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DEVELOPMENT OF BROADBAND NETWORK IN SLAVONIA AND BARANJA

RAZVOJ MREŽE ŠIROKOPOJASNOG PRISTUPA INTERNETU NA PODRUČJU SLAVONIJE I BARANJE

ABSTRACT

This paper accentuates the importance of electronic communications for the future of total cultural development and offers a short overview of the Digital agenda for Europe. A special importance is given to the development of broadband access in Croatia and to the postulates of the Strategy for the development of broadband in Croatia in the time period from 2012 to 2015. After an analysis of the situation in Slavonija-Baranja region, basic indices for the implementation of this strategy in Slavonija-Baranja region (by counties) are given.

Key words: *Broadband network, Digital Agenda, Internet, Slavonia and Baranja*

SAŽETAK

U radu se ukazuje na važnost elektroničkih komunikacija za budućnost ukupnog civilizacijskog razvoja te ukratko razmatra Digitalna agenda za Europu. Posebno se ukazuje na značaj razvoja širokopojasnog pristupa u RH te na postavke Strategije razvoja širokopojasnog pristupa u RH od 2012. do 2015. godine. Nakon analiza stanja na području SB regije postavljaju se temeljne smjernice za provedbu ove strategije na području slavonsko-baranjske regije po županijama.

Ključne riječi: *Širokopojasni pristup, Digitalna agenda, Internet, Slavonija i Baranja*

1. Electronic communication – future of development

Modern information and telecommunication technologies (ICT), especially Internet have greatly changed the lifestyle of people in the last 20 years; information and data transfer has been sped up, their quality and reliability has been increased, business costs have been reduced. Business transactions have been sped up, access to global market has been enabled, new paths for investment, goods and services have been developed, and the amount of available information has been increased – both in public and in private sector. New ICT is the foundation for the development of economy and knowledge society; Information and knowledge have taken the place of capital as a foundation of individual and social growth and development. [5] An expansion and accumulation of understanding and knowledge depends on the setup of a developed communications network for a quick and efficient transfer of information. [21] The development of fast access networks today has the same revolutionary effect as the development of traffic network or electro-energetic grid 100 years ago. Services converge in the direction of a digital world, they are universally accessible on all equipment, be it personal computers, smart phones, digital radio or HD television. Forecasts state that digital content and applications will almost entirely be delivered via internet by year 2020. [7]

The development of faster cheaper, more reliable and higher quality public services and public services business – working of state and local government, health, education and culture – as well as business workings and encouragement of rural areas development depend on ICT infrastructure coverage of an area, i.e. optic cable network (broadband access) which enables fast internet. Investing in broadband access is definitely useful if the approach is responsible – as a series of studies show. According to the results of a study undertaken for the EU [11], an increase in number of broadband users influences the GDP growth, with the increase being more important in a country that is more developed. Estimates show that a GDP growth of 0,47% is possible in countries where broadband access is less developed, 0,63% in countries where broadband development is robust and 0,89% in countries that are most developed – where all possibilities of the knowledge society are being used. It is also expected that investments in broadband access in EU member states by year 2015 will create around a million new jobs and will boost the economy with up to 850 billion Euros [2]. Other studies [21] include presumptions that have been additionally explored, so four indicators, directly connected to gain from broadband access, have been shown: average income, computer users number, smart-phone users number and network coverage. Based on the estimates of direct and indirect gain from the development of broadband access, analysis show that in the time period from 2010 to 2019 Croatia could have direct gain measured at between 2.2 and 3.2 billion Euros. It has been also stated that, generally speaking, an increase in 10% in the number of broadband users enables an increase in GDP of 1.38% which manifests in an increase of jobs in network development and maintenance as well as an increase in general economic activity because of an increased usage of electronic services available through broad-band access. [10]

2. Digital agenda for Europe and Croatia

A series of documents and a number of strategies in the field of broadband access development have been put forth in order of the assurance of greatest gains possible for the development of economy and population of the European Union.

2.1 Digital agenda for Europe

After a series of EU recommendations, a document titled „Digital agenda for Europe“ [3] for the first time offers concrete measures and goals and recommended time frames for the fulfillment of goals in the development of broadband access. A following list of goals of the Digital agenda for Europe has been put forth:

1. Broadband access availability:
a) basic access: 100% of the EU population by 2013
b) fast access (30 Mbit/s or more): 100% of the EU population by 2020

c) ultrafast access (100 Mbit/s or more): 50% of EU households by 2020

2. Common digital market;
3. Digital inclusiveness (an increase of internet usage to 75% of the EU population by 2015);
4. Public services;
5. Research and development (ICT expenses at 11 billion €);
6. Low CO2 economy.

