

PROJECT MANAGEMENT EFFECTIVENESS:**THE CHOICE - FORMAL OR INFORMAL CONTROLS****Andy Susilo**

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Email: f.rohde@business.uq.edu.au**ABSTRACT**

Development failures and runaway projects in the information systems (IS) area can result in substantial losses to organizations, either financially or to a company's reputation. One important strategy in mitigating risk is the use of effective controls over IS projects. This research investigates the effectiveness of control mechanisms in IS projects, i.e., how they have been established, applied, and how they have evolved throughout the project. We conducted an in-depth study of six information systems projects with six different project managers. We found that formal controls were adopted on project elements with clearly defined project outcomes and informal controls were adopted mainly on project elements that were unclear and often related to people. Furthermore, formal controls were dominant at project initiation and in most cases these controls became less dominant over the project duration. These formal controls were more rigorously applied in external IS projects while informal controls increased in importance throughout the project duration in internally developed projects. We found the existence of informal controls to be very important in helping ensure successful project outcomes.

INTRODUCTION

Failing to successfully deliver an IS project can result in substantial losses to organizations, either financially or to a company's reputation (Montealegre & Keil 2000, p.5; Wallace & Keil 2004). Moreover, the causes and outcomes of many runaway IT projects are covered up or ignored to save embarrassment, but unfortunately, the same mistakes occur repeatedly (Hartman & Ashrafi 2002; Johnston 2003).

Research findings to date show that the average percentage rate of successful IS projects over a number of years is still considered to be low (Figure 1). Figure 1 shows the failed project rate decreased substantially between 1996 - 2004, however, the successful project rate has only marginally increased during the same period. The Standish Group (2004) identified that the increasing rate of successful projects were occurring in small projects. These projects were less complex, had fewer potential problems and management had better control over the budget. In their latest report, the Standish Group concluded that smaller teams and projects with a reduced scope of work delivered better IS project outcomes. Interestingly, the challenged project rate rises quite dramatically for the same period. Thus while it appears the project failure rate has reduced, the failures have not been turned into project successes, merely challenged projects. These examples show that IS projects continue to be risky and warrant serious consideration before commencement. Their large budgets and low rates of success mean organizations invoke risk and, to some extent, risk cannot be avoided where project functionality is imperative (see Broadbent 2004; Turban, McLean & Wetherbe 2004; Weber 1999).

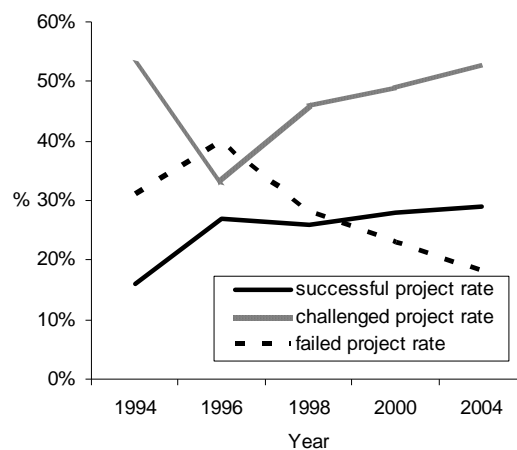


Figure 1: Trend of IS project history

(Adapted from Chaos report -Standish Group 1999; Standish Group 2001, 2004)

One important strategy in mitigating risk is the establishment of effective controls over IS projects. Several theories have been adapted from general project management theory and applied to the establishment of control over IS projects. The Project Management Institute (PMI) (2004) details nine elements of control known as the Project Management Body of Knowledge (PMBOK) (PMBOK 2004; Schwalbe 2004). Using the PMBOK as a framework, we investigate the establishment, application, and evolution of control mechanisms in IS projects and how they deliver better project outcomes.

We distinguish two different types of IS projects, internal IS projects and external IS projects. Turban et al. (2004, p613) define external IS projects or outsourcing IS projects as ‘the strategy to obtain IT services from outside vendors rather than from internal IS units within the organization’. Therefore, internal IS projects can be defined as obtaining IT services by using an organization’s internal resources. They noted an increasing trend towards outsourcing IS projects. The border between internal and external IS projects, however, has become blurred due to increasingly complex business processes and external parties taking on broader roles, e.g., an active role in decision making processes within the organization (CIO 2002).

