

STRATEGIC ENTERPRISE RESOURCE PLANNING FOR GLOBAL SUPPLY CHAIN COMPETITIVENESS

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ABSTRACT

Strategic Enterprise Resource planning (SERP) systems are networked and integrated information mechanisms which are developed to achieve competitive advantage for organizations operating in global scale. It plays a vital role in integrating various stake holders and channel partners involved in day-to-day operations. In the present, Globalized competitive environment adoption of technology has become inevitable and Organizations are competing with one other for small product margins. The objective of this paper is to investigate under which circumstances SERP may be involved in transformation of Organization resources to achieve Global supply chain competitiveness. The paper further examines its role in contribution to Knowledge Management applications and its support for Corporate Decision making.

Keywords: SERP, Global Supply chain competitiveness, Organization Resources, Knowledge Management.

INTRODUCTION

Strategic Enterprise Resource Planning played a vital role in software market during the last two decades. Organizations adopted Strategic Enterprise Resource planning (SERP) to improve day to day business processes, to gain competitive edge in product margins, to cut down costs and prepare for global competitiveness. Adoption of emerging technologies have become inevitable for Organizations to sustain in ever changing global competitive environment. Along with the growth of SERP implementation there is also criticism for expensive implementation costs, restricted functionality and inflexible, complex and complicated configuration installations.

Strategic Enterprise Resource Planning (SERP) is the basis that determines how the day to day business processes function. The implementation of a Customer Relationship Management (CRM) strategy requires a system in which an Organization's back office and financial functions are integrated with its front office Customer facing process. In order to be successful Organizations need to integrate front and back office functions on many levels in order to make Product and service data, order management, Customer

service etc as part of the system. Back office refers to Organizations internal processes and consists of Order Management and Billing, Distribution and logistics, Manufacturing, Procurement, Finance and Accounting, Human Resources etc. SERP plays a vital role in Integrating SCM (supply chain management), ERP (Enterprise resource planning), CRM, KMS and Corporate Decision Making Systems in Organization. With the advancements of technology it is a challenge for Organizations to implement Strategic Enterprise Resource Planning in a systematic manner and to achieve Synergy and build Global supply chain competitiveness.

Literature Review

This Literature review highlights the important issues Organizations encounter in Strategic Enterprise Resource Planning (SERP) Implementation to embrace Knowledge Management systems (KMS) and SCM-CRM Integration. In the process of SCM-CRM Integration advancements in technology have opened enormous possibilities to share information and resources. However, the adoption of integrated approach throughout the Supply chain requires a trade-off between autonomy and control between each supply partner relationship (Graham and Hardaker, 2000).

Organizations also need to understand the implications of integration across the entire supply chain (Venkatraman and Henderson, 1998).

SERP represents a philosophy of managing technology and processes in such a way that the enterprise optimizes the delivery of goods, services and information from the supplier to the customer. This demands change across the supply chain-change to management practices, performance metrics and business processes. Two major factors underpin the success of SERP implementation (Norris, 2001). Firstly, all Organizations involved must view collaboration as a strategic asset and an operational priority in order to facilitate trust among trading partners. Secondly, SERP allows information visibility across the supply chain to become a replacement for inventory it must therefore be managed with strict stringent discipline policies and monitoring mechanism. However, Kehoe and Boughton (2001) argue that total cycle time compression and inventory cost reduction will only occur when the entire supply chain is optimized rather than individual enterprises. Kennerley and Neely, (2001) draws the same conclusion, stating that all steps in the supply chain from design to after sales service must become an integrated flow of information.

SERP provides organizations with significantly increased strategic options for achieving long-term flexibility and adaptability – a critical competitive advantage (Sarkis and Sundarraj, 2000). It also levels the playing field between large and small companies, allowing any size enterprise to access suppliers and customers around the globe and with the advancements in technology customers are demanding faster turnaround and greater customization than ever before. At the same time, companies are looking for innovative ways to make their businesses more customer-centric. They need to improve their relationships with customers and create customer loyalty.