EU member states in the last couple of years, independently of the European commission efforts in the development of broadband access, independently propose national plans and strategies of broadband access development. These plans and strategies are different in each member state, but the following common trends can be noticed [7]:

− plans and strategies refer to a time period of 3 to 5 years for basic broadband access, and 7 or more years for fast and ultrafast broadband access;
− the goals are set in relation to the coverage of a certain percentage of the population or households by broadband access of a certain or minimal speed;
− the goals are different for basic broadband access and fast or ultrafast broadband access;
− plans and strategies promote, for the purpose of realization of the stated goals, an implementation of new generation networks, with the usage of optic fiber technology based on FTTx standard in an immobile communications network as well as by assigning of available radiofrequency spectrum for the construction of mobile communications network;
− financial means for the realization of stated goals have been assured.

The availability of basic broadband access in national strategies of EU member states basically relates to a 100% coverage of the population with access speeds of 512 kbit/s up to 2 Mbit/s in a time frame ending in 2010. The availability of fast and ultrafast broadband access relates mostly to 100% coverage of the population with access speeds of 20 Mbit/s up to 100 Mbit/s in a time frame ending in 2015.g.

According to these indices, Croatia is among the lowest ranked EU countries, with 20,07% population coverage, the EU average being 27,16%.

2.2. The importance of broadband access in Croatia

Broadband services development enjoys a special importance in the economic development of Croatia and especially for the development of knowledge society in Croatia. Newest broadband services (Internet education, social networking, HD television, tele-working etc) ask for adequate transfer capacities (more than 20 Mbit/s) which can be achieved with the help of optic access infrastructure and adequate new generation wireless technologies.

The necessary environment is being created by implementation of priorities from the regional development strategy of Croatia which concerns the development and promotion of IT and electronic communications infrastructure. Local and regional governments confirm their development documents (especially county development strategies and development program plans) with this strategy in order to enable the preparation of projects which fit their needs for broadband access. It is therefore necessary to create adequate conditions for investment in cable and wireless networks of the new generations and above all to enable space conditions which do not limit the further development of these networks. Being that a slowed development of construction of electronic communications infrastructure and connected equipment in mobile communications network due to an absence of required space conditions, an encouragement of planning of these networks in the next time period is necessary. This includes a change in the urban development plans in a way which will not limit the future development of these networks. [7]

Based on an analysis of the state of development of broadband access in Croatia, stagnation in the number of broadband access connections in comparison with the EU countries is easily observed. An important disequilibrium both in number and density of broadband access by counties is observed. This is caused by unfavorable demographic structure, ignorance in terms of usage of

information and communication technologies present with some inhabitants, as well as insufficient infrastructure of broadband access in all Croatian regions. An analysis of the current technological availability shows the dominance of only one kind of access connected with the existing communications network of copper twisted pairs, which are sufficient for current needs but unfortunately do not enable any major quality advance in broadband access and access speed.

Therefore, the following key challenges of broadband access in Croatia can be noted [7]:

− Conforming development strategies and plans on local and regional level with this strategy;
− A lack of adequate space conditions which not only limit further development of electronic communications infrastructure, but render broadband access impossible;
− A lack of knowledge and usage of computers, Internet and broadband access as well as a lack of knowledge of the power of information and communication technologies;
− Inadequate and regionally unequal amount of personal computers and broadband access points as well as accessibility of broadband access infrastructure;
− Inadequate offer of electronic communications services and content, especially in Croatian language, which require broadband access;
− Unsatisfactory usage of information and communications technology among citizens and in the economy;
− personal computers and broadband Internet access are not financially available to all the households.

A growth analysis of the number of access points and their density in broadband access for Croatia is shown in figures 2 and 3;

Year	Fixed	Mobile	Subscribers
2004	23.000	-	23.000
2005	116.000	-	116.000
2006	251.800	-	251.800
2007	387.019	-	387.019
2008	524.683	158.524	683.207
2009	684.960	252.238	937.198
2010	803.823	328.389	1.132.212
2011	861.276	287.953	1.149.229

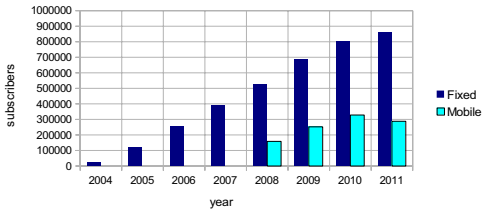

Figure 2
Number of broadband Internet access in Croatia
Source: HAKOM

Year	Fixed	Mobile	Subscribers
2004	0,52	-	0,52
2005	2,61	-	2,61
2006	5,67	-	5,67
2007	8,72	-	8,72
2008	11,83	3,57	15,40
2009	15,44	5,69	21,13
2010	18,12	7,40	25,52
2011	20,07	6,71	26,78

