E-Government: E-Tendering System

By

Asraf Bin Sabtu

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Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CERTIFICATION OF APPROVAL

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Approved by,

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(Mr Ahmad Izuddin b. Zainal Abidin)

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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

ASRAF BIN SABTU

ABSTRACT

Electronic government or e-government is a new concept for government to serve the citizen. Instead of using conventional technique, e-government could boost the government's capabilities in serving the citizen. E-government is an approach which using information and communication technology (ICT) in order to improve the efficiency in providing services and information to citizen. While E-Tendering System is an additional to enhance the e-government services. For that, the objective of this project is to make a study regarding e-government and e-tendering. The study mainly on how the e-government helping the efficiency of public sectors in performing government services to people. Besides that, another study regarding the current tender system and apply the concept to the system that will be developed. The second objective is to develop a prototype of e-government portal with e-tendering system. Based on the study from the first objective, a prototype of an end product will be developed. Rapid Application Development (RAD) is the method which will be used in this project. It is used due to time constraint and it is suitable for short duration project. Besides that, RAD includes developing a prototype in its phase before having a complete system. A questionnaire has been distributed as the part of the study in order to gather more information from user regarding e-government. The result is positively towards e-government which verifies the efficiency of e-government portal to citizen while e-tendering system will improve its efficiency. Some suggestions are also being carried out for future enhancement.

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND OF STUDY

The rapid changes in the information and communications technology (ICT) have helped to improve our lives economically and socially. This development has produced an environment in which people demanding for timely delivery of information and services as well as requirement for ready access constantly. People tend to get a better services and information especially from Internet to do any transaction. Therefore, the scenario had created a population of ICT literate people which involve people in develop city like Kuala Lumpur in Malaysia. Though, government has received the impact of the situation.

Due to the transformation, electronic government or e-government has been embarked in the government system. E-government refers to the technology that applies the concept of electronic commerce (e.g. information and marketing through Web sites, selling to customers on-line) to government operations. It transforms the traditional shape of governmental services and operations to more enhance way using ICT especially Internet or web-based applications. This is in order to deliver and provide better, more reliable and more effective government to serve the citizens.

While e-tendering is referring as a technology of an offer to carry out work, which has been specified by another person. The offer quotes a fixed price, which will be charged for doing the work. This technology applies the concept of electronic online services, which basically using the Internet. This project will focus on developing an application of government website providing electronic tendering system (e-tender) that is embedded from the result of this study.

1.2 PROBLEM STATEMENT

From my brief observation, the current process for offering and buying tendering is cost and time consuming. This is because most of the process is done manually. Government agencies need to advertise and announce any new tender in newspaper informing the purpose and scope work of the tender as well as requirements needed to perform the project. In order hand, the potential buyers need to buy the tender application form from the particular agency with such amount, fill it up before submit it to the address stated in the advertisement.

From the process, we could see that the both parties face the same problems; cost and time consuming. Government agencies have to provide certain amount in order to do the advertisement for each new tender that to be announced. The buyers also need to provide certain amount for the application form. Besides, they have to increase the cost to submit the form either by hand or using their employees. Time consuming from those activities will also increase companies cost.

E-government introduces ICT in order to provide easy access to governmental information and services to improve the quality of services. Thus, by having a portal of e-government that joining all the government agencies, people can easily get the government services regardless what the agency or address of the agency's website that they should visit. They can search for any information regarding tendering companies in the portal which might reduce time for searching in the newspaper.

By providing e-tendering in the e-government portal, buyers can easily apply to buy the tender listed in the portal. As simple as by clicking the mouse, buyers can easily completing the process for purchasing tender. They do not need to travel to buy or submit the form. For the government agencies, they could minimize the cost for advertisement for announcing the tenders as those tenders can be listed in the portal.

1.3 OBJECTIVES AND SCOPE OF STUDY

Objectives

- To perform a study regarding e-government and tender system procedure
- To develop a prototype of e-government website with e-tendering system

Scope of Study

The scope of study for the project is stated as below:

- To study about the e-government such as its concept and functionality. For the project, the author will study on how the e-government helping the efficiency of public sectors in performing government services to people.
- To study about the current tender system and apply the concept to the system that will be developed. Based on the study, a prototype of an end product will be developed, which will improve the efficiency of government services in e-tendering system and also will benefit the user of the system.

