-skills Strategy, which should include in particular the following activities:

*a) The strengthening of cooperation between public authorities and the private sector, the academic community, trade unions and associations through multilateral partnerships and joint initiatives,*

*b) The support for the development of a qualification framework for work with computers or the Internet and tools supporting the mobility and transparency of qualifications,*

*c) The support for investment in human resources, particularly through ensuring adequate public and private investment in human resources and electronic skills,*

*d) The support for the mutual recognition and transfer of accreditations and certifications between formal, informal and industry-led ICT education, the promotion of science, information and communications technology and electronic skills,*

*e) The support for the lifelong acquisition of electronic skills,*

*f) The dissemination of tried-and-tested solutions for training employees using e-learning, with particular emphasis on small and medium-sized enterprises,*

*g) The development of computer literacy,*

*h) The support for an active employment policy.*

Although the National E-skills Strategy has not yet been drawn up, we may assume that the measures contained in the strategy are still relevant. By passing Resolution

No. 503, dated June 29, 2011, the government therefore adopted the Draft Solution for the Coordination and Cooperation in the Field of E-skills in the Czech Republic. The main e-skills coordinator is the Ministry of Labour and Social Affairs, whose main task is the coordination of the entire agenda, particularly with respect to the EU and its bodies.

The following deficits related to electronic skills have been identified at the EU level:

- An inadequate number of qualified people in the labour market or the employment segment,
- A lack of qualified employees in organizations comparing the current situation to future needs,
- Differences in the actual skills of graduates and the skills expected by employers.

The basic principles that should be followed in order to improve the lifelong improvement of digital literacy are:

- a) Long-term cooperation – to boost cooperation between public administration authorities and the private sector, the academic community, trade unions and non-profit organizations, to promote involved parties and joint initiatives, including the monitoring of supply and demand, adapting curriculums to changes, attracting foreign students and highly-qualified ICT staff, long-term support for education in the field of ICT,
- b) Investment in human resources – to assure adequate public and private investment in human resources and electronic skills,
- c) Appeal – to raise interest in and awareness of science, mathematics, ICT and electronic skills, career and professional opportunities for young people in the field, to help parents, teachers and pupils to understand the growing range of opportunities offered by education and careers in ICT,
- d) Employability and integration – the development of digital-literacy and electronic skills tailored to suit employers in the public and private sectors, especially in small and medium-sized businesses, and at the same time focused on the needs of the unemployed, senior citizens, less educated people, the disabled and young people on the margins of society,
- e) Lifelong development of electronic skills – to assure that employees can regularly improve their electronic skills (e.g. through e-learning).

**Measure No. 16:**

**The Ministry of Labour and Social Affairs will work together with the Ministry of Education, Youth and Sports to draw up a strategy aimed at increasing digital literacy and developing electronic skills amongst citizens in order to develop optimal means of ensuring that new employees are prepared when starting a job and also to support current employees facing changes in information and communications technology and the effects of globalization. Other objectives include the narrowing of the digital divide and ensuring or improving the overall standard of digital literacy, thus strengthening the Czech economy and making it**



## **5.7. Domain names**

Domain names replace numerical Internet protocol addresses (e.g. 127.128.129.130) using words to make them more understandable – forming a domain name (e.g. www.vlada.cz or www.narodni-divadlo.cz). As every domain name - as well as every Internet protocol address - must be unique on the Internet, rules have to be put in place for the assignment of domain names.

The system used to assign domain names in the Czech Republic is - like in other EU member states - based on the principle of “first-come, first-served”, where the administrator of the national domain allows domains to be registered through what is known as the distributed system, whereby applications for the registration of domains are accepted by contractors association, so-called registrars, who deal with end users – applicants for registration. Over 40 registrars ensure the adequate competition and a wide choice for the end customer (as is evident from the falling prices of domain names).

The “.cz” national domain (including the conditions governing registration in the Czech Republic) is administered by CZ.NIC, whose registration conditions stipulate the same requirements for applicants based in the Czech Republic as well as applicants from the EU/EEC. A “.cz” domain can thus be registered by legal entities and natural persons from the Czech Republic and from abroad. To make it easier to enforce rights and to facilitate communication, at the request of CZ.NIC or the appropriate authority (particularly the court of arbitration), however, entities based outside the EU/EEC must give a delivery address within the EU/EEC. The “.cz” domain can be registered not only by Czech registrars, but also by 18 foreign registrars.

For a long time, work has been ongoing regarding the elimination of not just the technical and legal barriers related to the registration of a .cz domain, but also the removal of language barriers. The registrars use a form of assessment (rating) to facilitate registration (including the completion of the appropriate forms) not only in Czech but also in English and other languages, so that registering a domain does not pose an obstacle, particularly for foreign companies with plans to enter the market.

In accordance with the conditions of the international organization ICANN (Internet Corporation for Assigned Names and Numbers), the conditions governing registration are fully at the discretion of the administrator of each national (or other) domain and the assignment conditions should not be subject to regulation at the EU level. The current system used to assign domain names works reasonably well and therefore the principle of subsidiarity should be retained. Last but not least, it is necessary to consider the registration of new gTLD (generic top level domains, e.g. “.gov”), where any regulation could have a wider-reaching impact, including on

registrars based outside the EU whose services are used by European entities (a typical example is the “.com” domain).