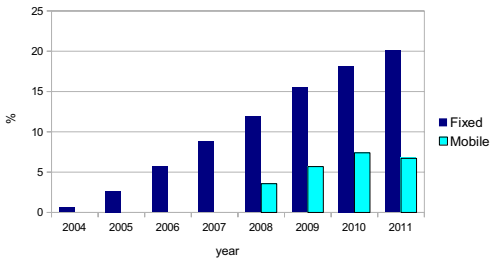

Figure 3
Penetration of broadband Internet access in Croatia
Source: HAKOM

An exponential growth of the number of connection points in the period from 2004 to 2011 can be noted. This at a rate of **147,3** or an index (base 2004 = 100) of *56611*. In the observed period an exponential growth of connection points of broadband Internet access can be observed*;* index (base

2004 = 100) is *5150*, meaning that the yearly growth rate is **75,6**. But, as a comparison with EU countries has shown, Croatia lags in this area of technological development.

2.3. Broadband services

Basic service offered through broadband access is high speed internet connection, which in turn allows users to use a whole array of applications of educational, business, information and other natures. An entire set of electronic systems and internet applications which enables citizens to access a series of public services (such as: e-education, e-health and e-management) needs to be mentioned. Also, an important bundle of application for Internet business and commerce (e-business, e-commerce and e-banking). Apart from the basic services of high speed internet access, broadband internet access enables TV content distribution services in addition to basic public speaking service. Table 1 shows potential users of broadband access.

2.5. Development of broadband services

Following information thus stated – broadband services are an infrastructural condition of general development (economy, public administration, social services and a population's standard of living), that is a necessary condition (lat. *conditio sine qua non*). Here it should be emphasized that a development of broadband services also represents an opportunity for economic and technological development of local companies and new employment of local population.

Development of broadband services is a complex technological process and also an important investment operation so its realization must (by nature of things) be undertaken in a number of mutually dependent steps: 1. Construction of distribution network, 2. Organization of distribution of existing services, 3. Usage and education of users ,4. Development of new applications.

Each of the steps should include many number of business and administration subjects; therefore all activities must be well planned, coordinated and synchronized. Many of the business undertakings in each step can include local business subjects – which would then require special organization.

Table 1 An overview of potential groups of broadband access users

No	Groups of users	Potential users
1.	Private users	Households Vacation homes (temporary inhabited)
2.	Business users	Family farms, Silos and cooperatives, Manufacturers and free professions, SME, Large companies, factories and business systems, Hotels and tourist camps
3.	Local and regional government bodies	Administrative bodies of communities and cities, local committees, businesses operated by local and regional governments
4.	State administration units	State administration units (health, social security, personal registers,...); Ministry units (police, revenue service, firefighters, vessel control)
5.	Educational units	Kindergartens; Elementary schools; High Schools; Faculties
6.	Health units	Ordinations, Ambulances, Hospitals
7.	Other public units	Libraries, Museums, Sports institutions, Nature reserves,
8.	Social organizations	Political parties, citizen groups, Syndicates

3. Strategy implementation in Slavonia and Baranja

National strategy of broadband access development provided the necessary technical and administrative (legal) frame, and its execution in Slavonia and Baranja region has its specific that stem from the condition of geographic and demographic characteristic, as well as economic

developments. [6] The determination of real state and the potential for usage of broadband services is the first step in the execution of the national strategy.

3.1. Situation by counties

According to the number and the density of broadband access points in three counties of Slavonia, Pozega-Slavonia, Virovitica-Podravina and Brod-Posavina counties are in the last place, Vukovar-Syrmia is in the middle and Osijek-baranja is in the top tier of all counties in Croatia.

3.2. Project „Slavonian network“

At the end of 2012 (after a series of gatherings and preparation activities) Faculty of Electrical Engineering in Osijek initiated the „Slavonian network“ project, which deals with the development of broadband access to Internet in five counties of East Croatia. The basic frames of the project are given here; [6]

Problem description: The number and density of broadband internet access points in Croatia is significantly below the EU member nations average (HR=20,07%, EU average=27,16%), with these figures being even lower in five counties of Slavonia and Baranja region (with the exception of the city of Osijek). Such a condition in modern times renders impossible the social and economic development, the efficient functioning of public administration as well as inclusion of the region in modern communication both domestically and with other users in EU countries.

Goal of the project: Enable broadband internet access in 75% percent of communities in 5 counties of Slavonia and Baranja region by 2015.

