Evaluating the Evaluations: Preconceptions of Project Post-Mortems

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Abstract: For future projects to improve, it is necessary to evaluate the lessons from previous projects. The majority of software methodologies recommend a review of the project to evaluate what worked and what needs improvement. These reviews are commonly referred to as project post-mortems. Existing research into post-mortems has found problems with the actual process itself and the use of the output from the process – the lessons learned. This research examines project post-mortems before the post-mortem has occurred – it is an examination of the beliefs and attitudes that project members bring with them into post-mortems. These attitudes can ultimately cause the failure of a post-mortem, even before it has begun. It is somewhat paradoxical that team members initially espoused positive views about post-mortems in a survey, yet further examination of key informants showed that these espoused views did not translate into reality. It is shown how hierarchical groupthink can help to forge negative beliefs and attitudes about post-mortems that will have a detrimental affect on the process itself.

Keywords: project evaluation; hierarchical groupthink; project post-mortem; espoused theory

1. Introduction

Project post-mortems strive to evaluate the current project, with the goal of providing guidance and potential solutions for similar issues in future projects (Wiegers and Rothman, 2001). Although post-mortems are advocated in a wide spectrum of systems development methodologies, several authors (Yourdon, 1998; Kwak and Stoddard, 2003; Hoffman, 2005; Olson and Stimmel, 2002) have cast doubt on their actual usefulness. The doubts centre on the ability of the team to honestly evaluate their own work in the project, and the work of others. Allied with this is a further doubt that the results of post-mortems (the lessons learned) are actually used in future projects. This paper describes research into project post-mortems that examines the potential problem where developers and managers bring biases about the post-mortem process itself into the post-mortem process. While research to date has found problems with the process itself (Yourdon, 1998; Kwak and Stoddard, 2003) and the use of the output of the process (Hoffman, 2005; Beynon-Davies et al., 2004), this research concentrates on the attitudes that project members bring with them about project post-mortems. These attitudes are actually in conflict with what the project team members proclaim to be their beliefs regarding post-mortems. Project team members espouse a belief that evaluations of projects, through post-mortems, are a useful exercise and would encourage additional use of post-mortems. The reality, though, is that conflicting beliefs actively work against their espoused belief in post-mortems. Ultimately, this will cause the exercise of conducting post-mortems to ultimately fail or, at the least, be less effective. If project members have negative biases against post-mortems, then it will make it more difficult to effectively evaluate a project. Existing research has concentrated on the post-mortem process (who is involved, what should be done, etc.); this paper examines the beliefs that are brought into post-mortems, through the use of a survey followed by interviews with key informants from project teams. The next section outlines the existing research into post-mortems and is shown to concentrate on the process of post-mortems, and their output. The use of a survey to determine the espoused beliefs of project teams is then explained. The use of key informants is then justified as the next step in the research. Finally, the analysis of the key informant interviews is presented with conclusions drawn from this research study.

2. Project post-mortems

For future projects to improve, it is necessary to learn lessons from previous projects. The goal of a project evaluation is to determine if project management is achieving its objectives (Phillips et al., 2002). The majority of software methodologies recommend a review of the project to examine what worked and what needs improvement. Examining previous projects "can help to sensitise project participants to the potential obstacles to a new projects success" (Al-Shahab et al, 2004, p.10). This is the perceived benefit of project post-mortems – providing guidance for future projects. The word "perceived" is deliberately used, as there are potential problems with post-mortems.
There are various names for this exercise, but the most commonly used is project post-mortem. Schalken et al. (2004) use the term post mortem project evaluations. Although Kerzner (2003) uses the term project evaluation to describe a post

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mortem of a project, the phrase is also used to describe an evaluation of a project member by a manager. Rainwater (2002) hopes that the term post-mortem is not used as its association with the medical practice of examining the dead gives a bad impression of its role. Wiegers and Rothman (2001) concur, arguing that project post-mortems examine success and failure – not just dead projects. They argue for the use of the term project evaluation. Kerth (2001) restricts the use of the term post-mortem to describe a review of projects that have failed (or died). Yourdon (1998) uses the term project evaluations or audits, while Wiegers (2001) refers to them as project reviews. Power (2002) refers to project evaluations, in the context of DSS projects, as occurring before the project – feasibility studies in affect – while Lewis (2001) description of project evaluations is more akin to project reviews during the project rather than at the end. Whichever term is used, project post-mortems are frequently recommended in projects by proponents of the harder, process based, methodologies but also by the softer methodologies such as the agile methods.

