

Making Enterprise Systems Work: The Role of Organizational Defensive Routines

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Abstract

This paper discusses some of the challenges that organizations face when trying to make enterprise systems work. Using critical ethnography, we studied the implementation of an enterprise system in a small-medium sized enterprise within a large conglomerate in Australasia. We found that organizational learning around strategically important issues failed to occur. This failure to learn negatively impacted the implementation of the enterprise system. We use the theory of organizational defensive routines to help explain this failure.

Keywords: Enterprise Systems Failure, ERP, Defensive Routines, Organizational Learning, Ethnography

Introduction

There is a substantial and growing research literature concerned with the implementation of enterprise systems. Many different aspects of enterprise systems implementation have been considered, such as the critical success factors for implementation (Nah et al., 2001, Umble et al., 2003), the need for user participation (Kawalek and Wood-Harper, 2002), or how the implementation strategy needs to take account of different organizational or national cultures (Krumbholz and Maiden, 2001). One important topic within this literature has been the subject of enterprise systems implementation *failure*. Since enterprise systems often involve the entire organization and are large, complex systems, implementation failure is not uncommon [Larsen and Myers, 1999]. Some IS researchers have pointed out that it is important for us to learn from such failures (Scott and Vessey, 2000).

This paper therefore contributes to the literature on the implementation of enterprise systems and to the literature on IS implementation failure more generally (Myers, 1994; Sauer et al., 1999). In particular we focus on one particular aspect of enterprise systems implementation, viz. organizational learning. Organizational learning is important, particularly during times of transition from one technology to another (Boudreau and Robey, 2005).

In the company that we studied, there were many political issues surrounding the development and implementation of the enterprise system. In this organization, enterprise integration was a corporate battle ground – it was the issue over which a political conflict between two camps was fought. However, in this paper we focus on just one aspect: the failure to learn. Our analysis shows that many issues were not debated productively because of the failure to overcome organizational defensive routines. These organizational defensive routines

meant there was a failure to learn, which negatively impacted the implementation of the new ERP system. Hence, the primary contribution of this paper is that it is one of the first to focus on the need for organizational learning in enterprise systems implementation, or more precisely, how failure to learn may contribute to implementation failure.

The organization was a small-to-medium sized enterprise within a large conglomerate within Australasia, called Stark (all names are pseudonyms in accordance with a confidentiality agreement). Stark was one of many subsidiaries within the Solteria group (one of the global 500 companies with annual revenues of more than US\$4 billion). One of the authors studied Stark using critical ethnography.

The paper is organized as follows. In the next section we review the research literature on enterprise systems. In Section 3 we discuss our theoretical framework. Section 4 explains our research method. In Section 5 we present our data on the history of enterprise integration at Stark. Section 6 analyzes and discusses the data. The final section is the conclusion.

Literature Review

Defining Enterprise Systems

ERP systems, or “enterprise systems” for short, have been defined as “comprehensive, packaged software solutions [that] seek to integrate the complete range of a business’ processes and functions in order to present a holistic view of the business from a single information and IT architecture” (Gable, 1998). In practice, however, companies with multiple sites may have different ERP configurations (Bhattacharjee, 2000; Markus et al., 2000). The conglomerate we studied, for example, was a large, highly diversified international conglomerate. Its various subsidiaries had over a dozen different ERP systems from all the major vendors! In this kind of situation, the concept of one tightly integrated package

for the entire enterprise is not feasible (although it may be feasible for individual companies within the conglomerate to have one ERP system).

A somewhat broader definition of ERP is offered by Shanks and Seddon (2000). Focusing more on the shared information and data flows that enable integration of enterprise-wide processes, they define ERP as “comprehensive packaged software solutions that integrate organizational processes through shared information and data flows.” In a later work, (Shanks et al., 2003) describe three characteristics of an enterprise system:

1. A set of integrated packaged application software modules
2. Impounds deep knowledge of business practices accumulated by vendors
3. A generic ‘semi-finished’ product with tables and parameters that must be configured to meet business needs.

From the above discussion, one can observe that the term “enterprise systems” is evolving. Also, over time, more and more features are being incorporated into enterprise systems (Davenport, 2000b).

Enterprise Systems Implementation

Recent research has emphasized the importance of the social, cultural and organizational aspects in ERP implementation (e.g., Krumbholz and Maiden, 2001; Larsen and Myers, 1999; Lee et al., 2003; Markus and Tanis, 2000; Soh et al., 2000). For example, Hanseth and Braa (1999) studied the ability of one organization to change after the ERP system had been implemented. They found that the dream of standardization was like “hunting for the treasure at the end of the rainbow” (Hanseth and Braa, 1999). Other IS researchers have focused specifically on the role of power and

politics in ERP implementations (Allen and Kern, 2001; Koch, 2001).

There are several ways enterprise systems may support, enable or constrain certain corporate strategic initiatives (Davenport, 2000b; Markus and Tanis, 2000). For example, SAP assumes a translation from strategy to strategic objectives to key performance indicators to the key processes that are in turn supported by the SAP system (SAP, 2001). This translation is assumed to be one way, from strategy to processes. In SAP’s worldview, the relationship between strategy, critical success factors, general (key) performance indicators, measurable performance indicators, processes and sub-processes is central to the implementation of an enterprise system. This is illustrated in Figure 1.

In analyzing the relationship between strategy and business processes, SAP has been influenced by Porter’s value chain (Porter and Millar, 1985). In Figure 2, for example, SAP promotes the benefits of an enterprise systems implementation by using Porter’s value chain concept.

