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Constructs of Process Change Management in ERP Context: A Focus on SAP R/3

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Abstract

This paper explores the ERP phenomenon from a process change management (PCM) perspective. A framework is used to highlight the various PCM constructs in the context of SAP R/3 implementation. Evidence on how these constructs are operationalized in practice is drawn from a large collection of R/3 case studies representing various organizational experiences. The paper provides foundation and recommends several ideas for future research and investigation.

Introduction

The recent development of enterprise resource planning (ERP) systems (e.g., SAP R/3, BAAN and Oracle) has taken both the academic and business community by storm. However, reported organizational experiences and market statistics relating to ERP have been contradictory. For instance, FoxMeyer Drug claims that its SAP R/3 initiative led its business into bankruptcy (Davenport 1998), while Chevron Corp. experienced a drop in purchase cost by 15% with hopes for a further 10% (Technology Strategies 1998). On the other hand, while the total ERP market was estimated to reach \$35 billion in 1997 (Mullin 1997) and is expected to reach \$94 billion by 2002 (Stein 1997), some recent figures show that more than 70% of ERP implementations do not achieve their estimated benefits (Technology Strategies 1998). A recent survey also reveals that popular ERP packages fall short of expectations in their levels of increasing turnover, recruitment and training (Deloitte 1998). This mixture of results makes the issue of ERP implementation of particular importance. ERP systems have great potential for providing an integrated application environment with a fast and seamless access to single unified information business-wide. However, it is clearly a risk-involving approach merely to consider the merits of such systems away from realizing the complexity associated with unifying both the technical and the business imperative, and the huge organizational changes that this process entails. This is evident in the experience of Applied Materials which found itself overwhelmed by the organizational changes involved, and therefore gave up on its ERP system (Davenport 1998).

As ERP is a relatively new phenomenon, the research related to it is still sparse. However, current research in this field shows a use of diverse theoretical frameworks and perspectives to address various ERP issues. For instance, in evaluating and analysing SAP R/3 implementation, Slooten and Yap (1999) apply a

contingency factors model while Scott (1999) uses a software project risks framework.

In viewing SAP R/3 as an enabling tool for business process change, these theories fall short of covering the multi-dimensional changes involved. Studying such changes entails taking a broader approach towards uncovering the multi-facets of process change management (PCM) in the R/3 context. These can be based on Grover's (1999) PCM framework which embodies five groups of facets, as follows:

- *Change management* – representing various human-related change activities,
- *Project Management* – relating to organizing and monitoring project team relations and activities,
- *Continuous process management* – concerning the ongoing business processes' evaluation and improvement,
- *Strategic planning* – referring to the set-up and planning of change goals and directions, and
- *Technology management* – covering the technology selection and development tasks.

These groups are interdependent as strategic planning directs the entire change efforts enabled by IT (technology management), human (change management) and process (continuous process management) through a well-disciplined project management. This framework is adopted in this paper to provide a structure for the analysis and discussion of the data, which have been gathered from various reported case studies and articles. This framework also facilitates the triangulation at both the data and theoretical level to enrich the study and expand its scope. Constructs of PCM in the R/3 context are identified, and representative examples of organizational experiences are also cited to illustrate the successful or otherwise practices relating to each construct. The five dimensions of the framework and their applicability to the R/3 context are discussed in the rest of this paper.

Change Management

Drawing on the view of Cooper and Markus (1995), change management in the R/3 context can be thought of as involving all human, social-related and cultural change techniques needed by management to ease the transition to and minimize organizational resistance of the new R/3 environment. The empirically-validated best-practice model developed by Clarke and Garside (1997) consolidates change management activities into five

major groups. These are commitment, people, communication, tools and methodology, and interactions.

Commitment – covers recognizing the level of change needed, ownership, and the provision of adequate resources. For example, Anheuser Busch Companies (Summer 1999) establish top-management support, ensure the leadership from a business perspective, and activate the role of championship in the efforts. Owens Corning (Bancroft, et al. 1998) ensures top management commitment to the company's plan to exceed customers' expectations, achieve growth targets and maintain industry leadership.

People – relates to the social and cultural aspects of change. Battco's (Stefanou 1999) experience illustrates the lack of trust between people when some managers were reluctant to share information with each other for fear of losing control over their jobs. Du Pont & Co. (Stevens 1998), for example, follows a careful transition process for its people, aiming to reduce anxiety resulting from possible layoffs.

Communication – covers issues related to internal and external communication. GTE (Caldwell 1998) gets its employees updated through organizing focus groups, publishing newsletters, and making use of e-mail messaging systems and web technologies. Cable Systems International (Stefanou 1999) increases the amount of information-sharing and exchange through establishing "cross-lateral" teams representing various functional areas.

Tools and methodology – relates to training, education and other tools necessary to ensure effective and smooth change. Kodak (Stevens 1997) establishes a competency centre responsible for knowledge management and transfer, as well as creating a common and global configuration and standards. On the other hand, Monsanto (Summer 1999) puts a huge investment on training and re-skilling its employees on the R/3 environment and methodology.

Interactions – synchronizes changes with other operations happening in the organization. For example, Du Pont & Co. (Stevens 1998) manages to play the role of integrator and leader of a major strategic alliance initiative bringing together suppliers, customers and consultants. It follows a shared alliance-management process to develop collectively an overall process architecture.

Project Management

In process change programs, effective project management is characterized with proper team formation and development (Dixon, et al. 1994), clear definition of roles and responsibilities (Talwar 1993), management of

external entities (customers and consultants), and measuring and monitoring progress.

