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WEB 2.0 TECHNOLOGIES IN COMPANIES: ATTITUDES OF B&H MANAGERS

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ABSTRACT

Objective of the study was to investigate what managers think about the impact of Web 2.0 technologies on business operations. The empirical research was conducted among top and middle managers in companies in Bosnia and Herzegovina during May and June 2015. The results show that, although all respondents do not use these technologies, they have a relatively positive opinion on the application of Web 2.0 technologies in business. According to their opinion, Web 2.0 technologies make the most important contribution to data and information sharing in company and have a significant impact on the quality of communication, both internal and external.These results encourage further research on the application of Web 2.0 technologies in business and the use of all the advantages and benefits they can provide to someone actively using them.

KEY WORDS

Web 2.0, Web 2.0 technology, management, business, business process

CLASSIFICATION

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INTRODUCTION

Web 2.0 is usually said to be a philosophy of mutually increasing collective intelligence and added value for each participant by dynamic information creation and sharing [1]. In a dynamic environment like this, users control their online experience and at the same time influence experiences of other users, achieving a number of benefits. Web 2.0 means a set of technologies such as Wiki systems, blogs, Web 2.0 social bookmarking applications, Web 2.0 podcasting applications, social networks, virtual worlds etc., applicable in different fields. It is reported as being most frequently and extensively used in education [2, 3], but its application for business purposes is becoming significantly stronger since companies achieve and maintain success through a number of positive aspects of their application. Thus, various Web 2.0 technologies are used today in libraries [4-6], in geographic information systems [7], in electronic banking [8, 9] etc. As for its use in the profit sector, or for business purposes, the application for marketing purposes is found to be the most extensive one, but the literature also contains examples of the application of web 2.0 technologies in finances and human resources. A more pervasive access to Web 2.0 technologies from the standpoint of business operations over the past 6-7 years has facilitated the development of new business models and strategies influencing how decisions are made in companies and affecting the ways they connect and communicate with suppliers and buyers.

The main characteristic of Web 2.0, compared to previous generations of Web technologies, is allowing two-way interaction between users. The older Web technologies enabled one-way communication based on the publication of various content available to everyone with Internet access. Web 2.0 provides two-way communication, but the consequence is more complex architecture. However, two-way and "live" communications have became standard; and Internet users have utilized them on daily basis. The next generation of Web technologies, Web 3.0, brougth new features. For example, Web 3.0 enables to users creating of intelligent user interface with recognizing capabilities and adaptive system behaviour for communication. The purpose of these technologies is to reduce gap between real and virtual world and to enable managining of virtual reality by the power of human mind.

Advantages and benefits of using Web 2.0 technologies in business, most often mentioned in literature, are the following [10-15]: encouraging and strengthening collaboration both within and outside the organization and changes in the way of interaction between all stakeholders, increasing the visibility and influence of the company, expanding the range of users of existing business applications of the company, flexible networking and simpler administration, help with data search, higher and better level of information.

Certainly, it is impossible to say that the application of these technologies in business does not have disadvantages too. As experiences of big companies, which use Web 2.0 technologies in their bussines activities, show, the main disadvantage of Web 2.0 technologies is reduced security. It is primarily related to the weak protection of confidential data from unintentional or intentional breaches with serious consequence that this data can be availabe to unauthorized persons. The additional problem is the lost of control over published content. Once published on the Web, content become subject to misinterpretation and misuse. Also, increased digitalization and intensive use of Internet bring different malware threats. The consequence of these treaths are more serious in Internet environment. However, past experience indicates that benefits do prevail, and are usually reflected in higher productivity, efficiency and effectiveness of operations, better results and guaranteed survival to which, eventually, the company strives. Therefore, it is no surprise that large global companies but also smaller enterprises in different parts of the world have recognized many of the above

advantages and benefits that Web 2.0 brings into business and implemented them in their daily operations very successfully encouraging others with their experience to follow suit.

It is indisputable that the use of Web 2.0 technologies will grow significantly, regardless of what technology, in what form and for what purpose may be the case, requiring continuous adjustment of companies and development of new business models.

Based on the described benefits and positive aspects associated with Web 2.0 technologies in literature, it is needed to investigate what managers (top and middle) think about the impact of Web 2.0 technologies on business operations.

