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Business Process Re-design in Enterprise Systems Projects: Radical and Evolutionary Change

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ABSTRACT

Business Process Re-design is a major component of an Enterprise Systems (ES) implementation. Organizations adopting ES systems face the dilemma of deciding the degree of changes to their existing business process and or changes to the ES package. This paper explores the nature and process of business process re-design efforts of an organization that had successfully implemented an ES packaged solution. This change encountered by the firm is viewed through the lens “Alternate Change Theories” established by Jarvenppa and Stoddard in terms of business process re-design. Results from the in-depth case study challenge the notion Business Process Reengineering (a radical form of change) in the context of ES implementations and also provides evidence as to why the business process re-design in ES implementations cannot be de-coupled into two distinct phases i.e. design phase and implementation phase.

Keywords

Business Process Re-design, Enterprise Systems, Evolutionary and Revolutionary Change

INTRODUCTION

One of the important development in the corporate use of packaged software in the 1990s arrived in the form of Enterprise Systems (Davenport 1998). While the term Enterprise Resource Planning (ERP) has been widely used in earlier literature, the roots of Material Resource Planning (MRP) from which ERP emerged have tainted the potential of information systems. Therefore the phrase Enterprise Systems (ES) has been suggested to capture the essence of an integrated information system (Davenport, 2000). ES, with an orientation to broad, cross-functional business processes and common information, was the answer to the demands of firms seeking integration of data and information needs (Somers and Nelson, 2003).

The process of ES implementation is challenging and intertwined with complex social, organizational and technical interactions (Parr and Shanks 2000). To gain a deeper understanding of the ES implementation process, various authors like Bancroft et al (1998) Ross (1998), Marcus and Tanis (2000) and Parr and Shanks (2000) have developed process models of ES. These process models are aimed to gain a deeper understanding of the implementation process and provide guidelines for successful implementation.

A major component or phase of an ES Implementation is configuration of business process or business process re-design, where organizations adopting ES packages face the dilemma of deciding the degree of changes to their existing business process and or changes to the ES package. There are two extremes, to in the many ways, in which business process redesign can be achieved i.e. Business Process Reengineering (BPR) and Business Process Improvement (BPI).

The traditional definition of BPR emphasizes radical redesign of business processes (Hammer 1990; Hammer and Champy, 1993; Davenport, 1993; Stoddard and Jarvenppa 1995) and rapid deployment leading to a radical change. The revolutionary change model is based on so-called punctuated equilibrium paradigm (Tushman and Romanelli, 1985; Gersick, 1991) where there are long period of incremental changes but radical changes occur at certain instance in times of in between.

BPI finds its roots in the Total Quality Movement (TQM) which advocates focus on incremental change and gradual improvement of business processes. BPI embraces the evolutionary change model (see Beer et al 1990; Jick, 1993; Leonard-Barton, 1988 and Liker et al 1987) that is based on the assumption that people directly affected by and involved in a change process must also take active part in the design and implementation of that change. Inherently the evolutionary change model assumes that real change is best achieved through incremental improvements over time. The advantages of the evolutionary change model are that it is less disruptive and risky than the revolutionary counterpart.

While ES literature has identified ‘business process re-design’ as a process in ES implementation, knowledge about this change effort has been, at best minimal. Conflicting assertions have appeared in the ES literature, with respect to the nature of change (business process redesign) where ES implementations has been equated with BPR (Sarker and Lee 2003, 2002) and the deployment of an ES solution forces the organization to engage in BPR (Glass 2000). ES implementations has also been viewed as missing link as the ‘missing link’ to reengineering, as they enable business process reengineering efforts by integrating the various business process of an organization (see Al-Mashari, 2001). However, Davenport (1998) is explicit in his assertion that ES Solutions are embedded with best practice business processes (or models) and the notion of BPR is obsolete, in the context of ES implementations.

