

Abridgment of Traditional Procurement and E-Procurement: Definitions, Tools and Benefits

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Abstract

The main aim of this paper is to contribute to our understanding of traditional procurement and electronic procurement process. Through the study of the literature, this paper concentrates on the traditional procurement and e-procurement from the perspectives of its definitions, tools and benefits. Considering the apparent shift from traditional procurement to an electronic procurement environment, public and private sector agencies worldwide can improve their procurement process, with the use of Internet-based technologies to procure goods and service. As stated by Neef (2001), if there is one sector in the economy where e-procurement can and will have an enormous effect, it is in the government. Thus, this paper makes a significant contribution to e-procurement field in rural areas development studies and research.

Keywords: Traditional procurement, e-procurement, definitions, tools, benefits

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1. Introduction

Procurement is a core activity for organisations (Akmal, Sofiah, Sundram & Bhatti, 2015; Turban et al., 2008). Advanced technologies such as e-procurement can help facilitate effective solutions for procuring organisations to procure from suppliers based on five “rights”, which are the ability to purchase items at the right price, the assurance that they will be delivered at the right time, delivered in the right quality, delivered in the right quantity, and that they will be purchased from the right source (Chaffey, 2004). Thus, e-procurement plays a role in providing fundamental support to the way that organisations conduct traditional procurement activities, by automating and simplifying many business processes and transactions (Turban et al., 2008).

2. Traditional Procurement

The terms “purchasing” and “procurement” are often used interchangeably within discussions about the buying activities of companies (Russel and Thukral, 2003). Russel and Thukral (2003) defined procurement as the application of the transactional function of buying products and services at the lowest possible price. This process involves the material management of goods and services, in addition to the management of purchasing transactions. However, Bodnar and Hopwood (2004, p. 277) defined procurement as “the business process of selecting a source, ordering and acquiring goods and services”. Bodnar and Hopwood (2004) highlighted the general steps of the procurement process as including requirement determination, source selection, request for quotation, selection of vendors, issuance of a purchase order, receipt of the goods, invoice verification and vendor payment. Drawing on Bodnar and Hopwood, each of these steps is further discussed below.

2.1. Requirement determination

Requirement determination is the procurement process that involves requesting goods or services that are required by users within the purchasing organisation. Normally, a purchase requisition is an internal document that is created to request the procurement of goods and services, in order to ensure the availability of products at a certain point in time. The purchase requisition needs to be approved by the purchasing manager or someone of an equivalent position, and the purchase requisition must be within the cost limits established by the purchasing manager.

2.2. Source selection

Source selection is the process of assigning a source of supply to the purchase requisition. This procurement process is designed to verify the source in regard to whether a contract exists with a supplier to supply the product that is requisitioned. If a contract exists, then the appropriate purchase amount request will be proposed. If no contract exists, then a request for quotation (RFQ) document is prepared to request products from the chosen supplier.

2.3. Request for quotation

The request for quotation is sent to the chosen suppliers. Normally, the request for quotation is prepared for high-cost items or services such as raw materials, for which bids are required as a matter of company policy. The request for quotation and the purchase requisition usually contains the same data; the difference between the two being that the request for quotation specifies both the closing dates for the application and the bid submission guidelines.

2.4. Selection of vendor

The qualified supplier is chosen based on the criteria listed by the buyer. Many criteria need to be considered when selecting the right supplier, including the delivery record of past orders, level of service, and the price and quality of the products.

2.5. Issuance of purchase order

A purchase order is a document that is prepared in order to confirm the goods ordered, including their quantity, price, delivery date, terms of delivery and terms of payment. By issuing a purchase order to a supplier, an agreement is made to conduct business by both parties, that is, the purchaser and the supplier. A contract is then created. The contract outlines the agreement in which a supplier undertakes to provide material within a certain period of time.

2.6. Receipt of goods

The goods receipt is prepared when the supplier makes the pre-arranged delivery. The delivered goods can also be from an in-house source, while they can also be transferred or moved from one location to another.

2.7. Invoice verification

Invoice verification is the process used to verify that the delivered goods concur with the goods requested by the purchaser prior to payment. This invoice verification ensures that the required costs and quantity requirements have been fulfilled.

2.8. Vendor payment

The final stage in the procurement process is the payment made to the supplier according to the payment terms and conditions specified in the purchase order. Payment is only made when the invoice verification is approved.

According to Presutti (2003), the procurement process should include the assessment of user satisfaction and supplier performance. This is to ensure the goods or services provided arrived on schedule and met the user’s needs. Further explanation of traditional procurement was given by Caridi et al. (2004) who stated that the purchasing process can include strategic buying, transactional buying and spot buying. The main objective of strategic buying is to establish long-term relationships between customers and suppliers, which requires careful supplier selection and long-term agreement in regard to supply management (Thirunavukkarasu et al., (2014). Transactional buying implies repetitive purchasing from the same supplier based on yearly blanket orders or outlined agreements. Spot buying refers to a response to a situation where urgent requests suddenly arise, and all pre-qualified suppliers are not capable of fulfilling them. This is also referred to as maverick purchasing (Turban et al., 2008).

