

Improvement of Web Services at the local level in Bosnia and Herzegovina

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Abstract. *Local web services (services that are offered by local community web portals – G2C communication) are one of the most important factor for stabile and prosper e-Government project. E-Government presents one-stop-shop for population that directly affect on public administration and their need to change way of information-service distribution. E-Government must provide information that is accessible via Internet or some other web based media (intranet portal). And, of course, progress in information distribution is tightly connected to IT architecture improvements, so it has also a very important factor in expensive investments. This paper presents a three year (years 2009, 2010 and 2012), four year period, of researching for local government maturity that is presented through web portal presentation at local level of public administration.*

Keywords: e-Governance, e-Government, e-Maturity, local community web site, municipality web site, web portal

1. Introduction

According to previous research, research has been conducted on sample of 134 municipalities and local communities¹ [1], according to the same source Bosnia and Herzegovina is made up 131 municipalities and local communities. According to data from the Identification Documents and Data Exchange Agency (IDDEEA) in BiH registered 131 municipalities [1] and 9 cities.

Research consists of crucial questions in order to compare results with data that is collected in

previous years. Main factors of research are: Web site existance, domain that web site is registred, CMS tool (Content Management System), external contact possibility (weather someone can send an e-mail or send some request in electronic form) and existance of advanced on-line services. In a large number of local communities and municipalities in Bosnia and Herzegovina in progress are projects for building backoffices [2] which will serve to citizens and that presents a lower level of “one-stop-shop on the place” services. For example, about (over) 42% of citizens in B&H have an internet connection [3], it is clear that a large number of citizens is “ready” for using on-line e-Government services.

Main parameters in this paper will be compared and presented by percentage and by graphics. As main parameters are choosen: local community and municipality web site existance, domain of the web sites, time to answer on „imagine“ citizen and existance of on-line services.

As a summary of the paper author will try to present a model that show current state of municipality web presentation and in compare to the similar research that is conducted in previous years, author will try to define an integrated quotient for general eReadiness in administrative circles at local level in society.

2. e-Maturity

G2C (Government to Citizen) - the act of government (public administration) and citizens. In this, the most typical relations it performs its basic role of "public service". It covers everything from issuing identity cards to citizens' participation in decision-making in the field of public policy (e.g. in the process of adapting regulations in the field of urban planning and environmental protection). What distinguishes e-Government from the "ordinary government" in this regard is the fact that citizen can access information and receive services quickly, using a wide range of mechanisms, any time and anywhere. The increasing spread of the

¹ Data on municipalities and the number of municipalities are taken from the Agency for identification documents, records and data exchange BH (www.iddeea.gov.ba)

Internet as the communication media and its accessibility has led to public administration in a position to exploit its capabilities and improve its relationship with citizens, its services more accessible and transparent, and the administration response to requests from citizens to make faster. New technologies based on Internet allows:

- the user to easily access public administration and get the service required;
- a service that is available to everyone 24 hours a day, and disabled persons who are not able to easily change the location;
- Public Administration to find out what people think about its services and on the basis that they document;
- Single touch point - access to all necessary information from any place and at any time [4]

It is necessary to establish and maintain communication channels with citizens, through which collected information about their needs and desires. Priority implementation of the new e-services need to be adopted to these needs. In this way, and citizens are involved in decision-making process of the orientations of e-Administration. Citizens need to inform you about new e-services across various media. e-Administration will achieve its purpose only if citizens are actually using e-services, a lot can be achieved even with the correct implementation of the portal e-government on which way to systematically put new e-services and encourages their use. In a G2C and C2G services needed specifically include the identification of citizens through the introduction of electronic, so called electronic identity cards or "smart" electronic cards to protect privacy and data security. C2G and G2C services need to enable citizens to the Internet performs all tasks related to paying taxes, taking personal documents declarations birth and death, scheduling weddings, etc. and the availability of various service information and participation in democratic processes. G2C and C2G services must be available to citizens 24 hours a day [4].

