Business-Driven Information Systems Change: Establishing an Alternate Lens for Understanding the Change Process

Full Paper

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Abstract

This research seeks to reframe the discussion around information systems change by examining how particular IS change needs driven by business needs interact with particular system characteristics to enable or constrain response options for organizations. Since this reframing argues for the contextual nature of understanding the change process, a series of 26 field interviews were conducted at five different organizations in different industries. From these interviews, our findings support that the research literature in areas of IT flexibility and agility could benefit from the further refinement of concepts to understand the contextual nature of IS change. Finally, we connect our research to Adaptive Structuration Theory as a meta-theory supporting our framework.

Keywords (Required)

IS change, Business needs, theory construction, Adaptive Structuration Theory.

Introduction

Employees of the modern organization rely heavily on information technologies to execute the major operations within an organization, to manage their daily routines, to learn from their environment, to capture and process data, and to record information and knowledge. While these technologies overall have led to greater efficiency and effectiveness at various levels including individual, group, facility, organization, and beyond, researchers and practitioners alike have recognized the effect of information technology to constrain an organization.

Part of the strain on organizations to handle change is created by the rules-based nature of information systems. The instructions that are designed, developed, and implemented vis-a-vis information systems to improve the efficiency and effectiveness of organization processes, for example, can be the source of rigidity when organizational changes require information systems change. As a result, researchers have long studied the concept of IT flexibility. The general idea is that if one can construct an information technology to be "flexible", when the need for change arises, the change will be "easier". However, prior IT flexibility research has treated flexibility as a property of a system overall rather than considering the context of the change request. As pointed out in this research, depending on the particular change requested of an information system, a system that had been considered "flexible" can suddenly appear quite rigid in light of an unplanned change. This highlights the importance of the business change request.

Thus, the core research question addressed in this study is "*What is the process of business driven IS change?*" This research attempts to reframe the concepts around information systems change to better acknowledge the context of a change request and the results of those requests given particular system characteristics.

The rest of the paper is organized as follows. The next section summarizes the existing theoretical perspectives on IS change. Section three outlines the reasoning for the chosen research method, its key tenants as well as the findings. Section four describes the theoretical model emerging from the data analysis, including how it fits into the broader IS nomological network. Final section summarizes the key contributions of this paper.

Previous Theoretical Frameworks

Academically, three streams of research have dominated the area investigating IS change and outcomes: a) IT flexibility (Salmela et al. 2015) and IT affordances (Doherty et al. 2006) b) IS strategy triangle (Pearlson and Saunders 2013) and alignment research (Sabherwal et al. 2001) and c) Digital options research (Sambamurthy et al. 2003).

Flexibility research has a long history in management, economics, and operations management research at all levels of research. In IS research, the term 'flexibility' has focused on IT infrastructure flexibility and its linkage to various organizational variables. A commonly used definition of IT infrastructure flexibility is the "*degree to which its resources are sharable and reusable*" (Duncan 1995). A comprehensive view of IT flexibility use in IS literature is presented by Salmela et al. (2015). This perspective has two shortcomings. First, it views IT as a closed system, unaffected by business change needs. Secondly, it does not provide insight into the change process.

The second stream of research that is concerned with understanding how systems need to change is alignment research. Researchers have also suggested that alignment changes over time depending on business needs and technology capabilities, going through periods of punctuated equilibrium (Sabherwal et al. 2001). More recently, researchers have argued that the focus needs to shift to a more operational level, rather than at the dominant firm level (Tallon 2008). However, research on going from one punctuated equilibrium to another has been missing.

The third stream of research that contributes to the discourse is the discussion on information systems as digital options (Sambamurthy et al. 2003). This stream of research views organizational performance through three organizational capabilities (agility, digital options, and entrepreneurial alertness) and strategic processes through the lenses of capability-building, entrepreneurial action, and co-evolutionary adaptation. Digital options research, while introducing important concepts of agility, reach and richness, has lacked clear explanation of how IS change happen as well as the empirical examination of the model.

Overall, research in this area has been lacking the investigation of business driven IS change as well as an investigation of the change process. Consequently, this research aims to contribute to the discourse around IS change by examining the interactions between business-driven IS change, application characteristics relevant to the change, and IS responses.

