# E-procurement for Small and Medium Enterprises in Malaysia

by

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Dissertation submitted in partial fulfillment of

the requirement for the

Bachelor Of Technology (Hons)

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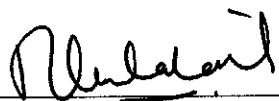Perak Darul Ridzuan

# CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
Information Technology Programme
Universiti Teknologi PETRONAS
in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION TECHNOLOGY)

Approved by,

_____
(Mr. Khairul Shafee Kalid)

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

December 2004

# CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

(SARYATI BINTI MOHD YATIM)

# ABSTRACT

In a day and age where IT technologies permeate virtually every facet of society, business organizations especially for small and medium companies should not miss the advantages of it. This research will look deep into the acceptance level of E-procurement among the Small Medium Enterprises (SME) in Malaysia. The aim is to find out the rationale behind these problems and the solutions to make the development of e-procurement successful. Investigation involves small and medium companies (SMEs) in Malaysia that have the opportunity to procure via Internet and also those companies who also do not have internet connection in the office. In this project, several techniques are used such as conducting interview session with companies, providing and distributing online questionnaires, and also observation through Internet and magazines. In this project, the functional and non functional requirement for an online community for SMEs are listed and ranked. Based on these requirements, the prototype of a web-based e-procurement intermediary for SMEs will be developed and ensure that it satisfied all the requirements. As the findings have been done, it highlights that the industry should realized the potential that e-procurement offers and the ability to help the small and medium companies to compete in larger markets.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Background of Study

This study will only covers for Malaysia including east and west Malaysia where the project is going to take place. As a fast and developing country, it is believed companies operate in Malaysia will have the potential to practice the e-procurement system no matter what kind of company they are; including small and medium sized companies. In every business organization, procure resources, goods or services for the company is one of core activity. Procurement process is important for making sure that business is in the flow although it is small or medium sized companies.

Number of companies that consider as small and medium size has increased day by day. Money is the big challenge where small and medium sized companies have to face if they decided to implement e-procurement in their business. From an organizational perspective, procurement is defined by the acquirement of goods and services from either internal or external suppliers or vendors. Normally, the procurement process is started with the purchase requisition (PR) being raised and is ended after the payment of the goods and services has been made. Thus, with the emergence of Internet based technologies and the implementation of sophisticated enterprise systems, organizations are able to utilize fully integrated electronic solutions to manage procurement activities which we called as an electronic procurement (e-procurement). This research will be emphasizing on the implementation of e-procurement that fully make use of the Internet.

## 1.2 Problem Statement

### 1.2.1 Problem Identification

In this research, the level of acceptance of e-procurement is the main objective where it is important to know how the small and medium sized companies agree to e-procurement. This will confirm whether e-procurement is beneficial for the SMEs and can be successfully be implemented in these companies. From the preliminary data gathering, it is believed that for most of small and medium sized companies, money will still be the issue that hinders them to take the challenge doing something new. These companies are afraid that the online procurement can only involve a lot of money than the income they will obtain. Uncertainty is also another main reason where they do not fully understand how the online procurement can help in their business processes. Plus, there are certain companies are comfortable enough with their manual type of procurement where they only have to interact with small numbers of suppliers. But, from the different point of view, manual procurement is a very expensive process that companies have to consider time, money and most importantly manpower. By using Internet technologies, a company can save a lot of these costs and get other benefits such as get the opportunities to choose the best suppliers or vendors that exist in the online procurement community. Therefore, it is essential for these small and medium – sized companies to understand and practice e-procurement in their business process.

### 1.2.2 Significant of the Project

In order to make sure these small and medium sized companies able to enter a wide challenge market, they should not miss the opportunities from the electronic transaction as the larger companies have been done. From the findings results, a prototype will be developed that meet all the requirement for e-procurement system and show how costs can be reduced by convincing the companies to implement the e-procurement.

## 1.3    Objective & Scope of Study

The objectives of this research are:

- To study the status of the e-procurement for Small and Medium Enterprise in Malaysia in order have a clear view of how far e-procurement can be successfully implemented.

- To identify the level of acceptance of e-procurement by the small and medium-sized companies whether to use or not to use e-procurement in their business process.

- To gather requirements which include functional and non functional requirements in order to develop a website that performs as an electronic market place for procurement. This will helps to reduce costs, time and manpower of the companies especially for small and medium sized enterprises.

- To develop a prototype of a fully functioning system that will be called as Online Procurement Community (PRO-C) for SMEs that can help those companies to gain benefits from internet technologies.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1    Introduction to E-procurement

E-procurement can be known as a new way in procuring goods, materials and services. According to Raju and Narahari, e-procurement is transforming the way companies communicate requirements and find the right sources for goods and services. The key aspect that differentiates electronic procurement or e-procurement with the traditional procurement is the utilization of the Internet. Internet is used as a medium to channel the inflow and outflow information of the procurement process. In traditional procurement, the tasks that need to be executed in the procurement value chain are done manually although there might be some computerization. Basically, traditional procurement would have these steps:

- *Purchase Requisition*

  Purchase Requisition is concerned by the procurement officer when the inventory department report that the resources have running low or there is an important item needed. Other than that, when an equipment or furniture required or need to be replaced, a purchase requisition has to be generated to inform the management so that the company can buy the new equipment or furniture.

- *Vendor selection*

  In the business area, any company has the choice to select their own vendor that meets all their expectations. The vendor selected must offer high quality goods at a reasonable and competitive price. Vendors should also able to attract their customer

by offering a reliable service in a sense that they can deliver the items ordered on time and accordance to the customer's requirements.

- *Quotation*

  Quotations include the items that the customer is ordering and the price that the vendor is charging for the particular items. Therefore it is important for the company in dealing good prices for the items with the vendor.

- *Manager's Approval*

  After quotations have been obtained, it is important to have the manager's approval. However, this approval does not necessarily come from the manager as a person with the authority to make purchases or use of the company's funds can approve a purchase. The main point is the purchases are in the best interests of the company and the quotations have been given to be confirmed.

- *Purchase Order*

  The purchase order is the document that contains the type of goods being ordered, the quantity and price offered for the particular goods. The purchase order is sent to the vendor or supplier specifying the request of goods for purchase. When the vendor received the purchase order, they usually call or fax the customer to inform the receivable of purchase order and the availability of the product that is being ordered. Sometimes, especially the smaller companies do not need the purchase order. Instead, they will only call the vendor, state their order and wait for the supplier to send the goods.

- *Invoicing and Billing*

  After the goods have been received by the customer, the vendor will then generate the invoice or bill. The invoice states the goods delivered and the cost for the goods and delivery. The invoice is also significant to record transactions of the vendor and its customers so that the vendor can check their income whereas the customer can check their expenses at the end of accounting period.

- *Payment*

   Payment is the end of the procurement process whereby the customers must pay to the vendor either by cash or cheques. Usually for smaller companies with the small amount of goods ordered, they will prefer to pay in cash, and for bulk orders the vendor will be compensated via cheques. The time of payment also differ for each company as there are companies will pay their supplier upon receiving the item ordered and some other companies pay their supplier at the beginning or at the end of the month.

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┌─────────────────────┐
│  Purchase Request   │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│      Approval       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│   Vendor Selection  │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│   Purchase Order    │
└─────────────────────┘
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┌─────────────────────┐
│    Goods Receipt    │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Invoice Verification│
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│      Payment        │
└─────────────────────┘
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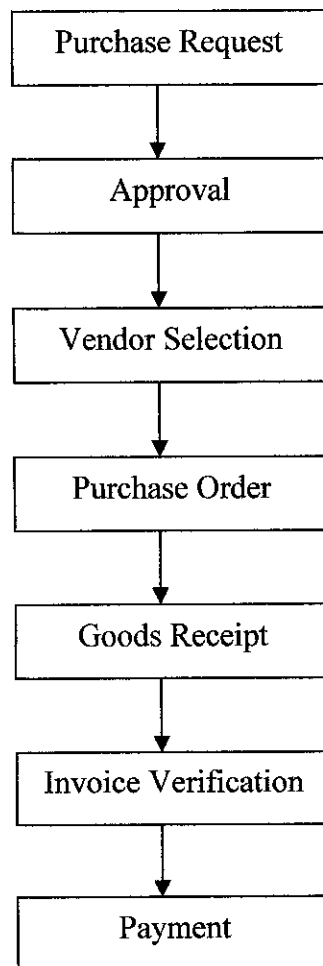
**Figure 2.1:** A typical procurement process

Figure 2.1 depicts a typical procurement process which starts from purchase request and end with payment. With a traditional procurement system or also known as paper-based procurement system, all process involved are done manually. The employee has to look up information in a paper catalog and fills out the paper requisition. They have to make sure that the goods they want to buy from a particular vendor are meeting with all the requirements needed by the company. When a situation where they have been through all the procurement process and suddenly the higher management or the managers do not approve the purchase, they have to start again and browse another paper catalog and make another call to the new vendor. This really waste the time and of course involve costs for paper used for printing of orders and invoices, phone calls, faxes sent as well as delivery services. A typical procurement transaction to complete can take a longer period of one or two weeks rather than two or three days. This time consumed can actually be lessened if the e-procurement system is used and therefore more money can be saved and more activities can be done.

With an e-procurement system, it has saved all the time typically lost in approvals and research and reduces the possibility of a rogue purchase. The company can browse an online catalog to make a requisition. They can also check the availability of the item in a quick online check. The company will have the power to choose their best vendor who meet the requirements and offer best services after making comparison between the vendors. Thus, the e-procurement really benefits the companies and we will look the importance of e-procurement for SME.

## 2.2 Benefits of E-procurement

According to Mark Small and Richard Grice (E-strategies for Small and Medium Enterprise), the Internet creates a new set of customer expectations other than quality, cost and delivery. These new Internet value components include:

- speed of service
- convenience
- personal service
- price

### *Speed of Service*

Using Internet, customers can order the products and services by simply clicking of the button. It really saved a lot of time as the company can reduced the time of searching the best vendors, making phone call and others. Buyers can get instant access to a big pool of sellers who offered variety of products. They can actually browse the online catalog and choose the item they want to purchase. They can also view different prices from different sellers which allow them to make decision on procuring resources.

However, trust is the important key for the internet trading especially in delivering the quality and best product and services that they promised in the online catalog. Therefore to maintain perception of the speed of service, vendors have to fulfill the customers' requirement and delivering the products according to the agreement. Nothing is more damaging to the reputation of an online service than products that arrive late or never at all.

### *Convenience*

The fact that customers can now procure goods and services from the comfort of their home or office means that the convenience value proposition has already been significantly changed. The company can also assess the vendor performances and service levels and negotiate better prices and contracts with vendors. Plus, the buyers can easily ensure their purchasing policies are complied with their own rules. In other

words, if the supplier does not comply with the rules, the transaction can be easily terminated thus eliminating such costs to the buyers.

## Personal Service

Using e-procurement, all purchases can be easily documented and recorded that can help the buyer to analyze their buying pattern. This helps to increase order fulfillment accuracy and eliminate untracked, maverick buying habits. For example, the company can revise the resources that they have procured so that they can plan their work more efficiently with this information. The buyers can also check whether the supplier are meeting with their requirement during purchasing and give the best services to them. Supplier who always sends defective items, late deliveries and wrong orders can be identified and considered whether to deal with them in the future again or not.

## Price Value

Using electronic transactions, the costs can be reduced by passing it on the customers to allow the vendor or enterprise to deliver the cheapest product without impacting the perceived quality. However, companies of smaller sizes have the problem when entering the market where the strategy is to compete on cost. The companies, on the other hand should focus on how to attract the customers so that their investment on using Internet or specifically e-procurement are more valuable.

According to Shaun Tan (Business Times, 5/9/2000), buyers can consolidate all orders into one big order to attract bulk discounts. It means that they will be able to form "buying consortium" with the suppliers to obtain prices for bulk orders instead of buying goods separately from the limited number of suppliers. The travel expenses can also be reduced as there is no need for buyers and sellers to meet each other. As more companies joining the Internet community, the choices for the buyers to procure resources with best offer can be increased.

Further details are from the articles in the I-Start New Zealand's e-business portal which has stated strong study on the aspects of e-procurement. Some of the benefits of e-procurement are as below:-

- Companies can save up to 20% on purchasing costs through an on-line e-procurement system by tracking purchases, consolidating suppliers and negotiating better discounts. .
- Manage all approved suppliers on-line.
- Browse, select and process orders quickly.
- Purchasing orders and reports can be produced in a choice of formats including XML, EDI, HTML, fax and email. Most systems will also integrate with ERP systems eliminating time-consuming error-prone double handling.
- Purchasing managers have more time to source, analyze and negotiate better deals.
- Better forecasting and accounting efficiencies, depending on the availability of specific software

## 2.3    Risks of E-procurement

These benefits don't come without risk. The greatest risk is that the companies do not know who they are dealing with. Traditionally when procuring goods and services, the buyer has the opportunity to meet and size-up potential suppliers. In a web based business transactions the only information about the supplier is that contained in their company details. Therefore, it will have the possibility the supplier or the buyer do not exist or is not a well-built company. This risk must be faced by the community in the e-procurement websites.