Lee, H.L., Padmanabhan, V. and Whang, S(1997) suggest that information exchange can help avoid one of the best known problems in the supply chain, Forrester's bull whip effect. The theory says that the irregularities and unpredictability in order quantities increase with the number of layers in the chain. This theme is supported by

Kehoe and Boughton(2001) who state that the Internet provides the ability for demand data and supply capacity data to be visible to all companies within a manufacturing supply chain and, as such, companies are in a position to anticipate demand fluctuations and respond accordingly. The Internet has allowed a shift towards dynamic communication and improved integration, often ahead of the physical movement of goods. Porter acknowledges the impact of the Internet on the supply chain (Porter, 2001).

For Organizations to take advantage of supply chain capabilities they must ensure that their own ERP systems are implemented correctly beforehand. Without properly functioning ERP Systems supply chain may do nothing more than create upstream and downstream problems at Internet speed (Norris, 2001). Alternative exchange mechanisms may be categorized based on the relative extent of vertical control available from the mechanism (Sporleder 1992). Allowing all partners in the supply-chain to dynamically view and manage both demand and capacity data raises opportunities for the simultaneous improvement in customer service levels and the reduction in overall inventory levels and associated costs, (Kehoe and Boughton, 2001). Instead of being linear and fixed, the e-supply chain is an enhanced network, a complex but well defined web of relationships with multiple channels and an open flow of information(Koch, 2000). However, organizations willing to share information with their supply chain partners may be few. Many companies believe that their own information gives them a crucial advantage and have no desire to share it freely (Agrawal and Pak, 2001)

Organizations wishing to integrate their supply chains will face many barriers, both internally and externally (Norris, 2001). Organizations are already communicating with each other but they need to move to the next phase where they are co-ordinating on a timely basis before they can collaborate, i.e share information electronically. Collaboration implies visibility of internal activities and metrics by external parties. An organization's ability to perform is therefore a lot more transparent, and therefore puts pressure on the organization. Managers need to be rewarded on how they optimize the entire supply chain rather than their own specific link. Change management

will be an important issue facing organizations. People throughout the Organization need to be able to manage the impact of having a faster flow of information.

Knowledge Management Systems

Knowledge Management is introduced in the analysis of strategic alliances. Knowledge Management logic helps in understanding the information-sharing aspects of a strategic alliance. Ambiguity plays a role in the extent to which information is shared. Knowledge management provides a novel insight into the foundations of a strategic alliance. The potential of a strategic alliance creating a real option for managers is examined along with the characteristics of networks that are organized around continuous learning.

The emerging area of Knowledge Management is introduced in the analysis of strategic alliances and networks. Knowledge Management helps in understanding a firm's willingness to enter into strategic partnering with another firm where the object of cooperation cannot be evaluated using conventional means. The structure of knowledge management is useful in providing novel pathways in which to explore inter-firm information sharing. Knowledge management logic is especially useful by providing additional characteristics of a strategic alliance, such as potential for learning and creating managerial flexibility. Such characteristics provide novel insight into incentives for entering into strategic alliances among vertically-allied economic agents within a supply chain.

Strategic alliances are viewed as a special case of strategic partnering. The analysis specifically focuses on the issue of performance evaluation of strategic alliances, especially when there is no separate profit centre created as part of the alliance. If no profit centre is a part of the object of cooperation, performance evaluation becomes more arduous and complex. In this situation, the partners to the alliance typically cannot use conventional performance measures, such as profit or return on investment, to judge the performance of the alliance or to evaluate the wisdom of their partner's decision to enter into the alliance.

Knowledge management has emerged recently as an integrated approach to identifying, creating, managing,

sharing and exploiting the information and knowledge assets of an organization (Sporleder and Moss 2002). The importance of skill acquisition, learning and the accumulation of capability over time is the core of knowledge management within an organization (Nonaka 1994 and Teece 2000). Organizational knowledge management may be viewed as a process of knowledge creation and the organizational performance outcomes that result from that knowledge. Information sources include networks for acquiring information from internal and external sources. The notion is that networking improves the flow of information.

