Perspective for E-Business in Bosnia and Herzegovina
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ABSTRACT
A large number of companies already well established in the market are using traditional business models: cost reduction, operational efficiency and increased products variety. In order to preserve its position on the market, companies must use the new information and communication technology (ICT) and new models of business. In the last decade, around the world, e-commerce and e-business as extension of e-commerce are becoming increasingly popular. In this paper is presented actual situation in Bosnia and Herzegovina in terms of ICT infrastructure and e-business.

Keywords: e-commerce, e-business, ICT infrastructure

1. INTRODUCTION
Bosnia and Herzegovina (BIH) is a transitional economy which is pursuing membership in the European Union and the World Trade Organization. BIH has a very complex administrative and political environment. BIH is divided into two “entities,” the Federation of BIH and the Republic of Serbs (RS). A third, smaller area, the Brecko District, operates under a separate administration. The Federation is further divided into ten cantons, each with its own government and responsibilities. [1].

Such cumbersome, dysfunctional and expensive administration is a problem in everyday life, but also in the development of e-business

WEF (World Economic Forum) in its regular Annual Report (The Global Competitiveness Report) estimates e-government readiness. WEF takes into account a number of indicators, such as factor of environment (infrastructure, political and regulatory environment, market environment), readiness (individual, government and business readiness) and the use of ICT (individually, business and government), [2].

In accordance with GCI (The Global Competitiveness Index), BIH is ranked on 87 position among 148 countries (Fig. 1).

It is overall index with sub indexes: basic requirements (BIH is ranked on 81 position), efficiency enhancers (BIH is ranked on 89 position) and innovation and sophistication factors (BIH is ranked on 89 position). GCI includes weighted average of many different components each measure different aspect of competitiveness, [2].

Basic GCI indicators for Bosnia and Herzegovina are:

a. Population of approximately 3.8 million.
b. GDP per capita (US$): 4461
c. total GDP (in billions$): 17.3

GCI indicators are organized by pillar (12 pillar presented on Fig 1). For the aspect of this paper the most important pillar is 9th, technological readiness

2. RELATED WORK
There is not complete survey about e-business in BIH and region. Some of the papers on that tames are [1] and [3], but both papers refer only to the applications of e-business (e-banking and e-government).

In this paper is attempted to more completely examine the situation in terms of e-business in BIH and it is contributions of this paper.

3. ICT INFRASTRUCTURE IN BIH
In accordance by International Telecommunications Union (ITU), key ICT indicators for
developed and developing countries are penetration rates for fixed, mobile and Internet subscribers. [4].

Here, it is made comparison between penetration rates in developed and developing countries and Bosnia and Herzegovina.

Data presented in this paper is taken from the Annual reports of Communication Regulatory Agency (CRA) in BIH and ITU. CRA collects data from the all operators in BIH and performs their processing and analysis, [5], [6].

![Fig 3(a): Penetration rates for fixed telephone subscription](image)

**Fig 3(a):** Penetration rates for fixed telephone subscription

![Fig 3(b): Penetration rates for mobile cellular subscription](image)

**Fig 3(b):** Penetration rates for mobile cellular subscription

![Fig 3(c): Penetration rates for Individuals using the Internet](image)

**Fig 3(c):** Penetration rates for Individuals using the Internet

Operators who has the license for public fixed and mobile telephone services that enables them to provide fixed and mobile telephony services in the whole territory of Bosnia and Herzegovina are:

- JP BH Telecom Sarajevo,
- Telekomunikacije RS a.d. Banja Luka (M:TEL),

From the figure 3(a) it can be concluded that number of fixed telephone subscription is in constant decline and it is global trend from both developed and developing countries and BIH.

From the figure 3(b) and 3(c) it is evident that the number of mobile and Internet subscribers continues to increase.

At the end of 2013, in Bosnia and Herzegovina operated a total of 69 Internet service providers with about half million of Internet subscribers, but starting from the definition of the ITU, according to which the Internet user is any person of 16 to 74 years, who uses the Internet during the year, it can be estimated that there were about two million Internet users in BIH, [6].

The broadband services from year to year continue to increase, so that the number of broadband subscribers has reached 99.38% of the total number of Internet subscribers (in fixed environment).

Penetration of broadband subscribers in relation to the total population of BIH was 13.42%. Within the structure of broadband connections (in fixed networks), xDSL access still leads with 57.14% out of the total number of broadband connections, with the rise of cable Internet access and FWA connections (Fixed Wireless Connection) compared to the previous year (Figure 4), [5].
UMTS (Universal Mobile Telecommunication System) is the third generation (3G) mobile telecommunications system that enables the provision of broadband services in wireless and mobile communications.