## 2.4    Why SMEs do not Prefer E-procurement?

The Small and Medium Enterprise (SME) business sector has a number of definitions and interpretations ranging from the extremely small one-person business, which clearly fits into the category, up to organizations which may have several hundred employees and annual turnovers of several million dollars. While the definition of SME can be seen to vary among publications, Small and Medium-sized Industry Development Corporation (SMIDEC, 1995) however has classified the Small being enterprises as an enterprise with a paid up capital of less than RM500,000 and employing workers not exceeding 50 persons. Meanwhile, medium being enterprises is an enterprise with a paid-up capital of RM500,001 and employs full time workers between 51 to 70 persons. One of the key features of SME businesses (Rogers, 1999) which distinguish them from larger enterprises is that they have a lower capital to labor ratio than large enterprises.

In the study by Joyce K.Y. Chan and Mathew K.O. Lee (SME E-Procurement Adoption in Hong Kong – The Roles of Power, Trust and Value, 2002), trust is the main thing that the companies relies on when dealing with electronic transaction. Trust seems to play a significant role in any exchange especially with its growing impact of electronic markets.

Players in the cyberspace must first trust on that environment before they trust on any particular player. In particular, SME are more exposed to external threat than their larger counterparts. When using the electronic transactions, they are more exposed to potential risks as they are unfamiliar with the trading partners as well as the technology that they are using. For example, they may suffer from the risks of confidential information being eavesdropped on the network.

Other than that, lack of previous experience or relationship with Internet-based suppliers may increase the risk perception in buyers' minds. In order to lower the risk perception of the suppliers, the buyer must trusts the capability of its suppliers and trust their intentions. Thus, the level of e-procurement is positively related to the buyer's

level of trust on its Internet-based suppliers. The factors affect trust and confidence when conducting business over the Internet is authentication, non-repudiation, integrity and lastly confidentiality. Overall, without a sufficient level of mutual trust, even low value transactions would not have started.

## 2.5    Web-based Procurement Community for SME

In a thesis entitled "Internet for Supporting Purchasing and Supply Management of Small and Medium Sized Enterprises in Developing Countries" by Monica Leicht and Marienstr, it also emphasize on implementing websites for purchasing, except that it is more highlighting the supplier's website. However, the main focus is still the same which is to allow a group of people to access a website and can browse catalog, generate purchase order, advertising their product and others. Online catalog is still being the main specifications in the website where it help to overcome many problems with traditional methods by offering the following attributes:-

- Latest version available
- Ease of access from PC with Internet browser
- Easy to use interface that requires little training and assistance
- Detailed searches through advanced search facilities.
- Browsing to compare products and prices.
- Placement of orders with electronic order forms.

Current catalogues tend to save time by having relevant, up to date information, can raise orders quicker, and can verify the status of a request without being forced to contact the supplier. They should, however, be employed where items are sold at pre-defined prices with very little price volatility.

Through observation via internet, some of the websites that provide services for procurement to companies such as e-bay and ePerolehan have been discovered.

Although it is not specify for small and medium companies, but it shows that e-procurement have been implemented. One of the examples is ePerolehan website whereby it converts traditional manual procurement processes in the Government machinery to electronic procurement on the Internet. ePerolehan allows suppliers to present their products on the World Wide Web, receive, manage and process purchase orders and receive payment from government agencies via the Internet. The supplier's product catalogue is converted into the form of an electronic catalogue or eCatalogue, which can be viewed from any desktop with a web browser.

Although ePerolehan only focus on governments and the associate parties, this concept of e-procurement illustrates a good example of the flow of e-procurement and what e-procurement can offer. The same goes with e-procurement for small and medium companies which these companies are also capable to gain advantages of using electronic procurement especially through intermediary websites.

