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The Hidden Dilemmas in Software Development Project Decisionmaking: Persist or Desist?

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Abstract

Given that decision makers continue to face dilemmas on whether to persist or desist with troubled projects, it is important for senior managers to support the assessment of decision dilemmas faced by project managers. By drawing on two case studies that exhibit project escalation situation, decision-makers in both cases were interviewed and important documents reviewed, the paper has identified five types of decision dilemmas and their associated characteristics: justification, sunk cost, ambiguity, opportunity cost and completion*. The decision dilemmas identified in this study and the recommendations for countering these dilemmas aim to help project managers improve the process of decision-making during project development. Furthermore, it is also important for organizations to be aware of the role played by decision dilemmas within the escalation phenomenon as such understanding could help organizations extricate themselves from future escalation predicaments.*

Keywords: Decision dilemmas, project decision-making, escalation of commitment, case study

1. Introduction

Most research on information systems (IS) development has sought to understand why commitment to projects escalates (e.g., Keil, 1995) and how to reduce commitment to troubled projects (e.g., Montealegre and Keil, 2000). Despite this progress, escalation still occurs with high frequency among IS projects (Pan et al., 2006). One major issue is that IS project managers do not pay enough attention to how much uncertainty surrounding decision-making could affect project outcomes. In fact, making decisions on whether to persist or desist with a troubled project is extremely difficult for project managers. Continuing commitment in such projects may lead to huge losses of valuable resources (Drummond, 1996; Keil, 1995). Therefore, breaking escalation cycles as early as possible seems to be the key to reducing or discontinuing the commitment to these troubled projects (Keil and Robey, 1999). Nevertheless, the timing of when to break such escalation cycles seems ambiguous. After all, how many of these warning signals are genuinely 'fatal' to IS projects and besides, any premature de-escalation may also lead to unnecessary waste of resources. The ambiguity arises mainly because in many organizational settings where decision situations are ill-structured (Hammond et al., 2006), decision makers are often compelled to 'play their cards and take their chances' (Staw and Ross, 1978). Many project decisions are made in the face of very difficult dilemmas and uncertainty plays a significant role in such project decision situations.

Therefore, it is imperative to unravel the nature of the hidden dilemmas faced by project decision makers and to identify a comprehensive set of remedial actions as a basis for decreasing the uncertainty surrounding decision making during project development. **Therefore the goal of this paper is to identify the nature of the hidden dilemmas in project decision-making and the conditions that contribute to these dilemmas**.

2. Theoretical Foundation

Escalation of commitment is a phenomenon that refers to situations where decision makers commit additional resources to a failing course of action (Staw and Ross, 1978). Drummond (1996) characterises escalation as why organizations seem to persist with failing ventures long after any sensible person would surely have given up. Keil (1995) considers project escalation to occur when there is continued commitment and negative information. Organizations apparently keep investing additional resources in failing IS projects in an attempt to make them work, and consequently these 'troubled' projects are continued even though it may make more economic sense to stop them (Newman and Sabherwal, 1996). According to Keil and Mann (1997), at least 30% of all IS projects exhibit some degree of escalation. Well-known examples may include, the Taurus project at the London Stock Exchange (Drummond, 1996), and the baggage handling system at the Denver International Airport (Montealegre and Keil, 2000). The alarming data suggest that IS managers are doing a poor job in identifying or terminating projects that are likely to fail.

Previous research suggests that escalation is a complex phenomenon that may be influenced by many different factors. Staw and Ross (1987) group these factors into four categories: project, psychological, social and organizational. These factors have been used widely in experimental-based studies (Sabherwal et al., 2002) and case studies (Keil, 1995; Newman and Sabherwal, 1996) to understand the escalation phenomenon in IS settings. In their study, Newman and Sabherwal (1996) examined a case of escalation of commitment to an IS development project at an organization called CENTCO. They found that "project and structural determinants are crucial in obtaining initial commitment for the IS project, social and structural determinants influence whether commitment to the project is withdrawn, and psychological and project determinants influence escalation of commitment" (Newman and Sabherwal, 1996, p.45). In Keil's (1995) study, he found three factors that had not been widely discussed in the escalation literature: 'emotional attachment to the project', 'empire building' and 'slack resources and loose management controls'. Sabherwal et al (2002) examined the effects of project, psychological, social and structural factors during four stages of an IS project. Their results support escalation in IS projects. Moreover, project factors and psychological factors, but not structural factors, seem to aid escalation. Project, psychological, and social factors also have different effects during various stages of the development.

