

# THE IMPACT OF E-PROCUREMENT APPLICATION ON BUSINESS ACTIVITIES IN MALAYSIAN CONSTRUCTION INDUSTRY

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## Abstract

The emergence of internet technology has spurred new and cost effective ways besides various innovative applications that business organizations could take advantage of. Among crucial business application is using the internet technology as a method of procurement for business-to-business, which is also known as Electronic Procurement (e-procurement). It is a method of procurement using the electronic catalog and automated workflow processes. One of industries that really need this e-procurement system is construction industry. In Malaysia, this industry is one of the largest networks of supply chain from the clients, the consultants, contractors, suppliers, manufacturers, the financier, insurance institutions and the consumers. Throughout this paper, the practice of e-procurement system in Malaysia, the challenges and the impact of adopting e-procurement will be discussed. As this is a conceptual paper, the findings could contribute much in expanding construction industries' motivation to embark on e-procurement endeavor.

## 1.0 INTRODUCTION

The global economy has changed dramatically from an industrial society to an information society. Several information and communication technologies (ICTs) have been developed in the marketplace and those ICTs have presented numerous opportunities and challenges for all type of industry, including construction industry. The construction industry is increasingly aware of internet-enabled applications and is adopting many such applications. Some companies have invested considerable time and resources in the development and implementation of e-commerce initiatives. With e-commerce, construction industry nowadays which involved owner, designer, contractor, subcontractors, suppliers and construction managers can have immediate access to information, broader reach, and the concurrent involvement of multiple people for real-time collaboration. This can lead to fundamental changes in the business processes associated with project delivery. In Malaysia, with the development of e-commerce, government has taken initiatives to facilitate its industry by launching Electronic Government. One of the applications that have been prioritized is E- Perolehan or *E-Procurement*. Construction industry as the second largest contributor to the national economy by accounting about 12 percent to the Gross Domestic Product ( GDP ) should redefine processes in terms of the value to the construction industry stakeholders and make it as a tool to improve the supply chain transactions. It is hope that by adopting e-procurement, there will be a lot less paper work and more time to do other activities, thus increasing productivity of the construction industry.

## Definition of E-Procurement

In general, e-procurement or electronic procurement is the exchange of information across electronic networks, at all stages in the supply chain, whether within organisation, between businesses or between businesses and consumers. E-procurement is the business to business purchase and sales of of supplies and services over the Internet that has been used to streamline, manage and report on the corporate purchasing function, and range from basic catalog access tools to systems that encompass the entire requisition-to-delivery process. ( Azham *et.al*,2005 ). Establishing an e-procurement solution involves implementing a software application tailored to a corporation's specific purchasing agreements, internal procedures and business rules. The application is accessible from the desktops of all employees via a standard Web browser, enabling a self-service purchasing environment that allows employee to select products and initiate orders 24 hours a day, seven days a week from anywhere in the world. ( Cheddar, 2000 ).

According to Neef ( 2001 ), e-Procurement is a new phenomenon but what it wants to achieve is not new. As long as companies have been around, they have sought to improve efficiency and effectiveness. E-Procurement is an umbrella concept that barks up the same tree, improving efficiency and effectiveness. He gives three example of this. Firstly, e-procurement systems continue the trend of reducing transaction costs by automating processes, replacing human labour with information technology. Secondly, e-procurement facilitates the breakdown of functional silos toward horizontal processes that facilitate increased integration, and Neef argues” *e-procurement is an important step towards development of the extended enterprise where the supply chain becomes a continuous, uninterrupted process extending from buyer through selling partners*”.

Carbone (1997) identified some of the key characteristics of e-procurement as follows:

- Reduction in transaction costs
- Quicker and more accurate transaction purchasing
- Elimination of maverick buying
- Reduced inventory
- Improved order tracking
- Improved information management
- Increased contract compliance
- Lower prices
- Increased employee satisfaction.