The fact that self-regulation and enforcement of the principle of “good governance” are effective is evident, for example, in the fact that since 2004, the wholesale price of a Czech domain has decreased more than four-fold, from 600 CZK to 125 CZK, and is now one of the lowest in Europe. It should be said that on the basis of a memorandum between the National Security Authority and CZ.NIC from March 2012, the administrator of the national domain also plays a role in safeguarding critical information infrastructure, information security and cyber security. In the field of cyber security, CZ.NIC acts as the National CERT (Computer Emergency Response Team), while the National Security Authority acts as the governmental CERT.

The Czech Republic supports transparent and non-discriminatory access to domain names. On June 25, 2012, the Ministry of Industry and Trade and CZ.NIC signed a memorandum of cooperation, based on the memorandum concluded between CZ.NIC and the Ministry of Information.

The Czech Republic also has an authority which decides on domain-related disputes (for the “.eu” and “.com” domains).

**Measure No. 17:**

**The Ministry of Industry and Trade will continue to strive - on the national and international level - to ensure that in matters relating to the administration of the Internet, priority is given to the principles of consensus-based self-regulation over legislative and regulatory measures.**

## APPENDIX

### Current state of usage of electronic communications and ICT in the Czech Republic

The following information provides a basic summary of statistical data relating to the current state of usage of electronic communications and ICT in the Czech Republic according to the results of a survey published by the Czech Statistical Office<sup>29</sup> as well as on the basis of a document entitled “Information on the Development of the Electronic Communications Market, Focusing on 2011 and Selected Indicators from the First Half of 2012”, published by the Czech Telecommunication Office.<sup>30</sup>

#### Fixed and mobile voice services, connection to the Internet

The number of fixed telephone lines in the Czech Republic is falling constantly. The number of active connections for PATS (publicly available telephone service) continued to decline, by 10.3% to 1.65 million active connections. In terms of the structure of active connections by technology type, there was a further decrease in the ratio of metal conductors to the total number of active connections. This is also reflected by the drop in analogue connections and the rise in VoIP (Voice over Internet Protocol) connections in the total number of active connections. The number of PATS subscriber stations was 2.27 million, which is a year-on-year decrease of 3.9%. Penetration of PATS subscriber stations fell from 22.0% in 2010 to 21.6% in 2011. Fixed-line penetration per 100 inhabitants (approx. 18) in the Czech Republic is one of the lowest in the EU. As the number of fixed telephone lines has decreased in the last ten years, the number of active SIM cards has risen, and this figure is one of the highest in the EU. According to EC methodology,<sup>31</sup> in 2011 the number of active SIM cards was 13.4 million, which is a year-on-year increase of 2.9%; penetration (the number of active SIM cards per 100 inhabitants) was 127.6%. The ratio of active pre-paid SIM cards to the total number of active SIM cards is falling steadily (in 2011 it was 40%).

The most widespread form of information technology in the Czech Republic is the mobile telephone, which in 2010 was owned by 96% of households, compared to 30% ten years ago. In contrast, only a quarter of Czech households had a fixed telephone line, compared to three quarters ten years ago. At the end of 2010 only 1% of households had neither a mobile nor fixed telephone, compared to 15% in 2000.

In 2011, 65% of Czech households had a computer and 61% were connected to the Internet. Despite the sharp rise in the number of households connected to the

<sup>29</sup> [http://www.czso.cz/csu/redakce.nsf/i/informacni\\_spolecnost\\_v\\_cislech](http://www.czso.cz/csu/redakce.nsf/i/informacni_spolecnost_v_cislech).

<sup>30</sup> [http://www.ctu.cz/cs/download/statisticke\\_udaje/rok\\_2012/informace\\_vyvoj\\_trhu\\_ek\\_2011.pdf](http://www.ctu.cz/cs/download/statisticke_udaje/rok_2012/informace_vyvoj_trhu_ek_2011.pdf).

<sup>31</sup> According to EC methodology, pre-paid SIM cards are those used at least once in the last three months to initiate or terminate a call, send an SMS or MMS, or use data services.

Internet in recent years, the Czech Republic is still behind the EU-27 average (73%). In the various household categories there are differences in the use of information technology. 84% of households with children and only 53% of childless households were connected to the Internet. The differences were even more striking between households of different income groups, as 92% of higher-income households had access to the Internet, compared to only 24% of lowest-income households.

### Expenses of Czech households on certain ICT services

In 2010, Czech households' expenditure on electronic communications services made up 4.3% of their total consumption expenditure. Although the lowest-income households spend an average of 4 thousand CZK less on these services per year, per household member, than households with the highest incomes. This expenditure, however, represents a higher proportion of their total consumption spendings. While in 2005 bills for fixed telephone lines made up 36% of household expenditures on telecommunications services, in 2010 the figure was a mere tenth of that, with 65% of expenditure going on mobile telephones and 25% on the Internet. The average annual revenue per user for services provided dropped to 5 064 CZK excluding VAT.

