How do Project Post-Mortems Contribute to Organizational Learning?

Full Paper

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Abstract

Project post-mortems have been identified as a key strategy for organizations to learn from their past failures and improve system development project performance. Although several guidelines for conducting post-mortems have been proposed those conducted result often in little novel insight and understanding. This study seeks to understand how the information captured and used as part of project post-mortems is or is not leveraged to facilitate organizational learning and what factors thwart such efforts. Twenty-five project and program managers are interviewed for how they collect, interpret, and use project data to learn and build local theories of project performance. Our findings suggest that post-mortem practices can facilitate organizational learning, however, we found the lack of incentives to use the data, opportunities and weak mechanisms for sharing post-mortem knowledge are key barriers for using generated project information for improved learning during post mortems.

Keywords

Project post-mortems; organizational learning; knowledge transfer; knowledge retention; knowledge creation

Introduction

Project post-mortems are an important means of learning and can play a critical role in improving an organization’s system work. Project post-mortems aim to capture information about project events and conditions and build local causal-effect models of factors and events that lead to specific outcomes. By doing so they seek to synthesize ‘lessons learned’ in forms that are transferable to other projects and thus facilitate continuous improvement (Kappelman et al., 2006; Lyytinen et al., 1996; The Standish Group, 2013; Verner et al., 2008). There is little understanding, however, “how” organizations can successfully gather and leverage information of a project’s performance. Therefore, organizations are unable to apply the lesson learned because they lack ways of conceptualizing project events and making them actionable. Generally, project based learning encodes inferences from history into routines that guide future behaviors (Levitt & March, 1988) and this takes place either by learning, doing or grafting from other’s experience (Epple et al., 1991; Levitt & March, 1988).

While the literature provides several guidelines of how to conduct project post-mortems (Schindler & Eppler, 2003; Hartmann & Doree, 2014; Anabar i et al., 2008; Duffy & Whitty, 2014) there is little understanding how an organization can effectively harness such information for learning and knowledge transfer. As a result data reviewed during project post-mortems such as project status updates or risk analyses fail to improve the project performance. One reason is that project post-mortems and related practices routinely fail to account for and interpret such data systematically. Rather project post-mortems are conducted as rituals to ‘finish’ the project. Therefore organizations ultimately fail to learn from their experience (Lyytinen and Robey 1999, Verner et al., 2008).

In this study we address this gap and seek to understand how the information captured as part of project post-mortems is leveraged to facilitate organizational learning and what factors thwart such efforts. This is accomplished by interviewing 25 project and program managers responsible for managing technology projects. The question the study seeks to answer is: What role do project post-mortems play in organizational learning about project performance and what factors influence their success?
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Literature Review

What are Project Post-Mortems

Project post-mortems have long been considered to be a ‘best practice’ for organizational learning as to improve project performance (Verner, et al., 2008). During post-mortems participants collect information on events and conditions during the project and determine what went well or poorly to identify reasons for observed outcomes. Knowledge is generally identified in terms of rough cause-effect relationships and is expected to provide opportunities for process improvement in future projects. There is general positive sentiment related to the value of post-mortems. For example, Anbari et al. (2008) summarize extensively reasons for conducting post-mortems: (1) people do not necessarily learn from their experience. Structured learning exercises need to be prompted to make the experience meaningful; (2) the knowledge of what occurred in a project is dispersed among several people and can only be made visible and explicit through post-mortems; and (3) consequent writing and disseminating of the lessons learned helps build reflective approach to project experience that avoids repeating the same mistakes (Anbari et al., 2008: 634).

Organizational Learning

Post-mortems are an instance of experience based organizational learning i.e. they seek to generate change in behaviors while the organization acquires more experience (Argote & Miron-Spektor, 2011). Post-mortems have all characteristics of experience based learning: They are routine-based, history dependent, and target-oriented; they are focused on encoding inferences from history into routines that guide future behaviors (Levitt & March, 1988). Organizations also learn based on the experience of others (Eppele et al., 1991; Levitt & March, 1988) therefore post-mortems form an important means of grafting that results in sharing knowledge within the organization. These two experience based learning modes run parallel in the context of post-mortems. During post-mortems the organization engages in novel and local knowledge creation by seeking to generate knowledge that is new to it through experimentation and reflection. After the post-mortems, the organization seeks to rely on information collected, interpreted and shared during post-mortem by making it accessible to external actors (Argote & Ingram, 2000; Argote et al., 2000; Levitt & March, 1988). Argote et al. (2000) refer to the latter process as knowledge transfer while others call it grafting. Hence, knowledge transfer is as important in organization’s use of post-mortems as learning from local experience. Organizations that transfer post-mortem knowledge effectively from one project to another are likely to be more productive than those that are less adept in such activity (Argote & Ingram, 2000).

