WEB 2.0 TECHNOLOGIES IN ENTERPRISES OF BOSNIA AND HERZEGOVINA?

WEB 2.0 TEHNOLOGIJE U BOSANSKOHERCEGOVAČKIM PODUZEĆIMA?

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Abstract: *The paper presents the results of empirical research on the application of Web 2.0 technologies in business operations. In the sample of enterprises from the territory of Bosnia and Herzegovina, it was analyzed how many companies use Web 2.0 technologies in their daily operations, which technologies are the most popular and most frequently used, what are the characteristics of the companies that use particular technologies, and to what extent the companies that do not use them are willing to do so in the future.*

Key words: *Web 2.0, Web 2.0 technologies, business, company*

Sažetak: *U radu se prezentiraju rezultati empirijskog istraživanja o primjeni Web 2.0 tehnologija u poslovanju. U uzorku poduzeća s područje Bosne i Hercegovine je analizirano koliko poduzeća Web 2.0 tehnologije primjenjuje u svom svakodnevnom poslovanju, koje su tehnologije najzastupljenije i najčešće primjenjivane, analizirane su karakteristike poduzeća koje koriste pojedine tehnologije te je istraženo kolika je spremnost poduzeća koja ih ne koriste da to učine u budućnosti.*

Ključne riječi*: Web 2.0, Web 2.0 tehnologije, poslovanje, poduzeće*

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1. Introduction

The Web was originally intended primarily for the exchange of data and information, and today it means a powerful, dynamic and robust platform that allows two-way interaction of different users, in different forms and at any time (24/7/365). This interaction is not only about communication, but today the Web is a means to search, store and exchange data, information and multimedia content, to communicate and collaborate (private and in business), to carry out economic exchange of goods and services, conduct business activities, acquire new knowledge etc.

Application of these technologies and their classification are very diverse. As Web 2.0 technologies, the literature today refers to Wiki systems, social networks, virtual worlds, Web 2.0 communication applications, blogs, Web 2.0 social bookmarking applications, Web 2.0 podcasting applications, hybrid Web 2.0 applications that include mashups and personalized webs, e-portfolio systems, repositories of artifacts, Web 2.0 applications for collaboratin. As examples of Web 2.0 technologies application, the literature today refers to application in electronic banking [6, 8], libraries [2, 3, 7], geographic information systems [4], and education [1, 12].

The use of Web 2.0 technologies for business purposes has been growing significantly in recent years. There are more and more investments in Web 2.0 projects and Web technologies have considerably helped develop new business models and strategies, affecting the way of decision-making, connecting and communicating with suppliers and clients in enterprises. Therefore Web 2.0 is often referred to as a philosophy of synergy of collective intelligence and added value for each participant by dynamically creating and sharing information. Application of Web 2.0 technologies in business operations is regarded as the strategic integration of Web 2.0 technologies in intranet, extranet and all business processes of a company. Implementation of these technologies in business operations would have a significant effect on search of data from both, internal and external, sources; on encouraging and strengthening of collaboration both within and outside the company; on expansion of the range of its existing business computer applications in the company, and their flexible and innovative integration and ease of administration, which ultimately makes the company successful in the long run and provides a comparative advantage over the competition. The aim of the paper is to examine the characteristics of the use of Web 2.0 technologies in daily operations of companies in Bosnia and Herzegovina. It is necessary to find out how many enterprises use Web 2.0 technologies in their daily operations, which technologies are the most prevalent and most frequently used, what are the characteristics of the enterprises that use particular Web 2.0 technologies and to what extent the companies that do not use these technologies are willing to do so in the future.

2. Research methodology

The empirical research was conducted in companies and institutions in the territory of Bosnia and Herzegovina in May and June 2015.

The survey used a questionnaire consisting of questions related to characteristics of the company (size, activity, ownership, capital share, the degree of formalization, ...) as well as questions on the use of Web 2.0 technologies in everyday business activities. The questions were designed as open-ended and closed-ended questions, and combinations thereof. The beginning of the questionnaire indicated the objective of the survey, the kind of subject being treated, shortly explained the Web 2.0 technologies and how they may affect business operations.

The survey was conducted over the Internet, and the questionnaire was prepared using the options offered by Google+. Total of 317 messages were sent by e-mail and automatic feedback messages for 181 of them as being read were received, while 16 return messages reported deletion of the received e-mails without reading. The return rate is 40.063%. Having conducted a logical and technical inspection of the collected data, 127 of them were retained for further analysis.