Thus we can see that certain strategic paradigms have permeated the way enterprise systems are implemented. Enterprise systems are often seen as a means of implementing corporate strategy (e.g., Davenport, 2000a; Kalling, 2003; Markus and Tanis, 2000).

In the organization we studied, as the dominant actors, coalitions, and political agendas changed over time, so too did the company’s enterprise integration strategy. In effect, the company’s enterprise integration strategy was a corporate battleground. Within the context of this corporate battleground, organizational defensive routines hindered the achievement of better understanding between parties to resolve strategically important issues. It is this failure to learn that is the focus of this paper.

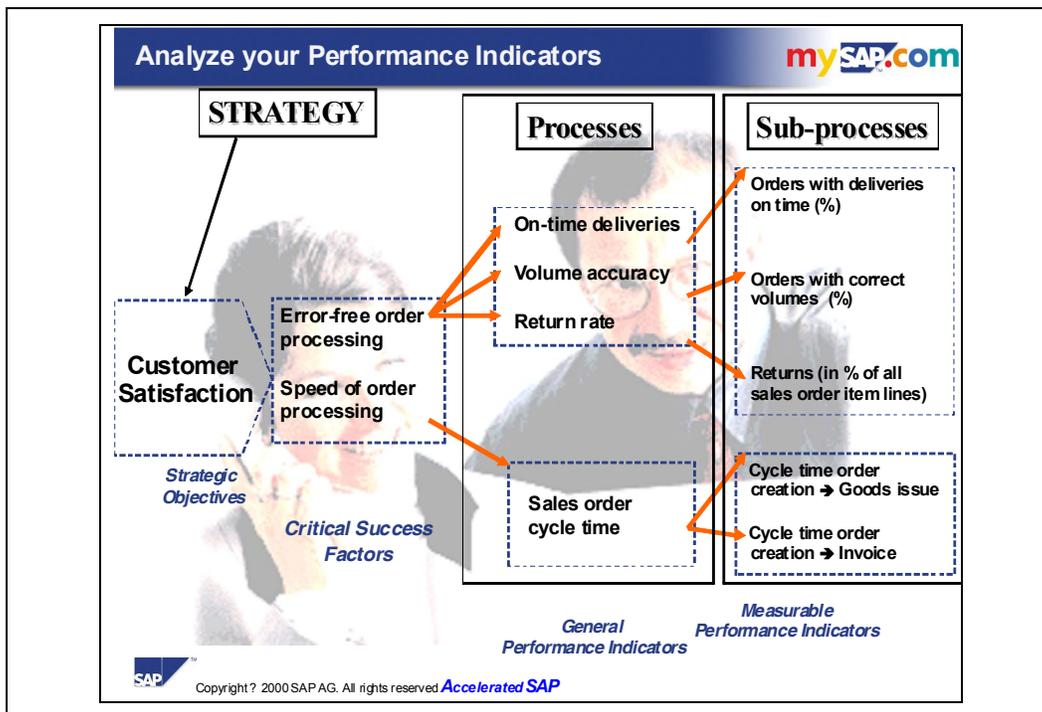


Figure 1 - Relationship between Strategy, Strategic Objectives, Critical Success Factors, General (Key) Performance Indicators and Measurable Performance Indicators (adapted from SAP, 2001)

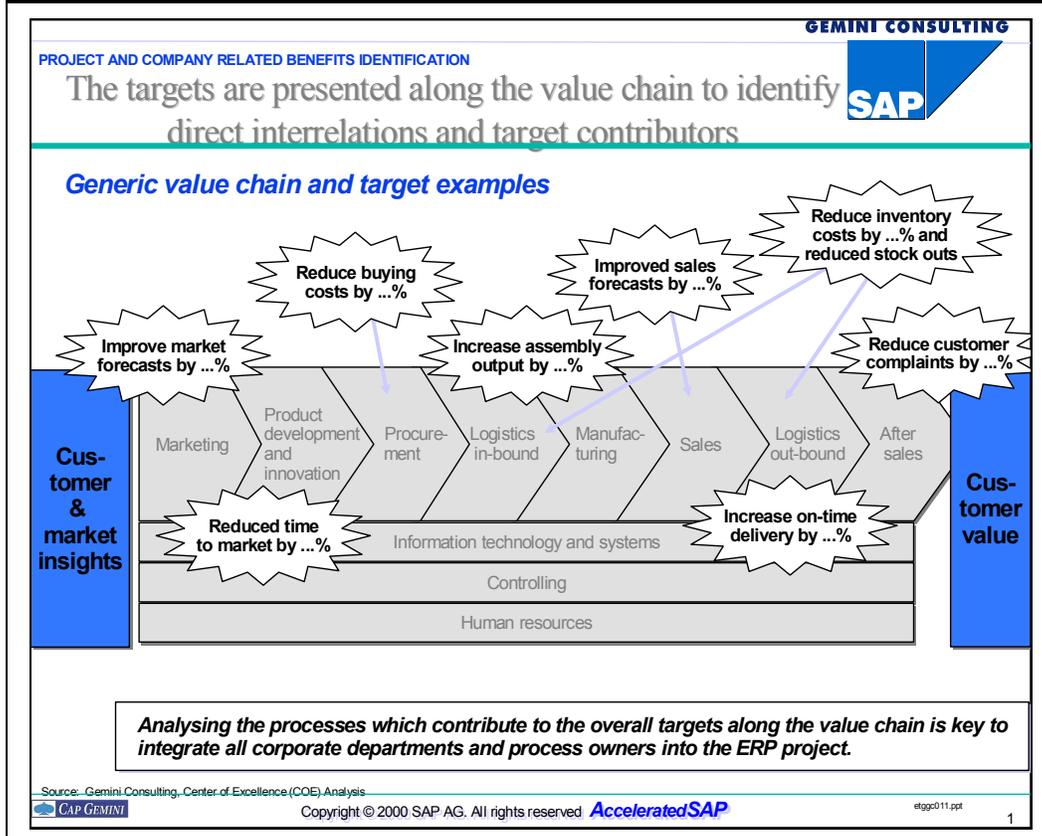


Figure 2 - SAP's and Cap Gemini Consulting's View of How Porter's Value Chain Relates to Benefits that Can Come from an ERP project (adapted from SAP 2001)