To reduce the effect of escalation, experts have advocated de-escalation to break such escalation cycles. Through de-escalation, troubled projects may be successfully turned around or sensibly abandoned (Keil and Robey, 1999). Despite the useful advice, the timing of when to trigger de-escalation remains ambiguous. Early escalation studies

suggest that the escalation phenomenon represents a syndrome of decision dilemma caused by the interplay between the degree of commitment to a course of action and the amount of equivocality perceived in the feedback on prior investments and in expectations for the future (Bowen, 1987). There are occasions in IS development projects which a decision has to be made on continuing the project, which is associated with certain costs, or cancelling it, and the consequences of either action seem uncertain (Mann, 1996). Although, escalation involves resource commitment in the face of negative interim outcomes, the eventual outcomes may or may not be negative. It is no wonder that Keil (1995) termed such decision dilemmas as one of the most difficult management issues that can arise in connection with IS projects. In summary, the review of the IS development literature suggests that existing escalation studies have paid little attention to what these decision dilemmas are and how they could affect project decision-making during project development. It is therefore the aim of this paper to address the gap in the escalation literature.

3. Research Approach

Two case studies were conducted for the purpose of this study (Klein and Myers, 1999). The case study approach is adopted as it allows for the better capturing of the organizational dynamics of a phenomenon (Newman and Sabherwal, 1996). The two cases were selected for study because the project escalation experiences they exhibit offer valuable examples of the escalation phenomenon. The first case study was conducted in an UK local government organization, BMBC (a pseudonym) which proposed an e-procurement system as part of its e-government initiative. From June 2002 to August 2002, interviews were conducted with the IS project manager, seven steering committee members and the e-Envoy[1]. The second case study was conducted in a large utility company in the UK, British Utilities (pseudonym), which proposed a queue removal system as part of its effort to remove long queues of customers calling its billing and customer service lines. Data were collected from November 2002 – March 2003. Altogether two project managers, two senior directors and four IS committee members were interviewed. These interviewees were selected as they all had direct influences on the decisions to persist or desist with the two projects. Primarily, semi-structured interviews and informal discussions were conducted with all relevant project decision-makers. These semi-structured interviews were tape-recorded with the interviewees' permission and transcribed immediately after the meetings. Each interview lasted an average of one and a half hours. Secondary data such as reports, memorandums and meeting minutes were also gathered to supplement the information collected through interviews. Each decision maker was asked: During the project development, did he/she ever feel uncertain about the prospect of the project and face any decision dilemma? If the interviewees answered yes (which they all did), the researcher followed it up by asking them to identify and describe these decision dilemmas. The researcher was particularly interested in finding out the nature of the decision dilemmas and their contributory conditions.

[1] An e-Envoy is the representative of the local council at the central government's e-government committee.

As a first step in the data analysis, the researcher analyzed the coded transcripts and secondary data, and created a detailed history of the project in narrative form. After validating the events with several individuals who were familiar with the project's history, the researcher identified portions of the text directly related to the decision dilemmas, and described what these dilemmas and their contributing conditions were. To reduce the researcher bias, the project information and interview transcripts were shown to a senior colleague who was uninvolved in the project. The role of this senior colleague was to "bring a different and possibly more objective eye to the evidence" (Eisenhardt, 1989, p.538). The information he received did not include the researcher's list of identified decision dilemmas and their contributory conditions. After that, the researcher and the senior colleague met to compare their individual lists. In cases where it was difficult to categorize, the researcher used his own judgment to assign the dilemma category that seemed to best fit the information presented. Finally, the decision dilemmas and contributing conditions were compared and contrasted against the array of factors identified in the IS literature as contributory to project escalation. The entire data analysis process went through numerous iterations (Klein and Myers, 1999) so that a coherent and consistent overview of the case organizations could be formulated.