The results were analyzed in the program Microsoft Office Excel 2007 and expressed in absolute and relative (%) frequencies.

3. Survey results

3.1. Characteristics of companies

Analysis of characteristics of the companies from which the respondents come indicates that most of them are employed in service companies (61.4%), 23.6% work in companies that provide the production and sale of products and others in companies operating in both. A more detailed specification of activities revealed that the most numerous companies are those engaged in retail and wholesale trade, followed by companies that provide public services (production and supply of electricity, gas, steam and air conditioning, water supply, sewerage, environmental remediation), then companies engaged in financial and insurance activities and information and communication services (mobile operator, TV, radio).

Distribution of companies by time of establishment shows that 40.9% of the companies were established in the period between 1990 and 2000, almost one third after 2000, while other companies were established before 1900.

Almost half of the companies have up to 50 employees, about 20% between 50 and 250 employees, and other companies have more than 250 employees.

As far as revenues are concerned, the distribution is slightly more uniform, with nearly ¾ of the companies whose employees participated in the survey having achieved a turnover of over one million KM in 2014.

Classification of the respondents showed that large enterprises were prevalent in the sample (39.4%), while micro enterprises were least common (11.0%). Small enterprises accounted for slightly over ¼ of the companies (26.0%), while 23.6% of them identified themselves as medium enterprises.

According to company organization type, the respondents mostly come from companies organized as limited liability companies (d.o.o.) - accounting for 45.7% of the sample. Joint stock companies (d.d.) account for 18.1% of the sample, public companies 14.2%, government institutions 16.5%, while 5.5% of respondents stated

that their companies have some other form of organization (respondents did not specify what which form of organization).

Distribution of companies by ownership showed that the sample was dominated by privately owned companies (53.5%). The second most represented companies are those owned by the state, accounting for 33.9% of the whole sample. They are followed by companies with mixed ownership, 9.5% of them, and 4 (3.1%) companies stated some other form of ownership, without specifying what form of ownership it was.

Analysis of ownership structure in terms of domestic/foreign owners showed that domestically owned companies are dominant (with domestic owners holding over 50% shares in 78.0% of the companies).

The question on the number of organizational units in the company was left unanswered by three respondents, while answers of the others ranged from 1 to 11. The most common answers were 4 levels (39; 30.7%) and 5 levels (28; 22.0%) and as it can be seen by summing the percentages, they account for more than half of the sample. Two levels were reported by 15.0% of the respondents, three levels by 16.5% of the respondents, and 6 levels by 10.2% of the respondents. Two respondents stated 1 level, one stated 7 levels and one 11 levels.

As for the degree of formalization in completion of tasks, it has been found that 70.1% of the respondents stated that their companies have partial formalization, i.e. employees have partial freedom in solving tasks. Of the remaining respondents, 18.1% reported that their companies operate with full formalization, i.e. employees do not have freedom in solving tasks, while other 11.8% reported working without any formalization, i.e. there is a full freedom in solving business tasks.

Slightly less than half of the companies (44.1%) have ISO standards.

As for the positions in which the respondents worked, heads of departments / subdivisions / branches / sectors were found to be the most common in the sample, accounting for 63.8% of the sample. Managers make up ¼ of the sample, while owners are only 14.

3.2. Web 2.0 technologies in business operations

The first question related to Web 2.0 technologies that the respondents were asked, was whether Web 2.0 technologies were used in their companies for daily operations. Of the 127 respondents, 58 (45.7%) reported using some of the Web 2.0 technologies. Respondents who answered that Web 2.0 technologies are not used or that they do not know whether they are used in their companies, were asked to answer the question about plans for the implementationof these technologies over the next 12 months. About 20% of them stated that the technologies will be implemented in the near future, about 10% of them stated that there will be no introduction, while the majority of the respondents stated that they did not know the answer to that question.

As already said 58 respondents reported that Web 2.0 technologies are used in their companies, and so it was investigated which particular Web 2.0 technologies are used and in what percentage (%). The results show that the most common Web 2.0 technology is Internet telephony (for business purposes it is used in 75.9% of the enterprises). The second most common one is business social networks (60.3% of the

enterprises), followed by instant messaging with 43.1%. Collaborative contents are used in ¼ of the companies, blogs for employees in 20.7% of them, and blogs for partners and associates in 15.5% of the companies. It is interesting to note that workspaces are not used in the companies although workspaces are suitable for business activities by facilitating the work of many different parties on joint activities. The same unenviable level of use is also observed for virtual worlds, wiki systems and RSS (used in 12.1% of the enterprises) and mash-ups (only 1.7% of the companies), although these technologies bring a number of advantages to the company, primarily by facilitating collaboration, exchange of data, information and knowledge and work on joint tasks both within and outside of the organization, and all of the above results in lower costs, higher efficiency and cost-effectiveness for the entire company.