To capture best practice in IS project management, Sauer et al.(2001) compared IS project management with construction project management. They found that construction projects had a better chance of success due to key factors inherent in the project manager such as experience, knowledge, and leadership. By having a good project manager, the project would have a better chance of implementing effective control mechanisms over the project, i.e., the better the set up of the control framework, the better the chance of a more successful project. Therefore effective controls should be set up during project initiation and exercised during project development. We aim to investigate the effectiveness of control adoption in various types of IS project types, from purely internal to purely external IS projects, from the initiation stage to the project implementation stage.

We assume the existence of control elements is important to ensure the quality of the project outcome and that their existence and adoption is vital to keep the project on track. We use control theory that has been refined over many years in combination with the PMBOK to frame the adoption of the control modes in IS projects for both external and internal IS projects. The theory examines the control framework in both formal and informal modes (Choudhury & Sabherwal 2003; Eisenhardt 1985; Kirsch 1997; Kirsch et al. 2002; Ouchi 1979, 1980). We propose two research questions, (1) What controls are in place at the project initiation stage? and (2) How do the controls (formal and informal) evolve during an IS project?

The format of this paper is as follows. Section 2 the conceptual framework underlying this research and develops initial propositions based on the research questions and theory development. Section 3 describes the research method and data collection process. Section 4 presents the research results. Section 5 summarizes this research, lists the limitations, and outlines possible future research.

THEORETICAL FRAMEWORK AND PROPOSITION DEVELOPMENT

Project Management Theory

We have adopted the PMBOK from the Project Management Institute (PMI) (2004) as a framework for the data collection and analysis because it is derived from theory in the project management area. It is accepted as generic theory that can be used in many projects in many fields, not only in IS (Wideman 1995). The project knowledge management theory covers crucial issues in project management and divides those issues into nine consecutive elements. They are derived from best practice in project study cases and can be considered as the most important elements in project management (for example, see Leach 2003; Morris 2001; Zobel & Wearne 2000). Although each element consists of a number of processes, some differences in the detail of the project knowledge elements across various project types can be found, e.g., success criteria, requirements management,

information management, performance measurement (Morris 2001). See Table 1 for the nine elements and their processes.

Element	Process within those Elements
1. Project Integration Management	project plan development project plan execution and integrated change control
2. Project Scope Management	scope planning, scope definition, create Work Breakdown Structure (WBS), scope verification and scope control
3. Project Time Management	activity definition, activity sequencing, activity resource estimating, activity duration estimating, schedule development, and schedule control
4. Project Cost Management	cost estimating, cost budgeting, and cost control.
5. Project Quality Management	quality planning, quality assurance, and quality control
6. Project Human Resources Management	human resource plan, human resource acquisition, human resource development, and human resource management.
7. Project Communications Management	communications planning, information distribution, performance reporting, and stakeholder management
8. Project Risk Management	risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control.
9. Project Procurement Management	plan purchases and acquisitions, plan contracting, request seller responses, select sellers, contract administration, and contract closure

Table 1: Project Management Body of Knowledge
(Adapted from PMBOK 2004, p.11)

Control Theory

Formal controls, i.e., behaviour controls and outcome controls, are defined as tools to measure performance (see Eisenhardt 1985; Kirsch 1996). Behavior controls articulate specific rules and procedures to be followed, while outcome controls articulate specific outcomes (Eisenhardt 1985; Kirsch 1996). A formal control would be a formal meeting with an agenda and formal minutes taken for distribution.

Informal controls, i.e., clan control and self control, rely more on 'unwritten practice code' such as social values, common beliefs, or traditions among people or individuals (Eisenhardt 1985; Ouchi 1980). Informal controls might include informal meetings where there is no agenda or minutes taken. Clan controls are controls that exist in a group or in individuals who share common beliefs or common goals (Ouchi 1980). Self controls are controls that are established by an individual to undertake a particular task by controlling their own actions (Kirsch 1997).

