Abstract

One of the most challenging issues in Project Management is dealing with Lessons Learned, which are present throughout the project. Web 2.0 technologies, e.g. wikis, blogs and social networks, can support the processes of collecting, storing, sharing, applying and reusing Lessons Learned in a project. Using such technologies to manage Lessons Learned evolve changes and technology implementation. Benefits Dependency Network, proposed by the Cranfield School of Management, works backwards from the project's objectives to ensure that all necessary project changes are made, as well as any necessary Information Technology implementation completed. This paper proposes a Benefits Dependency Network (BDN) to support the insertion of Web 2.0 technologies in Project Management focusing on Lessons Learned. Moreover, it also presents examples of measures of each type of benefits, which helps managers to better evaluate the investment.

Keywords (Required)

Project management, lessons learned, web 2.0 technologies, benefits dependency network.

Introduction

A challenge for project-based organizations is that they have little incentive or structure for long-term organizational learning (Hobday 2000). Although systematic project learning enables an enterprise to develop project competencies that lead to a sustainable competitive advantage, it seems that organizations have failed to provide an environment to promote the use of Lessons Learned (LL). Research in Project Management (PM) has highlighted the relevance of LL to support and improve results of projects (Weber, Aha and Becerra-Fernandez 2001; Schindler and Eppler 2003; Petter and Vaishnavi 2008; Williams 2008; Jugdev 2012, Duffield and Whitty 2015).

There are many definitions of LL, however this paper adopts the one proposed by Secchi, Ciaschi and Spence (1999, p.12), who defined a lesson learned as: “A Lesson Learned is a knowledge or understanding gained by experience. The experience may be positive, as in a successful test or mission, or negative, as in a mishap or failure. (...) A lesson must be significant in that it has a real or assumed impact on operations; valid in that it is factually and technically correct; and applicable in that it identifies a specific design, process, or decision that reduces or eliminates the potential for failures and mishaps, or reinforces a positive result.” LL are commonly used in projects, but practitioners are unwilling to share their findings, for example: Petter and Vaishnavi (2008) discovered from an experiment that 64% of participants had reported that they found documents filed by their peers beneficial, but only nine percent were willing to contribute to the documentation due to the time and level of effort required.

Web 2.0 tools can minimize the time and effort needed to create documentation necessary for LL, and therefore they can be an alternative to traditional PM tools, consequently they provide a fertile area for investigation. Web 2.0 tools allow project teams: to capture, store, retrieval, share and disseminate LL in a project. Recently, project managers have started to use Web 2.0 technologies to support their daily tasks.
Despite Web 2.0 technologies have a broad application in PM, for example creation of deliverables or status reports, this paper will focus on their use to manage LL.

Peppard et al. (2007, p. 3) define the term “IT benefits management” as “the process of organizing and managing so that the potential benefits from using IT are actually realized.” A Benefits Dependency Network (BDN) implements this concept. This study will propose the use of BDN to manage LL using Web 2.0 tools in PM. The set of benefits proposed in the BDN aims at improving PM and optimizing tasks execution. To the best of our knowledge, this is the first paper to approach the issue of LL using a BDN and applying emergent Web 2.0 tools in PM.

**Theoretical Background**

**Web 2.0 Tools and Applications**

Web 2.0 has the potential to complement, enhance, and add new collaborative dimensions to the processes of capturing, storing, sharing, disseminating and applying LL. Web 2.0 tools are characterized by ease of use and rapidity of deployment, which makes possible powerful information sharing and collaboration (Boulos et al. 2006). In addition, these tools have the advantage of reducing the technical skill required to use their features, which allows users to focus on the exchange of LL and collaborative tasks themselves without the distraction of a complex technological environment.

Wikis are one of many Web 2.0 components that can be used to enhance the learning process (Parker and Chao 2007). A wiki is a web application which allows people to edit content in collaboration with others. Standing and Kiniti (2011) stress the use of wikis for innovation, while Parker and Chao (2007) emphasize their use to enhance the learning process. Wikis allow the implementation of creating socially constructed knowledge. In a PM perspective, personal, corporate and structured wikis can be implemented to support collaboration among coworkers. Majchrzak et al. (2006) conducted a survey with 168 corporate wiki users. They found three main types of benefits from corporate wikis: enhanced reputation, work made easier, and helping the organization to improve its processes. On the other hand, Grace (2009) lists the challenges that organizations should be aware of before implementing a wiki platform. These challenges include: security, data migration, training and information structure issues.