## 2.0 E-Procurement in Malaysia

E-procurement in Malaysia is a leading e-Government Flagship application project developed under the Multimedia Super Corridor ( MSC ) initiative and is developed, implemented and managed by Commerce Dot Com Sdn. Bhd in collaboration with the Finance Ministry. E-Procurement in Malaysia or called as E-Perolehan has been successfully launched on 6 October 2000 with two modules; Central Contact and Supplier registration. The objectives of E-Perolehan are:

- Reengineering, automation and reschedule the existing rules of procurement;
- Ensure the supplier will get benefits in term of payment, faster press and secure;

- Reduce the operation cost and enhance the efficiency of turnaround time;
- Accountability and transparency of procurement activities in government service;
- Enhance the cooperation within private sectors and government agencies.

E-procurement is the nation's unique state-of-the-art electronic procurement system for Government-to-Business ( G2B ) exchanges on which suppliers maintains product and pricing information for access by government buyers. Suppliers who register with e-Perolehan can access the system using smart cards and then gain access to a variety of applications, including:

- Placing product catalogues online in a form, which can be viewed from any computer with a Web browser;
- Allowing suppliers to process purchase orders and receive payment form government agencies via the internet;
- Submitting quotation, obtaining tender document and submitting tender bids;
- Registering or renewing registrations with the Ministry of Finance through the internet and paying the registration fees.

As reported in The Star on 09 February 2005, the value of transactions through the system has risen from RM 1.9 million in 2002, to RM 70 million in 2003, and to RM 313 million in 2004. It's also expected to reach RM 1 billion this year. About 81,000 suppliers are registered under e-Perolehan of which 17,000 are fully utilizing the system, 639 government agencies are e-Perolehan enabled which 466 are in the Klang Valley. It's also reported that an additional 2,484 government agencies will have implemented e-Perolehan by the end of next year.

Overall, e-procurement provides a platform for business communities to learn how to do business online, initially with the government and in future with global clients and customers. The system was also aimed at transforming the nation's "bureaucracy-centered" government to a "citizen-centered" one.

## **2.1 The Electronic Procurement Process**

By subscribing to the e-Perolehan system, suppliers will be able to participate in the procurement exercise by the government. Upon final implementation of the e-Perolehan system, full services will be available to all four types of procurement that is Central Contract, Direct Purchase, Quotation and Tender. The implementation of the e-Perolehan system is done in phases. The e-Perolehan system provides the following modules:

### **Phase 1:**

- Supplier Registration
- Central Contract

### **Phase 2:**

- Direct Purchase
- Quotation and Tender

## **1. Supplier Registration**

E-Perolehan will be the single point of registration for the Suppliers. All approvals of the application for registration remain with the Registration Department of Ministry of Finance. Services available in the Supplier Registration module include the following:

- Supplier Registration can be done online via the Internet using the e-Perolehan website.
- E-Perolehan routes all successful Supplier applications for on-line approval by the relevant authority upon full submission of completed documents.
- E-Perolehan facilitates generation of certificate for registered and successful Supplier.
- The Supplier registration module supports on-line renewal of registration by the Suppliers.
- The Supplier registration module allows on-line application for registration of additional "Bidang" or Category.
- E-Perolehan supports on-line suspension or termination of the Supplier registration.

## **2. Central Contract**

The processes involved in Central Contract are:

### **i.Requisition Processing**

The requisition process starts when the Government User selects products or services to procure and ends when a purchase order (PO) has been sent to the Supplier. The detail processes involved are:

- **Product Selection**  
e-Perolehan allows the Government User to select products or services to be procured from the electronic catalogue stored in a central repository.
- **Requisition Creation**  
As the Government User selects the products; e-Perolehan will register the selection of products on the electronic requisition cart.
- **Requisition Approval**  
e-Perolehan supports online approval of purchase requisitions that are submitted.
- **Purchase Order Generation**  
On completion of final level approval of the requisition, the purchase order ("PO") will be automatically generated by e-Perolehan.

### **ii. Order Fulfillment**

The order fulfillment process involves acceptance of the PO by the Supplier, fulfillment of order by the Supplier and confirmation of receipt of goods or services by the Government User.

- **Acceptance of Purchase Order**  
Once the PO has been generated and sent to supplier; they are acknowledged and accepted by the suppliers.
- **Fulfillment of Order**  
Upon acceptance of the PO, a delivery order will be generated and sent prior to the actual delivery of goods.