Team formation and development - IMC Global (Plotkin 1999) adopts the "superusers" concept by forming a team of specially trained managers from various departments to meet regularly and share developments on all aspects of implementation.

Roles and responsibilities – Jo-Ann Stores Inc. (Chain Store Age 1998) coordinates the roles of Siemens and SAP, which together provide technical guidance on implementation, with Lake West Group which takes care of the BPR side of the project.

External entities - Textiles Plc (Holland and Light 1999) brings together internal and external expertise into a partnership with top management from all business units.

Measurement of progress - Information management shared services at Bristol-Myers Squibb (Cooke and Peterson 1998) schedules its R/3 systems' implementation into a number of releases to measure the response of users as well as to maintain control of the system.

Continuous Process Management

Based on the Elzinga et al. (1995) definition, business process management refers to the systematic and structured approach to analyse, improve, control and manage processes with the aim of improving the quality of products and services. In R/3 context, three process management activities are important, namely process redesign, process performance measurement and continuous process improvement.

Process redesign – covers appropriate identification of core processes, process orientation and documentation (Guha, et al. 1993). Textiles PLC (Holland and Light 1999), for example, models its business processes and redesigns them according to those within the global system. It aims to achieve 90% global processes and 10% local ones.

Process performance measurement – involves the evaluation of effectiveness of current processes and the adequate identification of process gaps (Guha, et al. 1993) using a set of performance indicators. For example, Alevo (Welti 1999) defines a measurement procedure which monitors and identifies any deficiencies in processes performance.

Continuous process improvement – sustains the improvement gained from R/3-enabled redesign (Bancroft, et al. 1998) through establishing a strategic improvement program that synchronizes ongoing initiatives in a progressive and incremental manner. Alevo (Welti 1999) sets up a number of well-planned post-

implementation projects aiming to keep the momentum of improvement.

Strategic Planning

The strategic planning process aims to define both the business and IT strategy, and to reconcile them together. Main activities involved in this process are carrying out performance gap analysis, justifying change, and setting out and deploying project strategies.

Performance gap analysis – works at comparing performance measures with those of competitors. This process uncovers performance deficiencies, captures leading practices in various business aspects and helps identify attributes for R/3-related process change. Lucent Technologies (Francesconi 1998) examined its financial processes in comparison to those of several large companies in different industries, and found that inefficiencies were primarily focused in the systems and staffing areas.

Change justification – ensures a continual interaction and reconciliation between the business imperatives and the IT imperatives. This process involves the development of taxonomies of benefits that reflect the positive and negative impacts of the R/3 on the whole business. For example, Monsanto (Sumner 1999) justifies its implementation from an operational excellence perspective, focusing on cutting the cost of core transactions-processing systems like order processing and inventory management.

Project strategies – draw the path for all R/3 activities and ensure their top-down deployment. ETH Zurich (Mahrer 1999), for instance, develops a clear vision and a set of strategic goals such as increasing user-friendliness, stabilizing staff cost accounting, and using the PCs for all activities. Lucent Technologies (Slooten and Yap 1999) defines a set of implementation assumptions relating to its approaches to thinking, working, controlling and modelling during the R/3 implementation.

Technology Management

Drawing on Grover's (1999) definition, technology management in the R/3 context can be seen as embodying three major tasks, namely software selection, technical analysis and design, and installation.

Software selection – involves investment evaluation, and contracting with supplier and consultants. For instance, The State of Kentucky (Henry 1998) bases its selection on realizing the need to leverage its existing PCs and LANs, and implement Electronic Fund Transfer, EDI and Internet.

Technical analysis and design – covers analyzing the current system infrastructure and the design of the new R/3 architecture. ComputerCo (Gibson, et al. 1999), for example, places an emphasis on designing business processes rather than on systems by making use of interactive business processes modeling techniques for configuring the R/3.

Installation – relates to customizing and configuring the R/3 modules, transitioning to the new system environment, and maintaining and supporting the system on a continual basis. RTL Television (Bancroft, et al. 1998) replaces its accounting, assets management, cost control and payroll systems with one integrated system.

Conclusion

The ERP is a developing multidiscipline phenomenon that calls for a multifaceted approach towards understanding its complexity. The mature field of PCM exhibits a matching character, and thus represents an ideal theoretical basis for comprehending such a phenomenon. This paper explores the SAP R/3 deployment process through a PCM framework, supported by extensive examples on the practice of a wide range of organizations.

This research is an evidence of the validity of PCM as a theoretical source suitable for guiding ERP research and practice. The paper provides taxonomies of PCM constructs in the case of R/3 implementation. The framework presented provides a road map that can be useful in guiding the implementation process. It can also be subjected to empirical testing using a large-scale survey. A number of critical success/failure factors can be developed using the framework, and their criticality can be assessed. Furthermore, a set of dependent and independent variables can be derived to construct a testable model that provides statistical measurements on the relationships between project success and various situational and contextual factors.

One major observation that this paper can provide is that existing ERP literature is so far largely dominated by anecdotal cases and comments, and the need for theoretically grounded and methodologically sound empirical research has never been more urgent. Based on this research, it would be interesting if the framework and taxonomies presented are extended to embrace more broadness, representativeness and generalizability. Each construct can be explored further using a micro-type of research that identifies internal elements, uncovers their working and relationships, and measures their two-sided effects on the deployment process. Longitudinal case research appears to be particularly appealing in the ERP field since it allows for more research patterns and rigorous evidence to emerge. A cross-cultural research will help uncover the global and regional issues and their interactions in specific organizational settings.

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