UMTS enables mobile communication with theoretical data transfer speeds up to 7.2 Mbps. It is designed to enable mobile users to transfer image, graphic, video and other multimedia content via computer and telephone terminal devices.

HSPA (High-Speed Packet Access) is a collection of mobile telephony protocols that extend and enhance existing UMTS protocols.

Access to Internet via 3G can be enabled on two ways:
- Via a mobile phone that supports 3G; that makes much faster access to (compared to GPRS/EDGE) content on the Internet.
- Via computers and PCMCIA card/USB modem/mobile phone that supports 3G; computer and mobile phone must be connected via the appropriate cable, infrared port (IrDA), or Bluetooth.

Coverage of the population with 3G services for all operators in BIH is:
- For BH Telecom, 87.05%
- For M:TEL, 71.36%
- For HT Mostar, 71.5%

The development of broadband Internet, together with the liberalization of the telecommunications market, influenced the offer service packages that simultaneously combined multiple telecommunications services:
- Internet, fixed telephony and IPTV (triple play concept) or
- Internet, fixed telephone, IPTV and mobile telephony (quadruple-play concept).

VoIP (Voice over IP) in form IP Centrex service is used too, but number of subscriber is very small and it is intended only to business consumers.

This service packages increases requests for bandwidth in access and backbone network.

In access network are used:
- ADSL, ADSL2, ADSL2+, VDSL, VDSL2,
- combination VDSL/VDSL2 technologies and optic
  - FTTH (Fiber to the Home)
  - FTTB (Fiber to the Building)

WDM/DWDM technology (Wavelength Division Multiplexing/Dense WDM) is used in backbone network with very high capacity.

One of the basic indicator for the utilization ICT within education, the number of pupils per computer in primary and secondary schools is not good in BIH. It is only about 26. It must be invested in computers laboratory and in the Internet connection to the school, [7]. ICT education becomes obligatory in the 5th grade for 8-year primary schools and in the 6th grade for 9-year primary schools, [7].

4. LEGAL FRAME OF E-BUSINESS IN BIH

Citizens in BIH are waiting for years on legislation that would regulate the field of e-business in BIH. BIH is one of the last countries in the region who adopted major low and related regulations in area of e-business. There are only a few documents on the state level like [8-10]:

- c. Regulations on access to records and data exchange, Official Gazette No. 35/2009

Legal frame for e-business in Republic of Serbs is more developed than Federation. Republic of Serbs has its own regulations in the area of e-business like:

c. It is made amendments to the Criminal Law of Republic of Serbs related to the area of the high tech. There is only proposition of Law of electronics document on the state level.

5. E-BUSINESS IN BOSNIA AND HERZEGOVINA

E-business and e-commerce are terms that are sometimes used interchangeably. But the terms are different. One of the description differences is given by E. Turban in [13]:

“E-commerce describes the process of buying, selling, transferring, or exchanging products, services, and/or information via computer networks, including the Internet. E-business refers to a broader definition of e-commerce, not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, conducting e-learning, and processing electronic transactions”.

Today, old economy organizations (brick-and-mortar) that doing business only off-line is transformed in two new types of organizations:

a. Click-and-mortar, that doing some activities on-line,
b. Virtual, that doing all activities on-line .

Some of the most popular e-business applications are: direct marketing, search job, e-banking, e-government, m-commerce, social networks, e-learning, auctions, travel, on-line publishing, consumer services, [13].

In the next, we will discuss about some of the above applications and their using in BIH.

5.1 Direct Marketing

Direct marketing is an activity that allows us to offer products and services or the transfer of certain news via mail, telephone (fixed or mobile) to potential customers of these products or services, [13].

The prerequisite for this activity is necessary processing size of personal data of potential customers. It carries a problem of privacy of personal data and necessarily requires a specific legal regulation. Legislation relating exclusively on direct marketing in BIH does not exist. These activities in BIH are subsumed under the Law on Protection of Personal Data and Law of Communications.

5.2 Search Job

There are many web sites for on-line searching job in BIH. One of the most popular is www.posao.ba. With the help of these web sites you can create professional biography by EU standards, which will be translated and applied to jobs online or through direct contact with the employer.

