Reviewing the Past for a Better Future: Reevaluating the IT Project Retrospective

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ABSTRACT

This paper provides a commentary on previous research to inform our understanding of IT project retrospectives. The literature surrounding project retrospective outcomes, measurement and processes are discussed, and critical factors necessary for project retrospective success are considered. Consequently, semi-structured interviews are undertaken with experienced project managers to determine levels of agreement between research and practitioner disciplines. Outcome findings include multiple project retrospective definitions being used, differing project retrospective outcomes being desired, thirteen project retrospective processes being advocated, and no project retrospective measurements given to confirm whether these outcomes have been successfully achieved. Subsequently, project retrospective processes are presented such that each process has the capability to deliver on any outcome irrespective of its nature. Further research is suggested necessary to pursue a more rigorous and relevant conceptual understanding of the IT project retrospective construct.

Keywords

Project management; retrospective; reflection; success; organizational learning; knowledge; outcomes; qualitative; interview.

INTRODUCTION

Effective Information Technology (IT) project management is becoming increasingly recognized as providing companies with opportunity to acquire a unique competitive advantage over other organizations (Ram, Wu and Tagg, 2014). However, while successful project delivery has increased in importance, organizations frequently fail to meet delivery time, quality and budget expectations. For example, only 34% of IT projects undertaken by Fortune 500 companies are completed successfully (Nelson, 2009), with failed IT projects costing U.S. businesses $75 billion per annum (Kasi, Keil, Mathiassen, and Pedersen, 2008). Consequently, organizations are routinely failing to secure the benefits that occur as a result of successfully delivering software projects (Keil, Mixon, Saarinen and Tuunainen, 1995; Keil and Flatto, 1999; Abdel-Hamid and Madnick, 1990).

IT project failure is widely acknowledged as an on-going problem within the software development community (Ewusi-Mensah, 1997). Lyytinen and Robey (1999) suggest that a key reason for this failure is software project delivery teams failing to reflect on, and thus learn from, previous project experiences. In this regard, not only are organizations failing to learn from previous project successes, but they are also failing to identify and learn from previous project mistakes: "we talk about software engineering but reject one of the most basic engineering practices: identifying and learning from our mistakes" (Boddie, 1987, p.77). Previous approaches to overcoming these learning failures have sought to focus on "best project practices" (Lyytinen & Robey, 1999), and the use of project retrospectives (Collier, DeMarco and Fearey, 1996). However, despite the best efforts of the academic community to address this failure to learn, 40% of IT investments continue to fail to deliver their expected returns (Kasi et al, 2008). Consequently, this problem remains widespread.

As organizations continue to fail to learn from project experience, and with previous literature recommendations failing to assuage this on-going problem, this article identifies a need to acquire further insight into the role and function of IT project retrospectives. Accordingly, the authors evaluate the nature of previous research on IT project retrospectives to assess the degree of cumulative knowledge in this area. More specifically, the authors seek to answer the following question: What is the level of agreement that exists in extant research as to the definition, measurement and purpose of IT project retrospectives? By answering this question, the authors seek to summarize previous approaches to reflecting on project experience as a result of undertaking a project retrospective. Interviews with software project managers to acquire "real-life" feedback and recommendations on project retrospectives are described. Consequently, prospective future research directions are suggested.

The rest of this article is structured as follows: in the next section, we review the project retrospective literature, and summarize the common themes relating to the project retrospective construct. This is followed by an analysis of the interview data. The article concludes by providing observations on the findings and recommendations of the paper, and suggests next steps for this enquiry.

IT PROJECT RETROSPECTIVES

A commonly-utilized approach to project reflection is the project retrospective, noting that "project retrospective" is but one term of many used to describe a post project reflection or post-hoc reflection during an on-going project. A project retrospective is a prescribed method for evaluating project performance, extracting lessons learned and informing future recommendations (Nelson, 2010); it is also a "systematic, formalized review of a product's quality and the associated quality of the processes that produce it" (Tiedeman, 1990, p.177), and "a series of steps aimed at examining the lessons to be learned from products, processes and resources to benefit on-going and future projects" (Myllyaho, Salo, Kananrianinen and Koskela, 2004, p.3).