2.1 Concerns with project post-mortems

Despite the many advocates of project post-mortems, there is not universal agreement as to their usefulness. Yourdon (1998) contents that post-mortems rarely work, in that they do not achieve their goals. Developers, at the end of projects, are too exhausted, frustrated, cynical, and fed up to perform the task well. Kwak and Stoddard (2003) discuss further concerns with project post-mortems. Often they are “feel-good” exercises and part of going through the motions; in other cases, if a project is unsuccessful, people do not want to draw attention to this fact (Hoffman, 2005). In fact, most organisations do not perform proper reviews of the project at all. Even if a post-mortem occurs, it is debateable whether the reports from previous post-mortems are actually reviewed or discussed (Olson and Stimmel, 2002). Yourdon suggests mini-audits conducted at several stages throughout the project. This could be considered as continual assessment. Humphrey (1989), referring to post mortems as phase reviews, is in agreement with Yourdon in that they should be held at prearranged times during the project. Keil et al. (2000) found that regular reviews assist in reducing the likelihood of a project escalating. Highsmith (2004) believes that project reviews should add value, not only to future projects, but also to the current project. Highsmith clearly differentiates post-mortems from reviews as post-mortems only occur at project end (the death of the project). Post-mortems need to be held regularly where the team evaluate their performance. Salo et al. (2004) concur, arguing that the processes followed by the project team (agile processes in their case study) need to be regularly evaluated and refined. Highsmith and Salo et al. are specifically referring to Agile projects, but there should be no reason why the same should not apply to other software development methodologies.

2.2 Explanations for the failure of project post-mortems

Various psychological and sociological reasons have been proposed as to why project post-mortems are ineffective. Although not specific to post-mortems, sociological research into evaluation is pertinent to the area of post-mortems that are effectively evaluations of work. Individuals are found to overestimate the performance of those they have positive relationships with (or who have higher status), while underestimating the performance of those where the relationship is poor (or who have a lower status) (Sherif, 1971). This has implications for post-mortems in that the project teams are asked to evaluate their own work and the work of others. Crocker et al. (1993) adds that people attribute success to their team’s abilities and failures to external influences. The Pygmalion Effect, described by Carreira and Silva (1998), shows how an individual’s expectations of something to be evaluated will affect the evaluation. The example given is of testing software. If the tester has a positive opinion of the code, or developer, then the evaluation will most likely confirm this opinion (whether the opinion is right or wrong, or the code good or bad). Yourdon (1993) states that developers cannot find bugs in their own code. In fact, developers strive to prove their code works, rather than finding fault with it. The Pygmalion Effect is similar to cognitive dissonance where an individual finds it difficult to find fault with his or her own work or decisions. Weinberg (1971) describes the theory of cognitive dissonance. The context it is described in is programmers evaluating their own work. Festinger originally described cognitive dissonance as individuals attempting to reduce cognitive discrepancies, even by changing their opinion (Festinger and Carlsmith, 1959; Aronson and Mills (1968); Festinger and Aronson, 1968; Cartwright and Zander, 1968; Taylor, 1971; Brock and Blackwood (1971); Harmon-Jones, 1998; Schelling, 1989; Landy and Conte, 2004; Statt, 2004).

This concept could be applied to project post-mortems, which involve the evaluation by a team of their own work and decisions, and the work and decisions of other teams in the project. This implies a concern for post-mortems as it could be

extrapolated that project teams will tend to attribute success and failure in a biased manner.