CHAPTER 2
LITERATURE REVIEW AND THEORY

2.1 INTRODUCTION TO E-GOVERNMENT

Lemuria Carter and France Belanger [1] has described e-government as the use of information technology, especially telecommunications, to enable and improve the efficiency in which government services and information are provided to citizens, employees, business and government agencies.

Zhiyaun Fang [2] defined e-government as a way for governments to use the most innovative information and communication technologies, particularly web-based Internet application, to provide citizens and business with more convenient access to government information and services, to improve the quality of the services and to provide greater opportunities to participate in democratic institutions processes. Zhiyuan also listed eight (8) different potential types or models in an e-government system which are; Government-to-Citizen (G2C); Citizen-to-Government (C2G); Government-to-Business (G2B); Business-to-Government (B2G); Government-to-Government (G2G); Government-to-Nonprofit (G2N); Nonprofit-to-Government (N2G); and Government-to-Employee (G2E).

In order word, e-government is an approach by the government by using information and communication technology especially using web-based in order to improve the efficiency in provide services to citizens. The objectives to create e-government are to provide citizens and business people to gain access to the information and services provided in the e-government. Therefore, based on the description of e-government and the benefits gain from it to citizens, it is likely to enhance its functions by providing e-tendering system.

2.2 E-GOVERNMENT IN MALAYSIA

Many develop countries such as The United States as well as Singapore has embarked electronic government (e-government) services to their citizens and Malaysia has going into that environment. E-government is a new paradigm of the government operations which will change the traditional ways of government services to the citizens. The use of information and communication technology (ICT) in government can enhance the delivery of public services, and thus improving the overall efficiency of government. Malaysia's e-government objective is to create a paperless public sector as well as to strengthen the relationships with citizens and businesses.

The e-government initiative was launched to lead the country into the Information Age. It will improve how the government operates internally, as well as how it delivers services to the people of Malaysia. It seeks to improve the convenience, accessibility and quality of interactions with citizens and businesses. At the same time, it will improve information flows and processes within government to improve the speed and quality of policy development, coordination and enforcement. [3]

Malaysia has certainly taken the first bold steps towards making e-government a reality which is the 7 pilot projects of the Electronic Government Flagship Application. The 7 pilot projects are:

- Project Monitoring System (SPP II)
- Human Resource Management Information System (HRMIS)
- Generic Office Environment (GOE)
- Electronic Procurement (E-Procurement)
- Electronic Services (E-Services)
- Electronic Labour Exchange (ELX)
- E-Syariah

Mohd Feroz Abu Bakar (Berita Minggu, 2005) reported that Tan Sri Samsudin Osman has stated that government has started developing information and communication technology (ICT) since 10 years ago and still upgrading in order to increase government conveying system.

The Malaysian Administrative Modernization and Management Planning Unit (MAMPU) seek to enhance the use of ICTs and have mandated that each agency create an IT strategic plan to help facilitate greater communication between agencies and the public.

Mohd Feroz Abu Bakar (Berita Minggu, 2005) also reported that Malaysian Administrative Modernization and Management Planning Unit (MAMPU) now seeks to enhance the use of ICT by joining all the government agencies under one portal that much easier to remember, which is www.gov.my. This portal is known as myGovernment. User can reach government services much easier via myGovernment portal which joining 844 websites from variety of agencies. The portal offers 356 online services for people, businessman, government personnel and non-citizen including downloading 2,930 forms.

Malaysia has provide a lot of services in the portal and still upgrading time to time to provide better services. With connection with other websites and providing around 400 services, it will enhance the efficiency of government. With this improvement, there will be no difficulties for e-tendering system to be involved in the planning progress.

2.3 E-TENDERING SYSTEM

Traditional process of tendering starts when the owner of the tender published the notification of tender through print media such as newspapers within a period of time. Then, the contractor will respond to the tender advertisement by purchasing the documentation, filling the requirements and submitting before the closing date. Refer to Figure 1, which shows the details flow of the tender process in traditional ways.