### Individual use of the Internet – shopping

Items most commonly purchased on the Internet are clothing and shoes, which were ordered via the Internet by almost every other shopper (45%). Services are dominated by tickets, bought over the Internet by 40% of Internet shoppers. Other popular products include cosmetics and medicaments (27%), sporting goods (26%), books and magazines (19%) and electronics, ordered by 19% of shoppers over the Internet.

### Entrepreneurs and the Internet

Around 96% of businesses with ten or more employees have a permanent connection to the Internet. Over the years the speed at which these businesses are connected has changed considerably; in 2011, 87% of businesses had high-speed Internet access while in 2006, only 18% of businesses had a connection speed higher than 2 Mbit/s. Businesses use the Internet for Internet banking (89%), phoning via the Internet (25%) or employee training (15%), for example.

● ● ●  
In recent years, the value of purchases made using electronic orders placed via the Internet has increased significantly.  
● ● ●

In recent years there has been a sharp rise in the value of electronic purchases made on-line. While in 2002, electronic sales by businesses in the Czech Republic made up a mere 4% of their total sales, in 2010 the figure was one quarter.

The proportion of employees using computers in businesses based in the Czech Republic has not changed much in recent years and remains around 40%; in January 2011, the exact figure was 43%. Personal computers with access to the Internet are used by 35% of company employees and this figure has also remained the same as in recent years. Businesses also allow employees to work from their homes. In January 2011, 27% of businesses allowed their employees to work from home, and this option was taken by slightly fewer than 3% of employees.

This trend shows that employers provide virtually all their employees with a computer, if they need it for their work.

### **Municipalities and the Internet**

As with businesses, most public administrations have permanent access to the Internet. Public administrations also offer Internet access to citizens, through publicly accessible computers in their premises. In 2010, this option was offered by 73% of municipal authorities, although this service is not much used by the public. In 2011, only 110 thousand people aged 16 or above used this service. Some municipalities also offer their citizens home Internet through a free wireless network. This is offered on a long-term basis by 10% of municipal authorities, and in 2011 was used by 4% of households.

### **Education and the Internet**

While in 2005 there were fewer than 9 computers and 7.4 computers connected to the Internet for every 100 pupils in Czech schools, six years later, in 2011, this figure had risen to 14.7 computers and 14.2 computers connected to the Internet.

Although this trend is positive, it must be emphasized that computer literacy or digital literacy is a key factor in the development of the knowledge and the information society. Information technology should be used everywhere in elementary school classes and not merely in subjects directly related to computer use. The government sees the full use of modern technology in classes in all subjects as essential for moving the education system forward from the simply mentoring facts to an emphasis on reader literacy, communications skills and logical thinking.

### **Healthcare and the Internet**

In 2010, 97% of independent doctors' surgeries in the Czech Republic had a personal computer and 79% of these were connected to the Internet (49% via a high-speed connection). The proportion of medical facilities with their own web site is much lower in comparison with other subjects (businesses or authorities), as in 2010 only 20% of independent surgeries had their own web site. Amongst the various types of surgeries there are also major differences in this indicator, for example 27% of

pediatricians had their own web site, while only 17% of general practitioners and 11% of dentists did have them.

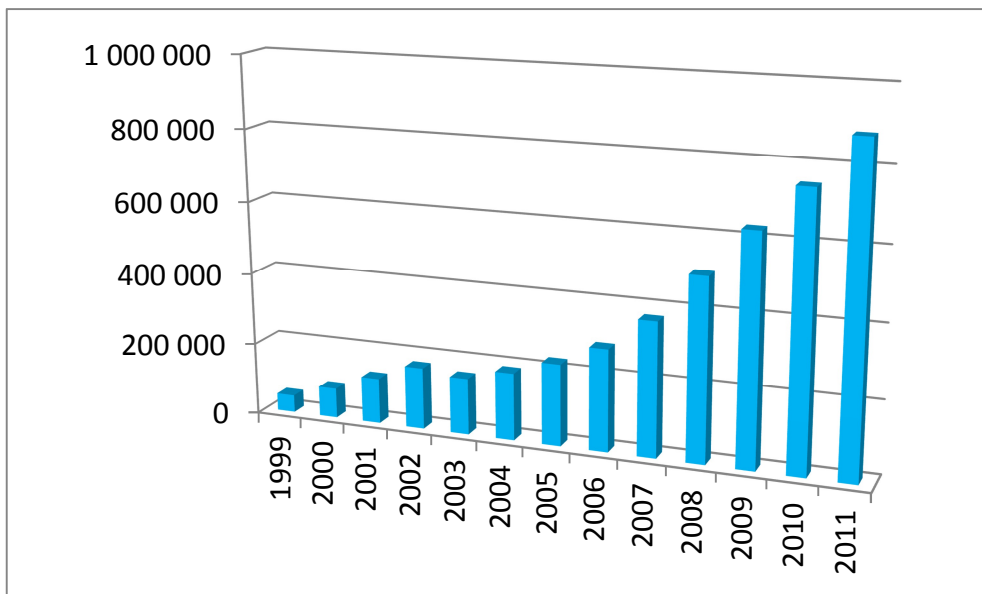
The Internet, both at home and in the surgery, is used by doctors of independent surgeries, for example to acquire information on practical medicine (67%), to communicate with patients (39%) or for managing medical records (9.5%).