While these definitions differ in terminology, they independently recognize that project retrospectives do not occur solely as a result of a failed project; project retrospectives also follow successful project delivery. Accordingly, project retrospectives should not be restricted to either successful or failed projects but to all project scenarios, as learning from any project outcome potentially provides valuable learning opportunities. Furthermore, irrespective of the nature of the failed or successful project outcome, these definitions identify the project retrospective activity as needing not only to identify and note negative outcomes that are not to be replicated, but also to seek out those positive elements that deliver desirable project results. Interestingly, however, several papers (e.g., Pan and Flynn, 2002; Williams, 2004) propose that the project retrospective is an opportunity to identify and discard negative activities that may compromise future project performance versus actions that enhance any implementation. Notwithstanding these observations, however, for the purpose of this paper, Nelson's (2010) definition of the project retrospective is adopted to facilitate the readers' understanding of the term's inclusive conceptual boundaries.

In considering how a project retrospective may achieve a successful outcome, it is important to consider which factors impact the project retrospective outcome being realized. For this to be achieved, project retrospective success must be defined. While there is relatively common agreement as to what defines a project retrospective, there is little agreement either how to determine when a project retrospective has achieved its aims, or how these aims are to be measured. Indeed, the authors have been unable to find any definition of how to measure project retrospective success from reviewing more than 40 project retrospective method papers. This finding suggests not only a divergence in defining a successful project retrospective, but also a critical need for an approach that allows these multiple project retrospective outcomes to be measured. Examples of the multiple IT project retrospective outcomes suggested by the literature include:

- Successful transfer and utilization of knowledge generated from one project to another,
- Enhanced organizational learning,
- Enhanced group learning,
- Enhanced individual learning
- Changes in organizational practices,
- Employee retention, and
- Process improvements.

As an example of a paper that seeks to capture the differing elements that comprise project retrospective success within a single publication, Myllyaho et al. (2004) identify six key benefits that arise from undertaking reflection activities within a software project perspective:

- To acquire a better understanding of other team members perspectives,
- To integrate individual / team learning,
- To identify hidden problems,
- To provide a foundation for documenting good practices to be replicated and bad practices to be dropped,
- To identify individual job satisfaction as a result of feedback, and
- To improve project cost estimations.

Similarly, Collier et al (1996) suggest that project team reflections provide an opportunity for a group of individuals to identify and discuss project conflicts, and to consider the team collaboration necessary to achieve a successful project delivery.

It is interesting to note that, despite the existing literature identifying the multiple, positive effects arising from undertaking reflection activities (Birk, Dingsøyr, and Stalhane, 2002; Tiedeman, 1990; Desouza et al, 2005), project retrospectives have failed to be commonly accepted and/or applied across industry. Kasi et al (2008) identify 19 barriers that account for organizations failing to learn from projects. These failures include limits on organizational intelligence, discentives for learning, educational barriers, and organizational design. This finding indicates that the foundation for a successful project retrospective may be compromised before its inception — i.e., that negative pre-conceptions of project retrospectives may exist prior to any retrospective being undertaken (McAvoy, 2008). If project members consequently have negative biases about the veracity of a project retrospective before it has even begun, then retrospective integrity may be compromised irrespective of supportive organizational structures or the potential to achieve the benefits arising from its utilization. Notwithstanding the multiple challenges arising from differing success outcomes having no measurement guidelines, however, various project retrospective processes have been proposed as shown in Table 1:

Author	Journal	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Ahonen & Savolainen (2010)	The Journal of Systems & Software	Data Collection	Workshop Meeting	Data Analysis	Reporting & Publishing Results	
Baaz et al (2010)	IEEE Software	Meeting Introduction	Data Collection	Sort & Vote	Analysis	Feedback & Agreement
Birk et al (2002)	IEEE Software	Preparation	Data Collection	Analysis	Results & Experience	
Collier et al (1996)	IEEE Software	Design & promulgate a project survey	Collective objective project information	Conduct a debriefing meeting	Conduct a project history day	Publish the results
Collison & Parcell (2001)	Book	Call the meeting	Invite the right people	Appoint a facilitator	Revisit the objectives and deliverables of the project	Revisit the project plan or process[3]
Desouza et al (2005)	Software Process Improvement. & Practice	Project Survey	Collect objective project information	Conduct a debriefing meeting	Project history day	Publish the results
Dingsoyr (2004)	Info & Software Tech.	Introduction	KJ Session 1	KJ Session 2	Root Cause Analysis	
Durr et al (2003)	Euromicro Conference	Planning & data collection	Introductory meeting	Feedback classification meeting	Data evaluation	Portfolio development and Improvement proposal meeting
Kasi et al	EJIS	Design the	Focusing the	Analyze and	Share and	Improvement

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3: Collison & Parcell (2001) outline subsequent stages that also include: ask what went well, determine why they went well, determine what could have been done better and ensure that participant leaves with their feelings acknowledged.

(2008)		organizational context	effort and collect data	interpret the data	exploit the resulting knowledge	proposal meeting
Myllyaho et al (2004)	ICSSEA	Plan a project review	Gather project data	Hold a post-intervention workshop or post-mortem review	Analyze the findings and synthesize lessons learned	Publish the results
Nelson (2010)	AMCIS	Project context & description	Project timeline & momentum map	Evaluation of project success / failure	Lessons learned	Recommendations for the future
Schieg (2010)	Journal of Business Economics & Management	Identify company success factors	Determine basic conditions	Designating objective and subjective data	Collection of experience	Creation of a catalog of measures
Whitten (1995)	Book	Declare the intent	Select the participants	Prepare the review	Conduct the review	Present the results / adopt the recomms.

Table 1: Project Retrospective Processes

While these thirteen processes differ in approach, they enjoy two common themes: firstly, that when the stages are synthesized (Kutsch and Hall, 2009), each process incorporates four fundamental components: retrospective initiation, data collection, data analysis and finding utilization, albeit at differing levels of granularity. This commonality suggests that these four constituent stages are critical to undertaking an IT project retrospective successfully. Secondly, irrespective of the nature of the retrospective outcome, each proposal suggests that it, as a single process, is capable of achieving *any* project retrospective outcome, regardless of what that outcome is. This is a surprising finding considering the considerable differences between, for example, process improvement versus employee retention. To obfuscate this observation further, little justification is given for how any one process can achieve such differing outcomes. Consequently, while individual processes may be particularly effective in achieving specific project retrospective outcomes, each may be challenged to deliver on all the success outcomes identified across the literature.

In summary, a review of the project retrospective literature has identified a number of challenges that require further investigation. These include multiple project retrospective definitions being suggested, various project retrospective outcomes being desired, varied project retrospective processes being suggested to achieve said outcomes, and no project retrospective measurements given to confirm whether these outcomes have been successfully achieved. Furthermore, despite the considerable differences seen across project retrospective outcomes, existing project retrospective processes are presented such that each process has the capability to deliver on any outcome irrespective of that outcome's nature.

Notwithstanding the strengths of each individual research approach, the existence of multiple retrospective recommendations suggests a lack of a cumulative tradition regarding how IT project retrospectives are conceptually understood. This in turn implies that previous approaches to IT project retrospectives have been insufficiently rigorous to meet the exactitudes demanded by the IS discipline, and that the subject therefore remains pre-paradigmic (Kuhn, 1962). Consequently, further effort is necessary to reconceptualize the project retrospective construct to move it to the paradigm stage. However, in determining the need for heightened levels of rigor, it is also imperative to consider practitioner approaches to undertaking IT project retrospectives. This is necessary to ensure that research objectives remain relevant in the organizational setting. By focusing on the practitioner's appreciation of IT project retrospectives, the authors hope to ascertain not only the levels of similarity between academic and practitioner understanding of the IT project retrospective, but also the level of agreement amongst practitioners themselves. By undertaking semi-structured qualitative interviews with eight experienced project managers, initial data are derived that will allow the authors to compare and contrast across literature and "real life" contexts prior to considering the next steps for this IT project retrospective research.

