Exploring Control Tensions in IS Project Portfolio Management

Research-in-Progress

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Abstract

While the concept of control has been widely studied in information technology project management, and a plethora of mechanisms are commonly used to control information systems development (ISD) teams, very little research exists on the management, and particularly control, of IS project portfolios. Using exploratory case studies this research-in-progress seeks to contribute to practice by first using control theory as a lens to uncover a range of formal and informal control mechanisms used in IS projects and portfolios. Secondly, it will identify and categorise the tensions that exist between IS project and portfolio controls. Finally, it will uncover the implications of tensions between project and portfolio controls and their impact on the management of IS project portfolios. This work contributes to the advancement of control theory and provides new insights for theory and practice by integrating the study of tensions and control.

Keywords: project portfolio management, formal control, informal control, tension
Introduction

While much is known about the different types of control exercised in information systems (IS) projects, the controls associated with IS project portfolio management (PPM) represents an important gap in our understanding, which this paper attempts to address. In recent years PPM has received increased attention from organisations driven by the need to gain maximum value from their project portfolio (Hunt and Killen 2008; Li et al. 2009). Yet, many organisations are struggling to implement adequate PPM (Goldfinch 2007) even though effective PPM can help organisations to maximise the delivery of value and return in their IS investments and has the potential to reverse a prevailing trend of IS failure. PPM is more than the management of multiple projects. It is an iterative process of selecting a balanced portfolio of projects, which may be combined into programs, that are aligned to strategic organisational objectives, allocating resources to work on those projects and regularly reviewing and updating the list of projects in the portfolio (Cooper and Edgett 1997; De Reyck et al. 2005; Meskendahl 2010; Unger et al. 2012).

Despite the importance of PPM literature is significantly lacking with relatively little rigorous, evidence-based research. Firstly, this literature is highly disparate, scattered across disciplines resulting in a lack of clarity, cohesion and cumulative tradition, all key traits of a mature theoretical body of knowledge (Frey and Buxmann 2012). Secondly, what PPM literature does exist tends to focus on the initial project selection phase (Archer and Ghasemzadeh 1999; Bardhan et al. 2004) and largely ignores the on-going portfolio management, evaluation and correction post-project selection (Frey and Buxmann 2012). Thirdly, more empirical research has been called for to better understand IS project portfolios; for example, how to better manage resource allocation (Elonen and Artto 2003), improve alignment of projects to organisational strategy (Elonen and Artto 2003), identify the controls used in project portfolios and their subsequent impact on performance (Martinsuo and Lehtonen 2007; Müller et al. 2008) and finally identify tensions between portfolio managers and senior management (Jonas 2010).

Our research proposes to provide insight into the management of IS project portfolios, present a step forward in understanding how controls implemented in project portfolios interact with project controls, identify any tensions that arise between project and portfolio controls and understand the implications of such tensions. Therefore, the research objectives that this paper addresses are as follows. To:

1. Determine the formal and informal control mechanisms used in IS projects and portfolios
2. Identify and categorise tensions that exist between project and portfolio controls
3. Uncover the implications of tensions between project and portfolio controls for the management of projects and portfolios.

Background and Motivation

Control is essential for project and portfolio management. But, PPM is more than aggregated project management (PM) and includes a number of specific challenges: i) a portfolio is measured on its overall success, but individual successful projects do not guarantee a successful portfolio; ii) PMM must satisfy long term strategic goals whereas projects may have more short term objectives; iii) tension can exist between a top down portfolio approach and a bottom up project approach; iv) PPM involves the control of multiple projects and controllers by one controller increasing the complexity of the controller-controllee relationship and the interactions between them. To date the PPM literature has not examined how project portfolios, once established, are controlled to ensure the successful delivery of projects that are continuously aligned with the organisations strategy.