Enterprise Systems Implementation and Organizational Learning

The literature on organizational learning emerged in the organizational sciences (Argyris, 1990; Huber, 1991; Simon, 1991) and has now started to influence IS research (Ke et al., 2003; Scott and Vessey, 2000). Robey et al. (2002) identified practices to address knowledge barriers such as development and maintenance of strong core teams, managing consulting relationships, user training in technical and business processes along with a phased implementation. Scott and Vessey (2000) applied Sitkins' (1992) learning framework to gain insight into IS implementation success and failure. Applying organizational learning from another angle, Ke et al. (2003) adopted Crossan et al.'s (1999) framework to derive insights into organizational learning at three levels – individual, group and organization. Boudreau and Robey looked at improvised learning which they define as “Learning situated in practice, initiated by users, and implemented without any predetermined structure, schedule, or method” [Boudreau and Robey, 2005, p. 9]. They suggest that improvised learning is an important process facilitating the transition from one enactment of technology to another. Learning is accomplished through the improvised contributions of multiple actors in an organization's social networks (Boudreau and Robey, 2005).

One of the theories within the organizational learning literature is the theory of organizational defensive routines. In this paper we use this theory to help explain how organizational learning may be hindered during the implementation of enterprise systems. This theory is discussed in the following section.

Theoretical Background

Although there are many different perspectives and theories within the

organizational learning literature, the theory of defensive routines is one of the most well-known. The theory was originally developed by Argyris and Schon (Argyris, 1993b; Argyris and Schon, 1978) and has been used in the organizational learning movement (Argyris and Schon, 1996; Kim, 1993; Senge, 1990), in general management (Senge, 1990), and system dynamics (Sterman, 2000). A few researchers have also used this theory in information systems (Henfridsson and Soderholm, 2000; Sallaway, 1987).

The theory of organizational defensive routines is based on the theory of action perspective. Argyris and Schon based this perspective in part on Bateson's (1972) four levels of learning. However, Argyris and Schon (1978) have adopted only three of the four levels of learning: single loop, double loop and deutero learning (learning to learn).

Within the theory of action perspective an organization has a theory of action that consists of strategies, norms and assumptions. For example, a vendor of enterprise software might have strategies that provide the rationale for using value-added resellers rather than dealing with customers directly. It might also have norms for performance such as a 20 percent per annum growth rate. Also, there would be assumptions that utilizing the resellers in a particular manner will be the most cost-effective way to conduct business. (Note that the term “strategy” used within the theory of action perspective differs slightly from the other notions of corporate strategy (e.g., Porter, 1996). We distinguish this by using the term “theory-of-action strategy”).

Single loop learning occurs when correction is done to the process through changes in theory-of-action strategies and/or assumptions; however the norms themselves do not undergo change. Double loop learning, on the other hand, involves changes in norms as well as perhaps theory-of-action strategies or assumptions.

Deutero learning, the third kind of learning, involves learning how to learn. Put in another way, single loop learning does not involve a change in the master program (or the governing values mentioned below) that causes the organization to perpetuate errors but double loop learning does (Argyris, 1993a).

Organizational defensive routines are defined as “actions or policies that prevent individuals or segments of the organisation from experiencing embarrassment or threat. Simultaneously, they prevent people from identifying and getting rid of the causes of the potential embarrassment or threat. Organisational defensive routines are anti-learning, overprotective, and self-sealing” (Argyris, 1990). These defensive routines are rooted in what Argyris and Schon call the Model I type of human behaviour summarized in Table 1.

The four governing values in the left column of the table represent norms and interpretive schemas that underlie unproductive action strategies. As a result of these values, unintended consequences of action such as a manager being seen as defensive, inconsistent, or controlling occur. When this happens, it is difficult to enter into productive dialogue to question the underlying assumptions of a course of action. Eventually, this manager does not revise some faulty assumptions, leading to decreased long term effectiveness.

Argyris and Schon distinguish between Model I social virtues (counter-productive behaviours that inhibit double loop learning) and Model II social virtues (complementary behaviours that facilitate double loop learning). These two models are described in Table 2.

Model II social virtues are based on the governing values of “valid information”, “informed choice” and “individual responsibility to monitor how well the choice is implemented.” This individual

responsibility includes monitoring how well one designs and implements his or her

decisions in order to detect and correct errors. These governing values form the foundation for two action strategies:

- Advocate one’s position and encourage inquiry or confirmation of it. This action strategy involves forthrightly expressing one’s views while providing illustrations of fairly observable data, e.g., what was seen and heard. The reason for doing so is to invite examination and discussion of the reasoning process that has led to one’s conclusion.
- Minimization of unilateral face-saving. Actions taken to save face, for yourself or someone else, are considered an act of mistrust of the other person’s capacities. Such acts should be assessed.