5.3 E-banking

According to data of the Central Bank of BIH, 96,041 citizens used e-banking services in 2012, which are 25,567 more users than the year before. In the same period, the number of company users rose to 29,599, which is an annual growth by 5.734. But, despite the growing number of e-banking services in BIH, it is still very far from the EU average, [14].

Basic forms of e-payments are:

Check like:
- Pay-now: ATM terminals (Automated Teller Machine), POS terminals (Point of Sale) and debit card,
- Pay latter: credit cards,
- Cache like: smart card, electronic checks and electronic money, [15].

Out of total 29 commercial banks in Bosnia and Herzegovina by the end of 2012, 26 banks provided cards services to their clients. The total number of issued cards, by the end of December 2012, was 1,830,299 being more by 39,254 cards compared to the end of December 2011, [14].

The debit cards were prevailing, there were 1,513,818 issued of these, followed by credit cards with 202.866 issued, and cards with deferred payment, being 122.841 in number. Out of total value of transactions, 73% was withdrawn from the ATMs, while 27% was paid via the POS terminals. In 2012 there were in total 1.284 ATMs (1.202 in 2011) and 19.320 POS (18.589 in 2011), [14].

PayPal system of electronic money is used in BIH from 2011 year.

5.4 M-business

M-commerce is transaction any monetary value which is realized via mobile telecommunications network, [16].

M-business is broader term than m-commerce and it includes yet: exchange goods, services, information and knowledge with the aid of mobile technology, like: WLAN, WiMAX, cellular networks (GPRS/EDGE/UMTS).

Some of the m-business applications that is used in BIH are:
- M-banking (SMS Banking): mobile banking information, mobile online stock transaction, mobile accounting,
- M-marketing: mobile coupons, mobile newsletters,
- Mobile entertainment: mobile gaming, downloads of music, video and ring tones,
• M-payment: BH Telecom in its offer has this service from 2011 year.

M-business is new channel for e-business which is insensitive to time and location and therefore represents an opportunity to create new business processes and improving old.

5.5 Social Networks

There is no enough data about popularity social networks in BIH but with high probability we can stay that it is (in accordance with the portal Business Insider, [17]):

- Face book for the general population,
- Twitter for young,
- Instagram for women,
- Google Plus and LinkedIn for men.

5.6 E-learning

From the chapter 3, it is evident that BIH has solid communications and Internet infrastructure, but ICT parameter, number of pupils per computer in primary and secondary schools is not good.

E-learning can be implemented as a complement to traditional face-to-face model, or as fully distance learning.

There are a large number of software solutions for e-learning on the market. The most of them is open source.

The most popular are Learning Management Systems (LMS). Moodle (Modular Object-Oriented Dynamic Learning Environment) is open-source solution based on PHP code, that is the most used at universities in Bosnia and Herzegovina.

5.7 E-government

E-government is e-business model in which a government entity buys or provides goods, services, or information from or to business (G2B) or from or to individual citizens (G2C), [13].

Complicated organization, unclear allocation of responsibilities among the various levels of government, and also the problem of their coordination of the work, (which relates primarily to the situation in the Federation) are often cited problems in development of e-government, [7].

Table 1: The most popular G2B and G2C services in BIH

<table>
<thead>
<tr>
<th>G2B</th>
<th>Availability G2B services</th>
<th>G2C</th>
<th>Availability G2C services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employees income tax payments registration, payment and analysis</td>
<td>46%</td>
<td>13. Job search</td>
<td>68%</td>
</tr>
<tr>
<td>2. Environment and construction permits obtaining a license</td>
<td>22.5%</td>
<td>14. Social benefits: unemployment benefit, child supplement, health care payment, student supplement and grants</td>
<td>8%</td>
</tr>
<tr>
<td>3. Electronic cadastre and related registers of ownership</td>
<td>25%</td>
<td>15. Personal documents ID, international passport, driving license</td>
<td>12%</td>
</tr>
<tr>
<td>4. Healthcare and pension payments and examinations</td>
<td>25%</td>
<td>16. Car registration, new, second-hand or imported</td>
<td>6%</td>
</tr>
<tr>
<td>5. Enterprise registration</td>
<td>32.5%</td>
<td>17. Public libraries: review of catalogues and ordering</td>
<td>60%</td>
</tr>
<tr>
<td>6. Company income registration</td>
<td>50%</td>
<td>18. Certificates of birth, deaths and marriage records, birth certificate, death certificate, marriage certificate</td>
<td>35%</td>
</tr>
<tr>
<td>7. VAT</td>
<td>50%</td>
<td>19. Admission to higher education institutions</td>
<td>25%</td>
</tr>
<tr>
<td>8. Customs declarations</td>
<td>100%</td>
<td>20. Residence registration in the event of a change of address</td>
<td>7.5%</td>
</tr>
<tr>
<td>9. A Single Window for the one-time filing of all required information on a foreign trade transaction</td>
<td>0.0%</td>
<td>21. Public procurement</td>
<td>25%</td>
</tr>
<tr>
<td>10. Public procurement</td>
<td>25%</td>
<td>22. Registry of mortgages of legal persons</td>
<td>50%</td>
</tr>
<tr>
<td>12. Submission of statistical data to the State Statistical System (including harmonization with EUROSTAT requirements)</td>
<td>30%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: E-government development Index (EGDE)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>EGDE</th>
<th>Online Service Component (OSC)</th>
<th>Telecomm. Infrastructure Component (TIC)</th>
<th>Human Capital Index (HCI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>97</td>
<td>Bosnia and Herzegovina</td>
<td>0.4707</td>
<td>0.2835</td>
<td>0.3998</td>
<td>0.7288</td>
</tr>
</tbody>
</table>