Research Design: Qualitative Study

As mentioned earlier, the literature bases are insufficient for conducting a quantitative study effectively given the lack of direct applicability to this research and the lack of validated measurement tools. Therefore, this study uses a qualitative approach to explore the research questions as well as the context so that future research will have a broader footing to develop upon. A qualitative study allows researchers to describe the meanings of central themes in a given context (Brinkmann and Kvale 2014). This research used semi-structured interviews with industry IT practitioners as the primary data collection method. Interviews offer two additional advantages other research methods.

First, although the precise constructs that are important are not well defined, the existing research does provide us the ability to come up with an initial conceptual model consisting of the following constructs - business-driven IS change, application characteristics relevant to change, and IS responses. The model provided a general interview guide for structuring the questions (Miles and Huberman 1994). Semi-structured interviews allowed flexibility to discover whether the initial conceptual model or other underlying models exist in the minds of practitioners. This research sought to establish to what extent the initial conceptual model fits with practitioners' perceptions.

Second, interviews provide an opportunity to cover both factual and meaningful levels i.e. allows researchers to assign meaning to the interviewees responses (Brinkmann and Kvale 2014). They allow opportunistic discussions to arise. Since it was expected that different individuals would have different perspectives about IS change, the interview method allowed for more exploration to uncover details surrounding the concepts of this study that might have been unseen.

Site Selection and Interview Summary

Interviews were conducted at five large organizations (on site) in different industries. There were a few restrictions on the companies selected. First, the company had to be large enough to have an IT department. Second, the IT departments had to participate in at least some of their own software development. These five organizations were a part of a convenience sample but were considered typical large organizations. The organizations' pseudonyms indicate the industry they represent. Within each organization, interviews were conducted with as many individuals within the IT department as allowed. Table 1 indicates the organizations and informants involved in this study.

Organization	Informants	Organization	Informants
PowerCo	1. CIO	SoftwareCo	15. CIO
	2. Senior (Sr.) Program Manager		16. Director Corporate Application Supp.
	3. Business Analyst A		17. Business Analyst A
	4. Business Analyst B		18. Business Analyst B
	5. IT Architect		19. Business Analyst C
InsuranceCo	6. CIO	RetailCo	20. CIO
	7. VP System Implementation		21. CTO
	8. VP IT Planning w/ Jr. IT Planner		22. Director of Business Process
	9. Senior (Sr.) IS Manager		23. Manager of IT Strategy
	10. IT Development Mgr.		24. Senior IS Manager, Sales
	11. Senior Developer A		25. Senior Developer A,B, & C
	12. Senior Developer B		26. Extract, Transform, Load (ETL) Manager
BankCo	13. Senior Director of IT		
	14. Service-Oriented Architecture Manager		

Table 1: Organizations and Informants Included in This Study

In total, twenty-six field interview sessions were conducted with thirty-one individuals from five organizations (a few sessions had multiple informants present). Of these, twenty-one interview sessions were retained for data analysis. While field notes gathered from the excluded six interviews were used to inform the research, they were dropped from the coding process primarily because the interviews were not recorded at the request of the informant. Informants in this study include upper-level level managers, IT department managers, business analysts, and developers.

The interviews were semi-structured using a pre-designed script of open-ended questions based on the major constructs and relationships we wanted to examine. Follow-up questions were used where pertinent to gather more detail about a particular example or further investigate interesting viewpoints. By design, the interviews began with open-ended questions, but gradually got more targeted as the interview progressed. For example, if a respondent did not mention expansion in a IS change example, they were more directly asked about expansion by the end of the interview. This allowed the participant to discuss change to an application of their choice with as little interviewer bias as possible. Interviews ranged from about 25 minutes to 1.5 hours, with an average of approximately one hour. Interviews with participants were face-to-face in all but two sessions.

The questions in the interview scripts were tweaked based on results of a series of five pilot interviews within PowerCo. The pilot study allowed for questions to be revised in order to be more effective in examining the issues of interest for this study. While changes were made to the interview scripts, they were incremental, and therefore, the data gathered from PowerCo was folded into the final analysis for this work.

