Why Do You Control? The Concept of Control Purpose and Its Implications for IS Project Control Research

Completed Research Paper

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Abstract

Existing IS project control research primarily draws on agency theory to conceptualize control, relating control closely to aligning behaviors of self-interested controllees with organizational objectives. Recent studies in neighboring disciplines, however, suggest that the agency view of control is too narrow to fully understand control activities. Informed by these studies as well as drawing on stewardship and coordination theory, we introduce the concept of control purpose to the IS literature. We define this concept as the intentions underlying the controller's control activities, and distinguish between appropriation- and coordination-oriented controls. To evaluate the control purpose concept, we conduct a secondary analysis of 21 IS project control case studies. Results show that, despite their stated agency focus, most studies report on controls addressing both appropriation concerns and coordination requirements. On this basis, we discuss two potential research areas, knowledge management and control dynamics, where the control purpose concept can offer novel insights.

Keywords: IS project control, control theory, control purpose, appropriation concerns, coordination requirements, knowledge management, control dynamics.

Introduction

The control of information systems (IS) projects is a central activity in creating and capturing value from information technology (IT) resources. Existing IS project control research has produced a wealth of theoretical and practical insights on the antecedents and performance effects of control choices in a variety of project contexts including internal and (offshore) outsourced settings as well as agile and open source software settings (e.g., Choudhury and Sabherwal 2003; Gallivan 2001; Gopal and Gosain 2010; Kirsch 1996, 1997, 2004; Maruping et al. 2009; Tiwana and Keil 2009).

Consistent with prior research in related fields (e.g., Cardinal 2001; Das and Teng 1998; Jaworski 1988; Ouchi 1979), existing IS project control studies typically draw on agency theory (e.g., Kirsch 1996; Tiwana and Keil 2009) and define control as any attempts by a controller to align controllee behaviors with organizational objectives. The underlying assumption is that the primary purpose of control is to reduce agency problems such as moral hazard and adverse selection (Eisenhardt 1989). In other words, the agency view of control has a strong focus on mitigating concerns associated with appropriating value.

While appropriation concerns are certainly a key purpose of control, we argue that focusing solely on the agency aspect is too narrow a conceptualization of control as an organizational phenomenon (cf. McBride 2008). An important counterweight to agency theory is stewardship theory, which portrays the agent as a steward working towards the principal's goals, thus where goals between principal and agent are aligned (Davis et al. 1997). According to stewardship theory, the purpose of governance and control point to a different purpose, which is to allow coordination to be achieved most effectively (Donaldson 1990). Thus, the theoretical focus would shift from conflict of interest (agency theory) to team coordination (stewardship theory) Donaldson (1990, p. 375).

This view is backed up by control researchers in neighboring disciplines, who suggest that a broader perspective on the purpose of control is required to fully understand control activities and their outcomes (Dekker 2004). This is because solely focusing on appropriation concerns would shield other important purposes that need to be considered when successfully enacting controls. For example, managers of IS projects often find themselves in a situation where controls seem to be ineffective. One reason for this may be that the selected controls are primarily targeted towards managing appropriation concerns but ignore the need to coordinate across stakeholder groups and intra- and inter-organizational boundaries. Similarly, an overemphasis on appropriation-oriented controls may lead to negative, socio-emotional side effects on controllee motivation (e.g., Cram 2011), and may largely ignore strategic goals related to the creation of new value (e.g., Rai and Tang 2013). In situations where interest of principal and agent are aligned, stewardship theory would suggest that appropriation-oriented controls are unnecessarily costly and counterproductive, as they would diminish autonomy, responsibility and feelings of achievement of the controllee with negative side effects on motivation, satisfaction and performance (Donaldson 2008).

Against this backdrop, accounting and organization researchers have recently supplemented an economic view of control (i.e., agency, transaction cost) with another important purpose of control, namely the management of coordination requirements (Dekker 2004; Gulati and Singh 1998; Gulati et al. 2012). The coordination purpose of control is highlighted by Gulati and Singh (1998): Even if two parties "have complete confidence in each other and face no appropriation concerns whatsoever [...], they must still coordinate the division of labor and the interface of activities and products between them" (p. 783). While concepts from coordination theory may help to explain the coordination of tasks and operative activities, they do not explicitly account for hierarchical or contract-based controller–controllee relationships. Here, additional support comes from stewardship theory, which focuses on the control relationship between principal and agent (steward), in fact as one that is characterized by goal alignment and emphasizing coordination between the two parties (Donaldson 1990; Davis et al. 1997).

Drawing on prior work in the accounting, organization and management literatures, this paper introduces the concept of control purpose to the IS project control literature. We define control purpose as the intentions that underlie the controller's choice and implementation of specific controls, and conceptualize it in terms of the distinction between appropriation- and coordination-oriented controls. We thus extend the existing narrow view of control by drawing from stewardship and coordination theory, which can help explain coordination decisions taking place within the boundaries of control theory in situations that go beyond the traditional agency perspective of appropriating value. Stewardship theory, for example,

suggests that control systems foster collaboration and allow for the joint mobilization of resources to meet organizational demands (Hernandez 2012)

We believe that the control purpose concept offers a new way of thinking about what controls should be used under which circumstances as well as why implemented controls may not be effective, and thus has important implications for both researchers and practitioners. To evaluate the concept of control purpose, as well as to provide support for its meaningfulness, we review the IS project control literature and conduct a secondary analysis of published case studies. The results of our analysis reveal that, although all the reviewed IS project control studies define control from an agency perspective (e.g., Choudhury and Sabherwal 2003; Kirsch 1997), the great majority of these studies, at least implicitly, refer to both appropriation concerns and coordination requirements as the purpose of control activities. Furthermore, informed by the results of our literature analysis, we discuss the theoretical implications of the control purpose concept. Specifically, we suggest that this concept helps explain the link between control and knowledge processes, as well as contributes to a deeper understanding of how and why controls evolve, and the differences in such control dynamics between internal and outsourced projects in particular. In addition, the introduced distinction between appropriation- and coordination-oriented controls also informs the link between the control and the coordination of IS projects.

The remainder of the paper is structured as follows: The next section gives an overview of the IS project control literature and conceptualizes the notion of control purpose. We then describe the applied research methodology. Next, we present the literature analysis results and elaborate on the theoretical implications of the control purpose concept. We conclude by discussing the contributions and limitations of our study.

Theoretical Background

IS Project Control

The control of IS projects presents multiple challenges to managers. First, IS projects represent temporary organizations that are typically non-routine and non-recurring within a context, and entail considerable complexity and uncertainty (e.g., Kirsch 1997; Rustagi et al. 2008). Second, work processes and outcomes in IS projects are highly abstract, and are thus difficult to observe and measure (Mähring and Keil 2008). Third, during the course of an IS project, project goals and requirements, task characteristics, team composition, stakeholder involvement, and organizational context factors often change (Kirsch 2004; Markus and Benjamin 1996; Sambamurthy and Kirsch 2000). Adding to this, managers frequently lack relevant technical knowledge, which is subject to fast-moving fashion waves and hype cycles.

