

Information Systems Project Post-Mortems: Insights from an Attribution Perspective

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Information systems (IS) project failure is a costly and common problem. This is despite advances in development tools and technologies. In this article, we argue that one reason for this is the failure of project post-mortems to generate constructive “lessons learned” from previous projects. Over time, the ineffective practices would persist in the organization, rendering it resistant to change. The attribution theory literature serves as one of the few promising theoretical bases to explain why project post-mortems fail. A case study of a project post-mortem undertaken for an abandoned electronic procurement system project is discussed and analyzed. We identify five antecedent conditions of attribution error: the presence of self-appointed mindsets, the general persistence of negative beliefs, memory decay, selective recall of project events and the influence of power dynamics within the organization. We discuss the research and practical implications of these findings and suggest how the problem of attribution error may be minimized in project post-mortems.

Introduction

Information systems (IS) project failure is a widely recognized problem in the software development community (Ewusi-Mensah, 1997; Pan & Pan, 2006). Prior research suggests that the high incidence of failed IS projects may be due to the dearth of effective solutions to prevent project failure (Pan, Pan, Newman, & Flynn, 2006b). To date, several approaches have been suggested to address the

issues associated with IS project failure. Besides strict adherence to the “best project practices” (Lyytinen & Robey, 1999), experts also suggest gathering ex-post project knowledge through project post-mortems (Cannon & Edmondson, 2005; Collier, Demarco, & Fearey, 1996; Tax & Brown, 1998). Among these approaches, several claims have been made about the significance of the project post-mortem, including “(the) post-mortem is the best way to eradicate IS project failure” (Birk, Dingsoyr, & Stalhane, 2002) and “(the post-mortem) should be made standard practice for all cancelled projects” (Ewusi-Mensah, 1997, p.80). Nevertheless, records suggest that project post-mortems often fail to live up to their claimed significance (Lyytinen & Robey, 1999; Wastell, 1999). The deficiencies could be due to a fundamental issue described as ‘attribution error’ in the project post-mortem process. This issue has so far been remotely addressed by IS executives and could potentially affect the effectiveness of the project post-mortem as a project learning tool.

Generally, attribution error may be characterized as discrepancy in the attribution process during analysis. People may attribute their own behavior to an internal cause (personal ability, personal effort) in cases of success but to an external one (difficult task, poor chance, bad luck) in cases of failure (Heider, 1958, 1976; Henry & Martinko, 1997). Generally, attribution error is said to have occurred when one presents one’s attributions based on the notion of blaming others for mistakes in the project and accepting none of the responsibility for the errors. It is a phenomenon well documented in the social psychology literature (Hewstone, 1989) and applicable to the IS context (Henry & Martinko, 1997; Karsten, 2002; Kelley, Compeau, & Higgins, 1999; Magal & Snead, 1993). Attribution error can be exacerbated by the

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reluctance of project group members to admit the mistakes committed in previous projects (Brown & Jones, 1998). Under such circumstances, they tend to attribute negative outcomes to external causes rather than their own processes (Kelley & Michela, 1980) in order to absolve themselves of blame (Ewusi-Mensah, 1997; Peterson, Kim, Kim, & Tamura, 2002). Thus, while project failure may be linked to the abilities of project group members or their processes, information explaining the causes may not be reliably obtained. This could pose a serious problem since a social phenomenon such as the effectiveness of project post-mortems could only be understood through the eyes of the people who are studied, and the existence of attribution error would likely escalate the subjectivity of the phenomenon.

This paper draws on the attribution theory literature to explore the possible reasons for ineffective IS project post-mortems. The main reason why the attribution theory perspective is selected is that it has not been explored in the existing project management literature despite its potential as a promising theoretical lens to assess the effectiveness of learning from project post-mortems. Even though attribution theory may not explain all aspects of project post-mortem failures, we believe it can provide practitioners with insights on the interpretation of project members' attributions during project post-mortems. An example of how attribution theory may apply is to first assess whether attribution error occurs in project post-mortems (i.e., this is likely since prior literature suggests the tendency for project members to always attribute failure to factors external to themselves) and then identify the antecedent conditions of attribution error.

The main thrust of the article is as follows: Project managers and group members may fail to learn effective means to solve problems that are apparent in IS projects due to attribution error during project post-mortems. Without the appropriate structures and incentives for learning, attribution error would contribute to defective practices persisting in the organization (Lyytinen & Robey, 1999), rendering it resistant to change. Worse still, project managers and group members may even learn to fail (Jones & Hughes, 2001; Pan, Pan, & Hsieh; Pan, Newell, Huang, & Galliers, in press; Tan, Pan, Lim, & Chan, 2005) in the long run. Against such a backdrop, we present an exploratory study of a project post-mortem for an abandoned electronic procurement (e-procurement) system project. Our focus is the project members' perceptions of their own attributions in the project post-mortem. The two main research questions are as follows:

- Does attribution error occur in IS project post-mortems?
 What are the antecedent conditions that may influence attribution error?

Past Research

The adoption of the best project practices and quality standards during the development process has led to significant

improvements in rectifying the issues associated with software development failure (Drummond, 1995; Royer, 2003). In practice, major organizations have embraced project post-mortems as a learning mechanism; the reviews complement the use of development methods and quality standards to improve software project development processes. For example, Scarbrough, Bresnen, Edelman, Newell, and Swan (2004) outline propositions on two major processes of project-based learning: learning-by-absorption and learning-by-reflection. Apple uses a method that includes designing a project survey, collecting objective project information, conducting a debriefing meeting, keeping a project history day, and finally publishing the results (Collier et al., 1996). Microsoft, on the other hand, emphasizes post-mortem reports that include discussions on "what worked well in the last project, what went wrong, and what the group should do to improve in the next project" (Cusomano & Selby, 1995). Despite their wide adoption, project post-mortems have in reality enjoyed very little success in providing valuable "lessons learned" to prevent future project failure due to psychological barriers, team-based shortcomings, epistemological constraints, and managerial problems (Urban & Witt, 1990). Keegan and Turner (2001) also suggest that time pressure, centralization, and deferral are key reasons that impede project members' learning from and through projects. For that reason, it is important to explore some of the possible reasons behind ineffective project post-mortems and help address them.

