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A Practice Theory View of IS Governance

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Keywords: IS governance, IS portfolio, drift, practice theory

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Abstract

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Introduction

As more work processes are virtualized (Overby, 2008), IT has moved from being a functional tool to becoming embedded with how work is done (El Sawy, 2003). This evolution is reflected in the fact that IT expenditure now comprises more than 50% of many firms' capital budgets (Weill and Ross, 2004), and is growing faster than other capital investments. From a functional or instrumental perspective, firms invest in information systems to meet their operational and strategic goals, which can be either: a) defensive, indicating a focus on operational efficiencies, or b) offensive, referring to enhancing their competitive position (Nolan and MacFarlan, 2005). For example, firms focused on cost leadership purchase systems that minimize operational inefficiencies, such as automated billing systems to reduce clerical preparation and error costs. Firms that emphasize product differentiation invest in customer relationship management systems, so that they can collect customer feedback and use it to make their products more attractive.

These are examples of how business goals are aligned with IT capabilities (King, 1978; Brown and Sambamurthy, 1999; Henderson and Venkatraman, 1993; Oh and Pinsonneault, 2007; Sabherwal and Chan, 2001; Teo and King, 1997). Business-IT alignment is important since it has a significant impact on the value a firm obtains from its IT assets (Kearns and Sabherwal, 2006-7; Tallon, 2007-8). At the same time, this value is also affected by the riskiness of IT investments. With information systems becoming more integrated and heterogeneous, and as access to them is provided to more organizational members, the risks associated with them have increased (Markus, 2000). This risk is aggravated by the uncertain benefits and irreversible costs of IT adoption decisions (Fichman, 2004).

The increased susceptibility to risk and the possibility of significant negative performance impacts has prompted IS researchers and practitioners to ask: How do businesses ensure that their IT investments are aligned with or support their strategies? What mechanisms can organizations use to obtain greater value from their IT investments? How should IT investments be managed to ensure that they are flexible enough to allow organizations to explore future opportunities, but also stable enough to keep current operations running smoothly? These issues have been the domain of IS governance (e.g. Agarwal and Sambamurthy, 2002; Fonstad and Robertson, 2006).

Information systems (IS) governance refers to the structures, processes and relationships used to make IS-related investment, use and retirement decisions (Sambamurthy and Zmud, 2000; Schwarz and Hirschheim, 2003; Weill, 2004; Yu and

Wu, 2008). Prior research on this topic has examined issues such as the contingencies that affect the decision to decentralize or centralize IS decision-making and operations (DeSanctis & Jackson, 1994) and the specific mechanisms that can be used to improve business-IS alignment (Schwarz and Hirschheim, 2003).

The dominant perspective in IS governance research has been static, variance-based and management-oriented. This is in keeping with the traditional view that changes in IS portfolios (defined as the collection of an organization's IT assets) are the result of managerial reactions to changes in: a) the environment, such as competitive threats, new regulations, or resource shortages, or b) technology (e.g. Liu et al., 2008), such as the shift from centralized technology organized hierarchically, towards networks, informational products and services, and the reduction of time and space constraints on human activity (Avison et al., 1998).

An alternative view of changes in IS portfolios is to examine changes that are introduced at a sub-unit or more granular level. Here, IS portfolios change when managers and/or users, by their own volition and without taking into account the pre-existing IS governance framework into consideration, introduce new systems to replace existing ones. Examples include using web-based applications, such as Google Docs, Twitter, and wikis, or databases built with office productivity applications, such as Microsoft Access or Excel. Such actions are likely to occur more frequently with an increasingly IT-savvy workforce that frequently uses IT outside the workplace.

As IS portfolios change in this manner, it is possible that business-IT alignment could go awry. This phenomena contrasts with the prevailing perspective on IS governance which privileges the managerial inclination to control and supervise, and has little scope for users' agency to modify an organization's IS portfolio. This study uses practice theory to lay out how IS governance operates in such a scenario. The key concept underlying the evolution of firms' IT portfolios in this manner is Ciborra's (2000) concept of *drift*. Drift refers to the deviation of IT systems from their planned purpose for reasons that are often not within anyone's influence (Ciborra, 2000). Examples of drift during ERP implementation projects include changes in project objectives and configuration (Elbanna, 2007), and changes in power differentials within organizations (Ignatiadis and Nandhakumar, 2007a).

While drift has mainly been explored in the context of individual IS projects, it can be fruitfully extended to examine the modifications of an IS portfolio. *Portfolio drift* represents the unplanned changes in an IS portfolio (Figure 1). I define portfolio drift as occurring when an organization's IS portfolio is modified by sub-units without approval from the central IT organization, either in terms of systems with different capabilities from the existing systems being used or existing systems being re-configured[1]. Specifically, IS portfolios can drift in at least two ways:

a) Changes in the systems making up a portfolio: Legacy systems may not possess the capabilities users require. This may persuade sub-units to purchase shadow systems[2] to obtain the capabilities that the official legacy systems do not provide.

[1] This study focuses on the software components of an IS portfolio. Hardware is usually more embedded in work processes and thus, more difficult to work around.
[2] Shadow systems are IT purchases that lie outside the formal IT procurement plan, and are thus unknown to and unapproved by an organization's formal corporate IT department (McAfee, 2004).

b) Avoiding the use of systems in a portfolio: Sometimes, systems may seem to be unnecessarily burdensome to use because of their complex interface. This may prompt users to work-around the systems by using general purpose applications, such as spreadsheets, to carry out the same tasks complex reporting systems were designed for.

