ICT Infrastructure for Sustainable Society:
A Story of BH Telecom

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Abstract

World-class ICT infrastructure is the key to rapid economic and social development ofa country. Past studies show that the growth of ICT, particularly telecommunicationservices has a direct link with the economic growth of the country. However,the access to ICT infrastructure, services and applications and thus the level ofdevelopment varies among the countries. The focus of this study is on the currentsituation in Bosnia and Herzegovina (BiH). The main objective of the study is toexplore the penetration of telecommunication in B&H and the role of BH Telecom inthis process.

*Keywords:*ICT, infrastructure, sustainable society, case study

1. INTRODUCTION

The war that has ravaged Bosnia (1992-1995) did not just take its toll in casualties and material damage but has left the communications infrastructure crippled as well. While the other countries in the region introduced beginnings of information technologies, Bosnia had just started an arduous task of rebuilding its communications network. That task fell to the

shoulders of the state held PTT Company (Post, Telephone, Telegraph) more accurately to its offspring company - BH Telecom.

It is not against logic that ICT development and spread infrastructure has a beneficial effect of economic and social development. If we just take the basic economic principles of effectiveness and efficiency we can assume that a functional ICT can help reduce costs and redundancy and point out faults and bottlenecks which the system needs to address.

To understand what kind of impact the ICT provided by BH Telecom had we would have to have an extensive study of IT environments conducted in the private sector so that we can have a comparable ratio of increase in development compared to services provided. Sadly that kind of study has never been done which makes this hard to compare and contrast this relation in retrospect. However, previous projects, studies and activities had been conducted to promote usage of ICT technologies in the government, educational and private sectors. These activities were funded both by foreign agencies as well as local decrees and can provide the necessary comparison data for the case.

2. BH TELECOM

2.1.History

The firsts steps of the renewal and reconstruction of the new information and telecommunication system were taken by the mother company already in the war period. After the breakthrough of the telephony barrier in September 1993, the management board in the former Public Enterprise PTT B&H devised the interest in new technologies in the field of communications,and in doing so prepared the company for the inevitable market race in the aftermath of the war. Its courage and visionary orientation was proven in 1996 by investing significant financial assets into the GSM technology enabling the population a access to the world by new digital PSTN access points as well as mobile telephony and Internet. At the beginning of 2001 the company Public Enterprise PTT B&H was divided and into BH Postal Services and its offspring BH Telecom.

2.2 Services

BH Telecom had a long standing streak as the biggest provider of the telecommunication services in Bosnia – Herzegovina in the field of PSTN, mobile and data network.

In the area of the mobile telephony it introduced the GPRS/ WAP, MMS and SMS info and fun services on the VAS platform as well as EDGE technologies. At the end of 2006 BH Telecom had over 1.000.000 users with market participation of over 50% and annual increase

of the number of users for approximately 150.000 accompanied by continuous improvement and work on coverage of the territory and signal quality in the entire B&H.

In the field of PSTN numerous activities were conducted on application of the broadband network on the basis of the ADSL technology ensuring that BH Telecom has a very reliable and safe network accompanied by digitalization of total installed capacities of over 95%.

In order to even more improve its predispositions and promote the economc sector BH Telecom implemented new technologies in the domain also, such as IVR, SMS and VMS.

In recent years BH Telecom continually increased its broadbands speeds, removed the long standing limit on downloadable traffic, introduced VoIP, IPTV with video on demand and PayPerView options and continues to spread its network by reaching remote users via wireless technology.

2.3. Government support and internal operations

The business model of BHT allowed for special contracts to be offered to private, government and educational sectors. While the private sector offers were most concerned with stability and security, educational sectors are cost conscious options for users who require wide range of users with no specific requirements. The government sector is a cross between the two incorporating both a large scale of smaller, constant transactions with big emphasis on security and reliability.

