WEB TECHNOLOGIES DEVELOPMENT SUPPORTING CONTEMPORARY PROJECT MANAGEMENT NEEDS

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Abstract

During the last two decades, projects have become increasingly important and recognizable tools for achieving competitiveness, strategic aims and much needed positive changes. The consequence of this, among other things, is the growing number of projects which emerge and are carried out in all business systems around the world. With the growing number of projects, there arose the need for trained project managers. In order to successfully do their tasks, it is very important for project managers to know and understand various techniques and methods of project management. The rate at which the number of formally trained project managers is growing and the dynamics of their adaptation to the specificities of today's business environment is still insufficient.

Development of user-friendly IT support tools which would enable project managers to successfully implement projects without previous very long and intense project training imposes itself as a possible and increasingly available solution to the above mention problem.

The development of IT technology and software increased enormously in the last decade. The emergence of Web 2.0 technology finds new solutions, very useful and applicable also in the field of project management. These options are currently still underutilized by companies when dealing with projects. Capabilities of existing and emerging solutions of Web 2.0 development and the open source community create important value and the potential to increase the efficiency of project management.

The emergence of the Semantic Web (Web 3.0) currently being developed and implemented, with its innovations and technologies based on semantic and artificial intelligence, is expected to greatly change the present concepts of doing business. In the paper we will analyze the importance and possibilities arising from new web technologies (especially Web 2.0 and Web 3.0) when dealing with project management issues.

JEL Classification: L17, O22

Keywords: web technologies, projects, project management, Open source

1. INTRODUCTION

The needs of a contemporary project manager for successful implementation of current projects significantly differ from those in the recent past. These needs can be divided into the following nine groups (Figure 1): a) project preparation process support, b) project implementation process support, c) project decision making process support, d) communication management, e) virtual project teams cooperation, f) virtual project systems cooperation, g) permanent project tracking (monitoring) support, h) documentation management and i) lessons learned support.





Indications of all previously mentioned needs can be found in the basic document of the International Project Management Association (IPMA), under the name of IPMA Competence Baseline (ICB, Version 3.0). These needs are, directly or indirectly, described through individual competence elements which are considered important for every project manager. Short information on particular elements is given further in the text.

In today's modern business, good launching of a project provides the basis for future success of any programme or project. The implementation of project management includes defining the best possible processes, methods, techniques and tools, the change in attitudes and the application of organizational change along with permanent improvement. Project management must be implemented in ways most convenient for the organization. Decision making can be universally defined as a choice between more alternatives, which determines future actions. Decisions are often the result of very long and complex decision making processes. Communication involves effective exchange and understanding of information between the parties. Communication in a project should be useful, clear and valid. Projects are carried out by teams of people who often meet solely for the purpose of project implementation. Nowadays, teams do not necessarily meet at the same place (most often because of geographical distance between them), so we can talk about cooperation of virtual project teams. Besides the importance of connecting people (teams) virtually, today we can also talk about virtually connecting different project systems. Permanent project tracking (monitoring) during its implementation phase is of crucial importance for the success of every project. It is important in order to notice any deviation from the set objectives and project plans and to take corrective measures in order to return the project into the framework of previously devised plans.

Information management includes shaping, collecting, choosing and storing, as well as retrieving project data. Documentation includes all the data, information and knowledge collected during the life cycle of a project, especially those concerning project configuration, the changes and all the important contracts in the project. It is also very important to record everything learnt in the course of the project (since projects can also be regarded as processes of acquiring new knowledge) and use that knowledge in future projects.

(In today's business world) IT technology and the use of adequate software play an important role in mastering the above mentioned processes. Although there are numerous IT solutions currently on the market, in most cases they are very expensive. However, there are solutions based on Web.2 and open source software, which are considerably cheaper or even free to use. This paper will proceed to explain the concept and the advantages of Web.2 technologies, the open source and the new opportunities which arise from the forthcoming, so-called, Semantic Web.3 technologies for the needs of a modern project manager.

3. WEB 2.0

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation," and going beyond the page metaphor of Web 1.0 to deliver better user experiences (O'Reilly, 2005).

Some of the Web 2.0 technologies that can be useful for project management are: Blog, Wiki, E-Portfolio, Rss-Really Simple Syndication, Social Bookmarking, Podcasting, Document Management System, Social Network.

4. OPEN SOURCE

Open source software (OSS) is software with an available source code that may be used, copied, and distributed with or without modifications, and that may be offered either with or without a fee. If the end-user makes any alterations to the software, he can either choose to keep those changes private or return them to the community so that they can potentially be added to future releases (Kenwood, 2001.)

OSS is software licensed in such a way that when distributed in binary form, it comes with the source code. In addition to being available in source form, the software is also freely redistributable, modifiable, without discrimination, without ties to a specific product, without placing restrictions upon other software, and is technology neutral (Perens, 1999.).

