CHAPTER 3 - LITERATURE REVIEW

3.1 The Success Factor of E-procurement System

Usually, procurement activity represents one of the largest expense items in an organization's cost structure. The e-procurement is defined as the major activity of the supply chain management and procurement is supported by information technology. The system will help the companies develop a catalogue through the network to fulfil the needs of internal customers. To compete with other global players, firms need to craft a portfolio approach to manage their relationships with trading partners and work together to create a competitive advantage (Hope-Ross et al., 2000). Procurement can also be regarded as a dynamic process involving a constant flow of information, material, and funds across multiple functional areas within the organization. Therefore, no single e-procurement solution can adequately address the needs for a firm to purchase different types of goods or services (Hope-Ross et al., 2000; Rajkumar, 2001) and the firms will need to consider three major types of electronic environments for e-procurement: (1) buy side applications; (2) sell-side applications; and (3) marketplace services (Davila et al., 2003; Kyte, 2000a, b). At Bayer and Xerox the roll-out of the e-procurement system has been aligned with the SAP R/3 project. The decision in favour of a particular e-procurement system will usually depend on the existing ERP and procurement system. However, comprehensive studies on system evaluation are not usually performed. Selecting a system tends, therefore, almost without exception to be a pragmatic decision. Xerox, for example, evaluated e-procurement systems from Ariba, Commerce One, Oracle and SAP, and finally

chose the SAP solution because of its integration capability with their existing SAP R/3 system. Another major criterion when selecting an e-procurement system is its technological maturity. Cisco opted for Ariba's e-procurement system as it provided the best link to the Oracle system at the time and led in terms of user friendliness. Typically, all e-procurement systems have adapters to allow seamless integration with back-end systems. Cisco's Ariba system, for example, extracts all user information such as user name, password and IP addresses from the Peoplesoft human resources system. Additional interfaces exist to link in the Oracle financial and material management system. As e-procurement is not targeted exclusively at the optimization of internal processes, integration is also required with the suppliers and electronic marketplaces. SAP, for example, uses Emaro to link with suppliers' systems for order processing and accounting.

Onc of the important cycles of the e-procurement system is the spending analysis, which is the process of aggregating, cleansing, and analyzing corporate spending data for the purposes of reducing costs and improving operational performance (Mitchell, 2004). Functional silos, ad hoc management practices, weak technology support, and poor source data qualities have worked against firms' ability to conduct spend analysis (Mitchell, 2004). Without spend analysis, a firm cannot maximize its buying leverage, arrive at intelligent sourcing decisions, ensure compliance with supplier contracts, raise supplier performance,

optimize budgeting and planning, and anticipate the impact of changes in cost, inflation and other factors (Mitchell, 2004).

The best procurement practices require identifying which products or services should be sourced from specific suppliers and thus consolidate suppliers and contracts (Hope-Ross, 2001c). Lion Nathan, an Australian-based beverage firm, consolidated its sea freight spending and contracts with a single provider and achieved significant savings. Its operations in New Zealand, China, and Australia all used international sea freight services (Bushell, 2004).

Strategic suppliers of buyer firms usually constitute 20-40 percent of their supply base. These suppliers offer the buyer firm the greatest chances of e-procurement success. Buyer firms should further narrow down the list of candidate suppliers for e-procurement initiatives by considering only those with previous e-procurement engagements with other customers, those interested in emerging innovations, and those that have the local decision-making authority to approve the investments and business process changes the buyer might require (Kyte, 2001a, b, c).

Firms need to develop a solid business case for subscribing to e-procurement software and services through cost-benefit analyses (Hope-Ross et al., 2000). There is a wide variability in the price of e-procurement applications from about $10,000 (Trilogy software) at the low end and from $500,000 to $2 million

(CommerceOne solutions) at the high end (Hope-Ross and Reilly, 2000a). Firms may have to deal with multiple vendors, each specializing in different e-procurement functionalities (Rajkumar, 2001). Hackett studies show that firms that were most successful with their e-procurement practices also cut back on the number of vendors they had contracts with per billion dollars in spending (Roth, 2001).

The buyers will increasingly rely on their suppliers' ability to connect with them electronically and support the catalogue creation and maintenance issues involved in e-procurement. Thus, buyers need to carefully select suppliers who are in the best position to respond to their e-procurement deployment plans (Hope-Ross, 2001b; Rajkumar, 2001). Suppliers may prefer one e-procurement system over another on account of transaction fees being charged by e-marketplaces or catalogue managers (Hope-Ross, 2001a). Thus, buyers need to know if transaction fees are an issue for suppliers because, if this is so, these additional costs will very likely be passed on to the buyers. Certain suppliers will not be able to keep up with buyers' technology requirements (Hope-Ross et al., 2000). Buyer channel masters need to be prepared to underwrite the costs of getting valued but underequipped suppliers on board major e-procurement initiatives. PricewaterhouseCoopers calculated that a firm could gain savings of 30-40 percent of non-direct spending if they buy only from preferred suppliers (Hope-Ross and Reilly, 2000a). Certain procurement software products are designed to automate a firm's purchasing processes and policies and, thus,

direct order requests for specific goods to preferred suppliers (Kanakamedala et al., 2003).