Concepts drawn from attribution theory (Shaver, 1983) can be used as a lens to examine some of the reasons behind the deficiencies in project post-mortems. The theory centers on the question of how people causally explain behaviors (Harvey & Weary, 1985), and it offers a means to investigate how people attempt to explain the causes of their successes and failures. Generally, people attribute their own behavior to an internal cause (personal ability, personal effort) in cases of success, but to an external one (difficult task, poor chance, bad luck) in cases of failure (Heider, 1976). Such attributions, however, carry a certain degree of bias (Weiner, 1995), which could disturb the attribution processes of mutually dependent and interacting individuals (Weber, 1994). Attribution concepts have also been used regularly in the IS literature, such as to explicate the usage of decision support systems (Hughes & Gibson, 1987), end user involvement (Magal & Snead, 1993), rejection of information technology (Henry & Martinko, 1997), and individual reactions to Enterprise Resource Planning (ERP) systems (Kelley et al., 1999). Most of these studies are based either on laboratory experiments or survey instruments aimed at uncovering relations between variables. None uses a case study to capture the organizational dynamics of the phenomenon of ineffective project post-mortems.

Furthermore, many of the existing IS project management studies focus only on why organizations fail to learn from their project experiences; none has examined the reliability of attributions made during IS project post-mortems. Given the recognition in existing research that learning takes

place within and from projects (Schindler & Eppler, 2003), our proposition in this study is: Attribution error may lead to ineffective project post-mortems since the best practices identified and the mistakes made may not have been acknowledged and made into valuable lessons learned for future projects. We will trace the antecedent conditions that affect attribution error and discuss their possible influences in the subsequent sections.

Methodology

Research Strategy

Given its exploratory nature, our research employs an interpretive case study approach (Klein & Myers, 1999). The research site is a large metropolitan borough council located in the United Kingdom. Called ECouncil (a pseudonym), the organization is considered a public organization. At the time of our study, ECouncil served a local population of 221,000 and provided a wide range of services that supported the active involvement of citizens. This study focuses on a project post-mortem conducted by ECouncil for an abandoned e-procurement system project called E-PRO (a pseudonym). Prior to the launch of E-PRO, procurement activities at ECouncil were mainly paper-based and recorded by batch-processing systems running on large mainframe computers.

Data Collection

We negotiated research access with ECouncil in late December 2001. At that time, the council had just completed its brief internal post-project review of the abandoned E-PRO project. Although we did not gain research access on time to participate in the council's actual postmortem meetings, we were given a copy of the review summary that provided the initial basis for our investigation. Data collection in the field began with a meeting with the IS strategic director, who provided additional documentations (the project review report and information on how project post-mortems were carried out in ECouncil). By examining this information, we were able to reconstruct the history of ECouncil's project post-mortem practices. Over the next 10 months (January to October 2002), secondary data such as reports, memos and meeting minutes were gathered to supplement the information collected through interviews. We conducted 28 semi-structured interviews, each lasting an average of one to one and a half hours. Altogether, 17 interviewees were involved. Details such as the dates of the interviews, the interviewees' job titles, the duration of the interviews, and whether a transcript was produced are shown in Appendix A.

For the interviews, we drew up a set of topic guides that focused on how project members would attribute causes to the abandoned E-PRO. Excerpts of the interview topic guides are shown in Appendix A. Even though interview topic guides were used, the interviewees were allowed to express their views on other aspects they considered important. Material drawn from the project post-mortem and attribution

theory literature guided the design of the questions. All interviews were conducted on a one-to-one basis by the field researcher. Most interviews were taped-recorded and transcribed with the interviewees' permission. In the few instances where the interviewee refused permission for or appeared uncomfortable with the use of the tape recorder, notes were taken (Yin, 1989). Additional observations were also noted immediately after each interview. Two rounds of interviews were conducted for every project member. The first round of interviews focused on why the project members attributed the abandonment of E-PRO to the causes they had identified in the official council post-mortem. The second round of interviews centered on whether they perceived inconsistency in their attributions. The second round of interviews was conducted exactly 2 weeks after the first round to allow a more thorough examination of what the subjects had said in the first round of interviews. Those project members who admitted that their attributions were inconsistent were asked to indicate what other causes could have contributed to the decision to abandon E-PRO. They were also asked to identify the possible antecedent conditions that they perceived could bring about attribution error.

We acknowledge that it may be difficult to assess the truth of interviewees' accounts through only two rounds of interviews. A more robust analysis would require access to their innermost thoughts and motivations for project reviews. However, this is clearly unrealistic in a field study such as ours. To overcome this limitation, we tried to minimize the reservations that interviewees might have in speaking their mind by clearly explaining the objective intent of our study, which was to help improve future project management performances within the council. In addition, we emphasized our respect for the interviewees' privacy: We conducted all our interviews on a one-to-one basis and assured the interviewees that all interview conversations would be kept confidential, even from their colleagues.

Data Analysis

As a first step in the analysis, we used background documents and transcripts of the interviews to create detailed narrative histories of E-PRO and of the prevalent project post-mortem practices at ECouncil. Knowing the histories would help unravel the entanglement between phenomenon and context (Pan, Pan, & Hsieh, 2006a). Next, we created two lists of project members' attributions of why E-PRO was abandoned. The contents for both lists were derived from the two rounds of interviews. The two rounds of project members' attributions were compared and contrasted against the detailed narrative history of E-PRO. The triangulation was to allow for the validation of each data source and enrich the researchers' interpretation of the data (Yin, 1989).