Plans for the development of e-administration to the priority should have the following 12 services for citizens as defined by the European Union [5]:

1. Sales Tax (tax returns, notice of assessment)
2. Services seeking employment with the Department of Employment,
3. Social Insurance
4. Personal documents (passport, identity card and driving license)
5. Car registration (new, used and imported)
6. Obtaining a building permit,
7. Police reporting (eg. in case of theft)
8. Public libraries (availability of catalog and search tools publications)
9. Birth certificates (birth, marriage, death)

10. Sign in competition for higher education faculties,
11. Notice of moving (change of address)
12. Services related to health (interactive advice regarding the availability of services in different hospitals; scheduling examinations at hospitals).

The European Commission is to monitor development indicators of information society in EU member states adopted a standard list of indicators. These indicators provide insight into development, and provide a basis for planning priorities and making recommendations. In October 2004, the research was carried out, which was published in March 2005, and included all 25 EU member states: Iceland, Norway and Switzerland. Measured by the degree of availability of 20 public services that are identified as basic. Services are divided into 12 by which the target groups of citizens: taxes on income, job search, social security, personal documents, car registration, building permits, reporting to the police, public libraries, birth certificates and marriage certificate, secondary school enrollment, change of residence and services related to health care and eight (8) more services in which the economy is the target group contributions for employees, taxes on corporate income, VAT, company registration, submission of statistical data services, customs declarations, permits related to environmental protection and public procurement. For the degree of accessibility were used two different criteria - On-line access to public services (availability of public services online), which set the e-Europe 2002 action plan and complete on-line access (full online availability), which introduced an action plan for e-Europe 2005th. When it comes to "simple" On-line availability of services, made the difference between 4 levels, according to [6]:

- The available information necessary for starting the procedure;
- One-way interaction - ability to download the document in non-electronic, paper form;
- Two-way interaction - starting with the official procedures of the electronic document;
- Full electronic processing of cases.

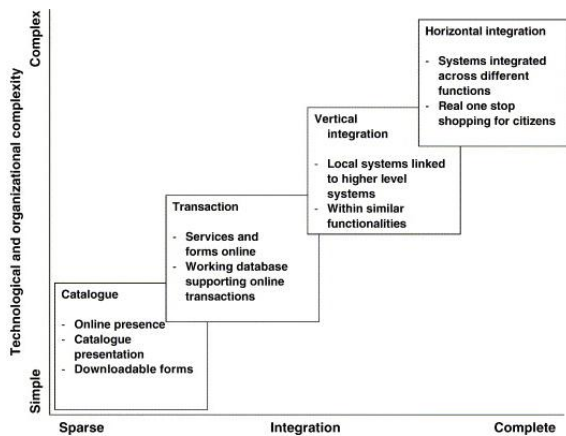


Figure 1 Layne and Lee Model [6]

In many publications on the topic of E-Government-a [7], often to explain the development of e-Government's model takes the following Baum and Di Maio [8], better known as "the Gartner model".

3. Research

As mentioned, research topic is aimed at e-Municipality and services provided to citizens, particularly the safety of web service through which they offer their services. The subject of research concerning the safety and e-Services (G2C services). The object of research by local communities in BiH - Municipality. The purpose and objective of the research is to show at what level of maturity are web portals of municipalities, and the willingness of municipalities to e-Communication (e-Rediness). The study was based on several items:

- Testing e-Readiness municipalities to communicate
- Testing the level of service (e-Maturity) offered through a web service
- Testing of technologies that are the basis for the implementation of web portals.

The research includes 134 (municipalities and local communities) research units, and according to relevant state institution, that is 100% specimen.

3.1. Web site analysis

Analysis of the municipalities via a web page (web site) was done for several reasons. The primary objective was to demonstrate the following:

- Whether all municipalities have a web site?
- Does the site there is the possibility of contact with the Municipalities and in what way (e-mail/e-form)?