Control determinants such as task programmability, information systems, and uncertainty factors, influence the control model. For example, behavior controls are specific rules and procedures and are such ideal in controlling routine and simple jobs. Outcome controls could be used when the level of the risk became higher and where behaviors were difficult to measure (Eisenhardt 1985). Govindarajan and Fisher (1990) incorporated two additional variables, "behavior observability construct" and "retained task programmability" into the original control model matrix of Eisenhardt (1985) and Ouchi (1979). Table 2 shows the adjusted matrix.

		Task programmability	
		High	Low
High outcome observability	High behavior observability	Behavior	Outcome
	Low behavior observability	Outcome	Outcome
Low outcome observability	High behavior observability	Behavior	Clan
	Low behavior observability	Self	Self

Table 2: Control Matrix Related to Behavior and Control
(Kirsch 1996)

Kirsch (Kirsch 1996) found that the more the project manager understood the project content, the more the processes became clearer resulting in behavior control domination. Outcome measurability affected both outcome control and self control. She pointed out that when the project outcomes became clearer and more visible, the objectives became easier to specify. As a result, the goals are easily established (outcome control) and this in turn motivates personnel to establish individual goals (self control). Although a portfolio of control is established at project initiation, the controls vary in response to problems encountered during the project. Their data showed that formal controls dominated the model over time (Choudury and Sabherwal, (2003). When appropriate mechanisms exist in the project, project managers tended to utilize formal control. In situations when the appropriate mechanisms were unavailable, the project managers resorted to enforcing inappropriate informal controls or defining new mechanisms including new informal controls (Kirsch 1997). Kirsch (Kirsch 2004) noted that informal controls function as complementary mechanisms to support formal controls. Both control modes evolve as the project progresses and both work side by side to achieve better project outcomes.

Because of their increasing importance in the IS portfolio Kirsch et al. (2002) undertook further refinement of project controls in the external IS project environment. Kirsch et al. (2002) reviewed the application of the control mechanisms in outsourced IS projects and found it was important to

have a client that understood the system development process so that the client could apply the appropriate control. A solid understanding could lead to behavior control whereas an incomplete understanding could result in clan control. One important observation revealed that the client's satisfaction was improved by introducing the formal and informal controls to the client so that they could incorporate these controls in their own projects.

Research Scope and Propositions

We contribute to existing theory by extending the investigation of formal and informal controls over both internal and an external IS projects. This study compares and contrasts the similarities and differences between the two types of IS projects, and uses project management knowledge from the PMBOK as a framework to evaluate the application of controls in these projects. We distinguish between internal and external projects because external projects are often outsourced and performed by non-organizational employees. There is a perception that external projects are better controlled and more successful. The scope of this research is as follows.

First, the control modes in this study are investigated from the client perspective as in the previous studies such as, Kirsch (1997), Kirsch (2002) and Choudhury and Sabherwal (2003). We build on the way the control modes are setup and applied throughout the project life cycle. Second, due to the size and dimension of the data structure, and the timeframe of this study, the analysis and discussion are performed at the level of formal and informal control definitions. Finally, we do not elaborate on the detailed processes within each element from the PMBOK but focus on the adoption of formal and informal control elements at the nine project element layers and discuss the research results at each level.

The first research question "What controls are in place at the project initiation stage?" aims to determine the existence of controls at project initiation. Most elements in the PMBOK recommend control methods. Moreover, Kirsch (1997) and Choudhury and Sabherwal (2003) also noted the dominance of formal controls at the beginning of the external IS project. Therefore:

Proposition #1: Controls are in place for each PMBOK element.

Each PMBOK element listed in Table 1 requires a series of processes to be undertaken. Many of the processes will be required to produce specific outcomes that can result in a series of rules and procedures that are to be followed or result in specific outcomes. These types of situations lend themselves to the adoption of either behavior controls or outcome controls, i.e., formal controls. Thus:

Proposition #2: Formal controls are applied to PMBOK elements that have clear requirements and can support the formal controls.

While the preference is to establish formal control, there will be times when executing the processes within the PMBOK deals with uncertainty, especially when the project is innovative. Innovative projects are associated with increased risks (For example, see argument from Ferguson, Finn & Hall 2005). Uncertainty leads to a lack of clear requirement specifications and as such the establishment of clear rules or procedures to ensure the appropriate outcomes are difficult, i.e., formal controls are difficult to establish. When formal controls are difficult to establish there is the tendency to adopt informal controls as one mechanism to mitigate the risk. Hence:

Proposition #3: In the absence of clear formal control requirements, informal controls will be adopted.

