EVOLUTIONARY SENSEMAKING IN ENTERPRISE APPLICATIONS IMPLEMENTATION: INSIGHTS FROM A STATE-OWNED ENTERPRISE IN CHINA

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EVOLUTIONARY SENSEMAKING IN ENTERPRISE APPLICATIONS IMPLEMENTATION: INSIGHTS FROM A STATE-OWNED ENTERPRISE IN CHINA

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Abstract

The successful implementation of Enterprise Applications (EAs) hinges on a process of organizational sensemaking that enables the focal organization to gain an understanding of the unique contextual issues within and surrounding the organization, and continuously monitor and re-interpret these issues so that the approach to EA implementation can be modified or re-aligned accordingly. Yet, little attention has been paid to the examination of this process of organizational sensemaking. Using a case study of the EA implementation journey of Shanghai Tobacco Corporation, the purpose of this paper is to examine the nature of organizational sensemaking in EA implementation in the context of a dynamic environment, and its implications for the nature and outcome of EA implementation. With its findings, this study contributes to the theoretical discourse on EA implementation by constructing a model of the sensemaking process, and provides indications to practice on the effective implementation of EAs.

Keywords: Enterprise applications, organizational sensemaking, state-owned enterprises, case study
Introduction

Enterprise Applications (EAs) refer to custom built or commercial software solutions, such as enterprise resource planning systems, supply chain management systems, and customer relationship management (CRM) systems, that enable the integration of data and processes across functions in an organization (Brown and Vessey 2003; Lai and Yang 2009). The momentous potential of EAs for improving management control over complex business processes, operational efficiency and organizational performance has led to their widespread adoption, to the extent that EAs now underpin the operations of most of the large and medium enterprises worldwide (Davenport 1998; Liang et al. 2007). Accordingly, issues pertaining to the implementation, assimilation and organizational implications of EAs have attracted a significant amount of research attention over the last decade.

In particular, there has been a proliferation of research on the critical success factors (CSFs) (e.g. Finney and Corbett 2007; Nah et al. 2001) and key mechanisms (e.g. Kim and Pan 2006; Robey et al. 2002) of effective EA implementation. Yet, notwithstanding the immense academic and practical contributions of this stream of research, the failure rate of EA implementation projects remains significantly high (Liang et al. 2007). More recent studies have attributed the high rate of failure to the complexity of EA implementation (Xue et al. 2005). This complexity, in turn, stems from the idiosyncrasies of an organization’s unique business processes (Hong and Kim 2002), the specific constraints imposed upon an organization by the environment (Gosain 2004; Xue et al. 2005), and the need to align the structures and processes embedded within the packaged or custom-built EA with these factors (Sia and Soh 2007; Soh et al. 2003). Moreover, the complexity is exacerbated by the continuous and unpredictable environmental changes that characterizes the contemporary business landscape (Sambamurthy et al. 2003).

The complex, idiosyncratic and dynamic nature of EA implementation in an unstable, turbulent environment makes it difficult, if not impossible, to define a generic set of CSFs or key mechanisms that are invariably salient across all contextual conditions. Instead, the successful implementation of EAs more likely hinges on a process of organizational sensemaking (Gosain 2004; van Fenema et al. 2007) that enables the focal organization to gain an understanding of the unique contextual issues within and surrounding the organization (Howcroft et al. 2004), and continuously monitor and re-interpret these issues so that the approach to EA implementation can be modified or re-aligned accordingly. Yet, little research attention has been paid to the process of organizational sensemaking in the context of EA implementation. Beyond its academic significance, the lack of knowledge in this area may account for the significantly higher rates of implementation failure (Xue et al. 2005) in the rapidly developing EAs markets of Asia and Eastern Europe (Sia and Soh 2007), as the context surrounding EA implementation is both dramatically different from those typically studied in the literature, and constantly evolving in light of the sweeping economic and political reforms that are taking hold in these regions (e.g. Martinsons 2004; Xue et al. 2005).

Using a case study of the EA implementation journey of Shanghai Tobacco Corporation (STC), a state-owned enterprise in China operating against a backdrop of constant and unpredictable environmental changes as a result of industry reforms and the National Informatization Plan (NIP) (see Loo 2004; Ma et al. 2005) of the Chinese government, the purpose of this paper is to examine the nature of organizational sensemaking in EA implementation in the context of a dynamic environment, and its implications for the nature and outcome of EA implementation. In doing so, this study hopes to contribute to the theoretical discourse on EA implementation by constructing a model of the sensemaking process, as well as provide indications to practice on how to make sense of the salient contextual issues within and surrounding the organization that influences EA implementation, and more importantly, how EAs can be implemented effectively. Specifically, the research questions that this study aims to answer are: (1) How does an organization make sense of EA implementation in a dynamic environment characterized by continuous and unpredictable change? and (2) how does organizational sensemaking influence the nature and outcome of EA implementation?

Theoretical Background

Existing Perspectives on Enterprise Applications

EAs are designed to facilitate the seamless integration of all the information of an organization held in different business functions; such as finance, logistics, human resources and sales, for the purpose of integrating the business processes of the organization (Davenport 1998). The integration of an organization’s business processes is expected
to enhance its competitiveness by improving the way strategically important information is created, shared and managed across business functions and geographical locations (Howcroft et al. 2004). In addition, EAs are expected to bring about many other significant benefits, which include (1) enhanced data accuracy – by eliminating redundant data entry and concomitant errors, and simplifying data analysis, (2) operational efficiency – by reducing inventory, human resources, operating and administrative expenses, and (3) organizational effectiveness - by facilitating standardized procedures, reduced cycle times, increased customer responsiveness and enhanced organization wide decision support (Lee et al. 2003; Markus and Tanis 1999).