The question that emerges from such divergent views is “What is the nature of change with respect to business process re-design, when an organization implements an ES package”? To explore the dichotomy of BPR (revolutionary change) and BPI (evolutionary change) in the context of ES Implementation, this research study adopts the ‘theoretical lens’ developed by Jarvenppa and Stoddard (1995, 1998).

THEORETICAL LENS

To examine the change management tactics in business process re-design, Jarvenppa and Stoddard (1995, 1998) had established “theoretical lens”, which outlined the elements of change. The “theoretical lens” further provided criteria, which classify these elements into Evolutionary and Revolutionary Change. The following table reproduces the “theoretical lens”:

| Element | Evolutionary Change | Revolutionary Change |
|--------------------------------|--------------------------|-----------------------------|
| Leadership | Insiders | Outsiders |
| Outside resources | Few, if any, consultants | Consultant led initiative |
| Physical separation | No, part-time members | Yes, Greenfield site |
| Financial crisis | None | Poor Performance |
| Rigid Milestones | Flexible milestones | Firm milestones |
| New reward /compensation | No change | New scheme |
| Simultaneous IT/process change | Process first | Simultaneous process and IT |

Table 1: Alternate Change Theories

Source: Jarvenppa and Stoddard (1998, pp.17)

The “theoretical lens” was applied to fifteen (15) business process redesign projects in eight different organizations. The results from this showed, that business process re-design efforts emerged to be revolutionary (radical) during design and evolutionary (incremental) during implementation (Stoddard and Jarvenppa, 1998). The conclusion reached by Stoddard and Jarvenppa (1998) was that organizations engaged in business process re-design projects must start with the radical design phase as ‘design tended to occur quickly, was somewhat self-contained, and typically had a punctuated end point’. These radical designs can then be implemented, incrementally. Thus, the reengineering project is to be decoupled into two phases; design (blueprint for change) and implementations of these designs. By decoupling into phases, organizations, can accomplish a breakthrough result with evolutionary implementation tactics. They further conclude that evolutionary tactics and incremental approaches to business process design can be undertaken by organizations that are confronted by strategic crisis, have limited funds and prefer to minimize the project risk of failure. This is viewed as a “Quality Initiative” as opposed to BPR.

The “theoretical lens” established by Jarvenppa and Stoddard (1995, 1998) is appropriate to ES projects as these projects involve business process re-design efforts and not much is known in the ES literature, as to how and why, organizations adopted a particular change tactics.

RESEARCH METHOD

The qualitative research paradigm covers several types of inquiry that outline techniques for designing the research and collection and analysis of data. The research strategy adopted for this study is the Case Study method. Case study, defined by

Benbasat et al. (1987 pp 370) as a method that: “examines a phenomenon in its natural settings, employing multiple methods of data collection to gather information from one or few entities (people, groups or organization)”.

The importance of case study research in the academic field of Information Systems (IS) has been well-recognized (Klein & Myers, 1999; Lee, 1989; Benbasat et al., 1987). The most common qualitative method used in information systems is case study (Orlikowski and Baroudi, 1991) as according to Benbasat et al. (1987) the focus of IS research interest has shifted from technical to organizational technical issues.

The overall goal of this study is to examine the nature change tactics and process business process re-design in ES projects. Each ES project is unique to the organization that adopts an ES package and the process of ES implementation is a complex undertaking, dependent on the various contextual factors (selection of ES and modules, interaction with existing systems and processes, skill and knowledge of existing staff and external consultants, management support, project resources and scope to name a few) that influence the ES deployment.

The exploratory nature and intensive style of research planned, to gain maximize exposure to a variety of research interest, prompted the investigator to study one ES Implementation. As a single investigator conducted this research, pragmatic considerations like access, feasibility, time and resources were also factor in studying a single ES Implementation.