- Which domain is the community web page (top level domains, subdomains, etc.)?
- Which technology has made web page (web portal)?
- What is the safety factor of the web portal?
- At what level are services (web services) municipalities – e-Maturity model community?

3.2. Whether municipality own a Web site

This research was conducted via search engines (Google, Yahoo or Bing) and author tried to find whether any of the municipalities has a registered domain name, and whether there is a web site on that domain. The study was conducted for all 134 municipalities. Key words that were used were: općina, općina, opština, opština, local community, and the name of each municipality. Total number of municipalities is 134: 99 municipalities has a web site (portal), 16 of them doesn't have a web site, while nine sites (9) has a reserved domain, but not designed web page, one site is locked by a hacker and one site is unavailable during virus-infected content Figure 2.



Figure 2 Web presentation of municipalities

3.3. Is there any possibility of eContact on the web site

Figure 3 presents the analysis of opportunities contact the municipality some of the ways:

- Through e-mail
- Using Web e-Forms
- Through e-mail and e-form

According to the data, 20 municipalities have the possibility of contact through e-mail addresses and through on-line e-forms, 48 municipalities have the possibility of contact through e-mail, 29 municipalities have the possibility of contact via online form (e-form), while as many as 19 municipalities do not have the

possibility of contact with administrative employees in the municipality.

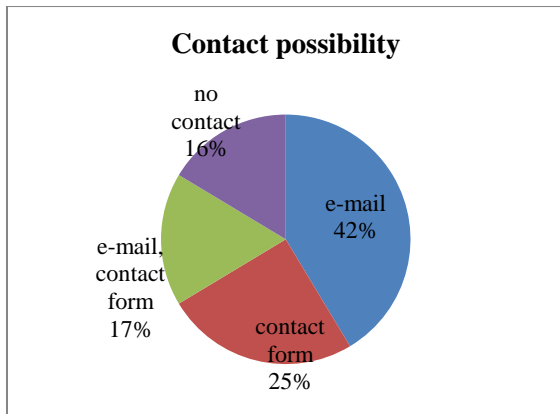


Figure 3 Possibility for contact through web

3.4. Technology that is basis for Web site

The next thing that was important in terms of accessibility, quality and safety of services offered to citizens via the web portal is a technology that is based web portal. Today, the world's most popular system of "Open-source" CMS (Content Management Systems) - content management system, and such a situation in BiH, however, here arises the problem of safety because they are all in the open-source systems are vulnerable, and essential daily viewing and patching „security vulnerabilities“.

In Figure 4 we see the technology, according to which are web portals carried out. Evidently, the most used "global popular" Joomla CMS "with as many as 49% of the total participation (Joomla CMS in all versions).

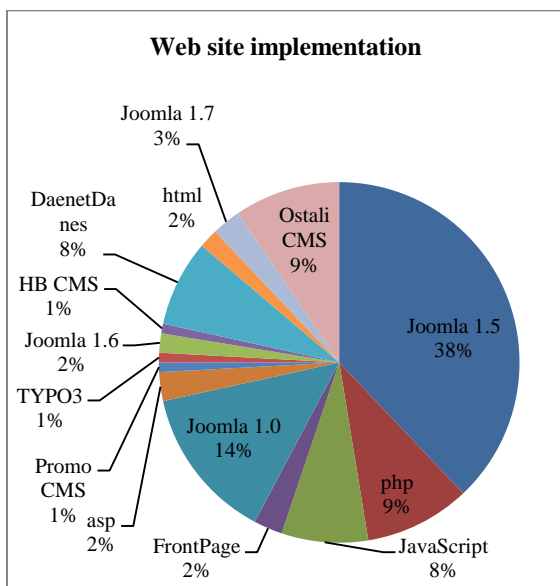


Figure 4 Web Site Implementation Technology

The second part of the research was based on the checking of the CMS is used, and based on that finding a "hole" that is the same vulnerability in the official portals author CMS. Method of checking was legal, without any "penetration" tests and was based on a review of the original sites ("view page source") through the browser Internet Explorer / Firefox. Even 78% of the web portal (91/116) had a "default" configuration, which includes basic settings of the portal that arises during the initial configuration. 22% of the portal has been configured so that it can be said that they were safe. It should be noted that the "default" configuration of friendly Web 2.0 application and „un-patched“ systems are the biggest security problems for every information system [10] [11]. The results of the research is shown on Figure 5