If the number of Web 2.0 technologies that particular companies use at the same time were analyzed, the results show that most enterprises use two technologies (31.0% of them), followed by companies that use only one Web 2.0 technology (25.9%) and companies that use three or four technologies (17.2% and 13.8%). Other respondents stated that more than four Web 2.0 technologies are used in their companies at the same time. When it was analyzed in more detail which particular technologies these were, it was established that Internet telephony and instant messages most frequently appear as a combination of two of these technologies, while a combination of three of the technologies usually consisted of Internet telephony, blogs partly for employees or partly for partners and associates and business social networks. A group of four technologies is most often a combination of Internet telephony, instant messaging and business social networks on the one hand, and blogs for employees, collaborative contents or virtual worlds on the other hand.

Next, for each Web 2.0 technology listed in the questionnaire, and which was reported by some of the respondents as being used in business operations, the characteristics of companies using them were analyzed. In this way, the intention was to find out which particular companies have recognized the benefits of particular Web 2.0 technologies and actively use them in the realization of their business activities. The results are presented in Table 1.

Web 2.0 technology	**n**	**Characteristics of companies**
Internet telephony	44	Used by medium and large enterprises, up to 25 years of age, having up to 250 employees and annual revenue in excess of one million KM, most commonly providing services, privately and domestically owned, organized as limited liability companies, partially formalized, having ISO standard, having from 2 to 5 organizational levels
Business social networks	35	Used in companies of all sizes, but slightly more frequently in medium and large enterprises, mainly under 25 years of age, having up to 250 employees, consistently with the size having all categories of

Web 2.0 technology	n	Characteristics of companies
		revenue reported, equally dealing with supply of both products and services, privately and domestically owned, organized as limited liability companies, partly formalized, having ISO standard, having from 2 to 5 organizational levels
Instant messaging	25	Medium and large enterprises, under 25 years of age, having up to 250 employees and annual revenue in excess of ten million KM, mainly dealing with provision of services, privately and domestically owned, organized as limited liability companies, partially formalized, having and not having ISO standard in approximately equal numbers, having from 2 to 4 organizational levels
Collaborative contents	14	medium and large enterprises, under 25 years of age, with up to 250 employees and annual revenue in excess of ten million KM, mainly dealing with provision of services, privately and domestically owned, organized as limited liability companies, partly formalized, without ISO standard, with 4 or 5 organizational levels
Blogs for employees	12	micro and large enterprises, up to 25 years of age, having up to 50 employees and annual revenue up to one million KM, mainly dealing with provision of services, privately and domestically owned, organized as limited liability companies, partially formalized, having ISO standard, having from 4 to 6 organizational levels
Blogs for partners and associates	9	small and large enterprises, of all age categories, with up to 250 employees and annual revenue up to one million KM, mainly dealing with provision of services, privately and domestically owned, organized as limited liability companies, partly formalized, having ISO standard, with 4 or 5 organizational levels
RSS	7	micro and small enterprises, younger companies, having up to 50 employees and annual revenue up to one million KM, mainly dealing with provision of services, privately and domestically owned, organized as limited liability companies, partly formalized, without ISO standard, having from 2 to 4 organizational levels
Virtual worlds	7	micro and small enterprises, under 15 years of age, having up to 50 employees and annual revenue up to one million KM, mostly dealing with provision of services, privately and domestically owned, organized as limited liability companies, partly formalized,

Web 2.0 technology	n	Characteristics of companies
		without ISO standard, having from 2 to 4 organizational levels
Wikis	7	small enterprises, younger companies, having up to 50 employees and annual revenue up to one million KM, equally dealing with supply of both products and services, privately and domestically owned, organized as limited liability companies, partly formalized, without ISO standard, with 2 or 3 organizational levels
Mash-up	1	this is a small company established after 2000, having less than 50 employees and annual revenue up to 400,000.00 KM, dealing with provision of services, privately and domestically owned, organized as limited liability company, without any formalization, without ISO standard, having two organizational levels
n - Number of companies		

