The driving factors that promote e-purchasing implementation in organisations

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There has been a rapid increase in the number of organisations undertaking business-to-business (B2B) e-commerce initiatives. One of such initiative that has a far reaching impact on electronic communication, information exchange and business transaction is e-procurement. With the view to promote the use of e-procurement in enterprises, this review endeavours to identify the prominent factors that significantly influence its use by organisations as a key component of their supply chains. The basis of this review is the numerous publications related to e-purchasing and e-procurement adoption from the years 2001 to 2010. Eighteen (18) driving factors are uncovered by this review as motivating enterprises to adopt e-procurement to strengthen existing practices. By categorising these factors into four dominant groups - cost, time, quality and competitive advantage, the authors of this review hope that the information would be of benefit to organisations bent on injecting improvements into their supply processes. Additionally, the insights gained from this review can be of benefit to future research. For instance, a study can be carried out to check out the factors that can influence the use of e-procurement in the construction industry supply chain.

Key words: E-purchasing, e-procurement, driving factors, supply chain.

INTRODUCTION

There has been a rapid increase in the number of organisations undertaking business-to-business (B2B) e-commerce initiatives. These initiatives that spawn from the growth of the internet allow organisations to conduct their businesses more efficiently and productively (Sharma and Gupta, 2003). Using various innovative technologies that include electronic data exchange (EDI), direct link-ups with suppliers, Internet, Intranet, Extranet, online catalogue ordering, online auctions, extensible mark-up language (XML) and e-mail, they all facilitate B2B electronic communication, information exchange and business transactions (Lisa and George, 1999). Other popular e-commerce applications used by organisations in their B2B relationships are EDI, web-forms, XML, electronic marketplaces and B2B portals (Chan and Swatman, 2003; Hsio, 2003).

Procurement is a key business activity. Hence, it is only natural that there emerges an electronic form of procurement that can take the activity to the next level. Known generically as e-purchasing or e-procurement, it streamlines the corporate purchasing process by eliminating traditional paper-based documents such as purchase orders and requisition forms (Thompson et al., 2009). The other aspect of the e-procurement system is its ability to allow users gain direct access to the supply systems by conducting purchasing electronically. The increased popularity of e-procurement over the years stems primarily from the managerial benefits that the system provides. For one, it can reduce markedly the costs associated with the procurement process. According to Torbjom (2007), procurement costs generally amount to 40 to 60% of an organisation’s total revenue, and out of this, the amount that can be saved...
Definition of e-purchasing

There are numerous definitions of e-purchasing in existing literature. Heijboer and Telgen (2002), for instance, refers to it as the combination of two meanings: the first being a process of creating purchase requisitions by an internal customer by means of an electronic catalogue, and the second being the use of an internet-based software system for the purpose of information flow and verification in the operational purchasing process.

This definition echoes that of Boer et al. (2001), who refer e-purchasing as the process of creating and approving purchase requisitions; placing and creating purchase orders; and receiving goods by a software system based on internet technology. A somewhat concise definition of e-purchasing is given by CIPS (2009), which describes it as the combined use of information and communications technologies through electronic means. The purpose is to enhance internal and external purchasing, improve supply chain management and provide tools and solutions that will effect improved purchasing and supply management. From the perspective of e-commerce, e-purchasing as B2B purchasing practices that utilise e-commerce to identify potential sources of supply, purchase goods, transfer payments for purchases and interact with suppliers. The discussion on the adoption of e-purchasing at the enterprise level demonstrates its extended definition.

Motivating factors for e-purchasing

From the review of the literatures, an overall of eighteen (18) driving factors are extracted. The factors are: purchase process cost savings, material cost savings, transaction cost savings, reduced administration costs, strategic cost savings, lowered inventory management, decreased costs via reduced staffing, shortened purchasing cycle, time reduction via greater transparency, time reduction in evaluation, time reduction via improved internal workflow, time reduction via purchase order fulfillment, increased quality via increased visibility in the supply chain, increased quality via increased efficiency, increased quality via improved communication, attainment of competitive advantage and increase of profit margin (Table 1). These factors are then further categorised according to four groups.