Despite its immense promise, the devastating consequences of EA implementation failures are well documented. As seen in firms such as Dell Computer, Mobil Europe, Dow Chemical, AeroGroup and FoxMeyer, EA implementation failures can lead to severe financial losses, the erosion of competitive advantage, reduced organizational performance and even bankruptcy (Davenport 1998; Soh and Sia 2004). The severity of the consequences of EA implementation failure, together with the magnitude of the investment, resources, commitment and organizational changes required for implementation, have sparked a proliferation of research on EA implementation over the last decade. EA implementation research, in turn, can be divided into two major research streams: variance research centered on identifying the CSFs of EA implementation, and process research centered on explaining the key mechanisms of EA implementation (Robey et al. 2002).

CSFs are conceptualized as the key areas where “things must go right” for a business to flourish (Rockart 1979, p. 85). In the context of EA implementation, they refer to the necessary conditions for effective EA implementation. In an extensive review of the literature, researchers have found over 20 CSFs identified in prior studies (Finney and Corbett 2007). The more frequently cited CSFs in the literature include top management commitment and support, change management, BPR and software configuration, training and job redesign, quality of project team, implementation strategy and timeframe, as well as the presence of a project champion, among others (Bingi et al. 1999; Finney and Corbett 2007; Nah et al. 2001).

Adopting a different perspective, process research on EA implementation centers on the unfolding sequence of events or states that explain EA implementation outcomes (Robey et al. 2002). And while the earlier process studies (Bhattacherjee 2000; Markus and Tanis 1999) were akin to stage models that simply provided a description of the different phases of EA implementation (Robey et al. 2002), more recent process studies have attempted to explain the key mechanisms behind effective EA implementation. For example, Robey et al. (2002) suggested that the process of addressing configuration knowledge barriers and assimilation knowledge barriers is crucial to effective EA implementation. Similarly, Kim and Pan (2006) explained the intricate inter-relationships between factors related to organizational commitment, project management, business processes and technology, and how the interactions between these factors influence the outcome of EA implementation.

Yet, despite the amount of research in this area, the rate of EA implementation failure remains high with estimates ranging from 40% to 60% (Liang et al. 2007). Recent scholarship has advanced the idea that the high rate of failure is due to the inherent complexity of EA implementation (Xue et al. 2005). The complexity, in turn, stems from the difficulty in aligning the embedded structures and processes of the custom built or packaged EA with the existing structures and processes of the organization (Sia and Soh 2007; Soh et al. 2003). More specifically, when building a custom EA or configuring a packaged EA, the organization has to consider the specific institutional (Gosain 2004) and cultural (Xue et al. 2005) constraints imposed upon the organization by the environment, as well as the unique structures and processes deliberately adopted by the organization for strategic or operational purposes (Hong and Kim 2002; Soh and Sia 2004).

For example, prior studies conducted in the context of China has revealed that both the process (Newman and Zhao 2008) and consequences (Martinsons 2004) of EA implementation are heavily dependent on environmental forces; such as environmental instability and partnership uncertainty (Chang et al. 2008), cultural influences; such as Confucianism and power distance (Lee et al. 2009; Newman and Zhao 2008); and organizational factors; such as communications and leadership style (Martinsons and Westwood 1997). Moreover, the complexity of EA implementation is heightened by the turbulence and velocity of the modern competitive landscape (Sambamurthy et al. 2003). This is because as the environment changes, it imposes new constraints on the organization that make the goal of alignment between the EA and the organization a moving target.

Overall, the need to consider firm-specific structures and processes in each instance of EA implementation; either imposed by the organization’s unique context (Gosain 2004; Xue et al. 2005) or adopted as a consequence of specific strategic choices (Hong and Kim 2002; Soh and Sia 2004), and the dynamic nature of the environmental forces (Sambamurthy et al. 2003) that influence them, invalidate the notion that a universal set of CSFs or key
mechanisms that are applicable across all contextual conditions can be found. Instead, it may be more important for the focal organization to engage in a process of organizational sensemaking (Gosain 2004; van Fenema et al. 2007) to gain an understanding of the salient contextual issues within and surrounding the organization that influence EA implementation, and constantly monitor and re-interpret these issues so that their implementation approach can be modified or re-aligned correspondingly. Accordingly, to examine and explicate the nature of this sensemaking process, our inquiry begins with a review of the literature on organizational sensemaking.

**Existing Perspectives on Organizational Sensemaking**

Organizational sensemaking is a process of social construction in which organizational members attempt to interpret and explain cues from the environment that leads to the enlistment of action (Maitlis 2005). It is particularly important in situations that demand coherent shared understandings among relevant stakeholders that sustain relationships and enable collective action (Weick 1993), and has a profound influence throughout the organizational hierarchy (Maitlis 2005). For the top management, sensemaking activities such as environmental scanning and issue interpretation (Thomas et al. 1993) are critical to strategic change initiation (Gioia and Chittipeddi 1991) and organizational decision making (Maitlis 2005). For other organizational stakeholders, sensemaking affects how they maintain the organizational image in the process of organizational adaptation (Dutton and Dukerich 1991), manage their organizational identity (Pratt 2000), and respond to organizational crises (Gephart 1993).

The process of organizational sensemaking begins with reciprocal exchanges between the focal organizational actor (i.e. the sensemaker) and the environment (Weick et al. 2005). These exchanges encompass the sensemaking activities of sensing anomalies amidst the flow of events and inputs that surround the sensemaker, and enacting order into flux by extracting cues from the raw flow of activity for closer attention (e.g. Chia 2000). Through these exchanges, “the current state of the world is perceived to be different from the expected state of the world” (Weick et al. 2005, p. 414) by the sensemaker, which activates the need for further sensemaking. These triggers of organizational sensemaking breach the sensemaker’s expectation of continuity, disrupts ongoing collective organizational action, and may take the form of a situation of discrepancy, breakdown, surprise, interruption, opportunity, or disconfirmation (Weick et al. 2005).