These action strategies have been found to lead to productive reasoning where individuals make their premises and inferences explicit and clear (Argyris, 1990).

The use of defensive routines as a lens helps us understand why actors may not be able to resolve contradictions inherent in organizational life. However, the theory of defensive routines has its limitations. For example, the theory of defensive routines assumes that organizational members altruistically want to solve the problems they see around them. However, altruistic goals may not be the same for every group. Also, the theory does not cater for situations where actors purposely act to fulfil their hidden agendas at the expense of the organization. Additionally, we acknowledge that the theory was developed in the West by Western scholars, and hence it may not be applicable in all situations or in different cultures. We mention some additional limitations of the theory after our discussion of the analysis and findings.

Table 1 - Model I Theory-in-Use				
Governing values	Action Strategies	Consequences for behavioural world	Consequences for learning	Effectiveness
Define goals and try to achieve them	Design and manage the environment unilaterally. (Be persuasive, appeal to larger goals, etc.)	Actor seen as defensive, inconsistent, incongruent, controlling, fearful of being vulnerable, withholding of feelings, overly concerned about self and others	Self-sealing	Decreased long term effectiveness
Maximize winning and minimize losing	Own and control the task. (Claim ownership of the task, be guardian of the definition and execution of the task.)	Defensive interpersonal and group relationship (dependence on actor, little helping of others).	Single-loop learning	
Minimize generating or expressing negative feelings	Unilaterally protect yourself. (Speak in inferred categories accompanied by little or no directly observable data, be blind to impact on others and to incongruity between rhetoric and behaviour, reduce incongruity by defensive actions such as blaming, stereotyping, suppressing feelings, intellectualizing etc.)	Defensive norms (mistrust, lack of risk-taking, conformity, external commitment, emphasis on diplomacy, power-centred competition and rivalry).	Little testing of theories publicly Much testing of theories privately	
Be rational	Unilaterally protect others from being hurt (withhold information, create rules to censor information and behaviour, hold private meetings).	Low freedom of choice, internal commitment and risk-taking.		

Table 2 - Comparison between Model I and Model II Social Virtues	
Model I Social Virtues	Model II Social Virtues
<i>Help and Support</i>	
Give approval and praise to others. Tell others what you believe will make them feel good about themselves. Reduce their feelings of hurt by telling them how much you care, and if possible, agree with them that the others acted improperly.	Increase the others' capacity to confront their own ideas, to create a window into their own mind, and to face their un-surfaced assumptions, biases, and fears by acting in these ways toward other people.
<i>Respect for Others</i>	
Defer to other people and do not confront their reasoning or actions.	Attribute to other people a high capacity for self-reflection and self-examination without becoming so upset that they lose their effectiveness and their sense of self-responsibility and choice. Keep testing this attribution opening.
<i>Strength</i>	
Advocate your position in order to win. Hold your own position in the face of advocacy. Feeling vulnerable is a sign of weakness.	Advocate your position and combine it with inquiry and self-reflection. Feeling vulnerable while encouraging inquiry is a sign of strength.
<i>Honesty</i>	
Tell other people no lies or tell others all you think and feel.	Encourage yourself and other people to say what they know yet fear to say. Minimize what would otherwise be subject to distortion and cover-up of the distortion.
<i>Integrity</i>	
Stick to your principles, values and beliefs.	Advocate your principles, values and beliefs in a way that invites inquiry into them and encourages other people to do the same.

Research Method

As was mentioned earlier, one of the authors studied Stark – one of many subsidiaries within the Solteria group - using critical ethnography. Ethnographic research has emerged as one important method for studying the social and organizational contexts of IS development and use (Harvey and Myers, 1995). One of the strengths of ethnography is that it is one of the most “in-depth” or “intensive” research methods possible. The distinguishing feature of ethnography is that ethnographers immerse themselves in the life of the people they study, and seek to place the phenomena studied in their social and cultural context (Myers, 1999). As Myers explains,

The main difference between case study research and ethnographic research is the length of time that the investigator is required to spend in the field and the extent to which the researcher immerses himself or herself in the life of the social group under study. In a case study, the primary source of data is interviews, supplemented by documentary evidence such as annual reports, minutes of meetings and so forth. In an ethnography, these data sources are supplemented by data collected through participant observation. Ethnographies usually require the researcher to spend a long period of time in the “field” (Myers, 1999).

Critical ethnography is one particular kind of ethnographic research (Myers, 1997). Critical ethnography sees ethnographic research as emergent process, involving a dialogue between the ethnographer and the people in the research setting (Myers, 1999). Critical ethnographers describe, analyze, and open to scrutiny otherwise hidden agendas, power centers, and assumptions that inhibit, repress, and constrain (Thomas, 1993). We believe that the research method was particularly appropriate given the subject matter. It would be virtually impossible for a researcher to

discover organizational defensive routines, hidden agendas and assumptions if they were not “there” for an extended period of time.