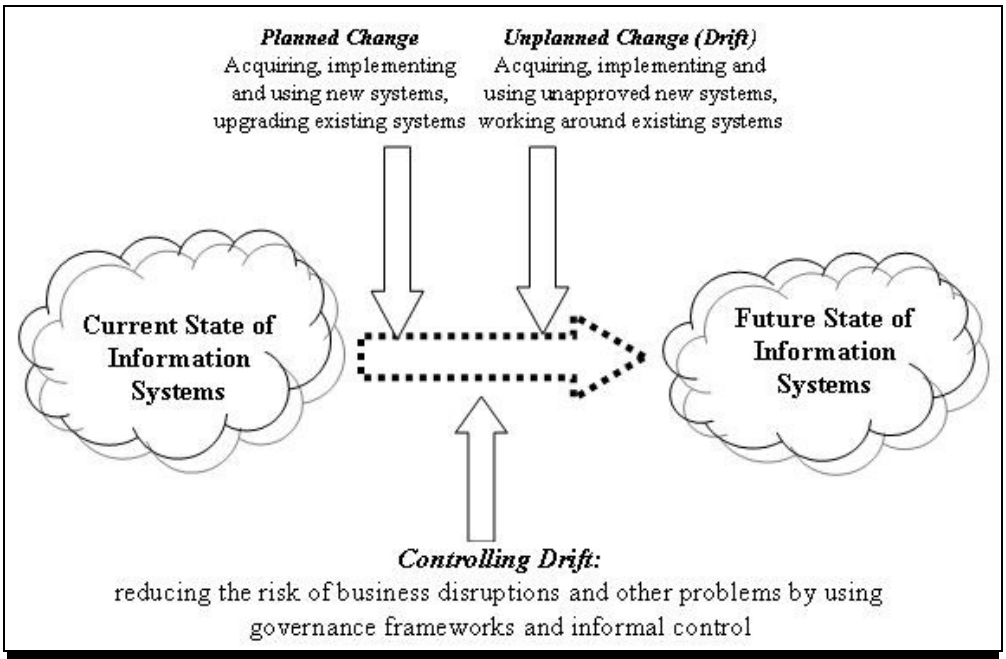

Figure 1. IS Portfolio Drift

What are the implications of a drifting portfolio? First, it results in a fragmented IT portfolio, which can make it difficult for managers to obtain an accurate view of firm activities, and leads to high maintenance and support costs (McAfee, 2004). Second, IT investments designed to achieve some particular business goal may not be fully or appropriately utilized. In short, business-IT alignment could become a "long, torturous and fragile process" (Ciborra, 2002) when portfolios drift. Third, the direct costs of drifting, in terms of the time and effort expended by individual employees on searching for and deploying workarounds or shadow systems, can be substantial. IT adoption decisions are challenging because their benefits are uncertain while their costs are substantial and

inter-temporal (Fichman, 2004). These decisions become even more complicated when portfolio drift occurs, as there is uncertainty about whether new investments will be appropriately adopted and used. The upshot is that IT managers may find it difficult to provide the IT-enabled capabilities required by their organization.

It is worth noting that the mirror image of drift is innovation and experimentation. Since users are often closer to an organization's operations than IT managers, they are better able to ascertain the type of IT they require to complete their tasks effectively. Thus, their decisions to adopt new technology may lead to beneficial outcomes. Over time, users in other sub-units may learn about innovations elsewhere and decide to implement them locally. It is an empirical question whether the costs of supporting a fragmented IS portfolio and searching for alternative applications outweigh the benefits accrued by using these alternatives. It can be argued that while the latter may be significant at the sub-unit level, obtaining improvements at the level of the overall organization requires substantial effort at communicating the benefits of these alternative applications up the hierarchy and across to other sub-units. Moreover, transmitting this information in a timely manner is a challenge. Hence, in balance, this paper assumes that, while innovation is a possibility, the unplanned modification of an IS portfolio by sub-units is more likely to lead to bear the characteristics of drift.

This article theorizes that IS governance mechanisms can be used to manage IS portfolio drift. These mechanisms specify the decision rights, relationships and processes relevant for making decisions on IT investments, so that organizational goals are achieved (Sambamurthy and Zmud, 2000; Schwarz and Hirschheim, 2003; Peterson, 2004; Van Grembergen, 2004; Weill, 2004). While various IS governance frameworks

exist, little research has examined the particular procedures that can be used to minimize portfolio drift. In this study, a practice lens is adopted (Bourdieu, 1977; Orlikowski, 2000). Thus, IS governance is conceptualized as a series of situated practices undertaken by reflexive actors to steer the portfolio-in-use. The trajectory of these actions is defined by a constant interaction between the capital these actors possessed and their dispositions, as well as the structures of the social spaces they operate in.

An example would be managers persuading employees to use a new application, which monitors their actions, while employees would prefer to use an existing application that does not support tracking. In this case, there is a tussle between the managers' inclination to control employees, facilitated by the economic performance measures managers are assessed against, and employees' disposition to minimize interference in their workspace, driven by their interests in maintaining discretion over their job and a sense of mystique about the tasks they accomplish, so as to reduce the chances of technology replacing them. As this dynamic plays out, new structures are created or old ones may be strengthened, which have an impact on the success of such initiatives in the future. For example, employees who successfully resist the implementation of such software boost their perception of themselves as being independent of the organization, which increases their level of symbolic capital. In contrast, the traditional perspective on IS governance would adopt a managerially-centric stance, suggest mechanisms for carrying out such plans, and not consider the possibility that the interests of employees and managers would not align, leading to acts of resistance. This static viewpoint would also limit our understanding of how actions in one time period have consequences in the future.

In the next section, I examine the extant research on IS governance and the challenges researchers face when applying it to organizations. I then present an alternative conceptualization, based on practice theory. I conclude by offering some suggestions for future research.

