INNOVATION IN THE MANAGEMENT OF LESSONS LEARNED IN AN IT PROJECT WITH THE ADOPTION OF SOCIAL MEDIA

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ABSTRACT:

This research explores the gap in the management of lessons learned (MLL) in an Information Technology project (IT), validating a model (named Target) with the support of a wiki platform in a medium-sized company in the IT industry. This model supports the following MLL processes: awareness, collection, verification, storage, dissemination and reuse. This study adopts the paradigm of the Design Science Research and the Technical Action Research method to instantiate the Target model in the implementation phase of an IT project. The theoretical contribution lies in the practical utility of an LL model, which was validated in the field promoting innovation in the MLL. The practical implications can be seen in the company's learning to introduce the MLL, improve design productivity, increase employee collaboration and better disseminate knowledge.

Keywords: Knowledge management; lessons learned; web 2.0; Information Technology Projects; Social Media; DSR; TAR.

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NOVAÇÃO NA GESTÃO DE LIÇÕES APRENDIDAS EM UM PROJETO DE TI COM A ADOÇÃO DE MIDIAS SOCIAIS

RESUMO

Esta pesquisa explora a lacuna na gestão de lições aprendidas (GLA) em um projeto de Tecnologia da Informação (TI), validando um modelo (denominado Target) com o apoio de uma plataforma wiki em uma empresa de médio porte no setor de TI. Este modelo suporta os seguintes processos do GLA: conscientização, coleta, verificação, armazenamento, disseminação e reuso. Este estudo adota o paradigma Design Science Research e o Método de Pesquisa-ação Técnica para instanciar o modelo Target na fase de implementação de um projeto de TI. A contribuição teórica reside na utilidade prática de um modelo de GLA, que foi validado no campo promovendo inovação na GLA. As implicações práticas podem ser vistas no aprendizado da empresa para introduzir o GLA, melhorar a produtividade do projeto, aumentar a colaboração dos funcionários e disseminar melhor o conhecimento.

Palavras-chave: Gestão do conhecimento; lições aprendidas; web 2.0; Projetos de Tecnologia da Informação; Mídias Sociais; DSR; TAR.

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INTRODUCTION

Project environment, best practices, and management of lessons learned (MLL) have received attention in practice and research for more than a decade (Wagner &Bolloju, 2005; Hartmann & Doree, 2014).

The MLL issues faced by companies present challenges that must be overcome in a structured way (Wiewióra & Murphy, 2015). Projects must form libraries with plans, budgets, learned reports and lessons, operationalizing the MLL (Chronéer & Backlund, 2015), which can improve the distribution of knowledge in a social network (Crawford &Cabanis-Brewin, 2005; Milton, 2010), thus meeting the need for an increase in skills of project members, as regards LL (Williams, 2008).

More recent studies focus on mechanisms to improve knowledge sharing (Gomes, Oliveira & Chaves, 2016), based on practical communities, exploiting social media (Lee, Reinicke, Sarkar, & Anderson, 2015, Karagoz, Korthaus, &Augar, 2016). In fact, better understanding the role of social media in managing LL in projects remains a challenge to the Project Management (PM) community.

Chaves and Veronese (2014) present a proposal to introduce social media in the MLL. Rosa, Chaves, Oliveira, and Pedron (2016) created an LL model named Target, supported by social media, which includes LL processes throughout the project life cycle.

The use of social media facilitates shared real-time communication and is already a reality. On the other hand, the practice suggests that censures imposed by organizations in communication determine business rules, and are poorly understood by most project managers, a scenario that contributes to overlooking that reality (Levitt, 2011). Adding to this scenario, the management of projects, such as in the software industry, begins to incorporate the Project Management 2.0 approach (Kerzner, 2015), including it in its practical storage and processing in the cloud, which suggests the

need to evolve in training, and other practices (Levitt, 2011).

In this context, Rosa et al. (2016) created an LL model named Target, supported by social media, which includes LL processes throughout the project life cycle.

This research aims to contribute to the MLL by an instantiation of the Target model using a wiki. The Target model, which was validated by experts in projects (Rosa et al., 2016), is now applied in practice to foster innovation in the MLL. The model proposes the adoption of awareness, collection, verification, storage, dissemination and reuse processes in MLL. Social media support the model.

The following research question underpins this study: **To what extent does the Target model contribute to MLL in an IT project?** The research has two goals: to validate the instantiation of Target model in an IT project using a wiki; and obtain from users their perception of ease and convenience of use, and assess possible behavioral changes in MLL.

THEORETICAL FOUNDATION

The approach of organizational knowledge management is characterized by the ability of a company to create knowledge as a corporate asset and understand the need to manage it and give it the same care as that devoted to the achievement of tangible assets (Nonaka & Takeuchi, 2003).