# CHAPTER 3

# METHODOLOGY/ PROJECT WORK

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        ┌─────────────────────────┐
        │  Planning and Preliminary│
        │     Data Gathering       │
        └─────────────────────────┘
                     │
                     ▼
        ┌─────────────────────────┐
        │   Research and Data      │
        │      Collection.         │
        └─────────────────────────┘
                     │
                     ▼
        ┌─────────────────────────┐
        │  Data Compilation and    │
        │       Analysis           │
        └─────────────────────────┘
```
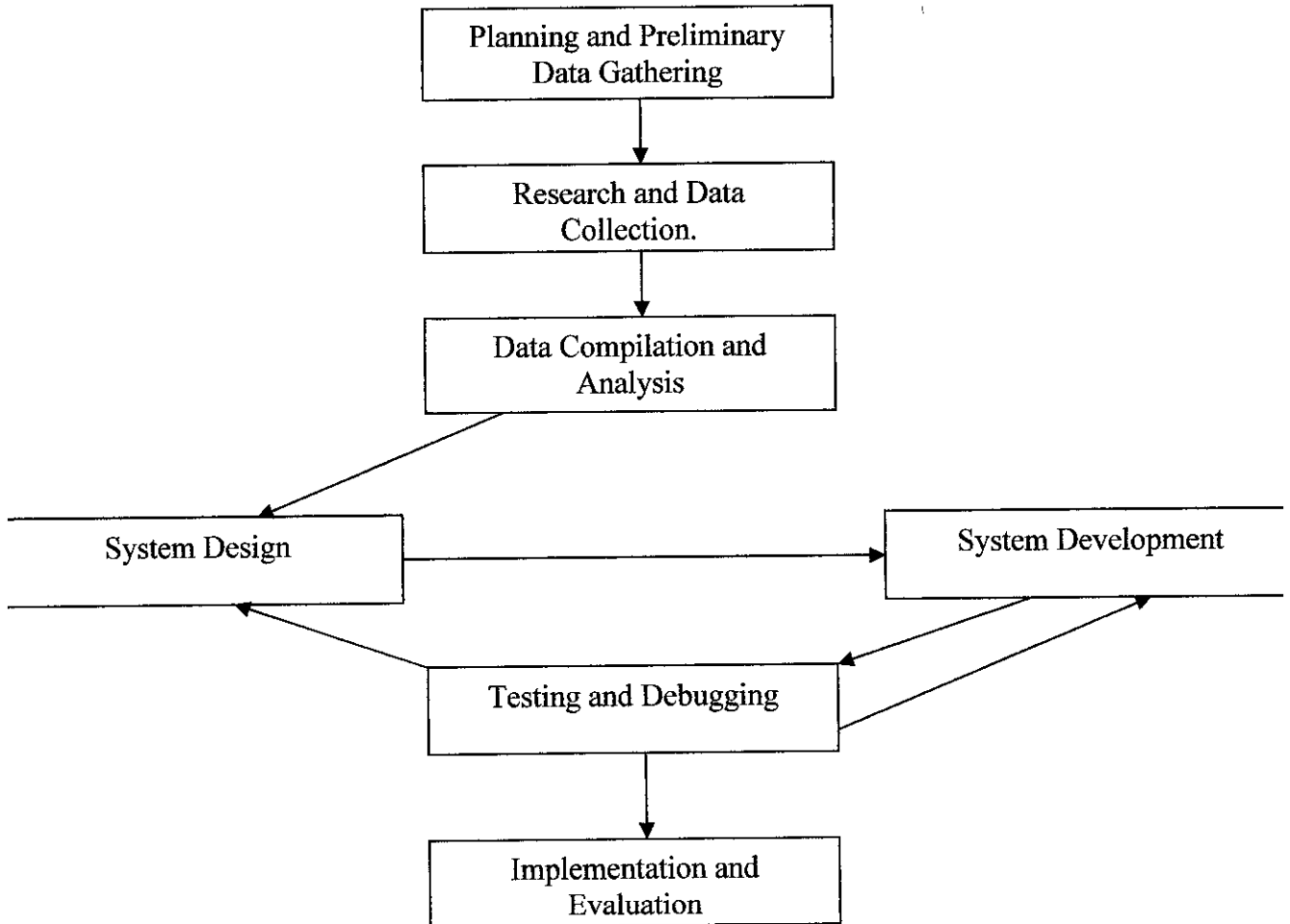
**Figure 3.1:** Project Methodology

Figure 3.1 describes the flow of procedures that are planned for this project. The project begins with planning and preliminary data gathering and ended with implementation of the system and the evaluation.

## 3.1 Procedure Identification

### 3.1.1 Planning and Preliminary Data gathering.

This is the first phase of the project whereby all the essential activities that have to be done in order to ensure the effectiveness and smoothness of the flow of the project. All data needed in the research are gathered first to have the clear view of the project and understand more on the procurement process. A timeline is also being prepared so that the flow of the project can be controlled and deadlines can be set.

### 3.1.2 Research and Data Collection

This phase is where all the data from the companies are collected. Firstly, the list of the companies which is considered as small and medium-sized companies is been searched before continuing with the research process. The search is done by using the Internet, newspapers and magazines.

After the list of companies and the information of those companies have been gathered, it will proceed with data gathering for the findings. There are several ways to collect all the data and information needed which includes interviewing companies, distributing and providing questionnaires, call conversations with the respective companies and also observation through the internet and magazines.

The importance of data collection is to gain as much knowledge and understanding the scope of e-procurement especially for SMEs. The data that are very sufficient to this research includes:-

- List of small and medium sized companies in Malaysia (company information includes name, address, contact number etc)

- Information of procurement process in the company (including number of supplier, cost to procure etc)

- The level of ICT (Information and Communication Technology) usage in their company whether they are aware of government's initiatives or not.

- The level of acceptance of the SME in order to include e-procurement in their business operation.

- The requirements which are general, functional and non functional requirements for the websites as the main element to be included.

- The acceptance of testing phase whether the company is interested to join the testing phase for the websites after completing the development phase.


### 3.1.3 Data Compilation and Analysis

The results obtained upon the completion of the research procedures are conformed and analyzed. All the requirements are sorted out whether it is functional and non functional and evaluated. The most important features and details will be put into account during the design of the prototype.


### 3.1.4 Prototype Design

After analyze all the requirements, the project will be continued with the design phase. Tools to be used are chosen first so that preparation for the development of the system can be done. Flow of the system will also be drawn to show how the system works, and how the data and information flows within the system.

The design should be based on the requirements needed for the procurement process and appropriate for those in the corporate sector. The design must be formal, informative and user friendly as well. Database for the system should also be designed

in order to make sure that it is efficient and well-organized to manage all the requirements of the user and the system itself.

### 3.1.5   Prototype Development

Programming skills will be needed for this development phase in order to make the prototype successfully developed. Programming language that will be used is such as ASP, JavaScript, XHTML and others that will be considered later if useful for the development of the system. The system should be based on the data flow design which has been drawn in the design phase.

### 3.1.6   Testing

During the Development phase, few testing will be conducted in order to make sure the system is working well or not. This can help to find errors and flaws of the systems and try to fix the problem. After completing the system development, the major testing for working prototype will be done in order to make sure it meet all the system requirements and make any corrections if there is any flaws encountered.

### 3.2   Tools

To accomplish the task of designing and developing this prototype, many applications and tools would be required. Different parts of the prototype need different tools.

- *Macromedia Dreamweaver MX*
  It's a web page/application authoring tools which used to design for the platforms page of the e-procurement systems.

- *Adobe Photoshop 7 and Ulead Photo Impact*

  Adobe Photoshop and Ulead Photo Impact is hands down, the most popular program for creating and modifying images. This pictures authoring tools is used for the design phase of the system. Adobe Photoshop will be used to design the interfaces of the web pages and used to editing some graphics or pictures which need to be touch to produce a good image.

- *Microsoft Internet Information Services (IIS)*

  Microsoft Internet Information Services (IIS) 5.0 is a powerful web server that provides a highly reliable, manageable, and scalable Web application infrastructure for the Windows 2000. IIS helps organizations increase Web site and application availability while lowering system administration costs.

- *Active Server Page*

  ASP (Active Server Page) scripting is important in this system as it is used in the development phase using the Macromedia Application. ASP is a Microsoft technology for sending to the client dynamic Web content, including XHTML, Dynamic HTML, ActiveX controls, client-side scripts and Java applets. The Active Server Pages processes the request (which often includes interacting with a database) and returns the results to the client -- normally in the form of an XHTML document, but other data formats (e.g., images, binary data, etc.) can be returned.

- *MSSQL*

  The database of choice was MS SQL Server 2000. The database is used to store and retrieve information using the application system. Beside that, the store procedures are written and executed on this database server.

# CHAPTER 4

# RESULTS AND DISCUSSION

## 4.1    Data Collection and Method

On 14<sup>th</sup> of August, about 59 sets of questionnaires were distributed to the participants in Seminar on Business Coaching for SME in University Malaya Centre for Continuing Education (UMCCED), Kuala Lumpur. The participants were identified as representatives by small and medium sized companies who came from around Kuala Lumpur, Selangor, Negeri Sembilan and Malacca. There were 24 participants who responded and submitted the questionnaires.

Further data collection activity was conducted on 9<sup>th</sup> to 11<sup>th</sup> of September 2004; about 82 sets of questionnaires were distributed to the participants in SMIDEX 2004 in Putra World Trade Center (PWTC) in Kuala Lumpur. This exhibition were participated by more than 150 small and medium companies including German companies. Out of 82 sets of questionnaires distributed, 61 companies had responded and submit the questionnaires. From both events, the total amount of questionnaires that successfully gathered is 85.

The questionnaires are divided into 6 sections namely Company Info, ICT Initiatives, E-procurement Initiatives, the Acceptance of the Web-Based E-procurement Intermediary, Requirements of E-procurement and Testing Phase. The first section which is company info will gather all the company details and the process of procurement in their company. The second part was aimed at identifying the level of ICT usage in the company followed with section three for the understanding of e-procurement. The section three will also explain the acceptance of the company towards e-procurement.

The next section was intended to get the information on how well they know about web-based e-procurement intermediary. In section five, requirements of e-procurement website were divided into 3 types which are general requirements, functional requirements and non-functional requirements. General requirements are the requirement that often offer in any websites, functional requirements are the description of activities and services a system must provide while the last one is non functional requirements are the descriptions of other features, characteristics and constraints that define a satisfactory system. These requirements will clarify all important things that they want the websites to provide. The last section is the testing phase where the company will show their interest or not to join the testing phase if the website have successfully developed. Overall, from the questionnaires it will really help to justify what the e-procurement is and as well as give a brief description of e-procurement and . the acceptance level of e-procurement for SME.