There is agreement in the literature that there both similarities and differences between PPM in IS and PPM in other disciplines such as financial portfolio management, new product development, and research and development (Cho and Shaw 2009; Frey and Buxmann 2012). Jeffery and Leliveld (2004) are of the view that product development and research and development are similar to IS PPM as is financial PPM. For example, in finance portfolio managers manage a portfolio of stocks and shares with the aim of maximising return for the investor by balancing risk and return, which is similar to managing a portfolio of IT investments (Jeffery and Leliveld 2004). In contrast, Cho and Shaw (2009) argue that financial PPM is quite different with the return from financial investments equal to the sum of the returns of individual investments, whereas the return from an IS portfolio may not be equal to the sum of the returns of the individual investments. Secondly, re-selling financial products is also possible, whereas re-selling a
A greater knowledge about the mechanisms required to control an IS project portfolio is demanded as organisations attempt to increase performance and gain efficiencies through PPM (Müller et al. 2008). Many organisations are seeking means to control portfolios of projects but, they admit that these means are not easy to find, especially portfolios with complex projects or interdependencies between projects (Bardhan et al. 2004; Rungi 2010). Every organisation has differing needs and objectives. Consequently, we expect that each organisation will need different controls to operate within their environment. To date published literature has outlined many controls for IS projects (e.g. Choudhury and Sabherwal 2003; Harris et al. 2009; Kirsch 1997). But, there is a need to improve our understanding of the controls used in IS project portfolios, which is the first step that this research seeks to address.

We further develop the topic of control in IS project portfolios by examining the tensions between project and portfolio controls. Tensions are concerned with the choice between alternative forms of management practices or controls (Huxham and Beech 2003). They arise when management must choose between two controls, not necessarily between good and bad controls. Organisations are continually challenged to manage tensions between controls. For example, tensions between informal controls such as fluid roles and team autonomy, which allow for innovation, or formal controls such as use of formal methodologies or centralised authority, which provide predictability (Burns and Stalker 1961; Watson and Rosborough 2000). This is even more challenging for organisations that operate in a dynamic environment, where technological advances are made rapidly and they are under pressure to keep pace with the market or competitors. Research in new product development shows that effective portfolio management is vital to successful product innovation (Cooper et al. 1999) and that managing tensions is also crucial to success (Lewis et al. 2002). Therefore, organisations must select their controls carefully to ensure they are appropriate and that they minimise tensions bearing in mind that the use of particular controls may sometimes have negative implications (Gopal and Gosain 2010).

The range of controls used to manage IS projects varies from project to project, with a flexible approach to control often required, particularly in an uncertain environment (Harris et al. 2009). From a portfolio perspective it is unknown what controls are used or how they change as an organisation’s needs change. Lycett et al. (2004) argue that tensions can arise between projects and what they term programs where there is an excessive focus on control, and where an inadequate connection exists between projects and programs and the alignment of these with the strategic objectives of the wider organisation. We argue that this is exacerbated when dealing with project portfolios as project managers are even further removed from the strategic decision-making process. There is little evidence regarding the tensions between project and portfolio controls and whether these tensions have a positive or negative impact on organisations.

The remainder of the paper is structured as follows. The next section reviews the relevant literature on control followed by literature on tensions and the categorisation of tensions. This is followed by a description of the proposed research methodology and analysis strategy along with some preliminary findings from a pilot study. The paper concludes with some limitations of the study, a discussion and detail of the next steps the authors will take to complete this study.

**Theoretical Background**

**Control**

The term ‘control’ can be defined in a number of ways. In the context of this study control refers to organisations influencing people to take actions and make decisions, which are consistent with the goals and objectives of the organisation (Das and Teng 1998; Eisenhardt 1985; Jaworski 1988; Ouchi 1979).
Typically control involves an individual controller exercising control and evaluating and influencing an individual controllee (the target of control), but it may be extended to involve teams of individuals as the controller or controllees (Choudhury and Sabherwal 2003; Kirsch 2004). A broad range of control modes and mechanisms are used by organisations to control the behaviour of their employees (Kirsch 1997). Prior research defines four modes of control (behaviour, outcome, clan and self), each of which has distinctive characteristics (Table 1) and is categorised as either formal or informal control (Eisenhardt 1985; Jaworski 1988; Ouchi 1979). Formal control (behaviour and outcome) specifies documented rules and procedures that require particular behaviours to achieve desired outcomes, which are then monitored and evaluated resulting in rewards or sanctions (Das and Teng 1998; Eisenhardt 1985). Informal controls (clan and self) are social or people-based and focus on the role that individuals or groups play in the exercise of control (Eisenhardt 1985; Jaworski 1988; Ouchi 1980). They are typically undocumented and rely on common values and beliefs, or traditions among people (Ouchi 1980). The degree to which each mode of control or combination of controls is exercised can vary. Yet, many organisations tend to focus on formal controls due to the ease with which they can be observed and measured (Anthony 1952) even though it is recognised that informal controls have an equally important role to play such as allowing teams or individuals to establish their own standards, monitor conformity to these standards and take action if deviations occur (Jaworski et al. 1993).