Current Perspectives on IS Governance

Managing IT assets and operations effectively and successfully is a critical issue, as poor governance can result in financial, operational and strategic impairment (Kearns and Sabherwal, 2006-7). Governance has thus been a widely-studied topic. Table 1 lists the definitions of IS governance from various studies. The common theme is the focus on IT-specific decision-making to achieve organizational goals, which privileges the managerial, functionally-rational perspective on IT management.

	Study	Definition
1	Sambamurthy & Zmud, 1999	"locus of enterprise decision-making authority for core IT activities" (p. 105); IT-related authority pattern
2	Agarwal & Sambamurthy, 2002	Three models for organizing the IT function to boost business innovation: partner model, platform model, scalable model
3	Schwarz & Hirschheim, 2003	IT-related structures, architectures, and associated authority patterns implemented to accomplish IT activities in response to an enterprise's environmental and strategic imperatives
4	Weill, 2004	Specifying the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT
5	Peterson, 2004	a) The distribution of IT decision-making rights and responsibilities among stakeholders, and b) the procedures and mechanisms for making and monitoring strategic decisions regarding IT
6	Van Grembergen, 2004	Organizational capacity exercised by management to control the formulation and implementation of IT strategy and thus ensure the fusion of business and IT
7	IT Governance Institute, 2003	Structure of relationships and processes to control the enterprise in order to achieve the enterprise's goals by adding value while balancing risk versus return over IT and its processes

8	Yu & Wu, 2008	Process, structural and relational governance (i.e. behavior control mechanisms, decision-making structures, communication processes)

Table 1: Definitions of IS governance

Studies of IS governance have discussed a variety of structures organizations can use to manage their IT resources, based on different ways of allocating decision rights across multiple organizational levels and between the IT and business departments (e.g. Warkentin and Johnson, 2006; Weill and Broadbent, 1998). A common theme in this field has been the debate between centralization and decentralization (e.g. DeSanctis and Jackson, 1994), since each option has different benefits and drawbacks in terms of responsiveness and standardization. The widespread use of outsourcing has fostered the idea that the key objective of governance is to create a platform for supporting organizational activities (Sambamurthy and Zmud, 2000; Agarwal and Sambamurthy, 2002; Schwarz and Hirschheim, 2003), through the use of relational and integration mechanisms to link IT use and management. One example is the use of horizontal governance mechanisms to facilitate cross-unit collaboration (Brown, 1999).

Another stream of governance research has examined the contingencies that influence the governance structures chosen (Brown and Grant, 2005). These include the mode of corporate governance, economies of scope, and absorptive capacity (Sambamurthy and Zmud, 1999), firm culture and vision (Brown and Magill, 1994), the role of the board of directors (Nolan and McFarlan, 2005; Huff et al, 2005), and the level of globalization, which has made it important to balance local responsiveness and obtaining economies of scale (Weill et al., 2007).

Recent research (e.g. De Haes and Van Grembergen, 2008; Debreceny, 2006; Guldentops et al., 2002; Liu and Ridley 2005; Nicho and Cusack, 2007) has studied the use of externally-developed and rigorously-codified IS governance frameworks, such as COBIT (Control Objectives for IT) and ITIL (IT Infrastructure Library). These are auditable lists of requirements that organizations are recommended to adopt, so that their IT systems remain usable and useful, as well as aligned with their business[3].

Issues with Current Perspectives on IS Governance

This section is divided into two parts: i) the theorizing of the IS governance concept, and ii) its underlying assumptions. Three comments are worth making in terms of its theorization. First, IS governance research has largely focused on the different mechanisms and structures available. Since an IS portfolio emerges over time as managers and users interact to decide which goals it should support, an opportunity exists in terms of research on the process of governance and changes in the IS portfolio being governed.

Unlike variance theories, which focus on how antecedent factors give rise to particular conditions, process theories discuss the sequences of events that take place within the context of those factors (Markus and Robey, 1988). The absence of process research gives rise to three gaps in our understanding of IS governance: a) how do the competing interests of users and managers interact over time to make up a narrative of organizational IS governance (Robey and Boudreau, 1999); b) how do changes by users at the level of individual systems impact changes at the level of the portfolio; and c) is

[3] Some, such as ITIL, focus on the day-to-day operational aspects of providing IT services, so as to enhance their quality. They cover procedures such as providing a help-desk, rolling out software updates and managing IT security. Others, such as COBIT, take a different approach. Developed by auditing professionals, these guidelines emphasize balancing the risks and returns of IT use by putting in place a set of internal controls.

the IS governance process *teleological* (i.e. the portfolio progresses toward a clearly specified end-state), *evolutionary* (i.e. the portfolio that survives has undergone variation, selection and retention processes at the system level), or a *life-cycle* (i.e. the portfolio follows a linear, irreversible and predictable progressions of states) (Van de Ven and Poole, 1995)? Fleshing out a process theory of IS governance is useful because it will answer these three questions.

The second comment on prior IS governance literature is that there have been few attempts to organize the various components of IS governance and allied concepts, such as IS planning, adoption, assimilation, and project control, into a coherent theoretical framework (cf. Bacharach, 1989). Doing so will provide: a) theoretical benefits: expanding IS governance's nomological network will improve our understanding of the antecedents and consequences of different governance practices, and b) practical value: IS governance's ability to enhance the business value of IT investments will be clarified.