Learning capacity differs among firms or agents in the supply chain. The absorptive capacity (learning capability) of an individual or organization is the ability to recognize, assimilate and incorporate information, either internal and external to the organization (Cohen and Levinthal 1990). Absorptive capacity partially determines the use of knowledge and the quality and scope of decision-making based on it. One tenet of the model is that as absorptive capacity of an organization or an individual improves, the more new knowledge is created. Powell, Koput, & Smith-Doerr, (1996). The knowledge management logic is based on the notion that knowledge creation is positively correlated with both innovation (Nonaka 1994) and financial performance (Nelson and Winter 1982). Innovation and improved performance are the end points from new organizational knowledge.

The application of knowledge management logic to strategic alliances seems appropriate. One driver behind the formation of strategic alliances is often regarded as information sharing or exchange (Sporleder 1994). The aspect of knowledge transfer in strategic alliances is focused on casual ambiguity that is common in resource-based theory of the firm. Ambiguity conceptually provides barriers to imitation, which makes it difficult for rivals to know which competencies form the basis for competitive advantage (Simonin 1999). Ambiguity is empirically verified by Simonin (1999) to play a major role in the knowledge transfer process among alliance members. Thus ambiguity is a contingency that appears to influence the outcomes of knowledge transfer in a strategic alliance. Ambiguity

joins the list of other factors thought to influence knowledge transfer such as complementarities of existing firm assets among alliances partners and the governance mechanism employed by the alliance. Complementarities of assets are thought to enhance the firm's capacity to understand new information from the partners of the alliance. Opportunism and trust are thought to be important in the outcome of a strategic alliance. The extent of trust is rooted in the cultural-value similarities among alliance members and may be related to the social capital of the organizations of the alliance. This social-capital direct tie back to the knowledge management literature could serve as the base for numerous interesting and novel hypotheses and interactive influences regarding information sharing, trust and social capital in alliances.

Finally, the notions of relational embeddedness and structural embeddedness flowing from knowledge management logic may be important to understanding why strategic alliances form among particular firms and not others. Network embeddedness, encompassing both structural and relational embeddedness, may influence the outcome of a firm's participation in an alliance and could affect the design and implementation of strategy relating to quality signaling in supply chains (Spotleder and Goldsmith 2001). The type of social capital that generates a competitive advantage over rivals may depend on the competitive environment. Firm engaged in knowledge exploitation, rather than exploration, may require specific knowledge that is best procured from dense network structures Rowley, Behrens, and Krackhardt, (2000). However, dense networks may cause firms to neglect or not fully appreciate new information and alternatives (Nahapiet and Ghoshal 1998).

From Figure 1 the SERP Implementation framework is a model for efficiency and performance based on the concept of fully Integrated Organization. Management in Organizations is part of the SERP decision process while commercial depend on CRM process and procurement rely on SCM.

The order of Implementation doesn't mean to complete all 5 levels first and follow it with other systems. All the five levels

of SCM, ERP, CRM, KMS and Corporate Decision Support Systems (CDSS) are reference and fundamental levels in Organization which play an important role in Implementation to meet the objectives. However Implementation thoroughly depends on Organization situation. It has enough financial and human resources many levels could implement in parallel after knowing their dependencies. The most important element is starting the Integration with a core as the framework shows importance of Integration related to Strategic Enterprise Resource Planning (SERP).