The definition of procurement outlined above is broad in its approach. Van Wheel (2000) presented the purchasing process model by including the broad scope of the purchasing process as part of the procurement process. This model is shown in Figure 1.

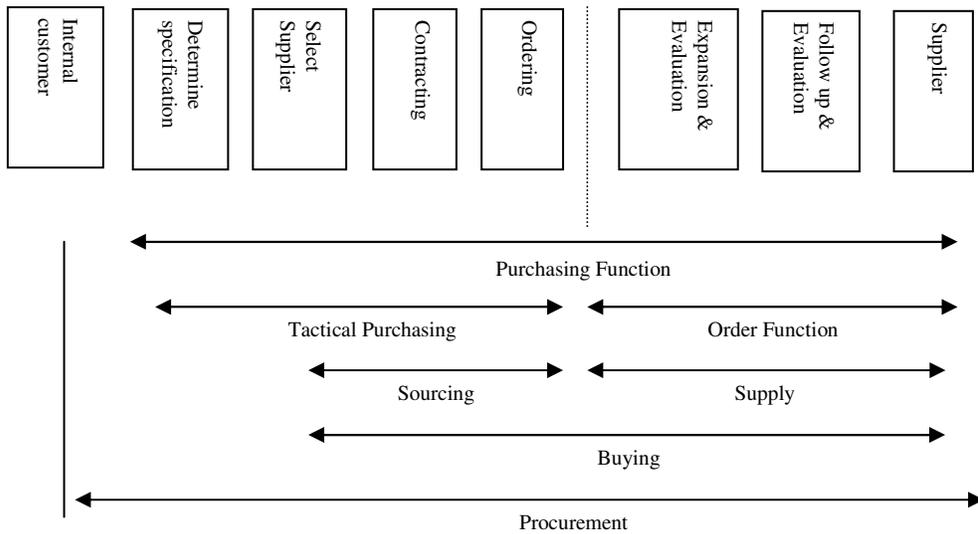


Figure 1. Procurement process model (Adopted from Van Wheel, 2000)

As identified in the procurement process outlined by Van Wheel (2000) as displayed above, the purchasing function becomes part of the procurement process. Likewise, Gabeur and Segev (1998) stated that procurement is a process that is concerned with all the activities involved in obtaining materials and services, and managing their inflow into an organisation towards the end-user. Based on the process of acquiring goods, procurement activities are often divided into direct procurement and indirect procurement (Segev and Gebauer, 2001). The characteristics of the two activities are presented in Table 1.

Table 1. Comparison of direct procurement and indirect procurement (Gebauer and Segev, 2001)

Type of feature	Direct procurement of materials		Indirect procurement of materials	
	Raw material and production goods	Maintenance, repair and operating supplies	Capital goods and services	
Quantity	Large	Low	Low	
Frequency	High	Relatively high	Low	
Value	Industry specific	Low	High	
Nature	Operational	Clerical	Strategic	

As identified in the table above, there are two types of goods purchased in a market: direct material and indirect materials. Direct materials include those that are purchased to be used as part of the construction of a good (Gebauer and Segev, 2001). An example of such a material is steel used by the construction industry. Indirect materials consist of goods and services that are used to assist in the construction of a product (Gebauer and Segev, 2001). Examples of indirect materials include computer equipment and software, magazines and books, maintenance equipment, repairs and operation equipment, office equipment and supplies such as paper for the photocopier or printer. Examples of services include advertising, consultancy, travel and utilities, and health benefit plans.

As a basis of the procurement model developed by Van Wheel (2000), further research has been conducted in order to explore the concept of procurement as a business strategy, which led to the development of another model for procurement as shown in Figure 2. The new model is explained as an extension of the procurement process, in the way that it becomes part of a business strategy. This revised procurement process is divided into two parts: strategic procurement and operational procurement.

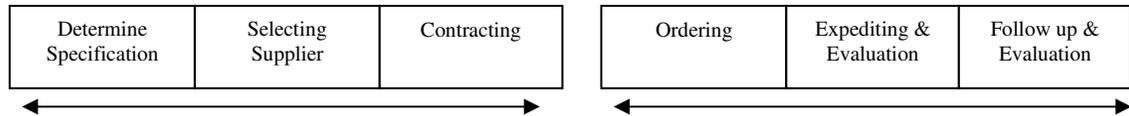


Figure 2. Procurement process model (Adopted from Van Wheel, 2005)

Strategic procurement focuses more on the issues that relate to managing the suppliers and dealing with contracts. Purchasing managers need to spend more time and effort on upstream procurement activities such as qualifying suppliers, negotiating prices and terms, building rapport with strategic suppliers and carrying out supplier evaluation and certification (Matthews, 2005). As such, procurement is a core activity in a business. Approximately 80 percent of an organisation’s purchase items, mostly maintenance, repairs and operation (MRO) equipment (such as office supplies), constitute between 20 to 25 percent of the organisation’s total purchase value (Turban et al., 2008). The figure indicates that in a profit environment, assuming a 20 percent gross margin, every dollar saved in procurement costs will render a five dollar saving, and therefore an increase in revenue (Hawking and Stein, 2003).

The traditional procurement system requires employees to coordinate vast amounts of paperwork. This paperwork can include purchase orders, supplier acknowledgments, shipping and receiving documents,

invoices and accounts payable vouchers, supplier payments and account reconciliation reports. The flow of this information is presented in Figure 3.

