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Usage of Technology Enhanced Learning Tools and Organizational Change Perception

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Abstract. This paper presents an analysis of organizational changes perceived by the employees in the organizations where Technology Enhanced Learning was facilitated by tools such as wiki, (we)blog, Internet forum and social network, practice often considered as E-learning 2.0. Our research focuses on the technologically advanced organizations, leaders in the ICT and IS adoption. We specifically observe the perception of influence on the organizational structure, organizational culture and the knowledge management processes in the organization. Our findings are that the TEL tools are perceived to have a noteworthy impact on the organizational change in the three mentioned areas, and that the perception of change significantly differs depending on whether the employees are regular or are not regular users for organizational structure and knowledge management processes.

Keywords: Organizational change, TEL, E-learning 2.0, Web 2.0, wiki, blog, Internet forum, social network, organizational structure, organizational culture, knowledge management.

1. Introduction

Contemporary organizations are influenced by an exponentially growing volume of technological changes. Outstanding among those technological changes is the change in information and communication technologies (ICT), sometimes suitably called a revolution. In an overall scope of ICT applied in the organizations we can find the technologies that support learning processes, which is logical, since knowledge is based on information. The technological support to any learning activity is in its widest terms dubbed Technology Enhanced Learning (hereinafter: TEL). The research in this field covers mostly technological and academic application aspects, but the literature analyzing the impact on the organizations is scarce. The concept of TEL is specific in its wider scope, limited to neither academic nor other educational applications. Therefore the term has been chosen instead of E-

learning 2.0 although, from the technological aspect, E-learning 2.0 is more appropriate due to social network usage and Web 2.0 technologies. In this paper we will analyze the impact that technologies commonly used for TEL have on organizational structure, culture and knowledge management processes, describing TEL in business environment. In a host of other technologies, TEL is facilitated today by Wikis, forums, blogs [1], social networks and other interactive technologies that allow the teacher, the learner and the administration functions [2], but is not limited to the mentioned technologies used as example in the case of this research.

Different aspects of organization have been connected to technology since the beginnings of the scientific approach to management, to mention e.g., Frederick Winslow Taylor, but the groundbreaking work was that of Joan Woodward [3], in which relations were established between the success of the organization and the conformity of the organizational structure, on one side, and technology, on the other. Some criticism also emerged as Aston group estimated that the impact of technology on the organization is more limited than it was stated in Woodward's earlier research [4]. The research that followed only reconfirmed the links of organizational structures with technology, and introduced new factors, in addition to purely technologic artifacts, namely, the recurrent social practices in technology implementation and the community of users [5]. The contemporary research finds the influence of organizational structures and technology to be complementary [6] and reconfirms the existence of the relationship between technology and the governing structure [7,8].

In accordance with the previous analysis, we found theoretical background to study the impact that specific technologies and tools, common in TEL, have on organizations. Therefore, the following hypotheses are proposed:

H1: The perception of TEL tools usage impact on the organizational structure significantly differs between the employee groups pursuing regular and non-regular TEL usage

H2: The perception of TEL tools usage impact on the organizational culture is significantly different between employee groups with regular and non-regular TEL usage

H3: The perception of TEL tools usage impact on knowledge management practices in organization is significantly different between employee groups with regular and non-regular TEL usage

2. Methods

In order to empirically check whether there is any perceived influence that the implementation of TEL tools has on organizational changes, we have conducted a survey among the employees in knowledge based industries

(e.g. software engineering, business analysis, consulting, high education, design) that are supposed to use the TEL tools widely. Since the term TEL is not well known to the population, tools like wiki, forums, blog and social networking were explicitly presented to respondents as Web 2.0 concepts that can be used as TEL tools. The organizations to serve as samples were carefully chosen in order to represent the population of technology advanced organizations. Overall, we have gathered 55 responses online and 45 responses in paper as a response to more than 250 invitations. There were 6 questionnaires with missing values. This survey was part of a larger research effort that also included a dissemination of Web 2.0 and TEL tools and loyalty shifts from the company as an entity to industry as a group of connected individuals somewhat resembling a medieval guild (without restrictions), which in turn might be the topic of future papers.