Third, similar to scientific management's impact on work (Braverman, 1974), the use of formal IS governance frameworks has reified IS governance. Although listing and classifying governance processes into a fixed structure helps IT managers in the management of their IS assets, the disadvantage is that this approach excludes governance based on personal relationships. Thus, while governance encompasses both control and collaboration (Sundaramurthy and Lewis 2003), in practice, it is often inclined towards the former, not the latter, when applied to IT assets. Formal governance relies more on monitoring and hierarchies and less on empowerment and peer support. Emphasizing formal governance practices limits the possibility that informal control of some sort, such as clan control (Ouchi, 1979), could be part of IS governance.

This is contrary to the contention that informal or implicit control systems, based on shared norms, can be more effective for achieving coordination than control systems that depend on explicit rules and regulations (Denison and Mishra, 1995). These informal systems are based on the quality of personal relationships, which have been found to improve compliance with Section 404 of SOX, as they enabled CIOs to use the appropriate tactics when working with other managers to implement IT controls (Braganza and Franken, 2007). The importance of informal governance rises when we consider that employees today have more leeway to decide on the systems they use when engaging in their work tasks. Instead of relying on strict controls to enforce the use of official systems, well-developed personal relationships may be more effective at preventing workarounds or the use of shadow systems. Although informal governance is said to be unrepeatable and ad-hoc (Boh and Yellin, 2006-7), its value lies more in the shared understandings it creates in the working environment than in any explicitly-defined processes.

The next part of this section analyzes the assumptions made in the IS governance literature. First, managers use IS governance to achieve business-IT alignment, i.e. the harmonization of IT and business strategies. Thus, IS governance is assumed to be functional or instrumental: it has a positive effect on an organization's IT portfolio, by ensuring that the organization is using the right systems and using them well, and IT-specific risks have been mitigated. However, business-IT alignment may not result even when an IT portfolio is governed 'appropriately' (Ciborra, 2000). On the business side, managers may be muddling through uncertain environments, and have no clear strategy for the IT portfolio to be aligned with. In terms of the technology, the effects of

improvisation by the various stakeholders, political battles, and path dependency may mean that the final portfolio may be an unexpected outcome. In contrast to formal and controlled IS governance, business-IT alignment may be comprised of user-driven unplanned activities that make work processes less onerous. Thus, IS governance's ability to achieve the very goal it is designed for may be inherently in doubt.

A second assumption of the IS governance literature is that the IS portfolio can be controlled by management. However, the stickiness of the installed base of IT because of its high switching costs (Shapiro and Varian 1999), combined with IT's embeddedness in social arrangements and conventions of practice (Star and Ruhleder, 1996), indicate that management's influence on the IS portfolio is constrained. Moreover, a focus on control implies relying on single-loop learning, whereas IS implementations often require double-loop learning (i.e. revising one's goals and principles) because of the unexpected events that occur (Ciborra, 2000).

At the same time, IT's changed characteristics have enhanced the ability of users to modify an IS portfolio. Traditionally, users were involved in structuring organizational systems by offering requirements, testing systems, and evaluating their relevance to their work (Barki and Hartwick, 1992). As greater numbers of general-purpose applications (such as Internet browsers and spreadsheet software) with more powerful capabilities became available and more broadly diffused, individuals were exposed to IT outside their work environments more frequently. The increased pervasiveness of IT made them familiar and comfortable with different types of IT. This had an impact on their role as users of systems, as they were now able to modify organizational IS portfolios by installing new applications or developing workarounds. In short, they could

decide on the system-in-use, instead of having to use the system as it was presented to them.

This section has listed some challenges with the extant IS governance literature. The limited theoretical development and ambiguous consequences brought about by improvements in IT indicate that this domain awaits some rich theorizing. This study focuses on the impact of history on the success of IT adoption decisions, the ongoing tension between managers and users on the type of IT the organizational portfolio should be comprised of, and the effect of this tension on business-IT alignment and firm performance. In such a context, IS governance should be viewed as an emergent process of formal and informal practices designed to achieve a truce among management and users regarding the capabilities of the IS portfolio. The next section sketches out the theoretical scaffolding for this definition, by relying on the practice lens of organizational research.

The Ad-hoc Evolution of IS Portfolios

IT management studies often adopt a managerially-oriented perspective of IT investments (e.g. Sambamurthy and Zmud, 2000; Schwarz and Hirschheim 2003), where managers plan and make IT investment decisions based on their strategies, and users specify their requirements, test the systems, and use them. This top-down view of the introduction of IT in organizations contrasts with Ciborra's (2000) argument that IT adoption processes are characterized by bricolage. This section discusses how these events could lead IT portfolios to be different from what they were intended to be.

The top-down perspective on IT adoption leaves out any consideration of the agency of users in affecting organizational IT portfolios. Users can have an impact in at least three different ways:

a) They affect the adoption rate of technologies:

- Understanding individual adoption is important, as greater IT use by individuals mediates the relationship between IT investment and firm value (Devaraj and Kohli, 2003). Users' adoption is affected by their personal experience with the technologies (Mao & Palvia, 2008) and their inclination to imitate social peers (Isaac et al., 2006), the fit of the technology with their identity (Speier and Venkatesh, 2002), and the customizability of the technology and the legitimacy of its introducers (Kohli and Kettinger, 2004). Even in situations of mandated use, users have been able to find workarounds for what they see as the technology's constraints (Bourdeau and Robey, 2005).
- Resistance to IT implementation occurs when users expect threatening consequences regarding their status or how they organize their work from new systems (Lapointe and Rivard, 2005; Walter and Lopez, 2008). Users can also limit their adoption as an attempt to reassert control over their work. This could be in retaliation to business process management's emphasis on using IT to control how work is done, which reduces the scope for personal creativity and makes workers more dispensable and interchangeable (Braverman, 1974).
- Finally, users may find the technologies better suited for achieving corporate-level objectives, such as uniformity and standardization, than the aims of their business units, such as experimentation and customization (Gallagher and Worrell, 2008).

b) They can introduce new technologies as substitutes for the current ones:

- Their dissatisfaction with the existing technology could be due to changes in work practices or organizational control mechanisms brought on by the use of those technologies. For example, the introduction of a collaborative technology could be used by some institutional groups to assert their dominance over other groups (Hayes, 2008).

c) They can introduce new technologies to complement the current ones:

- Organizations are increasingly adopting new technologies after they were used by individual innovators among their staff. Examples include devices, such as USB thumb drives and personal digital assistants (PDAs) (e.g. the BlackBerry and the iPhone) and communication applications such as online chat and voice-over-internet-protocol (VOIP).