## 4.2    Empirical Results

*Company Information*

Table 4.1 provides a snapshot of frequency responses on firm's type of industry. Of the 85 companies that responded to the questionnaires, 98.82% (84 companies) have computers with internet connections in their offices. Therefore it shows that these companies are aware of the computer technologies. In this section also include the procurement cycle and cost of procurement issue. From 58 companies, 12 of them said that they procure 1-5 times a month; 6 of them 6-10 times; 7 said 10-15 times; and 33 of them said more than 15 times. It shows that the procurement activity is quite actively been done in the small and medium companies. The estimation cost for one complete procurement cycle, 17.24% said that they estimate below RM100, 13.79% is RM100-RM250, 15.52% is RM250-RM500 and 53.45% estimate more than RM500. Based on these results, the cost of procurement is relatively high especially for small companies.

| | |
|---|---|
| Chemical Petrochemical Products | 9 |
| Electrical&electronic telecommunications | 18 |
| Food,beverage & tobacco | 2 |
| Machinery and engineering | 21 |
| Textiles | 1 |
| Retail and wholesale | 3 |
| Info technology | 2 |
| Biodegradable food containers & customized packaging | 1 |
| Motor | 1 |
| Furniture | 5 |
| Services | 5 |
| Paper and printing | 1 |
| Training center | 1 |
| Semiconductor | 1 |
| Transportation | 1 |
| Automative Interior Trim Components | 1 |
| Rubber product | 1 |
| Plastic Injection Moulding | 3 |
| Filteration | 1 |
| Government | 1 |
| Security | 1 |
| Industrial Oil Cleaning Solvent | 1 |
| Brass Wares | 1 |
| Manufacturing | 4 |
| **Total Companies** | **85** |

**Table 4.1:** Type of industry



Cold calling, 1, 0%

Meet the supplier, 61, 23%

Telephone, 79, 30%

E-mail, 59, 22%

Fax, 65, 25%

Telephone
Fax
E-mail
Meet the supplier
Cold calling

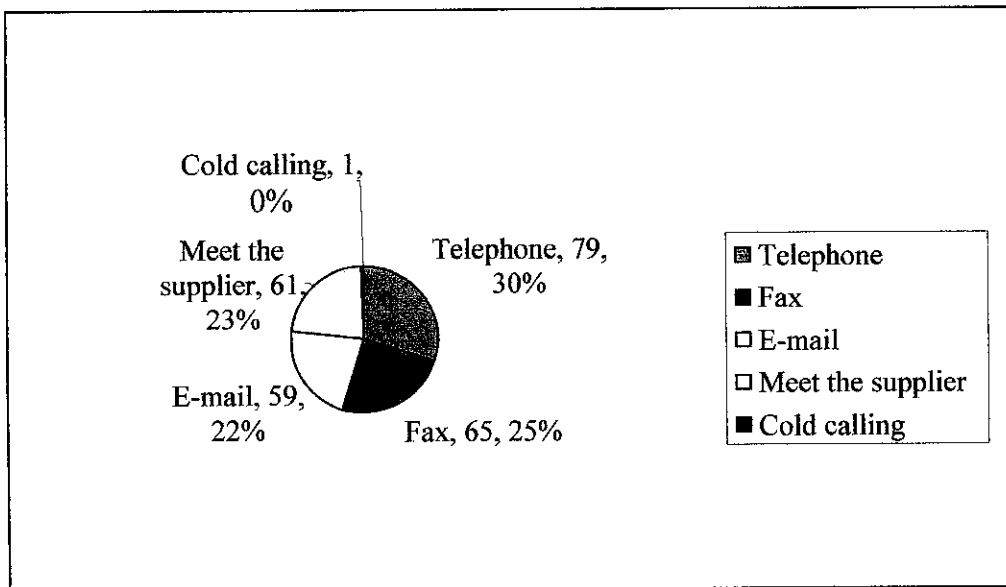**Figure 4.1:** Type of contact with supplier

For the second section which is the ICT initiatives, 42% of them are strongly agree, 49% agree, 4% for neutral and strongly disagree and 1% for disagree. Out of 80 companies, 60 companies have implement ICT in their companies and another 20 do not implement it. The reasons which make difficult to implement any ICT usage in the companies are because of high cost (46%), comfortable with current operation (31%) and lack of computer literate (23%). Figure 4.2 shows the data on how many companies agree and disagree on the government initiatives to implement ICT in business.
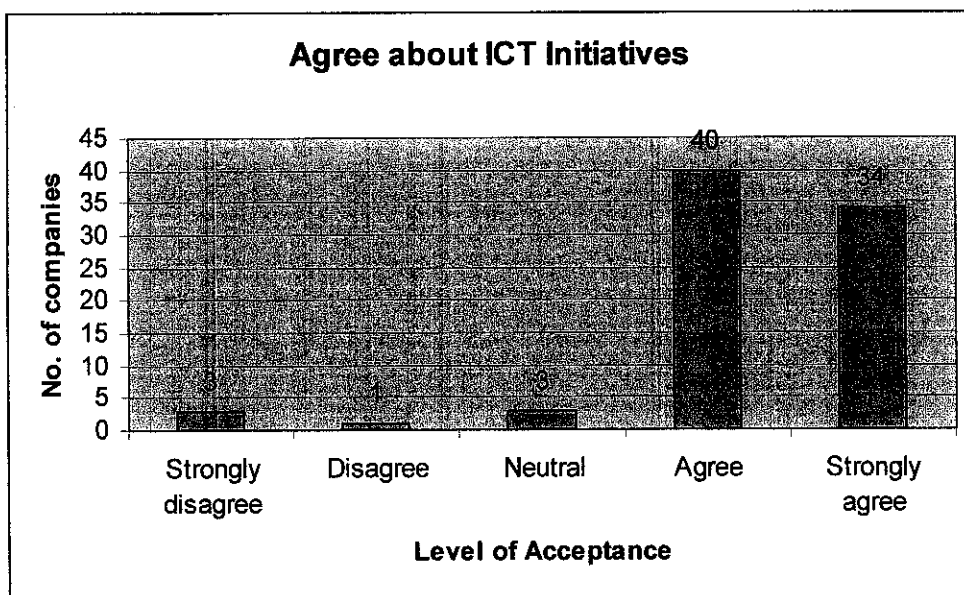


**Figure 4.2:** Agree about ICT initiatives

The next section will describe more on e-procurement initiatives. 54 companies had said that they have heard about e-procurement before. But, only 21 companies (27%) who had already implement e-procurement system in their companies by buying from software vendor, develop by external software developer or develop the system by themselves. Not enough budgets are the main reason why these companies do not implement e-procurement which has the percentage of 40. Other reasons which hinder them not implementing e-procurement is because of comfortable with current business operation (19%), lack of technical skills(16%), lack of knowledge on e-procurement (24%) and company is too small(1%). These data is shown in the Figure 4.3:-
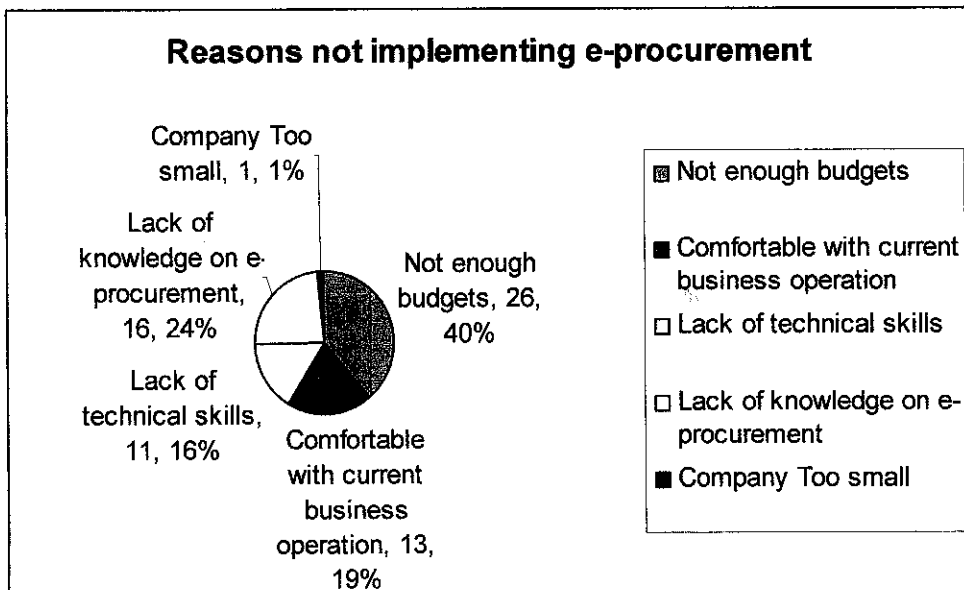


**Figure 4.3:** Reasons not implementing e-procurement

| Agreement | Value | f | % |
|---|---|---|---|
| Strongly agree | 1 | 18 | 23.6842 |
| Agree | 2 | 45 | 59.2105 |
| Neutral | 3 | 10 | 13.1579 |
| Disagree | 4 | 1 | 1.3158 |
| Strongly disagree | 5 | 2 | 2.6316 |
| **Total** | | **76** | **100** |

**Table 4.2:** Agreement on e-procurement should be used by SMEs

From Table 4.2, the median is found at case 38 which is contained within the category "Agree". The median is the appropriate measure of central tendency for ordinal data. However, the Likert scale which generally associates numerical values with ordinal data (in this case, 1 to 5 for "Strongly agree" to "Strongly disagree"), permits to calculate an arithmetic mean. This mean is calculated to be 2.0, which is Agree. Hence the mean has provided more information than the median that proves that most of the companies think that e-procurement should be used by the companies of small and medium sized.

*Acceptance of Web Based E-procurement Intermediary*

After getting all the information and knowledge on the companies stand and belief on e-procurement, the acceptance level of the web-based e-procurement intermediary also consider as important as the main objective of the research is to emphasize on electronic market for SME. 45 companies had said that they know the existence of websites which allow them to procure goods and allow selling products to others. Some of the websites that they stated are government e-procurement, e-bay, Sunway e-procurement, and www.eperolehan.com.my. From the questionnaires, it shows that most of the companies agree that web based e-procurement community will offer advantages and potentials to the SME (95% said YES and 5% said NO). Out of 75 companies, 71 of them are interested to join and only 4 companies do now interested when respond to the question whether they are interested to join the website e-procurement community.

After gathered the entire information essential to know the acceptance level and their knowledge towards e-procurement, the next section were aimed to collect information on the requirements needed in the website. The requirements are showed in the table below:-

| Criteria | No of companies |
|---|---|
| Calendar | 42 |
| Online Calculator | 41 |
| Messaging Service | 64 |
| Search service | 68 |
| Forum | 46 |
| Others: | a) pictures of product<br>b) term and conditions<br>c) previous quotation and offer price<br>d) integration with PO/invoice/DO/Accounting system |

**Table 4.3:** General Requirements

| Criteria | No of companies |
|---|---|
| Catalog | 69 |
| Product selection | 65 |
| Contract pricing support | 57 |
| Faxing services | 52 |
| Content management | 56 |
| Product comparison capabilities | 53 |
| PO | 63 |
| Invoice | 59 |
| Reporting | 66 |

**Table 4.4:** Functional Requirements

| | V. unimportant | Unimportant | Neutral | Important | V.important |
|---|---|---|---|---|---|
| Security | 8 | 0 | 2 | 14 | 53 |
| Integration | 7 | 0 | 6 | 32 | 31 |
| Ease of use | 7 | 0 | 3 | 22 | 41 |
| Reliability | 8 | 0 | 3 | 21 | 42 |
| Inexpensive | 7 | 1 | 9 | 20 | 36 |

**Table 4.5:** Non Functional Requirements

The last section is only to know whether they are interested to join the testing phase if has the chance to complete the development phase. 42 companies respond they are interested to join the testing phase while 26 companies are not willing to join.

## 4.3    Prototype

### 4.3.1    Concept

After completing the analysis phase, the development of prototype will be continued based on the requirements from the questionnaires results. This prototype will be web based and to access it the users must have an internet connection. The design would be user friendly as most of the small and medium companies' personnel have low or maybe no computer knowledge.

The idea for the design of this prototype is actually intermediary web based procurement where companies can communicate with each other to do business online. Another simpler way to describe the system is that the system acts like marketplace, where all the SMEs gather and display their items that are for sale.

The system requires the SME to register. Upon registration the company will be given a profile which its procurement officer can manage. It can be considered as an account where all the details regarding the company can be put here and be displayed to other SMEs who are logged into the system. Each company will have one administrator only which will manage the company's profile in the websites whom can change or update the company's catalog and information.

With the admin account, the SME will be provided an online catalog for them to display the products that they are selling. The catalog can be made available to other companies so that they can browse it and make an order for any products(s).

Once a company knows what it wants to procure, they can place an order to the company that manufacturers or distributes the item that they are requesting. This order will be sent to the recipient's inbox that alert them on the latest transactions so that they can take action accordingly. Upon receiving an order, the seller may decide if they could deliver the order. Once they have agreed to deliver, they can generate an invoice that will be sent to the buyer(s).

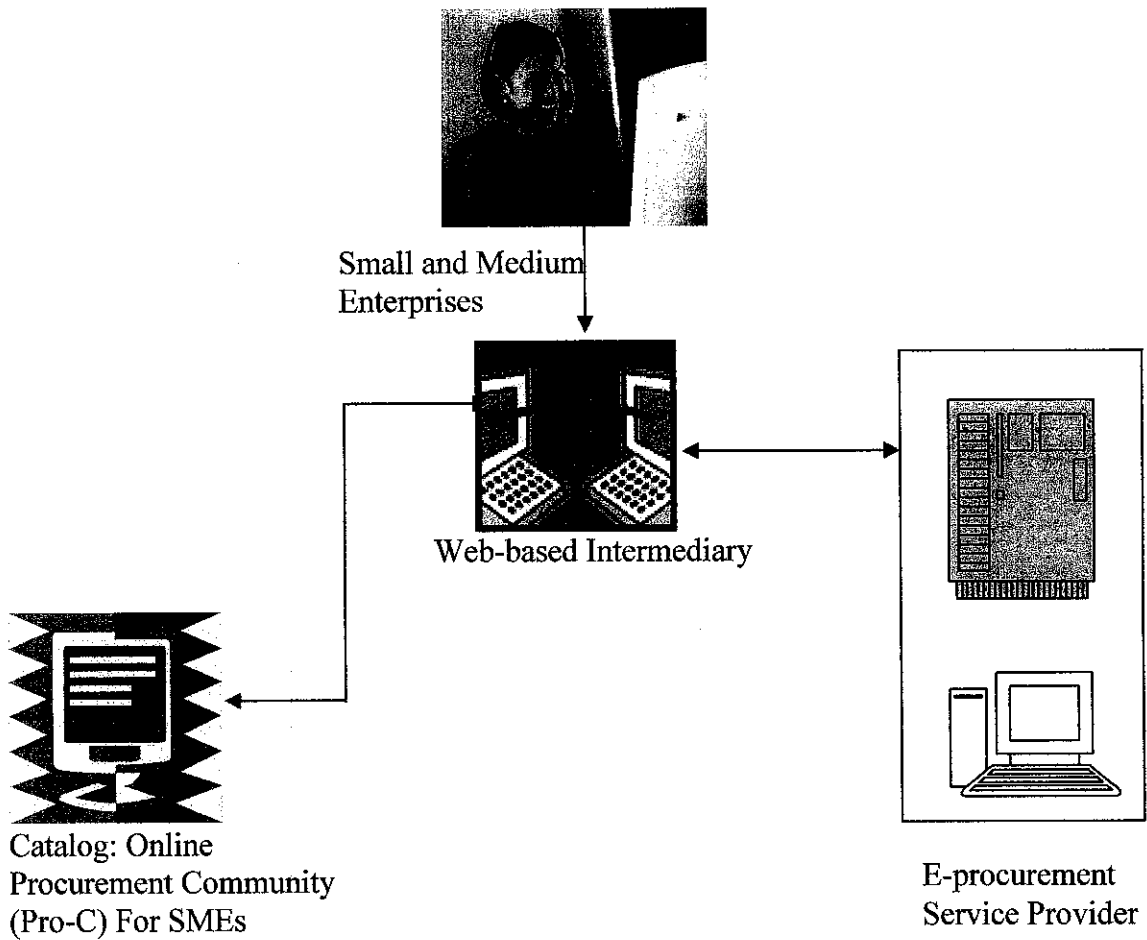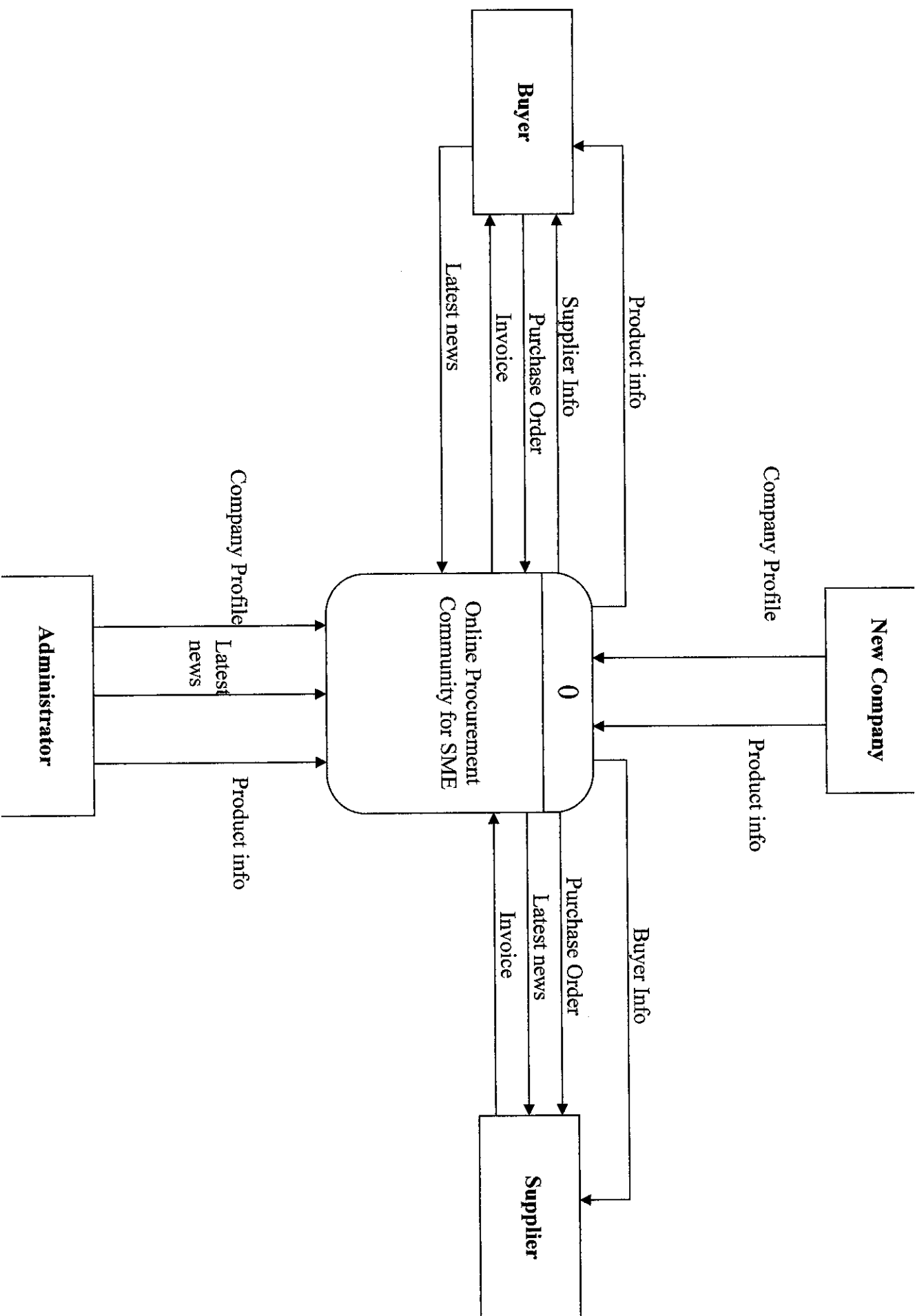## 4.3.2 System Architecture



**Figure 4.4:** A diagram of Pro-C architecture

Figure 4.4 shows the architecture of the system in general. To access the system, the SMEs have to log on to the Internet and access the web portal. As can be seen, there is a central element, the intermediary, which interconnects the different parts involved in a typical business environment, but with more dynamism compared to the traditional business forms.