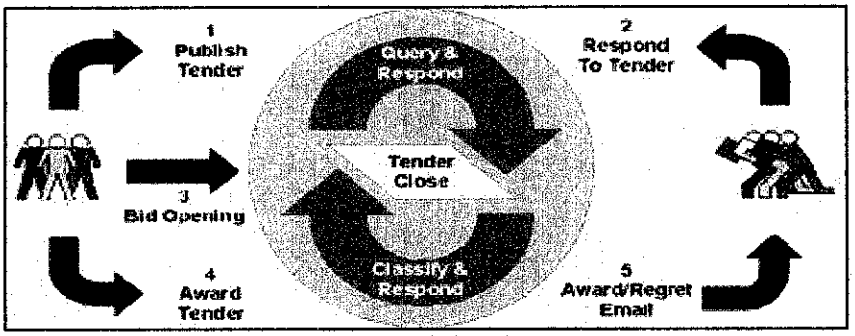

Figure 2.1: Traditional Tender Process

In contrast, e-tendering has evolved over the past decade from a dial up modem-to-modem computer access to a more elaborate Internet based tendering system. In today's terms, e-tendering may be defined on a broad spectrum from a simple Internet based system that displays only a brief description of the commodity being procured to a more sophisticated Internet system that provides contractors with the ability to download and pay for complete tender documents (specifications included) in electronic form, all without any paper being produced – paperless (refer to Table 1) and benefits to lower the cost to the organizations.

Table 2.1: Comparison of Conventional and e-Tender

Conventionally	e-Tender
Poor audit trail	Every action, may it be downloading of tender or submitting a tender is logged. A receipt of purchase and submission is automatically generated giving you a systematic and accurate audit trail
High paper usage and storage	Paper usage is minimized by over 90% as tenders can be viewed and submitted online. With e-Documentation, there is no need for physical storage space of tender documents.
Long lead-time is required for bidders to physically come to a centralized location to purchase tender	Tender documents can be viewed and downloaded via the Internet, hence there is no geographical boundaries making it fast and convenient, reducing lead-time by over 80%.
Poor information safety and availability	As all tender documents are securely stored online and backed up via remote servers, and are assured of 99.9% information safety, and availability.
Poor Information security and integrity	All activities online are logged and access to different types of information can be granted based on "need to use" basis. This gives the absolute control over tender information and documents.
High processing cost	Cost is fixed through process automation. Access to documents online further eliminates the need to manage documents requested by bidders saving more resources.
Time consuming and slow processing	Automated documentation flow reduces over 80% of tedious data entry and compilation, making it a breeze to process hundreds, even thousands of tenders.

(Source:www.ehealth4all.com)

Electronic tendering system could help in obtaining more profitable contracts with:

- Reduced cost – costs of participation for purchasers and vendors, advertisement cost
- Reduce labor intensive tasks – works for receipt, recording and distribution of tender is greatly reduced
- Minimize paper trail – tendering exercises are electronic facilitated
- Less manual forms – filling on tender application form and data re-entry upon receiving the tender are digitized
- Single point of access - Both vendors and purchasers can do business efficiently in a convenient and user-friendly manner.

CHAPTER 3
METHODOLOGY

3.1 INTRODUCTION

Methodology is defined as the collection, the comparative study, and the critique of the individual methods that are used in a given discipline or field of inquiry **[5]**. It is also being defined as an organized, documented set of procedures and guidelines for one or more phases of the software life cycle, such as analysis or design **[6]**. In other words, methodology is an approach that involves research or studies which is done in phases in order to perform a development in certain project.

There are many types of methodologies which could be used as based for development such as waterfall model, spiral model and others which will react with development process. Developer need to analyze the suitable methodology for the project in term of time constraint, cost consuming and level of user involvement. Time constraint and cost consuming is related with each other. This is because the longer time spent in the project, the higher the cost.

Those factors for choosing methodology are very crucial in order to produce a quality product which accepted by user as well as consistent and efficient performance. Besides, it will reduce cost for system development. In other hand, it will also encourage understanding the whole development process in each level of organization through standardize documentation.

