

Why Don't Systems Die? An Escalation of Commitment Perspective

Emergent Research Forum Paper

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Abstract

Legacy systems, using obsolete technologies, which are costly to maintain and which constrain users abound. Yet these systems persist and decision makers continue to allocate them resources despite better alternatives. Our research focuses on why such declining systems are not retired or replaced despite evidence that they have outlived their utility. IS research has studied such escalation of commitment but in the context of failing Information Systems Development (ISD) projects. While on the surface declining systems and failing ISD projects seem similar, important contextual differences imply that extant theorizing for failing projects is insufficient to understand the factors influencing persistence with declining systems. Our research contextualizes and extends escalation of commitment research to (a) understand factors influencing persistence with declining systems, and (b) extend the boundaries of current theory beyond the ISD context by redefining antecedents and hypothesizing their effects at later system lifecycle stages.

Keywords (Required)

Declining Systems, Legacy Systems, Escalation of commitment.

Introduction

Organizations often cling to extant systems despite evidence that these need to be replaced. For example, a large public U.S. university continued using a student enrollment management system built in the mainframe era well into the internet age. Its end-users engaged in workarounds just to perform their workflows. The system also impeded administrators' ability to assess proposed policies and effect change. Despite availability of good alternatives, this system persisted for decades. Systems refusing to die are not specific to the public sector. Many examples abound of organizations sticking to obsolete technologies and legacy systems which constrain their actions or are costly to maintain. The decline of an information system's capability to meet business requirements would rationally lead to its retirement or replacement. However, decision makers continue to allocate resources to such systems. Our research focuses on why these systems are not retired or replaced despite evidence that they have outlived their utility and despite the existence of better alternatives.

The issue of persistence to a course of action despite negative information has been examined in the context of failing Information Systems Development (ISD) projects using the theoretical lens of escalation of commitment (Keil 1995; Keil et al. 2000). We, thus, suggest that escalation of commitment provides a useful perspective to examine persistence with declining systems. However, important differences between our context and the traditional ISD context need to be taken into consideration for theorizing. First, the ISD context implies that the system is not in use and its benefits are yet unrealized. The challenge before the decision maker is to decide the next step of action given project characteristics and metrics. For declining systems, the decision maker must contend with a situation where the system has provided benefits in the past and is still in active use. Second, for an ISD project, the decision maker needs to choose between redirecting or continuing to allocate resources. For declining systems, the decision maker needs to choose between allocating resources for continued maintenance, retirement, or an alternative. Third, in declining systems, the decision maker must additionally contend with an established user base and organizational processes in which the system is embedded and routinized.

Given these differences, the extant theorizing of escalation of commitment for ISD projects is insufficient to understand the factors that lead to persistence with declining systems. The objective of our research is to

contextualize and extend escalation of commitment research to understand the factors that lead to persistence with a declining system despite evidence that it should be replaced. Specifically, we focus on examining structural determinants of escalation because these are suggested to exert salient effects at later stages of a project's lifecycle. Our study contributes to both the IS escalation of commitment literature by extending its boundary conditions and to practice by shedding light on why declining systems refuse to die.

Literature Review

Escalation of commitment refers to the tendency by decision makers to persist with a failing course of action despite the presence of negative information (Brockner 1992). Four types of determinants have been shown to influence escalation of commitment: project, psychological, social, and structural (Staw and Ross 1987). Staw and Ross (1987) suggest that the four types of determinants apply to different extents depending on the level of progress on the project. During the initiation phase, project related determinants are said to be more salient and with time, psychological, social, and structural determinants, in turn, provide stronger explanations for escalation of commitment. This temporal variation in determinants is not well understood in the literature (Sleesman et al. 2012). This may be partially due to the restricted project contexts in which escalation of commitment has been studied (e.g., the IS literature has focused on ISD projects).

We propose that escalation of commitment in the case of declining systems – that is, systems that have been operational in the organization for a long time but are now unable to effectively meet business requirements - provides an opportunity to extend this body of knowledge. We do so by leveraging the context of declining systems to (a) redefine the nature of structural determinants (because of their proposed salience at latter stages) and (b) theorize their effects on escalation of commitment to declining systems.