Next, by corroborating the antecedent conditions that could induce the instances of attribution error identified by project members and the evidence found in the prevalent project post-mortem practices within the organization, the field researcher developed a list of antecedent conditions

that could induce attribution error. Material drawn from attribution theory guided the design of these conditions. The list of conditions represented the field researcher's interpretation of the evidence gathered from the interview transcripts and internal documents. To reduce researcher bias and also to validate that no important event had been missed in the case summaries, the interview transcripts were shown to another researcher who played the role of an independent reviewer. The independent reviewer was not involved in the fieldwork and was therefore, at that stage, unfamiliar with the case. The involvement of this independent reviewer was to "bring a different and possibly more objective eye to the evidence" (Eisenhardt, 1989). The information that he received did not include the list that the field researcher had developed about the antecedent conditions that could induce attribution error. Instead, the independent reviewer developed his own list. The field researcher and the independent reviewer then gathered and combined their respective lists into a shared list of antecedent conditions that could induce inconsistency in the attributions of E-PRO's failure. In cases where the condition was difficult to categorize, both researchers used their own judgment to assign the conditions that seemed to best fit the information presented. The final step in our analysis involved generalizing our results to the theoretical concepts linked to the project post-mortem and attribution theory literature. The entire analysis process was highly iterative. It involved rigorous cross-checking of interview transcripts and case documents with theory. This approach is similar to the pattern-matching technique for case analysis advocated by Yin (1989).

During the data analysis, we associated the assessments obtained from the two rounds of interviews with the archived records of the development project and used the results to verify the reliability of the interviewees' responses. The triangulation approach used in this study should allow us to develop a richer understanding of the antecedent conditions that could induce attribution error. Intersubject reliability was increased by using narratives from one subject to confirm or contradict others in social triangulation, but there was no attempt to privilege one account over another. The field researcher judged that there was no overt attempt by the subjects to systematically conceal details or distort their stories.

Case Study: ECouncil

Background

ECouncil is a public organization in a large metropolitan borough in the United Kingdom. At the time of our study, it had 80 service sections that looked after 221,000 residents. E-PRO was part of the council's ambitious plan to purchase its supplies through a paper-free system. The e-procurement system involved putting both the tender and purchasing processes on a Web-based system for internal handling and external communication with suppliers. The project was by far the most complicated in terms of the number of stakeholder groups, with eight user departments and at least 70

suppliers. The project started in early 2000 with an initial budget of £750,000 and a completion deadline of June 2001. The project was eventually abandoned in December 2001, at an estimated cost of £1 million. The council's internal post-project review suggests an array of possible reasons might have influenced the abandonment of E-PRO.

Furthermore, the council had a poor project management history, with several cancelled projects, cost overruns, and project delays in the past. According to the estimates given by the IS strategic director at ECouncil, at least 40% of the previous IS projects were late and over the budget, 20% were abandoned, and 60% of the completed projects failed to meet the original objectives. Generally, the senior management viewed these poor management practices as unavoidable and the practices became an acceptable norm within the organization. Interestingly, many interviewees observed that several mistakes found in E-PRO were similar to those committed in previous projects. For example, users were allowed to change their requirements freely even though they had already signed off and accepted the prototype. Such regular and excessive changes often resulted in users experiencing serious conflicts with software developers. This apparent lapse cast serious doubts on the council's project post-mortem practices and their effectiveness.

Project Post-Mortem Practices

The council had a policy of conducting post-mortems after every project. However, many people underrated the importance of these reviews. Once a project had been completed, staff members in the department were satisfied simply because the project had gone "live." They rarely followed project procedures to undertake comprehensive reviews of all their project experiences. As an IS analyst in E-PRO commented, "We were not very good at going over and taking note of what the problems had been" (January 25, 2002, #4). Another obstacle that was cited was that there were "too many concurrent projects to handle" to conduct any project reviews, with everyone more concerned about completing their existing projects. As a result, project group members were not diligent in reviewing and evaluating past project development processes.

Another key reason why project post-mortems were not given priority was the senior management's low involvement in these reviews. Some of the mistakes were apparently hidden away by project managers because they were responsible for the project failure. The IS programmer commented, "Most reviews for failed projects were conducted for 'ceremonial' purposes. The senior managers showed little interest in these reviews. . . . Some of them were apprehensive about their own mistakes" (January 28, 2002, #8). One important point noted from the interviews is that project members lacked interest and enthusiasm to participate actively in project reviews. Structural conditions for learning, such as rewards and incentives, were non-existent. As project groupings were temporary, members would return to their individual departments immediately after project cessation.

Furthermore, there was a high turnover of IS executives. This was mainly due to the attractive remuneration packages and vast training opportunities offered by the private sector. As the IS strategic director suggested,

We would never be able to compete with private organizations. Some of the employees, especially the younger ones, would leave after a few years, taking along with them valuable knowledge and experiences. Even though attempts were made to retain this valuable knowledge by making post-mortem report writing a requirement in project development, the reports were simply filed away and we would never see them again. (January 15, 2002, #7)

During project post-mortems, other problems would arise. One issue was the close relationships among project members. These relationships affected how members attributed project outcomes to probable causes, with many of them refusing to engage in discussions on situations where their “buddies” might be held liable. Therefore, even if some lessons from previous projects were remembered, members were “unable” to exercise changes based on the constraints of the close ties. As the project manager pointed out, “I have been in this department for 18 years, and most of them (the colleagues) are like my family” (January 20, 2002, #9). Others also displayed their loyalty towards one another by saying, “Some of us [senior members who had chosen to stay with the organization] have worked in the same project group for the last five years, and the bond we have is very strong” (IS analyst, January 25, 2002, #7).

In addition, the council did not stipulate when project post-mortems should be carried out. Often, post-mortems were conducted many weeks or months after the cessation of the projects. By then, many project members would already have started on new projects, and consequently, valuable lessons for internal learning were forgotten. Due to the reasons stated above, there was general belief within the council that project post-mortems were insignificant and ineffective.