Knowledge acquired by either ways of learning becomes embedded in and changes the organization’s context. Knowledge is embedded in the context by influencing the participants, changing tools and tasks, or reconfiguring related social or technology networks. Knowledge is also embedded over time in organization’s latent elements such as its culture (Weber & Camerer, 2003). In this regard the purpose of project post-mortems is to engage the organization in learning from experience by creating novel knowledge that captures, given the evidence and related inferences, the most effective and successful way of accomplishing a given set of project tasks. The data collected during the project post-mortem and shared with other project members and made available for use by others involves knowledge transfer. The transfer happens through tools, guidelines, repositories, networks or shaping the culture.

Knowledge Creation and Learning

During learning knowledge originates from experience (Argote, 1999; Argote & Miron-Spektor, 2011; Levitt & March, 1988; Huber, 1991; Nonaka, 1994) which is converted through specific symbolic or cognitive processes that result in specific learning outcomes like causal frames, evidence, or awareness. In this regard project post-mortems serve as a means to capture the information about the projects symbolically and make inferences about that information towards generalizable, more abstract

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1 Both these activities call for knowledge retention which focuses on stocking knowledge in the organization’s memory and enabling related flows (Argote et al. 2000)
knowledge. Specifically, project post-mortems seek to influence process improvement by evaluating execution tactics of successful and unsuccessful interventions during the project. The knowledge is articulated in the form of cause-effect models and retained in organizational memory. This process, though necessary for learning, is not easy. Lyttinen and Robey (1999), for example, report three cases where the organizations failed to learn from their project experiences and as a result learned also to fail.

**Knowledge Transfer & Retention during Learning**

Knowledge transfer relies on the effectiveness of the organization’s knowledge management capabilities in storing and transferring knowledge across temporal (from one project to next) and organizational boundaries (from one project context to another project context). Knowledge management in project-based context faces many challenges due to the fluidity of organizational boundaries and shifting temporal boundaries. Projects differ from one another and knowledge transfer from one project to another can involve discontinuities in tasks, personnel, technologies and domain knowledge. Therefore it is difficult to develop stable routines that can maintain the flow of knowledge between the projects and can capture learning from one project and transfer it to the next one (Bresnen et al., 2003). Such problems in cross-project learning have also wider implications for organizational learning outcomes. Not surprisingly, developing the capability to manage knowledge across temporal and organizational project boundaries is seen as an important source of competitive advantage (Bresnen et al., 2003).

Knowledge created as part of the project post-mortem process becomes first shared and reviewed by the project team members. The information collected from each individual is captured into a shared document and reviewed and discussed by team members. The goal of this review is to generate and make transferable the knowledge between project members. Conducting a ‘history’ session provides next an opportunity for the project members to hear the voice and experience of others and to learn from them. Upon completion of the review, the lessons learned are finalized and stored in a project data repository. Organizations retain this data in order to allow team members from other projects to access the information. Surprisingly, there is little research in the literature about how knowledge created gets further disseminated, assimilated and retained within the organization and what mechanisms apply under different conditions in avoiding repetition of past mistakes (see e.g. Neustadt & May, 1986) or adopting successful practices (Day, 1994). A widely recognized belief is that the acquisition and retrieval of knowledge from repositories during knowledge transfer will automatically influence subsequent individual behavior which is most likely a moot assumption (Reder & Anderson, 1980; Walsh & Ungson, 1991)