All information such as company profiles, transactions and product information will be stored in the service provider's server. On the server side, the service provider would require tools such as ASP, MSSQL database, Internet Explorer, IIS and some security Applications such as SSL (Secure Socket Layer) or a firewall. For the client side, the only application needed would be the Internet Explorer or a browser.

The SMEs who is the administrator will deal with the catalog in the Online Procurement Community (Pro-C) For SMEs web pages. They are the responsible person for the company to register the companies and update the catalog and the company profiles. Meanwhile, for the company who has register in the website, can actually surf the website and depends on their need whether to order goods, find suppliers, communicate with other SMEs and others.
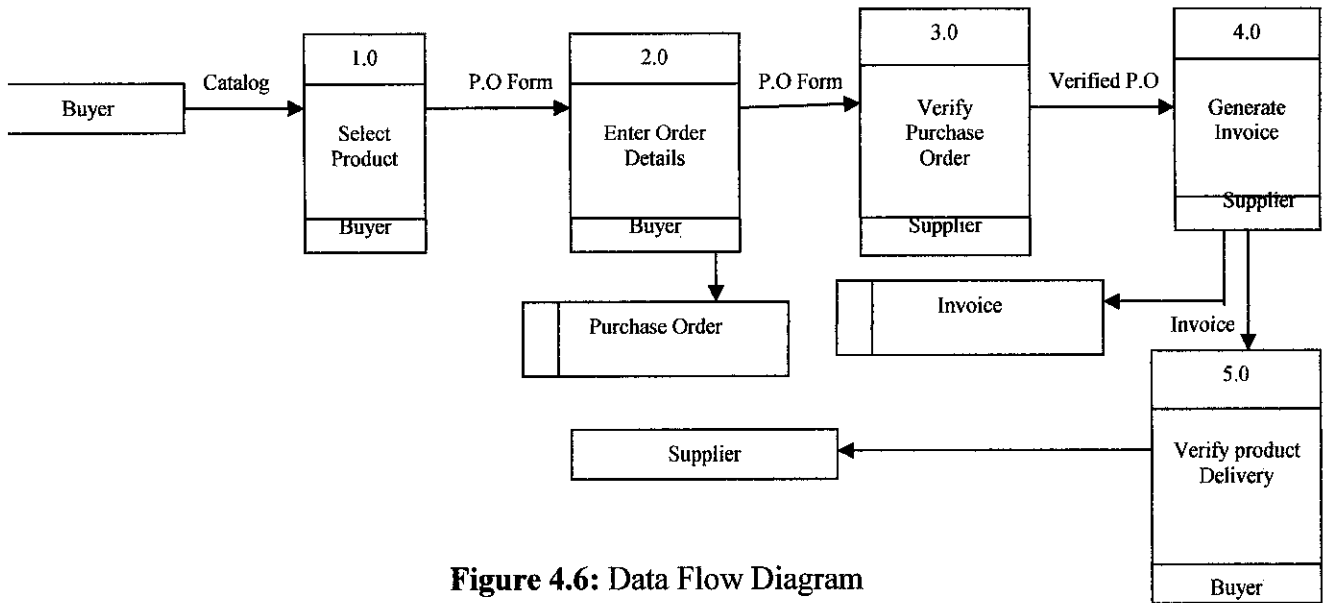
**Buyer**

Latest news
Invoice
Purchase Order
Supplier Info
Product info

**Administrator**

Company Profile
Latest news
Product info

Online Procurement Community for SME

0

**New Company**

Company Profile
Product info

Purchase Order
Latest news
Invoice
Buyer Info

**Supplier**

**Figure 4.6:** Data Flow Diagram
(Level 1)

Figure 4.6 shows the data flow diagram (level 1) that includes all the main process for Pro-C websites which start with select product in the catalog and end with verifying product delivery by the buyer.
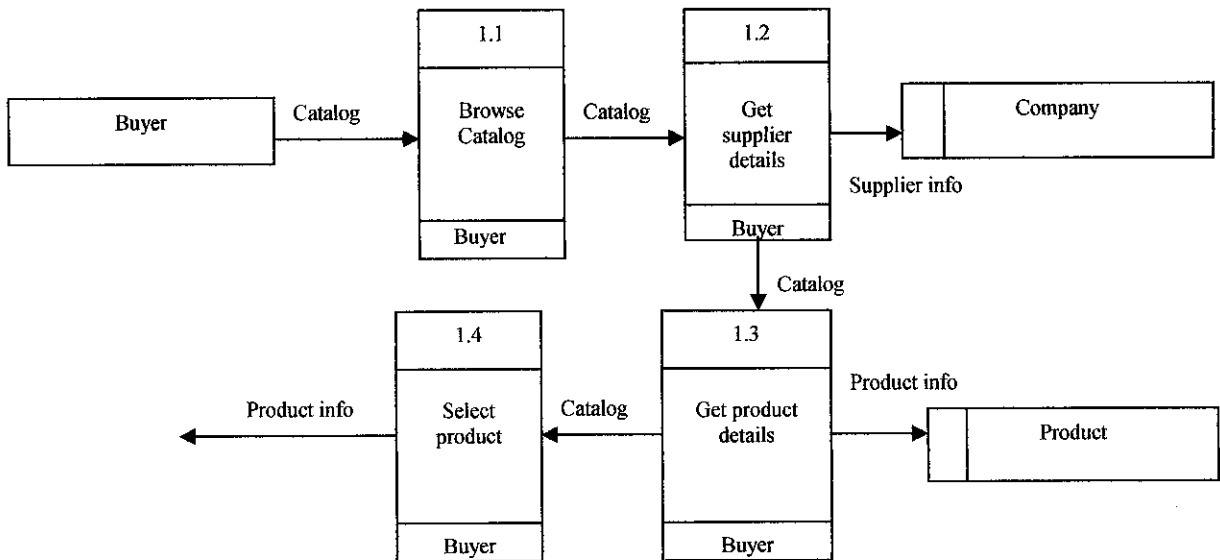


**Figure 4.7:** Data Flow Diagram
(Level 2)

Figure 4.7 shows the level 2 for the "select product" process which start with the buyer browse the catalog to get all the information they need and end with select the product.
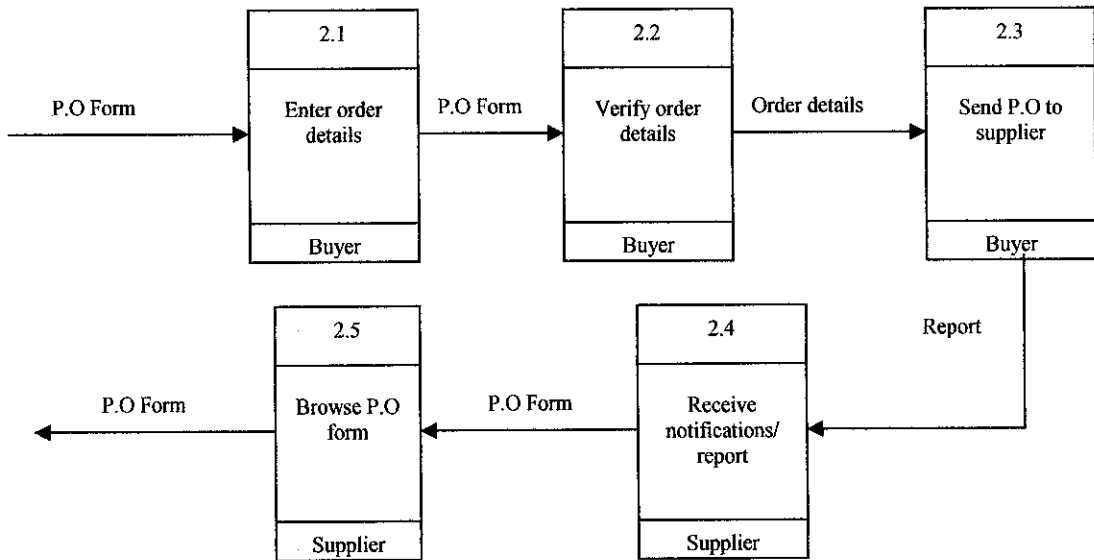
**Figure 4.8:** Data Flow Diagram
(Level 2)

Figure 4.8 depicts the process of "Enter Order Details" which continue after the buyer select the product. The buyer will fill in the purchase order (P.O) form and the form will be sent to the supplier. The supplier will received a notification and can view the P.O form.
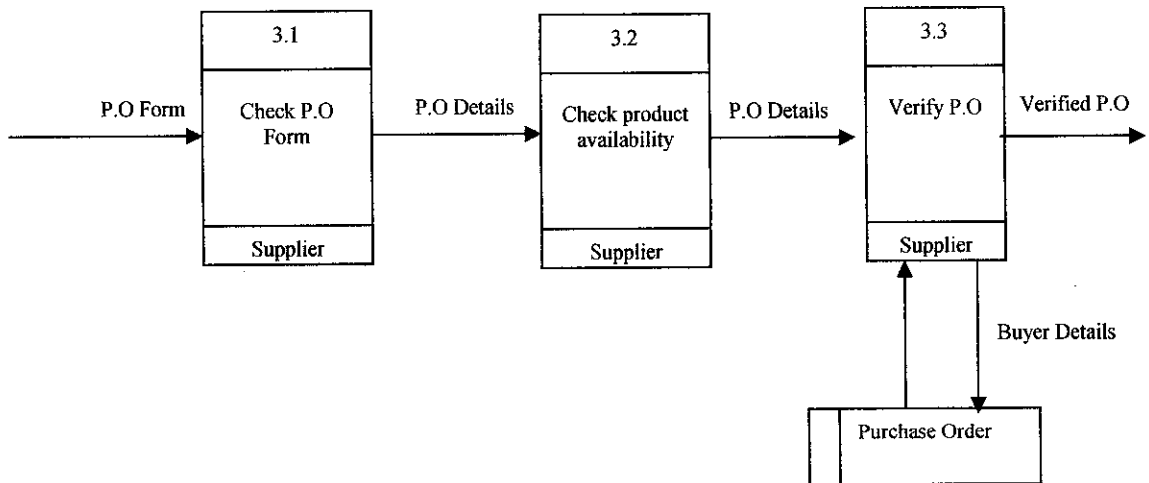


**Figure 4.9:** Data Flow Diagram
(Level 2)

Figure 4.9 shows the process after the supplier views the P.O form and have to check the product availability. The end of this process is verifying the P.O.
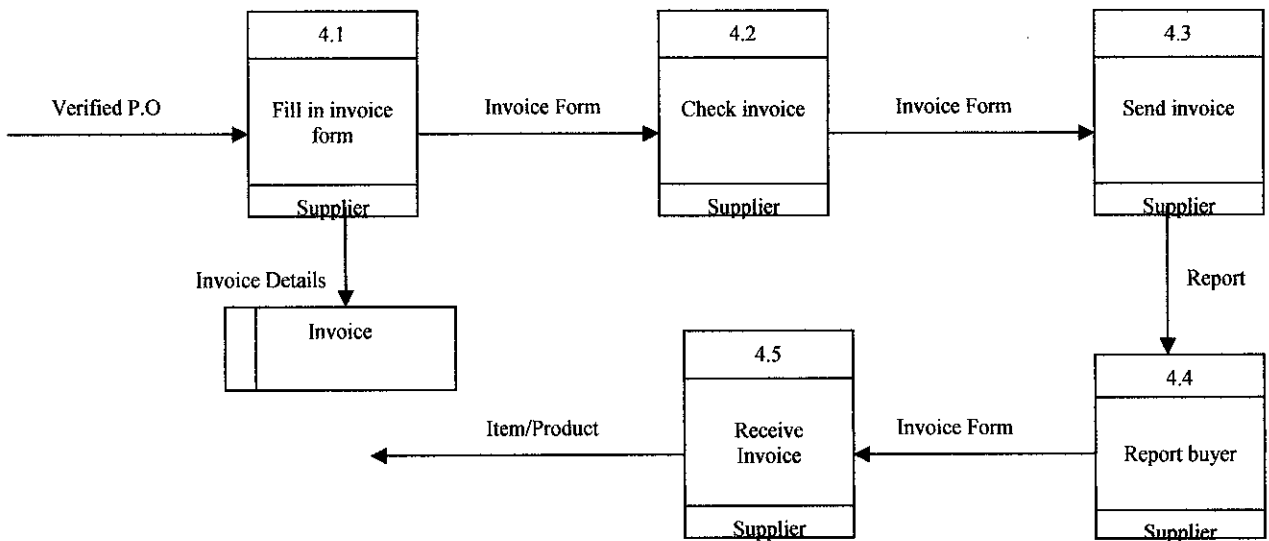
**Figure 4.10:** Data Flow Diagram
(Level 2)

Figure 4.10 shows the process of "Generate Invoice". The supplier will fill in the invoice form and it will be sent to the buyer. The respective buyer will received a notification to check the new invoice.
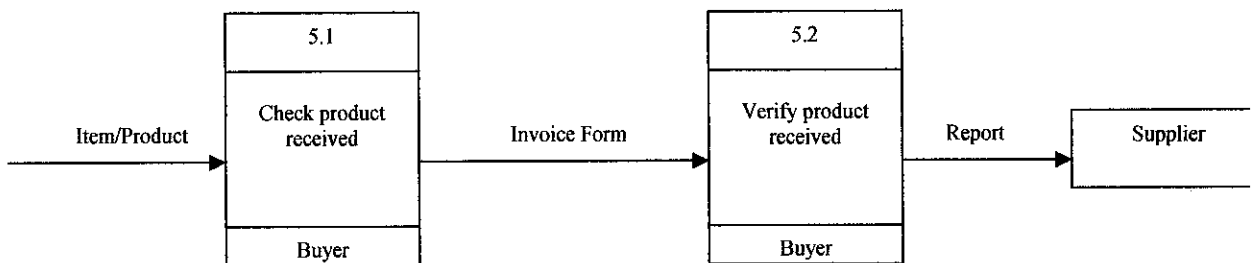


**Figure 4.11:** Data Flow Diagram
(Level 2)

Figure 4.11 depicts the last process of the Pro-C websites which take place after the buyer received the products ordered. The buyer will check the condition of the products and verify it if they are satisfied or send comments/complaints if they are not satisfied.

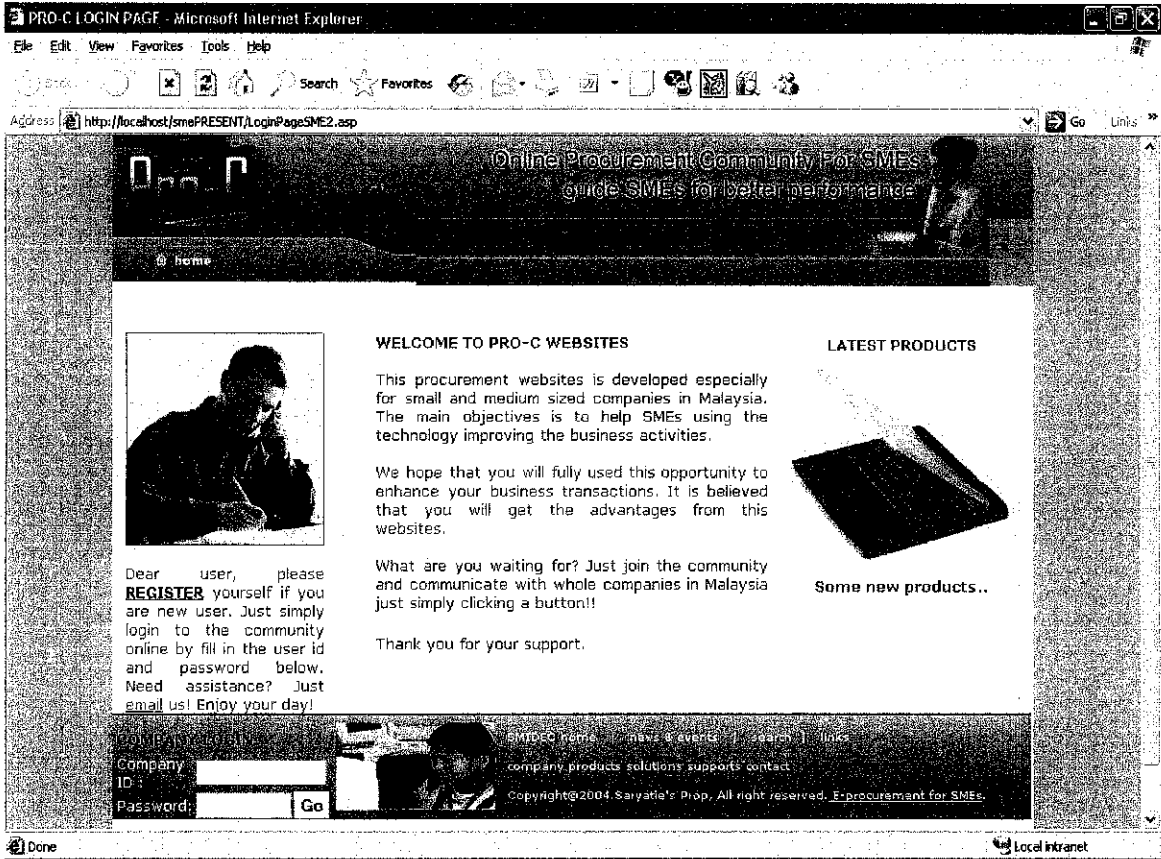## 4.4 Prototype Interface

*Login Page*



**Figure 4.12:** The Login Page

Figure 4.12 depicts the login page for the system. If the company is not registered in the system, it has to register first before login to the main page. If the company is already a member of the online community, the user can just key in the company ID in the textbox and enter the password.
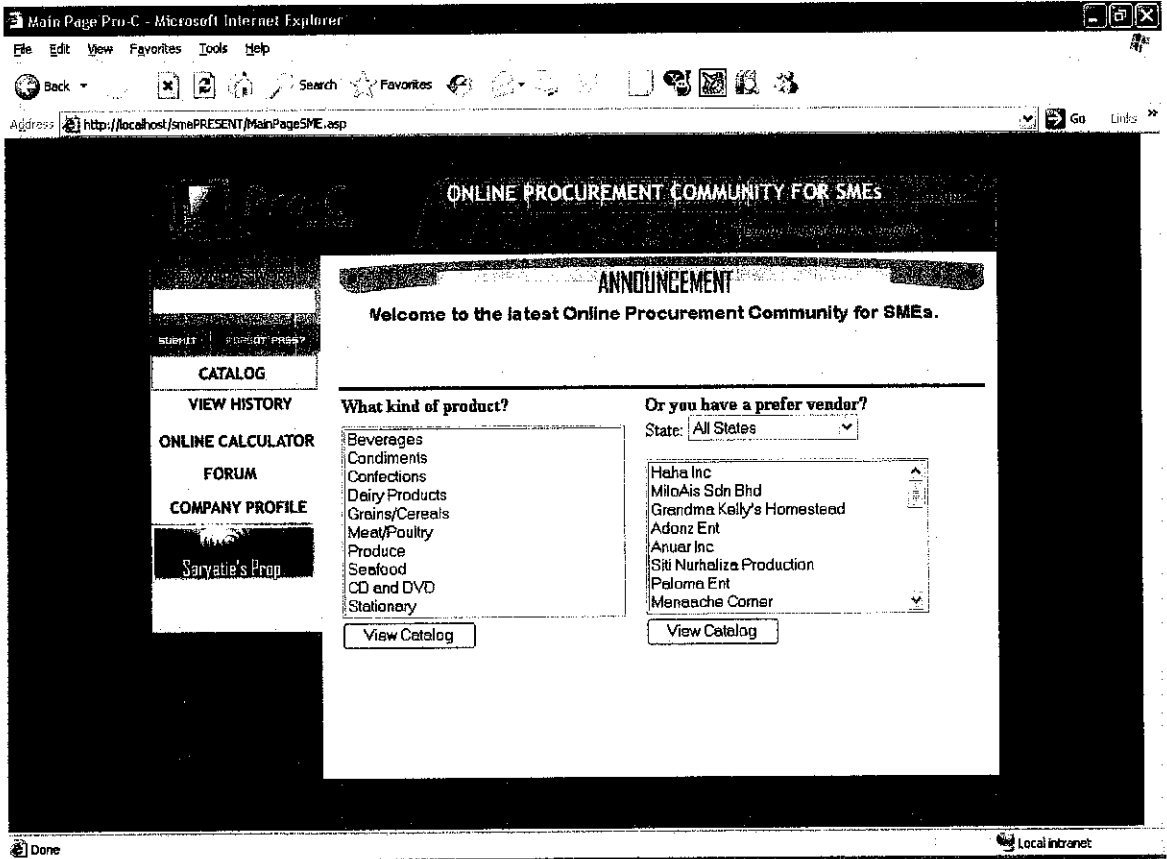
*Catalog Page*



**Figure 4.13 :** Catalog Page

After successful login, the main page will be displayed. Figure 4.13 depicts the catalog page where the user can choose to view the catalog by the type of product or by preferred vendor.
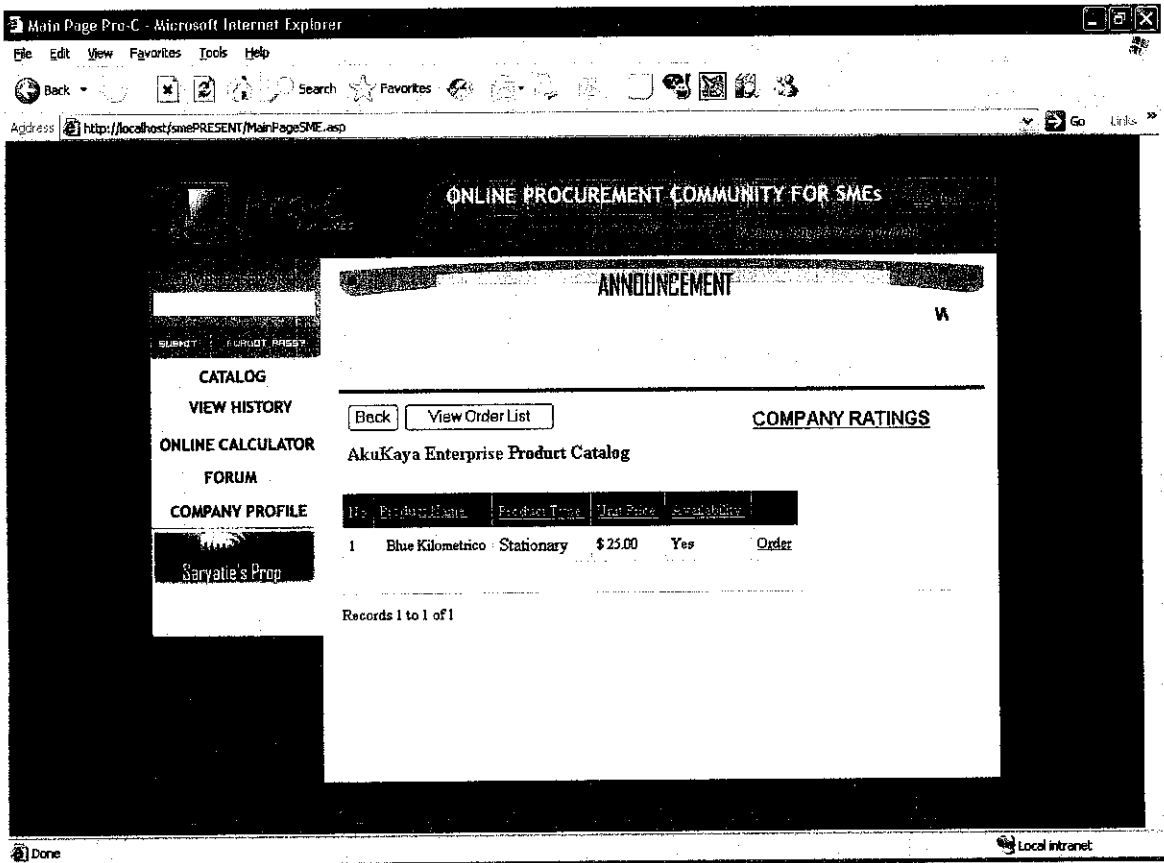
**Figure 4.14**: Company Catalog Page

When the user choose to view the company's catalog and click the view catalog button, the page in Figure 4.14 will be displayed where it shows all the products offer by the company. The user can order the product by clicking the Order link in the table. If the company has many products, the user can buy any products that they want by click on the links and the products that they ordered will be in the order cart.

*Purchase Order Form*



**Figure 4.15:** Purchase Order Form

The figure above is the purchase order form where it stated all the details of the buyer, vendor and the purchase order details. This form will be sent to the particular vendor and the vendor when login into the Pro-C will get a new announcement stating that they has a new purchase order form. Then, they will check and verify the purchase order form and send an invoice if they are agreed to sell and send the products ordered.

**Figure 4.16:** Invoice Form

Figure 4.16 shows the invoice form that will be filled up by the vendor. After they have fill up all the details of invoice in the form they will click on submit button and send to the buyer. When the buyer login to the websites, it will show an announcement stating that there is an invoice received. When they have look through to the invoice, all they have to do is wait for the goods to be delivered to them. Later, after they received the goods ordered, they will checked the goods whether it is in a good or bad condition. If the goods are not like what they have agreed before, they should complaint to the vendor and if the goods are according to what they are expecting, they will verify the invoice.

## 4.5    Discussion

The survey results presented in the research can give a brief explanation on the status of e-procurement for SME in Malaysia. From the findings, it is true that small and medium-sized companies are aware with the technologies that have been spread out throughout the world. E-procurement is one of the advantages that do give chances to any kinds of companies to be more efficient and competent in the business operation including SME.

From section one of the questionnaires, it shows that many of these companies use the internet technology in their business operation including contact with supplier through e-mail. Furthermore, in section two, most of them believe that government initiatives to encourage companies to use Information and Communication Technology (ICT) are the right thing to do in order for them to prepare themselves competing with other strong companies around the world especially in developing countries. This also includes small and medium sized companies because they are part of the business world. The reasons that thwart them to use any ICT including e-procurement are pertaining to cost which they said very high and they do not have that much capitals. This statement is further strengthening by a survey done in China, *"Commercial Internet Adoption in China: Comparing the experience of small, medium, and large businesses"* where they stated that 82% of small companies in China have the obstacle to exploiting the web because of lack of capitals.  Other reasons that they mention are they are comfortable with current business operation and lack of computer literate. However, the survey results also indicate most of the SME are agree that e-procurement is a good investment for their company and they do think that the e-procurement based system should be used by small and medium industries to compete in the global market. This really shows that e-procurement initiatives could be implemented by not only for large companies but for small and medium companies too as long as they have the capabilities and are willing to take the challenges.

But, the main focus of the research is to come out with web based e-procurement also called as Online Community for SME. The survey results from section four do explain the acceptance level of these companies towards the web based intermediary of procurement. 95% are interested and 5% are not interested to be part of the online community which gives them opportunity to promote and sells product as well as procure resources and goods that the company need. This had proved that an online procurement community for SME is advantageous and valuable to be implemented because small and medium sized companies do show their concern in extending their business operation in technology area.

## *The Functional and Non Functional Requirements*

In order to develop this website, we have to know all types of requirements needed in order to be in procurement process. The survey results have listed all the requirements which include in general requirements, functional requirements and also non functional requirements. All these requirements are taken into account in order to develop a website that is useful and beneficial for all users to use. Functional requirements are the most important element that should not be left out because it involves the exact procurement process in the company. Without these requirements, the website is worthless and do not meet the objective to ease the traditional procurement process. The examples are:-

- *Catalogs*

    Most of the companies agree that by having an online catalog in the website would prove to be useful in the business. This catalog can be browse whenever they want to advertise their company's products as well as search other goods and products for their company purposes. The catalog will help the companies to give information of their products in order other buyer would have interest to deal with them. This really helps them to save cost and time and certainly improve their business operation to be more effective.

- *Generate Purchase Order*