Cost driven factors

The procurement activity is one of the single largest expense items in an organisation’s cost structure (Attaran and Attaran, 2002). Through automating the purchasing process and distributing transactions electronically, organisations hope to reduce this expense. Of the total procurement expense, costs associated with transactions are the most significant. These costs refer to the total internal costs of completing a purchase - from requisition to payment (Heijboer and Telgen, 2002). According to the literatures, the primary reason for organizations’ adoption of e-purchasing is precisely to reduce cost (Buxman and Gebauer, 1999; GXS, 2010; Pin and Ziwen, 2010; Vinit et al., 2010). Typically, under e-purchasing, the reduction in transaction costs related to purchase order, invoice and payment processing ranges between 8% to 10% (Poirier and Bauer, 2001). Other cost driven factors encompass the need to reduce material costs, administration costs, strategic costs, inventory-related costs and staffing costs.

Adoption of e-purchasing at enterprise level

Most of the literatures indicate that larger enterprises prefer to adopt e-purchasing due to reasons of financial capacity, infrastructure, technical expertise and knowledge know-how (Dawn and Larry, 2008; Oliveira and Martin, 2008). Other studies, such as Daniel and Grimshaw (2002), indicate that large enterprises use e-commerce for a wide range of activities, such as, streamlining internal processes and improving supplier relationships. In principle, buying enterprises with a larger purchasing unit are likely to adopt e-purchasing because they can avail themselves of its intense information processing capacity. Besides, large enterprises most often possess the financial wherewithal to invest in new systems, establish e-commerce information links (Min and Galle, 2003), and use more complex technologies like website, internet and extranet. In the adoption of e-procurement that includes the e-purchasing module, advances in such infrastructure technologies is vital in order to conduct on-line transactions smoothly. Moreover, the needs of large enterprises are significant and they have many trading partners. This factor alone renders them more predisposed to reaping economies of scale from the system.
Table 1. List of potential driving factors promoting e-purchasing.

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**Time driven factors**

Besides cost, time savings is the other factor that propels organisations to implement e-procurement or e-purchasing (Anumba and Ruikar, 2002; Naseebullah et al., 2010; Vinit et al., 2002). The traditional purchasing process takes too much time and effort to complete. In contrast, e-procurement with an embedded e-purchasing module allows all activities related to purchasing be carried out automatically, thereby reducing the cycle time drastically by the purchasing cycle (Dawn and Larry, 2008; Dooley and Purchase, 2008; Prerera et al., 2008; Pin and Ziwen, 2008;
Radovilsky and Hedge, 2008), the communications cycle (Hawking and Stein, 2004), the evaluation time (Pin and Ziwen, 2010) and the purchase order fulfilment cycle (Perera et al., 2008; Ho et al., 2006) As a result, the work flow of the purchasing activities become more efficient and individuals have more freed up time to concentrate on strategic activities, such as developing relationships with partners. In a competitive environment, it is pertinent that organisations costs in specific find ways to outperform competitors and meet the stringent demands of customers. Reducing processing time through e-purchasing allows management to work on areas that add value to the organisation and improve its competitive edge. From the review of the literatures, other time-driven factors that motivate organisations to adopt e-purchasing include the need to reduce evaluation and internal workflow cycle times.

**Quality driven factors**

Most enterprises are seeking means to improve the quality of their business processes. According to Beamon and Ware (1998), improving the quality of the business processes is the key performance of an organisation. The result of these improved processes is efficiency (Beamon and Ware, 1998). The application of e-purchasing is seen that transaction cost saving, decrease in costs via reduced staffing, and increased quality via increased efficiencies and improved communication.

**Gaining competitive advantage**

Gaining competitive advantage is the single key element that gives an edge to a business beyond what the competitors have or do. As stated by Clyde and Meenu (2000), competitive advantage is one of the major factors that will determine the future survival and success of organizations. Bell (2001) recommends that changes take place if electronic solutions are to become predominant and enterprises are to remain competitive in the new business scenario. Wong and Sloan (2004) point out that gaining competitive advantage through reduction in cost and increased profitability are seen as some of the most important perceived benefits of electronic transactions, like e-purchasing. From the study made by the authors of this review, two (2) factors emerged as competitive advantage-driven factors of e-purchasing, namely, gaining competitive advantage and increasing profit margin.

**RESEARCH METHODOLOGY**

A literature review using the terms ‘e-purchasing driven factors’ and ‘e-purchasing or e-procurement driven factors’ was carried out on forty-six (46) scholarly and peer-reviewed journal articles, books and reports. Several criteria were used in the selection of the said materials:

**Coverage**

The literatures were chosen based on the extent of treatment accorded to the subject matter under investigation. Only materials that contained more than one factor was considered.

**Year of publication**

The published articles and reports were from the years 2001 to 2010.

**Titles**

The publications selected for the review were published in highly-reputable journals and books, for example, Automation in Construction, Journal of Information Technology, Supply Chain Management, Electronic Commerce Research and Application, etc.