4. Case Description

The BMBC Case

BMBC is a UK local government organization that proposed an e-procurement system as part of its e-government initiative. The project costing £150, 000, started in January 2001 and planned to complete by December 2001. The organization aimed to be the first local government organization to purchase its goods and services online. The project was headed by the IS manager, who was overseen by a steering committee and an e-Envoy who represented BMBC in the central government's e-government committee. An external software vendor was tasked with developing the software. During design and testing, the project stalled due to a disagreement between the users and the vendor over several design requirements. The contractor demanded an additional £150, 000 for the additional changes. The users refused as they viewed those changes as alterations necessitated by the contractor's mistakes. However, the steering committee agreed to the payment and continued the project. According to one of the IS committee members:

> "The users had repeatedly complained about the low quality of the software and the failure of the IS contractor to understand their requirements. On the other hand, the IS contractor also expressed dissatisfaction with the users for frequent changing the requirements. The situation became ambiguous and complex with regards to which party was really at fault and what action we ought to take."

The project did not continue for much longer before the same problems resurfaced and resulted in one of the users blowing the whistle on the project, and reporting it to the e-

Envoy. The IS project manager revealed that the users were resolute about project abandonment:

> "I faced a lot of pressures from the users. But how could I give up? With all the resources invested, the option of reverting to buying packaged software was unimaginable".

Given the importance of the project, the e-Envoy intervened and stated that the project had to continue. According to the e-Envoy:

> "The project was clearly having problems. But I did promise the central government that we could achieve it".

Several problems were identified, which led to the project team exploring alternative courses of action. The e-Envoy commented:

> "Before an alternative action plan was developed, there was a lot of confusion. I was unsure if we could turn it around. But the project was critical to us and I had to take my chances by asking the project members to continue even though it had reached a point where most of them had given up."

One of the steering committee members commented:

> "We lacked faith in the turnaround effort. Some of us were thinking of investing in new packaged software which was cheaper than the additional investment needed for the system improvement effort."

Eventually, the project team proposed a reduction of project scope without causing significant changes to the original specification. The e-Envoy admitted:

> "Even though some committee members informed me of several problems arising, I simply told them that we were very close and it was too late to give up."

To obtain stakeholder buy-in, the e-Envoy influenced all constituencies to support the turnaround strategies before rolling them out. The IS project manager also commented:

> "With only three departments instead of the entire organization, and with the project divided into many stages, all of us felt confident that the completion of the first stage was within our reach."

All changes were implemented and they produced good results. When the first phase of the e-procurement system finally went live in August 2002, the project was eight months behind schedule and close to £200, 000 over its original budget.

The British Utilities Case

British Utilities is a large utility company in the UK that proposed a queue removal system as part of its effort to remove long queues of customers calling its billing and customer service lines. The project started in May 2001 and was expected to roll out after one year. The initial budget for the project was £1 million. The project was headed by a project manager and supervised by an IS committee. The project suffered several delays due to the departure of several key project executives during its development. According to one of the senior directors:

> "There was huge ambiguity in the project after the project champion left the project team. Exactly, who was to take over? Also, whether the system could really solve the long queue problem and maybe we should consider other options?"

Every change of new project managers would initiate the process of recruiting new project members. This had caused the project to drift for a relatively long period. Furthermore, each change would bring about several new changes to the proposed system. All these problems required an additional investment of £750, 000 from the original budget. The IS project manager commented:

> "Many project members had doubts on whether further investment was necessary. It was a difficult decision for me. However, I insisted of having it since we had already invested so much."

The senior director who was also the subsequent project champion supported the additional investment. One of the committee members agreed that the project team was eager to complete the project:

> "The senior director had wanted the project to continue until it was completed. He wanted to see it through since he believed that the project development wouldn't be far away from the end-point."

> "What were we going to tell everybody if the project did not succeed? It had to go on. I wanted to prove that my original decision was right. After all I was always right in previous decisions."

The project was used as publicity to demonstrate that the company was working towards improving its customer service. Nevertheless, the project was eventually abandoned in

August 2002 due to a sudden sharp decrease in call queues and also the detection of a deficiency within the system which made the system redundant. According to one of the committee members:

> "Instead of further investment to improve the system, the opportunity cost issue triggered a decision by the top management to invest in a fully fledged CRM system that would provide a total customer relationship management solution. The queue removal system could not fulfill the strategic needs of the company and justify any additional investments."

5. Discussion

The findings from the two case studies concur with the notion that there are occasions in IS projects which a decision has to be made on continuing the project or cancelling it, with the consequences of either action seem uncertain (Keil, 1995). Five hidden dilemmas in project decision-making and their characteristics are discussed below.