SCM-ERP-CRM Integration

The rapid growth and Adoption of technology has resulted in Organization restructuring with the objective of utilizing Organization resources to enhance supply chain competitiveness in global scale. In the present context Organizations are planning to integrate ERP, SCM and CRM applications to achieve competitive advantage in the global market place. Integration of ERP, SCM and CRM is a challenge to many Organizations and effective Implementation results in well executed business strategy. For Organizations to maximize revenue and profits it is important to synchronize supply and demand in real time and Strategic Enterprise Resource planning (SERP) facilitates Supply chain operations, Customer interaction, Order tracking, Purchasing and Materials management. SCM and CRM when considered as separate applications Organizations may miss strategic opportunities and it results in poor performance. Integration of SCM and CRM is

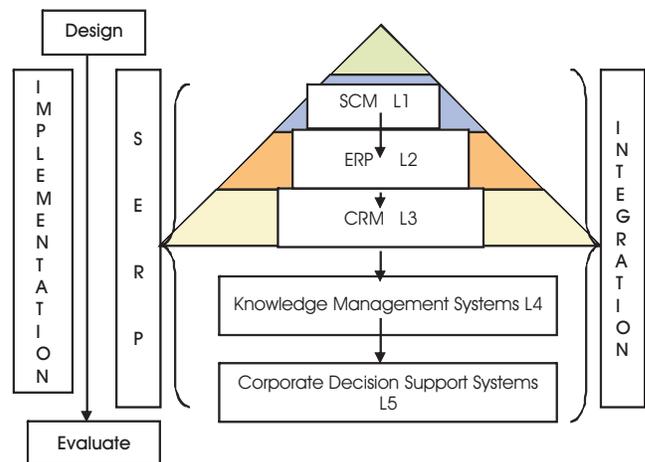


Figure 1. SERP Implementation Framework

essential for Organizations to operate and compete in global business environment.

According to Frohlich and Westbrook, (2001) Integration is “the quality or state of collaboration that exist among departments that are required to achieve unity of effort by the demands of environment”. Recent studies in the context of supply chain management however have proposed a broader concept of integration that includes not only integration of buyers but also integration of suppliers in the chain. For the purpose of research the authors define Integration as the collaboration and linkages between and across organizational functions as well as organizational partners, including customers and suppliers.

The purpose of this study is to

- To build a foundation for understanding the important Determinants of SERP Implementation in Organizations
- To examine and contribute to the new forms of Knowledge Management Systems (KMS) in organizations.
- To test the value of SCM-CRM integration in Organization performance.

Hypothesis

Ho1: SERP Implementation will have no effect on Organization performance.

Ho1: SERP Implementation will have a significant positive effect on Organization performance.

Ho2: KMS will have no effect on Organization performance.

Ho2: KMS will have significant positive effect on Organization performance.

Ho3: SCM-CRM Integration will have no effect on Organization performance.

Ho3: SCM-CRM Integration will have significant positive effect on Organization performance.

Research Methodology

This study used Survey method to investigate SERP Implementation, KMS and SCM-CRM Integration characteristics in Pantaloon Retail sector. A questionnaire is drafted with independent variables in SERP

Implementation, KMS, SCM-CRM and Organization performance. This draft questionnaire was then pre-tested with academicians and practitioners to check the content validity and then modified as suggested. The modified questionnaire was pilot tested to examine content validity and research suitability for the target sample size. The data was obtained from Enterprise Resource Planning (ERP), ,logistics and purchasing managers who had thorough knowledge and experience of SERP Implementation and Integration practices followed in organization. These respondent managers were asked to rate their SERP practices in relation to understanding of Knowledge Management Systems (KMS), SCM-CRM Implementation and its impact on Organization performance. The independent variables of SERP implementation and Integration practices usually reflect corporate level practices and dependent variable Organization performance reflects corporate level results.

The survey specifically concentrates on Pantaloon Retail SERP, KMS and SCM-CRM integration practices and its impact on Organization Performance. The total number of distributed questionnaires were 400. Initially ninety 90 completed questionnaires were received and with follow ups another 20 twenty added to the score. Overall 110 completed questionnaires were received with a response rate of 27 % which is an average response rate.