These are examples of the evolution of an IT portfolio from the bottom up, propelled not by managerial mandate but individual choice and technological improvements. Understanding these processes would help remove the sense of '*deux et machina*' often found in studies of IT adoption. Rather than assuming that the new technology was inserted into an organizational context by some neutral or uncaring source, it makes more sense to view the adoption of new technologies as being motivated by some underlying discomfort with the existing range of technologies, an urge to enhance one's work effectiveness by using more advanced tools, or, even perhaps, an inclination to reduce the burden of one's tasks in some manner.

The prevalence of the managerially-oriented, top-down view of IT investment can be partly attributed to the use of the term "IT portfolio". Extending concepts across domains

can often lead to a mistaken belief that the underlying assumptions are equally valid in both domains (Kogut and Kulatilaka, 2004). Thus, although the term "IT portfolio" is widely used by both IS academics and practitioners, in some key aspects, the portfolio metaphor does not transfer completely to an IT context (Ciborra, 2000). For example, while the individual components of a financial portfolio can be bought and sold fairly easily, the components of IT portfolios have high switching costs and are sticky assets, meaning that their value is often embedded in their use in a particular context (Shapiro and Varian, 1999). Also, while the value of each component in a financial portfolio does not depend on the others, IT assets are often valuable to organizations because of their links to other assets in the portfolio (Ciborra, 2000). The examples above of user resistance to the introduction of new technologies represent some of the transaction costs encountered in the IT adoption process. In addition, the ability of users to introduce new technologies implies that IT portfolios are more dynamic and reactive compared to financial portfolios, since there are two sources of change: management and users.

Research on IT management often assumes that the IT portfolio purchased is the one that is ultimately used. Thus, there is little consideration of the ability of users to modify the portfolio in the ways listed above. In some way, this study expands on Soh and Markus' (1995) process theory of IT investment. While they place IT use as a mediating factor between IT expenditure and performance, this study expands IT use to consider changes in the IT portfolio itself[4]. Given that many actors are involved in the development of an organization's IT infrastructure, and that its history makes many decisions path-dependent (Ciborra, 2000), it is unavoidable that IT portfolios will be more

[4] This could be an indicator of the theory's 'aging', as some of the examples provided above of users' reactions to IT investments are only possible now because of the relatively higher IT savvy of most employees and the improved modularity and user-friendliness of most technology today.

dynamic than they are commonly presumed to be, and that the sources of this dynamism are from both ends of organizational hierarchies.

A useful perspective for framing this evolution of firms' IT portfolios is Ciborra's (2000) concept of *drift*. Drift refers to the deviation of IT systems from their planned purpose for reasons that are often not within anyone's influence (Ciborra, 2000). Ciborra focused on the unintended consequences of IS implementation projects, and argued that drift resulted from resistance, learning-by-doing, sabotage, coalition shifts, or serendipity. Even when management is focused on control, drift occurs because of environmental turbulence, implementation tactics, the power of the installed base, the difficulty of second-guessing final user behavior, and the complexity of new infrastructure (Ciborra & Hanseth, 2000). Examples of drift during enterprise systems implementation projects include changes in project objectives and configuration (Elbanna, 2007), and changes in power differentials within organizations (Ignatiadis and Nandhakumar, 2007a).

I argue that IT portfolios can drift in at least two ways:

1) Changes in the systems making up a portfolio: the introduction of shadow systems

- These systems are put in place when:
    a. the existing system lacks certain capabilities, or
    b. users have experience with or learn about newer technologies, usually outside work

2) Avoiding the use of systems in a portfolio: the use of workarounds (Gasser, 1986)

- Users will work around a system when:

a. it is a poor fit for their work tasks,

b. they prioritize different objectives (e.g. convenience) from managers (e.g. control),

c. they want to reassert control over their work

Drift is purposeful but unplanned, occurs while the technology is being used, and is the opposite of control, i.e. it is emergent. A portfolio that drifts may end up being more successful as it has been allowed to adjust to suit different actors' needs (Holmstrom and Stalder, 2001). The easier availability of substitutes and the multiple uses to which each technology can be put makes a portfolio fragile and ambiguous (Ciborra, 2000).

A key consequence of portfolio drift is portfolio fragmentation. This refers to an IS portfolio that is populated with a variety of applications that are not coherently integrated or harmonized to remove redundant capabilities. A fragmented portfolio leads to higher maintenance costs, as additional resources have to be allocated to support the various different applications. Streamlining a portfolio by removing redundant or duplicate applications would lead to savings in license fees, as well as the skilled manpower that was devoted to supporting those applications. Fragmentation also promotes a limited "view" of business activities (McAfee, 2004). Since different processes are supported by distinctly separate applications, managers will not be observing the same set of events or flows. This constriction of information reduces the quality of decision-making and creates the risk of disjointed responses to environmental changes.