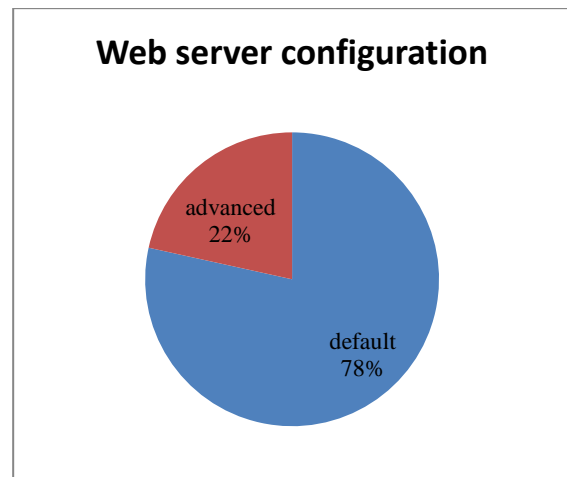


Figure 5 Web Site Security

3.5. Municipality Web site domain

Next the authors interested in the domain where the registered web site of the Municipality. We wanted to know whether the site is registered to a so-called. "Top-level" public domain, or perhaps subdomains. State is as follows:

- 53 municipalities were registered in the national top domain. Ba
- 18 municipalities were registered to. Org domains
- 16 municipalities were registered. Com domains (???)
- 8 municipalities were registered to. Rs.ba subdomains
- 8 municipalities were registered in. Net domains
- 4 municipality has been registered. Info domains
- 4 municipalities were registered to. Com.ba subdomains
- 7 municipalities were registered. Gov.ba subdomains

- 2 municipalities has been registered on .Rs domain (domain of another state)

Figure 6 shows the structure of registered domains in relation to the total number.

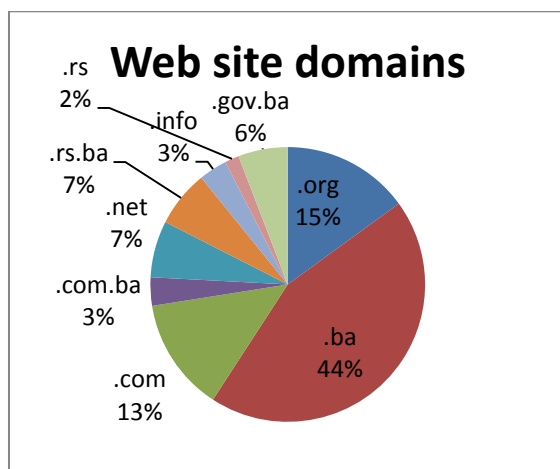


Figure 6 Registered domains

3.6. Municipality services - eMaturity

This study was the most complicated and require much effort and time. As we have previously stated, we analyzed the 134 local governments. In the process of collecting data, which were relevant to set up research, we encountered many difficulties, but also interesting facts. Our goal was to get a complete picture (for this reason, we analyzed all municipalities in BiH) management of the ICT sector, but the front-end segment. This segment is of particular interest. As such, it participates in close communication with the user part of the services that has thought out and organized back-end background (ICT management). It is interesting that we can point out the fact that several web portals exist under the domain name .com, or the domain of another country .rs. We also have several portals that were created as a static presentation of figures, and along with it yet and literally mapped (portals were created under The European Commission, and, though financially supported, it is inaccessible and does not provide any information in the recent times, they are not updated since the time of activation in a public web space). Portals with this structure have such an ICT management, since none of these portals is provided giving feedback to the previously described e-mail request. In the sphere of problems include web presentations municipalities that have been infected by viruses and worms, which, possibly a protected computer, preventing access. While unprotected computers when connecting to these portals „infection“ and is used for transporting these „trojans and worms“, which directly affect the already shaken ICT structure, in general terms, at the state level.