    One of the major processes in the procurement phases is generating purchase order. Ordering items from other company or supplier requires that the buyer send a purchase order to the seller. This form will be generated for the buyer to fill in their order and later on it will be sent to the supplier.


- *Generate Invoice*

    Once an order has been received, the company which sells the product must respond by delivering an invoice. This invoice is to verify the availability of the product on sale and it proves as a document which states that the order item ordered will be handed to the purchaser.


- *Reporting*

    Reporting is one of the requirements that most of the companies require. They would like to get updated information on the flow of procurement happen in the websites. Probably they would have the report that can send straight to their email or via fax when there is an activity in their account such as company's order or purchase order generated.


There are four non functional requirements that are considered as important in the procurement website. There are:-


- *Inexpensive*

    For small and medium sized companies, definitely cost will be an obstacle to make any changes or improvement. Therefore, inexpensive is major specification that these companies want to. When the system is inexpensive and do not involve a lot of money the buying power required to implement the system could be very small or probably non-existent. This will give the opportunity to the especially small companies to implement e-procurement solution in the business.

- *Security*

  As stated in the literature review, trust is important in an online transaction. To keep the trust within the companies, a secure website should be implemented. One way to have a secure transaction without being intercepted, pampered or manipulated by irresponsible people is to have a login page where it can only allow responsible party to access the websites including the administrator and head procurement officer. Therefore, all the companies' details and transaction in the websites are well secured and they will have no problems in using the system.

- *Reliability*

  A reliable system is very important. The website must certainly error free, as it deals with the important transactions between two or more companies. It must also be available when needed and meets the objectives of the user. Errors and mistakes may be acceptable in paper based transactions but in online system, these should not be occurring.

- *User Friendly*

  User friendly also is the most important requirements needed by companies. A system which is not user friendly may not be used by the user as they will have the difficulty to navigate through the system. A user friendly system will make them comfortable and can use without any assistance.

## 4.6     Cost Issue

The most important issues to be discussed are the cost of procurement and the procurement cycles in the small and medium companies. Based on the results collected, most of the companies answered that in one month they will have more than 15 times procurement activity in the company. It shows that the procurement activity is active inside the company. Therefore time, money and labor resource will be consider in the procurement cycle where these companies will usually want to decrease the cost of business activities in order to gain profit. The website of online procurement community is the best solution where the cost of procurement will be decreased as the labor cost can be reduced and save more time.

Other than that the cost of procurement cycle should also be analyzed as to know how much benefits gained for the small and medium sized companies. Based on the results, more than half of the respondents said that they have to spend more than RM500 for one complete procurement cycle. According to the article published in DM Direct Newsletter January 09, 2004 entitled Asset Life Cycle Management - Benchmarks and Quantified Savings, it stated that, the average cost to process a purchase order is $US150. The cost to receive, reconcile and pay the invoice is typically an additional $US50 according to the analysts. Then, add in a $US25 cost to plan procuring asset requirements. Therefore, the cost for procurement is $US225 which means that RM854.22. From the results gathered in the questionnaires, more than 50% of the companies saying that the cost of procurement per cycle is more that RM500. Therefore, cost issue will strengthen the reason to develop the procurement system for small and medium companies. If the company join the online community, the cost of procurement will be reduced compared to the traditional way of procurement as they can save money in paying the telephone bills, labor costs and other related costs.

## 4.7    Comparison with other E-procurement Websites

ePerolehan websites is one of the procurement websites that provide services to the companies in Malaysia. By subscribing to the ePerolehan system, suppliers will be able to participate in the procurement exercise by the government. Upon final implementation of the ePerolehan system, full services will be available to all four types of procurement that is Central Contract, Direct Purchase, Quotation and Tender.

Basically, the services provided by this websites are being proved in the analysis part as the functional requirements needed in an e-procurement system such as catalogue management, direct purchase which start with purchase requisition and ended with payment and invoice generated by the supplier. The concept of ePerolehan is basically the same as being proposed by Pro-C except, the focus is slightly different where ePerolehan more concentrating on the government users as the buyers whereas the suppliers are company who registered to the system. Pro-C is focus on small and medium sized companies as the buyer and also as the seller where these companies will communicate with each other in the online community.   In ePerolehan system, the process of procurement start with purchase requisition part when the Government User selects a product to procure, and it ends when a purchase order (PO) is sent to the Supplier. Next is the order fulfillment process which involves the fulfillment of order by the Supplier, confirmation of receipt of goods by the Government User and the Payment to the Supplier. The flow of ePerolehan system might be wider than the process involved in Pro-C. In Pro-c, the purchase requisition is not included where it assumes that the purchase requisition and quotation are being approved by the procurement officer in the companies itself. The end of procurement process also is different where the ePerolehan includes the payment advice system but not in Pro-C. It might be easy for the government to handle the payment process as the buyer is only on the government side and only have to pay to the various suppliers. In Pro-C, the companies have to manage the payment themselves as it involves in highly security aspects and it is depend to both companies (seller and buyer) to deal about payment process.

The same goes to another procurement websites which is Procurehere (http://www.procurehere.com) which is own by Procurehere Sdn.Bhd. Actually, Procurehere is one of procurement service provider in Malaysia which provides procurement services to the companies in Malaysia and also some other countries. The companies can choose either be a supplier or buyer when register to the Procurehere. The concept is similar to the Pro-C where all the procurement process will be automated through online transactions. But, the scope and services offered by this procurement service provider company will be broader such as e-auction technology where companies can upload their projects to try an online auction and others.

# CHAPTER 5

# CONCLUSION AND RECOMMENDATIONS

## 5.1 Conclusion

The Internet is globalizing marketplaces and increasing the marketing reach of the organization. As the digital economy grows, companies will have to react more quickly to customer needs, bring products to market with greater speed, and increase their responsiveness to changing business conditions. Organizations will increasingly be under pressure from both their competitors and partners to improve inter-business integration, and the Internet offers an ideal platform.

Based on the research been done and responds from the companies especially SMEs had stated that usage of e-procurement is low because of the cost problem. They said that they have not enough budgets to implement such systems. Because of the cost issue, this Pro-C website is being introduced with the intention to decrease the cost of procurement. Another reason that hinders the SME to implement the e-procurement is lack of knowledge on e-procurement. For this problem, should depend on the companies itself to learn something new that can help their business operation or for the government, they should promote e-procurement to SMEs by explaining the advantages of e-procurement. What the SMEs have to do is to take the challenges and rationalizing the risks and at the end they will gain benefits from their decision.

## 5.2    Recommendations

For this project, the most crucial part is to meet all the requirements gathered from the data collection and analysis part. It is true that these requirements can be changed from time to time as it is usually dynamic according to different perceptions from the SMEs. The project will be convincing and effective if the scope of the project be widening in terms of number of companies responds to the questionnaires and interview session. This is because with more data collected, higher understanding level can be achievable.