To manage the uncertainty and ambiguity caused by these sensemaking triggers (Maitlis 2005), the process of organizational sensemaking moves into an enactment phase, characterized by the sensemaking activities of noticing and bracketing. These activities, informed by the mental models of the sensemaker accrued from prior experience, aim to convert the chaotic flux of circumstances into ordered situations (Weick et al. 2005). This is achieved through the production of new accounts; defined as discursive constructions of reality that interpret or explain (Maitlis 2005), or the activation of existing accounts that are “forcibly carved out from the undifferentiated flux of raw experience and conceptually fixed and labeled so that they can become the common currency for communicational exchanges” (Chia 2000, p. 513).

Following the enactment phase, the process of organizational sensemaking enters a selection phase in which the multiple possible accounts are pared down to a single plausible account through a combination of retrospective attention, further in-depth comparisons with the mental models of the relevant organizational stakeholders, and articulation – defined as the social process by which tacit knowledge is made explicit or usable (Weick et al. 2005). Finally, the tentative and provisional plausible account becomes substantial and solidifies in a retention phase as it is iteratively related to past experience and connected to salient organizational identities (Pratt 2000). The retained account may then be used as guidance for further interpretation and organizational action (Weick et al. 2005).

To facilitate collective organizational action among the relevant stakeholders, the sensemaker has to engage in sensengiving – defined as “the process of attempting to influence the sensemaking and meaning construction of others toward a preferred redefinition of organizational reality” (Gioia and Chittipeddi 1991, p. 442). Through the dissemination of accounts that take the form of narratives, symbols and other sensemaking devices, and the use of evocative language, sensengiving may be enacted by the leaders of an organization to shape the sensemaking processes of organizational constituents toward an intended definition of reality. Alternatively, sensengiving may also be enacted by other organizational stakeholders through activities such as questioning, issue selling and the propagation of ideas in consultative committees (Maitlis and Lawrence 2007). The different degrees of leader and stakeholder sensengiving, in turn, may be used to define four forms of organizational sensemaking (refer to Figure 1) with distinct process characteristics and outcomes (Maitlis 2005).
Different Forms and Outcomes of Organizational Sensemaking

The extent of leader sensegiving is positively associated with the extent of control that the top management has over the process of organizational sensemaking for two reasons. First, leaders tend to exercise their formal authority to create platforms and opportunities in which the pertinent issues can be discussed formally. Second, the other organizational stakeholders, in deference to the leader’s authority, tend to participate and support these contrived occasions for sensegiving. Conversely, the extent of stakeholder sensegiving is positively associated with the extent of animation, defined as the rhythm and intensity of the flow of information (Stensaker et al. 2008), in the process of organizational sensemaking. This is because the circulation of information is increased both directly from the stakeholders who are actively engaged in interpreting the events and issues surrounding the organization, and indirectly from the leaders of the organization who are motivated to contribute both resources that facilitate stakeholder sensegiving and information in response to the stakeholder activity (Maitlis 2005).

From the interactions between different levels of control and animation, four distinct forms of organizational sensemaking emerge (For a review, refer to Maitlis 2005). More specifically, when the sensemaking processes are characterized by high control and high animation, organizational sensemaking emerges in a guided form. Consequently, the accounts generated from the process are both unitary; due to the high level of top management control, and rich; due to the integration of diverse stakeholder perspectives, which enable an emergent series of actions with consistent foci. On the other hand, sensemaking processes that are not controlled but animated produce a fragmented form of organizational sensemaking. This form of sensemaking results in a multiplicity of narrow accounts as the divergent perspectives of different organizational members are not integrated or reconciled, which in turn, gives rise to an emergent series of inconsistent and contradictory actions. Conversely, when sensemaking processes are controlled but not animated, organizational sensemaking takes on a restricted form. This leads to the production of accounts that are unitary but narrow due to a lack of contributions from a diverse group of organizational stakeholders, which in turn, precipitate actions that are consistent but unamenable to subsequent improvisation and extensions. Finally, organizational sensemaking is minimal when the sensemaking processes are neither controlled nor animated. Accordingly, the accounts generated from this process are neither synthesized from the perspective of multiple stakeholders nor based on a single, well-developed perspective of a specific stakeholder group, which in turn, does not allow for coordinated, effective and sustained action.

To summarize, the nature and outcome of organizational sensemaking are influenced by the extent of animation and top management control (Maitlis 2005), and these factors in turn, are dependent on the different patterns of leader and stakeholder sensegiving (Maitlis and Lawrence 2007). Applying this knowledge as a theoretical lens to analyze the events that transpired at STC, a process model of organizational sensemaking in the context of EA implementation in a dynamic environment is inductively derived to address the research questions set forth at the beginning of the paper.
Research Methodology

The case research methodology was adopted for this study. Case research is particularly appropriate for the purpose of this study as our research questions are “how” questions (Walsham 1995) that delves into the process of organizational sensemaking and the underlying mechanisms through which it influences the nature and outcome of EA implementation. In addition, as EA implementation comprises of a technological, a social and a strategic dimension (Xue et al. 2005), the inherent multi-dimensional complexity of the phenomenon makes it unlikely to be based on an objective reality, making it more appropriate to examine the phenomenon by interpreting the shared understanding of the relevant stakeholders (Klein and Myers 1999).

Based on our research questions, two conditions formed the basis for case selection. First, the case organization selected for this study must have implemented an EA in a dynamic environment. Second, the process of organizational sensemaking should ideally have been enacted in a variety of ways as this allows us to identify how different forms of organizational sensemaking lead to different forms of EA implementation, with correspondingly distinct outcomes. The case of EA implementation at STC, a state-owned enterprise in the Chinese Tobacco industry, is particularly appropriate for our purpose as different forms of organizational sensemaking were enacted, leading to distinct approaches to EA implementation that resulted in dramatically different implementation outcomes over its storied EA implementation history that spanned over 15 years.