In the IS project control literature, *control* is typically defined as any attempt to align individual behaviors with organizational objectives (Choudhury and Sabherwal 2003; Henderson and Lee 1992; Kirsch 1996; Kirsch 1997; Tiwana 2010; Tiwana and Keil 2009). This is consistent with prior control definitions in related literatures (Cardinal 2001; Das and Teng 1998; Flamholtz et al. 1985; Jaworski 1988; Merchant 1988; Ouchi 1979). In this behavioral view, control is often thought to be dyadic in the sense that there is a controller (the individual exercising control) who regulates or adjusts the behavior of a controllee (the target of control) (Choudhury and Sabherwal 2003; Kirsch 1996). The control activities carried out by the controller are usually categorized into different types or modes of control. The dominant control typology within IS research can be traced back to the work by Ouchi (1979, 1980) and Kirsch (1996, 1997). This typology consists of four control modes, which can be divided into formal (behavior and outcome) control and informal (clan and self-) control (ibid). Formal control modes are characterized by explicit controller prescriptions, whereas informal control modes attempt to influence implicit determinants of controllee behaviors (Jaworski 1988). Controllers combine formal and informal control modes into a portfolio of controls (Kirsch 1997). Within a portfolio, each control mode can itself be implemented through multiple control mechanisms (ibid).

Extant research on the control of IS projects provides a rich body of knowledge regarding the antecedents of control mode choices (e.g., Kirsch 1996, 1997) and the performance effects of such choices (e.g., Gopal and Gosain 2010; Tiwana and Keil 2009), while dynamics in the configuration of the control portfolio, with some notable exceptions (e.g., Choudhury and Sabherwal 2003; Kirsch 2004), are, so far, less extensively explored. Earlier research studies focused on hierarchical control relationships in internal IS projects (e.g., Henderson and Lee 1992). More recent studies have paid increasing attention to business-

IT control relationships (e.g., Kirsch et al. 2002), client-vendor control relationships (e.g., Choudhury and Sabherwal 2003; Gopal and Gosain 2010), as well as control in specific IS project settings including open source (e.g., Basnet and Lane 2005; Gallivan 2001) and agile IS development (e.g., Harris et al. 2009; Maruping et al. 2009). Although the increasing range of project types, control relationships, and software development methodologies included in IS project control studies has produced a wealth of theoretical and practical insights, it has also brought along several inconsistencies across study results. For example, Choudhury and Sabherwal (2003) find that key control mode antecedents, such as the controllee's IS knowledge, do not easily translate from internal to outsourced IS project settings. Relatedly, Tiwana and Keil (2009) reveal that controls enhance the performance of internal IS projects, but not of outsourced IS projects. Although these studies point to control differences between internal and outsourced projects and offer some potential explanations for these differences, our understanding of how and why the control of internal IS projects is different from the control of outsourced IS projects is still limited. Furthermore, despite the increasing body of research on the control of IS projects, there are still several areas that require further attention. For example, while existing research has identified the controller's and the controllee's knowledge as key antecedents of control mode choices (Kirsch 1996, 1997), it remains unclear how control activities affect different stages of the knowledge management life cycle (Turner and Makhija 2006). Another major gap in extant literature is that most prior research has applied a static perspective to study the control of IS projects (Gregory et al. 2013). Consequently, our understanding of how control activities change over the course of an IS project remains fragmented.

In an effort to further theoretical progress in the area of IS project control research, this paper introduces the concept of control purpose to the IS literature. By extending the conceptual 'toolbox' available to IS researchers, this concept helps address some of the above-highlighted research gaps and inconsistencies in extant literature, and opens up promising new opportunities for future research in the area.

Concept of Control Purpose

A frequent argument for the importance of IS project control is that "successfully building systems [...] requires effective management of relationships among [project] stakeholders to elicit their contributions and cooperation, while, at the same time, maintaining progress toward the project's goals" (Kirsch 1997, p. 215). This argument is consistent with Gulati and Singh (1998) and Dekker (2004), who highlight two central control problems, namely the management of appropriation concerns and coordination requirements: *Appropriation concerns* "arise from the uncertainties associated with future specifications, cost uncertainties, and problems in observing [participants'] contributions, all of which aggravate the potential for moral hazards" (Gulati and Singh 1998, p. 788). *Coordination requirements* arise from the need to integrate the critical and complementary skills and knowledge of the diverse set of stakeholders involved in IS projects (Kirsch 1997; 2004). As a result, coordination requirements give rise to another set of concerns that is different from appropriation concerns (Gulati and Singh 1998).

On this basis, we introduce the concept of control purpose, which we define as the intentions underlying the controller's choice and implementation of specific controls. Focusing on control intentions (why?), the control purpose concept is clearly distinguishable from control choices (what?) and the implementation of such choices (how?). We conceptualize control purpose in terms of the distinction between appropriation- and coordination-oriented controls (see Table 1).

Appropriation-oriented controls primarily relate to agency theory. Such controls aim at safeguarding investments from being appropriated by the potentially opportunistic other (Dekker 2004), and thus at minimizing agency problems (Gulati and Singh 1998).). This can be seen as a consequence of the two root causes of agency problems: goal incongruence, or the extent to which there is a lack of shared understanding regarding the relative importance of key performance criteria (Jap 1999; Jap and Anderson 2003), and information asymmetry, or the state in which the agent has superior information, for example, because of her expertise (Jensen and Meckling 1976; Levinthal 1988; Libertore and Luo 2010; Nilakant and Rao 1994). Goal incongruence and information asymmetry may give rise to adverse behaviors by the agent, prompting appropriation concerns and the use of controls intended to ensure compliant behaviors (Gulati and Singh 1998).

In contrast, *coordination-oriented controls* relate to stewardship theory, with its underlying focus on value creation and coordination. In contrast to agency theory with its 'economic model of man' that views individuals as individualistic, opportunistic, and self-serving, stewardship theory views agents as

collectivist, pro-organizational, and trustworthy, where motives are aligned with the objectives of their principals (Davis et al. 1997, p.21). As already motivated in the introduction, this perspective emphasizes control activities focusing on coordination by means of empowerment, guidance, facilitation and cooperation rather than on appropriation by means of supervising monitoring and rewarding. This perspective is further emphasized by the underlying, more positive 'model of man'. It thus adds to control theory a distinct coordination perspective that is able to explain motivational and situational reasons behind the coordination of two parties from a different viewpoint than agency theory (Donaldson, 1990).