<table>
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<tr>
<th>Mode of Control</th>
<th>Characteristic</th>
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| **Formal Control** | **Behaviour** | Behaviours that transform inputs to outputs  
Controller monitors and evaluates controllees’ behaviour  
Explicit link exists between extrinsic rewards and following behaviours |
| | **Outcome** | Desired task outcomes are known and measurable  
Controller evaluates whether outcomes were met  
Explicit link exists between rewards and producing outcomes |
| **Informal Control** | **Clan** | Task-related behaviours and outcomes are not pre-specified  
Goals are determined by clan and evolve during the task period  
Clan identifies and reinforces acceptable behaviours  
Rewards based on acting in accordance with clan’s values  
Shared experiences, values, and beliefs among the clan members  
Members exhibit strong commitment to the clan |
| | **Self** | Controllee sets own task goals and procedures  
Controllee is intrinsically motivated  
Controllee engages in self-monitoring and self-evaluation  
Rewards are based partly on controllees’ ability to self-manage |

Table 1. Characteristics of Four Modes of Control (Kirsch 1996)

Both formal and informal controls are exercised through various control mechanisms used to influence controllee behavior for example; linking salary to performance (formal control), or team building (informal control) (Kirsch 1997; Kirsch 2004). Control modes and mechanisms can complement each other with the same control mechanism used to implement various modes of control. For example, in software development a project plan monitors behaviour by prescribing a specific development methodology and measures outcome by determining if the target date was met (Choudhury and Sabherwal 2003; Kirsch 1997; McBride 2008; Nieminen and Lehtonen 2008; Sabherwal 2003). Controllers must determine the appropriateness of each control mechanism for the task at hand (Kirsch 1997) while recognising that formal control mechanisms are much easier to identify and implement than informal control mechanisms (Nieminen and Lehtonen 2008).

Previous studies on control in ISD has examined, for example, control of internal ISD projects (Kirsch 1996; Kirsch 1997; Kirsch et al. 2002); the performance of project teams (Henderson and Lee 1992); the factors influencing the choice of control modes on ISD projects (Kirsch 1996; Kirsch 1997); controlling a project from the client perspective (Kirsch et al. 2002) and the evolution of controls in outsourced
projects (Choudhury and Sabherwal 2003). However, this research has tended to be limited to single projects with little to no research examining control in project portfolios. This first objective of this research will use Table 1 as a basis to identify and categorise IS project and portfolio control mechanisms.

**Tensions**

The concept of tensions is highly complex and has been interpreted in many different ways (Huxham and Beech 2003). Definitions of tensions range from “stretching something tight” to “barely controlled hostility” (Harcourt and Brace 2011). In this study tensions are specifically referring to “being concerned with the choice between alternative forms of management practice” or “alternate pieces of good practice advice” (Huxham and Beech 2003). They can exist in many forms. For example, Smith and Lewis (2011) categorise tensions as paradoxes, dilemmas or dialectics and Huxham and Beech (2003) refer to them as dilemmas, tri-lemmas or even multi-lemmas. Such tensions can be either obstructive where for example, they cause breakdown, or they can be beneficial, fostering competition and challenge (Veryard 1987) with management involved in the process of continually resolving tensions.

Tensions can exist between different levels of an organisation (Nonaka and Toyama 2002; Rummel 1977). From an information systems perspective where previously tensions existed between project managers and senior management the relatively new role of portfolio manager results in a change in the balance of power. This leads to new tensions between these key personnel (Jonas 2010). We further argue that new tensions will arise between project and portfolio controls. For example, portfolio managers must establish clear controls around resource allocation to minimise tensions with project managers as they continually negotiate with them to ensure the allocation of appropriate personnel to the right projects (Engwall and Jerbrant 2003). It is not uncommon for project managers to act politically to secure resources for their project at the expense of the portfolio (Elonen and Artto 2003). Such tensions may be partially due to the focus of the portfolio manager who looks at the ‘bigger picture’ as opposed to the project manager who is attempting to address immediate needs (Laslo and Goldberg 2008). It is also recognised that the more informal side of project portfolio management warrants further research. For example, how it may lead to tensions or conflicts of a long-term nature, which may result in reduced management quality, inefficiency, and ineffectiveness (Jonas et al. 2013). Consequently, more research is required to explore the nature of control (formal and informal) and tensions in an information systems context.