The field of knowledge management generates increasing interest in several areas such as the project management (Kebede, 2010). This happens in the discipline of knowledge management because its processes and tools aim to increase the potential knowledge for making more assertive decisions, contributing to the competitive advantage of the organization (Kebede, 2010).

The MLL is part of knowledge management, contributing to the identification of the root cause of problems recorded and studied, an activity that helps maintain the social capital of the organization (Park & Lee, 2014). Lessons learned (LL) projects as a

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learning activity, in many cases, become critical for the project in the implementation of an Information System (IS) (Milton, 2010; Park & Lee, 2014).

The MLL may pose psychological challenges and individual characteristics that motivate people to share information (Jugdev & Wishart, 2014).

Swan et al. (2010) indicate that the mechanisms of high level of knowledge articulation and knowledge coding tend to be ineffective considering that projects are in their structure and nature temporary endeavors. In this sense, some scenarios can collaborate with learning in projects, dependent on senior professionals, professionals with knowledge and experience in project teams. Key people are important in enabling the transfer of learning between individuals (Kerzner, 2015; Swan et al., 2010).

Argote (2011) analyzes organizational learning considering three steps in its composition: creation, retention and transfer of knowledge. When companies learn from experience, new knowledge is created for the company. Knowledge must then be maintained so that it exhibits some persistence and validity over time (Argote, 2011). Knowledge can be transferred within and between project units. When transferring knowledge, the project is affected by experience, based on that of previous projects (Argote, 2011; Sense, 2004).

One of the most common ways to share project knowledge is to capture the positive and negative aspects of LL (Wiewiora& Murphy, 2015). Thus, when used effectively, the process can assist project managers in the reuse of knowledge and prevention of future errors and their repetition (Pemsel & Wiewiora, 2013). However, the processes of capture, storage, analysis and reuse of LL often remain underestimated (Wiewiora & Murphy, 2015). Wiewiora and Murpy (2015) argue that Web-based collaboration is easily accessible, intelligible and user-friendly, allowing the sharing of project knowledge to overcome existing problems. As a result of this study, some characteristics of these tools are highlighted in relation to LL: storage and sharing, visibility, feedback, priority, Capture mechanisms, capture tools, systemic approach and

quality. Based on these authors, the LL can have a strong influence on people, groups and especially on the more experienced, inside and outside the projects.

In addition to these factors, the use of processes and tools, especially those with easy access, such as the collaborative tools of web 2.0, can help in the management of LL (Chaves, Araújo, Rosa, Gloria Jr, & Nogueira, 2016; Veronese & Chaves, 2016). These issues contribute to the objectives of the research, during the instantiation of the Target model and in the use of the wiki, with its convenience, ease of use and behavior change, contributing to the MLL.

The increasing adoption of virtual teams in IT projects contributes to the need for employee mobility and the need for collective, rapid decision-making by project team members in different locations (Reed & Knight, 2010). This contributes to the increase in virtual teams and the use of web 2.0 collaborative tools as support for decision making (Turban, Liang, & Wu, 2011).

Technology plays an important role, and the use of centralized systems is especially important to support collaboration (De Mattos & Laurindo, 2015). Wikis are suitable for projects with teams physically distributed in remote locations, allowing team members to organize and publish content, freeing the project manager for greater dedication to other activities (Milton, 2010).

Wikis assist project teams in defining scope, documentation, collaboration, discussion and follow-up activities. Added to these scenarios, IT projects and software quality are very dependent on the definition of the scope, the specification of tasks, communicated and understood. This scenario contributes to the assertion that wikis can be a potential solution for defining scope and tasks effectively used to promote an evolutionary mindset throughout the project (Chaves, Tessi, Winter, & Damasceno Jr., 2015; Gholami & Murugesan, 2011; Han &Anantatmula, 2007; Rosa et al, 2016).

Holtzblatt et al. (2010) conclude that the return on investment depends heavily on how the technology is adopted. For a positive effect on collaboration, the authors conclude that we should

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consider what prevents workers from coding and sharing knowledge. It is necessary to be aware of the work environment that users are entering, checking the possibility of sharing knowledge in various tools. Holtzblatt et al. (2010) also suggest an incentive structure, clear policies and guidelines, and support and encouragement of information sharing practices.

A wiki-based system allows you to maintain and control activities that include complete control over versions and their content. Wikis also include a history of revisions, allowing archived changes to be rolled back, and the traceability of information, which helps control inappropriate information by identifying the authors through the history. This ease of control and identification does not eliminate user mistrust regarding malicious content, posing doubts about the reliability of the wiki. Added to this, security issues should be strongly considered in building the process of using the wiki (Gholami & Murugesan, 2011; Von Krogh, 2012).