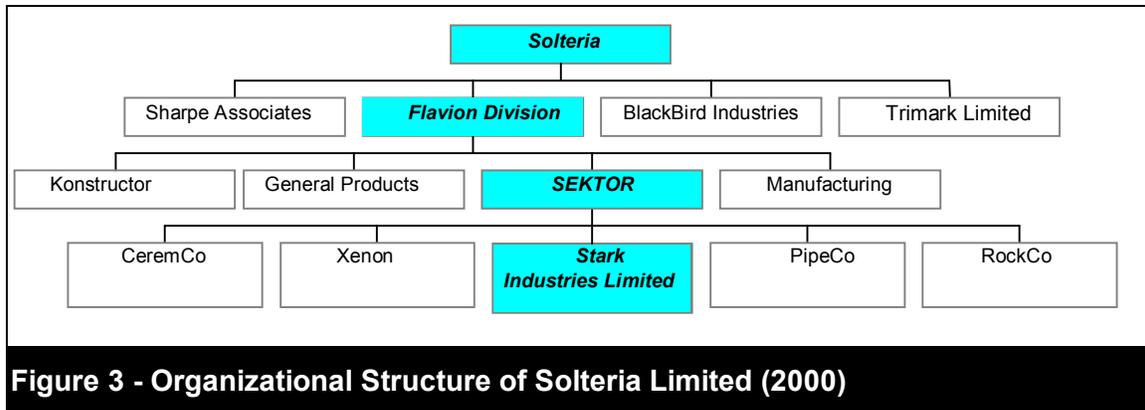
The data was obtained over a six-year period in total, from 1996-2001, with the most intensive period of fieldwork relevant to enterprise systems implementation being from August 1999 to August 2000. For the first year, one of the authors used the in-depth case study methodology to research the link between quality management and organizational learning at one of subsidiaries of Stark. It was then that the issue of defensive routines as a hindrance to effective resolution of issues was identified.

Critical ethnography was adopted in later stages of the study. As with ethnography more generally, the research project was highly iterative and emergent [Agar, 1986]. Data sources included interviews, informal chats, meetings, observation, the company’s Intranet, and various documents such as e-mails, annual reports, and newspaper articles.

One hundred and five formal interviews were conducted (most of which were audio taped) with 69 people during the most intensive period of fieldwork. Many informal discussions with employees also took place. As well as interviews, meetings were attended at various levels and departments.

Enterprise Integration at Stark

Stark is a small-to-medium sized enterprise within a large conglomerate within Australasia (called Solteria). Solteria was one of the global 500 companies with annual revenues of more than US\$4 billion. The organisation structure of the Solteria empire for the year 2000 is shown in the next figure (with the reporting line for Flavion, SEKTOR and Stark highlighted, and the subsidiaries of the other divisions omitted).



Stark employs around 700 people and is now comprised of five businesses: CamCo, MaxCo, HinoCo, DrinCo and ModCo. Prior to November 1999, Xenon was also part of Stark.

1993 - A Change of Strategy

In February 1993 David Callon assumed the role of general manager of Stark. Prior to his arrival, the three business units — MaxCo, Xenon and CamCo — were merged to form a new entity: Stark Industries Limited. An enterprise integration movement now began at Stark. Stark was restructured along regional lines to achieve greater market awareness and customer focus (this was in contrast to the previous emphasis on production). With the reorganization also came the consolidation of administrative centres.

Under David Callon there was a change of strategy for the company. It was decided that Stark would no longer focus on production, but would become the marketing arm of the SEKTOR Group of companies. Stark would focus on the creation of new markets, the transformation of its product-oriented mindset and culture to one of providing customers with end-user system solutions, and differentiation through better service. Stark believed that it had to transform itself from a traditional product-focused business to a service-oriented business.

After this strategic review, Stark undertook many projects with the aim of developing a new corporate identity, developing new

corporate capabilities, and changing the organization. One of these was a Strategic Information Technology Project (SITP).

1995 - The ERP Project

The Strategic Information Technology Project was undertaken from June 1994 to May 1995 and was assisted by a large global consulting company (herein called BigFive Consulting). Stark recognized that the information systems of Stark needed to be linked to its strategic business plan.

The primary objective of the SITP was “to achieve greater integrity, reliability, timeliness and usefulness of information available to Stark management.” The SITP team with the help of BigFive Consulting recommended that “Stark seek an integrated packaged software product to support all if not most of the business functions.” The new system was expected to support a new re-engineered process, namely, the centralized order acceptance and delivery process for Stark. This would involve a new centralized order acceptance and delivery centre that would centralize order acceptance and delivery across MaxCo, CamCo and Xenon. After a long software search period, Stark selected DAREA (a pseudonym for one of the top five ERP vendors in the world).

The new system was chosen to support a corporate culture and work environment that was yet to be created. This new corporate world would involve the consolidation not only of plants within CamCo (that were currently competing against each other) but also of the three main businesses of Stark.

Traditionally, most of the companies within the Solteria empire were fairly autonomous. The Solteria conglomerate as a whole had a cultural norm of commensurate authority, responsibility and accountability at the business unit level. However, this cultural norm was now diametrically opposed to what was proposed with the new ERP system. Although the sister companies were not used to collaborating with each other, the new system would require a certain degree of cooperation and process standardization.

The centralized order processing system

A new centralized order acceptance and delivery centre was established for all of the Stark companies, replacing the ones that had existed within each Stark subsidiary. The locally-based order processing facilities were closed down in the interests of creating a more tightly integrated enterprise. However, the new centre did not function as expected. Not once did a customer place an order for three different kinds of products from the three business units at the same time (one of the rationales for installing the system). Also, the centre was never able to achieve the goal of on-time predictable delivery (touted earlier as a key differentiator for competitive advantage). This was mostly because certain powerful figures within Stark were able to over-ride the system in order to satisfy the demands of large customers (this is discussed in more detail below). Also, given that Stark was formed from three adversarial, previously competing firms, the workers at the centralized centre still tended to identify themselves more with their own subsidiary than Stark as a whole. We observed a former order taker of MaxCo complaining of doing CamCo's work, even though they were now

working at the centralized order acceptance and delivery centre! This worker did not identify with, neither did they want to learn about, the other businesses of Stark.