Perception of Attribution Error

Most project members admitted that their attributions contained some degree of inconsistency, which they acknowledged would affect the reliability of the information collected during project post-mortems. The project manager recalled, “There would always be inconsistency in such situations. On hindsight, I think they did contribute to the loss of valuable information” (January 20, 2002, #10). The IS analyst also observed, “Inconsistent attributions played a big part in this organization. At times, favoritism set in to protect project mistakes made by ‘certain people’” (January 25, 2002, #11).

Most interviewees agreed that providing effective attributions would help improve the credibility of project post-mortems within the council and that would lead to improving the lessons learned from prior project experiences. As the purchasing officer explained, “If we could see some positive impacts emerging from these reviews, it would definitely

arouse greater interest. But often times, nothing new was gathered” (February 16, 2002, #6). The technical service manager added, “Sometimes, project members attending these post-mortems were too afraid to speak the truth. They tried to be politically correct in the things they said” (February 8, 2002, #9).

Case Findings

Effective attribution is an important step in gathering knowledge on prior project experiences (Peterson et al., 2002). Such learning would help reduce the tendency of similar mistakes being made in future projects. However, our findings suggest that attribution error could not be avoided. Almost all interviewees admitted inconsistency in their attributions. A summary of the key findings on whether project members perceived inconsistency in their attributions, and the antecedent conditions that we perceive had brought about them are presented in Table 1 (Table 1 also contains excerpts of the interviewees’ transcripts and the narrative history of E-PRO’s development process).

From our analysis of the case data, five antecedent conditions of attribution error emerge, which we will discuss in detail in the next section.

Presence of Self-appointed Mindsets

Our findings suggest that self-appointed mindsets that suppressed doubts about self-ability and efforts were present in two particular cases that influenced the project members’ attribution process. A self-appointed mindset here refers to a mindset that protects either an individual or a group from opinions and information that increase dissonance (Janis, 1972). Interestingly, the two people who in our case had self-appointed mindsets¹ were the IS strategic director and the IS project manager—both leaders in the project group. One possible explanation for the inconsistency in their attributions is that individuals with a high degree of personal responsibility are likely to engage in self-justification to show that the decisions they have made are “correct.” Additionally, they may also fear that if they admit to themselves and others that something is wrong, they could lose their effectiveness, their self-esteem, and perhaps even their identity (Shaver, 1983). Our finding reinforces Andrews’s (2001) explanation of self-serving bias which attributes to the desire to protect self-esteem and self-presentation. Self-appointed mindsets automatically absolve leaders of any personal responsibility for project failure in terms of their efforts and abilities as they have to “maintain a positive public image” (Peterson et al., 2002). This reason is more commonly witnessed in public organizations, since they often come under high political pressures such as the demands of interest groups and the

¹We acknowledge the limitation that there may be differential interpretations on this particular empirical evidence from the case. Changing opinions between research interviews could also be interpreted as, for example, lack of serious (self) analysis at the first interview.

TABLE 1. Summary of key findings on project members' perceptions of inconsistency in their attributions and the possible causes.

Project Member	Perceived Attributed Cause(s) of E-PRO Abandonment (After Round 1)	Other Cause(s) after Considering the Effect of Attribution error (After Round 2)	Condition that Brought About Attribution error
IS Strategic Director	<p>The project manager mishandled the project. IS strategic director: "The project manager ought to have addressed the users' doubts and offered them effective solutions. Even if his efforts had failed, he should have reported the matter to me without delay and not kept me in the dark for so long." (15 January 2002, #9)</p> <p>Comparative evidence extracted from the project development process: In December 2001, the IS strategic director was informed of the problems the project faced. He explained why the news came as a surprise to him, "I had appointed the project manager to lead the project. Besides, even at the bi-monthly management meetings over the project period, he did not inform me of any problems." (IS strategic director, 15 January 2002, #9)</p>	<p>"Maybe at times I should have been more hands on." (IS strategic director, 29 January 2002, #13)</p>	<p>Presence of self-appointed mindsets that suppressed doubts about his own efforts. {Note: Here, a self-appointed mindset refers to the mindset that protects either an individual or a group from opinions and information that increase dissonance (Janis, 1972).}</p>
IS Analyst	<p>Poor quality of software produced by the IS contractor. IS analyst: "To be honest, some of the mistakes they [the IS contractor] made were shocking. They were 'schoolboy errors'." (25 January 2002, #11)</p>	<p>"The prototype was designed solely by the project manager without any consultation with the users. But no one raised the red flag." (IS analyst, 8 February 2002, #13)</p> <p>"Two of our colleagues were transferred to another department after strongly voicing their disappointment with the prototype." (IS analyst, 8 February 2002, #13)</p>	<p>The influence of power dynamics within the organization.</p>
IS Project Manager	<p>Frequent changes in requirements by the users. IS project manager: "We spent some time making changes to the system prototype. In my view, these changes were not so critical. The users did not request changing any of the basic processing. What they wanted was that the system should present information in the way they preferred, which could always be dealt with later." (20 January 2002, #11)</p> <p>Comparative evidence extracted from the project development process: The changes intensified and became increasingly unmanageable. They increased from an average of 46 to 112 for every round of design meetings. To make matters worse, the user managers insisted on introducing two specialists from their departments who were more experienced with daily procurement transactions. One of the user managers explained why including two additional members in the project group was necessary, "They identified problems from the perspective of people 'on the ground', and we thought it was important that we included their viewpoints." (Head of corporate affairs, 22 February 2002, #8)</p>	<p>"Should have included users who were directly involved in daily operations from the project outset." (IS project manager, 4 February 2002, #14)</p>	<p>Presence of self-appointed mindsets that suppressed doubts about his own ability.</p>
Chief Procurement Officer Corporate Service Manager	<p>Chief procurement officer: "Simply unlucky." (2 February 2002, #3)</p> <p>Lack of effort from project group members. Corporate service manager: "Unfortunately, some of them didn't take their responsibilities seriously. There were always at least two to three people missing from our project meetings." (8 February 2002, #9)</p>	<p>"Cannot recall." (Chief procurement officer, 16 February 2002, #7)</p> <p>"Shortage of relevantly skilled IS analysts and an incapable project manager." (Corporate service manager, 22 February 2002, #13)</p>	<p>Memory decay. Persistent negative belief that project post-mortems were ineffective.</p>

(Continued)

TABLE 1. (Continued).