Figure 1 presents the Target model proposed by Rosa et al. (2016), which is predictive and explanatory in its processes, with support from the wiki (Rosa et al., 2016). The Target model is focused on the needs of lessons learned in projects during the phases: initiation, details (planning), implementation (execution) and closing of project life cycle.

The Verify process was added to the Collect process, and the Disseminate process was added to the Store process. This unification was created because the verification process was taken as an optional process that could be carried out at the time of collection.

The Dissemination process was included in the Store process, because it can be triggered as a notification at the time of storage. Although this process has been united with the storage, it can also occur intrinsically with the awareness process (Rosa et al., 2016).
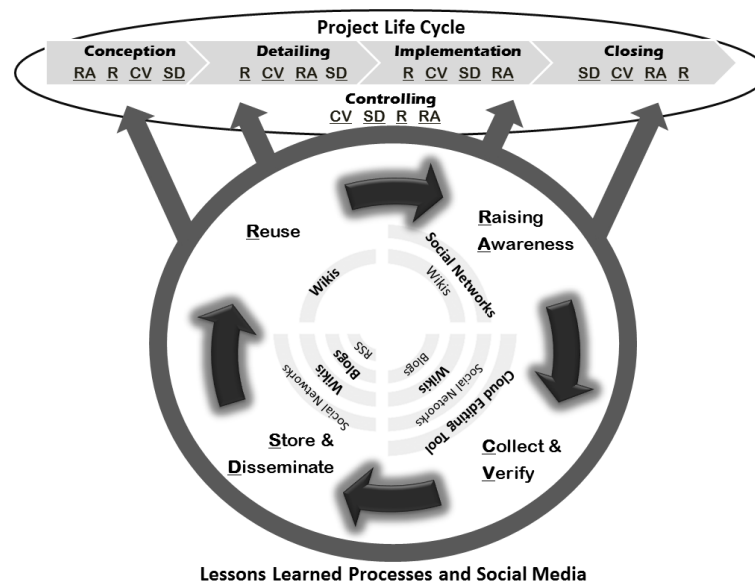
Figure 1 - The Target model. (RA stands for Raising Awareness; R stands for Reuse; CV stands for Collect & Verify; and SD stands for Store & Disseminate). (Rosa *et al.*, 2016)

METHODOLOGY

The main criterion of quality of knowledge is its validation by the informed public - scientific information based on the presentation of empirical evidence (Aken, 2005; Huff, 2000).

Founded in this concept, this study introduces a model of MLL in field-testing with technology-based

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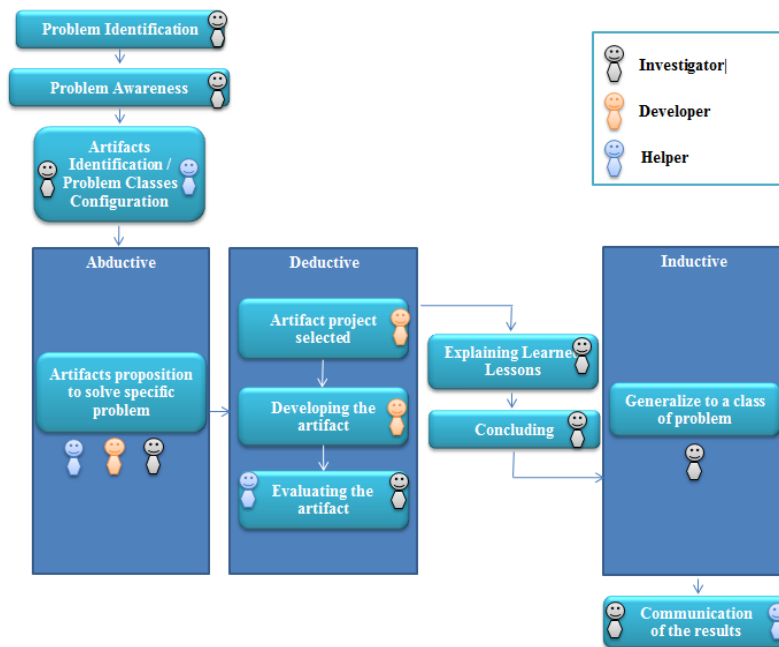
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support, and an analysis of its use. This study stimulates the effort to improve MLL through practical situations involving the subject studied. In an exploratory context with practical actions, this study is supported by a qualitative and exploratory approach. The ontology of this research is objective, related to facts and data, and hence measurable. This study creates conditions to interfere in the appearance or modification of facts in order to explain what happens with practical phenomena in an MLL environment in an IT project.