Significant benefits from e-procurement come from reengineering procurement business processes and subsequent modifications in employee behaviour and relationships with suppliers (Attaran and Attaran, 2002; Supplier Selection & Management Report, 2001; Rajkumar, 2001; Hope-Ross and Reilly, 2000a; Lin and Hsieh, 2000). Use of an e-procurement application is secondary only to meeting change management requirements in affected procurement business processes. Firms usually begin their e-procurement efforts by sourcing indirect goods and/or services first (Davila et al., 2003; Orr, 2002; Kyte, 2000a, b). The Aberdeen Group (2001) found that about 30-60 percent of a firm's total expenditure is due to purchases of indirect goods/services. It is recommended that the firm centralize the control of its contracts, product data, catalogues, and price updates for indirect procurement (Bartels, 2004a, b; Hope- Ross and Reilly, 2000b; Hope-Ross et al., 2000). Web-enabled procurement enables the firm to centralize purchasing business processes and gain three benefits: (1) spreading administrative costs over a larger volume of purchases; (2) negotiating more favourable prices and terms for goods/services purchased; and (3) motivating end users to use the software and, thus, eliminate off-contract buying (Subramaniam and Shaw, 2002). Croom's study of procurement practices in the UK, continental Europe, and the USA reveals that centralization allows firms to

gain greater control over sources of supply, purchase price, and inventory policies (Croom, 2000).

Workflow rules embedded in the software govern the e-procurement tasks (1) Access and privilege rules: the information presented to authorized users needs to be determined by information access and privilege rules covering such things as customer-specific information that may include pricing and detailed product item specifications; (2) Non-repudiation rules: allows suppliers to ensure that the electronic message has been received by buyers and also authenticate the origin of the message; (3) Pricing rules: alerts buyers that certain suppliers have increased the prices of certain goods beyond preset thresholds (Rajkumar, 2001; Hope-Ross and Reilly, 2000b; Hope-Ross et al., 2000). Eastman Chemical Company designed purchase order rules so that purchase requests below $2,000 translate into a formal purchase order generated by CommerceOne EnterpriseBuyer, which then transmits the document to CommerceOne MarketSite, which directs the purchase order to the right supplier. Purchase requests above $2,000 are forwarded to the firm's SAP R/3 system (Aberdeen Group, December 2001).

Providing visibility into individual and unit spending within the firm is a precursor step to conducting spend analysis (Hope-Ross and Reilly, 2000b; Hope-Ross et al., 2000). "Visibility" means making transparent who is doing the spending, how much they are spending, on what they are spending, and with whom they are

spending (Bushell, 2004). “Visibility” also means assigning ownership of spending to the individual or unit that knows most about the purchase and sharing the responsibility over purchases with all other corporate units using those same goods. Managers should also track saving targets for each spend category, link these targets to departmental budgets, track actual savings achieved and, finally, tie the bottom line to individual or unit performance evaluations linked to the savings targets (Kanakamedala et al., 2003).

3.2 Challenges of E-procurement System

Less developed marketplaces may not be able to offer a complete line of services such as electronic requests for quotes, reverse or forward auctions, dynamic bidding, and e-catalogue creation and maintenance to subscriber firms. To gain a critical mass in membership, these marketplaces are reluctant to charge members high enough fees to cover the costs of delivering basic and other value-added services such as hosting services, logistics, payments, systems integration, outsourcing, and information technology consulting (Kyte, 2000b). Immature marketplaces also do not understand the use of effective business models and may lack sophistication in the way they approach potential member firms (Furlonger and Landry, 2001).

Buyer/channel master firms will need to deal with the technological immaturity of a number of suppliers and their unpreparedness to respond to electronic purchasing initiatives (Hannon, 2001; Kyte and Miklovic, 2001; Min and Galle,

2001; Kyte, 2000b). Firm size appears to be a factor here. The Min and Galle study (2001) indicates that small firms are averse to innovation and tend to lack the technical knowledge/expertise, personnel, and IT infrastructure needed to respond to channel master requests to connect with them using certain electronic procurement arrangements.

Consultant expertise on more advanced procurement initiatives is still limited and a peculiar difference among industries complicates the matter even more. Larger and leading-edge firms are used to educate their “consultants”, but smaller firms will expect more current and directive guidance from so-called consultants than is usually available in the marketplace (Kyte, 2000b). Earlier e-procurement vendors found that they locked themselves into ineffective pricing models for both client licences for buy-side applications and transaction charges for marketplace services (Kyte, 2000b).