The community which emerged through open source was much distrusted and denied phenomenon. It is made up of enthusiastic software developers who, in addition to their jobs, develop software solutions in their free time and offer them to the public for free. Since the code of this software is open and can be adapted according to individuals' or project teams' needs, the only condition is that it is still subject to free software licensing after the original software code has been changed, which means that it can be used and modified without restrictions. Software developed by open source community can compete with a lot of commercial software, but because of the amounts of money invested into commercial software, especially into its marketing and design, a lot of people are not aware of the potentials of open source software.

The biggest database of open source software on the web is called SourceForge. net. and it comprises one of the largest open source communities. SorceForge is a major website for open source development projects that provides a set of tools to developers. It is also a virtual hangout, a place that open source developers visit regularly to see what kind of projects are evolving and who is doing what in specific areas. Today SourceForge page has more than 430,000 projects and 3,7 million registered users, connecting more than 41,8 million clients with over 430,000 downloads a day (sourcefoge.net).

Some of the open source software solutions concerning project management, cloud, business operations and cooperation are the following: *ProjectLibre, Open-Project,]project-open[, ProjectPier, ProjectHQ.*

5. SEMANTIC WEB (WEB 3.0)

The idea behind the Semantic Web is to weave a Web that not only links documents to each other but also recognises the meaning of the information in those documents (Frauenfelder 2001). In other words, when semantics technology is implemented into the web, web browser would not offer search results according to the entered key words; instead, it would understand the meaning of these words or sentences and would offer search results based on the understanding of the entered concept.

Transformation of the current Web from a series of interconnected, but ultimately semantically isolated data islands into one gigantic, personal information storage, manipulation and retrieval database (Kück, 2004.).

Tim Berners-Lee sees it as being an extension of the current World-Wide Web that will bring a common structure to the content of Web pages, thereby providing

such content with meaning which will allow external software agents to carry out sophisticated tasks on behalf of the reader or user and, as such, promote a greater degree of cooperation between humans and computers. In so doing, a new age of computing will be ushered in where machines are better able to 'process and "understand" the data that they merely display at present' (Berners-Lee et al. 2001).

The Semantic web, or, as it is sometimes called, Web 3.0, could be described as intelligent Web, Web combined with AI (Artificial Intelligence). The idea of a semantic web as a place where all the information is categorized and saved so that the computer can understand it in a way much the same as humans, is gradually being realized.

There is a case to be made that the Semantic Web is doing just fine, in places like e-Science and e-Research, and it is only a matter of time before that success includes (more of) e-Business as well (Smith et al. 2006).

6. CONCLUSION

Technologies mentioned in this paper and the open source software are widely applicable in successful project management, although their potential has not been fully recognized yet. Many open source solutions developed for project management support in different project phases are currently available (table 1). These solutions are primarily oriented towards supporting the project preparation and implementation phase, while others are oriented towards decision-making support, virtual project teams cooperation, virtual project systems cooperation and permanent tracking / monitoring support. With their characteristics, Web 2.0 technologies can most often be used in cooperation of project teams and the entire project community, as well as in acquiring new knowledge concerning experiences gained on projects carried out worldwide. The open source community has gained momentum and started to grow rapidly in the last few years; it develops software which is applicable in all parts and processes of project management and can compete with large commercial software, and this is about to bring big changes on the software market. The use of the Semantic web, the Web 3.0 technologies in the field of project management is yet to take hold, but a lot of changes are to be expected in that respect in the near future.

	CONTEMPORARY PROJECT MANAGEMENT'S NEEDS								
	Project	Project	Decision	Virtual project	Virtual project	Communication	Permanent tracking	Documentation	Lessons
	preparation	implementation	making	teams	systems	management	/ monitoring	management	learned
	process support	process support	support	cooperation	cooperation		support		support
WEB 2.0 technologies									
Blog			~						\checkmark
Wiki			~						\checkmark
E-Portfolio	~		V					~	\checkmark
RSS – Really Simple Syndication			\checkmark				\checkmark		\checkmark
Social bookmarking				\checkmark					\checkmark
Podcasting				\checkmark					\checkmark
Document mng. system								~	\checkmark
Social network				×	\checkmark	×			\checkmark
OPEN SOURCE software									
ProjectLibre	✓	~	\checkmark				×		
OpenProject	✓	~	✓	×	\checkmark		×		
]project-open[✓ 	~	\checkmark						
ProjectPier	✓	~		×	\checkmark		×		
ProjectHQ	✓	×		✓	✓				
SEMANTIC WEB – WEB 3.0									

Table 1: The application of web technologies and OSS in the field of project management

Source: Authors' own

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