The organization selected for this research study is in the brewing industry and had replaced its business information systems with SAP R/3, an ES packaged solution. Successful Breweries¹ (SB) Ltd. has its roots in New Zealand. Established in the 1860s, it was until recently listed on the New Zealand Stock Exchange. The company's majority shareholders are leading breweries based out of Singapore and Germany. SB employs over 450 staff in communities throughout New Zealand and has its head office in Auckland. Besides the four breweries, SB has sixteen offices across New Zealand.

The business information system of SB was installed in 1985 and supported the base financial, sales and distribution operations. The system was a combination of a COBOL based ComOps package² and a series of "bolt on" solutions that had been developed in-house using a software package called Power House. SB decided to replace the ComOps with SAP R/3 solution as ComOps system was not Year 2000 (Y2K) compliant. The major SAP modules that included within scope of the ES project were Financial Accounting (FI), Controlling (CO), Material Management (MM) and Sales and Distribution (SD).

RESEARCH METHODOLOGY

This research study replicated, the methodology adopted and published by Jarvenppa and Stoddard (1998). This research study examined the change management tactics, adopted by SB, in their efforts to deploy (implement) the ES package. For purposes of this study, the focus of the change management was restricted to the phase, where business processes were designed and implemented. Thus, the unit of analysis³ is the business process redesign in an ES Project.

SB's ES project had characteristics similar to those selected by Jarvenppa and Stoddard (1998). The characteristics of the SB's ES project are enumerated in the following:

- A cross-functional scope (more than two functional areas)
- Both technology and business process scope
- ES project goals included improvement in performance especially in areas of business efficiency, customer service, business accountability, business flexibility)
- ES project involved simultaneous change in organizational design and information technology

To conduct research investigations, four (4) field trips to SB were made. The first trip focused on preliminary investigation pertaining to the ES implementation and signing of the confidentiality agreement. The next two (2) trips were devoted data collection and interviews. The final trip was undertaken to present the findings in view of the objectives established for the research.

For this research study, the source of evidence resided in the form of documents, archival records, and electronic files. In addition I conducted focused semi-structured interviews with individual team members, primarily to enhance knowledge that was not evident and as a mechanism to triangulate evidence. Besides gathering multiple sources of data, this study created

¹ Company preferred to remain anonymous

² Organizations like SB have been using packaged solutions long before 1990s.

³ The research design had ES Project of SB as the unit of analysis for research. This nature and process of Business Process Re-design was the embedded unit.

and maintained a “case study” database. Further, a logical database (see Table 2) was created to maintain a chain of evidence. The logical database was organized by “elements and questions”, established in the study by Jarvenppa and Stoddard (1998). These elements and questions were then used, as the guide to analyze if change tactics, used in ES implementation with respect to business process re-design, were revolutionary or evolutionary?

| Area of Tactic | Questions Examining Tactic |
|--------------------------------|--|
| Leadership | Were the champions and sponsors from outside or recent new comers? Were the champions and sponsors part of the management board? |
| Outside Resources | Were employees excluded? Were a lot of outside such as consultants or recent new comers to the organization employed? |
| Physical Separation | Was the project team isolated from the rest of the organization? |
| Financial Crisis | Was there a financial crisis or an anticipated financial crisis threatening the survival of the organization? |
| Rigid Milestones | Were there stated milestones for the field implementation and were they adhered to? |
| New rewards /compensation | Were there new compensation schemes or rewards? |
| Simultaneous IT/Process Change | Was the IT change to occur and did it concurrently with other hard system changes such as process and organization design (i.e. team) changes? |

Table 2: Logical database

Adapted from Jarvenppa and Stoddard (1998, pp.19)

RESULTS

Table 3 outlines the evidence gathered from examining the business process re-design effort, undertaken when SB deployed the SAP R/3 solution.