The use of modern ICT technology is limited to internal needs only; the range of Internet services for patients or for transferring documentation between doctors is very limited.

### Domain names

One factor influencing the development of the digital economy, especially e-Commerce, is the ease of obtaining a domain name - something that plays an important role for the ease of access to a particular service. In this regard, the Czech Republic has some of the lowest prices in the EU for domain registration.

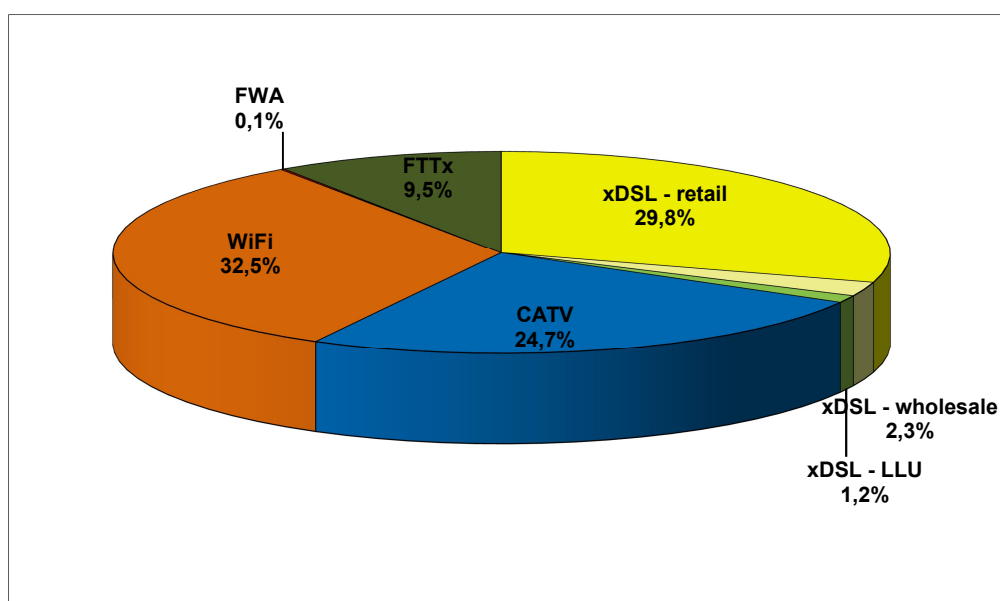
In 2011, the national domain administrator, CZ.NIC, counted 880 708 domains in his database, 41.64% of which were held by organizations and 58.36% by individuals. Compared to 2010, the number of registered “.cz” domains increased by almost 15%, which confirms the interest of Czech entities in registering national domains. Besides the option to register the “.cz” national domain, businesses and individuals in this country also use other domains, particularly “.com” and “.eu”, which were registered to Czechs 150 000 times last year.



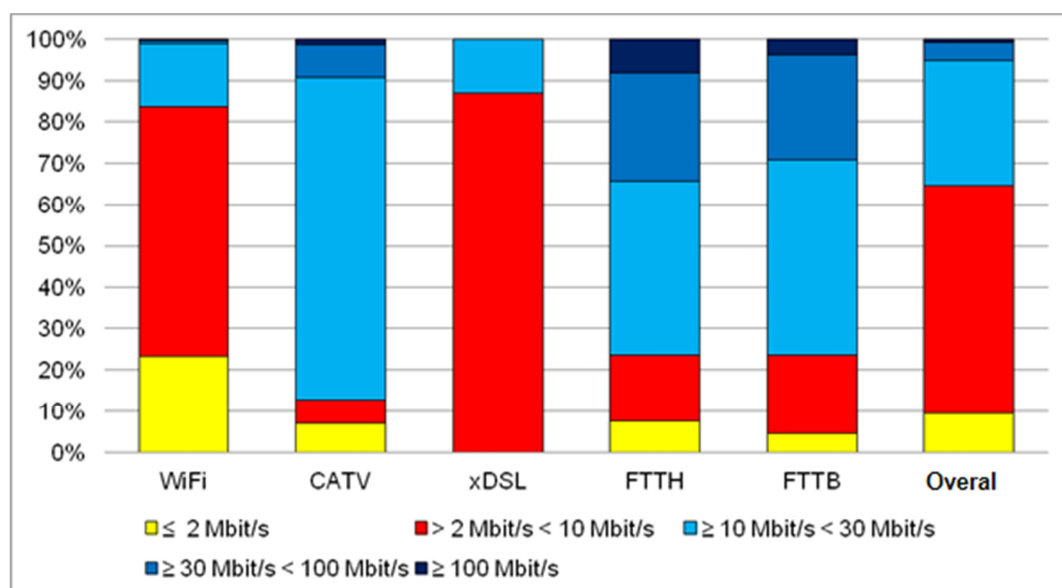
Graph No. 5: Trend in the number of domains assigned in the Czech Republic, source: CZ.NIC

## Current state of coverage and use of high-speed Internet access

The current state of use of high-speed Internet access is the subject of a data survey carried out by the Czech Telecommunication Office in order to analyze the relevant market. Since the last analysis the total number of retailers has increased from 1 770 000 (end of 2008) to approx. 2 516 000 (end of 2011). If adding access in mobile networks, the number of users has increased from approx. 2 050 000 to around 3 159 000.