For future expansion of the project, it is recommended that a study and analysis of using agent and XML in the project can be done. The different concept of the prototype and ideas may help in rationalizing all the limitations of the prototype done in the project.

The scope of the project may be broaden by incorporate with payment system which will involved other party other than supplier and buyer such as bank and finance institutions. The payment system may be use credit card or direct debit accounts from banks. On the other hand, the system administrator and the procurement service provider must consider the security aspect of the system as it will engage with very sensitive and confidential data of the company.

## 5.3    Future Enhancements

There are a lot of features and ideas can be generated for the future enhancements. Some of the features that can be included in the prototype of the system are :-

- Forum, faxing services, contract pricing support and others.
  Due to the time constraint and lack of skills, this requirement could not be implemented although it had been included in the data collection and analysis phase. Based on the data gathered, this requirements are been highlighted by the companies to be included as one of the system module. Therefore, it is

advantageous if these requirements can be implemented in the e-procurement websites.

- Increase time to conduct research

If given opportunity and more time to conduct a more effective research, the study of e-procurement for small and medium enterprises will be more valuable and conducive as more companies can contribute in the interview session or respond to questionnaires.

- Review systems

For online transactions, the most critical risk is the supplier and buyer does not know who they are dealing with. With a traditional procurement process, they have chance to meet each other and discuss on the agreement but with web based transactions, only information about the supplier and buyer is contained in the web pages. But, the risk can be counterbalanced through a review system, where previous buyers rate the quality and value for money of their chosen supplier. This information is freely displayed whenever that buyer makes subsequent orders. Obviously unscrupulous suppliers which get bad ratings can simply choose to create a new account. But it seems that buyers invariably ignore bids made by suppliers without ratings and instead favor those with good ratings. Thus having no ratings is no better than having bad ratings and therefore dumping an old account gives no real advantage. Therefore, for future enhancements, the review systems should be included in order to reduce the risks.

- New programming languages

Other programming languages such as using PHP, JSP or even XML can be considered to be used in the future. This language can be chosen based on the priorities or the best suited for the development of the websites.

## 5.4    System Limitations

The prototype of the system that has been implemented is not fully functioning based on the requirements needed by the companies. Lack of time and skills do make difficulties in the system development. Thus, many of the requirements especially the functional requirements that are crucial to the websites could not be applied.

One of the functional requirements needed by the companies is the pricing contract support. It is actually required in the actual procurement process where the supplier and customer can negotiate the price and make an agreement. However, in the websites developed, the price is fixed unless the company administrator changes the price of the product in the company catalog. This has affected the relationship of the supplier and customer when an online transaction is made where they could not discuss and get to know each other. Therefore the closeness of relationship and interaction between two or more companies are lessening when dealing via internet.

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13. *Realizing the Potential of Electronic for SMEs in the Global Economy* by Mariarosa Lunati

14. *Internet for Supporting Purchasing and Supply Management of Small and Medium Sized Enterprises in Developing Countries* by Monika Leicht, 2000
   http://www.intracen.org/ipsms/tools/diplomarbeit.pdf

15. *Commonwealth Electronic Procurement* by Mr. Tracy Dann, April 2000

16. http://www.microplex.com/support/docs/ComInvExample.html.
   Accessed - September 2004.

17. http://www.vanderbilt.edu/studentorganizations/manual/small_po.html.
   Accessed – September 2004

18. http://www.export911.com/e911/purch/docPO.htm

Accessed – September 2004


19. http://root.main.uab.edu/images/vpad/pdf/purchasing/Req.pdf

Accessed – September 2004

# APPENDICES

# Gantt Chart

| ID | Task Name | Duration | Start |
|---|---|---|---|
| | E-procurement for SMEs in Malaysia | 160 days? | Tue 4/27/04 |
| 1 | 1. Selection of Project Topic | 1 day? | Mon 7/26/04 |
| 2 | 2. Form 01 and 02 Submission (To FYP Coordinator) | 1 day | Tue 4/27/04 |
| 4 | 3. Approval of Topic | 1 day | Wed 7/28/04 |
| 5 | 4. Preliminary Data Gathering | 14 days | Tue 7/6/04 |
| 6 | 5. Submission preliminary report | 1 day | Mon 7/26/04 |
| 7 | 6. Research and Data Collection | 22 days | Mon 8/2/04 |
| 8 | 6.1 Interview Respective Companies | 17 days | Mon 8/9/04 |
| 9 | 6.2 Distributing online questionnaires | 22 days | Mon 8/2/04 |
| 10 | 6.3 Information gathered | 22 days | Mon 8/2/04 |
| 11 | 7. Data Compilation and Analysis | 22 days | Mon 8/2/04 |
| 12 | 8. System Design | 13 days | Mon 8/16/04 |
| 13 | 8.1 Review System Requirement | 1 day | Mon 8/16/04 |
| 14 | 8.2 Incorporate feedback on System Requirement | 1 day | Mon 8/16/04 |
| 15 | 8.3 Architecture Design | 7 days | Tue 8/17/04 |
| 16 | 8.4 Database Design | 7 days | Tue 8/17/04 |
| 17 | 8.5 Interface Design | 7 days | Tue 8/17/04 |
| 18 | 8.6 Design and Requirement Review | 3 days | Thu 8/26/04 |
| 19 | 8.7 Design Amendment | 2 days | Tue 8/31/04 |
| 20 | 8.8 System Design Complete | 0 days | Wed 9/1/04 |
| 21 | 9. System Development | 32 days | Wed 9/1/04 |
| 22 | 9.1 Review System Design | 1 day | Wed 9/1/04 |
| 23 | 9.2 Web Interface Programming | 27 days | Thu 9/2/04 |
| 24 | 9.3 Database and Administrative Function | 27 days | Thu 9/2/04 |
| 25 | 9.4 Developer Testing and Debugging | 6 days | Fri 10/1/04 |
| 26 | 9.5 Development and Design Review | 3 days | Mon 10/11/04 |
| 27 | 9.6 Amendment | 1 day | Thu 10/14/04 |
| 28 | 9.7 System Development Complete | 0 days | Thu 10/14/04 |
| 29 | 10. System Testing | 30 days | Thu 9/2/04 |
| 30 | 10.1 Unit Testing | 30 days | Thu 9/2/04 |
| 31 | 10.1.1 Interface Testing | 27 days | Thu 9/2/04 |
| 32 | | | |

Timeline columns: 3/28, 4/11, 4/25, 5/9, 5/23, 6/6

| | | |
|---|---|---|
| Task | Milestone ◆ | External Tasks |
| Split | Summary | External Milestone ◆ |

| ID | | Task Name | Duration | Start | 3/28 | 4/11 | 4/25 | 5/9 | 5/23 | 6/6 |
|----|---|-----------|----------|-------|------|------|------|-----|------|-----|
| 33 | | 10.1.2 Database and Administrative Testing | 27 days | Thu 9/2/04 | | | | | | |
| 34 | | 10.1.3 System Testing | 3 days | Mon 10/11/04 | | | | | | |
| 35 | | **10.2 Integration Testing** | **6 days** | **Fri 10/1/04** | | | | | | |
| 36 | | 10.2.1 System Integration Testing | 3 days | Fri 10/1/04 | | | | | | |
| 37 | | 10.2.2 Modify System Integration | 2 days | Wed 10/6/04 | | | | | | |
| 38 | | 10.2.3 Re-test Integration Testing | 1 day | Fri 10/8/04 | | | | | | |
| 39 | | **11. Amendment** | **2 days** | **Mon 10/11/04** | | | | | | |
| 40 | | **12. Complete System** | **0 days** | **Mon 10/11/04** | | | | | | |
| 41 | | **13. User Documentation** | **5 days** | **Mon 7/26/04** | | | | | | |
| 42 | | **14. FYP Presentation** | **1 day** | **Mon 12/6/04** | | | | | | |

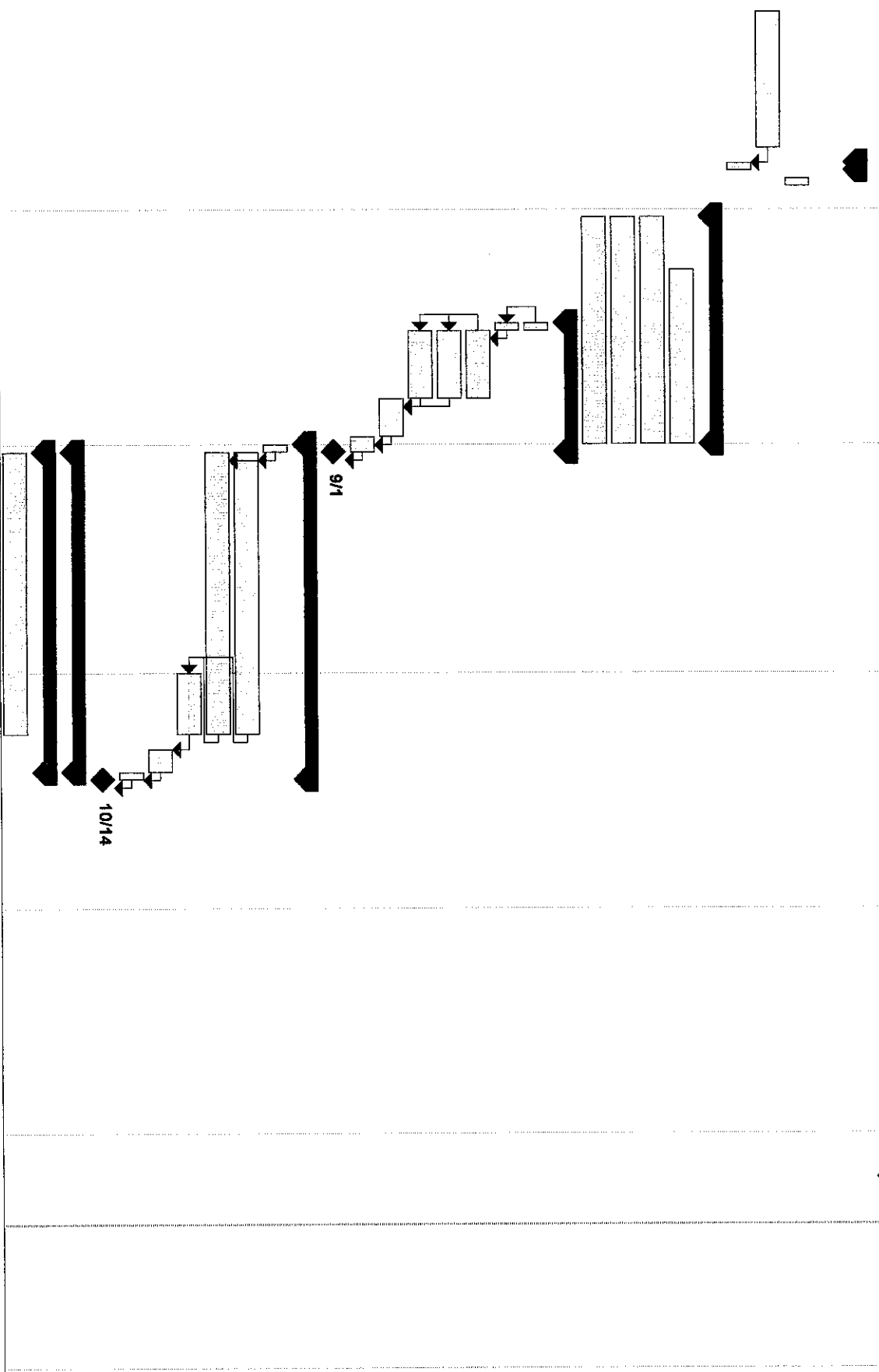| | | | | | |
|---|---|---|---|---|---|
| Task | | Milestone | ◆ | External Tasks | |
| Split | ........... | Summary | ◆◆◆ | External Milestone | ◆ |

Task

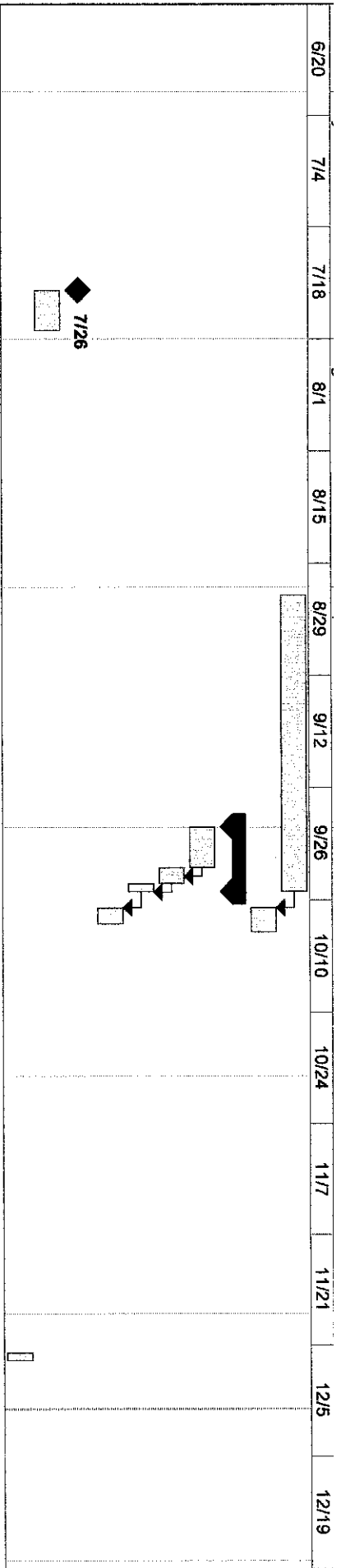Split

Milestone ◆

Summary

External Tasks

External Milestone ◆

6/20　7/4　7/18　8/1　8/15　8/29　9/12　9/26　10/10　10/24　11/7　11/21　12/5　12/19
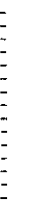
9/1

10/14

6/20 | 7/4 | 7/18 | 8/1 | 8/15 | 8/29 | 9/12 | 9/26 | 10/10 | 10/24 | 11/7 | 11/21 | 12/5 | 12/19

7/26

| Task | Milestone ◆ | External Tasks |
| Split | Summary | External Milestone ◆ |

UTP/ACAD/IT/IS/02-006

3 August 2004

To Whom It May Concern

Dear Sir

## FINAL YEAR PROJECT

We wish to inform you, that the following student is registered year 5 students from UTP;

1) Saryati Bt Mohd Yatim        -       ID No : 2163

To fulfill one of the requirements for graduation, the students are expected to conduct a Fina Year Project which require them to do detail research in any related area.

As such, we would be most grateful if you could kindly assist them in any way possible i carrying out their project.

Thank you.

Yours sincerely

**Khairul Shafee Kalid**
Supervisor
Information Technology & Information Systems Programme

cc      Shuib B. Basri
         Co Ordinator
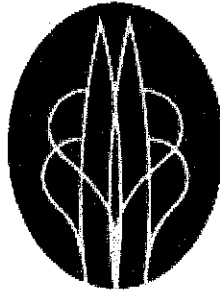