Old-timers versus New-timers

At the highest level of Stark, there were two groups: the New-timers and the Old-timers. The New-timers were comprised of the then general manager of Stark, David Callon, and several senior managers. The New-timers believed that new technology was needed to improve the business.

The Old-timers believed the business was as simple as it always had been. Therefore, these new initiatives served only to over-complicate the business. In their opinion, there were only a few fundamental things one needed to do to run the business well.

Wyatt Dunkins, the current leader of the Old-timers, had been with Stark since the early 1980s and had been part of the team that expanded the business. He was considered one of the most powerful figures in Stark.

1997-1998: The Strategic Debates

Although Stark had yet to fully implement its new ERP system, there were debates at senior levels of Solteria and Flavion on the fundamental role that Stark would play within the Sector. Wyatt Dunkins, one of the Old-timers, lobbied for a change in Stark's strategic role and enterprise integration strategy with the CEOs of SEKTOR and Flavion. He argued that the three main businesses of Stark should be managed in a more separate manner. The end result of these debates was a decision to change Stark from a marketing arm of SEKTOR to that of production i.e. back to what it was before! In late 1998 Gene Romm succeeded David Callon as the new CEO of Stark.

[The change of Stark's strategic role has] certainly taken place since I left [in December 1998]. But [it was] starting to take place a little bit over the

implementation [of] Project Bridge. We're challenging, at senior levels in Solteria about what role Stark was to have inside the SEKTOR [group of companies] – whether it was about strategic growth or whether it was just an operating unit that was at the end of the value chain and we wanted to keep it tight and simple. (Interview with David Callon, General Manager of Stark from 1993 to 1998).

1999: New Leader, Different Vision

Gene Romm did not share the same integrated company vision as David Callon. Instead of a tightly integrated company, Gene Romm espoused a clearer separation between MaxCo, CamCo and the individual businesses of Stark. This stood in contrast to the previous CEOs view that Stark's businesses should be tightly coordinated. As Gene Romm explains:

I think Stark's application of DAREA is wrong... The software itself is not the issue, it's how the business chooses to use it. And in my judgment one of the mistakes that Stark has made is they've modified it far too much and the fundamental business model that Stark set out to put together for DAREA is wrong. They assumed that Xenon, CamCo and MaxCo were all one business, in simple terms, and they're not. They are three separate businesses and we may manage them as one but they are still three separate businesses. And they should be "informationized" as three different businesses not "informationized" as if they are one (Interview with Gene Romm, General Manager of Stark from December 1998 onwards).

The previous enterprise integration strategy for Stark was now starting to unravel.

2000: Post-Implementation

By the end of 1999, Stark had managed to roll-out DAREA throughout the whole country.

However, Stark employees generally hated DAREA. Worse, many senior managers believed that DAREA had been a bad investment. The new CEO of the SEKTOR group thought that DAREA was inferior to another ERP product usually used widely throughout the group.

In February 2000 the ERP Support team at Stark considered various options to upgrade DAREA to a later version. However, given the latest business strategy for Stark, they decided to move towards splitting the "sales and distribution" tables shared by MaxCo and CamCo. In hindsight, they considered that these two businesses were too tightly integrated.

In summary, we can see that David Callon, appointed CEO in 1993, had a strategy of creating a tightly integrated, service-oriented company. DAREA was chosen and implemented to support that strategy. However, David Callon, along with his strategy, left in 1999. Of the twelve managers who signed off the ERP project at the start, only three were left by December 2000.

Now Stark had a new CEO and a new strategic vision. This strategic vision was diametrically opposed to David Callon's vision, but almost identical to what it had been before he came along. This meant that DAREA was designed for a world that would never exist.

*"It didn't take a 180 degree turn but it, sort of - we were quite expansionist and visionary and we came back to a very conservative operational [focus] and ... so it wasn't a dramatic change but it was more a degree of how expansionist we would have been had we wound the dial back a little bit to be more conservative. But that – that did have an implication on [the] DAREA [project]. And would we have chosen DAREA or a similar ERP system if we had the more conservative vision? **Probably not.**" (Interview with David Callon, initiator of the ERP project when he was the General Manager of*

Stark from 1993 to 1998, emphasis added)

Analysis and Discussion

In this section we will analyze our data using three themes: conflict of strategic paradigms, influence of dominant actors, and organizational defensive routines.

Conflict of Strategic Paradigms

At a deeper level, one can observe a conflict of strategic paradigms between two opposing camps: the New-timers and Old-timers. The New-timers believed that Stark should compete on the basis of service and on-time delivery, whereas the Old-timers believed that Stark should complete on the basis of social capital accumulation and maintenance. Nowhere was this more evident than at the centralized order acceptance and delivery centre.

The centre was the epitome of Stark's enterprise integration efforts. By the end of 1999 the strategies of the New-timers had been inscribed into the centre's processes and systems (c.f. Orlikowski, 2000). However, the centre never achieved the results of the dream of integration.

This was because the centre was designed to ensure on-time predictable product delivery as a key differentiator for competitive advantage. However, from time to time, Wyatt Dunkins or the Auckland Sales Manager (of the Old-timers) would force a large order through the already congested product delivery schedule to please a big customer. This was because, in his view, Stark depended on good social capital accumulation and maintenance with large customers. These customers would call up on one day and make demands that their order be put ahead of others. Wyatt Dunkins did not want to lose these big customers (and he was prepared to disadvantage smaller customers and disrupt the delivery schedule if needed).