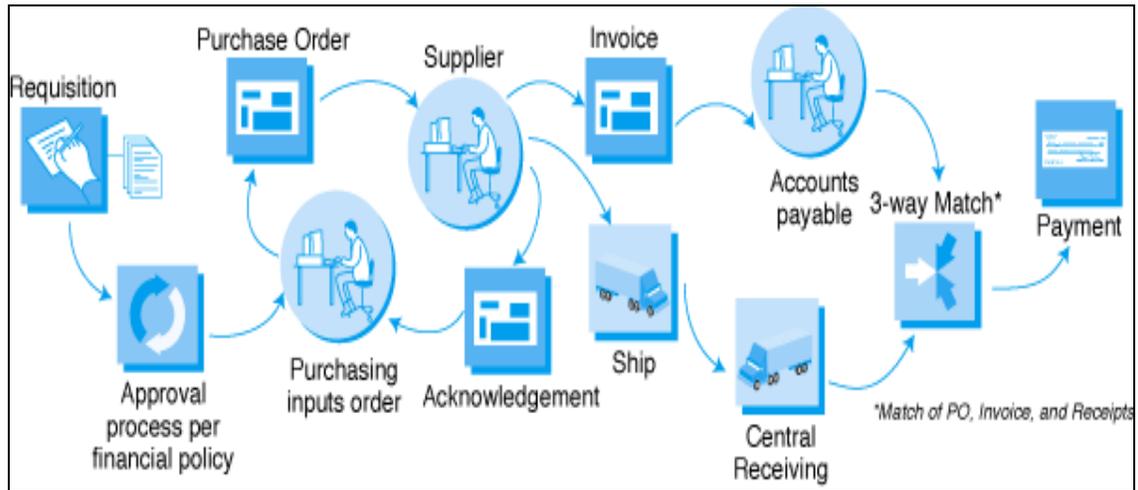


Figure 3. Traditional Procurement Process

The typical cycle time for traditional procurement is five and a half days (Chaffey, 2004). The process flow analysis for the traditional paper-based procurement process is represented in Table 2.

Table 2. Process flow analysis for traditional procurement (Adopted from Chaffey, 2004)

Task description	Flow process	Time
1 Search for goods	Process	1 hour
2 Fill in paper requisition	Process	10 minutes
3 Send to buyer	Transport	1 day
4 In buyer's in-tray	Delay	½ day
5 Buyer enters order number	Process	10 minutes
6 Buyer authorises order	Process	10 minutes
7 Buyer prints order	Process	10 minutes
8 Order copies to supplier, and goods delivered	Transport	1 day
9 Delivery from supplier	Inbounds goods	1 day
10 Order copy to accounts	Transport	1 day
11 3-way invoice match (purchase order, invoice and receipts)	Process	1 day
12 Cheque payment	Process	10 minutes

The organisational procurement process has remained similar for decades and most of the corporate buyer's time is spent on non-value-added activities such as data entry, correcting errors in paperwork,

expediting delivery, and solving quality problems (Turban et al., 2008). Traditional procurement involves many paper-based processes (Chaffey, 2004; Mitchell, 2000).

Selamat et al. (2007) stated that there are several weaknesses inherent in traditional procurement, including too much paperwork, repetitive orders, a need to manage many suppliers, less cooperation between users and procurement, tendencies to handle jobs with emergency processes, too many level approvals required, long processing times and potential collusion. Maverick purchasing is another result of traditional procurement inefficiencies (Turban et al., 2008). A maverick purchase involves the unplanned purchases of items which are needed quickly, and are therefore bought from non-approved vendors at higher prices (Turban et al., 2008). Another inefficiency of traditional procurement relates to tendering and negotiation, an inefficiency which frequently causes distrust, poor quality of products, and poor service (Cannon, 2003).

Due to these problems, organisations have realised that the procurement process should be considered not only a stage in the transactional process, but also an element of a business's strategy (Matthews, 2005). Therefore, organisations should explore new ways of purchasing goods and services. One important new way of procuring goods and services is through e-procurement (Davila et al., 2003; Neef, 2001; Quesada et al., 2010; Turban et al., 2008)

3. E-PROCUREMENT

Traditionally, procurement has involved a number of communication mediums designed to facilitate the procurement process between various parties including buyers and suppliers (Turban et al., 2008). Communication mediums have included mail, phone, fax, electronic data interchange (EDI) and more recently, email and the Internet (Tatsis et al., 2007). There has been an era of technology that has evolved with the concept of procurement. From the early 1980s, EDI has been used to automate routine transactions between established trading partners, especially for the trade of direct goods and services (Weber 2001). In the early 1990s, Web-based technology evolved to assist in the procuring of goods and services (Oliviera and Amorin, 2001). Most organisations use Web-based technology because it can integrate an organisation's systems internally and externally in regard to procuring goods and services (Roche 2001; Talluri et al. 2006; Versendaal and Brinkkemper, 2003). The use of such mediums has transformed the traditional procurement process to one that now uses electronic means to communicate and collaborate, giving rise to the term "e-procurement". E-procurement has evolved into the use of electronic technologies to streamline and enhance the procurement activities of an organisation (Hawking and Stein, 2004).