The survey consisted of a descriptive part, where respondents stated their industry, working experience, company size, average number of forum, wiki, blog and social networks used for the sake of job tasks and open comments. A large number of interviewed personnel in our sample was working in software engineering/development (26), education (15), marketing related professions (14) or high education (12). The total working experience ranged between six months and 30 years, the mean being 6.18 years and the standard deviation amounting to 4.70. The respondents evaluated their perception of influence on the structure, the culture and the knowledge management practices on a scale from 1-10, where 1 was described as an extremely low and 10 as an extremely high influence.

Important terms were described for the convenience of respondents, and definitions were proposed on questionnaire in order to ensure the understanding among parties. The organizational structure was defined as a formal system of hierarchy, coordination, communication and control in the company. The organizational culture was defined as a system of beliefs, values, customs, behaviours and traditions shared by employees that defines the ways in which they interact with each other and with other stakeholders. The knowledge management was defined as a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable the adoption of knowledge.

Finally, a definition need to be provided for both the regular and a non-regular implementation of TEL tools mentioned in the introduction and in the hypotheses. Since literature does not provide an explicit range of chosen sets of tools, we have suggested a border in the light of the frequency analysis described in the results section and the common sense at 5 uses of TEL tools per week. That point was chosen as a border in the light of the analysis of six user groups and on the assumption that a significant usage should in average considered to be at least once per day, i.e. at least five times per week. Also, it is in accordance with our sample median of 6, and therefore such division gives us roughly the same group size, needed for a further statistical analysis.

The original survey with explanations in electronic form is available at http://www.surveymonkey.com/s/JBC969J. First, the chosen variables were

analyzed using the descriptive statistics, and the frequency analysis. The gathered data did not yield any conclusive directions towards the model as in the case of using a linear or other regressions with several experimented models, and the results suggest that the included factors do a good job in explaining part of the dependent variable variance, but that more factors should be incorporated in the model. This will be one of the main guidelines in our future research. To further examine our hypothesis a t-test has been used to determine a statistically significant difference since this is the method recommended in the cases when samples are relatively small [9] as stated by Krishnawamy et al, p352.

3. Results

Regarding the use of the selected TEL tools, the respondents offered 94 valid responses, the resultant mean of which was 22.77 and the median was 6 uses per week, with the standard deviation of 36.27. The descriptive statistics is presented in Table 1, and bar chart of average uses per week on the x-axis with the percentage of users on the y-axis is presented in the following figure.

Table 1. How often do respondents use Web 2.0 features weekly

N	Minimum	Maximum	Mean	Std. Deviation
94	.00	150.00	22.7713	36.26935

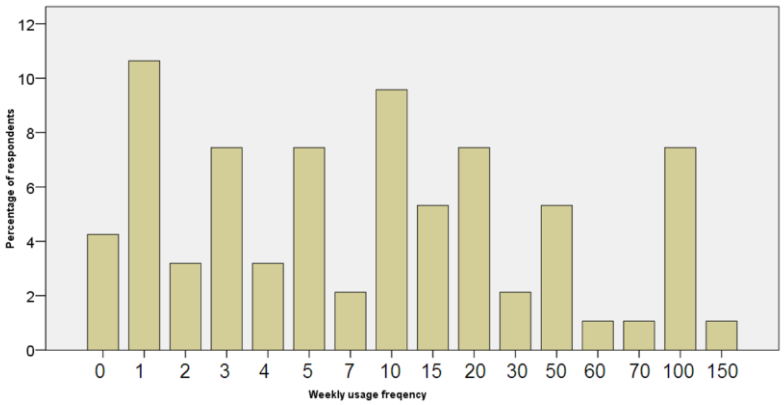

Fig. 1. Bar chart for the frequency of use per week by the percentage of users

When we analyze influence on the structure, the culture and the knowledge management in the organization, results differ. On a 1 to 10 scale, where 1 means the least influence, and 10 means the most influence, the average for the entire sample was 3.87, with a standard deviation of 2.42. This is quite a low value, and can be explained as the perception of the interviewed employees in technologically advanced industries that mentioned concepts