A blog is a discussion or informational site published on the Web which consists of entries displayed in reverse chronological order. Most blogs are interactive (i.e. open to comments by visitors) and have a set of characteristics which allow them to gain popularity. Grudin (2006) described the technical and behavioral characteristics of project blogs. Project blogs are lightweight, chronologically sequenced, easily skimmed with easily accessed entries. In a survey of 212 blog participants, Hsu and Lin (2008) found that ease of use and enjoyment, and knowledge sharing (altruism and reputation) were positively correlated with attitude towards blogging. In the context of a project, a reverse blog, which is composed by its users, can be useful. Reverse blogs can be used for tasks such as project progress reporting which can be easily seen by managers or clients.

**Lessons Learned supported by Web 2.0 Technologies**

Project learning has been captured and shared through: structured project lessons (project reviews) and less structured Community of Practice. LL are also relevant ways of gathering and sharing both formal and informal project knowledge (Jugdev 2012).

Dealing with LL involves several processes, which include: store, capture, share and verify and disseminate LL. There are at least two more processes to manage LL which improves the application and encourages the reuse of the lessons. These processes are not described in this proposal because they are considered as post-implementation processes. Chaves and Veronese (2014) present a proposal of use of Web 2.0 technologies to support the LL processes, which is represented in Table 1.
Lessons learned processes | Type of data and Sub-processes | Web 2.0 tools |
--- | --- | --- |
Storage | Structured | -- |
| Semi-structured | Wiki, Web-based Office Suite |
| Different media | Video |
Capture | Passive collection | Wiki, Web-based Office Suite, blog, VoIP and video |
| Reactive collection | VoIP and video |
| After action collection | Wiki and Web-based Office Suite |
| Proactive collection | Wiki, Web-based Office Suite, VoIP and video |
Share and Verify | Passive share | Wiki, Web-based Office Suite, social network and social bookmarking |
| Active verification | Wiki, Web-based Office Suite |
Disseminate | Passive dissemination | Wiki, blog, microblogging and social network |
| Active casting | RSS |
| Broadcasting | Email |
| Active dissemination | RSS |
| Proactive dissemination | Social bookmarking |

Table 1: Lessons learned processes supported by Web 2.0 technologies.

The **Storage Process**: In the implementation of Web 2.0 tools to store LL, project managers must be able to choose which tools will be used as well as how these tools will work together. Structured data requires the use of forms and metadata which makes the process slow and bureaucratic, and consequently inhibits the capture of LL. LL can be stored in text format or in different media using videos. Semi-structured LL can be stored in a wiki or Web-based Office Suite. Both allow the collaborative edition of the content, an essential feature of Web tools. LL described in textual data allows the project manager to define a template (e.g. in question/answer or problem/solution format) to facilitate information retrieval.

The **Capture Process**: The process of capturing LL involves at least four sub-processes as well as the use of a set of methods and technologies. The most appropriate methods to carry out passive collection are: project review, learning history, micro article and journaling (Loo 2002). A learning history consists of the main events of a project arranged in a chronological order and it usually contains between twenty and one hundred pages (Schindler and Eppler 2003). A micro article is written in an informal style and it is usually limited to half a page. It consist of a topic, an introductory short description of its contents and a key word part for indexing the article (Schindler and Eppler 2003). A journal is “an articulated narrative that follows from the reflective and critical thinking about one’s learning experiences or specific learning events” (Loo, 2002). After action means any activity executed throughout the project, not necessarily during or near the completion of a project. After action collection can be supported by collaborative Web 2.0 tools such as: wikis or a Web-based Office Suite because they allow workers to capture lessons throughout the project. Proactive collection may be performed configuring and editing pages in a Wiki, for example.

The **Process of Sharing and Verification**: The process of sharing and verification implies that project members passively or actively share their knowledge using the Web 2.0 tools defined by the project managers in the storage process. Passive share means to share a LL among project members. For instance, a project member finds a solution for a technical problem in a forum and they share the URL of the web page using a social bookmarking tool. In this case, the wiki platform works as a centralized repository with links pointing to information on the social bookmarking tool and the Web-based Office Suite tool. Active verification is the act of verifying whether the solution found is really a LL as well as validating its: correctness, consistency, redundancy, and relevance. This validation work is facilitated
because of the previous phase (share) which allows the capture of knowledge from several project members. This means that the verification process receives the status of a “mature” LL.