The Target model is the artifact validated in practice under the paradigm of Design Science Research (DSR) (Gregor & Hevner, 2013; Pournader, Tabassi, & Baloh, 2015). Recent debates seek to contribute to the practice through research, for example the European communities in Germany and the UK (Gregor&Hevner, 2013).

The importance of research to the practical field highlights the orientation of the DSR paradigm, emphasizing the link between the utility and the truth, "the truth lies in the utility" (Pournader et al., 2015). This view of DSR does not preclude its potential to contribute to the improvement of the theory (Cole, Purao, Rossi &Sein, 2005). In line with

the paradigm, the method adopted in this work was Technical Action Research (TAR). The method supports the search for a solution to a problem using an artifact or prescription, narrowing the gap between theory and practice. While most methods of empirical research seek to study the phenomenon as it is currently, researchers using action methods (e.g. action research) seek to intervene in the situations studied (Wieringa, 2012).

A satisfactory solution, but not necessarily perfect, it is a common practice in DSR (Cole et al., 2005; Huff, Tranfield, &Aken, 2006; Lacerda, Dresch, Proenca, & Junior, 2013; Papas et al, 2012). TAR under the same platform as the Action Research method adds to the technical nature of research, which is conducted on two simultaneous and independent fronts, the practical and the theoretical (Thiollent, 2009). This research proposes a solution to a specific and empirical problem, where literature does not offer a theoretical framework, a feature found in Action Research (Patton, 2015). The steps of the study based on the method and paradigm are presented **in Figure 2**, deepening the study on collecting information in a software development project.

Figure 2 - Scientific approach and its stages.
Source: Adapted and extended Dresch et al. (2015).

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The research was carried out in two cycles. During the instantiation of the artifact, adjustments, actions and their evaluations were carried out between cycles.

In an attempt to find a solution for the customer's problem, meetings were held in order to understand the project mechanisms, MLL, the company´s characteristics, develop the wiki pages with managers, directors and all the 29 employees. Ten employees, from three distinct areas, worked directly in the research.

The interviews began forty-five days after the wiki pages were released for use and after two months of awareness and preparation work. After the first three interviews, it was possible to make adjustments, increasing awareness actions and dissemination of the work, in addition to stimulating employee participation. During the research, documents, meeting minutes, project records and processes were collected, contributing to the researcher's analysis and observations in the field,

concluding with a confirmatory focus group, two months after the instantiation of the artifact.

The interview and focus group protocols are available in Appendix A and Appendix B.

PARTICIPANT PROFILE

Table 1 shows the classification of respondents and Table 2 their functions. Each respondent is represented by the initial "I" plus a numeric character, e.g. "I1". The results indicate an average age of 26, 80% with bachelor's degree, and 20% with bachelor's degree in progress. Added to this scenario, 20% have completed or are completing an MBA. Most respondents, 90%, do not have schooling in projects, only one of them is attending an MBA in projects. The average IT experience of the respondents is 4 years and 3 years is the average time working in the company where the research was carried out.

Questions	Interviewees									
	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10
Age	30	31	22	25	27	26	22	22	22	32
Gender	M	M	F	M	F	M	M	F	M	F
Years of IT experience	10	10	3.6	2	1,2	10	1,2	2	3	2
Experience in projects	Not much	6 years	Not much	6 years	Not much	Not much	Not much	Not much	Not much	Not much
Schooling in projects	None	None	None	None	None	None	None	MBA in Projects	None	None
Educational level	IS Graduate and MBA	IS Graduate	IS Graduate	IS Graduate	IS Graduate	IS Graduate	IS Graduate	Logistics Graduate	IS Graduate	QM Graduate
Years in the	9	6	2	4	1	3	1	2	2	2

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Table 1 – Interviewee Profile

INTERVIEWEES ID	FUNCTION
I1	Training analyst
I2	Developer
I3	Customer service
I4	Developer
I5	Support analyst
I6	Developer
I7	Support analyst
I8	Support analyst
I9	Support analyst
I10	Manager

Table 2 – Interviewee Function

ANALYSIS OF RESULTS

The analysis of the interviews, confirmatory focus group, the participation of the researcher and direct observation in the field, plus the content of the documents collected were enough to make it explicit that the company did not have a formal process of MLL. In addition, at the beginning of the study, decentralized records were found without any standardization in meeting minutes, network repositories and notebooks in desk drawers.

The contributions of the participants were identified by the analysis of their wiki records containing their experiences. These records represent the practice of employees in their work. During the interviews, most respondents said that people need to make it a habit to use LL, referring to themselves and co-workers, either in the registry or the reuse of knowledge, as stated by I4:

I4 - "The habit of registering still needs to grow a lot, it is a matter of habit, culture, the company, and getting to the person that I am."