Being a state held company as well (the government is a majority share-holder) BHT had regarding its own problems regarding its internal organization and operation redundancy. All available technologies (landline, internet, GSM service) started further improving in their own direction with no coherent relationship between the users. Therefore it was normal for one user to regular receive 3 or more bills monthly all coming from the same company all due to be paid in different times. In 2009 in cooperation with local software companies a new information system has been devised to unify the subscriber tree and provide a single platform from where all customer operations can be conducted. By doing so instead of juggling between several different applications and multiple entries on different databases everything can be done from one place with added monitoring and customer history. This not only allowed faster and more reliable service but also helped decrease the costs to the company. Regarding the topic of the paper this could be a proving case for itself but for the purpose of exploring the impact on society we will focus on government institutions as a measure of improvement to society.
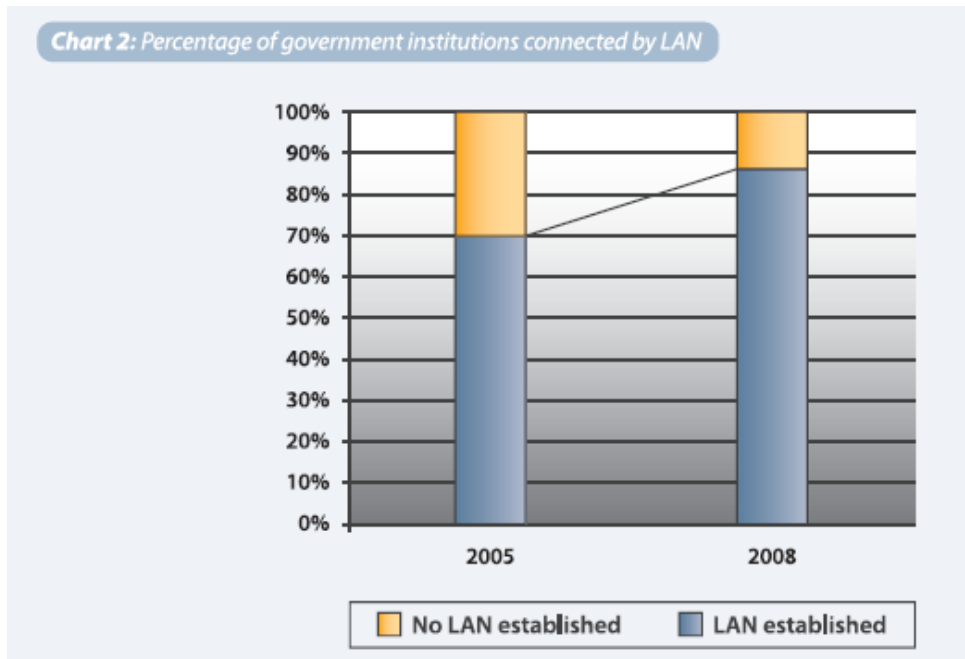
3.EFFECTS OF ICT DEVELOPMENT IN B&H

The development of informational society in BIH was abruptly stopped by the fall of Yugoslavia and the following war. The drawback in development was even more dramatic because it happened it the time of explosive global expansion of ICT development and practical usage. It is important to note that in 2002 it was estimated that there were over 300.000 PC in households, over 5000 web sites and 100.000 internet users. However most of thesestatistics is centered on urban population and the "digital divide" between urban and rural population is one of the greatest obstacles in enabling ICT infrastructure.

3.1. Government

According to the results of the study conducted by UNDP in cooperation with the Council of Ministers n 2009 government institutions have made significant progress towards incorporating and overall acceptance of ICT in their work. The results showed that 95.74% of government employees use computers in their daily work. This study does not allow us to see the quality of hardware nor the sophistication of usage but does show the results of penetration of ICT in administrative usage.