The objective of the research was set accordingly: to investigate the views of managers of companies in Bosnia-Herzegovina on positive aspects of the application of Web 2.0 technologies in everyday business.

At the beginning of the paper is explained what are Web 2.0 technologies, where they are used and what are the advantages and disadvantages of their use in everyday business. Also, the methodology of the study is described; presented and discussed the results and pointed out some concluding remarks.

METHODOLOGY

The empirical research was conducted in companies and institutions in Bosnia and Herzegovina during May and June 2015. The sample consisted of 127 top and middle managers in B&H companies. The sample consisted of 127 top and middle managers in B&H companies. Online survey has been conducted (questionnaire was prepared in Google Forms), a link to access the survey was sent to 317 e-mail addresses. In total, 135 questionnaires were collected, and after a logical analysis, 127 of them were accepted for further analysis. The return rate is 40,063 %. The criterion for inclusion of companies in the study was not set up, questionnaires were sent to all companies regardless of their characteristics (size, activity, structure, ownership, etc.). The criterion of participation of respondents from companies was set up through the organizational structure - only owners, directors, managers (regardless of the hierarchical level works), head of the department / sector / office could participate in study.

Questionnaire consisted of two main parts was used. The first part of the questionnaire consisted of basic information on respondents (managers) and the companies in which they worked - gender, age, professional qualifications, daily use of the Internet, self-assessment of IT knowledge, use of Web 2.0 technologies in private life, workplace, company size, primary activity, the degree of formalization and application of Web 2.0 technologies in daily business operations. These questions were designed in the form of closed questions. The second part of the questionnaire contained a set of 22 statements (Table 1) on the contribution of Web 2.0 technologies to daily operations of companies and the ways in which they affect internal and external operations. The statements were rated on a scale from 1 to 5 (strongly disagree (1) ... (5) strongly agree).

Table 2. Statements on the contribution of Web 2.0 technologies to company operations.

Code	Statement - Application of Web 2.0 technologies in the company
S1	… contributes to the company's performance
S2	… improves staff efficiency
S3	… facilitates project management
S4	… facilitates decision-making
S5	… facilitates task completion control
S6	… provides better communication within the company

Code	Statement - Application of Web 2.0 technologies in the company
S7	… provides better communication with partners and stakeholders
S8	… shortens the communication chain
S9	… reduces conflicts within the organization
S10	… facilitates communication between the organizational structures
S11	… facilitates information sharing
S12	… allows better information management
S13	… can shorten information exchange paths
S14	… facilitates realization of meetings
S15	… facilitates staff training
S16	… improves the level of information
S17	… helps reduce communication costs
S18	… helps reduce costs generally
S19	… can reduce and improve the organizational structure of the company
S20	… improves the organization's visibility
S21	… helps provide user support
S22	… improves the image of the organization

In the beginning of the questionnaire it was shortly described what is meant by Web 2.0 technologies and what kinds there are.

In total, 135 questionnaires were collected, and after a logical and technical analysis, 127 of them were accepted for further analysis. The collected data were subjected to descriptive statistical analysis using the program Microsoft Office Excel 2007. Results are presented as absolute (f) and relative frequencies (%), mode (D), mean (M), standard deviation (SD), coefficient of variation (CV), median (C), interquartile range (IQ). Mann-Whitney U test was used for detecting the differences between the group of managers.

RESULTS

The results show that men account 69,3 % of the sample. Almost 80 % of the respondents are younger than 45 years (18,9 % are younger than 30 years). The respondents are relatively well educated: 63 % have a university degree, and 22,0 % have a MSc or PhD degree. Slightly less than half of the respondents (47,2 %) reported using the Internet up to one hour a day for leisure activities, while almost ¾ use the Internet up to two hours a day. As for the use of the Internet for business purposes, the results show that 51.2 % of the respondents spend almost a third of their daily work time on the Internet. Slightly less than ¾ of respondents use Web 2.0 technologies in private life. For their IT knowledge, most of the respondents gave themselves ratings 3 (39,4 %) and 4 (44,1 %) - the mean was 3.75 (range 1-5, SD=0,723, CV=19,28 %).