have a below-moderate influence upon the organizational structure. Electronic ties of all sorts, including collaborative networks are found to be loosening the constraints of the organizational structure [10]. The influence of computer networks on the organizational structure is already elaborated, and it is concluded that computer networks (including collaborative networks) enable the emergence of new organizational forms [11]. The perceptions of the employees about the influence of the mentioned concepts on culture are higher; the respondents offered an average grade of 4.67, with a standard deviation of 2.56. This could be interpreted as the perception that the mentioned Web 2.0 concepts have a moderate influence on the organizational culture. Major influence, as was expected, was perceived to be that on the knowledge management, where the average grade is 5.52, with a standard deviation of 2.75. The processed data are presented in Table 2.

Table 2. Perception of partial influences descriptive statistics

		Perceived influence on structure	Perceived influence on culture	Perceived influence on knowledge management
N	Valid	100	99	100
	Missing	0	1	0
Mean		3.87	4.67	5.52
Median		3.00	4.00	5.50
Std. Deviation		2.423	2.556	2.747

If we want to differentiate the results on the use of the mentioned TEL tools in detail, we can select six logically grouped clusters that are similar in size, and given in the following table with selected comments specific to the respective groups. If we analyze the perception of the influence on those groups, we will find that there is some correlation between the usage and the perception of influence on structure, culture and knowledge management. The overall perception of influence on structure also grows as usage grows, with the exception of the sixth group. The culture shows mixed results, while the influence of knowledge management suggests a strong growing trend, with the exception of the third group. The disruption of steady growth that is especially evident in the case of the perceived influence upon the culture could have a twofold explanation. It might indicate that employees perceive changes in the organizational culture differently from the changes the structure and knowledge in the context of an increased Web 2.0 usage, or it might be the consequence of other, non-measured features in this specific sample. In order to recheck the actual reason a new study can be conducted, focused on organizational culture, and possibly on a larger sample. The overall results presented in the "Perceived total influence" column of table 4 are the sum of the perceived influences for the culture, the structure and knowledge management (in each of the six groups). Such transformation of several Likert-based scales by the summation displays an acceptable internal

consistency according to George and Mallery [12] with Cronbach's Alpha value of .785. The goal was to present one aggregate measurement indicating the overall changes in organization. The results are presented in the table 4.

Table 3. Qualitative description of user groups

Weekly use (user groups)	Group	Example comments on usage
(0-2] (1)	Non-users	"I prefer other sources" "I use only basic corporate intranet"
(2-4] (2)	Occasi-onal users	"I use it when I have a problem" " I consult other people about their experience in working with some equipment and I use the information I get in sales"
(4-10] (3)	Moderate users	"More often when I have a problem" "At least once a day"
(10-16] (4)	Regular users	"Every time I have a problem, and for contacts" "I have to search for a solution on corporate blogs because of the lack of knowledge among colleagues in my organization" "A few times a day for information purposes"
(16-60] (5)	Frequent users	"…we have in-house wiki knowledge base, when I have problem, I visit forums..." "I follow many blogs, I don't visit them only when I have a problem"
(60-) (6)	Intense users	"I use the wiki, forums and social networks to look for some answers, and to keep informed about business, etc." "More than 15 times a day I look f wiki, forums, keep informed about business over social networks"

Table 4. Analysis of perceived influence in six groups of users

Weekly usage (user groups)	No. of surveyed users	Perceived influence on structure	Perceived influence on culture	Perceived influence on knowledge management	Perceived total influence
(0-2] (1)	16	3.19	3.56	4.19	10.94
(2-4] (2)	21	3.33	5.30	5.57	14.20
(4-10] (3)	16	3.88	3.31	4.69	11.88
(10-16] (4)	14	4.50	4.86	6.14	15.50
(16-60] (5)	14	4.93	6.07	6.43	17.43
(60-) (6)	13	4.54	4.92	7.00	16.46

A further analysis is aimed to be conducted on two groups, since the presented six groups are not a sufficient sample for significant statistical results to be obtained. In the light of the previous analysis, the dividing point

was chosen to be at 5 uses of TEL tools per week. The first group covers the respondents who use the TEL tools less than five times per week (the group with a lower usage frequency), while the second covers the employees that use those concepts five or more times per week (the group with a higher usage frequency). The conclusions are similar to those of the previous analysis. The first group has lower mean levels as to the influence on the structure, the culture and the knowledge management. The difference between the mean values for the perceived influence in all three groups can be observed in the following two tables.