Abdel-Hamid and Madnick (1990) discuss a further failing when learning from project failures. People are more prone to covering up their mistakes than highlighting them. Kwak and Stoddard (2003) attribute this failing to the propensity within companies to "shoot the messenger." This deters people from reporting problems. Kirkpatrick et al. (1992) concur, describing how the bearers of bad news are received negatively. Chapman and Ward (2002) refer to the tendency to avoid revealing bad news as the conspiracy of optimism. Beck and Fowler (2001) specifically describe a reluctance to reveal bad news regarding the project's schedule as schedule chicken – no team want to be the first to report on a schedule miss (this would only occur during regular project reviews as opposed to a final post-mortem). Busby and Payne (1999) show a further effect on the estimation of projects based on post-mortems. Project post-mortems provide input into the estimation of future projects. Estimates of work often rely on comparisons to previous projects. Overconfidence is evident as individuals demonstrate a bias for evidence that supports their view, or estimate, while ignoring the evidence that contradicts. The positive reinforcers overwhelm the evidence of any negative reinforcers, as described by Arrow et al. (2000) and Brown (1980).

The research above concentrates on the reasons for the failure of project post-mortems. The failure occurs because the post-mortems are not performed correctly or their output not used correctly. Various sociological and psychological influences have a detrimental affect on the process. This paper investigates the attitude of developers towards the entire process, as opposed to examining failures during and after the process. These attitudes, which project members bring with them to post-mortems, may be having an affect on the post-mortem process itself. During this research project, it was noted that developers had what appeared to be a positive view of post-mortems, yet this was rarely translated into effective action. What follows below is an examination of why this positive attitude did not lead to effective action.

3. Research approach

This research was approached in two phases. Developers and project managers from two diverse software development organisations were surveyed to determine their view of post-mortems. Following the survey, the results were analysed and a need for further examination was determined. Four key informants were chosen (from the two organisations used in the survey and a further organisation) to provide further insights into the results of the survey. A fifth key informant was interviewed at a later stage in the research to illicit further refined information. This approach was chosen, as surveys on their own are unlikely to determine social processes at work. Sawyer and Guinan (1998), investigating the production and social processes involved in software development, used surveys and interviews. They justify this, as they believe that this is the best method to gather data on perceptions of production and social processes. There is considerable justification for the use of key informants. Examples include: Poggie (1972), Kumar et al. (1993), Schwenk (1985), Tremblay (1982), Holloway and Tordres (2003), Zelditch (1982), and DeSanctis et al. (1996). Key informants have been used to examine social influences (Jasperson et al., 1999) and they have also been used to examine projects (Van Fenema, 1997). Although researching inter-organisational relationships, Kumar et al.(1993) make a point that is of relevance to the use of key informants in all research. Key informants are often used where there is a lack of archived data. The example given is data on commitment or power. Schwenk (1985) makes the same argument, although his research was on organizational decision-making, where there is little archived data on the decision process – merely the result of the decision process. The attitude of project members to post-mortems is an area that would not be documented in a firm so the use of key informants is the approach chosen to investigate this area.

The initial survey was distributed to 25 developers/project managers divided between each organisation. The two organisations chosen were software development organisations, but their core industries were different to ensure that there would be different influences for those completing the survey. The results of the survey provided areas for further investigation. This investigation took the form of interviews with four key informants. Interviews with the key informants were unstructured, in accordance with the recommendation of Cowles et al. (2002) who regard the use of key informants as a naturalistic method of research. It is suited to situations where the underlying theory is not fully formed. As such, unstructured interviews are required – Cowles et al. refer to these as loosely structured. After the initial findings, two of the key informants were used to both verify the findings and to further refine them. An additional key informant was added at this stage to objectively review the existing findings.