Chart 1: Percentage of government employees using a personal computer
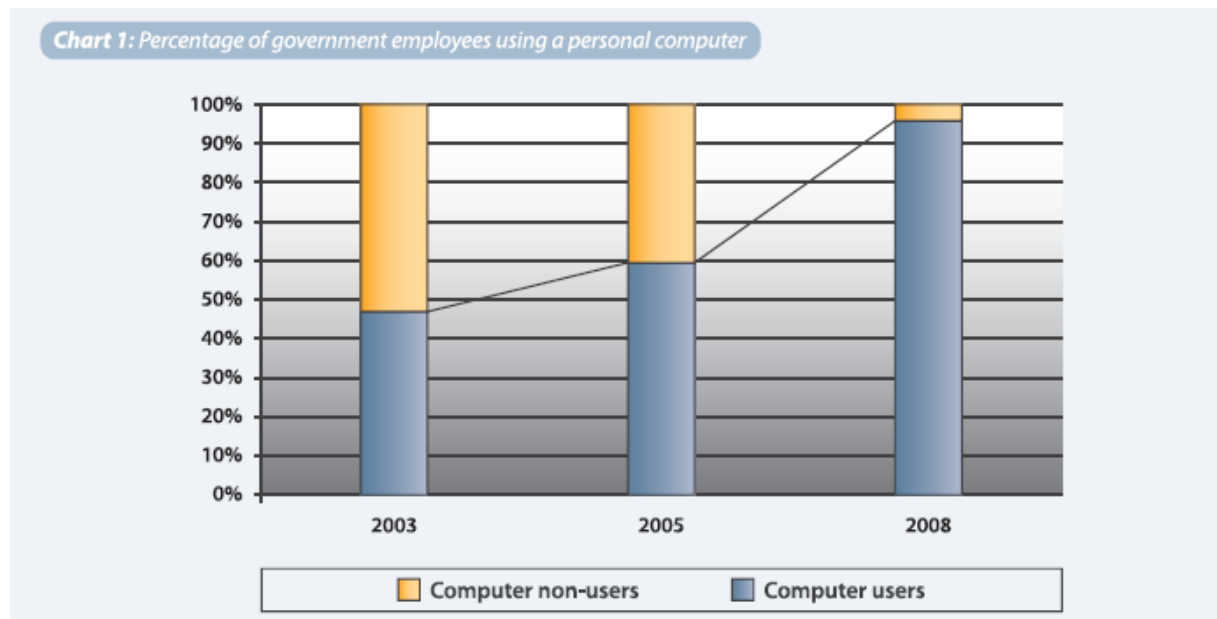
Another important statistic that has improved over recent year is the presence of local area networks within government institutions. This is an essential prerequisite for electronic information exchange in the daily work of government employees.

Chart 2: *Percentage of government institutions connected by LAN*

(Chart showing percentage of government institutions connected by LAN for years 2005 and 2008, with categories "No LAN established" and "LAN established")

Finally, the study examined the quality of the internet connection provided to the institutions which showed a dramatic increase in percentage of broadband connections as opposed to previously dominant Dial-up and ISDN connectivity.

Chart 3: Types of Internet connection
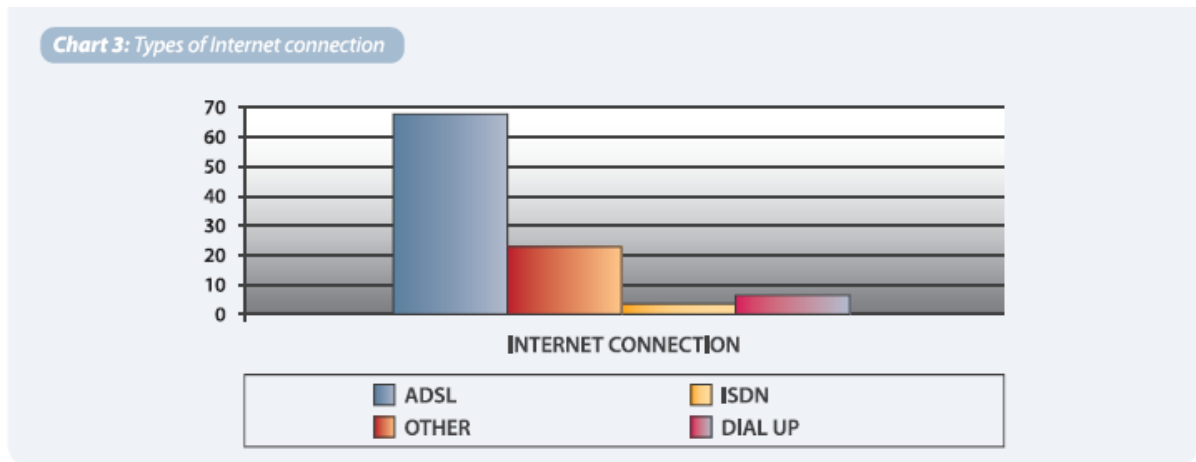
The survey, done in 2009 would probably encounter even more dramatic results since, in the case of BH Telecom the overall shift to broadband connectivity will result to entirely terminating its offering of Dial-up and ISDN service due to the lack of subscribers (and the need of) by the end of the current year.