METHODOLOGY

Research design

Adopting a qualitative research approach provides an opportunity to utilize different qualitative research designs including but not limited to case study design, ethnography, interview study, discourse analysis and action research (Robson, 2002). Gill, Steward, Treasure and Chadwick (2008) suggest that interview studies are the most appropriate qualitative research approach when detailed insights are required from individual participants. In this context, Patton (2001) proposes that "the task for the qualitative evaluator is to provide a framework within which people can respond in a way that represents accurately and thoroughly their point of view." One such framework is the semi-structured interview, hereby identified as "consisting of several key questions that help define the areas to be explored, but that also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail. This interview format provides participants with some guidance on what to talk about, which many find helpful" (Gill et al, 2008, p. 291). With the need to obtain key insights from the potentially broad scope that embodies the project reflection theme, utilizing a semi-structured interview methodology is recognized as an appropriate data collection methodology.

Data collection

Within a qualitative framework, non-probabilistic sampling is typically used (Hair, Money, Samouel and Page, 2007). Insofar as Patton (2001) suggests that the inquiry purpose and research question objectives must dictate the sample size, the authors negotiated access to eight project managers located in New South Wales, Australia in July 2015[4]. These negotiations were achieved using a "snowball" sampling approach, whereby one of the authors made contact with an initial group of respondents with a minimum of 5 years of project management experience over a range of different IT projects, in turn using this access point to make contact with further people relevant to the study. Informed by the literature review and the research question, stakeholder interviews were structured around five open-ended questions that investigated project retrospective appraisals. These in turn supported a blend of factual, open, closed and probing questions designed to "tease out" project retrospective themes (Appendix 1). Acknowledging King's (2004) observation that "the development of the interview guide does not end at the start of the first interview. It may be modified through use" (p.15), questions were customized to accommodate the different interviewees, with the authors being aware of the need to minimize modifications so that subsequent interview analysis was not compromised. Stakeholder interviews lasted for approximately one hour and were verbatim transcribed as soon as possible post interview completion.

Data analysis methods

Hair et al (2007) suggest that "the objective of qualitative data analysis is to identify, examine, compare and interpret patterns and themes" (p.301). They suggest a path to be followed that is initiated by coding data to simplify and focus on meaningful characteristics of the data by linking it to topics, themes, concepts and ideas so that the data can be manipulated, organized and eventually categorized. Miles and Huberman (2013) enhance this thinking through providing a qualitative data analysis framework that includes data collection, data reduction, data display, drawing conclusions and verification of findings. Coding and data display, reduction and drawing/verifying were performed on the data gathered through the qualitative semi-structured interviews. Each interview transcription was broken out by question, with replies organized by response type.

ANALYSIS AND FINDINGS

This section presents an analysis of the interview data. Hair et al (2007) identify the qualitative research analysis method that includes "identifying categories or themes for your data, assigning findings to the appropriate category, and specifying relationships." (p.35) All the interviewees have had exposure to, or understanding of, project retrospective analyses. To ensure respondent anonymity (Bryman and Bell, 2003), the interviewees are identified as "A" through "H".

Project retrospective motivation

4: For interviewee demographics, please see Appendix 1

In contrast to findings suggested in the literature, there was broad consensus that justification for a project retrospective was premised on a failed part or whole IT project to the detriment of learning from success. As C summarizes:

> *"I think each retrospective would start off by asking the same question. What's the problem, who can I get to help me with this problem, what are the potential impacts – i.e., budgetary, schedule, scope."*

B and G also explicitly identified retrospectives not being used for learning from previous positive outcomes:

> *"When we go back it's because we need to work out what's gone wrong. Not go back as to how things worked well." (B)*

> *"Because when the good project comes, it becomes boring, because nothing happens, it's all so smooth, it's too easy." (G)*