Graph No. 6 – Ratios of high-speed Internet access used by resident retail customers in 2011, source: CTO



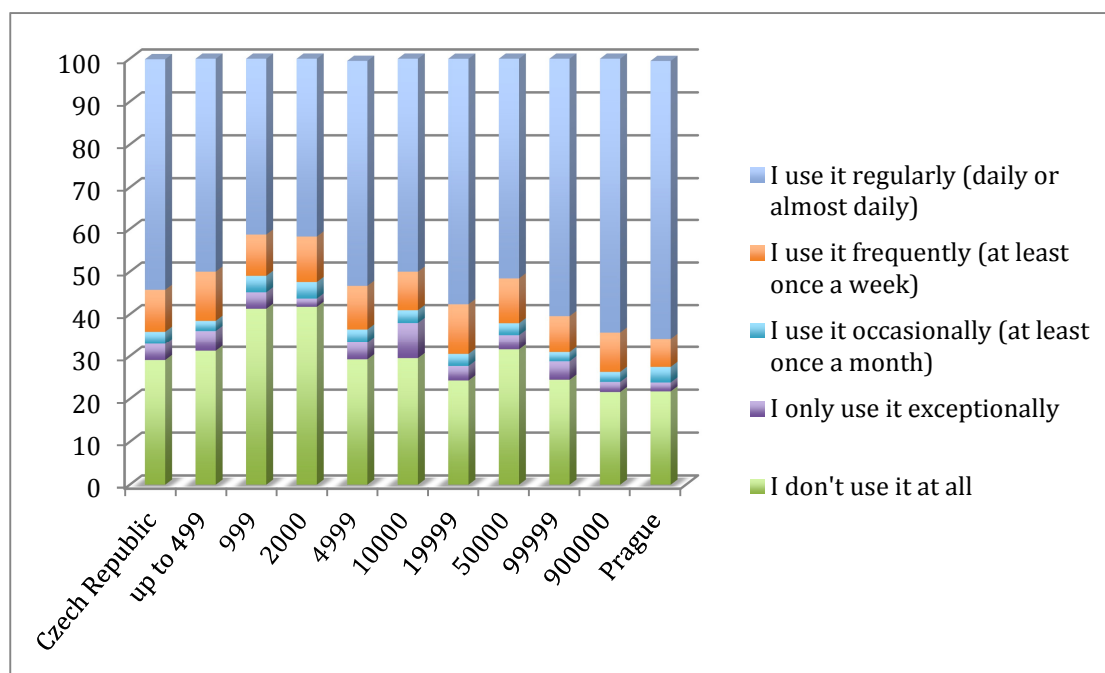
Graph No. 7 – Ratio of individual access speeds in the retail market at the end of 2011, source: CTO

Nevertheless, from graphs No. 6 and 7 it is clear that the Czech Republic does not have the adequate infrastructure for high-speed Internet access as stipulated by the objectives of the Digital Agenda.

In 2011, the Ministry of Agriculture drew up, using figures from the Czech Telecommunication Office, a study entitled “Current State of Coverage and Use of High-speed Internet Access, Particularly in Small Communities with up to 499 Inhabitants”.

This study investigated Internet usage; the response “I don’t use” was most commonly given in rural areas (over 40%), while in the whole of the Czech Republic the figure is almost 30%.

Nevertheless, there is a clear trend indicating that the intensity of Internet use increases slightly with the size of where people live, with two thirds of daily Internet users being located in large cities. The lowest intensity is, like the proportion of users, in smaller but not the smallest municipalities.



**Graph No. 8 – Frequency at which the Internet is used by inhabitants of communities of various sizes, source: Ministry of Agriculture**

This survey shows that there has been a significant change in the reasons people state for not using the Internet.

With the relative fall in the prices of ADSL, the increase in nominal Internet connection speeds and the existence of a large number of providers of high-speed Internet access via Wi-Fi, the argument that “it’s too expensive” has lost some of its grounds.