Contextual Differences Between IS Development Projects and Declining Systems

Declining systems are typically large systems used to perform an important business process and are used by a multitude of users as part of an organization's ongoing, repetitive activities. Their long tenure in use signals that they have delivered business value to their organizations and that they are embedded in the organization's processes and routines. Finally, they represent a continuous and significant operational cost for the organization's IT budget. The Project Management Institute's definition of a project as "a temporary endeavor undertaken to create a unique product, service, or result" illustrates the differences between an ISD project context (temporary, aiming at the creation of a unique system) and the context of declining systems (operational, embedded in organizational processes).

Given that escalation of commitment refers to adherence to a course of action despite the presence of negative information, it is important to understand the nature of negative information in both contexts. In ISD, project goals typically relate to scope, time, cost, and quality which are monitored and act as a reference point to judge negative information. For declining systems, negative information can no longer be inferred from typical ISD project metrics. Rather, negative information is likely to manifest through the system not meeting goals of operational metrics like availability and reliability. Furthermore, subjective measures like technical obsolescence, maintainability, software entropy or technical debt may also constitute negative information.

As highlighted by the student registration system example, negative information can also arise from organizational users (e.g., dissatisfaction, workarounds) and from external users, if the system is used for information exchange with customers or suppliers. Therefore, unlike the ISD context where negative information is considered salient and relevant to decision maker only, different negative information might be salient and relevant to different stakeholders of a declining system (e.g., negative information related to maintainability is salient only to the IT staff). Further, unlike negative information for ISD projects captured by objective project metrics, both objective and subjective measures capture negative information about declining systems. Table 1 summarizes these differences.

Dimension	ISD Projects	Declining Systems
Goals	Shared among stakeholders (Scope, Cost, Schedule, Quality)	Different among stakeholders (Technical, Business, Cost, External)

Negative information	Salient relative to shared goals	Salient relative to stakeholder-specific goals
Course of action	Continued commitment of resources	Continued operational use

Table 1. Contextual Differences Between ISD Projects and Declining Systems

Theoretical Development

Structural Determinants of Escalation of Commitment to Declining Systems

Our theorizing focuses on the effects of information asymmetry, goal incongruence, side bets, and institutionalization because, as elaborated below, they should either be redefined or exhibit different effects for escalation of commitment to declining systems. Table 2 defines these constructs for declining systems.

Construct	Declining Systems	IS Development Projects
Goal incongruence	Degree of non-alignment in the goals between various stakeholders of a declining system	Degree of non-alignment in goals between the project manager and their principal
Information asymmetry	Different negative information salient to various stakeholders and not available to the decision maker	Private information on project performance available with the project manager and not available to their principal
Information ambiguity	Conflicting negative information from stakeholders creating uncertainty for the decision maker	
Side Bets	Tangible and intangible costs already incurred which are related to the declining system, but not directly allocated to it	Tangible costs incidental to the project
Institutionalization	Degree to declining system is institutionally embedded in the organization	Degree to which the project is institutionally embedded in the organization

Table 2. Construct definitions

Information Asymmetry and Goal Incongruence

Prior IS escalation research has primarily focused on agency problems (Keil et al. 2000) as focal structural determinants, particularly *goal incongruence* and *information asymmetry*. In ISD projects, these constructs have been operationalized with (a) the decision maker as the agent and (b) project authority delegated from the project sponsor or top management as the principals. When an ISD project is failing, if the decision maker reveals the negative status of the project, it can damage their reputation. The decision maker's self-interest to conceal the information creates goal incongruence with the principal. Further, ineffective monitoring by the principal may fail to uncover the project's negative status, creating information asymmetry. Both goal incongruence and information asymmetry can lead the decision maker to escalate commitment to the project instead of redirecting resources or terminating it.

While in ISD studies *information asymmetry* is defined only as the presence or absence of negative project information (Keil et al. 2000), due to the multidimensional nature of negative information for declining systems, different types of negative information are salient to different stakeholders. Therefore, unlike ISD projects where information asymmetry exists between decision makers and their principals only, declining systems have potential information asymmetry between the decision maker and various stakeholders. If this information asymmetry is not costless to remove, it is likely that the decision maker continues to commit resources to the declining system, because they are not aware of the negative information held by

one or multiple stakeholders. This leads to the following hypothesis:

H1: Information asymmetry between stakeholders is positively associated with escalation of commitment to a declining system.