Project Member	Perceived Attributed Cause(s) of E-PRO Abandonment (After Round 1)	Other Cause(s) after Considering the Effect of Attribution error (After Round 2)	Condition that Brought About Attribution error
IS Programmer	<p>IS contractor's quality problem. IS programmer: "The two consultants sent by the contractor seemed rather inexperienced. They made silly and basic mistakes." (28 January 2002, #10)</p> <p>Comparative evidence extracted from the project development process: Version 0 was single-handedly designed by the IS project manager as he assumed that he had full knowledge of the purchasing process of the council.</p> <p>The IS project manager informed the software contractor of the changes, and the contractor proceeded with the revisions. Despite their great expectations, everyone including the IS project manager, IS analyst and the users, felt disappointed with Prototype 1: "They did not change some of the things we told them to. What was worse, they added new features which we did not even request for. They did not seem to understand what we really wanted." (IS project manager, 20 January 2002, #11)</p>	<p>"All of us felt that we had done our best." (IS programmer, 12 February 2002, #14)</p>	<p>Presence of self-appointed mindsets that suppressed his doubts about the group's efforts (emotional attachment to the group).</p>
Technical Service Manager	<p>Frequent changes to design requirement. Technical service manager: "There were indeed many changes. In my opinion, some of these changes could have been avoided by better communication among group members." (8 February 2002, #11)</p> <p>Comparative evidence extracted from the project development process: Despite several enhancements already added in Prototype 3, the changes intensified and became increasingly unmanageable. The changes increased from an average of 46 to 112 for every round of design meetings.</p>	<p>Nil.</p>	<p>Nil.</p>
Corporate Service Manager	<p>Lack of effort from project group members. Corporate service manager: "Unfortunately, some of them didn't take their responsibilities seriously. There were always at least two to three people missing from our project meetings." (8 February 2002, #9)</p> <p>Comparative evidence extracted from the project development process: One of the problems was that there were always two to three members missing from every project meeting. So when they returned at the next meeting, they would disagree with some of the decisions that had already been made in the meetings that they had missed. This greatly affected the whole decision-making process. It was obvious from further discussions that the IT department did not understand some of the changes the users wanted. The users were surprised as they had always assumed the source of the problems was the contractor.</p>	<p>"Shortage of relevantly skilled IS analysts and an incapable project manager." (Corporate service manager, 22 February 2002, #13)</p>	<p>Persistent negative belief that project post-mortems were ineffective.</p>
Purchasing Officer	<p>Poor project planning and coordination. Purchasing officer: "Not too sure, maybe due to poor project planning and coordination." (16 February 2002, # 10).</p>	<p>"Maybe you should go ask the IT manager." (Purchasing officer, 2 March 2002, #12)</p>	<p>Selective recall of project events.</p>

(Continued)

TABLE 1. (Continued).

Project Member	Perceived Attributed Cause(s) of E-PRO Abandonment (After Round 1)	Other Cause(s) after Considering the Effect of Attribution error (After Round 2)	Condition that Brought About Attribution error
Purchasing Officer	<p>Comparative evidence extracted from the project development process: Overall, the ambitious project completion schedule, the massive project scope, the failure of the IS project manager to consult the users regarding the system requirements and the 'fixed price contract' represented what now appeared to be warning signs for the project development.</p>		
Head of Corporate Affairs	<p>Unlucky. Head of corporate affairs: "The whole team had done our best, but we were just too unlucky." (22 February 2002, #5).</p> <p>Comparative evidence extracted from the project development process: "On hindsight, perhaps the project manager shouldn't have gone on a six-week holiday during the crucial period of the project. The whole development period was further delayed due to his absence." (IS analyst, 25 January 2002, #11)</p>	<p>"The project manager should have been more responsible and set a good example during the project development process." (Head of corporate affairs, 8 March 2002, #12)</p>	<p>Presence of self-appointed mindsets that suppressed his doubts about the group's efforts (attempt to reduce group dissonance).</p>
Corporate Affairs Clerk	<p>Unrealistic project completion date set by the senior management. Corporate affairs clerk: "According to the project manager, there was simply no time to consult everyone on the design requirements since the project had an impossible deadline." (2 March 2002, #5).</p> <p>Comparative evidence extracted from the project development process: The cabinet representatives had demanded full project implementation within the council in the shortest possible time. This was due to their keen desire to be the first local government in the United Kingdom to purchase goods and services electronically. They were hoping to showcase the state-of-the-art system to other local governments who were also contemplating converting to e-procurement systems.</p>	<p>"I personally believed in his [IS project manager's] ability. But perhaps, he should have hired more programmers with the relevant skills." (Corporate affairs clerk, 16 March 2002, #8)</p>	<p>Presence of self-appointed mindsets that suppressed doubts about his manager's ability (Loyalty towards the project manager).</p>

need for support from constituents as they strive for co-operation between employers, employees and unions to ensure the successful delivery of services (Farnham, Horton, & White, 2003).