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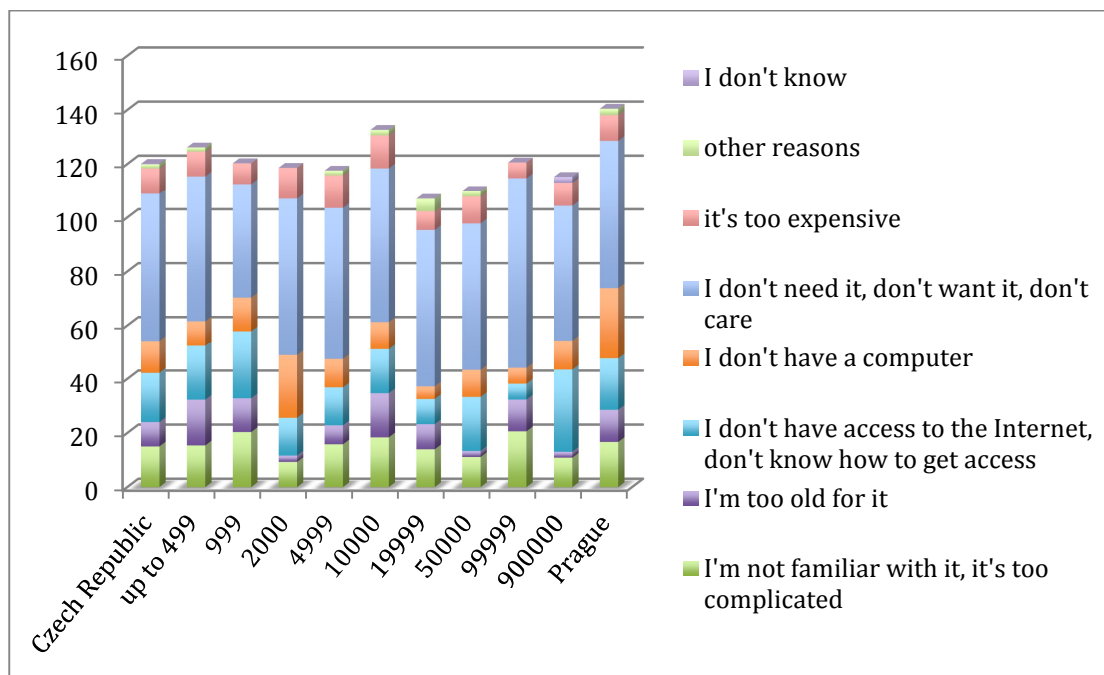
The lack of computer equipment, which was another possible reason for not using the Internet, has changed during the last two years, which have seen a sharp fall in the prices of laptop computers and a wider range of smart phones and tablets.

The lack of computer equipment, which was another possible reason for not using the Internet, has changed during the last two years as well, as we have seen a sharp fall in the prices of laptop computers and a wider range of smart phones and tablets, resulting in many households upgrading their home computer devices and passing on older computers to the older generation.

One thing that has helped to eliminate another important argument “I’m too old” and “it’s too complicated”, has been the new generation of grandchildren. Nowadays, as early as in elementary school, access to the Internet is becoming a basic requirement and a teaching aid, and it is also used by children when visiting their grandparents. The grandparents then see that it is not so difficult to use

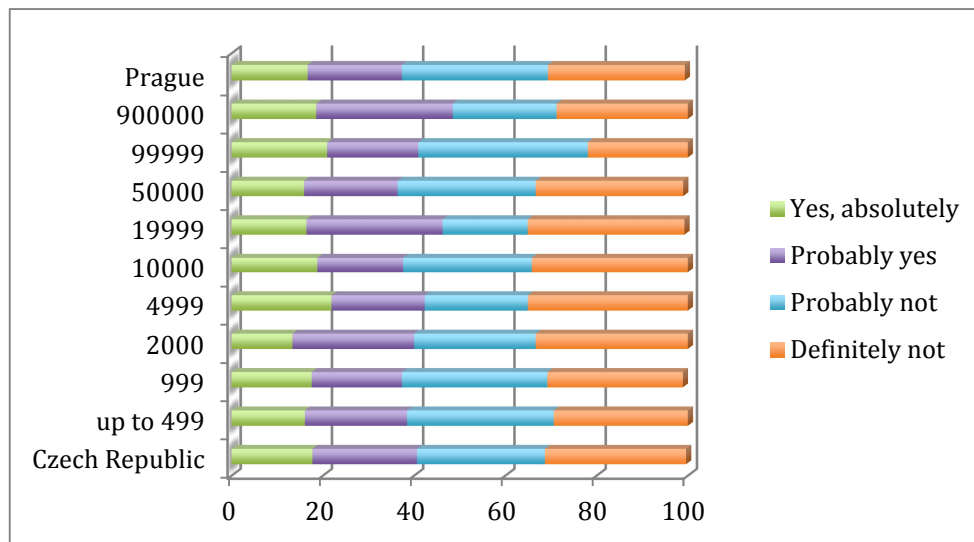
a PC, they are shown how to go about it, and then learn what is an albeit limited yet still useful palette of skills allowing them to use the basic services – searching, telephoning via the Internet, sending emails, shopping, social networks.

From graph No. 9 it is clear that the responses given in the smallest villages only differ from the nationwide average in that more people respond with “higher age”; it is not that people do not know how to work with a computer.



Graph No. 9 – Reasons for not using the Internet amongst inhabitants of various sized municipalities, source: Ministry of Agriculture

The subjective attitude to the Internet is clearly illustrated by the answer to the question of whether respondents can imagine life without the Internet, which most people would find difficult. The proportion of this answer in small communities is no different from the nationwide average, indicating that users in rural and urban areas share the same subjective need for the Internet.