**Research Design**

**Methodology**

The study sought to understand what roles do project post-mortems play in organizational learning in the context of information technology projects. How the information is captured and deployed as part of the project post-mortem process so that it facilitates organizational learning and improves project performance? To answer these questions, we sought to capture lived experience of program and project managers responsible for leading IT projects. The expectation is that such study will solicit and help theorize about the mechanisms and effects of project post-mortems towards organizational learning. Due to the little established theory and research in the area, the study applied grounded theory. Such an approach is ideal when one seeks to discover theory from qualitative data using systematic inductive coding and analysis (Glaser & Strauss, 1967). Specifically, we sought to uncover how the information captured by project post-mortems is leveraged by project members and managers to improve future project management tasks. Semi-structured interviews were used to capture project and program manager’s experiences about conducting and using post-mortems as part of project management work. The interviews were systematically coded and analyzed using grounded theory approach (open, axial, selective coding). This ultimately led to uncover novel conditions under which project post-mortems are likely to facilitate organizational learning. Through our analysis, we were exploring and grafting theory. The findings from this study will be used later to inform a mixed method study with the aim to develop and validate a theory of project-related learning related to post-mortems.
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Sample

We sampled using purposeful sampling. We sought to include in our sample experienced project and program managers who would have experience of project work and post-mortem practices. To qualify for the study, participants were required to have worked as a project or program manager. All interview participants had experience leading IT projects of varying sizes (small, medium and large). The participants were not pre-screened to confirm prior participation in a project post-mortem as it was the goal of the researcher to understand all methods by which learning from a prior project experience is identified and leveraged. Personal networks and snowballing were used to identify and list study subjects. The final sample included 25 IT professionals. To reduce contextual impact the sample represented ten companies across several industries including Financial Services, Document Services, Healthcare, Education, and Technology. One participant had less than five years of project/program management experience, eight had five to ten years of experience, eleven had ten to fifteen years of experience and five had fifteen or more years of experience. Six of the participants were male and nineteen were female.

Data Collection

Data was collected over a six-month period from April 2015 through September 2015. Semi-structured interviews were used to gather the data and followed a detailed interview protocol. The interviews focused on the participant’s experience as a project or program manager including their experiences leveraging learnings from prior projects. Open-ended questions were asked and probing questions were used to clarify and to expand upon the responses. The interviews lasted on average 60 minutes but no longer than 90 minutes. Eleven of the interviews were done in person, and the remaining fourteen were conducted via telephone. Additionally, at the conclusion of each interview, the researcher captured non-verbal data and key themes from the interview in a memo note. To facilitate the data collection process, the interviews were recorded upon receiving permission from the participant. Interviews were transcribed verbatim from digital recordings. All transcripts were checked with the interviewees for accuracy prior to analysis.

Data Analysis

Data was analyzed continually starting from the first interview and continued throughout the data collection period. One of the researchers listened to each interview several times and read each interview transcript repeatedly. Per tenets of grounded theory the data analysis started by separating, sorting and synthesizing the data through open coding where each transcript was coded following the three stages of coding (Corbin and Strauss 2008). During the first stage, the researcher sought to identify topics of particular interest or what Boyatzis (1998) refers to as codable moments resulting in 1,762 codes. The codes were next sorted and assigned to higher level categories that included fragments with similar meaning. Next, we conducted axial coding (Saldana, 2013) where the goal is to reassemble data that were “split” or “fractured” during the initial coding (Saldana, 2013). The axial coding process resulted in 32 broad, theme focused codes. The final coding step involved selective coding also referred to as theoretical Coding (Saldana, 2013). During this phase we focused on identifying key themes and cause-effect patterns in the coded material as to explain how post-mortems influence organizational learning.

Findings

Our findings suggest that the process and the effect of post-mortem practices on organizational learning is impacted largely by the lack of incentives to use the data, opportunities and weak mechanisms for sharing post-mortem knowledge. All these factors influence how project related knowledge is created, retained and transferred within and between IT projects.

Knowledge Creation

Conduct of post-mortems assumes that new knowledge is being created about project performance. Without any such knowledge to harvest, project post-mortems are deemed ineffective. However, knowledge is only created when there is sufficient opportunity to do so. Each participant recounted at least one experience in participating or facilitating a project post-mortem. Participants shared that project post-mortems occurred in various forms such as formal lessons learned sessions, informal lessons learned
sessions, after action reviews, stakeholder analysis and retrospectives. Lessons were captured related to
the project budgeting process, project communications, training, requirements management, timeline
and resources. This suggests that there is sufficient opportunity for knowledge to be created and harvested
if post-mortems are conducted diligently. The findings also suggest that significant challenges remain
with regards to the amount of and quality of the knowledge created. Specifically, we observed a lack of
incentives to harvest and use the information and poor timing of the project post-mortems that impacts
the overall quality and quantity of knowledge.