As for the distribution by workplace, 63.8 % are heads of departments, offices or sectors, 25,3 % of them identified themselves as managers, and 11.0 % are owners.
Characteristics of the companies from which the respondents come are the following:

- Time of establishment: 43,9 % of the companies were established between 1990 and 2000, 24,3 % were established before, and 31,8 % were established after that period.
- Primary activity: 61,4 % of the respondents come from service companies, 23,6 % from manufacturing companies, and the rest from companies that are equally engaged in production and sale.
- Number of employees: most companies in the sample have up to 50 employees (47,7 %), 17.8 % have more than 1,000 employees, 21,5 % have between 50 and 250, and others have between 250 and 1000 employees.

- Company size: approximately ¼ of them come from each small and medium enterprises, 39,4 % from large enterprises and 11,0 % from micro-enterprises.
- Ownership and ownership structure: 57.0 % of the companies are privately owned, 29,0 % are owned by the state, 10,3 % have mixed ownership, while 4 companies stated the answer Other. Domestic owners prevail in 75,7 % of the companies, 19,6 % reported foreign owners as being predominant, while the proportion of ownership is relatively balanced in 4,7 %.
- The degree of formalization: Almost ¾ of the respondents stated that their company has partial formalization, i.e. employees have partial freedom in solving tasks. 18,1 % stated 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.

As for the application of Web 2.0 technologies in daily business operations, it was established that 58 out of the 127 respondents (45,7 %) reported some of the Web 2.0 technologies being used in their companies. These respondents also answered the question which Web 2.0, technologies these were, and business social networks were found to be relatively well represented (60,3 %). They are followed by collaborative activities (24,1 %), blogs for employees (20,7 %), blogs for partners and associates (15,5 %) and virtual worlds, Wikis and RSS (12,1 % each), with significantly lower percentages. Mash-up is used least (1,7 %), while none of the respondents reported using workspaces.

Results of the analysis of ratings assigned to statements on the contribution of Web 2.0 technologies to company operations are shown in Table 2.

After it was established what managers, observed as a sample, think about Web 2.0 technologies in business, their attitudes considering past experiences in the use of Web 2.0 technologies were examined. Therefore, the differences in respondents' views considering the past use of Web 2.0 technologies in the companies were analyzed. As the question "Are Web 2.0 technologies used in your company/organization?" had three offered answers, 1) Yes, 2) No, and 3) Don't know, 16 respondents who answered Don't know were excluded from the comparison. The group of respondents whose organizations use Web 2.0 technologies in business operations consists of 58 managers, and the group of respondents whose organizations do not use Web 2.0 technologies in business operations consists of 53 managers.

Results of the comparison of attitudes of managers on the contribution of Web 2.0 technologies to company operations considering the past use of Web 2.0 technologies in the company (use vs. don't use) are presented in Table 3.

Table 2. Attitudes of managers on the contribution of Web 2.0 technologies to company operations. D – mode; C – median; IQ – interquartile range; M – mean; SD – standard deviation; CV – coefficient of variation; NA – not agree (marks 1 and 2); NO – no opinion (mark 3); A – agree (marks 4 and 5).

Code	Min-Max	D	C [IQ]	M±SD	CV (%)	% (n=127)		
						NA	NO	A
S1	1-5	4	4 [2]	3,95±0,91	23,1	5,5	25,2	69,3
S2	1-5	4	4 [1]	3,74±0,93	24,8	7,1	30,7	62,2
S3	1-5	4	4 [1]	4,13±0,89	21,6	3,9	19,7	76,4
S4	1-5	4	4 [2]	3,89±0,91	23,4	6,3	23,6	70,1
S5	1-5	4	4 [2]	3,94±0,89	22,6	3,9	26,0	70,1
S6	1-5	4	4 [1]	4,10±0,86	21,0	2,4	20,5	77,2
S7	1-5	4	4 [1]	4,04±0,86	21,3	4,7	15,7	79,5