| Area of Tactic | Evidence | Assessment |
|--------------------------------|--|---|
| Leadership | The general managers (process owners) along with business analysts of the various divisions of SB provided the “leadership” or direction as it pertains to the design of business processes. This was applicable to both “AS-IS and TO BE” business processes. The process owners also were responsible to approve these processes. The configuration of the “TO-BE” processes in the SAP R/3 system was primarily done by the SAP R/3 consultants with assistance coming from the technical members of SB’s project team. | Insiders |
| Outside Resources | Total of sixteen (16) members. Thirteen (13) were full-time employee of SB and three (3) were external consultants | SB led initiative |
| Physical Separation | The core ES Project team was assisted by other employees of SB on a need basis. The entire ES project was undertaken with full assistance and co-operation of existing staff of SB. | No Physical Separation |
| Financial Crisis | Existing business systems was not Year 2000 (Y2K) compliant. Strategic Crisis not Financial crisis | Strategic Crisis |
| Milestones | ES project was completed as per established scope and within the budgeted time and cost. | Yes, Firm Milestones |
| New rewards /compensation | The Project goals and objectives and outcomes stated for SB’s ES project neither outlined nor consider changes to existing reward structures or compensation schemes, by migrating from COMOPS to SAP R/3. | None |
| Simultaneous IT/Process Change | IT changes: Yes. Moved from COMOPS to SAP R/3. Process: Minor (existing business process supported by COMOPS system were configured and migrated to SAP R/3 environment), Organizational design: Minor (to reflect some change in process by moving to SAP R/3 environment). | Major change to IT infrastructure Minor change to business processes |

Table 3: Tactics used during business process redesign phase of ES implementation

The assessments made in Table 3 is then mapped to the theoretical lens (see Table 1: Alternate Change Theories), to determine if the nature of change, was evolutionary or revolutionary. Table 4 categorizes and summarizes the nature of change adopted by SB in the business process re-design phase during the ES implementation.

| Element | Evolutionary Change | Revolutionary Change |
|--------------------------------|---------------------|----------------------|
| Leadership | √ | |
| Outside resources | √ | |
| Physical separation | √ | |
| Financial crisis | √ | |
| Rigid Milestones | | √ |
| New reward /compensation | √ | |
| Simultaneous IT/process change | | √ (see discussion) |

Table 4: Assessment of Table 3 and Nature of Change Approach

DISCUSSION:

Based on the actions taken by SB during the process of SAP R/3 implementation and the evidence (reported in the result section), it would safe to assume that the nature of change, as pertaining to business process re-design, was evolutionary and not revolutionary. There are other observations made from these results that warrant further explanations.

1. **Are business process design and implementation de-coupled in ES implementation?** The simple answer to this is in the negative. Business process design and implementation of the design are undertaken in one single effort or phase). To illustrate this effort, one needs to examine the entire “configuration process”. The following figure illustrates the process undertaken at SB during the deployment of SAP R/3.