Goal incongruence in the ISD context is defined as non-alignment of goals between the top management or project sponsor (principal) and the decision maker or project manager (agent). With a declining system, goal incongruence arises among different stakeholders due to their differing goals with respect to the system and corresponding negative information. In turn, the multiplicity of stakeholders, some of whom may have negative information and some of whom may have positive information about the system may create information ambiguity for the decision maker. The decision maker then cannot unambiguously assess whether the system is declining. Such ambiguity increases the likelihood of adherence to the status quo (Samuelson and Zeckhauser 1988) leading the decision maker to continue commitment to the declining system. This leads to the following hypotheses:

H2: Goal incongruence between stakeholders is positively associated with information ambiguity for the decision maker of a declining system.

H3: Information ambiguity for the decision maker is positively associated with escalation of commitment to a declining system.

Side Bets

Side bets for an ISD project are defined as expenses incidental to the project spending itself i.e., expenses like skill building, training and upgrades of hardware and infrastructure (Keil 1995; Sabherwal et al. 2003; Staw and Ross 1987). Side bets are an under-explored aspect of escalation in ISD projects and their effect has not received empirical support (Sabherwal et al. 2003). The logic for the effect of side bets is that spending on side bets presumes the availability of funds. If an ISD project is failing, it may not only be difficult to justify such ancillary spending but also if any such funds were available, they are more likely to be committed to the project itself as an indication of escalation of commitment.

However, the past success of a declining system is more likely to have created conditions where side bets have already been made. These side bets may involve spending on business training and ancillary software and hardware and intangibles like the effort the stakeholders put into becoming skilled with the system, the organizational processes and routines that have been built around these systems, and the technical knowledge that the IT staff have built. Such side bets create additional dependency on the declining system increasing the likelihood of persistence:

H4: Side bets are positively associated with escalation of commitment to a declining system.

Institutionalization

Unlike ISD projects which are still under development, and thus, may not have had the opportunity to become institutionalized, declining systems are an integral part of the organization's operations. As discussed by (Ross and Staw 1986):

"Projects can at times become institutionally embedded in an organization, reflecting the web of interrelationships and obligations that extend from a variety of relevant constituent groups. In becoming institutionalized, a relatively permanent structure and system of relationships is erected that favors a policy or decision (Pfeffer and Salancik 1978). In addition, projects and decisions can at times come to be tied integrally to the values and purposes of the firm (Goodman et al. 1980). Thus, organizations may not even consider discontinuing longstanding programs and lines of business even though they incur huge financial losses" (p. 278).

Given that declining systems typically have long tenures in an organization and have had the opportunity to be embedded in the organization's daily operations, business processes and routines, we expect that these systems will be institutionalized. The degree to which they are institutionalized will influence persistence with these systems:

H5: Institutionalization is positively associated with escalation of commitment to a declining system.

Methods

The hypotheses will be tested in a field study using matched-pair survey data on declining projects. Surveys will be sent to IS managers responsible for these systems across a large number of organizations and a set of end-users of the systems. IS managers will be asked to identify a declining system (either current or one which has been replaced). Open-ended questions will focus on the history of the system and survey questions (based on validated scales) will capture the constructs of our study. The IS managers will also be asked to provide (if possible) data on the costs of maintenance of the system over time, of workarounds, and of enhancement requests that have not been implemented. A second survey will be sent to end-users of the declining systems which have been identified by the IS managers. The survey will capture the constructs of the study from an end-user's perspective. These matched-pair surveys from the salient stakeholders will allow us to appropriately measure goal incongruence and information asymmetry.

Conclusion

The study aims to (a) make contributions to our understanding of factors that lead to persistence with declining systems despite presence of other alternatives, and (b) extend the boundaries of IS escalation of commitment research beyond the ISD context by *contextualizing* and *redefining* structural determinants to reflect systems which are at considerably later stages in the system lifecycle and hypothesizing their effects on persistence. Structural determinants have not found much support in extant literature, largely due to the contexts where they have been tested. Our theoretical development shows that the redefined structural determinants provide a convincing explanation for persistence of declining legacy systems.

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