Research access was negotiated and granted in June 2008, and a total of 15 interviews were conducted with the key members of STC’s top management, Information Technology (IT) department and various business units over a period of 9 months. The interviews took an average of 90 minutes, were digitally recorded and later transcribed for data analysis. To allay any fear of speaking due to the presence of a recorder, each informant was assured of their anonymity and the confidentiality of the data provided, especially when potentially sensitive information is sought (Walsham 2006). The interview questions were tailored to the role of the informant and were designed to be open-ended and exploratory in nature. Each question was non-leading, and at the same time non-passive to maintain a critical balance between spontaneity and control over the interview (Walsham 1995). While the personal interviews formed our primary source of data (Walsham 2006), they were supplemented by newspaper articles, organizational documents, internal publications, and information from the corporate website. Notes from direct observation were also used to corroborate the data obtained.

To take advantage of the flexibility that the case research methodology affords, data analysis was performed in tandem with data collection (Eisenhardt 1989). Based on our review of the literature on organizational sensemaking, we identified an initial set of pertinent themes that formed the basis of our theoretical lens, which served as a “sensitizing device” (Klein and Myers 1999, p. 75) to guide data collection. The data from each interview were then organized and coded according to the set of themes and the theoretical lens was modified incrementally whenever new evidence that challenged the existing schema emerged (Walsham 2006). In addition, a systematic verification procedure was established to ensure that each finding was supported by at least two sources of data (Klein and Myers 1999).

Data analysis was carried out by recursively iterating between the empirical data, the theoretical lens, relevant literature and the emerging process model (Eisenhardt 1989). A combination of a temporal bracketing strategy, a visual mapping strategy and a narrative strategy (Langley 1999) was first used to organize the empirical data. From the emergent data, we noticed four distinct forms of organizational sensemaking enacted at different phases of STC’s EA implementation journey. Accordingly, the events, activities and decisions that transpired at STC were divided into four distinct phases to facilitate the examination of the different forms of organizational sensemaking, and their corresponding implications for the nature and outcome of EA implementation. In addition, several visual maps that summarized our interpretation of what happened and a detailed narrative were created to condense the voluminous amount of data into a more manageable form. Next, the visual maps and the narrative were compared with the relevant literature and our theoretical lens to shape our emerging theoretical ideas. These ideas were then captured in various diagrammatic sketches and these sketches, together with the visual maps and the narrative were verified with our informants at STC to validate our interpretation of the data and the emerging process model. This process continued until the state of theoretical saturation is reached; where it was possible to comprehensively explain the findings of the case study and no additional data can be collected or added to improve the developed model (Eisenhardt 1989).
Case Description

Organizational Background

The history of the modern tobacco industry in China can be traced over a hundred years when a group of American traders established the first cigarette factory in the city of Tianjin in 1891. Although domestic cigarette production began in the city of Guangzhou just eight years later, foreign tobacco firms maintained their market leadership in the Chinese tobacco industry for over 50 years until the Communist Revolution led to the founding of the People’s Republic of China (PRC) in 1949. In the immediate years following the establishment of the PRC, all the existing tobacco firms were brought under government control as the Chinese government sought to unify the tobacco industry under a system of centralized management and monopolistic operations. It was these circumstances that led to the birth of STC. The initial manifestation of STC was a private tobacco firm named Etsong Tobacco Company that was subjected to a government takeover in 1952. It was renamed Shanghai Cigarette Factory when it became the largest and only cigarette factory of the city of Shanghai in 1960.

The government agency established and tasked with the management of the tobacco monopoly system is the State Tobacco Monopoly Administration (STMA), and under its jurisdiction, the China National Tobacco Corporation (CNTC) was established to manage all the tobacco firms, as well as the production, distribution, marketing and sales of all tobacco products in the country in 1982. In line with the political and economic liberalization movement of the early 1980s, the STMA and the CNTC began a four-pronged modernization program centered on the acquisition of new technologies, global expansion, diversification into other industries, and the consolidation of production facilities that effected sweeping changes across the tobacco industry. Under the mandate of the modernization program, Shanghai Cigarette Factory was merged with a state-owned cigarette packaging firm, a state-owned tobacco logistics firm and the Gaoyang Cigarette Factory to form a vertically-integrated, large-scale corporation in 1993. The newly formed entity was renamed STC.

Since its inception, STC has been merged with the Beijing Cigarette Factory and the Tianjin Cigarette Factory to become the largest tobacco corporation under the purview of the CNTC. Today, from raw materials to final delivery, STC has achieved complete vertical integration along the supply chain, managing an extensive network of over 50 tobacco suppliers and 30,000 retailers worldwide. From 22 production facilities across the globe, STC produces a kaleidoscopic array of different cigarettes, ranging from the internationally renowned Chunghwa and Panda cigarettes, to local bestsellers such as Double Happiness, Peony, and South China Sea cigarettes. In 2007, STC’s gross profits and net assets were estimated at over US$456 million and US$741 million respectively. In terms of tax contributions, STC is ranked sixth among all corporations in the whole of China.

The achievements of STC are considerable given that it has had to contend with the challenges of a dynamic and unpredictable environment that is precipitated by two primary forces of change. The first stems from the modernization initiatives of the STMA and the CNTC, which intensified following the entry of China into the World Trade Organization (WTO) in 2004 as they sought to cope with the heightened competition caused by the liberalization of international trade. In particular, over the years, the modernization initiatives have led to a dramatic restructuring of the tobacco industry, a host of mergers; as smaller and less efficient tobacco firms are merged with the larger and more established firms, a series of new tobacco policies, and a revolutionary national competitive strategy that emphasizes market volume, brand building and bureaucratic management. The second force of change in the tobacco industry stems from the NIP (see Loo 2004; Ma et al. 2005) launched by the Chinese government in the mid-1990s. Aimed at driving industrialization and modernization through the adoption of IT, the NIP provided a strong impetus for government agencies and state-owned enterprises to adopt market-oriented business practices, contemporary management philosophies and cutting-edge IT to enhance their operations. This dynamic environment provided a backdrop of instability and constant change that endured throughout STC’s EA implementation journey.