Electronic procurement is an advanced business process used by organisations to procure goods and services. E-procurement has been defined in a number of ways. Table 3 represents various definitions of e-procurement, and outlines the similarities and differences between these definitions.

Table 3. Definitions of e-procurement from different sources

Source	Definition	Electronic tool /Web-based /Internet-based	Technology	Operational procurement process	Strategic procurement management	Supply chain integration	Procurement automation
Aberdeen Group (2001)	E-procurement is the creation of private, Web-based procurement markets that automate communications, transactions and collaboration between supply chain partners. It is about enhancing collaboration, streamlining processes, controlling costs, and enhancing information exchange within and across organisational boundaries.	X		X	X	X	X
Alanis and Roberts (1999)	E-procurement refers to the Internet solutions that help facilitate corporate purchasing.	X		X	X		
Chaffey (2004)	E-procurement should be directed at improving performance for each of the five 'rights' of purchasing, namely, the ability to purchase items at the right price, and the assurance that they will be delivered at the right time, delivered in the right quality, delivered in the right quantity, and that they will be purchased from the right source.				X		X
Croom and Jones (2007)	E-procurement is the use of integrated (commonly Web-based) communication systems for the conduct of part of or all of the purchasing process. These communication systems may be incorporated in stages ranging from the initial needs identification by users, through to searching, sourcing, negotiation, ordering, and receipt and post-purchase procedures.	X		X	X		X
Kameshwaran et al. (2007)	E-procurement is an Internet-based business process for obtaining materials and services, and managing their inflow into organisations.	X		X			
Minahan (2001)	E-procurement is the process of utilising Web-based technologies to support the identification, evaluation, negotiation and configuration of optimal groupings of trading partners into supply chain networks, which can then meet demands with greater efficiency.	X	X	X	X	X	

Mitchell (2000)	E-procurement is the process of electronically purchasing the goods and services needed for an organisation's operation. This process offers a real-time platform for conducting business while providing a significant opportunity to cut costs, increase organisational effectiveness and improve customer service.	X		X	X	
Moon (2003)	E-procurement is a comprehensive process in which governments use IT systems to establish agreements for the acquisition of products and services (contracting) or to purchase products or services in exchange for payment (purchasing). It employs various elements including electronic ordering, Internet bidding, purchasing cards, reverse auctions and integrated automatic systems.			X	X	X
Oliver and Amorim (2001)	E-procurement is the process of electronically purchasing the goods and services needed for an organisation's operations.	X		X		
Tatsis et al. (2006)	E-procurement is the integration, management, automation, optimisation and enablement of an organisation's procurement process, using electronic tools and technologies, and Web-based applications.	X		X		X

As can be seen from the definitions presented in the table above, the concept of e-procurement as a purchasing process to buy goods and services via electronic means, particularly through the use of Web-based applications (the Internet, email) has been widely discussed in the literature. The concept has been explored and explained by authors including Tatsis et al. (2007), Olivera and Amorim (2001), Moon (2003), Croom and Jones (2007), Minahan (2001), Aberdeen Group (2001), and Alanis and Roberts (1999). As highlighted in the definitions, the use of e-procurement offers organisations an opportunity to increase organisational effectiveness and efficiency in the procurement process, and to cut costs (Mitchell, 2000; Attaran, 2001; Kalakota and Robinson, 1999; Hu et al., 2007). Prier and McCue (2007) claimed that e-procurement can support operational and strategic procurement activities. As such, activities have the potential to make the identification of suppliers and negotiation with suppliers more efficient (Carter, 2001). Mindila (2008) argued that e-procurement is an enabler of smart management. E-procurement systems can automate workflows, consolidate or leverage organisational spending power, and can identify new sourcing opportunities through the Internet (Davila et al., 2003; Reddick, 2004). Furthermore, such a system can help in the searching, order processing, monitoring, and controlling and coordinating of procurement activities (Subramaniam and Shaw, 2004).

E-procurement activities include advertising tenders, submitting tenders electronically, electronic ordering, Internet sourcing via third parties, email communications between buyers and sellers, email communications related to contract management, and the integration of procurement within financial and inventory systems. In particular, e-procurement can facilitate the following three key processes involved in procurement (Chan et al., 2003):

- Information retrieval – whereby prospective buyers identify their own needs, and they evaluate the abilities of potential sources to fulfil these needs. They gather information about market conditions, products and sellers.
- Negotiation – whereby individual business partners start to interact with each other and determine the prices and availability of goods and services, as well as delivery terms. Successful negotiations are usually finalised with a contract.
- Settlement – whereby the terms of the contract are carried out and goods and services are transferred in exchange for money or other forms of compensation.

E-procurement fundamentally supports the way organisations conduct traditional procurement activities by automating and simplifying many business processes and transactions. These include processes and transactions such as supplier selection (Choi and Chang, 2006), contract negotiation (Bichler et al., 2001), price bidding (Rgahavan and , 2004; Stein and Hawking, 2003), and supplier relations from the operational level to the strategic level (Ho et al., 2008). In four case studies conducted in different industries by Bartezzaghi and Ronchi (2003), it was found that Internet adoption supported the procurement process as part of the customer-supplier relationship.