The second major consequence of portfolio drift is the loss of the resources spent during the search process. In terms of shadow systems, users or managers spend substantial time and money searching for the alternative systems, linking them to the other

organizational systems or databases, preventing security breaches, and so on. If workarounds are relied on, significant time is spent on learning how to carry them out, training others in the same task, keeping official systems updated if needed to, and so on. Associated with this loss of resources is the "wasted" IT expenditure implied by these workarounds and shadow systems. The unused investment represented by the systems in the official portfolio that are not used or under-used may add up to a significant amount.

Finally, portfolio drift may lead to a misalignment between the business and IS strategies. While business-IS alignment is a key driver behind a firm's IT investment decisions, the presence of IT investments driven by local or individual requirements may dampen organizational-level performance. This is because these alternative investments may prevent the organization from maximizing on the organization-level dimensions it has selected. When drift occurs, attaining business-IT alignment becomes more difficult for at least three reasons: a) IT managers may not be aware of the IT assets users have adopted to carry out their tasks; b) existing IT assets may not be meeting their specified requirements, because of political machinations during implementation; or c) business managers may be making decisions based on their IT systems' past performance, without realizing that this may have either declined or improved.

At an abstract level, IT managers face this choice: do they forego their portfolios' stability and adopt new IT innovations, or do they minimize changes so that their systems remain stable and easy to support? While managers are aware of the need to innovate to thrive, managing the process of adopting new systems to realize business value can be difficult (Fichman, 2004). Controlling portfolio drift is a 'wicked problem' (Rittel and Weber, 1973),

replete with incomplete and changing requirements, and difficult to resolve because of contextual interdependencies. The upshot is that IT managers may find it difficult to provide the IT-enabled capabilities required by their organization. In such contexts, alignment could become a “long, torturous and fragile process” (Ciborra, 2002).

Managers can use IS governance to curtail drift and thus prevent its negative consequences. The dominant assumption in the literature is that governance practices are imposed on organizations, and are not modified in response to the actions of users or resistance from the installed base of legacy applications. Viewing governance as a dynamic and adaptive process helps overcome these biases. This perspective is also closer to the reality of IS decision-making, which is characterized by bounded rationality, competing objectives, and sequential phases (Boonstra, 2003). The next section reviews the IS governance literature and its applicability to the present context where users’ personal experiences with the expanding capabilities of IT enable them to play an active role in developing organizational IT portfolios.

Practice Theory Perspective on IS Governance

Prior research in IS governance posits that organizations should choose their IT portfolios by taking their business goals as a starting point. This will allow business-IT alignment to occur, which should enhance organizational performance. Moving beyond this instrumental, variance theory approach toward a process perspective requires articulating a post-industrial managerial logic, where individuals reflect on their behavior and adjust their actions accordingly, making their responses to situations less

mechanistic and more emergent (Dijksterhuis et al., 1999). This shift away is best incorporated into IS governance research by using practice theory, where organizations are seen as collections of practices, which are materially-mediated arrangements of human activity organized around shared practical understanding (Schatzki, 2005).

Practice theory examines how micro-level social interactions have macro-level consequences, in terms of the emergence and development of socio-structural properties (Bourdieu, 1977; de Certeau, 1984; Foucault, 1980; Giddens, 1984). The objectivity-subjectivity divide in the social sciences is bridged by the understanding that agents are autonomous enough to transform social structures, while simultaneously being sufficiently conditioned to reproduce and incorporate them into their lived practice (Bourdieu, 1977). Agents are thus not automata, but interpreters of practices whose reflexivity frees them from mindlessly reproducing their initial conditions (Giddens, 1984). The dynamic relations between agents and their world are produced and reproduced during everyday practice. This practice is guided and enabled by social 'fields' (Bourdieu, 1990), which emerge through human activity. As agents interact in these fields, they produce different kinds of capital (economic, cultural, social, and symbolic), and differential access to these creates a basis for power.

Researchers in the field of information systems have used practice theory to study a variety of phenomena. These include IT use (Orlikowski, 2000; Vaast and Walsham, 2005), knowing (Orlikowski, 2002), knowledge sharing (Carlile 2004), augmenting relationships with electronic channels (Schultze and Orlikowski, 2004), resisting organizational change (Boudreau and Robey, 2005), boundary-spanning (Levina and Vaast, 2005), and boundary creation and renegotiation (Levina and Vaast, 2008).

These studies explicate the main dimensions of practice. First, practice is emergent, situated, and recurrent (Orlikowski, 2002; Vaast and Walsham, 2005). Emergent and recurrent indicate that agents' repeated actions enact structures, and that changes in practice require changes in agent's actions. Situated implies that changes in the situation of agents lead to adaptations in practice, which may further modify the situation. Second, practice takes place in a community (Orlikowski, 2002). Agents in different communities act in specific ways, since practice is a shared understanding. As individual agents change, changes in practice emerge collectively but without coordination. Third, practice involves the intertwining of practices, practitioners, and praxis (Orlikowski, 2002). Practitioners are those who do the work of developing and executing strategies, praxis is the actual activity they are engaged in, and practices are what practitioners draw on in their praxis (Whittington, 2006). Praxis includes episodes of activities that are routine and nonroutine, formal and informal, and occurring at the corporate centre and at the periphery. On the other hand, practices might be organization-specific, such as operating procedures, or extra-organizational, such as industry practices and societal norms.