3.2 RAPID APPLICATION DEVELOPMENT (RAD)

Rapid Application Development (RAD) is type of system development methodologies which has been exist in 1990-an. It is a programming system that enables programmers to quickly build working programs [7]. In other words, it solve the disadvantages of structured method by modified certain phases system development lifecycle to develop a system efficiently in short time. Therefore, user could understand more about the system and could give feedback for any changes should be made.

Due to the time constraint and insufficient cost, Rapid Application Development (RAD) is the most suitable methodology to perform the development process for this project. This is because time frame for Final Year Project to be completed is only 10 weeks. Therefore, Rapid Application Development could give more advantage in developing this project.

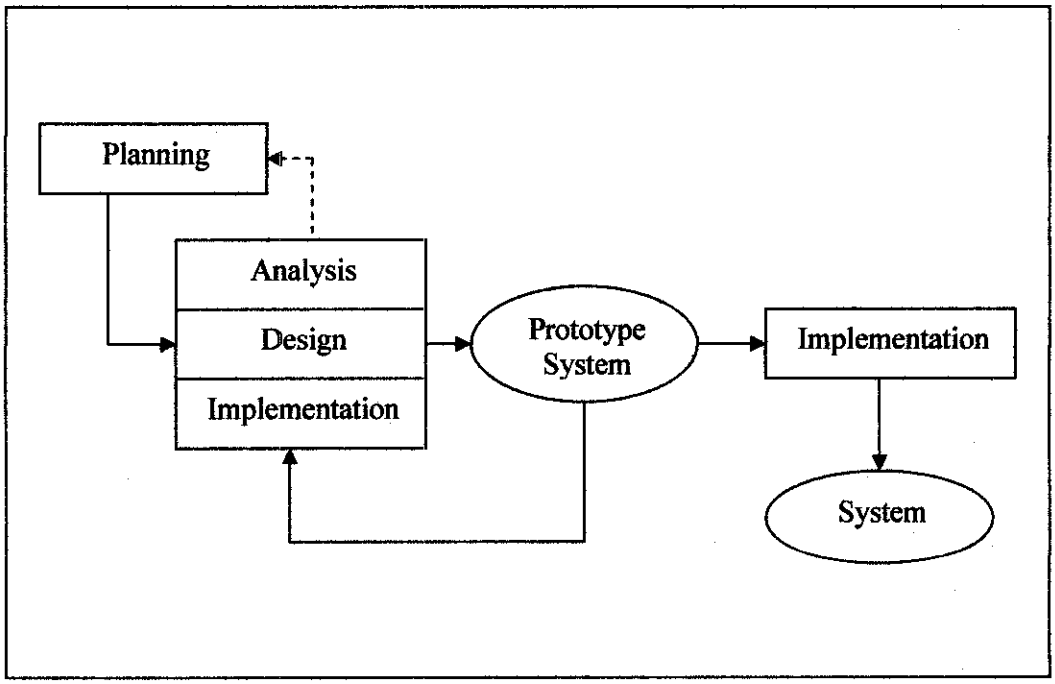

Figure 3.1: Rapid Application Development – Prototype [8]

3.2.1 Planning

Data collection

In this phase, there are two levels need to be completed. For the level is about doing research and study about e-government in order to achieve on of the objective of the project. This is done by searching information through Internet and books.

For the second level is for the collection of people behavior against e-government. The data was collected during the mid semester break through close-ended questions which being separated into 5 sections which are:

- Section A – Respondents' Background
- Section B – Computer and Internet Usage
- Section C – Usage of e-government services on the Internet
- Section D – Respondents view on the benefits of e-government services to Malaysian citizen
- Section E – Reaction towards e-tendering

For about 400 randomized people has been selected for completing the questionnaire which being distribute through personal distribution , local university network and electronic mails (e-mail).