Finding 1: No Incentive to Use the Information Captured. Fourteen out of the twenty-five
research participants noted that there is relatively limited value in the ‘recorded’ lessons. The activity was
mostly completed ritually, because it was an obligatory part of the project management process and the
post-mortem was conducted just to “check the box.” The information created was not viewed valuable to
the organization and therefore limited energy was put into the process. Mostly redundant or already
known knowledge was recorded as part of a project ‘ritual’ with no intention of future use. One participant
stated eloquently:

“Honestly, it felt more of a waste of time, because you knew no one’s ever going to view this document
again and the project’s already been implemented at that point, so the work’s done. No one’s ever going
to use the document you’re creating. It’s almost a waste of time, which I think is why people aren’t
focusing on getting it done today.” (PM C Transcript, P.6-7)

Additionally, none of the organizations had systematic routines to use the information once it was
captured during the project post-mortem. This resulted in the situation that occasionally valuable
information was not used when new projects were started. Sixteen out of the twenty-five research
participants shared that there was no requirement in their organization to share the information. Beyond
the requirement to complete the project post-mortem, project members were not expected to go back to
review the information collected from past projects. Additionally, the respondents indicated that there
was no mechanism that would facilitate the transfer of the information collected. One reason is that most
project and program managers are evaluated on whether or not they completed all project tasks in time.
If there is no incentive in the project management methodology or within the organization to utilize the
knowledge created as in other project steps, then little value is gained from the gathered information.
Most of these used resources were wasted and the learning was curtailed for future process improvement.
One participant stated:

“There is no edict that says every lesson, every project lessons learned needs to roll to the next project or
the next set of projects, and the project manager’s, program managers or portfolio leads need to
incorporate those as part of their new projects.” (PM E Transcript, P. 8)

Finding 2: Timing – Project Post-Mortems are conducted at the end of the project. The
formal post-mortems were always conducted at the end of the project. Most projects run by the project
managers were twelve months or more in duration. Throughout this time, project team members come
and go as they complete their assigned tasks. This resulted in low participation from project team
members in the final post-mortem. Given that project team members typically engage only for the time
required to complete their assigned task, many critical members were no longer available to participate in
the project post-mortem. At the same time remaining project team members did not remember all lessons
that had been identified throughout the project. This impacted the project team’s ability to create the
sufficient knowledge to facilitate organizational learning. Nineteen out of the twenty-five people cited the
timing of post-mortem as a barrier to the effectiveness of creating novel insights. One participant shared:

“You’ll lose the impact of what you learn when it’s been nine to twelve months before you reviewed it,
but if it’s something where you can go back to and easily access, it could be valuable to success, whether
it’s a project or an entrepreneurial endeavor.” (PM C Transcript, P.11)

Another participant stated:

“Everyone is tired, exhausted at each of those phases. You have a lot of people that feel like the project is
in control because if you’re doing a Lessons Learned, obviously, you have accomplished something. They
really don’t feel the urge to attend the meetings, so you tend to have a smaller audience and the audience
that does attend, they may or may not pay attention or really be involved in the conversation.” (PM D
Transcript, P. 3)
Knowledge Retention

Organizations are expected to have a strategy for how the new knowledge created is made available for others. All of the study participants indicated that the project post-mortem documents were normally stored on some sort of project repository. However, most indicated that were challenges to access the post-mortem documents because they were not organized, indexed or annotated. Another finding is that the project and program managers often retain ‘on the side’ personal information about the project (in the form of notes, diaries, or memos) as to facilitate their own personal development.