This behavioral issue was also mentioned in the confirmatory focus group, and during the observation of the researcher, which is clear in the statement by I6:

I6 - "I don't use the internal tool a lot in my work directly with what I do on a day-to-day basis."

It was noticed that at least one of those involved in the use of the wiki had difficulty in organizing his experience explicitly. This scenario suggests that there is difficulty in creating the habit of registering lessons learned.

The implementation of the awareness process was the main task during the field research period in the company, because it stimulates the participation of all project members. This implementation was the first intervention of the researcher, starting at the research dissemination meeting with discussion on LL. Throughout the project, we identified the need to increase awareness and dissemination of LL.

Therefore, disclosure has been expanded with the contribution of weekly internal email on the issue to all sections at weekly meetings aimed at

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agile software development. Also along this line the inferences throughout the day on LL, began to include reminders and encouragement by managers to use the artifact during the search. The researcher expanded the need for awareness and dissemination, based on some accounts collected in interviews:

I3 – "I haven't used the process and the wiki yet to support my current activity because I'm still in training in my new function. But I consider lesson learned important and the process is very practical."

I6- "I don't use the internal tool a lot in my work directly with what I do on a day-to-day basis"

I7 - "Even if I cannot post to the wiki, I send a general email to all staff, to formalize things, but people end up not taking any notice."

I9 - "The customer asks for something new that no one uses, agent needs to know how to be able to give support, guide, sometimes it is not documented, there is only the information with the person who developed it".

I7 - "In my notebook there are already some processes to take up, reserve a little time to go to the wiki and create."

Most interviewee responses were very positive about awareness in the use of the artifact. Only two interviewees were the exception to the positive outcome of the process, as they state that the artefact has not reached its goal. I6 answers this question hesitantly, unsure how to explain his point:

I6 - "It needs a more mature, higher contribution of people interacting. I do not use it, I do not need it, I can get it because I know it's there, but it's easier to wait for another person to do it".

For this same purpose, four respondents cite usability as a point to be improved in the wiki. Unlike, I5 valued the artifact, the process and the tool in addition to their importance in LL:

I5 - "I think the lessons learned are very useful for anyone, regardless of the area, it is a worthwhile experience, any company and people are welcome to use it. The sharing of information is valid since people can apply it in their daily routine."

The research highlights that the educational and cultural level of those involved, added to the fact that they have an average age of 26, are favorable as they belong to a generation involved with collaborative technologies in their daily lives. This scenario contributes to the employees' prioritization of their participation with individual concerns (Papadopoulos, Stamati, & Nopparuch, 2013).

The research thus shows a way for using the Target model for MLL in an IT company. Target was implemented in the project execution phase, with positive evaluation for all involved in the project. The research highlights the ease and convenience of use of a wiki, contributing to MLL in a medium-sized IT company.

The data collected throughout the research by interviews, focus group, documentation and observation of the researcher suggest that the Target model was positively validated. In this context, the results of question 9 present proposals by respondents for improvements in the architecture of the wiki.

The field research in the execution phase included dynamic adaptations of the process from information captured in the context of research and implementation of the process, throughout the artifact use, based on the inference of the investigator.

CONTRIBUTIONS TO THEORY AND PRACTICE

The paradigm on which the research is based, DSR, gives this research an epistemological position of pragmatism, and thus leads to the pursuit of improving both the theory and practice.

The theoretical contribution lies in the practical utility (Corley &Gioia, 2011) of an LL model, which was validated in the field. In addition, this research adds new knowledge to the MLL in projects by promoting innovation in the MLL and introducing a LL model validated in the IT industry.

The use of the wiki in the research contributes to the vision of Faraj, Jarvenpaa, & Majchrzak (2011) and Von Krog (2012), as a tendency for interaction in

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companies, especially in innovation with the adoption of social media.

As a practical implication, the use of Target model brings as a contribution a better MLL in an IT project. It contributes to the construction of knowledge through action and experimentation, considering the social environment in which it is inserted, consisting of a group of people working on the project. In this sense, the instantiation of an LL model in an IT project using a wiki facilitated stakeholder understanding as to how useful this model is.

FINAL REMARKS

The paper presented the empirical validation of an LL model in the execution of an IT project. With the active participation of the researcher in the field along with the company's professionals, observing and gathering information from the daily routines of work, it is possible to make a positive evaluation of the model's implementation.

In this sense, the wiki contributes to the collaborative environment proposed by the Target model, facilitating the exchange of experiences.

The main limitation of this research lies in the impossibility of validating the model throughout all stages of the IT project. We should also consider that the Brazilian economic environment affected the research setting throughout the year 2015, since the company faced necessary staff reductions and was unable to replace employees. Further research includes the validation of the Target model in all phases of the project life cycle and in other industries.