The Dissemination Process: Passive dissemination can be performed using wiki platforms, blogs, microblogs and social networks. In addition, Really Simple Syndication (RSS) is useful to promote active casting, since it provides a way to disseminate LL to specific users who are interested in a certain type of lesson. It is a service with a direct message. Broadcasting is carried out through bulletins which are sent to everybody in the organization using e-mail. Active dissemination can be also made using RSS so that project members would be only notified about the lesson if it was relevant to their tasks in the project. Proactive dissemination can be partially performed using a bookmarking service through the automatic suggestion of tags when project members are tagging web sites or web pages. There is no Web 2.0 tool to support reactive dissemination.

A Proposal of a Benefits Dependency Network to Support the Insertion of Web 2.0 Technologies in Project Management

A benefit is an advantage in favor of a stakeholder (Ward and Daniel 2006). These authors developed an organizational approach called Benefits Management to managing Information and Communications Technology and systems. It is comprised of five phases: identify and structure benefits, plan benefits realization, execute benefits plan, review and evaluate results and potential for further benefits.

Benefits Dependency Network (BDN) is a framework that helps organizations structure a Benefits Management approach. This framework covers: the business drivers (external and internal factors that driving investment), the organizational objectives of the investment, the set of IT to adopt, the enablers change factors, the organizational changes and, finally, the benefits to achieve with the IT investment.

Figure 1 lists the main Web 2.0 technologies for IT enablers. Stakeholders should have an understanding of the capabilities of these technologies to better exploit each one. In our proposal, all technological enablers who deal with LL are related to three change factors: project members training, change organizational culture, and redefine the management of LL processes. It is important to observe that the process of redefining the management of LL includes two sub-processes: identify leaders and define motivation mechanisms for project members.

Figure 1. A Benefits Dependency Network for managing lessons learned in Project Management.

Source: Based on Peppard, Ward, and Daniel (2007).
The BDN proposed focuses on the LL, so that the project change is focused on the main LL processes, which were previously redefined in the change factors. Table 1 shows that wikis platforms and web-based office suites are technologies that support the four main LL processes. For this reason, Figure 1 outlines a direct dependency from these technologies to the LL processes.

A project has to deal with external and internal drivers. An external driver affecting the use of new technologies to manage LL in PM is the availability of Web 2.0 tools. Another driver is the professionalization of the PM, which leads project managers to optimize all processes and tasks throughout the project. The main internal drivers are the need of PM to improve performance and the project managers to be aware about the benefits of LL. These drivers lead to the definition of objectives based on the potential benefits.

The objective of improving PM depends on all benefits. The optimization of the tasks execution is related to the better individual and group know-how which inhibits repeated failed procedures and increases repeated successful procedures benefits.

The management of LL brings a set of project benefits. The benefit of retaining knowledge can be reached with the storage and capture processes. The communication can be facilitated with the sharing and dissemination processes. Better individual and group know-how is promoted with all processes. The benefits of stopping repeated failed procedures and repeating successful procedures can be achieved with the sharing and verifying, and dissemination processes.

It is important to highlight that each benefit must have an “owner” within the organization - someone responsible for the achievement of the benefit. The definition of the “owner” depends on the existing positions in the organization being implemented the BDN.

Peppard et al. (2007) argue whether a benefit can be measured or not. According to them, if a benefit can be measured then one can prove that it has occurred. The benefits can be classified as: observable, measurable, quantifiable, or financial - for a detailed description of the classification of the benefits, see Ward et al. (2008). Taking the benefits outlined in Figure 1, Table 2 presents examples of how each benefit will be measured. Other measures in addition to those in Table 2, can be proposed based on the data of the organization being implemented the BDN.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Measures for each type of benefit</th>
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<tbody>
<tr>
<td>Retain knowledge</td>
<td>Observable</td>
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<tr>
<td>Improve Communication</td>
<td>Measurable</td>
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<tr>
<td>Better individual and group know-how</td>
<td>Quantifiable</td>
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<tr>
<td>Stop repeat failed procedures</td>
<td>Financial</td>
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<tr>
<td>Repeat successful procedures</td>
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Table 2: Examples of measures for each type of benefit. Source: Based on Ward et al. (2008).

**Final Remarks**

This paper introduced a proposal of a Benefits Dependency Network to measure the impact of Web 2.0 technologies in project management focusing on lessons learned. The main expected outcome with this proposal was to show that the implementation of new IT in projects can lead to a set of defined benefits for PM. As future work, the proposal needs to be validated with the Information Technology and Project Management communities using the action research method in a project-based organization. We also need to define other measures for each benefit, responsibilities for achieving all the benefits and implementing all the changes.
References