E-procurement is a powerful business tool that enables almost all of the purchasing processes to be undertaken via the Internet (Kheng and Al-Hawamdeh, 2002). However, the concept of e-procurement goes beyond procurement as just a purchasing process and can be extended across the entire supply chain. As stated by the Aberdeen Group (2001), e-procurement can enhance collaboration between supply chain partners. E-procurement is about enhancing collaboration, streamlining business processes, controlling costs and enhancing information exchange within and across an organisation's boundaries. Minahan (2001) pointed out that e-procurement is the process of utilising Web-based technologies to support the identification, evaluation, negotiation and configuration of optimal groupings of trading partners into a

supply chain network. Presutti (2003) claimed that the e-procurement process ultimately helps supply managers to evaluate and rate supplier performance efficiently.

Although there are differences among thee-procurement definitions in regard to the scope and detail, it is clear that they refer to the use of electronic technologies to support procurement functions. From the definitions, it can be determined that an e-procurement system serves as an enabler for all stages of the purchasing process, from selecting a source to ordering and acquiring goods and services via electronic means. Drawing on the various concepts used to explain e-procurement from different perspectives, e-procurement can be defined as the use of electronic tools and technologies, and Web-based applications, to support the procurement process conducted by the strategic procurement management. The procurement process includes sourcing, negotiating and collaborating with trading partners in order to undertake operational procurement procedures. These include ordering and receiving products, and procuring goods and services that will enhance the supply chain network.

It is useful to note, as Puschman and Alt (2005) explain, that most companies utilise e-procurement solutions in multiple ways. In regard to integrated e-procurement solutions, there is a need for an overall procurement strategy and organisational alignment of the various e-procurement solutions utilised in the procurement process as well as a need for integrated system architectures (Puschman and Alt, 2005).In addition, various e-procurement strategies need to be incorporated in a company’s procurement process, with an understanding of each strategy’s particular strengths (Riggs and Robbins, 1998; Dolmetsch et al., 2000).Usually, these strategies are complementary and support different parts of a company’s procurement process. This process is shown in Figure 4.

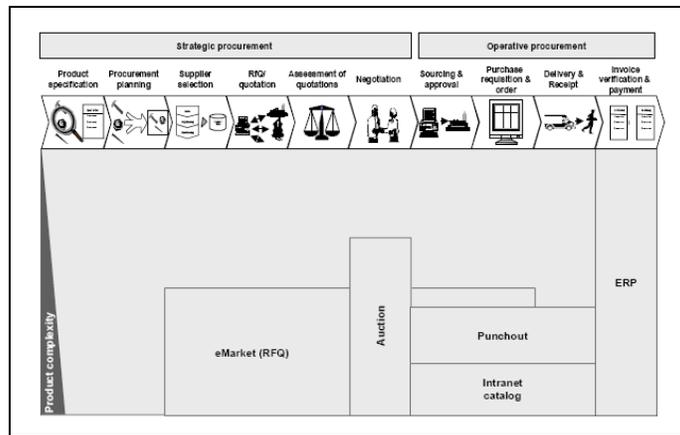


Figure 4. Supply chain process and e-procurement strategies (Puschman and Alt, 2005)

Figure 2.4 represents the procurement process and its e-procurement solution. The procurement process includes two stages: the strategic procurement process, and the operative procurement process. For the strategic procurement process, e-market or e-request for quotation (e-RFQ) and auctions, such as e-auction or e-reverse auction are the appropriate e-procurement solutions to use for procurement (Puschman and Alt, 2005). Intranet catalogue and enterprise resource planning (ERP) systems are suitable e-procurement solutions for operational procurement processes such as payments made for procuring goods and services (Puschman and Alt, 2005). E-procurement is a process that helps to expedite the procurement process in procuring goods and services. E-procurement tools can be used to assist the

procuring organisation to expedite the procurement process undertaken with the use of e-procurement. The next section discusses the e-procurement tools used in procurement.

4. E-PROCUREMENT TOOLS

E-procurement does not define a single application (Knudsen, 2003). Rather, e-procurement consists of many different tools. De Boer et al. (2002) identified six forms of e-procurement, namely: e-sourcing, e-reverse auctioning, e-tendering, e-informing, e-MRO and Web-based ERP systems. In addition, other forms of e-procurement have been identified. These include e-catalogues (Baron et al., 2000), e-purchasing (OGC 2005) and e-negotiation (Raghavan and Prabhu, 2004). All of these forms of e-procurement are used by organisations in both the public and private sectors (Futo, 2001), and, as noted above, most companies operate multiple e-procurement solutions (Puschman and Alt, 2005). Each form of e-procurement can be described as follows:

- E-sourcing refers to the process of identifying potential new suppliers for a specific category of purchasing requirements (Klassen and Johnson, 2005);
- E-reverse auctioning is an Internet technology that enables purchasing companies to buy goods and services that either have the lowest price, or a combination of the lowest price and other conditions (De Boer et al., 2002; Carter et al., 2004);
- E-tendering concerns the process of sending requests for information and prices to suppliers, and receiving responses from suppliers using Internet technologies (De Boer et al., 2002);
- E-informing is the process of gathering and distributing purchasing information both from and to internal and external parties (De Boer et al., 2002);
- E-MRO and Web-based ERP refers to the process of creating and approving purchasing requisitions, thereby replacing the traditional approach of utilising purchase orders and receiving goods and services with a software system based on Internet technologies (De Boer et al., 2002);
- E-cataloguing refers to the electronic presentation of information regarding the products and services of an organisation (Baron et al., 2000);
- E-purchasing refers to a series of tools used to help procurement professionals and end-users undertake more efficient processes, and receive more accurate order details. The tools include purchase-to-pay systems, purchasing cards and invoicing solutions (OGC, 2005);
- E-negotiation refers to a mechanism that allows for a recursive interaction between a buyer and supplier, thereby allowing the resolution of a good deal (Raghavan and Prabhu, 2004).

All the e-procurement tools described above are used by procuring organisations for procurement processes. However, in regard to e-procurement tools, Davila et al. (2003) identified four major e-procurement Internet-based information and communication technology requirements. Firstly, e-procurement software should refer to any Internet-based software application that enables employees to purchase goods from approved electronic catalogues in accordance with the company's buying rules. Secondly, e-procurement systems should refer to Internet market exchanges that bring together multiple buyers and sellers in one central virtual market space, and enable them to buy or sell from each other at a dynamic price. Thirdly, e-procurement systems should refer to Internet B2B auctions in which multiple buyers place bids to acquire goods and services via an Internet site. Fourthly, e-procurement systems should refer to an Internet purchasing consortia that gathers together the purchasing power of many buyers, thereby allowing the more aggressive negotiation of discounts.

Turban et al. (2008) identified that companies implemented e-procurement methods such as the aggregated catalogues of all approved suppliers combined into a single internal electronic catalogue. Such a catalogue allows direct purchasing from internal marketplaces without the approval of supervisors and without the intervention of a procurement department, as well as the aggregation of orders from several buyers into volume purchases, so that better prices can be negotiated. With the use of e-procurement tools in procuring goods and services, companies can gain many benefits (Attaran and Attaran 2001). Based on the empirical work by Gunasekaran and Ngai (2007), one of the reasons for organisations to implement an e-procurement system is the perceived benefits. It is therefore important that organisations understand what these benefits are. By knowing the benefits that can be attained from e-procurement, organisations can save billions of dollars annually (Mindila 2008).The following section discusses the benefits of e-procurement.

5. BENEFITS OF E-PROCUREMENT

There are many potential benefits that can be obtained by organisations in both the private and public sectors through the implementation of e-procurement. The benefits of e-procurement have been widely identified in the supply chain management (SCM) and e-procurement literature (Aberdeen Group, 2006; Neef, 2001; Attaran and Attaran, 2001). Major e-procurement benefits can include cost savings where, according to Bartezzaghi and Ronchi (2005), buyers report an average reduction in purchase price of 17%.Furthermore, Barratt and Roshdal (2002) claim that the Internet actually reduces maverick buying (unplanned purchases). Other benefits of e-procurement, as identified by Min and Galle (2001), include an increase in the return on investment, and the utilisation of just-in-time inventories. Another benefit of e-procurement, also stated by Min and Galle (2001), is the enhancement of supply chain efficiency by providing real-time data regarding product availability, inventory levels, shipment status and production requirements, and by facilitating collaborative planning amongst supply chain partners by allowing for the sharing of demand forecast data.

According to a report by the Aberdeen Group (2006), the Rolls Royce company implemented an e-procurement approach and identified one of the benefits as the additional control it offered over spending. One such form of control over spending is the ability to include the control of pricing levels through the use of efficient processes and the reduction of waste. A study by Subramaniam and Shaw (2004) showed that the use of B2B e-procurement is beneficial for unstructured procurement, such as the purchase of office furniture, due to its expediting of the ordering process. Furthermore, e-procurement processes can provide opportunities to make procurement for goods and services more transparent and efficient (Carayannis and Popescu, 2005). Dell Computing reported savings of up to US\$50 million, and a reduction of suppliers by 50%, after the company began to use e-procurement (Attaran and Attaran, 2001). Mercedes Benz, in its Spain operations, reported savings of up to US\$30 million and a reduction of suppliers by 65% after its adoption of e-procurement (Attaran and Attaran, 2001). Emerson likewise reported savings of US\$30million, while American West Airlines and the Eastman Kodak Corporation reported price breaks of 40% and 20%, respectively (Attaran and Attaran, 2001).

By implementing e-procurement while procuring goods and services for either production or non-production needs, companies can gain substantial benefits. Several potential benefits associated with the use of e-procurement have been discovered by organisations, and can be characterised into different fields including operational and strategic benefits (Croom, 2000), efficiency and effectiveness benefits (Kothari et al., 2007) and transactional, compliance, price and management information benefits (Eakin 2002).

Some of the benefits recognised through the use of e-procurement technologies include a 73 percent reduction in transaction costs, a 70 to 80 percent reduction in purchase order processing cycles, and a five to ten percent reduction in prices paid (Attaran and Attaran, 2001). For instance, IBM has realised indirect cost enhancements by implementing e-procurement. These indirect cost enhancements have included an improvement in on-time shipments from 90 to 98 percent, and a shortening of delivery cycle time by 55 percent, an improvement of inventory turn by 44 percent, and a shortening of the demand and supply planning cycle from 60 to 20 days (IBM, 2002).