This second question is "How do the controls (formal and informal) evolve during an IS project?" External projects that had 'tight' formal controls at the project initiation stage usually ended with fewer problems. However, external projects were also subject to 'unstructured tasks' emerging as

the project progresses (Choudhury & Sabherwal 2003). At the project planning stage, the PMBOK elements provide clear requirements for the identification of controls that should be implemented. As the project evolves there should be less and less uncertainty surrounding the project and thus its management.

Internal IS projects staffed by internal resources incur stable (salaried) costs on an ongoing basis. These projects invite few non routine events and are therefore unlikely to attract attention. Agreements are made internally in terms of cost, schedule and resources (but usually lack contractual agreement). Because internal projects do not have to consider the formality of contractual obligations, project overruns are not subject to the same scrutiny. Factors such as, time, budget, people and other factors could be discussed in a more 'friendly' environment that was less rigid, more negotiable, and allows for ex post changes. In contrast, external projects incur costs and are subject to schedules that have been contractually agreed. Invoices are scrutinized for compliance with the contract, and any deviations such as schedule slippages or added functionality are highlighted and questioned. Thus, external projects have greater visibility because of the formal processes associated with them. With the importance of maintaining control over external providers it is anticipated that as the level of uncertainty surrounding a project decreases any established informal controls may be replaced by more formal mechanisms. Thus as the project evolves formal controls are still the more extensive control mechanisms in place. Therefore:

Proposition #4: Informal controls evolve to be more extensive than formal controls during an internal IS project's lifespan.

Proposition #5: External IS projects evolve more extensive formal controls than internal IS projects during a project's lifespan.

RESEARCH METHOD

Six projects were chosen from three organizations, a portfolio management company (four projects), and insurance company (1 project) and a large municipality (1 project). The projects were chosen by the senior management of each the organizations, and all were large scale multi-person projects. Project managers across six different IS projects were subjected to indepth interviews to determine how controls are adopted in IS projects. To enrich the interview data, some of the interview sessions also involved a project team member, such as a business or system analyst. The initial interview questions were framed around the PMBOK components, and the control framework examined to determine the existence of controls for each component of the PMBOK. The questions were expanded according to the interviewee's answer. The aims of the interview were to explore the interviewee's experience and frame the experience in terms of the research questions and propositions.

The interview results were recorded and scripts summarized in a more concise and ordered report (according to the PMBOK sequence). Keywords were used to identify the existence of control modes for each particular PMBOK element. The summarizing process used a content analysis technique to paraphrase and remove unnecessary words (see Bouma & Ling 2004; Czarniawska 2004). The summary scripts were analyzed using pattern matching (Yin 1994) and processed through several iteration processes using the case ordered meta matrix method (Miles & Huberman 1994). These iterations categorized the projects and their project management elements into the appropriate control categories that have been established for each iteration. Each iteration had its own category or 'key words.' The initial data were the conclusion script from the previous section. The first iteration identified the dominance of the control mode within each PMBOK element. The

second iteration interpreted the 'extensive' use of the controls over the project duration and analyzed the trend throughout the duration.

RESULTS

The six in-depth studies took place across three different organizations: an investment corporation, a municipality, and an insurance company. Table 3 details the existence of controls within the elements of PMBOK for each project.