The interview script was partially adapted for the role of the individual being interviewed since the knowledge level and knowledge base of the individuals varied. For example, the CIO will have more insights about the business changes driving change efforts within his department, while the developer will have better understanding of the characteristics of the applications that allow or inhibit change.

Informants were allowed to discuss experiences and systems that they had personally dealt with in their job. This did lead to some overlap in systems discussed, but overlap of systems was not a requirement. This decision was made so that examples would be more concrete. An alternate design might have required discussions to center around a single system within an organization, but it was considered preferable to use examples that informants were most comfortable with.

When possible, the interview was recorded for transcription purposes. Recording of the interviews reduces "variation in observation" when creating codes and updating the coding template during data analysis iterations (Boyatzis 1998).

By conducting interviews within several different organizations with individuals in different roles, this study has benefited by casting a wide net. The broad range of organizations in various industries allowed this study to discover whether business-driven IS change issues were present in a variety of companies. By speaking with a range of informants in different roles, this study was able to collect a number of perspectives around business-driven IS change needs. Each of these perspectives was potentially different because of their varying "distance" from actual IS change at the code level.

Acknowledging that no study is perfect and all studies must make tradeoffs in execution, this study settled on a broad approach for preliminary study of the issues surrounding business- driven IS change. Further research will have opportunities to dig deeper using the findings in this study as a starting point.

Data Analysis

Interview coding started following the interviews within the third organization. This research employed a hybrid coding technique, utilizing both theory-driven code development and inductively-derived codes (Boyatzis 1998). This allowed the research to use previous research for guidance while considering new ideas and themes that emerged from the interview data. Code development began with an initial template based on the preliminary model components described above, but evolved as interviews were transcribed and analyzed.

Two coders were utilized to validate the coding scheme and determine the interrater reliability of the coding scheme. Interrater reliability allows the researcher to evaluate the consistency of matching codes to informant responses (Boyatzis 1998). The final coding scheme was iteratively developed based on discussion following coding sessions. The second coder studied ten of the final twenty-one interviews and coded seven. The following process was used on each interview in turn. First, each interview was coded independently by both researchers using the latest coding template revision. The codes were then compared and discussed. Where there was disagreement on a code or a new code was necessary; the code was discussed until a consensus was reached and the coding template adjusted by adding a new code or refining the definition of an existing code. Then the process continued with the next interview. After the coding scheme was stabilized, the primary researcher used the final coding scheme to recode the interviews used to tweak the Inter-rater reliability me. Inter rater reliability was > 0.80.

In qualitative studies, researchers strive for theoretical saturation, where "no new or relevant data seems to emerge" (Boudreau 2002). At the major construct level for this research (highest level codes), we believe that this has been achieved. Subsequent research will attempt to achieve theoretical saturation at the more detailed levels of the model (subcodes).

Findings

In essence, the initial conceptual model argues that the ability of IS to make changes quickly and easily cannot be predicted without consideration of application characteristics relevant to that change. Another way of saying this is that the IS response is dependent on, if not dictated by, both the particular IS change required and the application characteristics relevant to that change. For the sake of space, we include an example of how this process is manifested in practice.

In one example of business-driven IS change, the CIO of SoftCo discusses the business need to synchronize data in multiple systems. This business-driven IS change was based on a business need to have all parties of the organization reporting the same prices for products. The lack of synchronization meant that there was potential for salespeople to have different prices than the service organization or the website. The old process was to devote an individual to the task of maintaining price synchronization across the various applications. This business need led to IS change related to data integration and new processes. These particular IS changes are what we will call interdependency changes, or changes related to the interfaces of applications. This was one of the several categories of IS change that emerged from the interviews.

"So there's an SKU code for every product we sell on a price. And there's a set of tables that describes the service, the product pricing, the usage, the descriptions, and so forth that people can purchase. And we had a scenario where we had multiple systems where that data needed to be present. And we have a sales system that is separated from our financial system. Now on our web site, you know, we need to be able to show people product data. And then on our support system we need to know that when somebody calls in that they have purchased the appropriate product. So those same codes need to be immaculate. So what was happening was that there was an individual, well actually a couple of people, whose responsibility was to keep the pricing data in synch in all those different systems. So if we changed a price for a product, we had to go into each one of those systems and change it and hope, if you will, that they didn't miss anything … or that their business logic of getting from A to B to C was consistent."