While the nature of tensions can be complex, research shows that raising awareness on the types of tension that arise can improve practitioners ability to manage them (Huxham and Beech 2003). Yet, relatively little attention has been paid to the identification and resolution of tensions (Poole and Ven 1989). In many organisations the relationship between individual projects and its portfolio of projects is not always clear and is found to be a source of tension (Lampel and Jha 2004) with a lack of understanding of the causes and dynamics of such tensions leading to friction and failure (Aubry et al. 2007). In this study we will use Smith and Lewis’s (2011) categorisation of tensions (Table 2) to assist with identifying and categorising tensions between project and portfolio controls to better understand the different types of tensions that exist. This will address the second research objective of this study.

<table>
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<th>Type of Tension</th>
<th>Description</th>
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<tr>
<td>Performing Tensions</td>
<td>Tensions that emerge from divergent outcomes such as goals, metrics, and stakeholders</td>
</tr>
<tr>
<td>Organising Tensions</td>
<td>Tensions that emerge from divergent internal dynamics such as structures, cultures, practices, and processes</td>
</tr>
<tr>
<td>Belonging Tensions</td>
<td>Tensions that emerge from divergent identities among subgroups and between subgroups and the organisation</td>
</tr>
<tr>
<td>Learning Tensions</td>
<td>Tensions of growth, scale, and change that emerge from divergent time horizons</td>
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Table 2. Categorisation of tensions (Smith et al. 2013; Smith and Lewis 2011)

While there are numerous separate studies on control and tension the link between control and tension has seldom been addressed to date. This research proposes to extend existing research by integrating the
concepts of control and tension with a view to identifying tensions between project and portfolio controls. From a practical perspective we aim to provide new insights into understanding the implications of control tensions and their subsequent impact on the management of IS project portfolios. We have shown that the choice of project controls is well-established in extant literature therefore; we have chosen to focus on control in project portfolios. Further, we have demonstrated that tension is a complex phenomenon and has rarely been studied in information systems development and even less so in relation to IS project portfolios.

**Methodology**

Due to a lack of existing research on control or tension in PPM, this study adopts a qualitative approach (Miles and Huberman 1994) to “flesh out what is really happening” (Weingand 1993). A multiple-case study design is planned to broaden empirical evidence and to allow for comparison and cross-case analysis (Yin 2009). The intention is to conduct a number of case studies across the public and private sector. We will use a purposeful case selection strategy to select cases that are information–rich (Patton 1990). The selection of cases will be defined by two principles (a) at least one portfolio of IS projects exists and (b) each organisation has at least one person, such as a portfolio manager, who manages the portfolio of projects daily. Data collection will continue until saturation is reached (Corbin and Strauss 2008).

Data will be collected primarily through semi-structured interviews and where appropriate, document collection. Interviews will be conducted with project managers and portfolio managers (or equivalent role). Participants will answer interview questions based on their current project or portfolio of projects. We expect the number of interviews will vary by organisation. Each interview is expected to last one hour, which will be recorded (pending permission) and subsequently transcribed for coding purposes. Any documentation relating to current activities will be collected, where it is made available e.g. spreadsheets, screenshots of portfolio management systems, reports.

**Research Instrument Development**

An interview protocol was prepared based on (i) the four control modes identified in Table 1 and (ii) on the four categories of tensions presented in Table 2. Interview questions are primarily open-ended and are informed by the literature. They are designed to elicit the control mechanisms used by project and portfolio managers internally within the cases studied along with tensions that exist between controls. As such, controls involving third parties (e.g. external vendors) are excluded from the scope of this study. Interviewees are asked to provide examples and supporting evidence of specific incidents of control or tension and what impact the tension had on the management of their IS project or portfolio. This seeks to uncover examples of tensions between controls and how the tensions are handled and resolved.