Phase 1: MRP II Implementation Failure (1993-1994)

Prior to EA implementation, most of the departments and business units at STC were heavily reliant on paper-based information, although a handful of them had developed small systems and applications in isolation, resulting in the formation of “islands of automation” (Peppard 2007, p. 337) that resided within functional silos with minimal integration. EA implementation at STC began in 1993 with the implementation of BPCS, a Manufacturing Resource Planning (MRPII) package developed by SSA Global. The decision to implement BPCS was made unilaterally by
the top management of STC. In contrast, the involvement of the other organizational stakeholders; such as the IT personnel within the organization and the business units affected by the implementation, in the decision to implement BPCS was limited. For the IT personnel, it was largely due to their lack of capabilities and authority within the organization as the organizational IT function was not even a formal department within STC at the time. For the business units, it was because of their lack of knowledge on the implications and use of IT.

In fact, the top management similarly did not fully comprehend or appreciate the organizational implications of BPCS implementation. The implementation decision was not driven by strategic insights or operational needs, but was primarily influenced by the coercive, mimetic, and normative pressures (DiMaggio and Powell 1983) for EA implementation in the external environment. These institutional forces (Scott 2001), in turn, stemmed from the “informatization” movement that was rapidly taking hold within the national consciousness at the time. Consequently, the implementation process was unstructured and poorly planned, and when the system went live, STC quickly realized that the system was incompatible with its existing business processes. The misalignment between the structures and processes embedded within BPCS and the existing structures and processes of STC (e.g. Sia and Soh 2007) was so severe that only a small subset of modules from the software package could eventually be launched, and the use of all but one of the launched modules was quickly discontinued within months. The antecedents, nature, and implications of organizational sensemaking for the nature and outcome of EA implementation at STC during this phase, as well as the corroborating evidence are presented in Figure 2.


Following the failed implementation of BPCS, the top management of STC felt that it was too difficult to configure a packaged EA to suit its complex, formula-based production system (e.g. the production formula of cigarettes has to be constantly re-adjusted as the quality of each batch of tobacco leaves may differ). Yet, the management did not want to revert back to old, paper-based way of working as it would represent a considerable step backwards. Eventually, the decision was made to custom build an EA that was tailored to its idiosyncratic business processes. The experience of failure also imparted the lesson of the need to include the perspectives of other stakeholders in the

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1 In Figures 2-5, the source of each quote is labeled in the following format: Designation of Informant/ Stakeholder Group. The three primary stakeholder groups identified as salient to the process of EA implementation at STC are the Top Management (TM), the IT Department (ITD), and the various Business Units (BU).
process of EA implementation. Consequently, although the top management maintained an active role in directing the overall process of implementation (i.e. by identifying the key business processes for prioritized automation), the newly-established IT department was granted considerable autonomy to initiate module development in the areas they deemed important.

The needs of each functional department guided the development of the new custom built EA. Although the implementation process was primarily driven by the top management and the IT department, the business units, equipped with a better understanding how IT can support its business processes as a result of the experience of the previous phase, worked actively with the IT department to shape the development of the relevant modules when their business processes were identified for automation. However, as the business units had little influence over the overall direction of EA development, and moreover, as the modules were developed in isolation, this arrangement resulted in an effective but unsynchronized form of EA implementation, and the integration between the developed modules was limited. The lack of integration meant that there were little changes to the existing business processes of the organization. The processes were merely automated in a process termed “e-enablement” by the organizational stakeholders. The antecedents, nature, and implications of the sensemaking process for the nature and outcome of EA implementation in the second phase, as well as the supporting evidence are presented in Figure 3.

**Figure 3: Antecedents, Nature and Implications of Organizational Sensemaking in Phase 2(1995-1999)**


Although STC’s business processes were not re-engineered or optimized during the implementation of the custom built EA, the automation of its business processes nevertheless brought about some measure of efficiency gains. The efficiency gains provided the top management of STC with an indication of the strategic value of the EA, and consequently, they began to view the organizational use of the EA with increasing importance. In particular, the top management envisioned leveraging the EA to improve its business processes, management effectiveness, and streamline STC’s organizational structure, and to achieve these objectives, they realized that there was a need for systems integration. Yet, systems integration called for a shift from the unsynchronized approach to EA implementation to an integrated approach that accounted for not just the needs of the individual departments but the overarching needs of the organization as a whole, and the integrated approach was only possible if the various business units involved in a cross functional business process could shape the supporting module collectively.

Consequently, with the overall needs of the organization guiding the systems integration initiative, the top management and the IT department would first identify the existing system modules for integration, and the cross-functional business processes that were not automated in the previous phase for automation. After the modules and processes were identified, the various business units would actively provide feedback to the top management and the
IT department to provide a holistic picture of the organizational needs, and their requirements of the integrated systems throughout the implementation process. As a result of the experience gained from the previous phase, the business unit stakeholders were able to contribute more to the EA implementation process as they had a clearer picture of what they required from the system and how IT can enhance their business processes. In addition, as the IT department was largely credited for the successful implementation of the EA in the previous phase, its standing within the organization was enhanced. The IT department was institutionalized as an IT Information Center and given an expanded advisory role in directing systems development as the top management trusted their technical expertise. This approach to organizational sensemaking led to a coordinated form of EA implementation as the perspectives of a diverse range of organizational stakeholders were reconciled and integrated. The result was the integration of the numerous modules launched in the previous phase into three major systems: A financial system, a sales system, and a resource management system. The antecedents, nature, and implications of organizational sensemaking for EA implementation in Phase 3, as well as the corroborating evidence are presented in Figure 4.