Although, these applications did have user exits that would allow for data to be manipulated from outside the application, these user exits were inconsistent.

"Factually speaking the systems by this definition aren't consistent because they were built by different vendors using different functions."

While the user exits were created to modify the needed fields, and were thus application characteristics relevant for this particular IS change needs, their inconsistency with one another did not allow SoftCo to use any one of the applications as the system of record or master file. If there had been more consistency between the systems in terms of user exits, SoftCo might have been able to recode some of the applications to work together. Since the Type IIA (detailed later) IS response, rewriting all or most of the separate systems, wasn't a practical solution in this case, SoftCo chose a Type IIB IS response of expansion. This expansion IS response resulted in a new application outside of the scope of the original applications whose task was to maintain data consistency through data integration and replace the current manual process of updating several systems.

"…so what we did is we built a system, a custom application, that allows the users to create pricing in one system, a master record, and then pushes those changes to the other systems automatically. We call it Product SKU Integration. If I create a new piece of software and I add a price, I enter it in that application and it updates the financial system, the sales system, the customer relationship system, and training, database - whatever other environments are needed to be updated. I think five systems it actually touches and it keeps track in the back end of how all those translations work between systems A, B, and C. So in this system it might be called a price, and in this system it might be called a cost, here it might be called an inventory item or it might be called a SKU, whatever all those translations are there's this big secret table that keeps track of all that. The user doesn't need to worry about it. They just enter product and price and quantity, or whatever they do. The system does all that work behind the scenes in a consistent manner and we also have some clean up scripts to pick it all up from the beginning. So now you know that the product definition is consistent across throughout all of the products. That is really so important for reporting, for transactions. If I get a transaction on one system and look at it, well who sold it? Well I can go over here and see, here it was. We had a price that was the same. You don't have to worry about all those fundamental issues that we used to have."

This example illustrates all of the major constructs of the initial conceptual model – a set of business-driven IS changes (need for data consistency across systems), some application characteristics relevant to the change (not integrated, but with user exits), and a resulting IS response (expansion to add a new module talking to all systems). Furthermore, the example illustrates not only the existence of these constructs, but also the interaction between the particular business-driven IS changes and the application characteristics relevant to the change. In this case, the system had application characteristics, which were needed for data integration, but they were insufficient to meet the need. Consequently, SoftCo was left with expansion as their best alternative for an IS response to the business need.

Emergent Theoretical model

The above findings point to two critical things. First, the business change context is important. Second, the change process is a complex process. As mentioned earlier, none of the theories address these findings. In this section, we use the findings of the study as well as existing IS theories to come up with an emergent theoretical model that both, explains the findings of the study as well as contributes to theoretical expansion of the theory.

A core IS theory used to investigate change is Adaptive Structuration Theory (AST). While much of the search in this area has been at a group level, tenets of this search can be used to frame the process of change at other levels in the organization as well (Bostrom et al. 2006). Adaptive Structuration theory has recently been touted as a meta-theory for information systems that can incorporate other theories or frameworks to provide a broader nomological network (Bostrom et al. 2009). In the case of this paper, we draw on concepts from the three foundational concepts mentioned earlier within the frame of AST. In additional, adaptive structuration takes an input-process-output perspective, providing the ability to open the IS change process black box (Poole and DeSanctis 1990) – the key focus of this research.