**Industry or sector**

In order to get a wider perspective of driver factors for promoting e-purchasing, the articles reviewed encompassed e-purchasing/e-procurement implementation in various industries or sectors, such as, logistics, services, healthcare, manufacturing, retailing and the government.

Driving factors are defined as “those processes or items which produce benefits through the implementation of an e-purchasing solution” (Robert et al., 2007). The potential driving factors were initially identified by extracting from the review of the literatures. The factors were then arranged according to the criteria based on coverage, year of publication, title of the journal and proceeding industry or sector. From the selected list, these factors were then grouped in terms of cost, quality, time and competitive advantage. The result was a matrix of cost, quality, time and competitive advantage driven factors in tabulated form.

Subsequently, the four (4) driven factors were selected and counted for amount of frequency as they appeared in the listed journals. The method of analysis used was descriptive statistics. The frequencies of the four (4) driven factors were then transformed in the form of a bar chart with each factor showing percentage (%) of total frequency. The table (Table 1), bar graph (Figure 1) and pie chart (Figure 2) help to explain the four (4) driven factors extracted from the literatures.

**FINDINGS AND DISCUSSION**

Table 1 is a summary list of driving factors that influence the decision to adopt e-purchasing by organisations. From the eighteen (18) driving factors listed, it is evident that transaction cost saving, decrease in costs via reduced staffing, and increased quality via increased efficiency are the three (3) most dominant factors that propel organisations to adopt e-purchasing. On the other hand, factors of gaining competitive advantage and increasing profit margins are less dominant and less
Figure 1. List of driving factors (based on frequency quoted by researchers).

Figure 2. Overall (in percentage) driven factors promoting e-purchasing implementation (based on group factors).
highlighted by the researches from diverse backgrounds. Figure 1 indicates, in terms of frequency, the salient deciding factors highlighted by various researchers. The graph clearly indicates that the dominant driving factors are transaction cost saving, decrease in cost via reduced staffing and increased quality via increased efficiently.

In terms of categorising the driving factors according to groups; cost factor contributes 48% to the decision to go paperless; while time factor chalks up 24%, quality at 19% and gaining competitive advantage contributing a mere 9% (Figure 2). Hence, the aforementioned three (3) factors are the most significant driving factors that encourage enterprises to engage in e-purchasing.

Conclusions

In today’s ‘networked economy’, enterprises spend enormous resources to build and implement information systems to streamline their supply chains, improve services and spur process innovations. The e-purchasing system is one such system; it offers benefits not only to the selling entity but also to the buying entity ( Kaufman and Mohtadi, 2004). Its implementation is driven by many considerations, not the least being the purchasing goals of cost reduction, time saving, quality improvement, risk minimization and competition maximization (Thaithai, 2001). The findings of this review suggest that the driving factors that promote e-purchasing can be categorised into four groups, namely, cost, time, quality and achieving competitive advantage. Each group comprises of different factors. All of these factors have been theoretically or empirically proven from previous studies done in different backgrounds and various industries. These categories of driven factors were investigated in the context of general organisations. Therefore, future studies may require these driven factors to be redefined and further examined in detail for the purpose of let’s say, determining the factors specific to the construction industry. It is envisaged that this review will pave the way for more comprehensive studies on the validity of the driving factors in promoting e-purchasing adoption or in influencing management decision to embrace the system.

As far as this particular study is concerned, it has managed to uncover eighteen (18) factors that prompt enterprises to use e-purchasing or e-procurement as one of the components in the supply chain. The benefits of e-purchasing are quite obvious. Through automation of the various purchasing transactions, significant cost reduction can be attained. The time spent hitherto in processing manual documents can now be harnessed to more productive ends such as improving the buyer-supplier relationship and the whole communication process within the supply chain. Undoubtedly, these same benefits would be available to the practitioners in the construction industry. By highlighting the driving factors of e-purchasing that are borne by empirical and theoretical research, hopefully this study will benefit not only the entities that want to improve the procurement process but also spur further research.

FUTURE RESEARCH

This paper identifies generic factors that drive e-purchasing implementation in various industries. In order to establish reliable driving factors applicable to the construction industry, further research needs to be undertaken, particularly involving large construction enterprises that tend to lead in the adoption of e-purchasing (Thatcher et al., 2006). These enterprises possess huge information technology (IT) resources and the capability to leverage IT investments over a large revenue base in the long time frame (Thatcher et al., 2006).

REFERENCES

Heijboer G, Telgen J (2002). Electronic purchasing: determining the