Stewardship theory also differs conceptually from coordination theory, which is mainly concerned with managing resource and task interdependencies among equal multiple actors (Crowston 1997; Malone and Crowston 1994). More specifically, while coordination theory provides further insights into the purpose of coordination, stewardship theory helps to explain the more important motivational and situational circumstances behind coordination in cases where the controller-controllee relationship better matches one that is characterized by stewards that behave in the interest of the principal (Davis et al. 1997). When taken together, coordination theory and stewardship theory contain unique concepts that we perceive as supporting a consistent, integrated view of coordination-oriented controls.

Table 1. Appropriation- vs. Coordination-oriented controls

	Appropriation-oriented controls	**Coordination-oriented controls**
Definition	Controls targeted at the controller's anticipated concern about her organization's ability to capture adequate value from the IS project	Controls targeted at the anticipated complexity of the IS project and the difficulties associated with managing resource and task interdependencies
Underlying theory	Agency theory	Stewardship and coordination theory
Core assumptions	• Goal incongruence and information asymmetry between principal/agent • Agent self-interest and opportunism • Extrinsic motivation	• Common overall goal • Information/knowledge asymmetry among actors • Intrinsic motivation
Addressed problem	Appropriation concerns (e.g., adverse selection, moral hazard)	Coordination requirements (e.g., task interdependencies)
Supported process	Value *capturing*	Value *creation*
Overarching goal	Minimize agency problems	Maximize value
Control focus	Supervising, monitoring, compliance	Coordination (by empowerment, guidance, facilitation, trust)

Note: Based on Crowston (1997), Davis (1997), Dekker (2004), Eisenhardt (1989), Gulati and Singh (1998), Malone and Crowston (1994)

To clarify, in this paper, we do not aim to integrate control theory with coordination theory, or to extend coordination theory as such. Still, the focus is on control activities and how such activities might serve a coordination purpose. Consequently, we are not explicitly considering coordination theory as a whole, but we draw on concepts of coordination theory (e.g., task interdependency and complexity) in order to supplement stewardship theory and articulate a distinct view of coordination within the boundaries of control theory. Coordination is a central aspect of all organized activity and is implicitly and explicitly covered in many theories other than coordination theory, such as contingency theory, organization design, and stewardship theory.

It is important to note that Dekker (2004) and Gulati and Singh (1998) refer to the control problems of appropriation concerns and coordination requirements in the context of interorganizational relationships (e.g., strategic alliances). Our focus is at the project level and is clearly located within the boundaries of control theory, as opposed to project management, which encompasses a multitude of activities other than control, such as leadership, team processes, or managing change (e.g., Kerzner 2009).

On a related note, a key conceptual assumption of our paper is that both appropriation concerns and coordination requirements do not only apply to interorganizational (e.g., outsourced) projects but also to internal IS projects, which often require cooperation among (globally) distributed and/or a diverse set of project stakeholders. For example, if the task of an internal IS project is to develop a cross-functional software system, the heads of each of the involved business departments will face appropriation concerns and coordination requirements, and they will aim to exercise control over the internal IT department in order to ensure that the project does create value and that their departments do appropriate a fair share of the value created in the project. Furthermore, consistent with Dekker (2004), our paper makes the conceptual assumption that the two control purposes apply to formal as well as informal controls. For instance, if the members of the project team share norms and values that are well aligned with organizational objectives, clan controls will help mitigate appropriation concerns. On the other hand, if project team members value a collaborative work environment, clan controls will help reduce coordination needs.

Research Methodology

To evaluate the concept of control purpose, as well as to provide support for the meaningfulness of this concept, we reviewed the IS project control literature and employed secondary case analysis. Secondary case analysis typically refers to using pre-existing qualitative case data and their associated analysis as primary data to generate new insights or theory (Hanson 2010). Here, in line with the methodological approach used by Gallivan (2001), we developed a strategy for searching prior literature, defined a list of selection criteria, and singled out an appropriate content analysis approach.

To identify relevant studies, we followed a systematic search process, as recommended by Webster and Watson (2002): First, we conducted a database search for all leading journals in the IS field (AIS Senior Scholars' Basket of Eight) using keywords such as "project control", "control theory", and "organizational control". We also manually scanned the journals' tables of contents to pinpoint IS project control studies not caught by the keywords. Second, we searched the proceedings of leading IS conferences (e.g., ICIS and ECIS) as well as two journal databases (*Business Source Complete* and *ScienceDirect*). Third, we reviewed the citations of the articles and papers identified in step one and step two in order to identify prior studies relevant to the review scope (backward search). Fourth and finally, we used Google Scholar to search for other relevant work that cites key articles identified in the previous steps (forward search).

To select the studies to be included in our final review sample, we defined a set of three selection criteria: First, we limited our sample to qualitative (case) studies. This criterion enabled us to develop a more detailed understanding of the described project controls and the context in which they were used, and therefore to carefully map the concepts of appropriation- and coordination-oriented controls onto the reported study results. Second, the studies needed to contain empirical data and original analysis, that is, the authors themselves must have observed the control of one or more IS projects. Third, we excluded conference papers that resulted in journal articles as well as research-in-progress papers from our sample. With these selection criteria, we aimed at including all relevant IS project control studies with substantial content while avoiding an unmanageable sample (Leidner and Kayworth 2006). On this basis, we finally selected 21 studies (17 journal articles and 4 conference papers) for inclusion in our analysis. The studies span a time period of almost 20 years (1996-2014). 12 of the 21 studies examine the control of internal IS projects, while 9 studies focus on the control of (offshore) outsourced projects.

All case studies were uploaded into the software NVIVO, which we used for qualitative analysis of our data. We first analyzed the studies included in our review sample in terms of how they define control. Next, two members of the author team thoroughly read the case context (if applicable) and case results sections of each study in an iterative manner to identify statements and interview quotes that explicitly or implicitly refer to manifestations of appropriation concerns or coordination requirements (see Table 2 below for a sample of representative quotes and the corresponding coding results).

To define our initial coding scheme, we drew on key concepts of agency theory and main antecedents of coordination activities, such as goal incongruence, information asymmetry (appropriation concerns), and task interdependencies (coordination requirements). We particularly searched for occasions where we could relate purposes with the use of specific controls (see Table 1). Especially in the first iterations of our data analysis process, we thus applied a traditional form of content analysis, whereby we approached the

collected data with predefined concepts and searched for text passages that embodied these concepts (Andren 1981; Gallivan 2001). During the data analysis, we iteratively refined and extended our initial coding scheme by codes that emerged from our line-by-line coding. For example, it turned out that 'performance problems' were often mentioned in relation to goals that were not aligned (e.g., evidenced by different expectations between controller and controllee) or an increase in monitoring to reduce information asymmetries. Preliminary coding results were discussed with the other members of the author team to develop a shared understanding and resolve ambiguities. Here, the authors alternated between constructive and critical positions (Eisenhardt 1989), which helped consolidate the coding scheme and ensure that the codes were applied consistently across the case data.