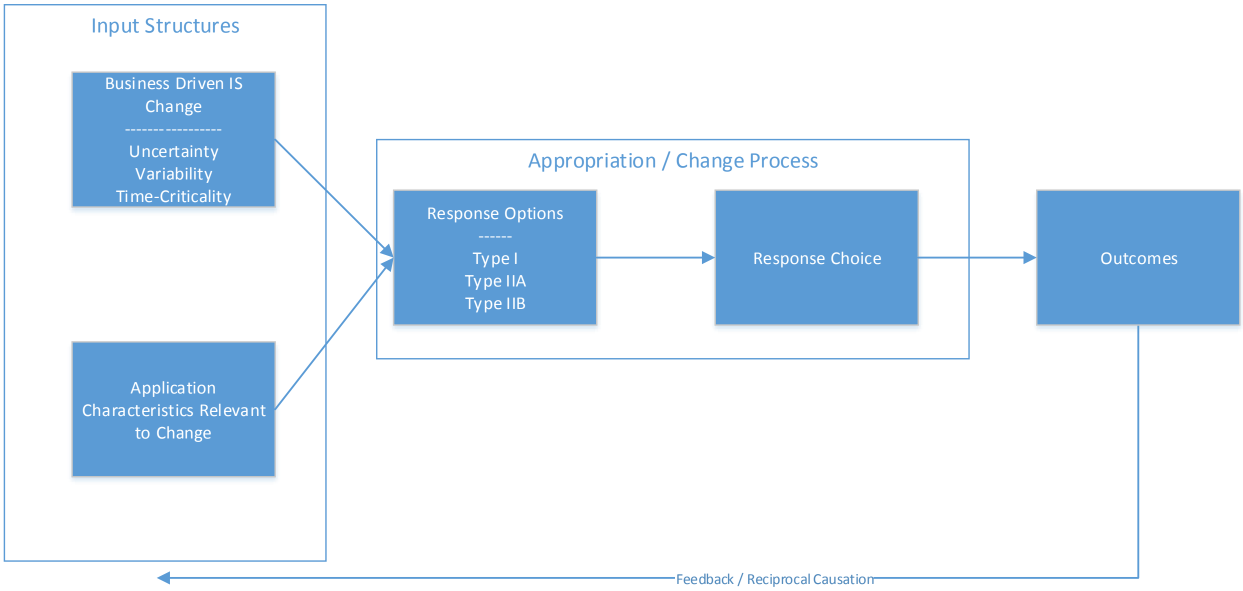

Figure 1: Modified AST model

The AST-based framework is presented in figure 1. It outlines four critical tenants 1) business context 2) Input structures to the change process 3) Change process and 4) Outcomes. The context the study outlines is the business environment under which the IS change is requested. It answers questions such as "why is the change requested". It also captures the other constructs, such as organizational agility and entrepreneurial alertness (Sambamurthy et al. 2003), each of which influence why a particular IS change is requested. From an AST perspective, it acts as the underlying philosophy of the change request.

The next key tenant relates to the influence of input structures embedded in the context of IS change. Structural features are rules, resources, and capabilities embedded in a context. The structures influencing IS change can be broadly divided into Business Change Request and Application Characteristics Relevant to the Change. Researchers focusing on the IS triangle, discussed earlier, have focused on business strategy and the IT artifact as the key inputs into the process of change. In this study, we build on these concepts to identify the key structural features in each case that influence the change process.

The third premise relates to the process of change. This also represents the core concept of interest for this paper. In the context of this research, it implies that the IS change process is composed of two steps. First step outlines the response options, an outcome of the interaction between input structures. The second step is actual choice and enactment of the choice. This part of the process has been labeled appropriation in previous research (Dennis et al. 2001; Limayem et al. 2006).

The last component of this AST driven model is outcomes. In this case, the outcomes relate to the implementation, usage and consequences of IS change over a longer period. These outcomes then influence subsequent change requests (both business and IT). This reciprocal causation, where the change choice subsequently influences response options is represented as a backward arrow in Figure 1. While the focus of the paper is the change process, and not the long-term outcomes of information systems, it is important to recognize this to present a complete nomological model.

The next subsections describe each of these tenants in further detail, integrating them with findings from the data analysis shown above.

Input Structure: Business-driven IS Change

The focus of this research is on business-driven IS changes, rather than technology-driven changes (such as technical upgrades, patches, etc.) because of our interest in changes that come from demands outside of the IS departments.

According to AST, inputs consist of spirit, feature and dimensions. Spirit outlines the overall business need independent of the systems in place, e.g. I need to have all departments use the same base of data because we have errors or I need to understand what my customer does. Based on the series of interviews during conducted for this research, the spirit of commonly mentioned business-driven IS changes has been identified (Table 2). While this list could be extended, it includes many of the most prominent business-driven IS changes.