**Analysis Strategy**

Data analysis will be conducted in a systematic and comprehensive manner. First, the transcriptions will be independently examined by each researcher to identify project and portfolio control mechanisms based on the characteristics described in Table 1. Each mechanism identified will be coded in a table as either a behaviour, outcome, clan or self-control mechanism across each of the cases. Supporting text or quotes from the data will be added to a separate column in the table as notes. Where mechanisms facilitate more than one control they will be classified under both. This will result in four tables, one for each control mode, with data categorised by project and portfolio. For each control mechanism to remain in the table it must be corroborated by at least one other interviewee across all cases. The researchers will then meet to review the tables generated and create a single comprehensive list of control mechanisms. The second step will involve reviewing the data to identify and code where tensions exist between control mechanisms. This will result in the creation of a matrix of control mechanisms for each case studied. Cells in the matrix will be highlighted where tensions between controls occur. Supporting evidence must be provided by more than one participant for the tension to remain in the matrix. The third step will involve categorising the tensions identified into one of four categories (Table 2) to better understand the types of tensions that exist within the organisations studied. The final step will involve reviewing the data again to establish the impact these tensions had on the project and portfolio.
Pilot Case

To date we have conducted a pilot study with one public sector organisation. The purpose of this was to familiarise the researchers with the subject under investigation, to test the questions for ambiguity and to time the duration of the interview. The case selected was based on convenience sampling where access to necessary personnel was available. Data was collected in one site through six semi-structured, face-to-face interviews with one portfolio manager and five project managers. Participating staff were employed by the organisation for an average of 11 years and had an average of 22 years experience. The portfolio manager managed a portfolio of 70 projects of varying durations and budgets. Interviews lasted approximately one hour and were recorded and transcribed.

The pilot case is a recently established regional group of hospitals offering varying levels of service which were merged as part of a national health strategy. It is funded by and accountable to a National Health Authority (NHA). IS projects are generally split between (a) the IS department who manage systems that support the daily hospital operations such as patient admissions and billing and (b) Medical Physics who deliver IS projects for all medical devices (IS equipment attached to a patient). In this organisation projects can be initiated nationally by central government or locally by laboratory services, IS, clinicians etc. Approximately 27 separate systems exist that are not properly integrated and do not have a common architecture. All of these systems need support and upgrades in order to facilitate business requirements and to satisfy the increasing reporting requirements to central government. Capital costs for national projects are funded by central government, but running costs are funded from local recurrent budgets as are projects initiated locally. Development is carried out by 3rd party vendors selected from a small pool of organisations capable of providing the high spec bespoke solutions required in this critical environment.

Preliminary Findings

Despite the explicit hierarchical structure imposed in the healthcare organisation studied our results provide evidence of a reliance on both formal and informal controls in both IS projects and portfolios. There is also preliminary evidence that tensions exist between project and portfolio controls, which impacts both the management of the project and the portfolio. As analysis is still underway only a sample of the findings are presented, which reveal examples of controls and tensions between project and portfolio controls.

The lack of formal controls to prioritise and select projects for the project portfolio provides powerful stakeholders within the healthcare organisation with the ability to use their informal networks to influence decision-makers. It can ultimately result in the allocation of budget to projects that are not of greatest strategic importance for the healthcare organisation. This leads to tension with formal project controls where project managers expend substantial effort creating business cases in conjunction with the business owners in order to define project scope and benefits.

The organisational structure promotes formal communication. However, tension exists between formal communication channels at project level and informal communication channels at portfolio level. Decisions are regularly made ‘on the corridor’ by senior management as opposed to at formal governance board meetings, which may or may not be communicated downwards to project managers who are expected to use the formal channels of communication. The view is that the informal meetings and discussions are a ‘way of getting things done’ as while there are lots of formal meetings ‘no decisions are made’. This can have implications for the organisation if an important decision is made and all appropriate personnel are not involved in the decision-making process.

Due to the nature of the organisation tight budgetary controls exist for the project portfolio. On occasion these cause tensions with informal controls at project level such as the shared value of ‘patient safety’. The culture within the project managers is that it is ‘inappropriate to deliver on time’, if the system is not ‘safe’ from a patient perspective. Project deadlines are extended by project managers when in the interest of patient safety. Consequently, additional budget is required to deliver the project, which has to be negotiated at a senior level. The implications are that monies from other planned projects must be reallocated to support the completion of existing projects. Further tensions exist between formal portfolio budget controls and formal project controls. Annual budgeting applied to the project portfolio made
schedule tracking difficult for the portfolio manager. Project managers tended to over-estimate progress to draw down funding before the year end as the culture within the healthcare organisation was to ‘spend it while it is there’.