The Justification Dilemma

Based on the theory of cognitive dissonance, self-justification theory attributes escalation to the reluctance of managers to admit, to themselves or to others, that previous resource allocations were unwise. Individuals seek to rationalize their previous behavior against a perceived error in judgment (Brockner 1992). Central to the concept, psychological self-justification is the notion of personal responsibility. Presumably, a decision maker with a high degree of personal responsibility for a previously chosen course of action will feel greater need to justify the initial resource allocation decision (Staw and Ross, 1978)**.** In both cases, the decision makers felt compelled to justify their prior decisions to prove themselves to external constituents and themselves despite having negative project feedbacks. For example, the e-Envoy in the BMBC case admitted having justification dilemma to continue the project even though it was clearly in trouble. The e-Envoy took it upon himself to successfully deliver the project so as to justify to the expectations of the central government and the public. In the British Utilities case, the senior director was eager to prove to his colleagues and subordinates that his original decision was right despite negative feedbacks and as a result, continued his commitment in the project. His behaviour of continuing the cycle of committing resources, problems and further commitment to justify previous decisions constituted escalation.

The Sunk Cost Dilemma

When deciding between cancelling a failing project and escalating commitment to the project, individuals may take sunk costs, representing an irrevocable investment of resources that should be irrelevant in decision-making because the past cannot be changed, into consideration (Kahneman and Tversky, 1979). Whyte (1986) suggests that sunk costs may influence decision makers to adopt a negative frame, thereby promoting risk seeking behaviour which can be observed as escalating commitment to a failing course of action. In the cases of BMBC and British Utilities, decision makers faced the

dilemmas of whether they ought to include the dollar amount that has been expended into the decision making process (Keil et al., 2000). For example, the IS project manager faced lots of pressures from users who were resolute about project abandonment. However with all the resources invested, he was reluctant to revert to buying packaged software. Similarly in the British Utilities case, the IS project manager had faced a very difficult decision since many project members had doubts on whether further investment was necessary. But eventually, he decided to continue despite negative feedbacks because lots of resources had already been invested.

The Ambiguity Dilemma

In an ambiguous situation, the tendency to escalate commitment is attributed to a variety of motives, including economic considerations, i.e. a belief that further resources commitment is economically prudent, curiosity and a desire to learn more about the phenomenon, and the need to make additional effort to examine if it will produce positive results (Bowen, 1987). In both cases, decision makers faced the dilemmas of whether to continue a project because of the ambiguous situations in which past performance information was equivocal and did not clearly indicate failure. In the BMBC case, several interviewees reported facing the ambiguity dilemma during project development. For example, the IS project manager highlighted the disagreement between the users and the IS contractor in which the situation became ambiguous and complex as to which party was really at fault and what action the project manager ought to have taken. Furthermore before the alternative action plan was developed, there was a lot of confusion and many committee members were unsure if they could turn it around. But the project was too critical and the e-Envoy was forced to take considerable risks by asking the project members to continue even though it had reached a point where most of them had given up. Similarly, in the British Utilities case, the senior director indicated the presence of ambiguity dilemma during the project development especially after the project champion left the project team. Basically whether the system could really solve the long queue problem and whether they ought to consider other options were totally unclear.

The Opportunity Cost Dilemma

In some project situations, opportunity cost may be incurred for investing in a project turnaround rather than a new project (Northcraft and Neale, 1986). In both cases, decision makers faced the dilemmas of whether to continue a project due to the opportunity cost incurred in investing in the project turnaround rather than in a new project. For example in the BMBC case, many committee members faced the opportunity cost dilemma since they lacked the confidence that the turnaround effort would work as some of them were even contemplating investing in new packaged software which was cheaper than the additional investment needed for the system improvement effort. Likewise, in the case of British Utilities, the opportunity cost issue triggered the top management's decision to invest in a fully fledged CRM system that would provide a total customer relationship management solution. Apparently, the queue removal system could not fulfill the strategic needs of the company and justify the additional investment.