Interestingly, and not discussed in the literature, using the motivation of problem resolution as justification for undertaking a retrospective, in several instances interviewees identified the need to review previous project retrospective outcomes to inform their current decision making:

> *"Yes, so if I have specific problems, I can go to the PIR (Post Implementation Review) team and ask them: who has delivered a project before, and I can end up talking to the PM to see how they fixed the problem." (F)*

Project retrospective success

The notion of successful project retrospective outcomes were discussed in all eight interviews. As another example of a finding not considered in the literature, examples of successful outcomes included not only external improvements, but also enhancing the project retrospective process itself:

> *"I know the guy that builds the (retrospective) methodology. In our organization we're very open, any of the recovery guys, or project excellence guys, which I'm part of, we influence the whole methodology. They actually look to us for input and modifications and adjustments to the methods." (H)*

Another new factor identified as impacting project retrospective outcomes was culture. Those interviewees with experience of managing projects and project retrospectives in different countries were clear about which cultures performed retrospectives best, noting that "Americans" refers to both North and South America:

> *"I find India is reasonably good. Japan is very strong, they stand out by far ... the British, the UK practices are really good too at doing it. The Germans, and then if I look across to Americans, the Brazilians are much better than any other Latin practice we have. Then the Canadians do a pretty good job." (H)*

> *"I'll have the Americans dominate. I'll have part of Europe fighting and disagreeing ... the Chinese coldly silent. I'd be the only one participating!" (B)*

Project retrospective process

In support of the processes presented in the research literature, multiple approaches to running a project retrospective were presented. These included not only retrospectives occurring after the completion of a project, but also variations on "agile" retrospectives run during the project to influence future performance of that same project:

> *"So every two days we would have an agile retrospective that would last for two hours. We would have 6 project managers at the minimum. With project resources the meeting would generally be up to 15 people. The scrum master would run the meeting." (F)*

Interestingly, three interviewees identified reasons for not following a project retrospective process. These included high levels of familiarity within the organization that facilitated an informal transfer of project knowledge, and the same members of the project team being involved in every project:

> *"I think that one of the benefits of belonging to our organization is that designers talk to designers, engineers talk to engineers, developers talk to developers … it's almost like a beehive – everyone is talking to everyone else." (D)*

This observation raised a further point for consideration: how to manage the transfer of both explicit and implicit knowledge in scenarios where project retrospectives were not being run:

> *"We always had the same project manager back on the same project, with the same project resources, so there's a lot of IP contained within people's heads." (H)*

The use of the same project team members as justification for not running a project retrospective suggests a further innovative factor not discussed in the research literature - that organization size is a reason when identifying which factors are relevant to delivering a project retrospective successfully; if an organization is sufficiently small, it may only have one project team to run all projects, and thus expending effort to transfer knowledge across the organization may be unwarranted. Conversely, to mitigate the threat of project retrospectives not happening, one interviewee (G) shared his approach whereby consultants are utilized to run the project retrospective, irrespective of the project or organization size, noting the importance for consultants to be able to bill the organization for the effort involved:

> *"The whole psychology of consultants is, hey it's not billable time. I had made it mandatory that every deal, every engagement had billable time for one day to do a PIR on a project that was longer then 6 months."*

DISCUSSIONS AND CONCLUSIONS

The purpose of this paper has been to summarize existing retrospective research to assess the degree of cumulative knowledge in this area. Furthermore, it has sought to acquire a level of understanding of the similarity between research and practitioner contexts. It is apparent that many differences in project retrospective, outcome, measurement and design permeate the literature. With multiple project retrospective outcomes provided, identifying which factors are critical to achieving these remains perplexing. This challenge is exacerbated considering interviewee feedback that identifies important factors to be considered that have not been discussed previously in the literature including the impacts of culture and organizational size on retrospective outcomes.