Expected results: (1) Stated condition A_1-A_5 , (2) Network register regulation by local administration units concerning distribution network, (3) Renewed urban development plans of local administration units, (4) Approving of local administrations units' decisions concerning payment of usage of distribution network, (5) Confirming relations between local administration units and distribution network users, (6) Unification of resources of local administration units by counties, (7) Initializing and developing the process of introduction (extension) of broadband access by counties, (8) Determining broadband access coverage of local administration units, (9) completion of financing studies for broadband access introduction (10) foundation of „Slavonian network“ consortium, (11) local administration units' funds reservation, by counties, (12) regional project application for Croatian and EU funds.[52]

Final beneficiaries of project results: (1) Population of 5 Slavonia-Baranja region's counties, (2) Public services in 5 Slavonia-Baranja region's counties (health, education, social services, public administration). (3). Economy in five counties of Slavonia-Baranja

Economic benefit as result of project realization, an estimate: Economic benefit (direct and indirect) of project realization is: (1) more efficient functioning of public administration, (2) better business results of economic subjects, (3) increase in population living standard, (4) development of new businesses based on broadband access.

Finally – realization of the project – on this basis only – will contribute to a minimum 0,7% GDP growth in Slavonia-Baranja region, starting from 2015. Strategic foundation of this project lies in the Development strategy of broadband access development in Croatia from 2012. To 2015. The project is to be executed in 6 phases in the time period from January to June 2013.

3.3. „Slavonian network“ consortium

It has already been emphasized that this problem concerns: 1) important question of technological access of Croatia to European communication currents; 2) complicated technological process of broadband services development, 3) important investment operation 4) demanding process of state determination in local administration units 5) Important elements of urban development plans of

[52] A_1 = Number of users ŠPP; A_2 = Density of users ŠPP, A_3 = Registry of distribution networks; A_4 = Ownership issues; A_5 = Urbanistic plans

local administration units. For the purpose of realization of this project, a unification of all social, expert and financial potentials in the region is needed; therefore a foundation of „Slavonian network“ consortium is being recommended, which would harmonize actions and coordinate the implementation of key stages of this project. The members of the consortium would be: five counties of Slavonia-Baranja region, Faculty of electro-technics in Osijek, The institute for strategic studies Panon Osijek, telecommunications service providers. The consortium would exist until the purpose of foundation has been fulfilled, i.e. by the end of 2015.

3.4. Master plan „The usage of broadband services in Slavonia-Baranja region“

Long-term project „development of broadband services usage in Slavonia-Baranja region is an important techno-economic and legal-administrative project with a complex technological and organizational structure and large financial means which needs to be realized in the next three years. The execution of such a project demands an integral encompassing of a number of technological, land-measuring, administrative, legal, urbanistic, marketing, organizational, educational and financial actions and processes as well as a whole array of business subjects and proceedings. All of this needs to be sufficiently explored and carefully planed so that the designated goal of the project can be reached. Therefore a creation of a project master plan encompassing the following details is necessary.

4. Conclusion

New ICT is the foundation of development of the economy and knowledge society; information and knowledge took the place of capital in becoming the foundation of individual and community development and growth. An expansion and accumulation of knowledge depends on the creation of a developed communications network for a fast and efficient transfer of data. The development of fast access networks has the same revolutionary effect that the development of traffic network or electro-energetic grid had 100 years ago. Services converge towards the digital world, they are universally accessible on any device, be it personal computers, smartphones, digital radio or HD television. Predictions show that by 2020 digital content and application will almost exclusively be transferred over the Internet.

The availability of basic broadband access in EU member states basically relates to a 100% coverage of the population with access speeds of 512 kbit/s up to 2 Mbit/s in a time frame ending in 2010. The availability of fast and ultrafast broadband acess relates mostly to 100% coverage of the population with access speeds of 20 Mbit/s up to 100 Mbit/s in a time frame ending in 2015.g.

According to these indices, Croatia is among the lowest ranked EU countries, with 20,07% population coverage, the EU average being 27,16%.

National strategy of broadband access development provided the necessary technical and administrative (legal) frame,

The number and density of broadband internet access points of users in five counties of Slavonia-Baranja region (with the exception of the city of Osijek) are below Croatian average. Such a state renders social and economic development, efficient functioning of public administration, as well as inclusion of the region in modern communication both domestically and with other users in EU countries impossible.

At the end of 2012. (after a series of gatherings and preparation activities) Faculty of Electro-technics in Osijek initiated the „Slavonska mreža“ project - which deals with the development of broadband access to Internet in five counties of East Croatia whose goal is to enable broadband internet access in 75% percent of communities in 5 counties of Slavonia and Baranja region by 2015. The realization of this project will bring significant economic advantages: from a more efficient functioning of public administration, better business results of economic subjects, higher standard of living for the population up to a development of new business activities based on broadband access.

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