Table 2. Coding examples of appropriation- and coordination-oriented controls

Reference	Quote	Control purpose (Manifestations)	Link to control
Kirsch (2004, p. 383)	The IS Managing Director provides another example*: "I typically do the walk around management style and check up with people, both the checking up from a technical standpoint and also checking up from a user standpoint, the user liaison, to get their feelings on how they feel that things are progressing."*	**Appropriation concerns** (Information asymmetry)	Behavior control, Clan control
Choudhury and Sabherwal (2003, p. 307)	"*It was at that point we realized we were in trouble and we started getting into our daily meetings and tight control over everything that was happening and working with them, very closely monitoring them."* [IS Project Manager] …none of the software would pass the test the first time around. To overcome this problem, [the] IS director called [the vendor's] president to encourage better self-control (especially in terms of testing)…	**Appropriation concerns** (Performance problems)	Formal control, Self-control
Chua et al. (2012, p. 13)	Unlike the earlier appointment, this *"screening and interview process was conducted by both the vendor and corporate management, who emphasized 'ability to fit' in the hiring interview."* [Project Manager]	**Appropriation concerns** (Adverse selection)	Clan control
Heumann et al. (2014, p. 7)	*"The release manager must coordinate with each team leader. For example, if he says the time frame [for the next delivery] is three months then he would ask us how the different work packages were connected and whether delivery in time was possible at all."* [Team leader infrastructure]	**Coordination requirements** (Task interdependencies)	Outcome control
Kirsch (2004, p. 386)	…to facilitate cooperation and coordination among stakeholders, formal plans and policies were put in place: *"The control is your project plan. You know, making sure that you have got a well thought-out, detailed plan, by country, because all the steps, the resources assigned, who's doing what to whom…"* [Global Implementation Manager]	**Coordination requirements** (Cooperation, Task interdependencies)	Behavior control
Gregory et al. (2013, p. 1219)	"*We asked ourselves the question: How can we bring the team up to speed early on […] One of the things we discussed was that we needed joint workshops in the beginning to establish common understanding, a joint working model, and deal with cultural differences*." [Client chief architect]	**Coordination requirements** (Knowledge exchange, Cooperation)	Behavior control, Clan control

Results of Literature Analysis

Our secondary case analysis of 21 IS project control studies reveals that all of the reviewed studies define control from an agency perspective. Kirsch (1996, p. 1) provides a common definition of control as "attempts to ensure that individuals working on organizational projects act according to an agreed-upon strategy to achieve desired objectives" (see also Kirsch 1997, p. 216). Thus, not surprisingly, all 21 studies in our sample refer to specific manifestations of appropriation concerns as the purpose of control activities. Nonetheless, our case analysis also reveals that 19 of the 21 studies simultaneously point to specific manifestations of coordination requirements as the control purpose (see Table 3).

Table 3. Appropriation concerns and coordination requirements in reviewed IS project control studies

Reference IS project type	Manifestations of **appropriation concerns**	Manifestations of **coordination requirements**
Beck and Schott (2012) Outsourced (global)	Goal incongruence (divergent values), Information asymmetry (project progress), Performance problems, Moral hazard (bargaining behavior)	Task interdependencies, Inter-vendor cooperation, Knowledge exchange (joint reflection, interorganizational learning)
Choudhury and Sabherwal (2003) Outsourced (partly offshore)	Performance concerns and problems (quality and time), Information asymmetry (difficulty in monitoring vendor behavior)	NA
Chua et al. (2012) Internal	Performance concerns and problems (quality), Goal incongruence, Adverse selection (primary vendor manager, uncooperative consultants)	Task complexity and uncertainty, Transfer of domain knowledge, Knowledge exchange (between business unit representatives and consultants)
Conboy (2010) Internal	Performance concerns and problems (budget)	Task complexity (context)
Cram and Brohman (2013) Internal	Information asymmetry (project cost and progress), Performance concerns (scope creep)	Task interdependencies, complexity, and uncertainty (via agile development approach), Knowledge exchange (between developers)
Gregory and Keil (2014) Internal	Information asymmetry (transparency of project progress)	Task interdependencies, Knowledge exchange, Participation, Collaboration
Gregory et al. (2013) Outsourced (offshore)	Goal incongruence (divergent expectations), Performance concerns (quality and time), Information asymmetry (project status and vendor processes)	Transfer of business-functional knowledge, Knowledge exchange, Cooperation (in various phases)
Harris et al. (2009) Internal	Performance concerns (bounded scope, quality, time pressure), Information asymmetry	Cooperation (of development units), Task interdependencies, complexity, and uncertainty, Participation (agile development approach)
Heiskanen et al. (2008) Outsourced	Performance problems (time, quality), Moral hazard (opportunistic behavior)	Cooperation

Heumann et al. (2014) Internal	Performance concerns (efficiency), Performance problems, Information asymmetry (across hierarchical levels)	Task interdependencies, Task complexity, Knowledge exchange and transfer (local and global transparency)
Kirsch (1997) Internal	Goal incongruence, Information asymmetry (project progress)	Knowledge exchange, Cooperation (among remotely located team members), Participation
Kirsch (2004) Internal	Information asymmetry (progress), Performance problems (local vs. global requirements), Goal incongruence (lack of commitment), Adverse selection	Cooperation, Task interdependencies (between project phases), Knowledge transfer
Kirsch and Cummings (1996) Internal	Performance concerns and problems (quality and time), Information asymmetry (performance evaluation)	Task complexity
Mao et al. (2008) Internal	Performance problems (time issues), Goal incongruence, Moral hazard (power struggle and internal conflicts), Adverse selection (developers)	Knowledge exchange (mutual learning), Transfer of domain knowledge, User participation
McBride (2008) Internal	Information asymmetry (project "health"), Adverse selection	Task complexity (breakdown of work tasks), Cooperation
Persson et al. (2011) Outsourced (nearshore)	Goal incongruence (divergent expectations), Information asymmetry (project progress), Moral hazard	Task interdependencies (mutual dependence), Knowledge exchange
Prifling et al. (2008) Outsourced (offshore)	Performance problems (with project implementation), Moral hazard (risk and conflict avoidance attitude)	Knowledge transfer (from client to vendor)
Prifling et al. (2009) Outsourced (offshore)	Performance concerns (quality), Goal incongruence (mismatch in client-vendor expectations)	Task complexity (breakdown of workload, equal work split), Cooperation (joint development), Knowledge transfer (from client to vendor), Task interdependencies
Remus and Wiener (2012) Outsourced (offshore)	Moral hazard (perceived threat of opportunism, miscommunication), Performance problems (quality)	Task complexity and uncertainty, Cooperation (between onshore and offshore vendor teams)
Soh et al. (2010) Internal	Information asymmetry (work practices), Performance concerns and problems, Adverse selection (primary implementation partner manager)	Cooperation (among stakeholder groups), Knowledge sharing (among stakeholders)
Zhang et al. (2007) Internal (globally distributed)	Moral hazard (distrust), Performance problems, Information asymmetry, Goal incongruence	NA
Note: References listed in alphabetical order.		