Project elements	Project #1	Project#2	Project#3	Project#4	Project#5	Project#6
Setup	Formal: strong Informal: undetected	Formal: strong Informal: undetected	Formal and informal share the same proportion	Formal: exists, unclear Informal: undetected	Formal: strong Informal: undetected	Formal: strong Informal: undetected
Scope	Formal: strong Informal: undetected	Formal: strong Informal: undetected	Formal: strong Informal: undetected	Formal: strong (?) Informal: undetected	Formal: dominant Informal: undetected	Formal: strong, dominant Informal: exists
Time	Formal: strong Informal: exists but not strong	Formal: strong Informal: exists but not strong	Formal: strong Informal: undetected	Formal: strong (?) Informal: undetected	Formal: strong Informal: undetected	Formal: strong, dominant Informal: exists
Cost	Formal: detected and quite strong Informal: undetected	Formal: detected and quite strong Informal: undetected	Formal: strong Informal: undetected	Formal: detected Informal: undetected	Formal: strong Informal: undetected	Formal: strong Informal: undetected
Quality	Formal: strong, rigorous Informal: undetected	Formal: strong, rigorous Informal: undetected	Formal: strong Informal: undetected	Formal and informal exist but they are ambiguous (?)	Formal: strong Informal: undetected	Formal: strong Informal: undetected
HR	Formal: less strong Informal: strong, dominant	Formal: less strong Informal: strong, dominant	Formal: undetected Informal: strong	Formal: strong (?) Informal: exists but not very often	Formal: strong, dominant Informal: exists, less dominant	Formal: strong, dominant Informal: exists, less dominant
Communications	Formal and informal share the same proportion	Formal and informal share the same proportion	Formal: less strong Informal: strong	Formal: undetected Informal: quite strong (?)	Formal and informal share the same proportion	Formal: strong, dominant Informal: not exist
Risk	Formal: strong (?) Informal: exists, not rigorous	Formal: strong Informal: undetected	Formal: strong Informal: exists but not strong	Formal: undetected Informal: quite strong (?)	Formal: strong Informal: undetected	Formal: strong, dominant Informal: exists
Procurement	Formal: strong Informal: not exist.	Formal: strong Informal: undetected	Formal: predicted to exist Informal: undetected	Formal: strong Informal: undetected	Formal: strong Informal: undetected	Formal: strong, dominant Informal: exists
Project Status	Semi external	Semi external	Internal	Internal and external	Internal and external	External

Table 3: Control Framework Evaluation for Each Project

Initially the data was summarized according to the four different IS project classifications,

- (a) purely internal,
- (b) a combination of internal and external where internal is more dominant → signed as 'more internal',
- (c) combination of internal and external where external is more dominant → signed as 'more external' and
- (d) purely external (Table 4).

The degree of dominance was determined by the vendor's involvement in the project. There were four different classifications in the measurement criteria as described in the notes for Table 4.

Proposition 1 predicted controls would be in place for each PMBOK element. Table 3 shows clearly the dominance of formal controls in most elements of PMBOK providing strong support for this proposition. There are some exceptions, mainly in human resources and communications where control is shared between formal and informal modes.

Proposition 2 predicted that formal controls are applied to elements that provide clear requirements and can support the formal controls. Table 4 shows that elements such as budget (cost), quality, and risk assessment made more use of formal controls. This was especially true for the procurement element in the purely external IS project.

Proposition 3 predicted that for each PMBOK element, in the absence of clear formal control requirements, informal controls will be adopted. The results of Iteration 1 (table 4) show that primarily formal controls were dominant, extensively used, and useful at the project initiation stage. However, some elements in the purely internal and more internal IS project types show that informal controls were equally present at the project initiation stage especially where they related to people management. Thus, there is moderate support for proposition 3.

PMBOK elements	control modes	IS Project Types			
		Purely Internal	More Internal	More External	Purely External
Setup	Formal	equal	dominant	dominant	dominant
	Informal	equal	not dominant	na	na
Scope	Formal	dominant	dominant	dominant (?)	dominant
	Informal	na	na	na	not dominant
Time	Formal	dominant	dominant	dominant (?)	dominant
	Informal	not dominant	not dominant	na	not dominant
Cost	Formal	dominant	dominant	dominant	dominant
	Informal	na	na	na	na
Quality	Formal	dominant	dominant	dominant (?)	dominant
	Informal	na	na	less dominant (?)	na
HR	Formal	na	less dominant	less dominant (?)	dominant
	Informal	dominant	dominant	dominant (?)	less dominant
Communications	Formal	equal	equal	na	dominant
	Informal	equal	equal	dominant (?)	na
Risk	Formal	dominant	dominant	na	dominant
	Informal	less dominant	less dominant	less dominant (?)	not dominant
Procurement	Formal	dominant	dominant	dominant	dominant
	Informal	na	na	na	less dominant

Table 3: Iteration 1, Control Dominance Interpretation

(Notes: There are three measurement levels plus one dummy situation as follows:

Dominant - clearly articulated; *Less dominant* - not clearly articulated, some impression exists;

Equal - Exist and share the same position equally; *Na-* not exist, unwritten, undetected)

The data were then analysed to determine how the formal and informal controls were exercised in accordance with the project phases of initiation, development and implementation (Kirsch 2004, p. 390). The given value for each cell was the extended analysis from the framework table and interpretation from the original transcripts. The result of this process is summarized and presented in Table 5.