Using a practice lens to study IS governance emphasizes its socially situated nature. Empirical evidence for this includes the use of horizontal governance mechanisms to facilitate collaboration (Boh and Yellin, 2007; Brown, 1999), the differences between IT professionals and accountants in the tools used to evaluate IT investments (Bajaj, Bradley and Cravens, 2008), and the impact of top management's beliefs on the use of enterprise resource planning systems (Liang et al., 2007). Governing IT portfolios incorporates behavior control and engaging in communication (Yu and Wu, 2008), with

both processes emphasizing the creation of a shared understanding. Nelson and Cooperider (1996) found that mutual trust and interests between IT and business managers had an impact on their shared knowledge, which in turn influenced the performance of their IT portfolio. Chan (2002) found that informal structures played a much more important role in improving IS performance compared to formal structures. As users and managers engage in these social practices, they are reproducing governance at different levels of an organization, and recreating business-IT alignment over time. The emphasis shifts from governance to governing. Alignment is thus not a fixed state but is being achieved continually.

Integrating this with practice theory is worthwhile because of the richer explanations possible. For example, practice theory provides useful terminology, such as *praxis and practice*, for explaining how IT managers decide on the type of governance mechanisms, and *symbolic capital*, the ability to classify other resources as valuable (Bourdieu and Wacquant, 1992), to describe the goal of IS governance. Practice theory also enhances the definition of how choices are made in governance: differential access to symbolic capital affects the ability of agents to strengthen or weaken the level of governance. This provides an engine that drives the shifts managers make during the search process. Hence, IS governance should be viewed as a political process where users and managers deploy their different sources of capital and draw on different practices from their individual fields.

Practice theory highlights that the governance process itself changes the structures in which governance takes place. The structures that are the most relevant here are *habitus* and *field*. Habitus is akin to culture but is also more than that. It consists of the

principles behind distinctive practices and classificatory schemes (Bourdieu, 1998). These principles are used during practice, as well as to generate new practices. While the habitus exists at the meso level (i.e. between the micro level (individuals) and the macro level), fields can be found at the macro level. They consist of groups of agents engaged in practice, and indicate their differing social positions. This difference identifies power relations between individuals. As agents act, they constantly shape their fields of practice and the boundaries of these fields. Table 2 below depicts the mapping of practice concepts to the domain of IS governance.

IS governance can be defined as *a sequence of practices an organization carries out, so as to arrive at an IS portfolio mutually acceptable to all interested parties*. As IS portfolios change over time, the relationship between IS governance practices and desired objectives may be unstable. Thus, new practices will emerge as managers and employees adjust their actions in response to changes in this relationship.

Since the portfolio-in-use is co-produced by managers and users, studying how both parties decided on a particular portfolio is a useful way for understanding the alignment between them. Goffman argued that studying how organizations and their members rationalize their actions often highlights contradictions between what is being done and why so, increasing the need for ideological or belief-based explanations (Manning, 2008). For example, individuals lower in organizational hierarchies often claim that their actions are carried out to cover the errors of those at the top. In the context of IT investment and use, users could maintain that their workarounds are ways of overcoming their managers' mistakes in choosing inappropriate systems. Alternatively, interactions between people break down when one party responds in a manner totally different from

the other party. From an IT management context, the results of such a disruption could be the use of shadow systems by employees, when managers do not accede to requests for new systems.

The above discussion highlights the difficulty of obtaining a payoff after implementing IS governance frameworks in organizations. Even though these frameworks may be fairly well-developed, some of their underlying assumptions make it challenging to appreciate their ability to help an organization obtain more value from its IT investments. This study argues that mandating, or suggesting, that organizations use certain policies or mechanisms has unnecessarily reified the formal aspects of IS governance. Implementing formal governance measures may, instead of enhancing business-IT alignment, be symbolic rituals for smoothing the interaction between an organization and the parties it interacts with (Goffman, 1967), such as regulators or industry associations. The reliance of formal governance mechanisms has been at the detriment of informal measures, which could complement or even substitute some of the formal ones, since governance encompasses both control and collaboration (Sundaramurthy and Lewis 2003).

Practice theory concept	**Definition**	**Application to IS Governance**
Practice	Emergent, situated, and recurrent actions of members of a community	a) IT use and resistance to adoption b) IT governance
Practices vs. praxis	Practices: what practitioners draw on during praxis Praxis: actual activity engaged in	a) Practices: formal governance frameworks e.g. COBIT b) Praxis: actual activities of governance- formal and informal, centrally-mandated and emerging from sub-units, routine and improvised
Symbolic capital	Ability to classify other resources as valuable	Ability to define: a) objectives of an IS portfolio;

		b) components of an IS portfolio
Habitus	Principles behind distinctive practices and classificatory schemes	Objectives for the IS portfolio desired by users/managers
Field	Groups of agents engaged in practice	Organizational space in which users and managers interact; their differential ability to promote/control drift indicates the power differences between them

Table 2: Applying Practice Theory Concepts to IS Governance

A recent survey found that, while organizations use well-known frameworks to apply good IS governance practices, half of them use these frameworks as a reference source and about a third apply them strictly (PricewaterhouseCoopers and Information Technology Governance Institute, 2008). This indicates that practitioners are aware of the limits of governance frameworks. However, there is little indication if they include informal measures to complement them.

Organizations are spaces for the negotiation of what counts as appropriate IT governance, in terms of the systems and practices that are valued. The starting point of a practice theory of IS governance is the role of agents as bearers of capital who are not enslaved by structures (Bourdieu and Wacquant, 1992). However, since capital, especially symbolic capital, is unequally distributed across agents, agents differ in their ability to achieve their competing goals, leading to drift in the IS portfolio. These goals are formed on the basis of their habitus- the prevailing ethos that guide their jobs or work units. For example, some departments, such as payroll processing, may prefer to minimize changes in the IT portfolio, as they are more focused on maintaining reliability.