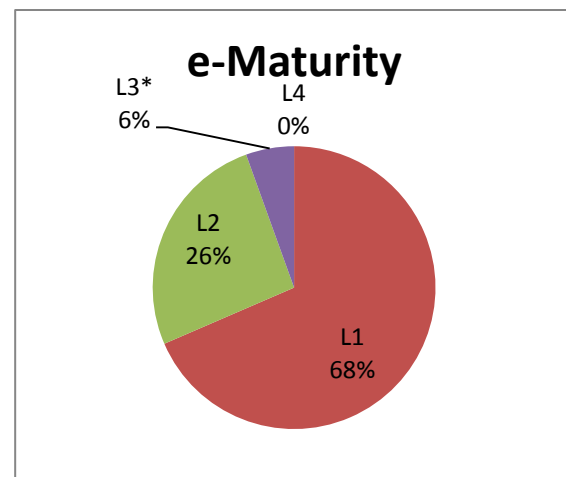


Figure 7 e-Maturity model

For e-Maturity model, levels are defined according to researched Layne&Lee model [6], where first level (L1) presents basic web presentation (description: static web site with basic information about local community or municipality). Second level (L2) more detailed, in regard to L1, web site (description: wb site with more information that contain document forms for download). Third and fourth level are created from the highest level where L3 presents web portals that contain at least one service, from on-stop-shop services category and L4 presents highly developed webportals where all services are enabled and implemented in electronic form and where we have all public sector transformed on one-stop-shop services for citizen purposes. Distribution of previously described levels is presented on Figure 7.

4. Comparative results – for four year period

During past 4 years, author tried to continuously conduct a research and compare collected data. Comparing data must show either progress or regression of situation in which there are services at the local level. Research are considered 131 local communities in 2009 to 134 local communities in 2012 year. Figure 8 presents existing web sites (blue) and nonexisting (red).

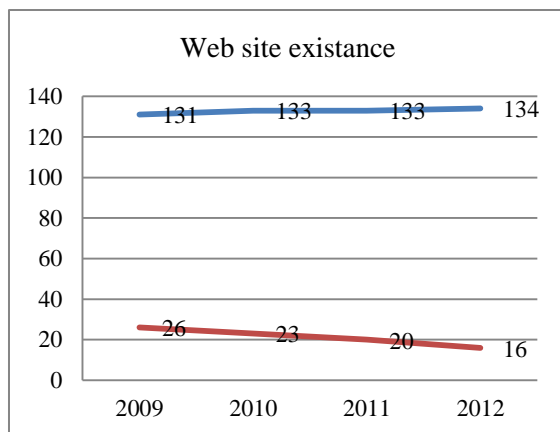


Figure 8 Web site existence during four year period

Second interesting thing are registered domains under web sites this is interesting for reason that we have several cases of official web sites (local community web sites) that are registered under other country domain (.rs). Figure 9 shows trend registrations per year for domains of observed web sites (2009 – green, 2010 – red, 2012 - blue). We can see that sites are registered on .ba, .org and .com (at most), also we see that there is rising number of web sites that are registered under .gov.ba governmental domain.