- **Acknowledgement of Goods Received**  
Upon checking and verification of the physical goods delivered or services rendered, the Government User is required to acknowledge receipt of goods in e-Perolehan and generate a Goods Received Note (GRN).
- **Purchase Order Matching**  
In order to enable payment, matching of PO, goods received notes, invoices and other supporting documents will be conducted.
- **Payment Advice Creation**  
Upon successful matching of all relevant documents, a payment advice will be generated by e-Perolehan and routed to the Government's legacy system for voucher generation and payment processing. The Government will make payment to Suppliers in accordance with the terms and conditions of the contract entered into between the Government and respective Suppliers.  
Overall, the processes are shown in Figure 1 below.

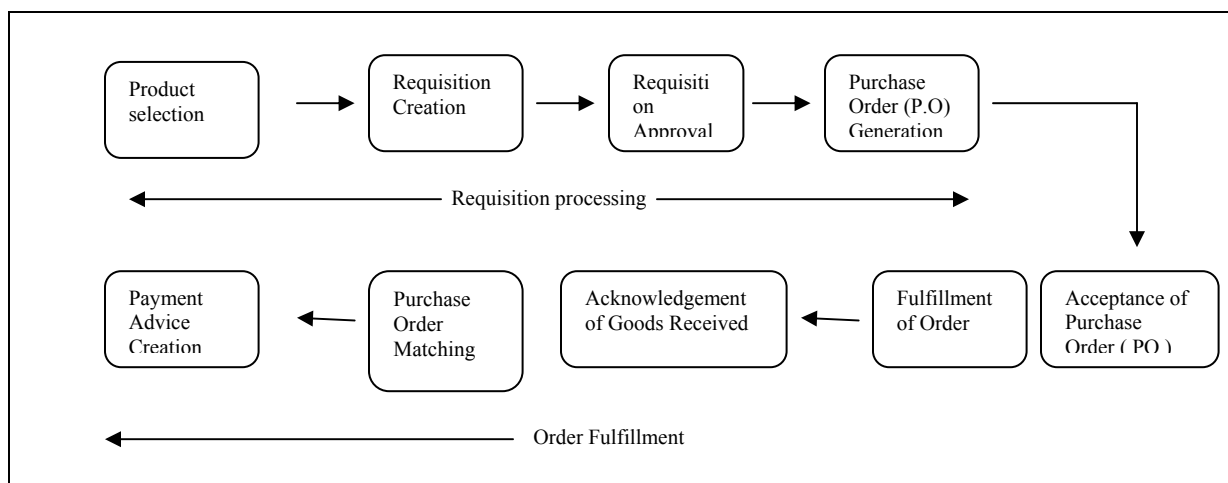


Figure 1: E-procurement processes under Central Contract phase.

Source: Ministry of Finance ( 2005 )

### 3. Direct Purchase

E-Perolehan has developed two modules for Direct Purchase; one has been designed for purchasing products and the other for purchasing services. There is a slight difference in the process flow as shown in Table 1 below:

| Direct Purchase for Products  | Direct Purchase for Services  |
|---|---|
| <b>Requisition Processing</b><br>The requisition process starts when the Government User selects a product to procure, and it ends when a purchase order (PO) is sent to the Supplier. <ul style="list-style-type: none"> <li>• <b>Product Selection</b><br/>e-Perolehan allows the Government User to select a product from the electronic catalogue that is stored in a central repository.</li> <li>• <b>Requisition Creation</b><br/>As the Government User selects the product; e-Perolehan registers the selection of that product in an electronic requisition cart.</li> <li>• <b>Requisition Approval</b><br/>The requisition is then created and submitted for</li> </ul> | <b>Requisition Processing</b> <ul style="list-style-type: none"> <li>• <b>Service Selection</b><br/>e-Perolehan allows the Government User to select a service to be procured from the electronic catalogue that is stored in a central repository.</li> <li>• <b>Requisition Creation</b><br/>As the Government User selects the service; e-Perolehan registers the selection of that service in an electronic requisition cart.</li> <li>• <b>Requisition Approval</b><br/>The requisition is then created and submitted for approval.</li> </ul> |