Just one year later, the reengineered centralized order acceptance and delivery centre was split. The individual companies of Stark were once again responsible for their own order processing and product delivery. This put an end to the dream of "mission control" that was pursued by David Callon. The Old-timers had won.

The influence of dominant actors

After Stark was formed from its constituent businesses, the New-timers attempted to develop a single corporate identity and chose a new ERP system to support the vision of a more tightly integrated, service-oriented firm. However this vision, along with the new ERP system, was diametrically opposed to some entrenched social structures and the values of the Old-timers. The Old-timers opposed the integration effort.

But by the time Stark's strategic role was changed back to being a production arm of the sector, DAREA had already been inscribed with the intentions of the New-timers. The company's ERP system was like a freight train that was almost impossible to stop.

Organizational Defensive Routines

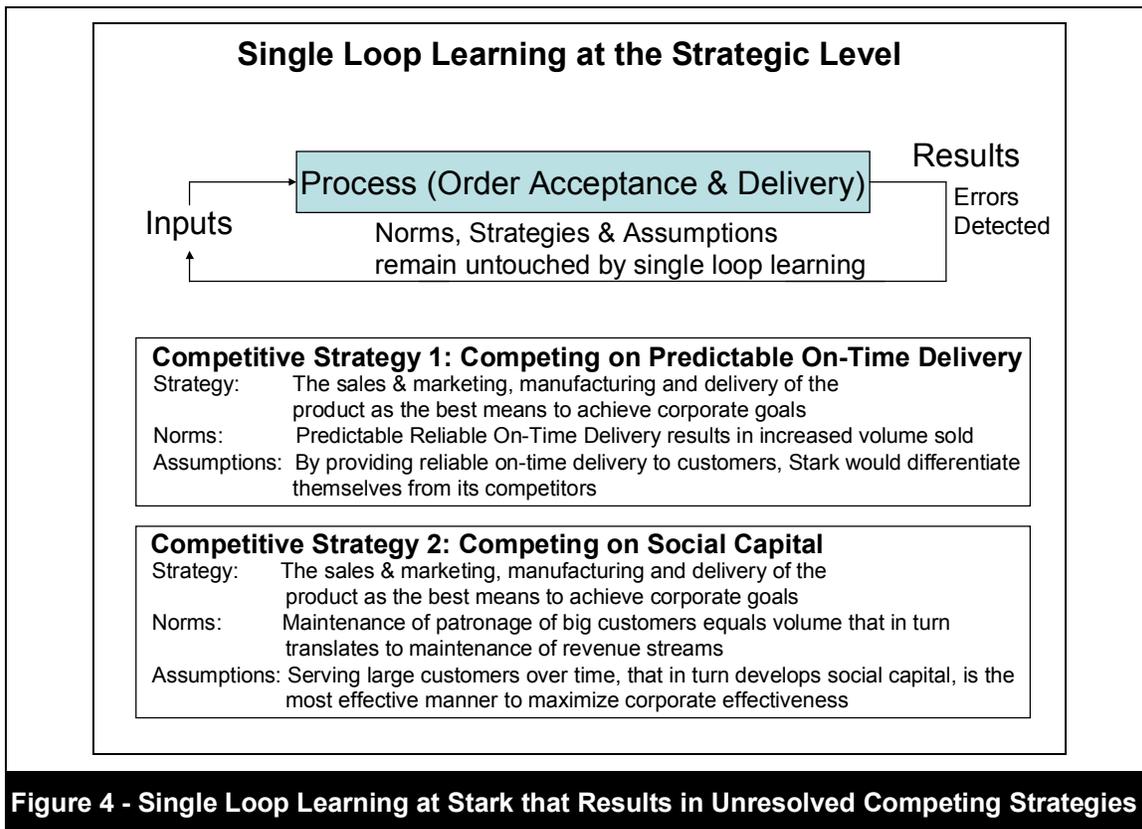
We suggest that overcoming organizational defensive routines may be important in information technology enabled enterprise integration projects. Strategic debates on important, conflicting and sensitive issues are often implicated in enterprise integration efforts. We suggest that resolution of these debates is crucial for a company's strategic objectives to be realized in an enterprise system.

In our analysis, we will focus on just one issue: the unresolved conflict between the strategies of the New-timers and Old-timers. The New-timers advocated competing via predictable on-time delivery, whereas the Old-timers advocated competing via accumulation and preservation of social

capital. While one might argue that the pursuit of both strategies was not mutually exclusive, in Stark they were debated as such. This unresolved debate can be understood by drawing on the concepts of single loop learning, double loop learning and defensive routines (Argyris, 1990; Argyris and Schon, 1978; Argyris and Schon, 1996).

Figure 4 summarizes the two competing strategies as single loop learning systems that were never effectively resolved by undertaking double loop learning. Double loop learning could have helped Stark effectively address apparent but not fundamental contradictions between the two strategies. The unresolved strategic debate trickled down to the design and operations of the centralized order acceptance and delivery centre.

In the figure above, both competitive strategies were concerned with the sales, marketing, manufacturing and delivery of the product to customers. However, the norms and assumptions of these two competitive strategies differed. With competitive strategy 1, the results of the order and delivery process are judged on whether on-time delivery has been achieved. This is based on the expectation that predictable reliable on-time delivery over time results in increased sales volume. With competitive strategy 2, the results of the order and delivery process are judged on whether Stark maintained or enhanced its social capital with its big customers. The basic rationale of this strategy is that maintenance of social capital will eventually result in guaranteed future sales. With regard to the differences between the assumptions of the two competitive strategies, both appear diametrically opposed.