The largest improvements in the government sector had been seen in its judiciary system both in terms of the infrastructure and project development. The judiciary system had made the biggest leap to automatization of its services and support and as the process matures the citizens will see the increasing benefits of ICT enabled administration.

Some of the project conducted in the process of improving the judicial system is

LAND ADMINISTRATION PROJECT (GTZ) - project on the

Implementation of laws related to land registers in Bosnia and Herzegovina.

LEGISLATION DATABASE PROJECT (UNDP and EU) - This webpage allows users to search, browse and access all laws in Bosnia and Herzegovina.

JUSTICE SECTOR DEVELOPMENT PROJECT (USAID) - The JSDP was designed to strengthen capacities within the justice sector in order to maintain and strengthen the rule of law. The primary goal is the provision of institutional support in order to strengthen the independence of the justice sector

3.2. Education

One of the main indicators of ICT usage within educational institutions is the ratio of pupils/studentsper computer. In comparison with the collected data from the 2005 e-Readiness Report we can observe an increase in pupils/students per computer ratio:

Chart 7: Number of pupils/students per computer
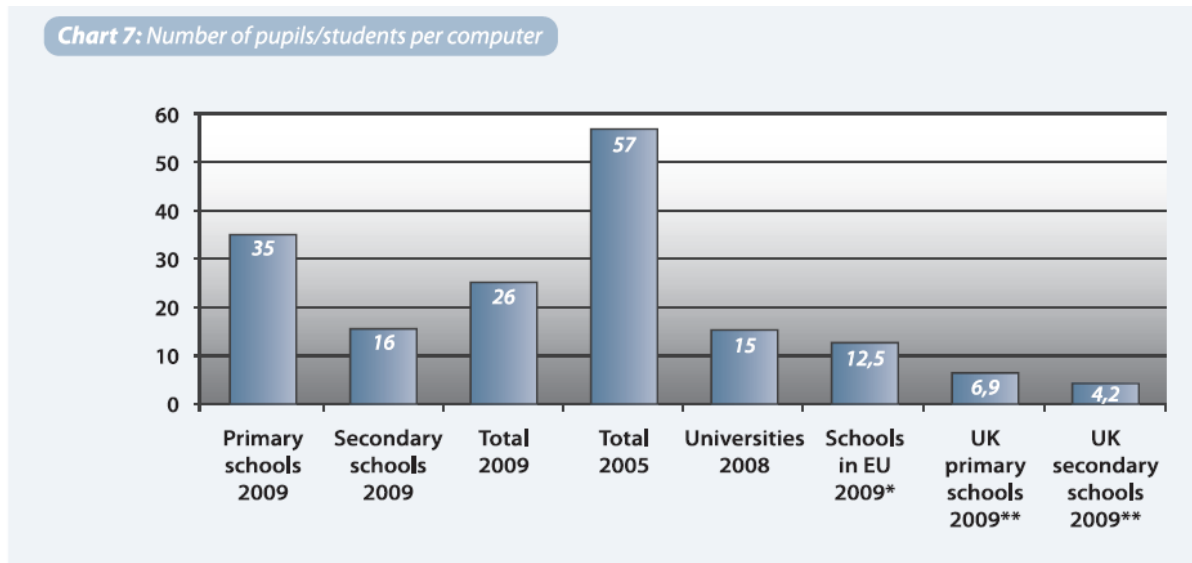
Though the increase is promising (especially considering the data dates to 2005) it is far away from adequate. Another problem is that the rate of acquisition of ICT technologies varies amongst different educational institution. While some have embraced information technologies and help/improvement that it brings other reluctantly implement new methods due to either financial reasons or unwillingness to learn new technologies.