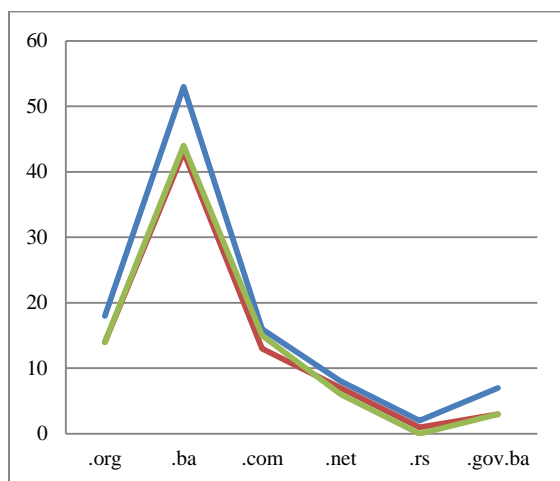


Figure 9 Domain usage in four year period

In order to evaluate local community eReadiness we must look into presented levels of maturity models. According to results of conducted research it is evident that almost all low level public sector (local communities and municipalities) are web covered (have their web presentations). As we see (Figure 10), Many resort to facilitating as many services on the web solutions or even to present as many information as possible for easier approach to communicate with citizens.

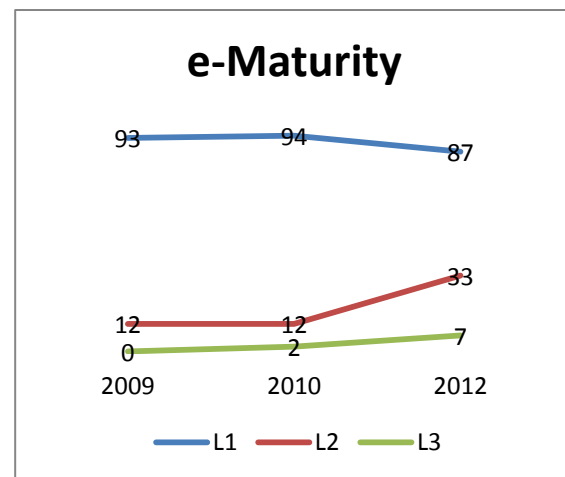


Figure 10 Web site existence during four year period

5. Conclusion

According to conducted research and researches from past years we can give several conclusive remarks that are applicable on presented problematics. First of all, there is no absolute web presence for all local communities and municipalities and from today views it is quite disappointing (even this trend is in regression), because we have free solutions that are never closer to apply and implement. Second, there is limited orientation toward direct communication with citizens (16% or 19 web presentations, of 118 active web sites, with no possibility of contact, either by e-mail or e-form) and that is one of goals that should be as soon as possible improved, it is essential factor for improvement of an impression and functionality. Third, another important factor for improvement is technology that web sites are based on. Majority of web sites is based on free CMS solutions with default (basic) web server configuration (78% of existing web sites using default web server configuration) and it is not surprising at all that these sites were attacked (hack attacks caused by antiACTA, Anonymus group, are not very difficult to conduct). Fourth, these research has been conducted on critical mass of state-administered (governmental) offices and there is a lack of awareness of conducting such project (web-portalization of local-public offices). First of all many of web portals do not use governmental or state domains (.gov; .gov.ba; .ba) even we have web sites that are running under domains of other country (.rs) and that is very devastating for further IT development for one country in transition.

In order to observe overall standings in this area and to try to give a global conclusion it is worth to highlight effort for better web presence of local community and municipality. As we can see from presented research results this improvement is

slow but it is conducted continued from year to year. One of significant factors for better results in this branch is quality and competent staff (author was not able to explore this indicator) that can create better and functional web workplace. Several web sites are based on donations and from beginning were not projected nor implemented with tendention of widely usage.

There is also significant indicator of ISO 9001:2008 certification for several municipalities and local communities but it is not followed by web presence development and it is related to IT staff and IT orientation or IT awareness. This directly implicate into commitment and profession of leading staff in public sector. Final remark - with consideration of personnel and profession of IT personnel and political will, developing a web presence with supporting services were satisfactory and felt a slight progress in this field.

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