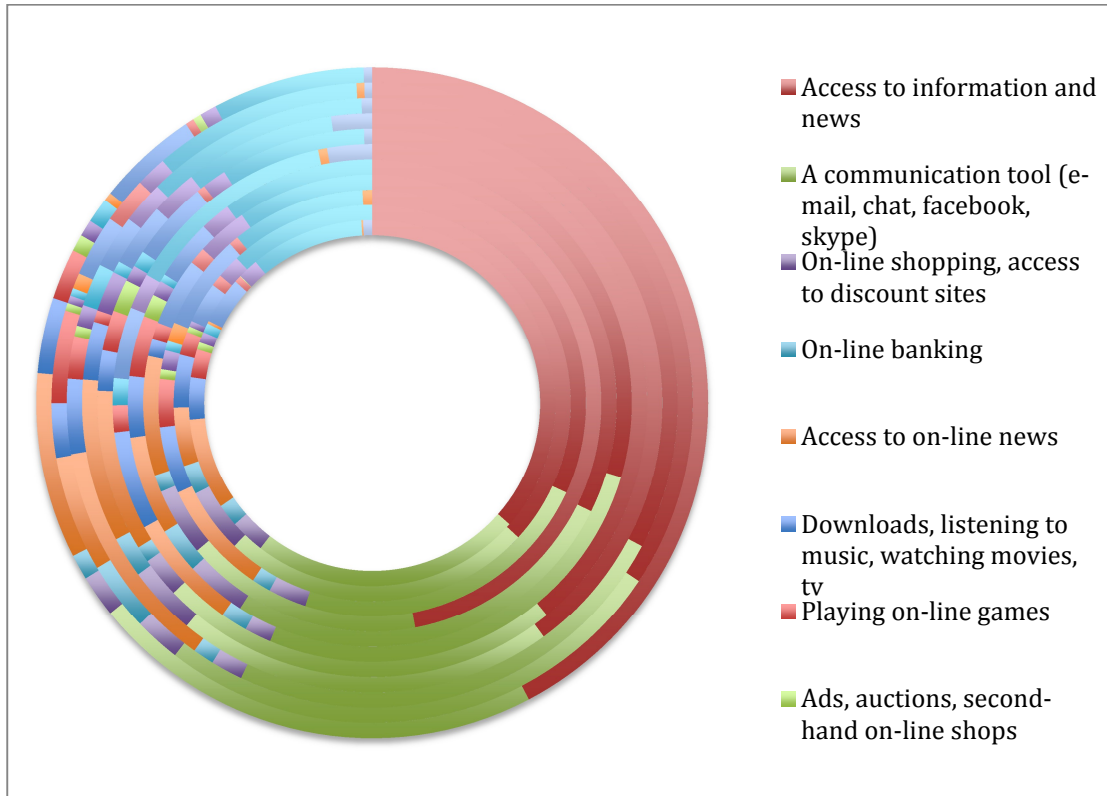
**Graph No. 10 – Assessment of quality of life without the Internet amongst inhabitants of variously-sized communities, source: Ministry of Agriculture**

This confirms the theory that the Internet is primarily a source of information but secondly it is also a channel for communication and entertainment (this is a more common reason amongst the young, but the situation is changing). Both these reasons are more common in small communities than in larger ones. This in itself confirms the aforementioned idea that older people in rural areas use the Internet for communication and entertainment, which helps to eliminate the limitations imposed by the size of their locality, often in combination with poor mobility and limited transport. This is perhaps why this activity is somewhat more common than in larger communities, where there are more contacts and better transport links.

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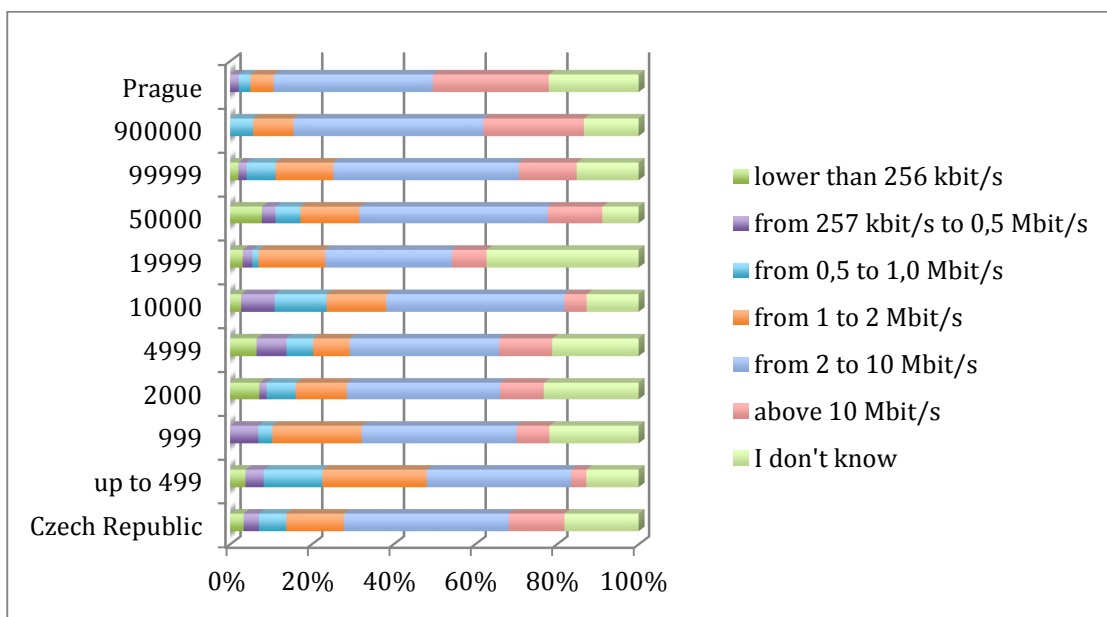
**This confirms the theory that the Internet is primarily a source of information, but it is also a channel for communication and entertainment.**