Table 5. Mean and median analysis on segment with lower usage of TEL tools

			Perceived influence on structure	Perceived influence on culture	Perceived influence on knowledge management	Frequency of weekly usage
Group1 (less than five uses per week)	N	Valid	40	39	40	40
		Missing	0	1	0	0
	Mean		3.20	4.36	4.88	2.01
	Median		3.00	4.00	5.00	2.50
	Std. Deviation		2.09	2.66	2.89	1.18
Group 2 (five or more uses per week)	N	Valid	54	54	54	54
		Missing	0	0	0	0
	Mean		4.56	4.87	6.13	38.15
	Median		4.00	4.50	7.00	17.50
	Std. Deviation		2.55	2.53	2.59	41.73

Table 5 gives us an insight into the perception that employees who use TEL tools less than five times per day have about the influence of those tools on the organizational structure, culture and knowledge management. We can see that the mean of the perceived influence on the structure is rather low, 3.20 out of 10. The perception of influence on culture the employees report is somewhat increased, and in case of the wikis, blogs, forums and social networks the mean of the influence amounts to 4.36 out of 10. Knowledge management is perceived as most connected, and the mean of the influence in this group is 4.88. The median values follow a similar trend, and the standard deviation is rather low. The employees in this group use the mentioned tools 2.01 times per week on average, and the standard deviation of that usage is again relatively low for this group. If we compare these results with the group 2 we can see that there is almost a linear increase in the perceived influence on all three variables, and still the order of the perceived influence is the same, however, this time the values are 4.56 out of 10 for the structure, 4.87 out of 10 for the culture, and 6.13 for the knowledge management. The average frequency of usage is much higher, it amounts to 38.15 times per week, while the standard deviation is relatively higher in

comparison with the first group. In the light of these findings we have performed a t-test to see if differences between those two groups, the one with the average usage frequency of the TEL tools like wikis, blogs, forums and social networks below five times per week, and the other, with more than five uses per week show any statistical significance. The following table presents the results for the structure, the culture and the knowledge management practices, respectively.

Table 6. T-test for perceived influence on organizational structure, culture and knowledge management

T-test for perceived influence on structure, culture and knowledge management with 5 as the cutting point	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Perceived influence on structure	3.178	.078	2.744	92	.007	1.356	.494	.375	2.337
Perceived influence on culture	.583	.447	.942	91	.349	.511	.543	-.567	1.590
Perceived influence on knowledge management	.971	.327	2.211	92	.029	1.255	.567	.128	2.381

Table 7. T-test for perceived influence on culture with 10 as the cutting point

T-test for perceived influence on culture with 10 as the cutting point	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Perceived influence on culture	.038	.847	2.154	91	.034	1.139	.529	.089	2.189

In the table 7 results are presented for the culture, separately analyzed with the cutting point of ten uses per week, in order to propose explanations for non-significant differences presented in the previous table. Descriptive statistics show that group with ten or more uses per week (41 respondent) have mean of variable perceived influence on culture of 5.29 and standard deviation of 2.571, while the group with less than ten TEL tools uses per week (52 respondents) has mean 4.15 and standard deviation of 2.5 for the same variable.

4. Discussion

The results presented in the above tables describe the employees' perceptions but we also presume that the described results are rather accurate in the description of the real influence, on the ground of the assumption that the employee perception is often the best way to measure the less tangible organizational phenomena. In performing their daily tasks the employees get a direct insight into the organization, with estimations that are often correct. Even if not so, the employee perception can materialize as "self-fulfilling" prophecy as explained by Merton [13] and if some trend is perceived as not to have any influence on their organization, it most probably is so. Also, Wanous et al. [14] maintain that a cynical and negative perception of organizational change by employees contributes to its failure, so if employees think that those tools are insignificant and have no influence, it will probably prove to be so in the organizational changes in reality.