Besides the IS strategic director and the IS project manager, other interviewees also had mindsets that suppressed doubts about the group's abilities and efforts. One reason could be the members' attempt to reduce the group dissonance which resulted from the project failure. According to the cognitive dissonance theory (Festinger, 1957), individuals tend to seek consistency among their cognitions (i.e., beliefs, opinions) and systematically evaluate causes of behavior in a commonsense search to understand why things happen. Therefore, when an inconsistency arises between

attitudes or behavior (dissonance), change is needed to eliminate the dissonance. Our analysis suggests that the self-appointed mindsets we observed in our study had emerged as a means to eliminate dissonance and reduce blame within the group. Another reason could be the project members' emotional attachment to the group, which could have put pressure on some members to maintain their loyalty to their fellow group members. After all, one is more likely to commit bias with people you know as opposed to strangers (Pan et al., 2006b). Therefore, there could be a conflict of interest between members' desire to maintain group loyalty and their responsibility to inform the senior management about what had really happened to the project. The implication is that project members' close relationships with fellow members

can potentially constrain their ability to effectively attribute project failure to the correct causes.

Persistent Negative Belief About Project Post-mortems

Many interviewees also reported the general persistence of the negative belief that project post-mortems were ineffective. Such a persistent negative belief is a psychological factor that can influence project members' cognitive frame to identify and interpret causes of project failure during project post-mortems since consensus is an important factor that may influence causal attribution process (Shaver, 1983). In the case of E-PRO, since the organization's incentive structure and learning were not mutually supportive, the persistent negative belief could discourage learning from previous experiences, and hence, induce attribution error. As the IS programmer said, "Conducting a project post-mortem is simply to fulfill the requirement of the organization's project policy. In actual fact, nobody believes in it" (February 12, 2002, #14). The mechanical performance of project post-mortems without any conviction of their efficacy may be termed the ritual coordination of behaviors among project members; such ritual coordination of behaviors can be explained by an important feature of the human identity, which is the capacity for sustained, repeatable, and complex behaviors (Harris & Sutton, 1986). It is a situation where prior failure inhibits a project member's willingness to reexamine the current course of belief and thus promoting attribution error. This could be due to the behavior of self-handicapping when one provides a ready excuse for potential failure and set up psychological obstacle to future success (Babcock, 1989). It represents "freezing" a negative impression over a long period of time within the organization, making it subsequently difficult to "unfreeze" the negative pattern (Schein, 1996). Consequently, the significance of project post-mortems could be undermined, and that would in turn affect how project failure is attributed to possible causes.

The main contributing factor to the persistent negative belief about the usefulness of project post-mortems in ECouncil was the senior management's failure to show active interest by adopting specific actions to guide the process along. The organization provided little incentive for project members to acknowledge their errors and admit their faults in the projects. The senior management failed to inspire and play a constructive role to create and maintain a supportive learning environment. This behavior is consistent with prior literature on public sector organizations; according to Holloway, Francis, and Hinton (1999), the transformational efforts of public sector agencies are often directed towards operational or easy-to-change processes or even simply towards measuring outputs with no attempt at understanding the processes which lead to them.

Memory Decay

Even if project members had wanted to be more consistent in their attribution processes, they would still be hampered by

memory decay. This is relevant as Ewusi-Mensah (1997) points out, "Executives should follow the cancellation decision with a systematic examination of what went wrong and why as soon as possible because participants' memories fade with time." Memory decay would affect the accuracy of the information recalled during the attribution process after a long lapse of time. As one respondent explained, "Many of us had already moved on to other projects. Sometimes, it was difficult recalling some of the events that had taken place." Furthermore, studies have shown that memory loss tends to escalate in cases of failure since people would rather forget the shame, guilt, and resentment from the aftermath of the failure at once (Drummond, 1995).

Selective Recall of Project Events

The most critical determinant of senior IS managers' ability to make reliable assessments of project failure is the nature of the information they receive during project post-mortems. Project experience that is adequate in scope and detail would provide an organization with the best chance of effective learning. The selective recall of project events by project members would mean a narrower scope of information, which could be potentially constraining since it may prevent the comparison of information with other sources and, as a result, preempts the benefit of more diverse perspectives (Wastell, 1999). Such information constraints could arise from a lack of interest. The need to complete other ongoing projects may well take priority over the learning process, which also explains why project members would devote less time to and have less concern for project post-mortems. Selective recall could also be explained by the cognitive dissonance theory, which suggests that in the case of a discrepancy between beliefs and behaviors, dissonance can be eliminated by reducing the importance of the dissonant beliefs (Urban & Witt, 1990). In the case of ECouncil, selective recall could have resulted from the project members' attempt to eliminate dissonance by refusing to recall events that were inconsistent with earlier beliefs since failure may lead to negative emotions (depression, helplessness) and individuals may selectively recall events.

The Influence of Power Dynamics within the Organization

As organizations consist of interdependent functional groups which have their power distribution ascribed (Cavaye & Christiansen, 1996; Markus, 1983), understanding the power distribution in development projects may help to explain the inconsistencies in some of the project members' attributions during project post-mortems. In the case of E-PRO, the IS analyst admitted that the influence of power had affected project members' behaviors during the project development and the project post-mortem. For example, none of the project members dared to raise the issue that the prototype was designed solely by the project manager without consulting the users. Even though two project members had tried to express their disappointments, they ended up

being transferred out of their original departments. Therefore the reason why the IS analyst made inconsistent attributions could be due to the fear of possible retaliation from the IS project manager if he were to criticize the manager. This is consistent with the psychology literature, which suggests that individuals tend to externalize failure for reducing frustration and anger over failure (Ross, 1977). In general, the possible threat of retaliation is not uncommon in the power politics of IS implementations (Silva & Backhouse, 2003). This constraint is particularly relevant, especially because the project manager had been working with the council for 18 years and might have substantial influence over the IS analyst's career advancement within the organization. This scenario can be characterized as the general phenomenon of the "mum effect" (Near & Miceli, 1986). Keil and Robey (2001) have demonstrated the mum effect in the IS context with specific evidence of problems that result from the reluctance of organizational members to transmit negative information concerning a project. Retaliation has also been identified as one of the primary triggers of the mum effect (Near & Miceli, 1986). It is therefore unsurprising that the analyst in the E-PRO case should be constrained in making reliable assessments and attributions. Understanding the power relationship within the project is important since identifying the project stakeholders and examining the distribution of their relative power could help project reviewers to better interpret and analyze project members' reflections of their prior project experiences.