3.2.2 Analysis

During this phase, the data collected through research, documentation and questionnaire were analyzed. From the data, we could define the scope and objectives of the project. Besides that, problems and constraint regarding the system development could be pulling out before conducting the system requirements study. This is to ensure that the development process running smoothly and properly. Therefore, the output for the analysis can be concluded as:

- Define scope and objectives of the project
- Determine possible problems
- Determine suitable solutions
- Determine system requirement specifications

As for system requirement specifications, it could be divided into three sections; development tools requirements, system requirements and security requirements.

Development tools requirements are:

- Macromedia Dreamweaver MX

  Macromedia Dreamweaver MX is an easier tool used to design a website which makes the ordinary and repetitive tasks of coding easier. It provides functions to build dynamic database-backed web applications using server languages such as ASP, ASP.NET, ColdFusion Markup Language (CFML), JSP, and PHP.

- MySQL

  MySQL is a multithreaded, multi-user, SQL Database Management System (DBMS). It is an open source database and free to be used for development. MySQL is the database which will be used in the project. All the data entry and processed data will be stored on the database.

- PHP

  PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML. For developing prototype system, I used PHP language because of time constraint and insufficient cost.

System requirements could be divided into 2 categories which are:

- Workstation requirements
  - Intel based PC with the minimum speed 100 MHz
  - 50 MB of memory
  - CD ROM drive
  - 32 MB RAM drive
  - Microsoft Windows 2000/ XP/ NT 4.0/ UNIX
  - Network card
- Server requirements
  - Intel based PC with Pentium processor
  - 32 MB SD RAM drive
  - 40 Gigabyte of free hard disk to put all the data in a server.

Security requirements

In order to maintain the security level of the systems, the author specified to use the following access right parameters:

- Authorized Level Access

  An authorized user entered the system using user identification has the right to view, modify and manipulate the data.

- Database Administrators

  DBA is the owner of the systems who has the access to make a change or modification throughout the times, subject to the future requirements.

- Unauthorized Level Access

  This type of user only can view the data without having the access to modify and manipulate current database. This is important to maintain the integrity of the database.

3.2.3 Design

System architecture

3-tier Client-Server architecture

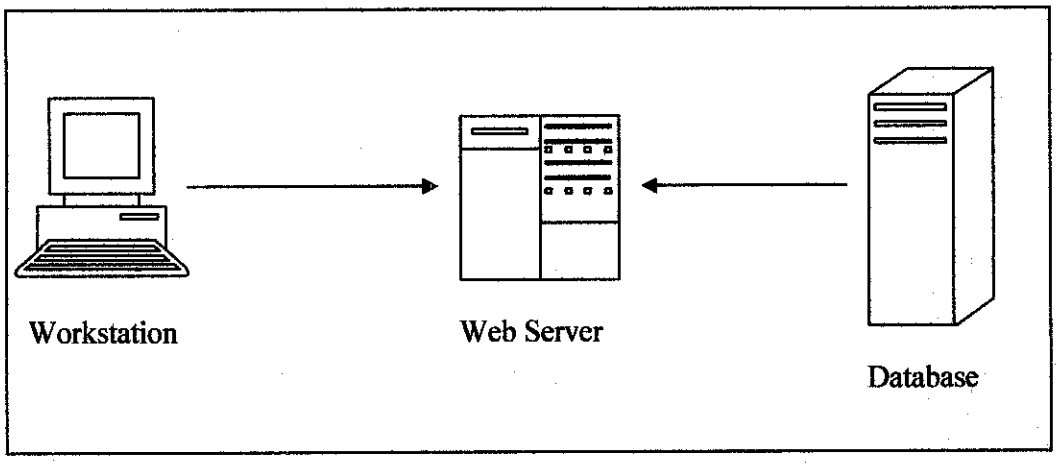

Figure 3.2: 3-tier Client-Server architecture

For this project, I used 3-tier Client-Server architecture as based of the system. This type of architecture is chosen because of the e-government environment itself which require server and database. User represented using workstation will interact with web server which handle the function of delivering the user interface in HTML and graphic. The database interacts with web server to produce the web server with data and information requesting by the workstation.

Conceptual model

In this model, I have identified objects which will interact throughout the system. There objects include; admin, contractors, tender and feedback. Figure below will show how those objects interact.