Finding 3: Inaccessibility limits use. Global access to the lessons learned was rarely made available to others through an accessible document repository. Project team members were only granted access to the data repository for their specific project instead of global access to all projects. When asked about access to lessons learned from other projects, a research participant stated:

“It’s new and you upload your lessons learned to this document repository. Do you have access to see everybody’s lessons learned document or just your project? Just my project or I would have to request access from the PM that owns another project to get that information.” (PM G Transcript, P. 9)

Additionally, the data was not stored in a format that would allow for easy search and retrieval of specific information. Seventeen out of the twenty-five research participants noted inaccessibility to the lessons learned documents. This lack of access impacted the organization’s ability for the knowledge transfer across project teams. One research participant shared:

..."the challenge is finding a better way to really house that knowledge on a shared site or some type of document management site...” (PM D Transcript, P. 10)

Finding 4: Project and Program Managers retain information to enhance their personal learning. Project and Program Managers benefited most from project post-mortem exercises. In their role, they were held accountable that the project post-mortem was completed as part of the project management process. As a result, they became intimately familiar with the lessons captured during the process. This knowledge, however, was mostly used personally and the knowledge was personally invested and interpreted. Thirteen out of twenty-five research participants indeed mentioned that retaining the information captured as part of the lessons learned was used for their own personal development and growth. One participant shared:

“Basically, at the end of projects you have your lessons learned best practices session. What I would do, if there was something that was a best practice I would make sure I leveraged it for a new project. For instance if conducting biweekly meetings was a best practice and my team seem to be engaged or it was better for their schedules, I would leverage that in a new project.” (PM A Transcript, P.3)

Another respondent shared:

“For me, it was imperative for me to learn and stack the types of things that I was learning on top of one another, so that I could be successful each time around, for each project. I think, to answer that question, for me, it was critical to take as much as I could from a previous project and use it in the current role to continue that process going forward” (PM C Transcript, P. 3)

Knowledge Transfer

Finding 5: Relationships and project narratives facilitate Informal Learning through Post-Mortems. Knowledge transfer related to post-mortem occurred mostly through informal processes that relied on project manager’s personal networks within the organization. Within these informal networks project managers shared a common vision for their project management team and peer groups and sought to work together to identify opportunities for improvement. In this regard project managers shared their lessons with other project managers through informal knowledge dissemination activities such as ad hoc knowledge sharing sessions organized by the program management office or one-on-one sessions with other project managers. Twenty out of the twenty-five participants reported participating in informal knowledge sharing sessions during which they shared the key lessons captured as part of the project post-mortems for the projects that they managed. During these sessions, the project
Managers also gained insights from the project post-mortem examples shared by other project managers within their team. One participant stated:

“What I try to do in my team huddle/my direct meeting for my PM is talk about challenges and lessons learned that they have come across with their project. If I bring it up to my meeting, I have my project manager share their challenges of lessons learned in our meeting. That’s how we leverage what we have today. Then, of course, the PMs, what they do is they actually use it towards this other project because our PMs carry anywhere between 5 to 10 projects at one time.” (PM K Transcript, P. 13)

Additionally, some respondents noted that they often sought contextual and informal input from other project managers. This was driven by their personal desire to grow professionally and learn. They asked for feedback and guidance on how to solve specific issues that the other project manager had experienced and solved. One participant stated:

“Say for instance I’m picking up a new group and I know the person who used to support them from a projects perspective, I would go talk to him. “Okay, I need to know what are your concerns? What issue did you see? What worked well?” Try to find someone if they’re available to give you some information beforehand.” (PM Y Transcript, P. 9)

Finding 6: Project methodology accentuates learning. To what extent ‘lessons learned’ are interpreted and integrated into system work and how was primarily driven by the deployed project methodology. The few respondents who were involved in projects (2/25) that leveraged an agile methodology where post-mortems were a systematic part of each ‘sprint’ reported that lessons captured as part of their ‘project post-mortem’ were immediately integrated into their next round of project routines. For the agile projects, project post-mortems took the form of project retrospectives which were conducted every two weeks as part of sprints. They included feedback from the managers and project team members. A two week cycle of organizational learning rather than 12 month learning cycle resulted in continuous and fast paced learning in which the knowledge was created, transferred and retained constantly via the project retrospectives. Action items were assigned to individual team members in which they were required to make the changes described in the lessons learned. Follow-ups to confirmed the resolution of each action item that was identified during the retrospective. The item stays on the agenda until it is resolved. In this approach, the team learns immediately from their past experience and implements corrective action immediately. One participant stated:

“What we normally do is we have action items on the areas that we discussed that could be areas for improvement. We actually work out a plan. How could we have done it better? What could you guys have done to make it better? We assign action items to each individual that it’s related to. When we have our next Retrospective, we discuss. We pull in the details from a previous meeting each time we discuss how well we applied those action items and those areas for improvement.” (PM N Transcript, P. 5)

Discussion

Our findings contradict the widely held belief that project post-mortems are not conducted (Verner et al., 2008). Through the interview of 25 project and program managers, 46 examples of project post-mortems were shared. Project teams perform project post-mortems as prescribed by the used development methodology. Project and program managers also identify lessons learned through their personal experiences and the personal experience of their peers. This contradicts what is identified through the literature where formal mechanisms are emphasized. Overall, the results of this study highlight the fact that outside the project and program manager’s personal desire to learn from prior experience, organizational learning from project post-mortems is impacted by the lack of the infrastructure and incentives that would facilitate learning.

For such organizational learning to occur, outputs of project post-mortems need be embedded in the epistemological forms and artifacts that sustain concrete knowledge and behaviors embedded in project settings such as the maps, stories, and programs (Argyris & Schon, 1996). Implementation of such forms calls the organization to create and provide the motivations and the opportunities to learn from the information collected during project post-mortems (Argote and Spektor 2011). This demands creating a context which amplifies the organization’s member’s abilities, motivations and opportunities to engage in
post-mortems and learn from them. Without the proper motivation to actually generate and use the information collected, project post-mortems will continue to be viewed as ‘check the box’ activities.

The opportunity to leverage the information collected as part of the project post-mortem must be available within the organization. “Members opportunities are affected by the organization’s structure and social network” (Argote, 1999, p. 40). Project and program managers can create opportunities to leverage the information based on their personal networks. However, this opportunity must exist within the larger organization. One step forward is that information collected should be made available to everyone and not just team members. Additionally, the project management approaches and development methodologies should be revised to incorporate continuous activities that facilitate the review and use of information collected as part of the project process. These changes would facilitate knowledge transfer and knowledge retention related to project execution.

Limitations and Implications for Future Research

As with any qualitative study the research has limitations. First though the information collected from the sampled population was rich and we reached empirical saturation, a more diversified sample across types of projects and settings might have resulted in more nuances. A large portion of the research participants (twenty out of twenty-five) worked in the financial services industry. Thus all findings may not be generalizable to other project settings. Second, the study participants were limited to project and program managers. Learning within IT organizations involves several other stakeholders such as business analysts, software developers and test leads. Including all team members in the sample and critical stakeholders within the respective organizations such as method and project management experts, heads of system development, tool specialists and so on would have helped obtain data on organizational learning in other relevant contexts as it relates to post-mortems.

This study contributes to the organizational learning literature by providing lived experience of project and program managers responsible for leading IT projects. We note that there are few incentives for project teams to leverage the detailed information collected during the process. A study to consider why organizations do not explicitly require the use of the information harvested will help understand reasons why project management practices do not change and how information is actually deployed in such contexts. Additional research on specific learning routines associated with project conduct across organizational settings that perform the same types of functions for information gathering, assimilation, interpretation and deployment would extend this research by providing a richer perspective on what routines lead to the garnering and deployment of specific types of information. Understanding at more detailed level mechanisms that influence how post-mortem information is shared via informal channels would help organizations to improve learning contexts and provide opportunities that can significantly improve their project performance. Finally, we need to study individual and project level factors that influence to what extent project team members learn during the project as part of their project experience. This could provide a better understanding of how knowledge is identified and created in software projects and would help organizations establish better protocols for leveraging information for learning.

Conclusion

The urge to deliver information technology projects faster, cheaper and with higher quality demands organizations to engage in new technology projects that align with their operational or strategic objectives. This demands organizations to engage in a continuous learning process of how to execute and manage projects effectively. We found that lack of incentives, opportunities and weak mechanisms for sharing post-mortem knowledge are key barriers for generating and using project information for improved learning. These topics highlight the pivotal challenges related to learning during and from project post-mortems. We surmise that these topics will remain on the research agenda for a while as organizations continue to struggle to improve their project performance.

REFERENCES