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**Graph No. 11 – What would you miss without the Internet – comparison amongst inhabitants of variously sized communities according to Graph No. 10, the inner circle representing the Czech average, source: Ministry of Agriculture**

The biggest difference between villages and cities is in Internet access speeds. In this respect small communities tend to differ greatly from larger ones –connections are much slower. As 54% of users nationwide have speeds in excess of 2 Mbit/s, in small communities the figure is only 39%. Connection speed therefore increases with the size of the locality.



**Graph No. 12 – Connection speed – comparison amongst inhabitants of variously sized communities, source: Ministry of Agriculture**

The size of a particular locality has long been a factor differentiating Internet use. The proportion of Internet users tends to increase with the size of the locality. Figures from recent research have shown that this situation is gradually changing. The use of the Internet in small communities has been positively influenced by the expansion of Wi-Fi networks.

64% of respondents from small communities with up to 499 inhabitants have access to the Internet at home, while in the whole of the Czech Republic only 3 more use Internet at home (67%). Of the 64% of households connected to the Internet in small communities, almost half (48%) have a slow connection (up to 2 Mbit/s), i.e. a connection that cannot be classified as high-speed Internet access according to the original Digital Czech Republic policy. In the whole of the Czech Republic, only 28% of users, a fifth less, have slow connections of up to 2 Mbit/s.

## Glossary

3DTV	television with a spatial image
3G network	3rd generation mobile communications network
B2B	<i>Business-to-business</i> , business relationship between entrepreneurs
B2C	<i>Business-to-consumer</i> , business relationship between an entrepreneur and a consumer
DAB/DAB+	<i>Digital Audio Broadcasting</i> , the standard for first/second generation terrestrial digital radio broadcasting
Digital	
dividend	Part of the frequency spectrum freed up by using more efficient transmission technology
DNSSEC	<i>Domain Name System Security Extensions</i> , technological specification allowing greater security of Internet traffic
DVB-T/T2	<i>Digital Video Broadcasting – Terrestrial</i> , the standard for terrestrial digital television broadcasting (T2 – second generation)
DVB-S/S2	<i>Digital Video Broadcasting – Satellite</i> , the standard for satellite digital television broadcasting (S2 – second generation)
DVB-C/C2	<i>Digital Video Broadcasting – Cable</i> , the standard for cable digital television broadcasting (C2 – second generation)
D-book standard	summary of recommended features of receivers in the DVB-T/DVB-T2
CTO	Czech Telecommunication Office
EK	European Commission
EU	European Union
Europe 2020	Supporting European strategy with the aim of boosting the development of the European economy
FM	Frequency modulation - the most common method for analogue radio transmission at very high frequencies (87.5 – 108 MHz)
HDTV	<i>High-definition television</i> , television with a high-resolution screen
HbbTV	<i>Hybrid Broadcast Broadband television</i> , hybrid television – uses television broadcasting to transmit main content and the Internet for additional and related information
ICANN	<i>Internet Corporation for Assigned Names and Numbers</i> – a non-profit organisation that allocates and manages domain names and Internet protocol addresses at the international level
ICT	<i>Information and Communication Technology</i> , information and communications technology
Interoperability	
technology	The ability to offer and receive services using various forms of
Interactive	

services	Additional services using the Internet as a channel for interactive communication with the content provider
IPTV	<i>Internet Protocol television</i> , the standard for digital television broadcasting via Internet protocol
LTE	<i>Long Term Evolution</i> , new generation mobile communications network designed for high-speed communication and Internet access
MPEG2	<i>Moving Picture Experts Group</i> , compression algorithm for digital image processing and the distribution of digital television signals
MPEG4	Advanced compression algorithm for digital image processing, more effective than MPEG2
MRD	Ministry for Regional Development
MIT	Ministry of Industry and Trade
MC	Ministry of Culture
M2M	<i>Machine to Machine</i> , remote communication between different devices
PIA	<i>Privacy Impact Assessments</i> , assessment of the impact of regulation in the protection of privacy and data
RFID	<i>Radio Frequency Identification</i> , technology enabling identification on the basis of radio waves, generally at short distances
SDTV	<i>Standard Definition Television</i> , standard screen resolution (typical for analogue television)
SFN	<i>Single-frequency network</i> , single-frequency broadcasting network – uses a single frequency for a group of transmitters
SIM card	<i>Subscriber Identity Module</i> , an electronic chip inserted into a mobile telephone and used to identify the subscriber in the mobile network