This paper is however concerned with three hypotheses presented in first part of the paper, connected to the results given in Table 5 as descriptive guidelines, and also to the results in Table 6 for the statistical significance of the mean difference for groups with a lower and a higher usage of the TEL tools. As described in the methods section, the t-test was used for statistical analysis. The results are relevant in verifying Hypothesis 1 (related to the structure) and Hypothesis 3 (the knowledge management), but do not support Hypothesis 2. This is all on the basis of our definition of the regular and the non-regular usages. A further discussion on results is presented in the joint description of the results, the theoretical review of the organizational impact in general and then in the review of the three parts together.

4.1. Description of results

If we interpret Levene's test for equality of variances, we can confirm the assumption that two groups in Table 6 have equal variances in all three cases and therefore follow and present the related results. The T statistics in the case of the perceived influence on the structure has the value of 2.744, with 92 degrees of freedom and two tailed significance of 0.007. Therefore we can conclude ($p<0,01$) that there is a statistically significant difference in the

means of the variable perceived influence on the structure. The second hypothesis states that the perception of the TEL tools usage impact on the organizational culture significantly differs between employee groups with the regular and the non-regular TEL usages. However, the results presented in Table 6 are not supportive to that hypothesis. The T-statistics has a relatively small value of -0.942, with 91 degrees of freedom and two-tailed significance of 0.349. Also, a 95% confidence interval of the difference is quite indicative, because values include zero. Therefore, we cannot confirm the second hypothesis. That is quite in contrast with the theoretical outline and with our expectations, and the explanation for this is given further on in the analysis. The third hypothesis states that the perception of TEL tools usage impact on the knowledge management practices in the organization is significantly different between the employee groups with the regular and the non-regular TEL usages. The results with t-statistics value of 2.211, 92 degrees of freedom and two-tailed significance of 0.029 indicate that there is a statistically significant difference between the two group means. Hence we can conclude ($p<0,05$) that the perception of influence the TEL tools have on the knowledge management practices significantly differs between the group that has a regular and the group that has a non-regular usage of the TEL tools.

Our empirical findings concur with the theory in the structure and knowledge management processes, but not in the culture. Several reasons for this have been proposed: the cutting point of five uses per week is not representative, and the function of the perceived influence is not linear, or our sample has not been large enough, or the respondents who filled in the e-survey might have had some problems in understanding the organizational culture. In order to check those assumptions, we have performed an analysis with a cutting point of 10, defining the non-regular usage as that which occurs less than 10 times per week, and the regular usage as one that occurs more than 10 times per week. The results, presented in Table 7 again point towards the assumption of equal variances, and this time the t-statistics with the value of 2.154, with 91 degrees of freedom and two tailed significance of 0.034 leads to the conclusion ($p<0,05$) that there is a statistically significant difference in the means of variable perceived influence on culture.

4.2. Theoretical review of impact of Forums, Blogs, Wikis, Social networks and other Web 2.0 based TEL tools on organization

All Web 2.0 tools, including those selected for this paper as favorable for TEL, enable companies to explore new ways to cultivate and exploit knowledge sharing with customers, suppliers and partners [15]. According to McKinsey [16], companies use tools like Wikis, Blogs or Social Networks, because they are important in supporting their market position as well as in addressing customers' demands. These Web 2.0 tools can improve the organizational and the individual performance, however, they also encounter several problems, mainly of organizational nature. Knowledge intensive industries,

such as software development companies, are quickly developing, involving many people working in different phases and activities. Knowledge in such companies is diverse and steadily growing. Organizations have problems identifying the content, location, and usage of the knowledge [17]. The employees with assigned tasks in such organizations have to communicate, collaborate, and coordinate internally in working groups, but also externally with other groups, even outside organizational borders.