Table 2 summarizes the antecedent conditions of attribution error, the category of project members and their possible influences in the E-PRO project at ECouncil.

Implications for Research

This study is significant in that it is one of the first case studies to investigate the antecedent conditions of attribution error and their influences in the context of IS project post-mortems.

While there are several earlier studies on attribution error in the IS area, they are based almost exclusively on either laboratory experiments or survey instruments aimed at explaining individuals' or groups' attribution error rather than case studies that could better capture the organizational dynamics of the phenomenon. The propositions set forth in this article represent opportunities for integrative empirical research in the areas of attribution theory and IS project management. Further investigation could examine the attribution process in greater depth and explore other manifestations beyond the few that have been identified in this study as antecedent conditions of attribution error. Further work is needed to operationalize the attribution perspective in a methodological framework for use in the IS context. The main lesson in this study may be that different rounds of detailed post mortem interviews—separated by time to allow interviewees to think about what they have said—could be an effective means of identifying root causes of project problems. Finally, one possible direction could also be replicating the existing study to a wider context or examining the effect of attribution error in other types of projects, for example, construction.

Even though this investigation has primarily focused on a public sector organization, the phenomenon of attribution error remains relevant and could also be widespread in development projects in private sector companies due to the firms' lower tolerance of project failure. To take our findings a step further, researchers could conduct comparative studies across sectors to uncover the impacts of contextual variations. Finally, the findings from this article could help establish organizations' valid "theories in use" (Lyytinen & Robey, 1999) in IS development. This is a relevant and interesting proposition: According to Lyytinen and Robey's model of organizational learning in IS development, part of "generating knowledge in establishing valid theories in use is by overcoming [the] biases established among IS development professionals" (p.97).

TABLE 2. Summary of antecedents of attribution error, the category of project members and their possible influences in the E-PRO project at ECouncil.

Antecedent Conditions of Attribution error	Possible Influences
Presence of self-appointed mindsets may suppress any doubts about the self or the group's efforts and ability during the project development process.	<ul style="list-style-type: none"> • Self-justification due to a high degree of personal responsibility • Desire to reduce group dissonance arising from project failure • Emotional attachment to the group: obligation to remain loyal fellow group members
Persistent negative belief that project post-mortems were ineffective	<ul style="list-style-type: none"> • Ineffectiveness of prior project post-mortems • Low involvement by the senior management • Ritual coordination of behaviors
Memory decay	<ul style="list-style-type: none"> • Failure to conduct immediate project post-mortems • Lack of time due to other project commitments
Selective recall of project events	<ul style="list-style-type: none"> • Lack of interest • Desire to reduce cognitive dissonance by seeking consistency between beliefs and behaviors
The influence of power dynamics within the organization	<ul style="list-style-type: none"> • Fear of possible retaliations from superior for speaking up • Fear of recriminations

A possible limitation of this study is that by applying attribution theory to examine only project post-mortem practices may have narrowed our research focus. While evaluating the reliability of attributions in project post-mortems may be useful, similar examination in the project development process itself could yield additional insights. Further work could focus on why, during project development, project members fail to attribute causes of failure to their own behaviors. Furthermore, future research should also attempt to relate such findings to assess the level of project performances in organizations and how much they have learnt from project failures.

Implications for Practice

By providing a better understanding of project members' attributions of project failure to probable causes and the antecedent conditions of attribution error, this study provides managers with useful insights on how to better interpret attribution inconsistencies. The insights are especially relevant since attribution inconsistencies may be inevitable during project post-mortems. Practitioners should perhaps also assess the subtle interplay between the antecedent conditions of attribution error. The assessment would allow managers to formulate responsive strategies to minimize attribution error during project post-mortems. For example, if the negative belief that project post-mortems are ineffective persists among project members in an organization, self-appointed mindsets are likely to prevail during project post-mortems. By understanding the possible interrelatedness between the antecedent conditions of attribution error, managers could adopt a holistic view in interpreting attributions during project post-mortems. Even though attribution error may be unavoidable, project managers and team members may take steps to minimize attribution error during project post-mortems. For that purpose, we propose several strategies and tactics below:

Self-Awareness

The first step is for individuals to recognize that there is a natural tendency for attribution error to set in. Project managers and members may ask themselves the following questions to help reduce the effects of the inconsistency: Am I able to objectively identify the factors that contribute to the project failure? Am I open to others' criticisms? Do I have any difficulty sharing project experiences even though it may mean admitting mistakes or facing recriminations and possible retaliations? Am I overly concerned about the welfare of the group rather than the organization as a whole? These questions help individuals reflect on the possibility of bias in their thoughts during project post-mortems. When individuals can mentally see themselves behaving in a given manner, they are self-aware. Furthermore, when individuals reflect on their past behaviors by using mental images, they can deduce aspects of their past functioning from what

they see internally—that is, they can acquire self-information and build a self-concept.

Unfreezing Persistent Beliefs

Unfreezing the negative belief about post-mortems being ineffective should help reduce attribution error. One way to do so is to continuously look out for inconsistency in persistent beliefs. Perhaps the positive effects of project post-mortems could be measured over a longer period rather than being just a “snap-shot” view. This would allow a better assessment of whether the post-mortems are effective. Another suggestion is to improve the senior management's commitment to project post-mortems. This would provide the necessary endorsement and safety net for project post-mortem practices. The involvement of the senior management would also raise the importance of the reviews and encourage more active participation among project members because new behaviors in the leader would encourage new behaviors in the followers. Finally, skepticism about the value of project post-mortems may be overcome by educating both management and project staff with a positive example. The review of a successful project could serve the purpose of enhancing the credibility of project post-mortem practices.