IS change spirit	**Description**
Data Integration	Connecting data components between applications
User Interface	A change to the presentation of information to the end user or a change in the interaction between the end user and the application
Communications	The implementation of new communications channels to meet a business need
Reporting	A change to the information presented in reports
Bus. Process Change	A change to an existing bus. process within an application or series of applications
New Functionality	Additional of functionality previously not included in the application
Data Collection	Addition of new data collection fields into applications or databases

Table 2: Types of Business-Driven IS Changes

AST, though, also argues that researchers need to focus on relevant structural dimensions of an input structures. Gebauer and Schober (2006) identified three such structural dimensions of business processes that impact IS flexibility-to-change: Uncertainty, variability, and time-criticality. Uncertainty of a business process is defined in this case as the "difficulty to predict the exact tasks and resources that are required to perform a particular process" (p.124) and can be environmental or structural in origin. Process variability refers to the number of distinct types of tasks in the process. Time-criticality of a process refers to the percentage of time-critical tasks of a business process. Subsequent research needs to map the spirit to these dimensions.

Input Structure: Application Characteristics Relevant to the Change

Information technology infrastructure has been defined as "a set of shared, tangible IT resources that provide a foundation to enable present and future business applications". The four primary components are 1) hardware and operating systems, 2) network and telecommunication technologies, 3) key data, and 4) core data-processing applications (Duncan 1995). In practice, the IT infrastructure contains multiple different applications, each a combination of the primary components outlined earlier. These applications are responsible for conducting the business processes of the organization and are at the heart of organizational performance. These business applications are the ones expected to be impacted when business-driven IS changes are necessary; and thus, are the core IT artifact for the purpose of this model. For this research, we are interested in those aspects of the application infrastructure that affect the ability to make the required IS changes as opposed to creating a full description of the infrastructure.

Researchers, over time, have identified a number of structural features that influence the IS change response: incompatible systems, inconsistent or localized data models, old system architectures (Broadbent et al. 1999), hard-coded business processes, and links between applications (van Oosterhout et al. 2006).

Additionally, research has suggested that complexity and development practices can have an effect on the maintenance of software (Banker et al. 1998).

Two key structural dimensions that influence the change process, as identified in previous research are integration and modularity (Byrd and Turner 2001; Duncan 1995). Integration and modularity were also identified as key structural dimensions in interviews.

Integration can be simply defined as the linking of information between various systems. At the data level, integration has been defined as "the use of common field definitions and codes across different parts of the organization" (Goodhue et al. 1992). At the process level, integration can be defined as linking the steps necessary to conduct business processes on separate systems. In application infrastructures, the connections between systems due to integration can be a barrier to changes in the applications.

A modular design is one that breaks up "a complex system into discrete pieces" to reduce an "unmanageable spaghetti tangle of systemic interconnections" (Langlois 2002). An alternate definition is: "A module is a unit whose structural elements are powerfully connected among themselves and relatively weakly connected to elements in other units" (Baldwin and Clark 2000). In software, modularity can be found at various levels depending on design. In general, software can be modular at the code-level with classes and objects, at the application level, at the add-on or plug-in level, and at the service level. At this point, there is no clear delineation between modularity levels, and quite often, the application infrastructure in organizations is a combination of systems with different levels of modularity.

Aside from modular design, other application characteristics relevant to changes described in interviews were reconfigurable design, dormant functionality, user exits, common languages, and hidden complexity. These types of designs generally had a positive effect on IS response ability because they enable changes. Characteristics noted as inhibitors to change were hard coding, non-hidden complexity, and complexity due to interdependency.

In one example of an application characteristic that positively affected response through reconfigurable design, InsuranceCo Sr. Developer A stated, "But the fact that we had made where it was assigned a table-driven function, we were able to add storm centers to that easily and functions into the program that allowed those to be dispersed among the multiple adjusters easier."

Sr. Developer B at InsuranceCo described the difficulty in response due to independency complexity: "If I've got to change a particular piece of an application that relies on a component that is used in a lot of different places and it's the component part of that piece that needs to change, that makes the change more difficult."