Hypothesis Testing

Three Hypothesis were used to test the relationships between SERP Implementation, KMS, SCM-CRM and Organization performance. Each item of the answer for the question regarding SERP Implementation, KMS, SCM-CRM was tested and organization performance was created as a dependent variable and one-way ANOVA analysis was performed to test whether using each Strategy effects the overall performance.

Table 1 shows SERP Implementation was confirmed to have positive effect on Organization with $F=9.074$ (Ho1) which is accepted, KMS application was confirmed to have positive effect on Organization with $F=8.063$ (Ho2) which is accepted, SCM-CRM integration was confirmed to have positive effect on Organization with $F=8.024$ (Ho3) which is accepted, The Null Hypothesis Ho1, Ho2, Ho3 were

Strategy	Hypothesis type	Category	N	Mean	F-value	Sig.
SERP implementation and Organization performance	H1	0	65	2.127	9.074	0.008
		1	45	1.934		
KMS application and Organization performance	H2	0	60	2.112	8.063	0.007
		1	50	1.924		
SCM-CRM integration and Organization performance	H3	0	58	2.102	8.024	0.006
		1	52	1.913		

Table 1. ANOVA Analysis: Effects of SCM-CRM Integration

rejected. Regression analysis was used to analyse and examine the effects in respective domains of SERP, KMS and SCM-CRM Integration. The questionnaire includes Fourteen constructs consisting of seventy four items. Most of the variables used formative multi-item scales.

It is evident from the results exhibited in Table 2 that SERP Implementation (C1), KMS (C2) are confirmed to have positive effect on Organization performance. The results of Customer Service (C12), SCM-CRM Integration (C10) and Distribution and logistics (C11) have further shown considerable positive effect on Organization performance. All these variables play an important role in SCM-CRM implementation and enhancing organization performance. The remaining variables have demonstrated a minimal effect in relationship with Organization performance. The Variables Customer influence level (C6), Queue at Billing (C9), and Relative Size of the Organization (C13) have demonstrated marginal negative effect on Organization performance.

Implications and Discussions

The present study offers several theoretical implications. The important point is that the effectiveness of specific Knowledge management practices can further facilitate better applicability of Resource planning in the realm of

Independent variables		Parameter estimate	t-value	p-value	R-Square	Adjusted R square
SERP Implementation	C1	0.283	1.917	0.074	0.072	0.048
KMS Application	C2	0.323	2.121	0.041	0.092	0.072
Access to Services	C3	0.057	0.312	0.739	0.003	0.021
Initialization of Service	C4	0.057	0.384	0.706	0.004	0.020
Problem resolution	C5	0.074	0.542	0.594	0.007	0.017
Customer influence level	C6	-0.002	0.012	0.993	0.001	-0.024
Customer complaints	C7	0.132	0.864	0.384	0.016	0.005
Customer Expectation	C8	0.091	0.613	0.558	0.007	0.016
Queue at Billing	C9	-0.091	0.072	0.947	0.001	0.022
SCM-CRM Integration	C10	0.321	2.116	0.042	0.091	0.072
Distribution and Logistics	C11	0.282	1.821	0.091	0.064	0.044
Customer service	C12	0.521	3.764	0.001	0.245	0.214
Relative Size of Organization	C13	-0.005	0.070	0.966	0.001	-0.024
Infrastructure and facilities	C14	0.356	2.549	0.019	0.132	0.112

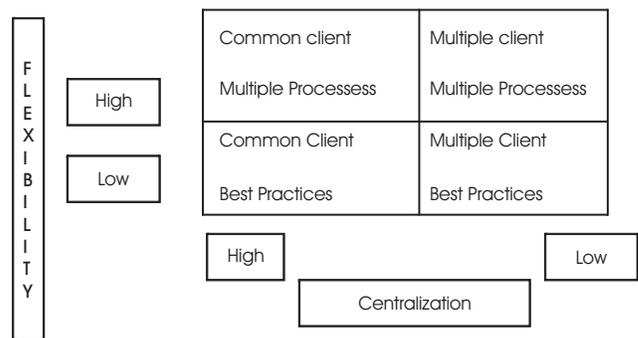
Table 2. Effects of SCM-CRM Integration and Organization performance

Strategic Enterprise Resource Planning (SERP) Concept. In the present study of Pantaloon Retail the validity can be related to a proposed illustrative framework based on Practitioners experience with SERP installations as supported by Flexibility - Centralization Matrix of Jacobs and Whybark as illustrated in Figure 2.