We also suggest a quantitative study hypothesizing relationships (e.g. rising awareness through the offering of wiki training programs will lead participants to perceive the tool as more useful, which in turn leads to more usage), control variables, and moderators (e.g. years of experience). In addition, the Target model could also be instantiated with other social media.

REFERENCES

Aken, J. E. V. (2005). Management research as a design science: Articulating the research products of mode 2 knowledge production in management. **British Journal of Management**, 16(1), 19–36. http://doi.org/10.1111/j.1467-8551.2005.00437.x

Argote, L. (2011). Organizational learning research: Past, present and future. **Management Learning**, 439–446. http://doi.org/10.1177/1350507611408217

Chaves, M. S., Araújo, C. C. S., Rosa, D. V, Gloria Jr, I., & Nogueira, C. D. (2016). A new approach to managing Lessons Learned in PMBoK process groups : the Ballistic 2.0 Model. International **Journal of Information Systems and Project Management,** 4(1), 27–45. http://doi.org/10.12821/ijispm040102

Chaves, M. S., Tessi, M., Winter, R. A., & Damasceno Jr., J. (2015). TECNOLOGIAS DA INFORMAÇÃO DA WEB 2.0 EM EMPRESAS E NA GESTÃO DE PROJETOS: ANÁLISE E UMA AGENDA DE PESQUISA. **Iberoamerican Journal of Project Management** 6.1, 23–46.

Chaves, M. S. & Veronese, G. (2014). A Proposal to Manage Lessons Learned in Projects: Web 2.0 Technologies to Promote Innovation. **International Journal of Innovation**, 2(1), 1-17.

Chronéer, D., & Backlund, F. (2015). A Holistic View on Learning in Project-Based Organizations. **Project Management Journal**. http://doi.org/10.1002/pmj.21503

Cole, R., Purao, S., Rossi, M., & Sein, M. K. (2005). Being Proactive: Where Action Research meets Design Research. In **International Conference on Information Systems** (ICIS) (pp. 1–21). Proceedings. Paper 27.

Corley, K. G. & Gioia, D. E. (2011). Building theory about theory building: what constitutes a theoretical contribution? **Academy of Management Review**, 36(1), 12–32.

Crawford, J., & Cabanis-Brewin, J. (2005). Optimizing human capital with a strategic project

International Journal of Innovation (IJI Journal), São Paulo, v. 5, n. 2, pp. 156-170, May/August. 2017.

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office: select, train, measure, and reward people for organization success. In **Presented at the PMI Global Congress** (pp. 1–15).

De Mattos, C. A., & Laurindo, F. J. B. (2015). Collaborative platforms for supply chain integration: Trajectory, assimilation of platforms and results. **Journal of Technology Management and Innovation**, 10(2), 79–92. http://doi.org/10.4067/S0718-27242015000200006

Faraj, S., Jarvenpaa, S. L., & Majchrzak, A. (2011). Knowledge Collaboration in Online Communities. **Organization Science**, 22(5), 1224–1239. http://doi.org/10.1287/orsc.1100.0614

Gholami, B., & Murugesan, S. (2011). Global IT Project Management Using Web 2.0. International **Journal of Information Technology Project Management**, 2(3), 30–52. http://doi.org/10.4018/jitpm.2011070103

Gomes, F.; Oliveira, M. & Chaves, M. S. (2016). Knowledge Sharing in Project Management Process Groups. 17th European Conference on Knowledge Management, Northern Ireland, UK, 1-2 September, 307-315.

Gregor, S., & Hevner, A. R. (2013). Positioning and Presenting Design Science Research for Maximum Impact. **MIS Quarterly**, 37(2), 337–355. http://doi.org/10.2753/MIS0742-1222240302

Han, B. M., & Anantatmula, V. S. (2007). Knowledge sharing in large IT organizations: a case study. **Gower Publishing**, Ltd.., 37(4), 421–439. http://doi.org/10.1108/03055720710838506

Hartmann, A., & Dorée, A. (2014). Learning between projects: More than sending messages in bottles. **International Journal of Project Management.** http://doi.org/10.1016/j.ijproman.2014.07.006

Holtzblatt, L. J., Damianos, L. E., & Weiss, D. (2010). Factors Impeding Wiki Use in the Enterprise : A Case Study. In CHI'10 Extended Abstracts on **Human Factors in Computing Systems**. ACM., 3,

4661–4675. http://doi.org/10.1145/1753846.1754208

Huff, A. (2000). CHANGES IN ORGANIZATIONAL KNOWLEDGE PRODUCTION. Academy of **Management Review**. http://doi.org/10.5465/AMR.2000.3312916

Huff, A., Tranfield, D., & Aken, J. E. V. (2006). Management as a Design Science Mindful of Art and Surprise: A Conversation Between Anne Huff, David Tranfield, and Joan Ernst van Aken. **Journal of Management Inquiry**, 15(4), 413–424. http://doi.org/10.1177/1056492606295900

Jugdev, K., & Wishart, P. (2014). Mutual caring - Resolving habituation through awareness: Supporting meaningful learning from projects. **Project Management Journa**l, 45(2), 66–82. http://doi.org/10.1002/pmj.21406

Junior, J. C. S. F., Machado, L., Klein, A. Z., & Freita, A. S. (2015). DESIGN RESEARCH: APLICAÇÕES PRÁTICAS E LIÇÕES APRENDIDAS. **Revista de Administração FACES Journal,** 14(1), 5–24.