Table 1. Characteristics of companies that use particular Web 2.0 technologies

Although it was established that Web 2.0 technologies are not used by many of the analyzed companies, and that the range of the technologies they use is varied, the following can be emphasized: in Bosnia and Herzegovina, Web 2.0 technologies are presently used in business operations predominantly by companies of middle age (from 15 to 25 years of age), engaged in the provision of services, mostly wholesale and retail trade, as well as provision of IT services, and information and communication services, generally having up to 250 employees, organized as limited liability companies (d.o.o.) or joint stock companies (d.d.), mostly privately domestically owned, having up to five organizational levels, partially formalized.
What should be noted is the fact that more specific and less common technologies (RSS, virtual worlds, wikis, mashups), are most often used by small enterprises with lower levels of revenue, which indicates that these do not entail excessive costs that are often expected when considering information technologies. Most Web 2.0 technologies generally do not require significant financial investments, and can bring a number of benefits to the enterprise.

4. Concluding considerations

Results of the survey are very interesting. Analysis of the frequency of use of Web 2.0 technologies in daily business shows that they are being used by nearly half of the surveyed companies. This is a relatively encouraging finding because the share of companies that use them was expected to be much lower. The most common technologies include Internet telephony, business social networks, followed by collaborative contents and blogs (for employees and for partners and associates). Other Web 2.0 technologies are represented to a limited extent.

As for the willingness of the companies that do not use Web 2.0 technologies in business operations, it has been established that less than ¼ of companies plan to implement them in their business operations during the next 12 months.

As the results indicate, some enterprises have recognized the advantages that different Web 2.0 technologies bring into business: encouraging and strengthening of collaboration within and outside the organization, increasing the visibility and influence of the company, significant help with search and sharing of data and information, better and higher level of information, lower costs etc. However, when the results are considered in a broad spectrum of available Web 2.0 technologies, it is obvious that there is a lot of room for improvement.

The established rate of use of Web 2.0 technologies calls for an extensive and systematic approach to promoting Web 2.0 technologies, emphasizing the advantages that they provide to the company by their proper and timely use. The activities of promoting and encouraging their use should certainly include the companies that are already using Web 2.0 technologies to share their experiences, which makes a much better stimulus to action than a mere presentation of theoretical expectations.

As for the limitations of the study, we should emphasize the size of the sample and the sampling method, credibility of responses on characteristics of companies, and respondents' familiarity with Web 2.0 technologies. Namely, in order to draw some more significant conclusions about differences between the companies that use Web 2.0 technologies in their operations and those that do not use them, it is necessary to examine larger and a more uniform sample. In this connection, a more uniform sample means more uniform proportions of companies through all classes of the observed characteristics. Moreover, such a sample would allow the application of advanced statistical calculation that would significantly contribute to the quality of the conclusions, while the results of this study were analyzed only through absolute and relative frequencies, which significantly limits the adoption of general conclusions.

Similarly, it would be good to conduct a survey at multiple organizational levels within a single company and include both superiors and subordinates in order to examine the contributions of Web 2.0 technologies to everyday communication on both sides.

Certainly, in interpreting the results of this research related to characteristics of the companies that use Web 2.0 technologies in their daily operations, it should be kept in mind that the data on characteristics of the companies are obtained from their employees and are not verified in the companies' official data. Namely, employees of companies are often reluctant to provide information about the company, concerned that they would reveal something that is forbidden and thus harm the company and compromise their jobs.

Another significant limitation is the fact that people are not sufficiently familiar with Web 2.0 technologies. Although the concept has long been globally embraced and fairly widespread, in domestic circles it is used mostly by experts. Respondents are familiar with individual technologies and so the results should be taken with a grain of salt. Namely, a possible situation is that the respondents unknowingly answer negatively when asked about Web 2.0 technologies, but react differently when asked about a specific technology, which brings into question their answers. Bearing this in

mind, it is not advisable to make generalized conclusions, at least not without a repeated survey.

However, despite the limitations of the study, these results make a good starting point for further research. Consequently, new research should devote particular attention to investigating the reasons of this situation, or investigating possible obstacles to a more intensive use of Web 2.0 technologies in business operations. In addition, special consideration should also be given to standpoints of managers on the application of Web 2.0 technologies in companies, investigating their views on the benefits of Web 2.0 technologies and their standpoints on the reasons of this situation with the rate of use, because managers are precisely those who make the backbone of business organization.

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