Choice and Change process

Much of the initial focus on organizational technologies was regarding building and implementing new technologies in organizations. Researchers initially focused on task-technology fit (Goodhue and Thompson 1995), focusing on how a particular application would support an organizational process. These models did not focus on changes in business requirements, but rather on achieving the right fit (design) and usage for the technology under investigation. Over time, studies have expanded their investigation to appropriation or adaption of technology during initial deployment.

A critical advantage that AST has over other theories is the ability to study change. This process is referred to as the reciprocal causation process. Reciprocal causation deals with the impact of the existing use of the systems, learning and modifying it. Such reciprocal causation leads to the changes in the spirit as well as the subsequent changes in the IT artifact. Such changes are done through "moves". These moves focus on specific actions learners use to produce and reproduce structures (Poole and DeSanctis 1992). Prior research has not studied reciprocal causation of organizational systems. Based on existing literature, three types of moves are identified in the conceptual model -Type I, Type IIA, and Type IIB. These are discussed next.

Type I Response

A Type I response is a response to foreseen diversity from the IS environment. The implication of this response type is that the possibility of a particular IS change was anticipated, and consequently the ability to make that change not only could have been, but was designed into the system in advance. Once the anticipated change is encountered, it is simply a reconfiguration change for the IS personnel.

The implication of anticipating particular change, or diversity, possibilities is that a Type I response (often through reconfiguration) is, in effect, a response prior to the occurrence of the change need. That is, a range of environmental diversity possibilities are planned for during the design phase. Consequently, additional time and effort must be devoted during the design phase to consider the change possibilities for the system, and the likelihood those changes will ever be necessary. This extra time and energy in development adds costs to the development process, which ideally are reclaimed through easier changes in the future.

Examples of Type I responses may be changing a tax table, adding a new vendor, or countless other possibilities. Regardless of the particular situation, the point is that for an organization to take advantage of rapid, reconfiguration type changes, the possibility for that change must be anticipated, whether the developer is internal or external. The InsuranceCo IT Development Manager describes this type of response: "if you wanted to add an additional line of business and you didn't have any special edits, you could put some entries into what we call the PVT [a table] and they'll start appearing."

Type II Responses

A Type II Response is a response to unforeseen diversity from the IS environment. In other words, the particular IS change was not anticipated (or if it was, it was not designed into the system) and therefore, the system cannot simply be reconfigured. Consequently, a Type II Response is always a reactive response in this context, and by definition, fits outside of the parameters of the original system design.

There are two subcategories of Type II Responses: Type IIA and Type IIB. A Type IIA Response is a response to unforeseen diversity, but the solution is within the scope of the system. In other words, when reconfiguration is not an option, IS personnel can modify the system at a more fundamental level, often through recoding, to meet the IS change needs. This response option is consistent with part of the IS maintenance literature where maintenance is initiated by a business change (Banker et al. 1998). In one example of a Type IIA response, the InsuranceCo Sr. Developer A stated, "So we had to write additional functionality into our system for the catastrophe situation so that it was easier to disburse the claims among multiple adjusters and handle bulk claims in one area."

A Type IIB Response is also a response to unforeseen diversity, but the solution is outside the scope of the original system. Therefore, many organizations find that adding a system to the infrastructure is a simpler, quicker, and more cost-effective solution than recoding. Additionally, many vendors, particularly ERP vendors, will not support modified systems making many organizations wary of changes to the ERP. Often, organizations find it more advantageous to add a system and integrate it with the ERP. The SoftCo CIO discusses an example IIB response: "…so what we did is we built a system, a custom application, that allows the users to create pricing in one system, a master record, and then pushes those changes to the other systems automatically."

Conclusion

The study makes three contributions. First, the study helps brings in business change context into the theoretical frame of studying IS change. The empirical findings substantiate the importance of this model. Secondly, the study provides an important theoretical lens to study change. The AST based model can also incorporate other theoretical frameworks for a broader study of IS change in the future. Finally, empirical findings of the study also contribute to the expansion of AST. The original conceptualization of AST conceptualizes the change process as a single step appropriation process. However, the empirical findings of the study show that, at least at an organizational level, the appropriation process is composed of two constructs: Response Options and choice. Evidence from this study shows that these are indeed separate steps. Results of the study also outline the possible response options, as well as the process through which the choice is made.

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