Karagoz, Y., Korthaus, A., & Augar, N. (2016). How do ICT project managers manage project knowledge in the public sector? An empirical enquiry from the Victorian Public Sector in Australia. *Australasian Journal of Information Systems*, *20*.

Kebede, G. (2010). Knowledge management: An information science perspective. International **Journal of Information Management**, 30(5), 416–424. http://doi.org/10.1016/j.ijinfomgt.2010.02.004

Kerzner, H. R. (2015). Project Management 2.0. **John Wiley & Sons**.

Lacerda, D. P., Dresch, A., Proença, A., & Júnior, J. A. V. A. (2013). Design Science Research: método de pesquisa para a engenharia de produção. **Gestão & Produção**, 20(4), 741–761.

Lee, L., Reinicke, B., Sarkar, R., & Anderson, R. (2015). Learning Through Interactions: Improving Project Management Through Communities of

International Journal of Innovation (IJI Journal), São Paulo, v. 5, n. 2, pp. 156-170, May/August. 2017.

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Practice. **Project Management Journal**, 46(1), 40–52. http://doi.org/10.1002/pmj.21473

Levitt, R. E. (2011). Towards project management 2.0. **Engineering Project Organization Journal.** http://doi.org/10.1080/21573727.2011.609558

Milton, N. (2010). The Lessons Learned Handbook: Practical approaches to learning from experience. (C. Publishing, Ed.) (First Publ). **New Delhi: Oxford - Cambridge** - 191 Pages.

Nonaka, I., & Takeuchi, H. (2003). Criação de conhecimento na empresa. (Campus, Ed.) (20a Edição). Rio de Janeiro: **GRUPO ELSEVIER** - 321 Pages.

Papadopoulos, T., Stamati, T., & Nopparuch, P. (2013). Exploring the determinants of knowledge sharing via employee weblogs. International **Journal of Information Management,** 33(1), 133–146. http://doi.org/10.1016/j.ijinfomgt.2012.08.002

Papas, N., Keefe, R. M. O., Seltsikas, P., O'Keefe, R. M., & Seltsikas, P. (2012). The action research vs design science debate: reflections from an intervention in eGovernment. European **Journal of Information Systems**, 21(2), 147–159. http://doi.org/10.1057/ejis.2011.50

Park, J.-G., & Lee, J. (2014). Knowledge sharing in information systems development projects: Explicating the role of dependence and trust. **International Journal of Project Management**, 32(1), 153–165. http://doi.org/10.1016/j.ijproman.2013.02.004

Patton, M. (2015). Qualitative Research and Evaluation Methods.US Patent 2,561,882 - 806 Pages (3rd editio). SAGE Publications, Inc; **Fourth Edition edition** (November 11, 2014).

Pemsel, S., & Wiewiora, A. (2013). Project management office a knowledge broker in project-based organisations. **International Journal of Project Management**, 31(1), 31–42. http://doi.org/10.1016/j.ijproman.2012.03.004

Pournader, M., Tabassi, A. A., & Baloh, P. (2015). A three-step design science approach to develop a novel human resource-planning framework in projects: the cases of construction projects in USA, Europe, and Iran. International **Journal of Project Management**, 33(2), 419–434. http://doi.org/10.1016/j.ijproman.2014.06.009

Reed, A. H., & Knight, L. V. (2010). Effect of a virtual project team environment on communication-related project risk. International **Journal of Project Management**, 28(5), 422–427. http://doi.org/10.1016/j.ijproman.2009.08.002

Rosa, D. V., Chaves, M. S., Oliveira, M., & Pedron, C. (2016). Target: A Collaborative Model based on Social Media to Support the Management of Lessons Learned in Projects. International **Journal of Managing Projects in Business**, (no prelo).

Sense, A. J. (2004). An architecture for learning in projects? **Journal of Workplace Learning.** http://doi.org/10.1108/13665620410528498

Swan, J., Scarbrough, H., & Newell, S. (2010). Why don't (or do) **organizations learn from projects?**, 41(3), 325–344. http://doi.org/10.1177/1350507609357003

Thiollent, M. (2009). Pesquisa-ação nas organizações. (**Atlas S.A., Ed.**) (2 edição). São Paulo: 165 Pages.