In the following, we elaborate on the controls that case companies used to manage the manifestations of appropriation concerns (appropriation-oriented controls) and coordination requirements (coordination-oriented controls) noted above.

Controls for Managing Appropriation Concerns

In the 21 case studies, we found a plethora of text passages and interviewee statements emphasizing that controls were used to address appropriation concerns.

Many studies point to actual **performance problems** as a trigger for introducing appropriation-oriented controls. For example, Choudhury and Sabherwal (2003) report on the case of an outsourced IS project, where the client introduced several additional controls after experiencing problems with the first software delivery by the vendor. The IS project manager commented: "*It was at that point we realized we were in trouble and we started getting into our daily meetings and tight control over everything that was happening and working with them, very closely monitoring them*" (p. 307). In another case of the same study, the decision to apply more formal controls, as well as self-controls, was based on **performance concerns** about the vendor's software testing procedures, as highlighted by the client's IS director: *"When we outsource… there has to be a tremendous amount of importance placed on communications… and keeping that up to find out what is going on… that kind of tracks what is happening, what's been decided, what's been promised… there definitely needs to be a lot of diligence…"* (p. 308).

We also found numerous instances of controls targeted at reducing **information asymmetries** between controller and controllee. For instance, in a global software development project, user representatives and IS executives supplemented formal controls with informal controls to monitor controllee behaviors and evaluate progress (Kirsch 2004). An example is provided by the IS Managing Director: "*I typically do the walk around management style and check up with people, both the checking up from a technical standpoint and also checking up from a user standpoint, the user liaison, to get their feelings on how they feel that things are progressing*" (p. 383). Relatedly, Choudhury and Sabherwal (2003) report on client executives asking vendors to temporarily relocate programmers to the client's head office as well as sending client managers to the vendor site to increase observability of vendor behaviors and reduce information asymmetries. The client's project manager commented: *"It is so difficult to ascertain exactly where programmers are in the development if you are not there and you have to be watching them…"* (p. 307).

On another account, Chua et al. (2012) study an internal IS project, where a conflict emerged from **goal incongruence** among different project stakeholder groups. "*Corporate management and consultants saw standardization of BU [business unit] processes and data as a key project objective [, whereas] BU representatives were generally skeptical about this goal, as they looked at the project more from the perspective of their respective BUs"* (p. 11). To align business unit goals with corporate goals, corporate management introduced a scenario approach, defined clear project milestones, and changed the project accountability structure: "*Now, there are strict time lines and accountability. Scenario owners have a deadline for decisions; if they can't make it, then it will escalate [to corporate]*" (p. 17).

In Chua et al.'s (2012) case study, there are also indications of **adverse selection**, which refers to the controllee's misrepresentation of ability and describes a key aspect of the agency problem (Eisenhardt 1989). For example, after the sudden resignation of the primary vendor manager, corporate management learned from its past experiences and exercised control over the selection of the successor. Consequently, the "*screening and interview process was conducted by both the vendor and corporate management, who emphasized 'ability to fit' in the hiring interview*" (p. 13). Similarly, Mao et al. (2008) report on an IS project, where the hired "*developers were JEEE experts [on the paper], but some members' technical skills were short of expectation and most importantly they could not collaborate as a team*" (p. 8). The situation worsened when several conflicts between developers and domain experts arose, and finally escalated when almost 20 of the developers went on strike. To deescalate the situation, the IS project manager eventually stepped in, established a new team structure, and heavily relied on clan controls.

Furthermore, in some case studies, we found instances of controls targeted at mitigating **moral hazard**, another key agency problem, which refers to a lack of effort on the part of the controllee (Eisenhardt 1989). For example, Beck and Schott (2012) examine the case of a large IS multi-sourcing project with four vendors involved. To safeguard against shirking and opportunistic behavior by the controllees, project managers applied a traceability matrix as a key control mechanism. Among other things, this matrix specified joint project deliverables and clearly defined vendor roles and responsibilities. The resulting transparency helped reduce blame-shifting opportunities and avoid discussions and conflicts, as

highlighted by a project manager from one of the vendor companies: *"It is essential to fully understand the project's objectives and its planning and to always give them top priority. This may also mean that we as a vendor have to concede at a certain point. But because we are concentrated on the benefit of the overall project goals, we accept this without discussion*" (p. 187). The example of the traceability matrix also indicates that a single control mechanism may fulfill a dual purpose (McBride 2008). Although the introduction of the traceability matrix was primarily driven by the client's appropriation concerns, this control also enabled the client to get an overview of vendor tasks as well as to recognize and coordinate interdependencies among these tasks (Beck and Schott 2012).

Controls for Managing Coordination Requirements

Despite the prevalent focus on appropriation concerns in existing IS project control studies, 19 of the 21 case studies included in our review sample also refer to coordination requirements as another important purpose of control. This observation provides empirical support for prior research studies, which suggest that managing appropriation concerns is not the sole purpose of control (Dekker 2004; Gulati and Singh 1998). For example, Kirsch (2004) reports on the case of a global software project, where controls were exercised to coordinate the interdependent tasks of installing new system modules and changing business processes. The Global Implementation Manager of the project commented: "*The control is your project plan. You know, making sure that you have got a well thought-out, detailed plan, by country, because all the steps, the resources assigned, who's doing what to whom, and you know what your fall-back position is if somebody slips*" (p. 386). The use of controls for managing **task interdependencies** is also evident in Heumann et al.'s (2014) study of a large internal IS project. In this project, many teams consisted of more than 20 members and worked on a wide variety of interdependent tasks. To coordinate project tasks, senior managers specified detailed controls, such as team deliverables and milestones that fitted the specific work processes of each team. One of the team leaders explained: "*The release manager must coordinate with each team leader. For example, if he says the time frame [for the next delivery] is three months then he would ask us how the different work packages were connected and whether delivery in time was possible at all*" (p. 7). On a related note, Cram and Brohman (2013) report on an agile software development project, where the IS project manager used controls to break down tasks in smaller sub-tasks. This helped reduce **task complexity** and **uncertainty**, as highlighted by a developer: "*In an agile project, because of the short durations, you tend to break your tasks down into fairly small increments. So… it's easier for the project manager and for the person responsible to know, 'yeah, I should be finished [with] this by this afternoon and I should work on this and the next four hours I should be working on this'*" (p. 145).

Several case studies also highlight the critical role of controls in facilitating stakeholder **cooperation** and **participation** in IS projects. For example, in Kirsch (1997), the IS manager explained the importance of a clan-like project team for coordinating team members that are split across project locations: "*I learned that on a project like this, you can't rely very much on formal hierarchies. It's much more teamwork. This is something new for me. That's another thing to learn: how to develop a real teamwork where hierarchy is not the most important thing, but everyone has his role and understands how he has to network with other people*" (p. 226). In this IS project, clan controls enabled project team members to address coordination issues by encouraging open discussions and joint decision-making, as highlighted by a project analyst: "*When it comes to making a decision on documentation, what standards we are going to be using on the design, we'll sit and we'll talk about it. And we'll go back and forth on it*" (p. 230).