Strict quality controls are defined at project level for some software systems. For example, any system installed in the laboratory requires a certain level of formal testing to maintain laboratory accreditation. Commitment is required from staff within the laboratory to test the system, but quite frequently the laboratory “has no staff [available] to test the system”. Therefore, tensions can arise between the formal quality controls required to deliver software systems and the formal controls of trying to meet an implementation schedule. This can have wider implications for the healthcare organisation. A delay in testing delays the overall implementation, which affects a number of clinical areas across the hospital group as “all departments in all hospitals [in the group] have to be ready to go live with a new version on the same day”.

**Limitations, Conclusions and Next Steps**

This study has a number of limitations. As with any qualitative study we will not attempt to generalise the findings, but rather to present the uniqueness of each case and identify where similarities and differences occur across a number of organisations. Secondly, the use of interviews as a data collection method has its limitations. The researcher may introduce bias, which we will address by corroborating information from different participants. It is also possible the participant may not be forthcoming with information or may struggle to answer a question. In such instances questions may be rephrased to assist with responding. While formal controls are relatively easy to identify, informal controls such as clan control are much more difficult to determine due to their subtle and intangible nature and it is possible that participants in the study may not identify relevant or interesting informal controls. Similarly, the concept of tensions is complex and while the notion of tensions between people is relatively easy to grasp, we anticipate that it will not be as easy to ascertain tensions between controls. We will interview multiple project and portfolio managers in each organisation in an attempt to address this and also to improve the reliability and validity of the findings.

This study is motivated by the increasing complexity of IS projects and portfolios within organisations. To date, little research exists on PPM in ISD despite the volume and impact of portfolio theory in other disciplines, and the fact that the IS field is symptomatic of a lack of adequate PPM. In particular, research has not focused on controls in PPM, dealt with the subsequent tensions that may arise from using these controls and the implications such tensions may have for the management of IS projects and portfolios. From a research perspective this study will advance the current understanding of project portfolio management by first identifying a comprehensive list of control mechanisms (outcome, behaviour, clan and self) implemented in IS project portfolios, which are already well documented for IS projects (Kirsch 1997; McBride 2008). This is important as it shows the range of controls that portfolio managers implement to manage their project portfolios, which is currently unknown and it will provide guidance for future researchers who wish to study control in IS project portfolios.

The second part of our study focuses on the identification and categorisation of tensions between project and portfolio controls. Previous literature has identified tensions within organisations (Smith et al. 2013; Tracy 2004). Our study makes a meaningful addition to the literature as little empirical work has attempted to understand if tensions exist between project and portfolio controls. Such understanding is useful to project and portfolio managers to inform them of considerations that may need to take account of in their day-to-day management and assist in the implementation of more appropriate controls to minimise tensions between controls.

The final part of our study will address the implications of tensions between project and portfolio controls for the management of IS projects and portfolios. This will make a contribution by helping organisations recognise that tensions exist between project and portfolio controls, which may result in the removal of some controls, the addition of new controls or the modification of existing controls in IS projects and portfolios.

In terms of next steps we will first complete analysis of the pilot data to compile an initial list of project and portfolio controls (behaviour, outcome, clan and self) followed by the documentation and categorisation of tensions between these controls, which will inform the second phase of data collection.
At this point in time we have obtained agreement from three organisations to participate in the study (one in the education sector, two in the software industry). We have also identified project and portfolio managers within each of those organisations who are willing to participate in interviews. This will provide the opportunity to conduct cross-case analysis across a range of organisations and industry sectors to determine the different approaches to controlling IS projects and portfolios. Following this we will be in a position to develop a comprehensive list of IS portfolio controls and identify tensions between these and project controls along with understanding the implications of such tensions for the management of IS projects and portfolios. Then we will determine if a point of saturation has been reached, or if additional data is required.

Future research, both quantitative and qualitative, may extend this research to examine a range of organisations across a number of industry settings to determine similarities or differences between controls and control tensions or examine the relationships and interactions between tension and control. This may involve an examination of controls used with third-party service providers. Other research may try to understand what leads to tension and examine if tensions identified may be used as a source for change in portfolio management work practices. Such research may help project and portfolio managers deviate from established norms and improve their practices. Finally, another strand of research may examine strategies for tension resolution and their application in IS projects and portfolios. Such insights will help project and portfolio managers to better understand control tensions and subsequently inform the adaptation of existing controls or the creation of more innovative controls.

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