Trkman, P. (2010). The critical success factors of business process management. International **Journal of Information Management,** 30(2), 125–134. http://doi.org/10.1016/j.ijinfomgt.2009.07.003

Turban, E., Liang, T. P., & Wu, S. P. J. (2011). A Framework for Adopting Collaboration 2.0 Tools for Virtual Group Decision Making. **Group Decision and Negotiation**, 20(2), 137–154. http://doi.org/10.1007/s10726-010-9215-5

Venkatesh, V., Brown, S. A., & Bala, H. (2013). BRIDGING THE QUALITATIVE-QUANTITATIVE DIVIDE: GUIDELINES FOR CONDUCTING MIXED METHODS RESEARCH IN INFORMATION SYSTEMS. **MIS Quarterly**, 37(1), 21–54.

International Journal of Innovation (IJI Journal), São Paulo, v. 5, n. 2, pp. 156-170, May/August. 2017.

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Veronese, G. T. & Chaves, M. S. (2016). An Integrated Approach to Collaborative Learning in Projects. Strategic Integration of Social Media into Project Management Practice. IGI Global, 160-178. doi:10.4018/978-1-4666-9867-3.ch010

Von Krogh, G. (2012). How does social software change knowledge management? Toward a strategic research agenda. The **Journal of Strategic Information Systems,** 21(2), 154–164. http://doi.org/10.1016/j.jsis.2012.04.003

Wagner, C., & Bolloju, N. (2005). Supporting Knowledge Management in Organizations with Conversational Technologies: Discussion Forums, Weblogs, and Wikis. **Journal of Database Management**, 16, 1–8.

Wieringa, R. (2012). Technical Action Research as a Validation. In Proceeding DESRIST'12 Proceedings of the **7th international conference on Design Science Research in Information Systems: advances in theory and practice** (pp. 220–238). http://doi.org/10.1007/978-3-642-29863-9_17

Wiewiora, A., & Murphy, G. (2015). Unpacking "lessons learned": investigating failures and considering alternative solutions. **Knowledge Management Research & Practice**, 13(1), 17–30. http://doi.org/10.1057/kmrp.2013.26

Williams, T. (2008). How do organizations learn lessons from projects - and do they? IEEE Transactions on **Engineering Management**, 55, 248–266. http://doi.org/10.1109/TEM.2007.912920

Woolf, S. H. (2008). The Meaning of Translational Research and Why it Matters. **JAMA**, 299(2), 211–213. http://doi.org/10.1001/jama.2007.26

Appendix A – Interview Questions

Introduction - personal data	
1	How old are you?
2	What is your gender?
3	How many years of experience do you have in Information Technology?
4	What is your experience / training in projects?
5	What is your educational background?

Perception of utility of a wiki by the user in his/her work environment.	
1	Is the wiki a tool that helps you to carry out your work?
2	Do you become more skilled in your work when using the wiki?
3	Do you consider the wiki useful for your work?

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	User's perception as to whether the wiki is easy to use in a project.

4	Does the use of wiki make performing tasks quicker / easier?
5	Does the use of wiki improve your performance at work?
6	Does the use of wiki increase your productivity at work?
7	Does the use of wiki increase your efficacy at work?
8	Do you consider the wiki easy to use in all its aspects?

	User convenience regarding wiki usage.

9	When you use a wiki, does it allow you to perform your work in the most convenient time for you?
10	Does the use of wiki enable you to do your work anywhere?
11	Do you find the use of wiki convenient in carrying out your work?
12	Do you consider the wiki appropriate for your work?

	Intention of the user to use the wiki.

13	Would you like to use wikis in future projects?
14	How often do you use a wiki?
15	Would you recommend the use of wiki to others?

	Efficacy of Target model

16	Did the LL processes become more agile considering the pace of execution?
17	Do the LL processes require less effort from human resources?
18	Did the LL processes achieve their purpose?
19	Did the LL processes facilitate the work?

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20	Do you recommend that others use the process?

Appendix B - Confirmatory focus group protocol

Division	Questions	
TAM	1	How was the utility of the artifact in the MLL perceived?
	2	How was ease of use of the wiki in the MLL perceived?
	3	How was the convenience of wiki use in the MLL perceived?
	4	Has there been increased use of LL with the instantiation of the artifact?
MAPN	5	At what stage of the project life cycle is increased use of the LL from the instantiation of the artifact perceived?
	6	Does the process of LL facilitate MLL in your project?
	7	How is the efficiency in MLL perceived when using the wiki?
	8	How is the effectiveness in MLL perceived when using the wiki?

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