The public sector e-procurement process has similarities with the private sector process in terms of its focus on value, competitiveness and accountability (Hardy and Williams, 2007). For example, the Republic of Latvia predicted that e-procurement systems, including e-auction solutions, would save at least US\$320,551 and create a turnover of approximately US\$7,693,000 each year from 2007 onwards. Denmark reported that the benefits derived from the implementation of e-procurement at the state, county and municipality levels resulted in a freeing-up of resources by approximately 40%, 65% and 30% respectively (Henriksen et al., 2004). Table 4 presents a summary of the key benefits that e-procurement can offer to an organisation.

Organisations that implement e-procurement solutions while procuring goods and services can gain all or a combination of the benefits described above. Organisations in both the public and private sectors can and do use e-procurement solutions, and the following section explains in more detail how e-procurement can be utilised in both sectors.

6. CONCLUSION

This paper contributes to procuring organisations either public or private sectors on understanding of traditional procurement and electronic procurement process, in particular, on the perspectives of its definitions, tools and benefits. With the understanding of the concepts of procurement traditionally and electronically, it is hope that public and private sector agencies in Malaysia can improve their procurement process and reap benefits in using e-procurement in particular for a development of rural areas.

Table 4. Operational and strategic benefits of using e-procurement

Operational Benefits	
Procurement Element	Description
Cost	<ul style="list-style-type: none"> • Reduced administrative costs of the procurement process (Croom, 2000) • Reduced transaction costs (Frohlich, 2002; Neef, 2001; Eakin, 2002) • Decreased costs of purchased goods and services (Ramfos and Fitsilis, 2007) • Cost reduction re lowering printing and mailing costs (Randall and Wyld, 2003) • Transaction cost savings (Henriksen and Mahnke, 2005) • Reduced search and monitoring costs (Kothari, Hu, and Roehl, 2007)
Delivery time	<ul style="list-style-type: none"> • Faster delivery time (Frohlich, 2002) • Faster cycle times (Boyer and Olson, 2002) • Faster ordering time (Neef, 2001) • Faster processing time (Randall and Wyld, 2002)
Paperwork	<ul style="list-style-type: none"> • Less paperwork (Neef, 2001; Ramfos and Fitsilis, 2007; Attaran and Attaran, 2001)
Errors	<ul style="list-style-type: none"> • Fewer errors (Randall and Wyld, 2003; Eakin, 2002) • Fewer repetitive administrative tasks (Neef, 2001)
Maverick buying	<ul style="list-style-type: none"> • Less maverick purchasing (Neef, 2001) • Increased compliance (Eakin, 2002)
Efficiency	<ul style="list-style-type: none"> • Faster tender processing (Ramfos and Fitsilis, 2007) • Transactional automation of processes (Eakin, 2002) • Open access to tendering information (Ramfos and Fitsilis, 2007) • Improved availability of payment (Eakin, 2002) • Enhanced transparency (Bartzenghi and Rochhi, 2003) • Improved auditing of each transaction throughout process (Croom, 2000)
Inventory level	<ul style="list-style-type: none"> • Reduced inventory level (Attaran and Attaran, 2002) • Improved availability of stock (Eakin, 2002)
Supplier	<ul style="list-style-type: none"> • Wider vendor choice (Neef, 2001) • Attraction of new suppliers (Randall and Wyld, 2003)

	<ul style="list-style-type: none">• Enhanced control over the supply chain (Henriksen and Mahnke, 2005)• Better service for suppliers (Attaran and Attaran, 2002)
Enhanced decision-making process	<ul style="list-style-type: none">• More accessible Internet alternatives for buyers (Neef, 2001)• Higher quality purchasing decisions (Henriksen and Mahnke, 2005)• Faster response to highly competitive new market entrants (Attaran and Attaran, 2002)• Consolidating purchasing practices that lead to greater discounts (Attaran and Attaran, 2002)• Better organised reporting of information (Boyer and Olson, 2002)• Tighter integration of procurement functions with key back office systems (Boyer and Olson, 2002)• Enhanced financial management (Ramfos and Fitsilis, 2007)• Organisational change and reformation (Randall and Wyld, 2003)
Inventory control	<ul style="list-style-type: none">• Improved inventory accuracy (Boyer and Olsoan, 2002)• Enhanced inventory turnover (Frohlich, 2002; Randall and Wyld, 2003)
Price	<ul style="list-style-type: none">• Better price (Randall and Wyld, 2003)
Process flow	<ul style="list-style-type: none">• Reengineered procurement flows (Neef, 2001)