Premised on the investigation undertaken to date, the authors identify further research being necessary to acquire a more rigorous conceptual understanding of the IT project retrospective. This provisionally includes seeking a greater understanding of which factors are most critical to influencing project retrospective success, identifying the most common project retrospective outcomes, and determining how project retrospective success is to be measured. At this early stage of the research process, the authors tentatively suggest the need for an overarching framework that provides a sufficiently flexible structure to manage the multiple permutations discovered within this research. Correspondingly, this research, and the workshop discussion that follows, will provisionally be utilized as a foundation for that structural creation.

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APPENDICES

Appendix 1 – Interview demographics and questions

In July 2015, the authors met with and interviewed eight experienced project managers from a mixture of organizations and industries based in Australia. Interviews lasted for approximately one hour, with each respondent being asked to provide specific details about a project where a retrospective has been utilized. Table 2 provides a summary of interviewee demographics and project contexts:

Interviewee	Length of Project Management Experience	Industries	Project Details where Retrospective utilized	Project Timeframe for Delivery
A	6 years	Government, Banking, Fast Moving Consumer Goods	Application and Infrastructure release	6 months
B	34 years	Government, Defense, Technology	Data Center migration	10 months
C	5 years	Telecommunications, Finance	Application and Infrastructure migration,	12 months
D	30 years	Education	Application release	1 week
E	9 years	Technology, Health Services, Telecommunications	Generic	N/A
F	7 years	Energy, Food Manufacturing, Accountancy	Application installation	4 months
G	8 years	Finance	Infrastructure upgrade	8 months
H	22 years	Defense, Aviation, Government, Technology	Generic	N/A

Table 2: Interviewee and project demographics.

The following 5 main questions were adopted for each of the interviewees, with follow-up supporting questions being used to "tease out" further details where appropriate:

Question 1: Please describe the project that was used as the basis for the retrospective being undertaken?

Follow-on's: How long did the project last for? How was the data from the project used? How many people were involved in the project? What was your role in the project? Who drove the project? Who was the sponsor of the project? How involved was the sponsor? How was project success defined and measured? How do you think the project went? Why?

Question 2: For the project that you have just described, please may you talk me through the process of doing the retrospective from start to end?

Follow-on's: At what stage of the project was the retrospective done? Who decided what the constituent parts of the retrospective were? How effective do you think the retrospective was in identifying key points from the project? Why was this the case? To what extent do you feel that the approach that was taken to undertake the retrospective was adequate? If in/adequate, why? If given the opportunity, what changes would you have made to the retrospective approach? What do you think was the motivation for the retrospective being undertaken? For your project, was a review taken at the start of the project regarding prior retrospectives? Have you ever experienced a project where, prior to it starting, a review of previous project retrospectives was undertaken?

Question 3: What roles were involved in doing the retrospective?

Follow-on's: Why do you think that the roles chosen to be involved when doing a retrospective were involved? Are there any roles you think should NOT be involved? Who should be responsible for running the retrospective? What skills are needed for doing a retrospective effectively? What training is needed to acquire these skills? To what extent does your organization have the skills and training needed for running and/or being a part of a retrospective? As far as you are aware, was any training given for doing a retrospective? To the best of your knowledge, was the retrospective budgeted for within the project prior to the projects inception? As a result of you being involved in the retrospective, what learning did you acquire individually?

Question 4: What do you think are the most effective retrospective techniques?

Follow-on's: Why are these effective? Can you give me examples of other retrospective techniques that are / might be less effective? To what extent do you feel that the approach taken to doing the retrospective was adequate? If adequate, why? If not adequate, why not? What changes would you make to current retrospective approaches?

Question 5: How have the outcomes of the retrospective been used in your organization?

Follow-on's: How effectively do you think this post-retrospective knowledge has been used? How are knowledge acquired from retrospectives shared in your organization? Do you think this approach is effective? Why? If you were given the opportunity, how would you change the approach taken to sharing the outcomes from your retrospective? Prior to undertaking a project, have you ever been involved in reviewing previous project retrospectives to learn from their experiences? If so, how useful did you find this experience? If not, why do you think this has not occurred? Do you think there are any side benefits that were not initially considered arising from as a result of doing a retrospective?