The use of coordination-oriented controls is also an important theme in Gregory et al. (2013). Their case study reports on a large offshore outsourced IS project, where the client and vendor met before the project start to coordinate and mutually agree on the control activities planned by the client firm. The client's chief architect commented: "*We asked ourselves the question: How can we bring the team up to speed early on, clarify and explicate mutual expectations, and create an effective shared operational plan? We coordinated our first actions closely with [name of vendor]-management. One of the things we discussed was that we needed joint workshops in the beginning to establish common understanding, a joint working model, and deal with cultural differences*" (p. 1219). This quote clearly indicates the need for **knowledge exchange** between client and vendor staff, which was addressed by the introduction of a variety of coordination-oriented controls, such as a formal communication plan, socialization activities, and project workshops. In another example, Heumann et al. (2014) describe how regular meetings and discussions of the project plan between senior executives, project managers, and team leaders were driven

by and enabled knowledge exchange and mutual agreement across hierarchical management levels. A team leader stated: "*We discussed whether we needed more time, whether certain aspects [of the plan] had to be changed, and how this would fit into the senior management's overall program. […] We had to mutually agree upon the final plan. It's no use, if there is a plan I can't fulfill*" (p. 7).

Relatedly, several case studies also point to the use of controls for coordinating **knowledge transfer** processes. For instance, Kirsch (2004) studies the case of global software project, where managers added "*formal and informal [control] mechanisms such as scheduled meetings and ad-hoc discussions to aid the knowledge transfer between stakeholders*" (p. 384). Also Chua et al. (2012, p. 16) provide examples of controls that were used for facilitating the transfer of domain and IS knowledge between project team members. For instance, blending team members from different business units and project tracks as well as specifying a common process modeling language and tool "*helped BU [business unit] team members understand the processes and requirements of other BUs and to appreciate the bigger, enterprise-wide picture*" (p. 16).

Finally, the reviewed case studies also point to **dynamics in control purpose**. For example, examining control balancing processes, Gregory et al. (2013) find that, during the course of an offshore outsourced IS project, the focus of the client's control activities shifted from "coordinated control", to "authoritative control", and back to "coordinated control". The first shift from coordinated to authoritative control was mainly triggered by unfulfilled expectations, especially in terms of vendor and project performance (see above). To address the resulting appropriation concerns, the client intensified the use of formal controls (e.g., status reviews, inspection of vendor documentation/reports, testing deliverables), as highlighted by the client project manager: "*Very detailed control was the important thing. At the end of the day you needed to inspect every single thing… that was more important than anything else*" (p. 1221). However, while the use of appropriation-oriented controls helped increase project effectiveness, it also neglected important coordination requirements and thus led to a decrease in shared understanding and a breakdown in client-vendor communication. A senior client project manager recalled: "*At some point in time we arrived at the conclusion that we could not continue to simply control the performance of the vendor… rather, we realized, in fact both we and the vendor realized that we could only master the challenges in the project by working together very closely*" (p. 1222). As a consequence, the client shifted back to its original focus of using controls primarily for managing project coordination requirements including the redefinition of cooperation processes and the closing of business-functional knowledge gaps. In a similar vein, Kirsch (2004) finds that coordination requirements are likely to increase during the transition between two project phases, leading to an increasing use of coordination-oriented controls: "*Project task interdependency can also trigger changes in control choices to ensure knowledge flow and coordination across phases. In these cases, formal and informal control mechanisms were added to manage the interdependencies between requirements determination and development, and between development and implementation*" (p. 391).

Table 3 summarizes the above discussion, highlighting manifestations of appropriation concerns and coordination requirements in the reviewed IS project control studies.

Discussion and Implications

The results of our secondary case analysis provide support for the existence of different control purposes in IS projects. Specifically, while all analyzed case studies refer to appropriation-oriented controls, 19 of 21 studies refer as well to coordination-oriented controls. It is also important to note that appropriation concerns and coordination requirements seem to be equally present in both internal and outsourced IS projects (see Table 3 above). This confirms our prior assumptions that both purposes coexist. The analysis of some case studies even suggests that control mechanisms are used for several purposes simultaneously, developing the idea that a control mechanism may fulfill a dual purpose, that is, address appropriation concerns and coordination requirements at the same time. This is consistent with McBride (2008) who highlights that a control mechanism "may be used to achieve a primary objective as well as a secondary objective" (p. 2395), and that studying the purpose(s) of different mechanisms would contribute to more nuanced understanding of how managers control and coordinate IS projects, as well as the requirements for tools to assist them. Thus, the control purpose concept, which distinguishes between appropriation- and coordination-oriented controls, can also help to shed light on the contentious discussion in IS

literature on the differences and the relationship between project control and project coordination (e.g., Sabherwal 2003; Van Fenema 2002).

One approach used in past studies is to distinguish control from coordination on the basis that coordination is concerned with task and resource interdependencies, while control is instead focused on organizational goals and the extent that they differ from individuals' goals (e.g., Kellogg et al. 2006; Kraut and Streeter 1995; Sabherwal 2003). Although this approach seems to effectively distinguish between appropriation concerns and coordination requirements, it often stops short of specifically recognizing the role of controls in a coordination context. An alternative approach is to define coordination in terms that are synonymous with control (e.g., Karimi and Konsynski 1991; Nidumolu 1996). Here, the control purpose concept helps to eliminate the resulting conceptual ambiguity by separating appropriation- from coordination-oriented controls. Moreover, the control purpose concept provides reconciliation between the two approaches described above by explicitly focusing on the role of controls in situations where appropriation concerns and/or coordination requirements exist.

On this basis, we suggest that a more explicit application of the concept of control purpose can help better understand control activities and control-related phenomena, as well as provide rich opportunities for future research. In the following, informed by the results of our literature analysis, we will discuss the most important findings.

Control Purpose and Knowledge Management

A key finding of our analysis relates to the link between control purpose and knowledge management activities. In the case of appropriation-oriented controls, we found strong emphasis on measurement and evaluation mechanisms targeted at reducing information asymmetries (e.g., Kirsch 2004), ensuring goal congruence (e.g., Gregory et al. 2013), as well as mitigating agency problems such as adverse selection (e.g., Chua et al. 2012) and moral hazard (e.g., Beck and Schott 2012). The use of such appropriation-oriented controls primarily triggers information/knowledge flows from the controllee to the controller. In contrast, in the case of coordination-oriented controls, there is particular emphasis on knowledge exchange as well as knowledge transfer from controller to controllee or among controllees (e.g., Cram and Brohman 2013; Heumann et al. 2014; Kirsch 1997; Soh et al. 2010) in order to integrate knowledge, i.e., to combine and deploy knowledge drawn from different domains (Newell et al. 2006).