|   |  |
|---|--|
| <p>approval. Purchase Inquiry Generation Upon approval of the requisition, a purchase inquiry is generated by e-Perolehan and sent to the Supplier.</p> <ul style="list-style-type: none"> <li>• <b>Purchase Inquiry Acknowledgement</b><br/>e-Perolehan allows the Supplier to send an acknowledgement in response to the Purchase Inquiry. The Supplier also has the right to decline the supply of the goods or services since the supplier does not have a binding contract with the Ministry of Finance, as in the case of Central Contract procurement.</li> <li>• <b>Purchase Inquiry Approval</b><br/>e-Perolehan supports online approval of purchase requisitions where the request for the supply of goods had been acknowledged by the Supplier.</li> <li>• <b>Purchase Order Generation</b><br/>On completion of the final level of approval of the requisition, a Purchase Order (PO) is generated by e-Perolehan.</li> </ul>   | <ul style="list-style-type: none"> <li>• <b>Service Order Generation</b><br/>On completion of the final level of approval of the requisition, a Service Order (SO) is generated by ePerolehan.</li> </ul>  |
| <p><b>Order Fulfillment</b><br/>The order fulfillment process involves the fulfillment of order by the Supplier, confirmation of receipt of goods by the Government User and the Payment to the Supplier.</p> <ul style="list-style-type: none"> <li>• <b>Fulfillment of Order</b><br/>Upon receipt of the PO, a delivery order is generated and sent with the actual delivery of goods.</li> <li>• <b>Acknowledgement of Goods Received</b><br/>Upon checking and verifying the physical goods delivered, the Government User is required to acknowledge the receipt of goods through e-Perolehan and then generate a Goods Received Note (GRN).</li> <li>• <b>Invoice Creation</b><br/>The GRN will be created by the Goods Receiving Officer (GRO). Upon electronic notification to the Supplier of the creation of the GRN, e-Perolehan helps the Supplier to generate the invoice.</li> <li>• <b>Payment Advice Creation</b><br/>When the Supplier creates the invoice, e-Perolehan receives this invoice and a payment match is done by the system, and at the same time, the system generates a Payment Advice. The Government finally makes the payment to the supplier.</li> </ul> | <p><b>Order Fulfillment</b><br/>The order fulfillment process involves the fulfillment of the service by the Supplier, confirmation of fulfillment of services by the Government User and Payment to the Supplier.</p> <ul style="list-style-type: none"> <li>• <b>Order Fulfillment and Service Rendered Note Creation</b><br/>The Service Rendered Note (SRN) is created by the Supplier after fulfillment of all the services. This SRN is acknowledged, approved and updated by the Government User.</li> <li>• <b>Invoice Creation</b><br/>On approval of SRN by the Government User, the Supplier creates an invoice.</li> <li>• <b>Payment Advice Creation</b><br/>When the Supplier creates invoice the e-Perolehan receives the invoice and the payment match is done by the system and the same time the system generates a Payment Advice. The Government finally makes the payment accordingly to the supplier.</li> </ul> |

Table 1: The processes of Direct Purchase for Product and services

Source: Ministry of Finance ( 2005 )

#### **4. Quotation and Tender**

E-Perolehan is offering a comprehensive procurement system through the process of Quotation and Tender, which will be automating the entire system, starting from a formal application from user's workplace, proposal preparation, advertising, evaluation, invitation to the suppliers, up to payment completion.

### **i. Quotation:**

- Quotation process is for any purchase with a total value of RM100,000 but less than RM200,000.
- Through the quotation process, invitation is sent out to the identified suppliers which enables prompt response from the suppliers

### **ii. Tender**

- Tender is for procurement with the value of RM200,000 or more.
- The suggested system will simplify the procurement process, as online transaction will be quickly and securely implemented.
- It multiplies efficiency and noticeably reduces turnaround time and related costs.

## **3.0 Advantages of E-Procurement**

Efficient procurement is increasingly being recognised as an essential part of business. It can lead to better value for money through more streamlined processes and improved management information. And it can cut a lot of the tedium from a job, freeing people up to concentrate on the less routine aspects of their roles. The statement from Ministry of Finance ( 2005 ), both supplier and government can benefits from adopting e-procurement system, that's are:

### **1. Supplier Benefits**

- Suppliers become much more accessible to a Government buyer, whenever and wherever he is.
- E-Perolehan enables the supplier's transition into e-Business, providing an entry point for e-Business capability.
- Suppliers will be able to adopt and grasp the e-Business concept more rapidly, due to the usage of e-Perolehan.
- Advertising of goods and services is much cheaper and faster, and yet reaches a much broader base of buyers.
- With the Internet platform, suppliers would virtually have a borderless advertising channel at a very low cost.
- Simplified processes and less manual work reduces administrative and operational costs. Through e-Perolehan, almost all the business operations will be automated, thus not only leading to lower operational costs, but as well as faster turnaround time to the buyer.
- Suppliers would be able to receive payments faster through electronic payment/MEPS. Supported by a highly secured network infrastructure, suppliers would be able to receive payments for goods and services in a shorter period.
- Improved business planning and forecasting due to a more efficient and predictable procurement process. Due to the fact that ePerolehan automates business processes and improves work efficiency, suppliers would be able to anticipate the procurement processes more accurately.

### **2. Government Benefits**

- Offers a more effective and efficient procurement process in line with the country's transformation to the K-Economy. E-Perolehan is a vehicle for the Government of Malaysia to leapfrog into the new economy and promote the widespread adoption of e-Business in the country.

- Lower operational cost over time. The Government of Malaysia will be able to reduce administration and operational costs through the usage of e-Perolehan as business processes are reduced and streamlined.
- Better and up-to-date choice of products and services. A Government buyer would have immediate access to a wide variety of products and services available to them via e-Perolehan, which will make them a better informed buyer.
- Latest product information and pricing available on-line. ePerolehan will always be up-to-date with the latest information that will help the buyer to make a more accurate procurement decision.
- A more skilled and knowledgeable workforce. Through its usage, e-Perolehan will indirectly promote a higher rate of IT literate workforce, both in the Government and private sectors.
- Better management of purchases and payments. With e-Perolehan, the Government buyer would be able to track or audit the procurement processes/transactions that have been made.

Geoffrey, S and Matthew ( 2001 ) also stated the benefit that government and supplier could get by adopting e-procurement system, that's are:

### **1. Cost Savings**

- Easier cost comparison among bidders, catalogues, etc. These cost comparisons promote lowest-bidder acceptance and quality-control across suppliers. Reduced uses of paper, postage, printing, and copying will save tremendous amounts of money.
- Just-in-time procurement. Gone are the days of the mule train and costly warehousing. Technology enables procurement to occur more often—delivery overnight, or within days in most cases. This practice is more effective and cost-efficient. Expensive warehousing costs (i.e. staff and space) can be avoided with e-procurement.
- Reduction of off-contract buying. Many employees purchase goods off contract, not realizing the savings that have been negotiated in the contracts because of the process necessary to procure the goods. E-procurement will reduce the incentive for employees to engage in off-contract buying because the transaction costs of purchasing under the contract will fall.
- Bulk or "warehouse" purchasing. One of the most promising benefits of e-procurement comes with government agency procurement collaboration. Governments can easily join together to purchase goods, enhancing their ability to negotiate lower prices from vendors, thereby cutting costs. Much like consumer warehouse clubs, per-unit cost decreases as quantity increases. Teaming up drives down costs and saves money. Technology makes it possible for cooperative agreements across city, county, or even state lines.

### **2. Increased Competition and Access**

- Wider "market" participation. Governments traditionally only advertise bids in local papers, necessarily limiting the number of potential bidders. The Internet is limitless—agencies can reach more bidders, resulting in more competition and lower costs.
- Greater Access. The Internet is always open. Vendors would have access to government bid information at their convenience, expanding the reach of



government to new vendors and participants. Greater access would lead to further competition among vendors, driving costs down even further.

### **3. Administrative Savings**

- Faster transactions. Traditional paper purchase order systems are plagued with delays. E-procurement allows purchases to be conducted almost instantaneously once authorization is granted.
- Paperwork reduction. By removing the need for multiple forms, staff time is freed up, increasing overall institutional efficiency.
- Easier management of purchasing and costs. The details of each procurement decision will be at the manager's fingertips on the computer, allowing the manager to examine total expenditures quickly and efficiently, rather than filed away in paper form.

### **4. Enhanced Accountability**

- By conducting business online, government agencies can show constituents how their taxpayer dollars are being spent much more easily. This transparency will encourage accountability for cost overruns and waste.