Code	Min-Max	D	C [IQ]	M±SD	CV (%)	% (n=127)		
						NA	NO	A
S8	1-5	4	4 [2]	3,77±1,09	28,8	12,6	22,8	64,6
S9	1-5	4	3 [1]	3,38±1,05	31,2	19,7	32,3	48,0
S10	1-5	4	4 [2]	3,83±0,92	24,0	6,3	28,3	65,4
S11	1-5	4	4 [1]	4,24±0,80	18,9	2,4	13,4	84,3
S12	1-5	4	4 [1]	4,09±0,86	21,1	3,9	18,9	77,2
S13	1-5	4	4 [1]	4,05±0,86	21,3	5,5	15,7	78,7
S14	1-5	4	4 [2]	3,84±1,01	26,4	10,2	22,8	66,9
S15	1-5	4	4 [2]	3,76±1,00	26,6	10,2	29,1	60,6
S16	1-5	4	4 [1]	4,19±0,80	19,2	1,6	17,3	81,1
S17	1-5	4	4 [1]	4,11±0,88	21,5	3,1	19,7	77,2
S18	1-5	4	4 [2]	3,85±1,01	26,2	7,9	26,0	66,1
S19	1-5	4	4 [1]	3,81±0,93	24,6	6,3	28,3	65,4
S20	1-5	4	4 [2]	3,95±0,90	22,9	3,9	24,4	71,7
S21	1-5	4	4 [2]	3,97±0,85	21,5	3,1	26,0	70,9
S22	1-5	4	4 [1]	4,12±0,88	21,3	3,1	18,9	78,0

Table 3. Attitudes of managers on the contribution of Web 2.0 technologies to company operations considering the past use of Web 2.0 technologies in the company (use vs. do not use). U – use, NU – not use, M – mean, SD – standard deviation, CV – coefficient of variation, D – mode, C – median and IQ – interquartile range.

Code	M±SD		CV (%)		D		C [IQ]		P*
	U	NU	U	NU	U	NU	U	NU	
S1	4,36±0,81	3,64±0,90	18,57	24,74	5	3	5 [1]	4 [1]	<0,001
S2	4,14±0,83	3,40±0,93	19,96	27,29	4	3	4 [1]	3 [1]	<0,001
S3	4,45±0,84	3,98±0,84	18,91	21,18	5	4	5 [1]	4 [2]	0,001
S4	4,22±0,84	3,62±0,90	19,85	24,94	4	4	4 [1]	4 [1]	<0,001
S5	4,21±0,83	3,74±0,90	19,79	24,14	4	4	4 [1]	4 [1]	0,002
S6	4,40±0,79	3,91±0,84	18,05	21,46	5	4	5 [1]	4 [1]	0,001
S7	4,24±0,87	4,00±0,76	20,39	18,99	4	4	4 [1]	4 [0]	0,034
S8	4,09±1,14	3,62±0,90	27,99	24,94	5	4	4 [1]	4 [1]	0,002
S9	3,60±1,06	3,25±0,96	29,38	29,55	4	3	4 [1]	3 [1]	0,054
S10	4,09±0,92	3,68±0,85	22,59	23,10	4	4	4 [1]	4 [1]	0,008
S11	4,45±0,71	4,17±0,80	15,85	19,24	5	4	5 [1]	4 [1]	0,049
S12	4,36±0,81	3,94±0,80	18,57	20,15	5	4	5 [1]	4 [1]	0,002
S13	4,29±0,84	3,98±0,77	19,52	19,39	4	4	4 [1]	4 [0]	0,012
S14	4,19±0,87	3,70±0,99	20,71	26,82	4	4	4 [1]	4 [1]	0,005
S15	3,97±1,04	3,57±0,95	26,29	26,67	4	3	4 [2]	3 [1]	0,017
S16	4,36±0,72	4,11±0,82	16,46	20,04	4	4	4 [1]	4 [1]	0,092
S17	4,34±0,95	3,98±0,77	21,79	19,39	5	4	5 [1]	4 [2]	0,003
S18	4,12±1,03	3,74±0,98	24,93	26,33	5	4	4 [1]	4 [1]	0,018
S19	4,16±0,93	3,51±0,87	22,45	24,75	4	4	4 [1]	4 [1]	<0,001
S20	4,17±0,92	3,79±0,82	22,06	21,55	4	4	4 [1]	4 [1]	0,004
S21	4,17±0,90	3,91±0,79	21,59	20,25	4	4	4 [1]	4 [1]	0,039
S22	4,40±0,86	3,92±0,80	19,50	20,51	5	4	5 [1]	4 [1]	<0,001