![Figure 4: Antecedents, Nature and Implications of Organizational Sensemaking in Phase 3 (2000-2005)](image)

**Phase 4: Strategic Enterprise Applications Integration (2006-Present)**

The cumulative experience of the previous phases has led to significant changes among the stakeholder groups involved in EA implementation. By the end of the third phase, the management was significantly more knowledgeable about the organizational implications of EAs (through the experience gained from managing the EA implementation process and leadership renewal), and cognizant of the need to include the perspectives of the IT department and the various business units in initiating and planning for EA development. On the other hand, as a result of their involvement in the process of systems integration, individual business units had learnt to look beyond their own needs and now had a deeper appreciation of the overarching needs and strategic objectives of the organization. In addition, in recognition of the key role it played in the EA implementation success of the previous phases, the IT Information Center was once again accorded with an expanded role in the organization. By 2006, the IT Information Center was known as the Center for Economic Information and was tasked with collecting and analyzing the operational data and statistics of the entire organization.

As a result of these changes, STC was ready to move beyond using its EA to cater to the needs of the organization, to leveraging its EA to support the organization’s strategic objectives for the attainment of competitive advantage. With the strategic objectives of the organization guiding systems development, all of the three stakeholder groups were actively involved in shaping and making key decisions about the implementation process. The top management would identify possible areas of development based on their strategic vision and verify the feasibility and utility of their plans with the Center of Economic Information (i.e. the organizational IT function) and the various business units. Likewise, the Center of Economic Information, based on a technical optimization perspective, and the
business units, based on their intimate knowledge of the firm’s business processes, would identify possible areas for development and verify their plans with one another before submitting their plans to the top management for approval. This approach to organizational sensemaking led to an integrative form of EA implementation as the three stakeholder groups were collectively engaged in shaping the overall implementation process. The integrative approach to EA implementation in turn, resulted in the successive launches of a host of new systems; including a data warehouse, a CRM system, and the SAP R/3, that were integrated using a Service Oriented Architecture (SOA). The various EAs launched were tightly aligned with and in support of the operations and business strategies of STC, and the seamless integration between them provided the organization with greater flexibility as it was able to pick and choose from the functionalities of various EAs that best suited their needs. The antecedents, nature, and implications of organizational sensemaking for the nature and outcome of EA implementation in the fourth phase, as well as the supporting evidence are presented in Figure 5.

**Figure 5: Antecedents, Nature and Implications of Organizational Sensemaking in Phase 4 (2006-Present)**

**Discussion**

By integrating the different patterns of organizational sensemaking across the different temporal phases, a model of process of organizational sensemaking in EA implementation at STC (refer to Figure 6) can be inductively derived. As our model suggests, the process of organizational sensemaking at STC is an evolutionary process that can be decomposed into four distinct phases. Given that the process model is inductively derived from empirical data, the following stream of reporting provides an explanation of how the existing literature corroborates our model and how the model enriches the existing perspectives of EA implementation.

**Phase 1: Controlled Sensemaking**

Prior literature has suggested that the nature of organizational sensemaking is a function of the inputs and context of the sensemaking process (Weick 1995). From our findings, in the first phase, the inputs took the form of institutional forces from the external environment (Liang et al. 2007) that served as the “seed” (Weick 1995, p. 51) for organizational sensemaking, while the context surrounding organizational sensemaking comprised of the characteristics of the various stakeholder group. In particular, despite the lack of the relevant knowledge, the top management adopted the role of a primary sensegiver; defined as a sensegiver (Gioia and Chittipeddi 1991) attempting to influence the actions of other stakeholders based on his or her first-hand interpretation of the inputs (i.e. flow of information) of the sensemaking process, and took complete control of the overall direction of the implementation process. On the other hand, as the business units and the IT department had neither the issue-related
expertise nor legitimacy to influence the sensemaking process (Maitlis and Lawrence 2007), both of the stakeholder groups were confined to the role of senseakers; defined as stakeholders in the process of organizational sensemaking that accepts the accounts of the sensegivers but do not contribute their perspectives in return.

The inputs and context of sensemaking precipitated a controlled form of organizational sensemaking characterized by total management control and minimal animation. The high control and lack of animation resulted in the production of a sensemaking account that is narrow and reflective only of the perspective of the top management, and as the perspectives of the stakeholders involved in actual systems implementation were never a consideration, this form of organizational sensemaking led to an experimental, unstructured and poorly-planned approach to EA implementation. Consequently, while the organizational actions adopted by STC were consistent, they were unamenable to subsequent improvisation and extensions (Maitlis 2005) which is particularly problematic in the context of EA implementation as EA implementation is a continuous process that demand ongoing attention and a series of maintenance actions over time (Markus and Tanis 1999). As a result of the unstructured approach to EA implementation, the misalignments between the EA and the organization (Sia and Soh 2007; Soh et al. 2003) could not be resolved, which ultimately, led to the failure of the implementation project.

**Phase 2: Disconnected Sensemaking**

In the second phase, the inputs to organizational sensemaking (Weick 1995) consisted of the needs of the individual functional departments as STC sought to custom build an EA in accordance to those needs. In addition, the roles of primary sensegivers (Gioia and Chittipeddi 1991) were adopted by the top management and the IT department, which was granted autonomy by the top management to initiate module development. The top management would identify the key business processes for prioritized automation and engage in unidirectional sensegiving to enlist action from both the IT department and the business units. At the same time, the IT department would build the system in consultation with the business units, which were able to participate as secondary sensegivers; defined as a
sensegiver attempting to influence the actions of other stakeholders based on his or her interpretation of the sensemaking accounts of the primary sensegivers, as a result of their enhanced understanding of IT.