Table 3: Online Service Index (OSI) and its components

<table>
<thead>
<tr>
<th>Country</th>
<th>OSI</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
<th>Total Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosnia and Herzegovina</td>
<td>0.2835</td>
<td>56</td>
<td>41</td>
<td>7</td>
<td>12</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 4: Telecommunication Infrastructure Index (TII) and its components

<table>
<thead>
<tr>
<th>Country</th>
<th>TII</th>
<th>Percentage of individuals using the Internet</th>
<th>Fixed/telephone subscription per 100 inhabitants</th>
<th>Mobile-cellular telephone subscription per 100 inhabitants</th>
<th>Fixed (wired) broadband subscription per 100 inhabitants</th>
<th>Wireless broadband subscriptions per 100 inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosnia and Herzegovina</td>
<td>0.3998</td>
<td>65.36</td>
<td>22.91</td>
<td>87.44</td>
<td>10.54</td>
<td>12.07</td>
</tr>
</tbody>
</table>

Table 5: Human Capital Index (HCI)

<table>
<thead>
<tr>
<th>Country</th>
<th>HCI</th>
<th>Adult literacy (%)</th>
<th>Gross enrolment ratio (%)</th>
<th>Expected years of schooling</th>
<th>Mean years of schooling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Index value</td>
<td>Year</td>
<td>Source</td>
<td>Index value</td>
<td>Year</td>
</tr>
<tr>
<td>BIH</td>
<td>0.72</td>
<td>88</td>
<td>98.00</td>
<td>2011</td>
<td>UNES</td>
</tr>
</tbody>
</table>

In Table 1 is presented the most popular G2C and G2B services in BIH.


In Table 2 is shown results for BIH.

BIH is ranked on 97 positions. In tables 3, 4, and 5 is shown EGDE components (OSI, TII and HCI) and their components, [18].

5.8 CRM in BIH

CRM is consumer-focused business strategy that aims to increase customer satisfaction and customer loyalty by offering more responsive and customized service to each customer [15], [19].

Customer Relationship Management (CRM) places the consumer in the center of interest of the company.

CRM is used in areas such as customer support and service, sales and marketing to optimize profitability and revenue.

CRM represents a tool which enable differentiation company from competition and it is very important in the battle with the competition.

Banks in BIH are first understand potential of the CRM but to date none of the banks are fully implements CRM in their business.

6. CONCLUSION

In the last decade, around the world, e-commerce and e-business as extension of e-commerce are becoming increasingly popular. For development of e-business in some country, that country must have a good ICT infrastructure. From the chapter 3 it is evident that BIH has solid communications and Internet infrastructure (it is above the world average) for development e-business. It must be invested in increasing number of computers in primary and secondary school and in broadband connections of the schools to Internet.
A major drawback is the lack of adequate legislation at the state level. If this problem is solved, perspective of development is good.

REFERENCES


[14] www.cbbh.ba


AUTHOR PROFILE
Zvezdan Stojanovic received the master degree in electrical and computer engineering from Faculty of technical Science in Novi Sad (Serbia) in 2005 and PhD degree at Slobomir P University in Bijeljina (Bosnia and Herzegovina) at 2010. Currently he is an Assistant Professor at Slobomir P University.