*Mann-Whitney U test

DISCUSSION

Results in table 2 show that the respondents, or managers and heads of different organizational levels, have a relatively positive attitude toward the application of Web 2.0 technologies in business operations. According to calculated means, all respondents most

strongly agree that Web 2.0 technologies facilitate information sharing (S11) and, consequently, arguably improve the level of information (S15) - means are 4,24 and 4,19, respectively. The above statements also have the highest percentage of agreement among respondents - 84,3 % and 81.1 % of the respondents rated them 4 and 5. Apart from these statements, an additional number of statements have the mean higher than 4, which indicates that respondents believe that Web 2.0 technologies provide better communication within the company, but also with partners and stakeholders, and offer better information management while reducing information exchange pathways. The mentioned advantages result in reduced communication costs, which the respondents emphasized as one of the most significant benefits of doing business with the help of Web 2.0 technologies.

As for the said advantages for the communication process, it should be noted that they apply not only to everyday communication, but also to specific "forms", i.e. improvements in communication lead to easier management of projects involving different people. This is also very logical because projects can be implemented by project teams formed by different departments from a single location area as well as by people from similar departments that are geographically rather far apart. It is much easier to implement a project in these situations, in particular its initial phases of analysis and planning, because when using Web 2.0 technologies, participants are not required to be at the same time in the same place, which often requires additional expenses. Similarly, work on the same documents is much easier without unnecessary complication and duplication of various documents. Besides, it should be noted that, in past, teleworking and performing tasks without physical presence of involved parties very often required expensive equipment which is used to establish a video conference, while today for such a type of interconnecting it is enough to have a personal computer and appropriate applications from the Web 2.0 spectrum installed on it.
Another mean greater than 4 is noted in the statement that the application of Web 2.0 technologies in business improves the image of the organization (S21). This is understandable because a high-quality organization and a well-organized both internal and external communication present the company in a good light, which creates a positive reaction in clients and future partners.
Other statements, except the statement S9: "*The application of Web 2.0 technologies in the company reduces conflicts within the organization*" have an mean between 3,5 and 4, while agreements of respondents range between 60 % and 70 %. These results indicate that the positive aspects of the application of Web 2.0 technologies in business operations are relatively well recognized among the respondents. Here, it should be noted that the rest of the respondents, who disagreed with certain statements, consists of two groups of respondents: the respondents who really disagree with the statements and the respondents who do not have an opinion, or those who gave statements the rating 3, which does not reflect either an increased agreement or increased disagreement. A more detailed inspection of results of these respondents established that their disagreement is around 10 %, except in the case of the statement S8, for which it was found that 12,6 % of the respondents believe that Web 2.0 technologies do not lead to shorter communication channels. Although respondents believe that Web 2.0 technologies in companies will facilitate internal and external communication and improve the level of information, they do not believe that these technologies will lead to a shorter chain of communication. This indicates that respondents still do not think about collaboration in a way that right from the start they are all simultaneously involved in considering and solving the set tasks, and that is exactly what Web 2.0 technologies can provide.

The rest of the respondents do not have either a positive or negative opinion prevailing. Based on the assumption that, after experiencing the use of Web 2.0 technologies in their

work, their opinion would change to positive, we would get a considerable degree of agreement, which means that positive aspects of Web 2.0 technologies overcome everything negative that some see in them. Certainly, it should be emphasized that these relatively positive results, as well as the expected positive results, can be due to positive experiences with ICT in general and the positive personal experience in the use of Web 2.0 technologies in private life, and future research should pay particular attention to this aspect in order to obtain a true picture of the perception of benefits of Web 2.0 technologies in business. The latter is stated because it should be kept in mind that slightly less than half of the respondents said that Web 2.0 technologies are used in their companies. Namely, a comparison of these results reveals a small inconsistency: although the respondents have a positive opinion on the benefits of Web 2.0 technologies in business, their use is not intensive. But in spite of it, acknowledging the part of respondents with negative attitudes, it could be very easily and concisely concluded that the respondents generally have a positive opinion on Web 2.0 technologies.