As regards the enhancement of learning in business, the benefits of collaborative tools have been elaborately studied [18,19,20] even during the early years of the Internet application [21]. Collaboration as part of learning which can be significantly enhanced by ICT can be described as sharing of common business goals by employees. It helps the organization get over any physical boundaries imposed on it by departments, functions, and levels of hierarchy [22]. The development of an accessible and economically efficient technology for dealing with vast amounts of explicit and partly tacit knowledge was one of the directions of the influence the Internet has imposed on organizational changes. Tools for advanced practices of knowledge creation and distribution are often available at little or even no direct cost as open source solutions and are not reserved any more for top tier companies. The perception of changes that the Internet related technologies imply on organizations, business and other aspects of our lives has been compared several times to changes caused by the printing press [23,24] or, more modestly, by the telegraph [25]. The improvements in the nature of the web continued to influence not only the knowledge in the organizations, but also the culture and the structure.

4.3. Influence on organizational structure - theoretical and empirical outline

The discussed difference in the perception of organizational change is in accord with the current view on the organizational structure. Nadler and Tuchman [26], viewing the organization as an information processing entity, find several important relations between the organizational structure and the technology used for information processing in the organization. Relations between the ICT and the formalization of the organization and its structure have also been observed [27,28,29,30,31]. New forms of learning highlight knowledge as one of the most important resources in the organization influencing authority, power, hierarchy, coordination and collaboration mechanisms, and hence organizational structure. A case study on Infostud, the company that owns several leading Serbian web portals, shows the relation between knowledge sharing and the TEL and the organizational structure. The problems caused by a fast-pace growth of the company were solved by technological enhancement of learning process in the organization. To support knowledge creation and sharing, this company has developed a system represented by the internal web site, where the employees interact, present ideas and can read the procedures and work instructions, the

knowledge database with advanced search options, and the internal messaging system. In order to develop an appropriate culture, they have changed the reward system towards supporting the desired values. Consequently, they have changed the reporting system and communication, influencing the organizational structure.

4.4. Influence on organizational culture - theoretical and empirical outline

The previously discussed results do not entirely fit into the existing theoretical framework regarding the organizational culture. The organizational culture, as a soft organizational concept should be more influenced by the change in the interaction among the employees. The mentioned tools allow for a much better interaction, and form something that Camarinha-Matos et al. [32] define as a collaborative network - a network consisting of a variety of entities (e.g. organizations and people) that are largely autonomous, geographically distributed, and heterogeneous in terms of their operating environment, culture, social capital and goals, but collaborate to better achieve common or compatible goals, thus jointly generating value. This concept has a large intersection with organizational culture. The relations between general ICT usage and the soft, cultural aspects of the organization, such as the management styles [33], the team interaction [34], the management orientation [35], learning in organization [36] or team collaboration [37] have been widely elaborated on in the literature.

A case study on one of fastest growing Serbian companies, Mozzartbet, is not in accordance with the results presented in Table 6, since it has found out that wiki, among other features, has a significant impact upon the organizational culture in that company [38] via employee behaviour. It is viewed as one of contributing factors to a relaxed and academic organizational culture in the IT department. The collaboration in problem solving is observed in different processes in the organizations, not only in case of wiki, and the conflicts on the technical issues among employees using wiki are mostly functional. In such an environment, the IT department of Mozzartbet, one of the major users of wiki, is more creative, more responsive to clients' needs, results in higher job satisfaction among the employees, a usual case in the organizations where a functional conflict is part of the culture [39]. Other features of culture in the IT department fit in a relaxed, academic culture frame, such as a low power distance, a flexible approach to working time, a relaxed general attitude, and a constant development of interpersonal relations among employees, not characteristic for other departments in the same company where technology enhanced learning and collaboration is not common practice. A reciprocal influence of the organizational culture on the TEL tools application was also observed in that company. The application of wiki as a tool for knowledge sharing was affected by cultural expectations determining which knowledge should be shared within the organization and which should be hoarded by individuals [40], and by features indirectly related

to the organizational culture, such as the reward system and the communication with senior management.