## **4.0 Issues and challenges surrounding E-Procurement in Malaysian Construction Industry**

In spite of all benefits that E-Procurement produces, the challenges of implementing this application do exist. According to Noor Raihan and Zaifuddin (2002), lessons learnt from a few local service provider companies that have embarked on the E-procurement endeavor indicated that factors such as incompetent infrastructure, global competition, human resistance to change and conflicting policies and standards pose immense pressure for the companies to move forward.

According to an E-Procurement service provider, Malaysians are not ready for the Multimedia Super Corridor (an advanced local cyberspace project), because of the lack of technical expert competency, especially in highly technical skills in the area of Computer Networking System and ATM technology. Thus, when dealing with technical issues in the discussion with International vendors, the local engineers may be lacking in support of arguments, losing control in the implementation and contributing less to solve the problem. Lastly, the vendors may bring more external support to support them and as a result there will be an increase in cost.

Besides that, the biggest challenge among other challenges facing the buy-side community is when suppliers are not willing to share the information openly with all the members of the supply chain by providing all information into the E-Catalog.

According to Seng, K.T and Hwee, Y.W (2003), the legal issues of e-procurement in the construction industry can be identified as lack of alignment in jurisdiction, confidentiality, legal liability and insecurity in E-transactions.

### **1. Lack of alignment in Jurisdiction**

The ease of performing transactions regardless of geographical distances is enhanced with the use of e-commerce. However, one is subjected to unforeseen exposures when

doing business electronically as different countries have different jurisdictions and variations in their legacy systems. Each country has taken different approaches in tackling e-commerce legal issues, and companies that are unfamiliar with foreign laws may face unexpected liabilities. Variations in the legacy systems of different countries could give different outcome in a dispute. This lack of alignment in the legal system is deemed as the most pressing issues because lack experiences and understanding in carrying out overseas construction projects. Hence e-procurement has further aggravated the legal issues of transacting globally.

## **2. Confidentiality**

Confidentiality issues are magnified with the use of IT as leakage of digital information is easily done, for instance forwarding emails and copying e-documents. This may have serious impact such as mistrust and financial loss on a company. For instance, trade secret, contract negotiation and other exchange of confidential information transmitted across the Internet are subjected to unauthorized access and disclosure, and other security issues. Many suppliers fostered the mentality that sharing information will expose them to risks. They ranked confidentiality of information as the top priority followed by ownership issues. This might be due to the ease of sharing and transferring data in the electronic medium. The new medium also facilitates meddling, theft or disclosure of confidentiality documents such as design drawings, bill of quantity and tender documents.

## **3. Legal Liability**

Legal liability is the duty of care and responsibilities one owes to another. One may be sued or have to pay for damages if one does not perform that duty of care. Most of the suppliers were concern over the legal relationship and liabilities issues, as there haven't any precedent for the contractual terms and liabilities between parties such as supplier and government agencies. Thus the contract drawn maybe biased or may have omitted certain clauses which are overlooked due to their inexperience in this new area.

## **4. Insecurity in E-Transactions**

Protecting a computer is relatively simple in the past, as one only has to prevent physical access. However, shared systems, shared network resources or web servers that are commonly used are subjected to theft, virus and worm attacks. Hence this has created difficulties in controlling access to a computer which contains confidential information and hence putting the integrity of the information at risk. These attacks can be either external (hackers) or internal (employees, partners and clients).

## **5.0 CONCLUSION**

This paper has highlighted the use of e-procurement systems in Malaysia, although there still facing uncertainty and challenges, but all of these create enormous opportunities and benefits for the subscribers to change, adapt and improve accordingly. The transition from procurement to e-procurement is not only technological; it also involves legal, organizational, socio-economic and democratic aspects. Essential ingredients of a successful transition include a vision, relevant policies, mission, strategic objectives and frameworks. Careful planning, strong and committed leadership and guaranteed funding are also critical factors for success. In Malaysia, e-procurement for

construction is still in its infancy stage which is expected to realize its full potential if also take into account international best practice and experience.

As this is a conceptual paper, research should be conducted in presenting the real situation on the impact and challenges faced by construction players especially contractors that involved more in e-procurement. The focus should be on investigating empirically how those companies are using e-procurement to gain competitiveness from supply chain management.

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