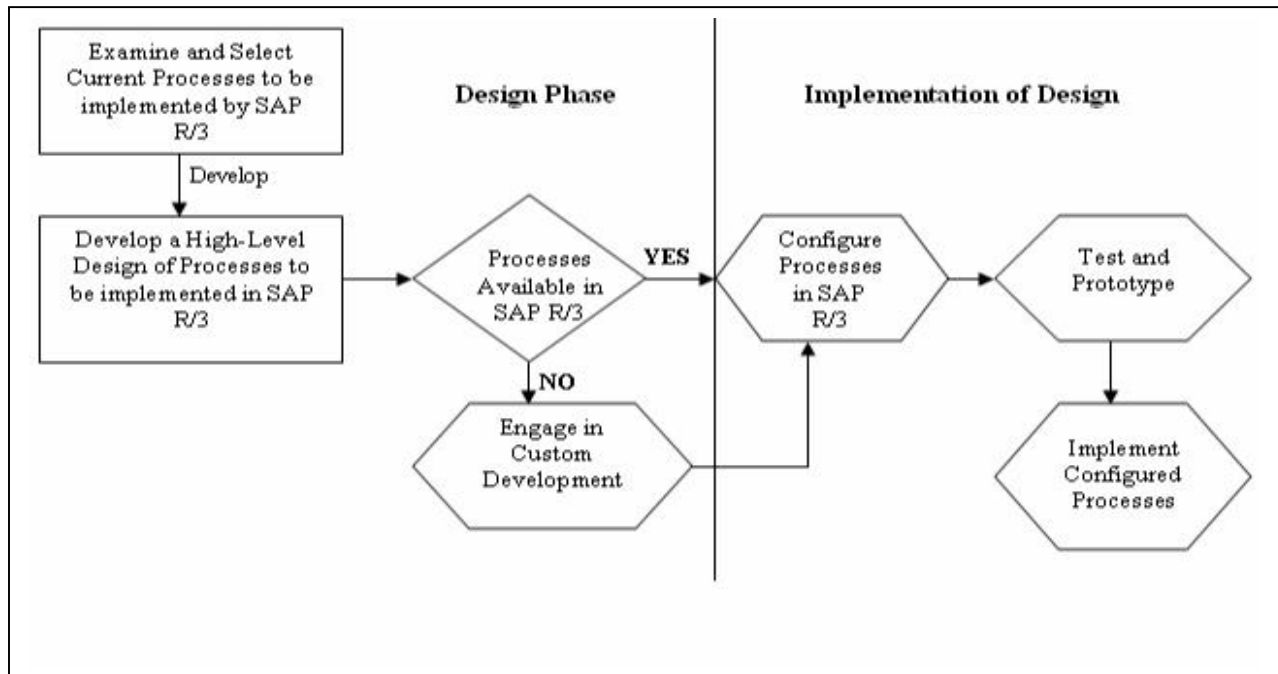


Figure 1: Configuration of Business Process during SAP R/3 implementation at SB

2. Is ES a deterministic technology?

Figure 1 also provides evidence to refute assertions that ES is a deterministic technology, where business process embedded in the ES package are forced upon organizations that implement them. In the case of SB, existing processes supported by the COMPOS and associated systems were migrated to the SAP R/3 environment. The technology infrastructure did change (from COMOPS) to SAP R/3 but such a migration did not have a significant impact to processes nor organizational design.

3. Does ES implementation equate to BPR?

Based on Figure 1, SB did not engage in radical (clean slate) design of business processes. In the case of SB, the existing process became the inputs for the future (desired) business processes. The future (desired) business processes were then matched with the functionality offered by the ES solution. Where a good fit between the desired (future) processes and the ES solution emerged, the processes were configured in the ES package. Custom solutions were developed, where there was not a perfect fit between the desired (future) processes and the ES solution. The entire design of the desired (future) business process was then implemented in the ES solution. In this ES implementation, SB designed and implemented the desired (future) processes based on existing processes. Justifying this action, JM⁴, Information Systems Manager and who represented SB in their ES implementation observed:

“It was a business system replacement project and we were not carried away, with implementing all the 'bells and whistles' available. We had to address the immediate issue of Y2K and the SAP R/3 solution gave us a jump-start. It was our priority in Phase 1, to complete the implementation, gain a better understanding of the new SAP R/3 environment and then experiment with other functionalities.

There is a myth that only ES packages have the best practices. SB, like others, have been adopting best practices, as and when needed, independent of software packages. This validates our need to continue with existing current business processes, with improvements offered by SAP R/3”

CONCLUSION:

The change tactics adopted by SB, during the “business process re-design phase” of SAP R/3 implementation, was evolutionary (BPI) and not revolutionary (BPR) in nature. Theoretical lens of Jarvenpaa and Stoddard (1998) has been useful in clarifying this finding. The finding, from this research study also recommends the addition of one element to seven (7) existing elements mentioned by Jarvenpaa and Stoddard (1998). The element is “Starting Phase” where “current process” is categorized under evolutionary change and “clean-slate design” be categorized under revolutionary change. Addition of this element will aid researchers in determining if BPR (that advocated radical or clean slate design) was undertaken. Again, researchers must pay closer attention to “what they did” and not “what they said”. To achieve this, one must examine the process.

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