The Completion Dilemma

One of the key driving forces that can encourage escalation is the proximity to the goal, or what is sometimes labelled the completion effect (Conlon and Garland, 1993). The completion effect which is derived from the approach-avoidance theory, suggests that the desire to achieve task closure or completion can have a significant influence on behavior (Katz and Kahn, 1966). This view is also consistent with early work on escalation conducted by Brockner et al. (1979, p.194), who observed that an individual's motivation for pursuing a course of action may shift over time "due in part to the presumed increased proximity to the goal". In both cases, decision makers faced the dilemmas of whether to continue a project based on the desire to achieve task completion. For example, the e-Envoy in the BMBC case recognized the completion dilemma over the project as he simply ignored the committee members' negative feedbacks and continued the project based on the close proximity to completion. In addition, with the new alternative plan, the project members were determined to complete the project as they felt that the end-point was in sight. Similarly, the project team in the British Utilities case was eager to complete the project. For example, the senior director had insisted on completing the project as he believed that the project development was towards completion. Various types of decision dilemmas and their descriptions are shown in Table 1 below.

Decision Dilemma	Description
Justification	Decision makers face the dilemma of whether to persist with a troubled project so as to demonstrate the validity of those earlier decisions.
Sunk Cost	Decision makers face the dilemma of whether to persist with a troubled project because of what has been already spent when the economically rational action is to quit.
Ambiguity	Decision makers face the dilemma of whether to persist with a troubled project in the situation where information on past performance is equivocal and does not clearly indicate failure.
Opportunity Cost	Decision makers face the dilemma of whether to persist with a troubled project based on the opportunity cost incurred in investing in a project turnaround rather than a new project.
Completion	Decision makers face the dilemma of whether to persist with a troubled project due to the desire to achieve task completion.

Table 1: Five Major Types of Decision Dilemmas Faced by Project Decision-makers in BMBC and British Utilities

6. Implications and Conclusion

The purpose of this paper is to provide a deeper understanding and explanation of the hidden dilemmas in project decision-making during IS project development. By drawing on two case studies that exhibit project escalation situation, conducting subsequent interviews with decision-makers in both cases and reviewing important documents, the paper has identified various types of decision dilemmas and their associated characteristics faced by project decision-makers. This study has made several contributions to research and practice. For research, this research represents one of the first studies to explore the types of dilemmas and their characteristics faced by decision-makers during project escalation situations. Until now, decision dilemmas have been

recognized as prevalent in project escalation settings but little is known about what they are and how they are like. For practitioners, this study develops a comprehensive set of remedial actions as the basis for decreasing uncertainty in decision making during project development. For instance, to counter the justification dilemma, the first option would be to reduce the desire for self-justification. This could be achieved by having a group decision making mechanism so as to diffuse individual responsibility. Individuals who initially approve a project should be separated from the group that evaluates its progress later on. Managers should also consider lessening the severity of penalties for failure so that the fear of failure would not trigger a strong desire for self-justification. To counter the sunk cost effect, project executives should honestly ask themselves whether they would choose the same course of action that they have taken if there had been no past investments. They should seek out and listen to the views of people who were uninvolved in the original choice and be alert to sunk cost bias in the recommendations made by others. To minimize ambiguity dilemma, it would be prudent for project executives to re-examine their assumptions during project development. Before further commitment of valuable resources (e.g., time, manpower and funds), managers ought to re-examine the original project assumptions and ensure that these assumptions have not changed. To resolve the opportunity cost dilemma, one key option would be to set minimum rate of return targets, often referred to as project hurdle rates. Project hurdle rates provide objective points of reference against which managers can judge whether a project is economically acceptable to their organization at a given point of project development and whether alternative investment should be considered. Finally, to counter the completion dilemma, one option is to promote regular reconsideration of the project instead of emphasizing project completion. Project completion may be deemphasized so that attention may be drawn to whether the objectives of the project have been met along the development path. The recommendations for decreasing uncertainty in decision-making during project development are shown in Table 2 below.

Decision Dilemma	Recommendation
Justification	Reduce the desire for self-justification by separating initial and subsequent project decision making. Use group rather than individual decision making mechanisms. Reduce the severity of penalties for failure.
Sunk Cost	Advise decision makers to disregard the level of sunk cost when deciding whether to continue a project. Encourage decision makers to set spending limits and make available alternative projects for investment.
Ambiguity	Know the stage of the project and manage accordingly. Assess risks early (and often) during the development process. Conduct serious project audits.
Opportunity Cost	Set minimum rate of return targets. Consider what the objectives are and whether they are best served by the status quo or an alternative course of action.
Completion	Promote regular reconsideration of the project instead of emphasizing completion of the project. Reward project executives based on project management processes rather than project completion.

Table 2: Recommendations for Decreasing Uncertainty in Decision-making during Project Development

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