Organizational units seek distinctiveness, and achieve it by their possession of different types and amounts of capital, which determine dominant and subordinate positions in a field. Bourdieu proposed that symbolic capital has both subjective and objective properties, and is formed through the shared meanings of value and worth. For example, the narratives of meritocracy, scientific management, and management scholarship have supported the value of some particular types of capital, such as schooling and professional experience, in organizations (Ozbiglin and Tatli, 2005). The symbolic capital that is pertinent in this study is the ability to decide what an organization's IS portfolio is. In the current functional perspective on IS governance, IT managers possess this capital, but users do not. Over time, situational changes affect the possession of this capital. IS portfolios have become more modifiable because of changes in IT, with greater numbers of general-purpose applications, and IT use, with increased exposure of individuals to IT outside their work environments. This has reduced the amount of symbolic capital managers had to define the IS portfolio and its organizational objectives. Improved IT capabilities meant that, while an IT manager could specify these objectives at the higher levels of an organization, it was difficult to prevent fragmentation at lower levels, which allowed users to set their own goals for the portfolio.

Users have adapted their IS use practice because of this situational change: they are more willing to try out shadow systems and use workarounds. Paralleling Orlikowki's (2000) distinction between technological artifact and technology-in-use, this situational change has created a gap between the intended IS portfolio and the portfolio-in-use. The latter differs from the former to the extent that certain components of the former are not appropriated by users because of a lack of fit with their tasks. If these components are mandated, users could develop workarounds, so that the portfolio does not interfere with

the completion of their work. The portfolio-in-use could also include components not present in the intended portfolio, as users and managers introduce shadow systems.

IT managers draw on the practices embedded in formal governance frameworks, such as COBIT, when engaging in the praxis of governance. Governance frameworks are conceptual artifacts, which can be flexibly deployed (Orlikowski, 2000). IT managers' relations with users and business managers are constantly being reproduced or transformed as technological and organizational changes occur. As users gain in their ability to define the portfolio, IT managers use their symbolic capital to define governance mechanisms as valuable and enact governance practices. They deploy this capital to ensure that the IS portfolio-in-use moves back onto the intended path, thus reducing fragmentation and business-IT misalignment.

The use of formal or informal control in the praxis of IT managers is a shifting balance, which depends on their power over users at a particular point in time. Formal governance mechanisms may, for example, not work well with independent-minded business unit managers, who are unconcerned with integrating their operations at the corporate level. In such a case, de-emphasizing formal governance and replacing it with informal practices, such as ceremonies involving respected outsiders or the intercession of influential senior executives, may be a more fruitful approach. Over time, the social structures suggested by these informal practices may be reproduced by reflexive business managers and users, who imbibe and accept the rationale for governance after interacting with such leading personalities. In that case, such methods may be better in the long run for enhancing the level of IS governance than the straightforward implementation of formal frameworks.

This practice-based theory of IS governance approach integrates portfolio drift and governance in a single conceptual model. It depicts how both of these processes interact and why they occur, adding dynamism to the idea of IS governance. This reflects the idea that business-IT alignment occurs both in the short-term, indicated by the mutual understanding of current objectives, and long-term, seen in a congruent IT vision (Reich and Benbasat, 2000). This study's practice-based theory also informs the dynamic model of alignment (Sabherwal et al., 2001), by expanding the sources of changes in alignment beyond managerial plans. Finally, the theory presented here contributes by describing a clear, specific objective for IS governance: an unfragmented IS portfolio which balances the interests of management and users. This interaction between governance and drift has an impact on the ability of organizations to achieve valuable IS outcomes.

Conclusion

As information systems become more closely linked to business activities, some of the traditional core questions asked by IS researchers rise in prominence again. How do businesses ensure that their IT investments are aligned with or support their strategies? What mechanisms can organizations use to obtain greater value from their IT investments? How should IT investments be managed to ensure that they are flexible enough to allow organizations to explore future opportunities, but also stable enough to keep current operations running smoothly?

These timely issues revolve around the gap between investing in IT resources to achieve organizational goals and effectively using them to obtain corporate value.

Understanding this gap and the subsequent danger of business-IT misalignment is a core strategic challenge for organizations and researchers. The practice-based theory presented here provides a deeper understanding of IS governance's role in remedying the challenge of portfolio drift.

A key contribution of this study is to provide a theoretical wrapping for IS governance based on practice theory. This approach places governance in its appropriate nomological network, alongside related constructs such as business-IT alignment, strategic IS decision-making, and the goals of an IT portfolio. In addition, the practice perspective frames governance as a dynamic phenomenon, which accounts for the ongoing interaction between management and users and the changes in business-IT alignment over time. Finally, the practice view enables the integration of formal and informal means of IS governance. Future researchers could examine the various aspects of this theory, such as the search process by users and managers or changes in the level of drift over time, in closer detail by using interpretive case studies.

This study also provides some evidence of the specific, tangible targets of IS governance. Previous work discussed IS governance's impact in a more diffuse manner; for example, it is used to boost business innovation (Agarwal and Sambamurthy, 2002), encourage desirable IT-related behavior (Weill, 2004), and control IT strategy to ensure its fusion with the organization (van Grembergen, 2004). While business-IT alignment is identified as the ideal goal of governance, little work has been done to relate the two concepts. This could be due to the uncertain time difference between instituting IS governance and observing its impact. From that aspect, portfolio drift is a distinct

phenomenon which can be examined as an interim goal that IS governance should have an impact on.

Empirical analysis is required of the phenomenon to describe it and examine its antecedents and consequences. Future research can then build upon the findings to open up the “black box” of drift by examining the decision-making processes and interaction with governance that take place at the multiple levels of an organization and across time. Future researchers could also examine other aspects of IS portfolios, such as the constraints placed on them by legacy systems, especially given the significant differences between IS and financial portfolios.

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