What can be observed from the results is the fact that although respondents believe that Web 2.0 technologies in companies will facilitate internal and external communication and improve the level of information, they also believe that these technologies will not lead to a shorter chain of communication too much. This indicates that respondents still do not think about cooperation in a way that right from the start they are all simultaneously involved in considering and solving the set tasks, and that is exactly what Web 2.0 technologies can provide.

The conducted analysis identified significant differences in attitudes between respondents in whose companies Web 2.0 technologies are used and respondents in whose companies they are not used. Of the 22 offered benefits that Web 2.0 technologies bring to business operations, a significant difference was found in 20, in one statement it is at the limit of the set significance, while in one statement the difference in attitudes is not statistically significant. That is the statement that the use of Web 2.0 technologies in the internal and external environment improves the level of information. Nevertheless, the average scores of both groups are relatively high, M(use)=4,36 and M(not use)=4,11. The rating 4 is the most common in both groups of respondents. If the obtained results are observed in the set range from 1 to 5, the scores are relatively high, and variations are relatively low, which indicates that both groups of respondents believe that the application of Web 2.0 technologies in operations can improve the level of information of all parties involved. As said, there is a significant difference in other statements, and a comparison of average ratings established for each statement that average is higher in respondents whose companies use Web 2.0 technologies. The largest difference in average ratings was found in the second statement (ΔM=0,74), or the statement that Web 2.0 technologies improve staff efficiency, while the smallest differences were in opinions found in the statements S7 (ΔM=0,24), S16 (ΔM=0,25), S21 (ΔM=0,26), i.e. both groups of respondents have the most uniform opinion about the help of Web 2.0 technologies in providing better communication with partners and stakeholders, in better information levels and in facilitating the provision of user support. Similarly, a comparison of average ratings suggests that both groups have the highest opinion on the contribution of Web 2.0 technologies to better communication with partners and stakeholders, information sharing and improvement of the level of information. In these statements, both groups of respondents have average ratings higher than 4. On the other hand, in two statements there are significant differences in average ratings, but both groups had averages lower than 4. These are the statements that application of Web 2.0 technologies in business operations reduces conflicts in the organization and facilitates training of staff. It is understandable that ratings are low in respondents from the sub-group that does not use Web 2.0 technologies in business, but the results of the sub-group that uses Web 2.0 technologies

in business operations should be viewed in the context of Web 2.0 technologies which they currently use. Internet telephony, instant messaging, business social networks are used the most, and none of these technologies is primarily intended for training of staff. On the other hand, conflicts are a specific area and are mostly the result of individual characteristics of a person, and can only be intensified by absence of direct communication, or face-to-face communication.

CONCLUSION

In this paper, the attitudes of managers related to the benefits of the application of Web 2.0 technologies in business are explored and discussed. The results show that most of them have relatively positive attitudes related to the benefits which Web 2.0 can provide for everyday business regardless they use them in their business or not. Respondents believe that Web 2.0 technologies make the most important contribution to sharing of data and information in company and have a significant impact on the quality of communication, both internal and external. Level of information, collaboration and teamwork in the company are accordingly improved, and so is the image of the organization. As the results indicate, differences in attitudes between respondents/managers who use Web 2.0 technologies in their business operations and those who do not use them were found. Respondents/managers who use Web 2.0 technologies in business operations have a more positive attitude toward the same, or they are more favorably disposed toward their use in business operations. A group of respondents who use Web 2.0 technologies in their company believes that these technologies contribute to business success, facilitate and simplify implementation of business tasks and activities, contribute to communication both within and outside the organization.

There is no generalized conclusions based on this research. The reasons for that are sample size and sampling method (representation of companies according to their characteristics); computer literacy of managers and their weak knowledge of the entire spectrum of Web 2.0 technology.

These results encourage further research on the application of Web 2.0 technologies in business and it would be important to explore the reasons why some companies still do not use these technologies and address the factors determining the extent of their application. Knowledge of all these differences, reasons and factors, would provide a true picture of the state of application of Web 2.0 technologies in business operations, which would be a starting point for appropriate action to encourage more intensive use of Web 2.0 technologies in business and make use of all the benefits that they bring along.

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