UNIVERSITI
TEKNOLOGI
PETRONAS

**Final Year Project**

**Information Technology**

**University Technology of PETRONAS**

Date: 09 September 2004

Dear Participant,

This questionnaire is designed to study the aspects of e-procurement initiatives for Small and Medium Enterprises in Malaysia. This procurement website will work as an intermediary party between supplier and buyer to procure resources, goods and others and also get any information needed (for example, list of suppliers, product details etc).

The information that you provide will help me to understand better about the requirements and important criteria in e-procurement context.

The study is to fulfill the requirement for final year project that intend to develop a website on online procurement community for SME. Hopefully, your cooperation and commitment to answer this questionnaire will help me to complete this final year project successfully.

Thank you very much for your time and cooperation. I greatly appreciate your organization and your help in furthering this research endeavor.

1

## SECTION ONE: Company Info

1) Please state name of the company:

_____

_____

2) Company Address: _____

_____

City: _____  Postcode: _____

State: _____

3) Telephone (Office): _____ 4) Email address: _____

5) What type of industry group?

- ☐ Chemical Petrochemical Products
- ☐ Electrical & electronic telecommunications
- ☐ Food, beverage and tobacco
- ☐ Machinery and engineering
- ☐ Textiles
- ☐ Paper and printing
- ☐ Retail and wholesale
- ☐ Others. Please specify_____

6) Is your company using computers that connect to the Internet?

- ☐ YES                    ☐ NO

7) How many suppliers do you currently dealing with?

- ☐ Under 5
- ☐ 6 – 10
- ☐ 10 – 20
- ☐ More than 20

8) How do you contact your supplier to procure for your company? *(Please tick on any of these)*

- ☐ Telephone
- ☐ Fax
- ☐ E-mail
- ☐ Meet the supplier
- ☐ Others. Please specify: _____

2

9) In one month, how many times do you procure in the company?

- ☐ 1-5 times
- ☐ 6-10 times
- ☐ 10-15 times
- ☐ More than 15 times

10) What is the estimation cost for ONE complete procurement cycle? (For example, telephone bills, transportation and others)

- ☐ Below RM100
- ☐ RM100-RM250
- ☐ RM250-RM500
- ☐ More than RM500

## SECTION TWO: ICT Initiatives

1) Do you agree on the government's initiatives encouraging SMI companies in Malaysia using the information and communication technology (ICT)?*(Circle the answer)*

| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

2) Does your company implement any ICT? For example, buying software from software vendor or develop own software in the company and others.*(If your answer is YES, please proceed to SECTION THREE: E-procurement initiatives)*

- ☐ YES                                            ☐ NO

3) What is the reason that hinders your company from implementing any ICT?

- ☐ High cost in buying technology equipment (computers, printers etc)
- ☐ Comfortable with the current business operation
- ☐ Lack of computer literate
- ☐ Others. Please Specify

_____

_____

_____

**SECTION THREE: E-Procurement Initiatives**

1) Have you heard of Electronic Procurement (e-procurement) before?

    ☐   YES                                    ☐   NO

2) Do you have an e-procurement system in the company?*(If your answer is NO, please proceed to question number 4)*

    ☐   YES                                    ☐   NO

3) If you have an e-procurement system in the company, how did you get the system? *(After you have answer this question, please proceed to question 6)*

    ☐    Develop the system by ourselves

    ☐    Buy from software vendor

    ☐    Develop by external software developer

    ☐    Others. Please Specify

_____

_____

4) What is the reason that your company does not want to implement e-procurement solution in the company?

    ☐    Not enough budgets.

    ☐    Comfortable with the current business operation

    ☐    Lack of technical skills

    ☐    Lack of knowledge on e-procurement

    ☐    Others. Please specify

_____

_____

_____

5) If all the reasons you have stated in question 4 are being solved, when do you plan to implement an e-procurement solution?

    ☐    Less than a year

    ☐    1 to 2 years

    ☐    More than 2 years

    ☐    Never

6) Do you think e-procurement is a good investment for your company?

☐   YES                                  ☐   NO

7) Do you think the e-procurement based system should be used by small and medium industries to compete in the market? *(Circle the answer)*

| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**SECTION FOUR: The Acceptance of the Web-Based E-Procurement Intermediary.**

1) Have you heard before of any websites in Malaysia that allows you to procure goods and also allow you to sell your products to others?

☐   YES                                           ☐   NO


If yes, can you state the name of the website:_____


2) Do you agree and believe that the web based e-procurement community for SMI really offer potential benefits to your company?

☐   YES                                           ☐   NO


3) If there is such websites that offer you the opportunity to promote and sells your product as well as procure resources and goods that your company need, is your company interested to be part of the website's community?

☐   YES                                           ☐   NO

6

**SECTION FIVE: Requirements of E-Procurement**

*General Requirements*

1) If you are developing the e-procurement system, do you want this requirement to be available in the system (please tick your preferences)?

| 1 | Calendar<br>This requirement provide calendar on the web page that states state or public holidays or any events. | |
|---|---|---|
| 2 | Online calculator<br>This requirement provides an online calculator for the ease of user. | |
| 3 | Messaging services<br>This requirement allows you to send or receive message from other members in the online community. | |
| 4 | Search services<br>This requirement allow user to search particular companies, product or others. | |
| 5 | Forum<br>Provide opportunity to user to discuss among the members in the online community. | |

Others. Please specify:

_____

_____

_____

_____

_____

_____

## _Functional Requirements_

_(A description of activities and services a system MUST provide)_

2) If you are developing the e-Procurement system, do you want this functional requirement to be available in the system?_(Please tick your preference)_

| 1 | Catalog<br>This requirement allow user to catalog and promote product, goods and services that they offer | |
| --- | --- | --- |
| 2. | Product Selection<br>This requirement allow user to select any product that they want to procure. | |
| 3 | Contract Pricing Support<br>This requirement allows buyer and supplier to make an agreement on price of products | |
| 4 | Faxing services<br>This is the service that help user especially companies that do not have connection to the internet. It will automatically send any latest news or new purchase order to the particular company via fax. | |
| 5 | Content Management<br>This will allow the user to control the content of the web pages themselves. For e.g. what they want to put in the catalog and others. | |
| 6 | Product comparison capabilities<br>This requirement allows user to compare product and services provided by companies. | |
| 7 | Purchase Order (P.O)<br>This requirement allow P.O to be generated | |
| 8 | Invoice<br>Invoicing includes generating and receiving invoices | |
| 9 | Reporting<br>This requirement is to report any activities or history on previous login or transactions. | |

Others. Please specify:

_____

_____

_____

_____

_____

_____

## _Non-Functional Requirements_

_(A description of other features, characteristics and constraints that define a satisfactory system)_

3) What are the criteria that you think are important to your e-procurement system?_(Please tick your answer)_

|  | Very Unimportant | Unimportant | Neutral | Important | Very Important |
|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 |
| i) Security | ☐ | ☐ | ☐ | ☐ | ☐ |
| ii) Integration | ☐ | ☐ | ☐ | ☐ | ☐ |
| iii)Ease of use | ☐ | ☐ | ☐ | ☐ | ☐ |
| iv) Reliability | ☐ | ☐ | ☐ | ☐ | ☐ |
| v) Inexpensive | ☐ | ☐ | ☐ | ☐ | ☐ |

4) For the documentation in generating invoice and purchase order in e-procurement system, can these be generalized and use the same format for all companies?_(If your answer is Acceptable, please proceed to SECTION SIX : TESTING PHASE)_

    ☐   Acceptable             ☐   Not acceptable

5) Does your company have its own purchase order and invoice format?

    ☐   YES                  ☐   NO

6) What are the criteria that you want for the purchase order and invoice to have?

    ☐   Company logo
    ☐   Company address
    ☐   Contact info
    ☐   Person in charged
    ☐   Name of supplier
    ☐   Item details
    ☐   Others. Please Specify

_____

_____

_____

**SECTION SIX: Testing Phase**

1) If we are developing the prototype for e-procurement which we call as a web based e-procurement online community for SME (that act as an intermediary), is your company willing to join the testing phase?

☐ Yes

☐ No

2) Contact No: _____

Do you have any comments on e-procurement?

_____

_____

_____

_____

_____

_____

*I sincerely appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you!*