E-procurement software is still limited in many ways. An IDC report revealed end user dissatisfaction with procurement applications because of lack of analytical capabilities (Vesset, 2003). Some e-procurement systems are unable to handle multiple data formats from major vendors such as Ariba, i2, CommerceOne, among others, or enable painless backend integration with the firm’s existing business applications (Attaran and Attaran, 2002). A number of e-procurement software packages cannot manage the complexities of different jurisdictions, currencies, tax structures, etc.; lack comprehensive payment and settlement

features like sophisticated invoicing, payment, reconciliation, authentication, and security; and lack higher-end features like demand management and spending analysis capabilities, and the ability to consolidate general ledger and invoicing systems (Kanakamedala et al., 2003; Roth, 2001). Lately, software vendors have added functionalities to e-procurement software and automated spend analysis to help firms identify sourcing opportunities, track employee purchasing transactions with various vendors, and assess compliance with corporate sourcing policies (Bartels, 2004a, b).

There are specific integration problems related to managing data coming from multiple systems interacting with the e-procurement package and from using different e-procurement packages as well. Interviews with procurement executives revealed the following concerns: difficulty in keeping controls and data management standards when adding other e-procurement systems; difficulty in taking spend data from e-commerce-driven transactions and connecting them to the rest of the purchase transaction data collected through other systems (Aberdeen Group, 2001); and lack of base “infrastructure” to collect transaction data from more than one e-commerce application.

Some firms struggle with the hazards of e-procurement experimentation. Komatsu Mining Systems (KMS), a $500 million international manufacturer of construction and mining equipment, created a private web-based network that integrates its existing Baan ERP system with the procurement systems it has

with its suppliers through a portal. At the time KMS was planning the portal, it did not have a reference project from which to learn or benchmark its concept and plan. Also, Baan was still developing its web-based iBaan products in conjunction with vendors that did not support a suitable level of integration with KMS's backend systems. KMS compensated for this by working with SysComSoft, and mapped out the business processes for its direct procurement activities. Through automation programming, SysComSoft created workflows between KMS's Baan ERP system and the iBaan-driven supplier portal. Through the use of a web browser, KMS's suppliers could access the supplier portal, have real time access to the firm's ERP systems, and download information for integration with their own business application systems (Aberdeen Group, 2001).

Standardization of codes used for product-related data (Ranganathan, 2003) and meeting different catalogue content format requirements will be specific challenges for e-procurement (Rajkumar, 2001). Extensible markup language (XML) has emerged as a promising possibility for standardizing data exchange formats and is intended to be used for developing data descriptions and protocols to describe different aspects of business transactions, including product features, prices, credit terms, and delivery options/transportation (Lucking-Reiley, 2001).

However, some employees are resistant to adapt to the change and to learn about the new procurement systems, especially if they have an alternative

means of accomplishing procurement such as through the use of procurement cards and expense submissions. Firms cannot usually stop using these older instruments that it needs to interact with suppliers at the low end of the technological spectrum (Hope-Ross et al., 2000). Knowing that significant changes are still forthcoming, employees are averse to learn software products that are in their nascent stage of development (Rajkumar, 2001).

To avoid the e-procurement implementation cost exceeding the budget, firms should be more cautious about calculating the costs of e-procurement initiatives and should anticipate the less visible items that may encumber the firm (Rajkumar, 2001). Hidden costs, which consist of any of the following items, could easily exceed licensing and maintenance costs by five or ten times (Hope-Ross and Reilly, 2000a; Hope-Ross et al., 2000): implementation (e.g. consulting fees); integration (e.g., human resource management systems, equipment asset management, IT asset management and financial); content aggregation and rationalization; catalogue and search engine; transactions; supplier enablement; user training; business process reengineering; associated licensing costs (e.g. additional database management system fees and integration-ware licensing); and administration (e.g. requisitioning, ordering, matching, and payment processing) (Hope-Ross and Reilly, 2000a; Hope-Ross et al., 2000). E-catalogues deserve special mention because they constitute a sizable portion of costs (Doyon et al., 2001).

Some organizations face difficulty in proceeding with the data collection for analyzing spend pattern because of “Maverick” purchases within the company. “Maverick” buying refers to the purchase of goods or services without using the firm’s formally defined processes and authorized vendors (Kyte, 2001c). Maverick buying has a number of deleterious effects: it deprives the firm of the ability to collect data on its employees’ spend patterns and, therefore, loses visibility and control over its expenditure; and it raises procurement costs for the firm by as much as 20 percent compared to purchases negotiated by the firm’s purchasing professionals (Orr, 2002). Maverick buying can be eliminated by presenting end users with a highly efficient and easy-to-use e-procurement system that will lure them away from old purchasing habits (Kyte, 2001c).

3.3 Conclusion

This chapter discusses the relevant literature. Two main topics (success factor and challenge of e-procurement system) are discussed. In addition, the relationship of success factors and challenges of implementing e-procurement systems are also presented.

In Chapter 4, the discussion will be on the method used in conducting the research, which includes the research framework, development of hypotheses, research instruments, sampling and survey method, questionnaire design and data analysis method.