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References

- Aberdeen Group (2006). *Rolls-Royce uses e-procurement to transform procurement*. Boston, Massachusetts.
- Akmal, A.O., Sofiah, A.R., Sundram, V.P.K., & Bhatti, M.A. (2015). Modelling marketing resources, procurement process coordination and firm performance in the Malaysian building construction industry", *Engineering, Construction and Architectural Management*, Vol. 22 (6), 644 – 668.
- Attaran, M., & Attaran, S. (2002). Catch the Wave of E-Procurement. *Industrial Management*, 44(4), 16.
- Baron, J. P., Shaw, M. J., & Bailey Jr, D. B. (2000). Web-based E-Catalog Systems in B2B Procurement. *Communication of ACM*, 43(5), 93-100.
- Bartezagghi, E., & Ronchi, S. (2003). Internet supporting the procurement process: lessons from four case studies. *Integrated Manufacturing Systems*, 14(8), 632-641.
- Bitchler, M., Lee, J., Lee, L. H., & Chung, J. Y. (2001). ABSolute: An intelligent Decision Making Framework for E-Sourcing. *Institute of Electrical and Electronics Engineers*, 195-199.
- Bodnar, G. H., & Hopwood, W. S. (2004). *Accounting Information System*. (Ninth Edition) International Edition, Pearson Prentice Hall.
- Carter, R. C., Kaufmann, L., Beall, S., Carter, L. P., Hendrick, E. T., & Petersen, J. K. (2004). Reverse auctions- grounded theory from the buyer and supplier perspective. *Transportation Research Part E*, 40, 229-254.
- Cerquides, J., & Sanchez, M. L. (2007). Enabling assisted Strategic Negotiation in Actual-World Procurement Scenario. *Electronic Commerce*, 7, 189-220.
- Chaffey, D. (2004). *E-business and e-commerce management strategy, implementation and practice*. (Second edition). Prentice Hall.
- Croom, S., & Jones, A. B. (2007). Impact of e-procurement: Experience from implementation in the UK public sector. *Journal of Purchasing and Supply Management*, 13, 294-303.
- Gebauer, J., & Segev, A. (2001). Changing Shapes of Supply Chains- how the internet could lead to a more integrated procurement function. *Fisher Center Working Paper 01-WP-1041*.
- Kothari, T., Hu, C., & Roehl, S. W. (2007). Adopting E-Procurement Technology in A Chain Hotel: An Exploratory Case Study. 26, 886-898.
- Matthews, D. (2005). Strategic procurement in the public sector: a mask for financial and admin. *Journal of Public Procurement*, 5(3), 338.

- Minahan, T. (2001), Strategic E-Sourcing: A Framework for Negotiating Advantage. – A white paper from the Aberdeen Group. Retrieved December 2001, from www.aberdeen.com/ab/hottopics/esourcing/.
- Minahan, T. & Degan, G. (2001). *Best Practice in E-Procurement*. Boston: Aberdeen Group.
- Mindila, A. N. (2008). E-procurement: enabling smart management in the procurement function: A case of Jomo Kenyatta University of Agriculture and Technology.
- Mitchell, K. (2000). Instituting e-procurement in the public sector. *Government Finance Review*, 9-12.
- Moon, M. J. (2003). Can IT help government to restore public trust?: declining public trust and potential prospects of IT in the public sector. Proceeding of the 36th Hawaii International Conference on System Science, 1-8.
- Moro, R. A., Rodriguez, A. J., Sanchez, L. M., Cerquides, J., & Magallanes, G. D. (2003). Embedding Decision Support in e-sourcing tools: quotes, a case study. *Group Decision and Negotiation*, 12, 347-355.
- Neef, D. (2001). E-procurement: From Strategy to Implementation. New Jersey: Prentice Hall. Negotiation Process, *European Business Review*, 99(5), 313.
- OGC (2005), “Sustainable Procurement and Procurement Efficiency Implementation”, Office of Government Commerce, [online], <http://www.ogc.gov.uk>.
- Oliveira, L. M. S., & Amorim, P. P. (2001). Public e-procurement. *International Financial Law Review*, 43.
- Presutti, W. (2003). Supply management and e-procurement: creating value added in the supply chain. *Industrial Marketing Management*, 32, 219-226.
- Puschman, T., & Alt, R. (2005). Successful Use of E-Procurement in Supply Chains. *Supply Chain Management: An International Journal*, 10(2), 122-133.
- Raghavan, N. R. S., & Prabhu, M. (2004). Object-Oriented Design of Distributed Agent-Based Framework for E-Procurement. *Production Planning and Control*, 15(7), 731-741.
- Reunis, M. R. B., & Santema, S. C. (2008). Extending the Network Approach in an Organization: The Key Towards E-Procurement Adoption. 1-20.
- Thirunavukkarasu, K., Ahmad Razi, A., Akmal, A. O., Farha, A. G., Mohamed Afiq, Z. and Sundram V. P. K (2014). *Logistics and Supply Chain Managements: A Malaysian Perspective*, Petaling Jaya, Selangor Malaysian Logistics and Supply Chain Association,
- Van Wheel, A. J. (2000). *Purchasing and Supply Chain Management*. Thomson Learning, Boston MA.
- Vaidya, K., Sajeew., & Callendar, G. (2006). Critical Success Factors that Influence E-Procurement Implementation Success in The Public Sectors. *Journal of Public Procurement*.
- Wyld, D. C. (2000). *The Auction Model: How the Public Sector Can Leverage the Power of E-Commerce Through Dynamic Pricing*. Arlington, VA: The Price Waterhouse Coopers Endowment for The Business of Government, October.