4. Survey results and further analysis through interviews

4.1 Survey results from the two development organisations

The initial phase of this research involved a survey of project team members across two development organisations. A total of 20 surveys were returned out of the 25 project team members. The survey was voluntary so the 5 team members (3 in one team and 2 in the other) were not pursued for the survey or their reason for non-completion. In the survey, the project teams were asked

- Do you agree with the following definition

Post mortems are project evaluations that discuss the successes and failures of a project. Lessons learned during the project are discussed and recorded.

- In your opinion, are post mortems performed simply to comply with process (i.e. because they must be done) or are they a beneficial tool in a project?
- How many post-mortems have you contributed to (either with information or by attendance)?
- At what stage of the project does the post-mortem occur?
- Does you team follow through on recommendations from a post-mortem? Indicate if this is the norm?
- Does you team
    - Undertake their own post-mortem
    - Take part in a larger post-mortem involving other teams
    - Both
- Do you believe that your team should undertake its own post-mortem

The main results of interest from the survey are described below:

- All project members had contributed to at least one project post-mortem.
- The majority (70%) of post-mortems occurred at the end of a project.
- 50% of project members stated that their team had never acted upon the recommendations of a previous post-mortem.
- 70% of teams within a project did not perform their own project post-mortem. They relied solely on the overall project post-mortem.
- 100% of teams believed that their individual team should perform post mortems.

The first four findings are consistent with the research into post-mortems described above, with one exception. Hoffman (2005) provides a figure of 13% as the number of IT projects performing post mortems. This low figure may be explained by the fact that it is expensive to hold an evaluation of all projects so only major projects are chosen. The survey though, found that all respondents had taken part in a project post-mortem, thus implying that most projects are evaluated. What does appear somewhat paradoxical in the survey results is the attitude of team members from both organisations towards post-mortems. Although the application of the process of post-mortems is poor, there is a desire on behalf of the developers to apply them correctly. This discrepancy between belief and action appears to match Argyris and Schon's (1978) description of Espoused Theories versus Theories In Use. Espoused theories are the beliefs that we describe ourselves as having – in this case the project members described how they believe in the value of post-mortems. Theories in use guide how we actually behave – what actually guides us as opposed to what we profess to guiding us. 100% of those surveyed espoused their belief in the usefulness of project post-mortems, yet half of these did not translate these espoused believes into actual use. To further investigate this paradox, it was necessary to delve further into the projects by interviewing key informants.

4.2 Explanations for the paradox of project team views versus reality

The four original key informants (a fifth key informant was used later) were interviewed with the goal of determining the reasoning behind the project members espoused belief in the value of post-mortems and the lack of follow through of this belief. Despite the fact that each informant originally stated their belief in the value of post-mortems, it became clear that there were underlying problems that ensured that that these beliefs did not translate into actions. A common theme in the interviews was the belief that each team (represented by the key informants) had that they themselves knew what were the problems and solutions for their projects and that presenting this view to others (in a post-mortem) was "a waste of time." What is interesting to note is there was no suggestion that they were covering up failures, merely that "outsiders" would not know how to use the teams input into a post-mortem. One informant who declared summed up this view, "my team knows what the problems in the project were and what to do to fix them. There is no point in involving others as they will only add overhead rather than helping to fix the problems."

From discussions with the project team, the team members consistently ranked themselves as

highly effective and enjoyable to work with. It is worth noting that they are referring to their own team, which is a subgroup of the entire project team. Each key informant concurred with this view, and this formed their belief in the ability of their own teams to solve their own problems without the use of a post-mortem involving other groups. Three of the four original key informants made the declaration that their team had faced these types of problems before and were more than capable of fixing them without involving others. Again, no reference was made to a desire to cover up failings - they felt that there was simply no need to involve others. Each informant felt that, by involving others, extra overhead would be added through additional processes. Two informants specifically stated that the other groups in a project might need additional processes to help them with problems experienced during projects but that their group preferred to work things out themselves. Each informant was asked if they felt that other groups could provide useful information to their team in a post-mortem. The informants accepted that this may occur, but their acceptance was grudging acceptance at best. Two informants stated that the other groups do not understand was their team does, so it is unlikely that they could provide much benefit to them in a post-mortem. The other two informants accepted that other teams input into a post mortem might help with some minor problems but not with major ones.