Project Types	control modes	Project Stages			Overall trend
		Initiation	Development	Implementation	
Purely Internal	Formal	Extensive	Extensive	Less Extensive	decreasing
	Informal	Less Extensive	Extensive	Extensive	increasing
More Internal	Formal	Extensive	Extensive	Less Extensive	decreasing
	Informal	Less Extensive	Extensive	Extensive	increasing
More External	Formal	Extensive	Extensive (?)	Extensive (?)	steady
	Informal	Less Extensive	Less Extensive (?)	Extensive (?)	increasing
Purely External	Formal	Extensive	Extensive	Extensive	steady
	Informal	Less Extensive	Less Extensive	Less Extensive	steady

Table 4: Iteration 2, Extent of Use of Controls Interpretation

The discussion above indicates that in the absence of clear formal control requirements, informal controls will be adopted prior to formal controls. All interview data indicated that the project managers applied strong formal controls at the project initiation stage (unfortunately, this study could not find example of new project without formal controls at the initiation stage). Informal controls were less extensive but the trend increased as the project progressed. From the interview data, project managers used informal controls both to keep track of the project progress within their project team, such as informal meetings with the team to determine progress and to train new people using informal training or mentoring. The project managers increased the adoption of informal controls when facing unstructured problems and increased the formal controls as soon as the problem became clearer. For example, the project manager in project #3 used informal meetings with the stakeholders to anticipate changes during the development and reformulate the formal requirements after the changes had been clarified. Thus, when facing a new challenge, project managers approach the challenge informally. This reasoning suggests moderate support for proposition 4.

Proposition 4 predicted that internal IS projects have less rigid formal controls than external IS projects whereas proposition 5 predicted that informal controls are more extensive than formal controls in internal IS projects. Table 5 and Figure 2(b) show an increasing trend in the use of informal controls in the purely internal, more internal and more external project types.

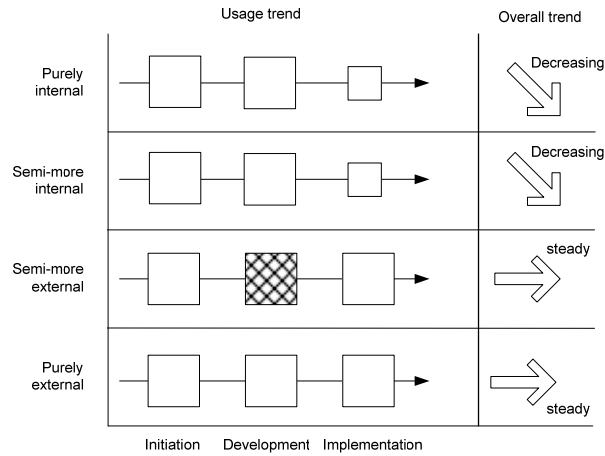


Figure 2(a): Trend Analysis - Formal Controls

(A block with crossed lines (▣) identifies a problem occurrence)

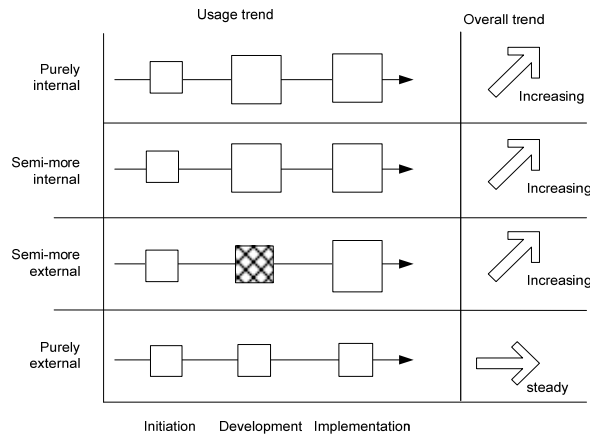


Figure 2(b) : Trend Analysis - Informal Controls

(A block with crossed lines (▣) identifies a problem occurrence))