Based on prior experience, the Organization prior to implementing SERP tend to lay in the Upper Right corner of the Framework (Multiple Clients and Multiple Processes) and after Effective implementation it moves itself to Lower Right Quadrant strategies.

(Multiple clients Best Practices). The survey results have suggested the importance of SERP Implementation, KMS and SCM-CRM Integration. All these forms have shown significant positive relationship with organization performance, in this case Pantaloon Retail sector. The findings from the study offered empirical evidence to confirm the validity and importance of Integration at various levels in the Organization and also contributed to the emerging literature on SERP among the partners to the Organization. In particular SCM-CRM integration levels showed significant positive relationships with overall SERP Implementation levels in the organization. The study further recommends at each specific time KMS plays a prominent role in the organization quest for Innovation and Corporate Decision making in Global Competitive environment.

Effective KMS results in optimum utilization of Organization resources and facilitates Global supply chain competitiveness. Integration and co-ordination among the stakeholders and channel partners in global scale results in enhancing Global supply chain competitiveness.



Source: Based on work of Jacobs and Whybark

Figure 2. Flexibility and Centralization Matrix

Several limitations need to be considered in the present study in view of the specific time period and factors considered as part of the study in retail sector. This study was conducted only at a fixed time period at Pantaloon retail and the results provide a snapshot of SERP Implementation, KMS and SCM-CRM integration. Therefore the results need not necessarily apply to other industries in other countries. The sample for the study was selected partly on convenience, therefore the findings cannot be generalized without caution. The average sample of 110 completed questionnaires prevented a more comprehensive statistical and in-depth analysis of the data collected during the study. The actual respondents for the study may have perceived SERP, KMS and SCM-CRM Integration in different ways.

Conclusion

The present study proposes SERP, KMS and SCM-CRM Integration at various levels in Retail sector and its importance in improving organization performance. In the future it is inevitable for Organizations to implement SERP, KMS to survive and sustain in competitive world. The study further highlights SCM-CRM integration at each level in the organization and the importance of Integration in enhancing organization performance. The study highlights the role of KMS in Innovation and Organization restructuring to meet everchanging dynamic business conditions and customer preferences. However, these results should not be interpreted to mean that other weaker predictor variables in specific performance should be ignored. These variables may be further interacted with or moderated so that the magnitude of its effect is changed. Future research should consider explaining such interactions and moderations in different integration practices in Organizations. The results of the study provides managerial insights about specific SERP Implementation mechanisms and SCM-CRM integration practices and its role in building Organization competitiveness in global scale.

There are various ways that SERP can be achieved to add value to Organization performance. Organizations can gain competitive advantage from SERP but they must embark on a process of continuous improvement and

Knowledge Management systems planning framework. Organizations which do not realize the importance of these innovative mechanisms will struggle in competitive convergence and over a period of time will be dominated by competitors. The present research demonstrates that SERP is not simply a matter of adding new applications and mechanisms in Organizations rather it is a challenge for Organizations to examine and redesign the process. To design an effective SERP firstly the present systems external and internal must be thoroughly examined in light of advancements in communication and technology. Secondly an effective Knowledge Management mechanism must be implemented. Thirdly SERP Implementation needs to be revisited with focus on SCM-CRM integration and should make sure that further mistakes are avoided in practice. Finally a robust, strong SERP Implementation mechanism needs to be developed and implemented with clear objectives and key success factors to achieve Global supply chain competitiveness.

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