Memory Process Stimulus

Memory of project experiences could be lost due to memory decay. Cognitive decline may set in where cognitively stimulating activities are few. One stimulant is to provide retrieval cues that enable project members to quickly access the information in memory. A good aid is to use documentation such as the minutes and memos taken during the project to stimulate project members' memory of project events. However, the documentation would have to be clearly written, contain a complete record of major decisions and be widely available and referred to during project post-mortems. Another important dimension is time, which is a crucial factor that determines the rate of memory decay since it is inversely related to the performance level of memory recall. Project members would be able to provide a fuller account of their project experiences immediately after project closures.

Pluralistic Intelligence and Incentive Provision

One of the most important ways to validate the reliability of an attribution is pluralistic intelligence, which is consensus on an attribution among various persons. If an attribution cannot be compared and validated, then the attribution may be untrue. Validation is especially useful in project group settings since many versions of a project event would be told, and it is difficult for the organization to pinpoint the root causes of negative project outcomes. Organization structures and incentives would also help encourage project members to participate actively in project post-mortems. This concurs with Pfeffer's (1998) study, which identifies

high and contingent compensation as one of the “high performance management practices” that produce innovation and productivity. Rewarding project members for sharing their project management experiences is of benefit to the organization since the key to organization learning is staff working “with what they have learned” (Lyytinen & Robey, 1999, p.97).

Conduct an Assessment of Stakeholders' Relative Power

By conducting an assessment of stakeholders' relative power, practitioners can identify and better understand the power distribution within the organization. Basically, stakeholders' relative power can be assessed using three variables of power: the ability to cope with uncertainty, substitutability and the centrality of activities. Substitutability is the ability of the organization to obtain alternative stakeholder's performance for the activities and centrality is the degree to which the activities performed by the stakeholder are interlinked into the system. Dominant power in an organization has high values on all three of the variables. Each individual's power strength should be considered accordingly and referenced against the project members' accounts of their prior project experiences. The project reviewer should identify those project stakeholders who have relatively lower level of power within the organization and try to ease any potential fear among subordinates who may be afraid of speaking up against their superiors.

Conclusion

As there have been no previous interpretive case studies that use attribution theory to examine the effectiveness of IS project post-mortems, this study represents a contribution to knowledge in the area. It complements the existing IS studies by highlighting the deficiency in project post-mortems, which may lead to the failure of project managers and group members learning from their previous mistakes. By examining the project post-mortem undertaken for the short-lived E-PRO project experience, we have answered our research questions. In the process, we have used attribution theory to explore five antecedent conditions of attribution error: presence of self-appointed mindsets, general persistence of negative beliefs, memory decay, selective recall of project events, and the influence of power dynamics within the organization. We have also explained why these conditions may occur, and we have recommended several strategies to minimize attribution error. Through interviews with relevant stakeholders and the review of important documents, we have gathered data on how project members may perceive whether inconsistency exists in their attribution and the antecedent conditions of attribution error. Minimizing attribution error may improve the effectiveness of project post-mortems, which may in turn enhance learning from project experiences and reduce the incidence of IS project failure.

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Appendix A

Additional Information on Methodology

Details of interviews: The interview dates, subjects' job titles, and duration of interviews and whether a transcript was produced.

Title	Interview Date/Duration (hour)	Transcript Y/N	Title	Interview Date/Duration (hour)	Transcript Y/N
IS strategic director	15 December 2001 (1h)– Negotiated Access	Y	Purchasing officer	16 February 2002 (1h)	Y
	15 January 2002 (1.5h)		Head of corporate affairs	2 March 2002 (1h)	
	29 January 2002 (1.5h)			22 February 2002 (1.5h)	
IS project manager	20 January 2002 (1.5h)	Y	Corporate affairs clerk	8 March 2002 (1h)	N
	4 February 2002 (1.5h)			2 March 2002 (1h)	
IS analyst	25 January 2002 (1.5h)	Y	IS contractor – Sales	16 March 2002 (1h)	N
	8 February 2002 (1.5h)			30 April 2002 (1h)	
IS programmer	28 January 2002 (1.5h)	Y	E-business manager	12 May 2002 (1h)	Y
	12 February 2002 (1.5h)		E-business clerk	18 May 2002 (1h)	Y
Chief procurement officer	2 February 2002 (1h)	Y	Cabinet deputy of coordination services (E-envoy)	30 July 2002 (1h)	Y
	16 February 2002 (1.5h)				
Corporate service manager	8 February 2002 (1h)	Y	Corporate service clerk	27 July 2002 (1h)	Y
	22 February 2002 (1h)		IS Contractor – Senior manager	27 July 2002 (1h)	N
Technical service manager	8 February 2002 (1h)	Y	Technical service coordinator	2 June 2002 (1.5h)	Y
	22 February 2002 (1h)				

Data Collection Excerpts of Interview Topic Guides

- 1 Find out the interviewees' views on why the organization has such a poor project management record.
 - 2 Understand the organization's project post-mortem policies and practices.
 - 3 Understand the interviewees' perceptions of project post-mortems' effectiveness, and whether they perceive learning from prior project experiences as important.
 - 4 Examine the senior management's role in project post-mortems.
 - 5 Investigate what the causes are that project members attribute the project abandonment to and why.
 - 6 Examine the project members' perceptions of how accurate they perceive their attributions to be and whether their attributions have been influenced by other people or other factors.
 - 7 For those who admit inconsistency in their attributions, investigate how their attributions can be different.
 - 8 For those who suggest objectivity in their attributions, ask whether inconsistency can be a potential factor that contributes to ineffective project post-mortems.
 - 9 For those who admit inconsistency in their attributions, ask for factors that have influenced their attributions.
 - 10 Identify major factors of how inconsistency could be overcome.
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Author Queries

- AQ1: Please double check that this is the reference you intended and also provide the year.
AQ2: Please provide publisher's location (APA style is "location: publisher").

Please send your signed CTA (Copyright Transfer Agreement) as soon as possible.