From the key informants' responses, it is clear that they find little value in conducting a post mortem which involves input from other teams – a likely occurrence in any project post-mortem as all teams are involved. Questions were then asked of the informants as to why they did not conduct their own team post-mortems. Again, the informants had a common response in that their team knew the problems they experienced in a project and what solutions were required. Having an official post-mortem was viewed as unnecessary overhead. One informant stated that "we know what we need to do and we get on with it." When this view was described to the other three informants there was agreement from each. The responses from the key informants, allied with the results from the surveys pointed towards the possibility of groupthink having an affect on the poor implementation of project post-mortems. The general consensus of those surveyed and the key informants (although coming from different project teams) gave the first indication that groupthink may be present in the projects under consideration. Cohesion is a major factor in groupthink and each team member in the survey expressed their enjoyment of working with their team. Groupthink is defined by its originator Janis (1972, p.9) as "a deterioration of mental efficiency, reality testing, and moral judgement that results from in-group pressures." Ottaviani and Sorensen (2001) define it as "the psychological drive for consensus at any cost that suppresses disagreement and prevents the appraisal of alternatives in cohesive decision making groups." Janis (1972) presents six problems that group think brings – the symptoms of groupthink:

- Little or no consideration of alternate plans
- Risk is not reassessed
- No review is taken of rejected plans
- Advice from outsiders is not sought
- Facts that support the plan are acknowledged, facts that so not support the plan are ignored
- Contingency plans are not created

These symptoms were compared to the result of the survey and to the interviews with key informants to determine if groupthink was affecting the attitude of team members to project post-mortems (and ultimately affecting whether post-mortems were performed or not).

Table 1: Groupthink indicators.

Little or no consideration of alternate plans: The key informants believed that their group were the only people who could determine what problems existed and how to correct them in future projects. In doing so, they are ignoring possible alternate plans to solve future project problems.
Risk is not assessed: The attitude of three informants, that their team were more than capable of fixing any future problems found in the project, could be taken as over-optimism. With over-optimism comes a tendency not to correctly assess risk.
No review is taken of rejected plans: The over-optimistic attitude of the informants may imply a lack of consideration of alternate plans.
Advice from outsiders is not sought: This symptom of groupthink came across strongly. The informants' argument against post-mortems was that others could not provide any, or very little, useful information. In fact, the informants' opinion of groups other than their own was poor.
Facts that support the plan are acknowledged, facts that do not support the plan are ignored: Again, the fact that the view of outsiders was not sought may indicate that this symptom of groupthink was playing a part.
Contingency plans are not created: Again, the over-optimistic belief in the informants own team's ability implies that alternate plans are not considered. Two informants suggested that others would suggest processes as solutions to their problems in the project. This solution was regarded as suitable for "lesser" teams, but not their own. It appears that little consideration is given to whether these processes would in fact provide benefit.

Table 1 indicates a correlation between the symptoms of groupthink and the descriptions of projects given by the key informants, highlighting a potential problem. Groupthink appears to be having an impact on the informants' desire to conduct, or be involved in, project post-mortems.