4.5. Influence on knowledge management practices - theoretical and empirical outline

The results regarding the influence on the knowledge management adhere to the current theories and practices. Wiki allows for a large number of autonomous, heterogeneous and geographically distributed individuals and organizations to collaborate and jointly generate or record knowledge. On the Internet forum, the same entities can collaborate, but with much more interaction to find a solution to a problem, and generate, combine or share knowledge. Knowledge interactions among employees can be facilitated by the Internet forum, as a communication and collaboration tool for the development of a knowledge support system for dynamic manufacturing networks [41]. Interactive blogs are rather similar to forums, but in the context of TEL they are characterized by a more individual tone and more control. A collaborative blog allows for the multiple users to share knowledge, thus providing a collaborative network. The social networks, those business oriented in particular, can bond interested parties, creating a network of resources that can be used to solve complex business problems. Social networks connect virtual organizations [42,43], and the process is alleviated technically by the Internet social networks. Therefore our results regarding the knowledge management practices comply with the existing work in the field. Further, the published case study concerning the Mozzartbet company is in accordance with conclusions regarding the knowledge management. Wiki is, among other tools, used in that company in order to enhance the learning process, as a tool which allows the users not only to access its contents but also to change the contents online [44]. The knowledge regarding the system development is gathered in more than 1100 articles using an JSPWiki open source solution.

Simultaneously with the quantitative data gathering, the Internet forum “elitesecurity.org” was used to start discussions on the mentioned topics and gather a qualitative input. This forum is one of the major tools in collaboration and knowledge sharing on high technologies in Southeast Europe, and has a community of more than 275.000 registered members. We conducted a discussion and information exchange while the research was in progress rather than after its completion, as described by Pastore [45]. The discussion was partly aimed at the topics defined for this research. Several respondents indicated that their status in the enterprise can be affected by their being active in the usage of the mentioned tools, confirmed by examples where activity was aimed at solving practical problems in the company. New cultural norms were also described, e.g. during the job interview, the managers inquired into the applicants’ acquaintance with the forum, blog or other virtual community activities. Such behaviour was accepted as appropriate and beneficial to the company, providing more information about the candidate for

the reviewer and resulting in a better selection process. Also, several responses indicated that the structure, culture and other organizational features reciprocally influence the application of wikis, blogs, forums and social networks to the benefit of the company, e.g. the organizational aversion toward those tools or cultural norms that regard it as leisure activities.

5. Conclusion

It is not often noticed that the learning process is undergoing a change in magnitude unparalleled since the dawn of the human civilization. In paradigm, the process of learning among humans has undergone few changes since the Paleolithic hunters taught younger tribe members. The concept was that distinguished individuals with knowledge presented their knowledge using the theory and practical examples to a group of individuals that presumably lacked that knowledge. The development of writing was another way to partly store that knowledge and communicate it without an interaction with the knowledge-bearer, and effective printing technologies made it applicable to wider social groups. Today, TEL allows for the forming of collaborative networks and generates knowledge in interaction among participants with much more efficiency due to technology enablers, creating an effective and efficient knowledge system that is more than a mere sum of its components. It brings another paradigm change that could lead to even more important advances than the previous ones. Therefore, we can expect that such change will also have an impact upon the organizational phenomena.

We can conclude that the application of modern learning technologies, predominantly of the ICT domain is a novel and promising field. In addition to the issues concerned with core principles and technologies, a large number of lateral questions arise. The impact on the organization is one of those questions, and we hope that this paper will shed some light on them. Based on this research, we conclude that the application of the TEL tools selected as representative for business organizations is perceived as a noteworthy impact on the change of the organizational structure, the culture and the knowledge management processes in the organization. Also, we can see the differences in the perception reported by the groups as related to the usage frequency of those tools. The differences are evident in mean values, but are of a statistical significance only for the structure and the knowledge management processes. If we however choose a different cutting point in 10 uses per week, the difference in the perception of influence on the culture change also becomes statistically significant.

We suggest that further research on this matter should be aimed at description of changes that are observed as influenced by the TEL tools in this paper. Specific aspects of the structure, like centralization, job division, coordination, control, departmentalization or formalization, to name just a few, could be analyzed under the influence of those tools. Also, the change in the

knowledge management processes and its specific parts, like knowledge mapping, creation or sharing could be documented. Further research should especially be aimed at clearing out the perception of influence on the organizational culture change. There is also a large number of other characteristics in the organization that could be changed by the impact of the TEL tools application, that can form more elaborated model in future research.

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