Looking back at Table 1 (concerning Model I theory in use), we can see that prevalent norms of interaction in organizations are based on four governing values as follows:

1. Defining goals and trying to achieve them.
2. Maximizing winning and losing.
3. Minimizing generating or expressing negative feelings.
4. Being rational.

With Stark, as mentioned above, there were two schools of thought. David Callon, the leader of the New-timers, with his team of senior managers sought to develop the New Stark World. In a sense, it was natural for them to “define goals and try to achieve them unilaterally.” This governing value results in the following action strategies: “designing and managing the environment unilaterally by being persuasive, appealing to larger goals etc.” David Callon and his team had attempted to persuade the rest of Stark by several change programs.

However, the adoption of social norms of interaction that were consistent with Model I theory-in-use resulted in “actors seen as defensive, inconsistent, incongruent, controlling, fearful of being vulnerable, withholding of feelings, overly concerned about self and others or under-concerned about others” as described in Table 1. The evidence seems to indicate that David Callon and his team pursued the New Stark objective and the strategy of on-time product delivery without letting the Old-timers inquire into their thought processes. Otherwise, the inherent conflict between competing via on-time delivery and competing via management of social capital could have been productively resolved before the former strategy was committed to Stark’s ERP system. These actions ultimately resulted in learning that was self-sealing and that led to decreased long term effectiveness (refer to Table 1).

On the other side of the fence, Wyatt Dunkins of the Old-timers also unilaterally defined goals and tried to achieve them by attempting to design and manage the problems and the environment unilaterally. In doing so, Wyatt Dunkins attempted to appeal to higher goals, such as the need to maintain the corporate social capital to achieve sales volume necessary to keep Stark afloat. This imperative was used to justify his actions of disrupting the product delivery schedule to maintain corporate social capital. By his actions, Wyatt Dunkins could have been seen as defensive, controlling, and being under-concerned about others. Consequently, his actions within the single loop learning system illustrated in the previous figure became self-sealing. By self-sealing, we mean that both camps failed to resolve their conflicting strategies productively.

Thus the failure to overcome defensive routines can be considered a major hindrance to Stark resolving the apparent conflicts between the two strategies of competition. Our evidence indicates that David Callon and his team of New Timers pursued the New Stark objective and the strategy of on-time product delivery without any serious debate with the Old-timers. On the other side of the fence, Wyatt Dunkins and the Old-timers also unilaterally defined goals and tried to achieve them without discussing these with the New Timers. The result was a lack of productive debate, the non-achievement of the on-time delivery strategy, and widespread dissatisfaction with the ERP system.

It is widely recognized that the linkages between strategy, strategic objectives, key performance indicators and the capability accorded by the enterprise system are crucial in the realization of benefits in enterprise systems investments (Davenport, 2000a; SAP, 2001). However, as the discussion above shows, unresolved strategic debates (cf. Argyris and Schon, 1996) may also lead to a waste of effort in integrating the enterprise. We suggest the lack of resolution of these debates may be due to

organizational defensive routines that prevent mutual learning taking place.

Limitations

We have suggested that the theory of organizational defensive routines may help to explain how organizational learning may be hindered during the implementation of enterprise systems. However, we acknowledge that there are some limitations of the theory.

First, the theory does not deal with the hidden agendas and power centres that may influence strategic shifts, decisions and posture expressed through the actions of dominant actors (Myers and Young, 1997). Second, as a micro-level theory, it does not take into account wider social and institutional structures. These structures are much better handled by a macro-level theory such as structuration theory (DeSanctis and Poole, 1994; Giddens, 1984; Orlikowski, 2000). We freely acknowledge that multiple perspectives are needed to help us understand how to make enterprise systems work.

Conclusion

Given that enterprise systems are large, complex systems, involving many different parts of an organization, it is perhaps not surprising that implementation failure is not uncommon (Larsen and Myers, 1999). In this paper we have focused on organizational learning as one important aspect of enterprise systems implementation, or more precisely, how the lack of organizational learning may contribute to implementation failure. Organizational learning is important, particularly during times of transition from one technology to another (Boudreau and Robey, 2005).

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In this paper we have discussed the implementation of an enterprise system in a small-medium sized organization within a large conglomerate within Australasia. We have seen that enterprise integration at Stark was a corporate battleground. A strategically important debate within Stark was not resolved before the project to implement a new enterprise system started. This meant that the viewpoint of one party (the New-timers) was subsequently inscribed into Stark's enterprise system. Some years later, however, the Old-Timers gained the ascendancy, meaning that the ERP was now ill-suited to support their requirements. The end result was a new ERP system widely perceived to be a failure.

We have suggested that organizational defensive routines hindered the achievement of a better understanding between the interested parties to resolve these strategically important issues. In our view the poor outcome could have been avoided if the strategically important debate within Stark had been resolved. These organizational defensive routines meant there was a failure to learn, which negatively impacted the implementation of the new ERP system.

We believe our findings may be applicable to many organisations implementing ERP systems throughout the world. While the research project was conducted in Australasia, the theory of organizational defensive routines has been used in many countries with thousands of managers over a period of more than 30 years (Argyris, 1993b). Further research is needed to find out if a failure to learn is a common feature of enterprise systems implementation efforts.

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