Taking on a knowledge management perspective our findings contribute to the discussion of how controls relate to different knowledge management activities, such as knowledge generation, transfer, integration, and application (Turner and Makhija 2006). We conclude that different control purposes are likely to evoke different knowledge transfer patterns in IS projects. For instance, the use of appropriation-oriented controls targeted at reducing information asymmetries between controller and controllee (e.g., status reports, weekly status meetings) primarily serves the transfer of knowledge from the controllee(s) to the controller. In contrast, the use of coordination-oriented controls promotes the transfer of controller knowledge to the controllees, e.g., through the specification of IS development processes (Choudhury and Sabherwal 2003), as well as knowledge transfer among controllees, e.g., through co-location (Chua et al. 2012). The latter is also consistent with related research on the link between coordination practices and knowledge sharing. For example, Kellogg et al. (2006) show how the enactment of a coordination structure facilitates knowledge sharing across different communities (controllees) of a marketing organization. The enacted structure "affords cross-boundary coordination [of knowledge flows] while facilitating adaptability, speed, and learning" (p. 22) and is thus distinctly focused on maximizing the value of existing knowledge, which is in line with the notion of coordination-oriented controls.

Information-processing capabilities of controls are not only relevant for the knowledge management activities of transfer, sharing and integration, which we found in the secondary case analysis, but also for generating knowledge. Knowledge generation consists of the processes by which an IS project creates new knowledge (i.e., knowledge not previously possessed by the collection of project participants) (Turner and Makhija 2006). The ability to generate new knowledge within an IS project is found to be a function of the extent to which the project draws on open-ended search strategies, ongoing trial and error, and constant reevaluation of existing knowledge in the light of newly available information (Nonaka 1994). Such rather unsystematic processes rely a great deal on project participants' tacit knowledge that is difficult to codify or convey to others (Turner and Makhija 2006). The tacit nature of these processes increases coordination requirements and therefore promotes the use of coordination-oriented controls. In contrast, the processes

that facilitate knowledge generation seem to be at odds with the purpose of minimizing agency problems, and thus with the use of appropriation-oriented controls. Moreover, an important impetus for the generation of new knowledge is the incompleteness of existing knowledge. Knowledge incompleteness is closely related to the concept of task uncertainty (Turner and Makhija 2006), which refers to the difficulty and variability of the performed work (Van de Ven et al. 1976), and is acknowledged as a key antecedent of both coordination activities (e.g., Kraut and Streeter 1995) and control activities (e.g., Rustagi et al. 2008) in IS projects. This means that if the knowledge available in an IS project is incomplete, the project task will become more uncertain, and the need for coordination-oriented controls will increase (Dekker 2004). In addition, the generation of new knowledge is facilitated by the diversity of the existing knowledge base. Here, coordination-oriented controls help managers elicit and leverage the specific knowledge of a diverse set of project participants (Kirsch 1997).

Taken together, this implies that coordination-oriented controls are well suited for handling tacit, incomplete, and diverse knowledge, i.e., attributes of knowledge that characterize the generation stage of the knowledge management life cycle. This further suggests that coordination-oriented controls are more conducive to the generation of new knowledge as compared to appropriation-oriented controls. Initial evidence for the close link between coordination-oriented controls and knowledge generation is provided by prior control studies in the innovation context. For example, in her study on technological innovation in the pharmaceutical industry, Cardinal (2001) considers input controls as a form of coordination-oriented controls, which help manipulate the incompleteness and diversity of existing knowledge, and create a knowledge environment conducive to the development of innovative ideas and solutions.

Control Purpose and Control Dynamics

Another key finding is that the relative importance of the two control purposes is likely to shift over the course of an IS project. For example, many of the analyzed case studies indicate that performance concerns and problems often trigger an increase in, and sometimes shift towards, the use of appropriation-oriented controls (e.g., Choudhury and Sabherwal 2003; Gregory et al. 2013; Heiskanen et al. 2008). Relatedly, Kirsch (2004) observes an increase in coordination requirements at the transition points between IS project phases.

While the majority of existing IS project control studies adopts a static perspective to examine control antecedents and project performance effects at a particular point in time (e.g., Kirsch 1996, 1997; Gopal and Gosain 2010; Tiwana and Keil 2009), only a few studies apply a dynamic perspective to analyze how control activities change over the course of an IS project (e.g., Choudhury and Sabherwal 2003; Gregory et al. 2013; Kirsch 2004). In this context, we argue that the use of a control purpose lens has the potential to provide new valuable insights into IS project control dynamics. For example, Kirsch (2004) studies two IS development projects to develop a model of control dynamics. Her model suggests that control is exercised differently for each project phase. In the initial requirements determination phase, where control relationships are not yet formalized and project goals and processes still need to be established, controllers make extensive use of informal controls exercised as "collective sensemaking". During the development phase, control is exercised as "technical winnowing" with a heavy reliance on formal controls. In the final implementation phase, formal controls are complemented with informal mechanisms to exercise control as "collaborative coordinating". The three phase-specific control strategies identified by Kirsch (2004) suggest that project phases vary in terms of appropriation concerns and coordination requirements. This variance, in turn, triggers changes in the configuration of the control portfolio. In other words, while "collective sensemaking" and "collaborative coordination" clearly indicate a focus on the use of coordination-oriented controls, "technical winnowing" indicates a focus on the use of appropriation-oriented controls.

Furthermore, by expanding the control mode framing that dominates much past research on the control of IS projects, the concept of control purpose may also help explain differences in control dynamics across internal and outsourced projects. For instance, Kirsch (2004) finds that informal controls dominate the control portfolio at the start of internal IS projects (see above), whereas Choudhury and Sabherwal (2003) find that formal (outcome) controls dominate the initial control portfolio in outsourced IS projects. Here, applying a control purpose lens suggests that controls will be chosen based on the relevant appropriation concerns and/or coordination requirements present at a particular point in time. In outsourced settings, early project phases are likely to be characterized by uncertainty about vendor behaviors, triggering the

client's use of formal controls to address appropriation concerns. As the project progresses and behavioral uncertainty decreases, the client firm is likely to shift its control focus to coordination and value creation, thereby also increasing its use of informal controls (Choudhury and Sabherwal 2003). On the other hand, in internal settings, it can be expected that appropriation concerns are less pronounced in early project phases. Rather, controllers are likely to focus on addressing coordination requirements through informal controls, which are replaced or supplemented with formal controls when appropriation concerns become central (Kirsch 2004). An alternative explanation for the above-described differences in control dynamics may be that coordination-oriented controls take on different forms in internal versus outsourced projects: while client managers may primarily use formal controls (e.g., the outsourcing contract) for the purpose of coordinating the vendor firm, internal managers may primarily use informal controls for coordination purposes.