3.3. Private sector

The reliability on ICT technologies is present in all branches of economy but the impact on society is best measured observing the development of IT market itself. According to the International Data Corporation (IDC) the IT market in Bosnia and Herzegovina stagnated at $167 million in 2010. When measured in local currency, the market expanded 5.0% from the previous year. According to a recent report from market research company IDC, per capita IT spending in Bosnia and Herzegovina reached $36 in 2010, or 4.3% of the EU average. Between 2011 and 2015, IDC expects the Bosnia and Herzegovina IT market to expand at a compound annual growth rate (CAGR) of 11.8% to reach $291.49 million in 2015.Like in many developing counries benefits from ICT technologies in Bosnia are predominantly that of it's mobile operators and service providers. Survey done in 2003 conducted by UNDP showed that 8,6 % of countries GDP is shared between ICT service providers. To effectively

use the resources provided this trend has to be reversed: The service providers must be second to the market which benefits from the service and creates value.

Although in recent years the IT market has significantly expanded, most of the companies are foreign subsidiaries who use the local work force for "cheap labor" because of the difference of standards in the regional industies. The same standards apply for platforms, standards and equipment needed therefore it is hard to be competitive in foreign markets. This can be attributed as the largest reason for stagnation in the industry because even if ICT technology is present and suffice the needs of IT developement the lack of financial investment and high prices due to economies of scale hinder their development.

3.4 Role of BH Telecom in ICT industry

In terms of the three sustainable society branches spoken of BH Telecom was involved in all aspects. In the goverment sector as the state owned operator it provided majority of the infrastructure (at least in the Federation entity). Most if not all goverment institutions are connected with broadband internet and connected via local area networks. In the educational sector there is a wide gap left by the discontinuation of the academic research newtork which has never been filled. BHT has on numerous occasions collaborated with educational institutions and promoted programs in the educational sector but the task of establishing an unified network falls upon the legislation of the goverment. If and when the goverment decides that the need for such a network cannot be ignored BHT has the resources to create it.

Concerning the private sector BHT is a long time partner with two of the worlds leading plaform solutions – Oracle and Microsoft and in that way enabled all its customer to use and develop their own solutions based on that platform. Regarding other branches of the industry BHT offered specialized business packages suited for the needs of companies either operating on the internet or using its benefits. This feature did expirience a decline due to the appearance of smaller ISPs which are focused on delivering more customized and suitable offerings but some of which still use BHT infrastructure.In this sector services of BHT provided operational requirement for e-banking, virtual private networks or even such services as Mparking.It is also important to note the distribution of IPTV, although BHt is not the fist operator to offer the service, the service it does offer is not just centered in the urban areas but all over the country enabling suburban and rural areas the quality of IPTV service which can compare to world standars.

4.CONCLUSION

The facts presented in this paper that there is indeed an increase in development of ICT in all aspects of the society, although it is less than desirable. It would be unfair and incorrect to attribute all of it to the services provided by BH Telecom but it cannot be denied that BH

Telecom was in all recent years and still is the largest provider of ICT services all across the country. Furthermore where other ISP providers are mostly profit oriented the role of BHT as the state operator is to provide service everywhere regardless of the profits involved.

Development of ICT undeniably affects the society as a whole in a beneficial manner but B&H has reached a point where future development is not hampered by the lack of its infrastructure but rather a lack of financial investment in further improvements. Though the lack of resources is high compared to world standards or even countries in the region it is the usage of these resources that creates the demand. Until our society does not promote and invest in incorporating ICT in our daily routine the stagnation is inevitable and furthers the gap between B&H and the countries of the developing world. If that demand does happen and is adequately supported by the ruling structures, BH Telecom has the necessary resources and skill to answer that call.

"For a country to put ICT to effective use it must be 'e-Ready' in terms of infrastructure, the accessibilityof ICT to the population at large and the effect of the legal and regulatory framework on ICT use".

Source: bridges.org, http://www.bridges.org/e_readiness_assessment

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