These changes in the inputs and context of organizational sensemaking led to a disconnected form of organizational sensemaking characterized by high control and low animation. And while both the IT department and the business units have a expanded role in organizational sensemaking (and hence, a greater extent of animation), the account produced by this form of sensemaking remains narrow as the sensemaking process remains dominated by the top management and the IT department (Maitlis 2005). In particular, as both primary sensegivers lacked the detailed domain knowledge (Maitlis and Lawrence 2007) to initiate integration between modules, the individual modules of each functional department were developed in isolation, which led to an unsynchronized approach to EA implementation. And while the unsynchronized approach to EA implementation resulted in the successful “e-enablement” of the business processes of the various functional departments and business units, the lack of integration between the developed modules limited the benefits that could be derived from the EA to basic efficiency gains.

**Phase 3: Collaborative Sensemaking**

The evolution towards a collaborative form of organizational sensemaking in phase 3 was precipitated by further changes to the inputs and context of the sensemaking process (Weick 1995). Owing to the objective of systems integration, the overarching needs of the organization formed the new inputs to sensemaking in this phase. In addition, as the IT department was conferred with greater legitimacy within the organization, and as the business units’ knowledge of how EAs can support their business processes grew, both stakeholder groups took more active roles in the process of organizational sensemaking (Maitlis and Lawrence 2007). In particular, while the top management and the IT department remained the primary sensegivers (Gioia and Chittipeddi 1991) in the sensemaking process, the business units would make sense of the accounts of both stakeholder groups and reciprocate with its own account based on its extensive knowledge of the business processes. On the other hand, as a result of its increased standing within the organization, the top management was receptive to the technical advice of the IT department. The iterations of bidirectional sensegiving between the three stakeholder groups enabled a high extent of collaboration in organizational sensemaking as it allowed the different groups to reconcile their conflicts and differences, and develop an understanding and appreciation of the other groups’ point of view.

The collaborative form of organizational sensemaking is characterized by high control and moderate animation due to the bidirectional sensegiving processes between the three stakeholder groups, which in turn, leads to the production of accounts that are unitary and rich. As the diverse accounts of the various stakeholder groups are consistent, they enabled an emergent series of actions that have a coherent focus (Maitlis 2005), leading to a coordinated form of EA implementation. The coordinated form of EA implementation, in turn, enabled the creation of modules that supported cross functional business processes and the integration of the disparate modules developed in the prior phase into three major enterprise-wide systems.

**Phase 4: Ubiquitous Sensemaking**

In phase 4, the inputs to sensemaking (Weick 1995) comprised of the strategic objectives of the organization as STC began to aim at leveraging its EA for competitive advantage. In addition, with the collaborative sensemaking arrangement of the previous phase, the top management developed a deeper appreciation for the expertise and domain knowledge of the IT department and the business units, while the IT department and the business units were now more attuned to the overall needs and strategic objectives of the organization (Maitlis and Lawrence 2007). As a result of these changes to the characteristics of the stakeholder groups, all of the three stakeholder groups were now primary sensegivers (Gioia and Chittipeddi 1991) in the process of organizational sensemaking and were actively involved in initiating, shaping and making decisions about the implementation process. This precipitated a ubiquitous form of organizational sensemaking, where all the stakeholders relevant to the sensemaking process are concurrently interpreting the inputs to sensemaking, and engaged in iterations of bidirectional sensegiving that enabled the different stakeholder groups to reconcile or acknowledge the conflicts and differences between their views.

The ubiquitous form of organizational sensemaking is characterized by moderate control; as management control over the implementation process is ceded to the other two stakeholder groups, and high animation; as all the three stakeholder groups were primary sensegivers and concurrently engaged in bidirectional sensegiving with one
another. The moderate control and high animation resulted in the production of a sensemaking account that is unitary and extremely rich (Maitlis 2005) in that it completely amalgamates the perspectives of all the relevant stakeholder groups, which in turn, enabled an integrative form of EA implementation characterized by a collective approach to systems implementation. Through this integrative approach, STC was able to align the perspectives and interests of the various stakeholder groups (Light 2005) and consequently, launch a series of EAs in accordance with their strategic objectives in quick succession. Further, they were able to achieve seamless integration between their systems and business processes using the SOA platform that was strategically important to supporting STC’s evolving business model, ultimately improving operational efficiency and enhancing the strategic flexibility of the organization.

Conclusion

Limitations and Future Research

This study is not without its limitations. In particular, although the single case research methodology adopted in this study is a “typical and legitimate endeavor” in qualitative research (Lee and Baskerville 2003, p. 231), a common criticism of the methodology is the problem of generalizability or external validity (Walsham 2006). However, while it must be readily acknowledged that the single case research methodology makes statistical generalization impossible, we nevertheless assert that our study is valid and generalizable beyond its singular context as the developed process model is not only grounded in the empirical reality of a real world organization, but also corroborated by the propositions of some of the most established works in management and IS literature. As such, this study invokes the principles of “analytic generalization” (Yin 2003, p. 32) or what some researchers refer to as “generalizing from description to theory” (Lee and Baskerville 2003, p. 235). Nevertheless, future research can be directed at statistically validating the propositions of our process model, so that the boundary conditions of our study can be better defined.

A second limitation of this study concerns the retrospective nature of the personal interviews that form our primary source of data. Given that our account of the events, decisions and activities that unfolded at STC spanned a period of almost 15 years, it must be acknowledged that a synchronous approach to data collection would be impossible. However, as retrospective responses are susceptible to errors of recall (Glick et al. 1990), we have tried to circumscribe the problem by only having informants who were personally involved in the process of EA implementation during the relevant period of interest (Pan et al. 2007). In addition, a systematic data verification procedure was adopted to ensure that all the information used in this study were triangulated by at least two sources of data (Klein and Myers 1999).