Finally, existing studies on IS project control dynamics often adopt an encounter-based approach to study changes in project control activities (e.g., Choudhury and Sabherwal 2003; Heiskanen et al. 2008). Here, the control purpose concept can provide more nuanced insight on why project encounters trigger control dynamics. For example, the occurrence of negative encounters, such as the discovery of problems with the quality of the developed software or a lack of project progress (Choudhury and Sabherwal 2003), is likely to lead to an increase in appropriation concerns and the use of corresponding controls. Similarly, contract dispute between client and vendor is likely to decrease the controller's goodwill trust in the controllee, leading to greater reliance on appropriation-oriented controls (Dekker 2004). On the other hand, the departure of well-respected project staff can be expected to negatively affect the controller's competence trust in the project team, thereby triggering changes in the use of coordination-oriented controls (ibid). The concept of control purpose may thus contribute to a deeper understanding of the conditions that trigger control balancing processes (Gregory et al. 2013), which refer to adjustments that the controller makes to the used control types/modes, control degree, and control style in response to critical project encounters (e.g., gaps in shared understanding and unfulfilled expectations).

Contributions and Limitations

Informed by recent studies in the accounting and organization literatures as well as drawing on agency and stewardship theory, this paper contributes to the IS literature by introducing the concept of control purpose to this literature. Going beyond control modes—the dominant conceptual lens in existing IS project control research, the control purpose concept expands the conceptual toolbox available to IS researchers. The control purpose concept therefore provides a fresh theoretical perspective, which has the potential to resolve inconsistent results in prior literature and opens up promising avenues for future research. Specifically, as highlighted above, the distinction between appropriation- and coordination-oriented controls helps shed light on how controls impact different knowledge management activities (e.g., knowledge generation and transfer), as well as helps develop a deeper understanding of IS project control dynamics and how such dynamics differ across internal and outsourced IS projects (cf. Discussion and Implications section).

For example, prior IS project control studies identified the controller's and controllee's knowledge as key antecedents of control mode choices. Specifically, existing studies find that the controller's IS knowledge increases the use of behavior, outcome, clan, and self-controls (e.g., Kirsch 1996, 1997; Kirsch et al. 2002), and that the controllee's IS and domain knowledge make the controller feel more confident in applying outcome and self-controls (e.g., Choudhury and Sabherwal 2003; Kirsch 1997). Due to its strong focus on viewing knowledge as a control antecedent, prior literature, however, has overlooked one critical feature of IS project controls, namely, "their ability to manage the flow of knowledge" (Turner and Makhija 2006, p. 197). Consequently, it remains unclear how controls relate to different activities of the knowledge management life cycle (e.g., knowledge generation, transfer, integration, and application). To address this gap in extant literature, the notion of control purpose provides researchers with a novel conceptual lens, which may help study and explain the role of IS project controls in managing knowledge. In other words, given their inherent focus on distinct problems and processes (i.e., minimization of agency problems vs. maximization of project value), we expect appropriation- and coordination-oriented controls to differ considerably in terms of how they contribute to different knowledge management activities in IS projects.

Future research studies that take into account the purpose of control activities should draw on primary data, focusing on the controller's intentions (i.e., the purpose) rather than the nature of selected and

implemented controls. Such research may lend itself to methodologies such as action research or longitudinal case studies that enable in-depth discussions with managers on controls as a problem-solving mechanism. Moreover, future research should take into consideration that a single control mechanism may fulfill a dual purpose, that is, address appropriation concerns and coordination requirements at the same time. Furthermore, although we establish appropriation concerns and coordination requirements as the two main categories of the control purpose concept (Dekker 2004; Gulati and Singh 1998), it is possible that additional categories exist. Therefore, future research could seek to identify other theories (e.g., critical social theory, psychological ownership) that may inform other control purposes. By adding new facets to the control purpose concept, or by refining the two categories proposed in this paper, further insights can be generated for researchers and practitioners. Here, the ideas brought forward by stewardship theory might add insights on motivational and situational factors when coordinating controllees. In addition, future research on the control purpose concept may help clarify the interaction between formal control and trust, i.e., whether the two act as complements or substitutes, which remains a much-debated question in the IS and related literatures (e.g., Das and Teng 2001; Dekker 2004). For example, acknowledging the multidimensionality of the trust concept, Dekker (2004) distinguishes between goodwill and competence trust (cf. Das and Teng 2001; Nooteboom 1996), and argues that the former is related to appropriation concerns, whereas the latter is connected to coordination requirements. On this basis, he suggests that the relationship between goodwill trust and appropriation-oriented formal controls on the one hand, as well as competence trust and coordination-oriented formal controls on the other hand, may actually not be linear. Rather, it may follow an inverted u-shape curve. This is largely in line with related findings in earlier literature, which find that over-reliance on formal structures may lead to a vicious cycle of poor performance and distrust (e.g., Sabherwal 1999).

As with any research, our study is subject to several limitations. First, we recognize that there is a degree of subjectivity in the distinguishing between appropriation- and coordination-oriented controls. In some cases, the control purpose was evident (e.g., a stakeholder meeting is established to coordinate IS project tasks); however, in other cases, the purpose was more ambiguous because the intent of a control was not explicitly discussed (e.g., a stakeholder meeting is established, but no specific reason is noted). Although our study draws only on data we considered to have a clear control purpose, we may have been able to generate additional insights had we known more about the control context in the reviewed case studies. To some extent, our study is thus limited by the employed secondary case analysis approach. Second, our study makes the conceptual assumption that the control purpose concept applies equally to internal and outsourced IS projects. Even though this assumption is supported by our literature review, which reveals that both appropriation concerns and coordination requirements represent important control problems in internal IS project settings, it may still be that these control problems are more pronounced or different in outsourced project settings (Dekker 2004; Gulati and Singh 1998; Tiwana and Keil 2009). Finally, our conceptualization of control purpose implies that controllers have the autonomy to freely shape their control activities based on their individual perceptions of relevant appropriation and coordination concerns. It remains, however, unclear if this assumption also applies to highly regulated industries (e.g., banking and healthcare) or highly competitive industries (focusing on cost minimization), where controls are more standardized and controllers often have limited influence on altering the IS project controls in place.

Conclusion

In conclusion, findings from this study point to the importance of distinguishing between appropriation- and coordination-oriented controls, that is, the concept of control purpose. For practitioners, this concept offers a new way of thinking about what controls should be used under which circumstances, and why current controls may not be effective. Depending on the evolution of an IS project, controllers may wish to more mindfully adjust their portfolio of controls as being increasingly targeted towards appropriation concerns and coordination requirements, respectively. From a research perspective, the control purpose concept contributes to clarifying important elements within control theory, including how IS project controls relate to knowledge management and coordination activities, as well as how controls evolve over the project course. Against this backdrop, we hope that our study will inspire future research on the control of IS projects and further theoretical progress in this area.

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