Project managers of these project types began to adopt informal controls, specifically during the project development stage. On the other hand, the use of informal controls in the purely external project type remained the same. Interview data suggested that the usefulness of formal controls in several elements in the purely internal project type decreased over the project duration. Hence, the adoption of formal controls became less rigid in the elements that showed a decreasing trend because project managers relied on more informal control elements as the project progressed. However, some of the control elements in the more internal and more external projects show a steady trend (extensive at the project initiation). Consequently, the adoption of formal controls in these project types was still high as the project progressed. This implied that in the purely internal project, proposition 4 is confirmed but in the combination of project types, this proposition is only moderately supported.

Proposition 5 predicted that external IS projects have more extensive formal controls than internal IS projects. Table 5 and Figure 2a show that the overall trend of using formal controls decreased over the project duration. The more external and purely external IS projects showed that formal controls had been used extensively during project initiation, development and implementation. One important note is that the use of formal controls in the development stage of semi-more external projects caused problems. While most of the interview data supports this proposition, there was one exception from the iteration results. The more-external project type (project #4) showed that although there were strong formal controls at the beginning of the project, it suffered from inadequate infrastructure that would normally have detected the problems in the early stages. Although the project manager stated that they adopted formal control mechanisms such as a project schedule, formal meetings, and written documentation, those mechanisms lacked the monitoring required from the project personnel, i.e., project staff lacked the management skills necessary to ensure the success of the formal controls. Thus, there is moderate support for proposition 5.

CONCLUSIONS

Through the use of a different approach to data analysis, this study reveals some interesting findings and extends the results from previous research. First, this research analyzed the control adoption of the PMBOK elements across all project types studied. This research found that formal controls were adopted for PMBOK elements that could deliver clear outcomes, such as budget, quality, and procurement (especially when dealing with external parties). Informal controls, on the other hand, were adopted mainly on PMBOK elements that related to people, such as human resources and communications. This research also confirmed that some of the elements used both control modes such as in project set up (or project initiation) management, project time management and project risk assessment, and the degree to which both control modes were employed varied across the project types.

Second, from the control point of view, this study supported the results of Choudhury and Sabherwal (2003), i.e., that formal controls were dominant at project initiation and in most cases these controls became less dominant as the project progresses. For example, as the project team started to get to know each other and adapt to the project environment, there is less reliance on outcome/behavior controls and the informal control adoption process becomes more important and extensive.

Moreover, this research extends Choudhury and Sabherwal's (2003) work by considering internal IS projects. We found that formal controls were more rigorously applied in a purely external IS project. Informal controls, on the other hand, increased in importance throughout the project duration in purely internal and more internal project types. In most cases, the purely internal and more internal project types shared a similar trend.

The last contribution relates to the existing project management knowledge theory. This study found that the existing PMBOK theory emphasizes 'physical' methods or, in this study, formal controls. The theory does not address the 'unwritten method' or informal approach. Indeed, the data showed that the existence of informal controls is also important to ensure that the project delivers its outcomes successfully and this agrees with previous research findings (Choudhury & Sabherwal 2003; Kirsch 2004). Therefore, PMBOK theory needs to be extended to incorporate informal methods of control into the existing body of theory.

The results of this research should be interpreted taking into account the following limitations. First, the usual caveats associated with interview and qualitative research are acknowledged. Second, only six projects were used during the research. Third, the organizations selected were well

established but from only one geographical location. As such there is a potential lack of generalisability.

There are a number of opportunities for future research with four mentioned here. First, the controls could be further segmented into outcome, behavior, clan, and individual controls. Second, the study could be replicated using a more quantitative approach. Third, the research could be replicated and also include “troubled” projects from different firms. Finally, a longitudinal study could be performed to fully appreciate the controls as they evolve through the project lifecycle.

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