4.3 Confirmation of findings and an explanation offered

It was still unclear though where this groupthink originated – what could cause groups to harden their belief that the evaluation of projects does not provide benefit. Two of the key informants were re-interviewed while a further key informant was questioned. Each informant concurred, with the hindsight provided by the research findings, that groupthink was affecting how evaluations of projects were viewed and performed. While discussing these findings, each informant described phenomena of interest to this research. The first original informant, a developer, mentioned that his project manager was highly regarded, as he did not pretend to the team that evaluations were useful. As the project team itself found these evaluations to be ineffective it was "refreshing to have a project manager who didn't try to pretend to us that they were useful." The second original informant, a project manager, agreed that groupthink was affecting the project team's view of evaluations so he was not going to go against the team. While it may appear from this that the project managers are affected by the team's negative attitude it is actually a question of which came first – the chicken or the egg. Is the team affecting the project manager or is the project manager affecting the team. The final key informant, who had not taken part in the original interviews, was able to objectively examine the findings on groupthink. When it was put to her that her project team could demonstrate a common negative opinion of project evaluations, the response was that "if the project manager feels that they are useless, why would the team think any differently." These interviews point to the fact that the groupthink appears to be "directed by" the project manager. This fits with the description of hierarchical groupthink as opposed to the commonly described peer groupthink. Cartwright (2002) specifically differentiates, and names, two types of groupthink. Peer groupthink originates in a need for conformity and close integration within a team. Huczynski and Buchanan (1991) argue that the synergy and loyalty, which are regarded as team's greatest benefits, are the same factors that lead to groupthink. Hierarchical groupthink originates in a desire to please a leader, specifically the desire not to disagree with them. It is similar to approval-seeking behaviour as found in Lippitt et al. (1968) and ingratiation through conformance with the leaders view, described in Jones et al.(1968) and Hurwitz et al. (1968).

A desire to conform to the view of the project manager and the project team has lead to hierarchical groupthink. This created a common view of evaluating projects through post-mortems, and the view is a negative one. This negative view of the evaluation process occurs prior to the evaluation itself, and will thus negatively affect the evaluation itself.

5. Conclusions

It is clear from the analysis above that hierarchical groupthink is having a detrimental affect on the project team's view of project post-mortems. While traditional research has shown problems with the actual process of post-mortems and highlighted concerns regarding the use of the post-mortems for future projects, this research shows that there are problems before the process has even begun. Al-Shehab et al. (2005) argue for project evaluations, or post mortems, to be seen as risk management exercises, through the creation of visual models of the risks. While this is a useful exercise, the risk identified in this paper occurs before the project has even begun. Hierarchical groupthink is shown to have a negative impact on the team members' impression of post-mortems, even though project members espouse a positive view in the survey. This hierarchical groupthink tends to convince team members that the process itself is not valuable – it would even be portrayed as a waste of time.

This research does not argue against the previous findings on post-mortems, in fact the initial survey results concur with much of the earlier research. What differentiates this research from earlier research is a concentration on attitudes concerning the post-mortem that are prior to the post-mortem itself. These attitudes and beliefs can impact any future project. Existing research highlights problems that occur during and after the post-mortem. It is the view of this author that this research augments, rather than contradicts this existing research. Benyon-Davies et al. (2004) argue that the evaluation of a software development project should be a continuous process. The findings of the paper do not disagree, yet there is a need to add to their argument. The evaluation process – the post-mortem – must itself be evaluated to determine how the negative attitudes towards post mortems can be mitigated or removed. An evaluation that the participants regard as a waste of their time can hardly be an effective evaluation. While Sirkin et al. (2005) found that projects that evaluated

progress frequently were more likely to succeed, if the project team have a negative opinion of the evaluation process then more frequent evaluations may not be effective.

While the chosen research method was effective for this piece of research, there are areas of concern. Without the use of key informants, it is unlikely that the occurrence of hierarchical groupthink would have been found. It is difficult to build a rapport with informants to the degree that they will admit to faults, not only in their own projects but also, in themselves. This researcher was able to develop a relationship, over a long period of time, with the five key informants used, but it would be extremely difficult to develop such a relationship with a larger number of individuals. This would limit the number of projects that could be investigated. The number of projects studied in this research does not enable claims of generalisation. In fact, each project team and project manager was highly regarded by its members (high cohesion) creating an element of uniqueness of the cases. Future research could examine if the same problems are seen in teams with low cohesion. What is not clear from this study, and a potential area for future research, is how these attitudes should be managed. Cohesion is strived for in teams, yet it is this cohesion that can cause the groupthink that ultimately works against the effectiveness of project post-mortems. The solution appears to be in the attitude of the project manager - how to change this attitude is a further area for research.

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