Theoretical Implications

By addressing the research questions set forth at the beginning of this paper, this study makes several important theoretical contributions. First, by constructing a model of the process of organizational sensemaking in EA implementation, this study fills an important gap in the literature. As it is important to consider the specific structures and processes imposed upon (Gosain 2004; Xue et al. 2005) or voluntarily adopted (Hong and Kim 2002; Soh and Sia 2004) by the organization in each instance of EA implementation, the generic CSFs and key mechanisms (Kim and Pan 2006; Robey et al. 2002) prescribed for effective EA implementation may be less relevant or useful than understanding the process through which organizational stakeholders interpret and explain cues from the environment that leads to the enlistment of the appropriate action (Gosain 2004; van Fenema et al. 2007). This study sheds light precisely on the mechanism that enables the focal organization to understand and act upon the specific contextual issues within and surrounding the organization, contributing a different perspective of effective EA implementation that accounts for its complex and idiosyncratic nature.

Second, with a longitudinal study of EA implementation in a dynamic environment spanning 15 years, this study contributes to an evolutionary perspective of EA implementation. The existing studies on EA implementation tend to adopt a static view of the environment that is disjointed from the reality of constant and unpredictable change in the contemporary business landscape (Sambamurthy et al. 2003). As the environment changes, it imposes new constraints on the organization that adds to the complexity of EA implementation. The evolutionary perspective is thus an important contribution as it elucidates the mechanism through which the focal organization can continuously
monitor and re-interpret the changing contextual factors surrounding EA implementation, and subsequently, modify or re-align its implementation approach accordingly.

Third, this study has identified four different approaches to EA implementation that stem from four distinct forms of organizational sensemaking. In establishing the intricate connectedness between the two processes, this study makes an important contribution to EAs research as it demonstrates that EA implementation is neither a singular, homogenous process as is typically assumed in the literature (Robey et al. 2002), nor a random, heterogeneous set of processes. In addition, the four distinct approaches, when taken together, form an empirically grounded typology of EA implementation processes that future research can build upon. In particular, future studies can examine the nature of the four EA implementation approaches identified, or investigate other antecedents or consequences of the different approaches that are beyond the scope of the current study.

Finally, this study also makes a number of significant contributions to the literature on organizational sensemaking. First, although recent sensemaking research have made a conceptual distinction between the different forms of organizational sensemaking (e.g. Maitlis 2005), little attention has been paid to how the process of organizational sensemaking may change or evolve over time. The process model developed in this article is thus an important contribution, as it underscores the evolutionary nature of the sensemaking process and uses the changes in the characteristics of organizational stakeholders over time to explain how organizational sensemaking can evolve from one form to another. Second, this study extends recent efforts at structuring the discourse on organizational sensemaking by incorporating the direction of sensegiving among the relevant organizational stakeholders in the conceptualization of the different forms of organizational sensemaking, and introducing three distinct sensegiving roles (i.e. primary sensegiver, secondary sensegiver and sensetaker). This introduces a new level of theoretical sophistication to our understanding of the different social processes of organizational sensemaking and enriches the developing “language with which a variety of everyday sensemaking processes can be described, compared, and contrasted” (Maitlis 2005, p. 44).

Practical Implications

At our case organization, the mechanism we found for resolving the conflict between the EA and the organization was a process of sensemaking that evolved gradually over an extended period of time. While this mechanism is not necessarily universal, and is likely due to the cultural influence of Confucian philosophy, which eschews radical change in favor maintaining a state of harmonious equilibrium (Lee et al. 2009; Martinsons 2004; Newman and Zhao 2008), our findings should not be taken to mean that there is nothing a practitioner can or should do. Instead, we contend that the process model developed in our study provides a number of important practical indications for three groups of practitioners.

The first group of practitioners consists of those from organizations implementing an EA against a cultural backdrop distinct from that confronted by our case organization (e.g. other developing countries in Eastern Europe, South America or Africa), but are nevertheless confronted with a lack of fit between the structures and processes embedded in the EA and the structures and processes of their organization. For this group of practitioners, our study provides a comprehensive and empirically supported framework that highlights the potential negative consequences of force fitting an EA that is designed in a dramatically different context to an organization, and hints at the general principles for managing this conflict. In particular, our model suggests that the various stakeholders across an organization must acquire sufficient knowledge of the organizational implications of implementing the EA, and the organization must work towards involving all stakeholders in initiating and planning for EA implementation so as to find a collective solution that minimizes the extent of misalignment between the EA and the organization.

The second group of practitioners comprises those from organizations involved in the implementation of an EA in a similar context (e.g. China, Taiwan, Vietnam, and Singapore). For this group, our process model can help them to identify the form of sensemaking that is prevalent within their organization and select an appropriate approach to EA implementation accordingly. For instance, if the decision to implement an EA was thrust upon the top management of an organization by institutional forces (e.g. Gosain 2004) or decision-makers at the national level (e.g. Davison et al. 2008), our process model suggests that at the minimum, the IT department should be co-opted to lead module development (i.e. as primary sensegivers) and coordinate the process of requirements gathering with help from the business units (i.e. as secondary sensegivers). Moreover, our study provides important indications on how an organization can progress towards the forms of sensemaking that give rise to more strategic implementation outcomes. For example, our model suggests that that the top management has to be willing to relinquish some extent
of control (especially with regards to areas that require IT or function-specific domain knowledge), the IT function has to acquire the requisite implementation capabilities and be granted the authority to carry out their work, while the business units have to increase their understanding of how IT can facilitate their operations and become more involved in the implementation process (Newman and Zhao 2008; Tong and Mitra 2009). In other words, although the empirical evidence from our case study indicates that the nature of organizational sensemaking may require time to evolve, our model hints at the measures that an organization can take so that the evolutionary process can be accelerated.

Finally, this study could also be important to EA vendors who wish to capitalize on the opportunities of the rapidly developing EA markets of regions such as Asia and Eastern Europe (Sia and Soh 2007) as it provides a glimpse into the psyche of an organization that is evolving through the various stages of readiness for EA adoption. In particular, the process model can be used to help the vendor tailor its offerings for organizations in varying stages of readiness, or identify and target the organizations that are ready for the implementation of a packaged EA, so that the likelihood of implementation failure can be reduced.

References


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