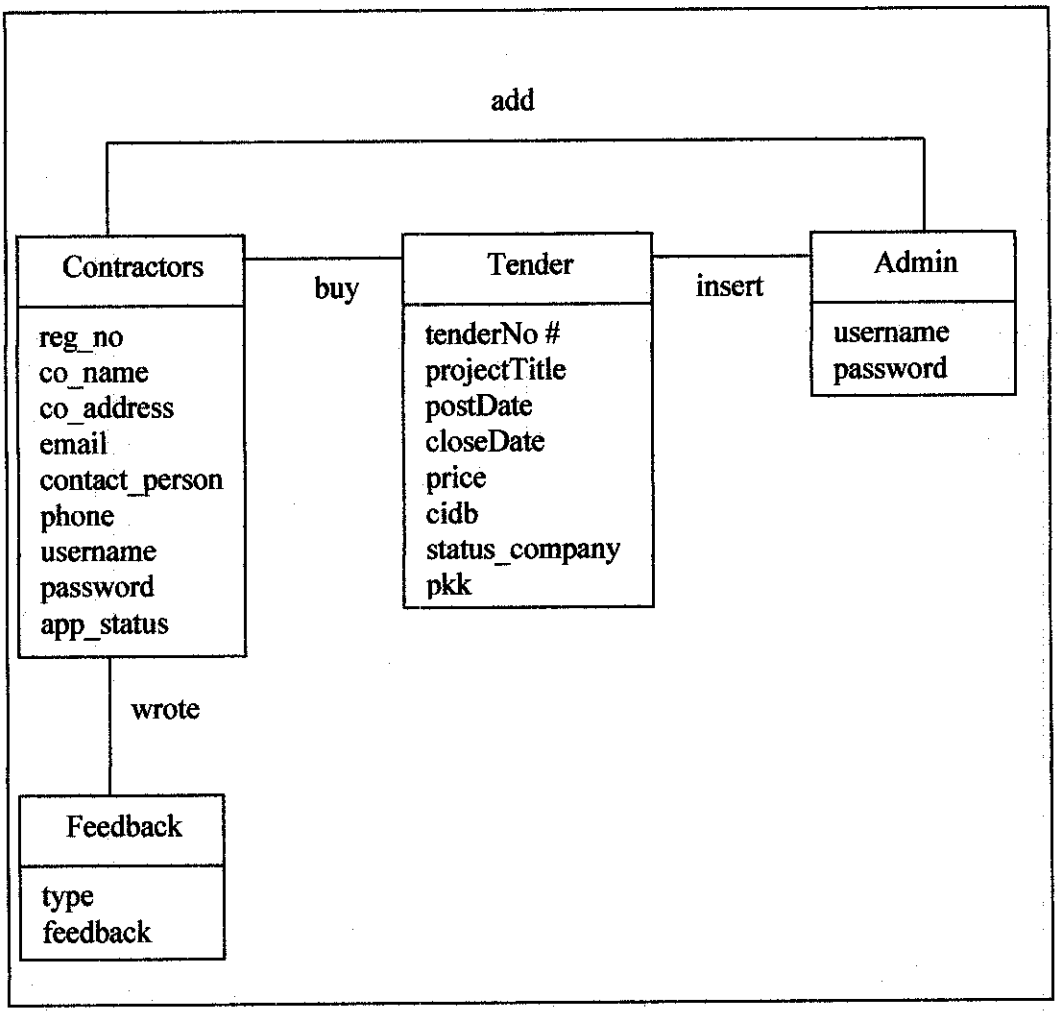

Figure 3.3: Conceptual Model

Data Flow Diagram

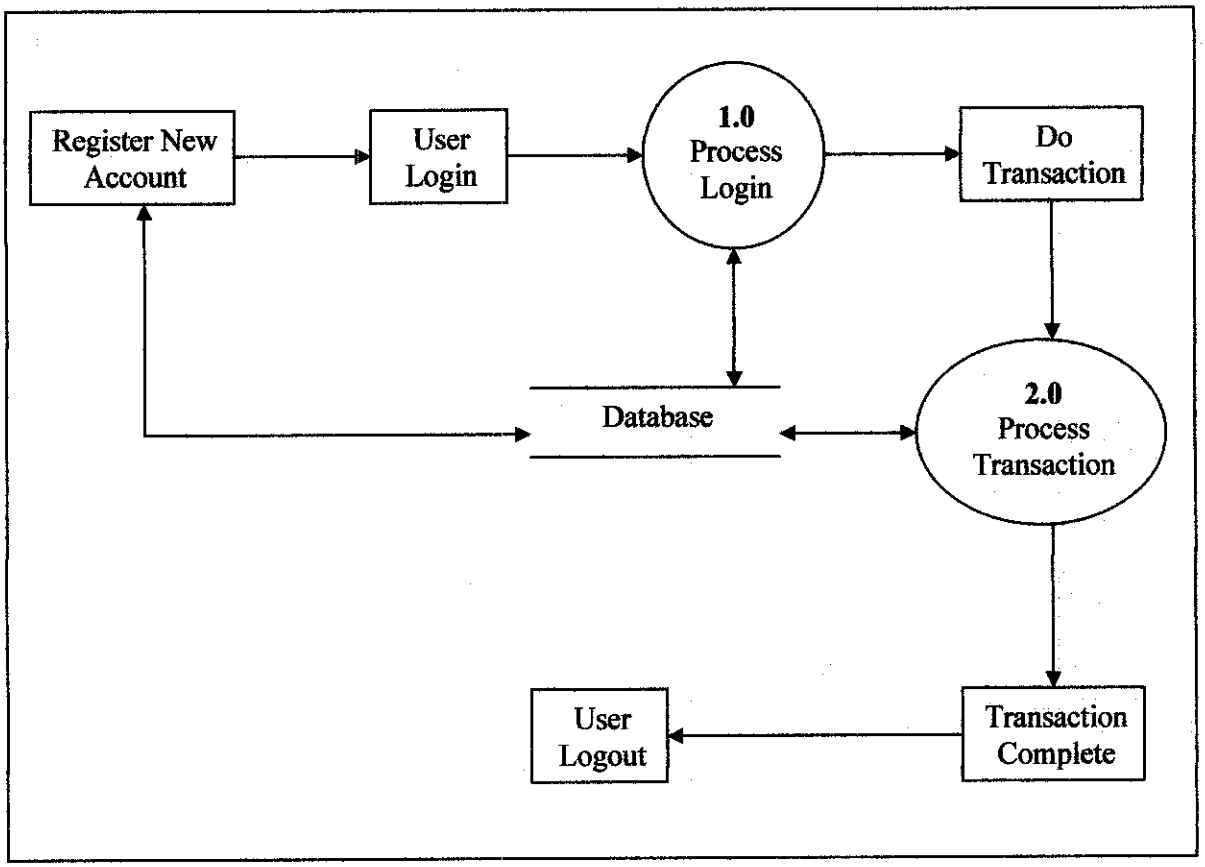

Figure 3.4: Data Flow Diagram

3.2.4 Implementation

In this phase, system development has been took place to turn the detailed design into code. Complete system which is the final product is the deliverable for constructing phase which will be the input for the next phase. A complete system is means that the system has been tested by user and they are agreeing to accept the system. For this stage, the development of system is including develop the template design for interface into system, create data entry, and database and server configuration.

3.2.5 Prototype

In this phase, a complete prototype system has been developed. It is not a complete system as it still in development process which requires having phases of testing and feedback from the user. System testing is conducted using white-box testing where the testing involving only the developer. The testing is done in order to detect and fix bugs and errors from the outside view of the system. In this system, there is a function for feedback where user could write any comments, complaints or suggestion regarding the system for future enhancement. The continuous enhancement is believed could create a better system for future usage.

CHAPTER 4
RESULT AND DISCUSSION

4.1 RESULT

Along mid semester break, about 400 respondents have been chosen randomly to complete the questionnaires. It was distributed through personal distribution, local network and e-mails. There are 5 sections in the questionnaire which are:

- Section A – Respondents' Background
- Section B – Computer and Internet Usage
- Section C – Usage of e-government services on the Internet
- Section D – Respondents view on the benefits of e-government services to Malaysian citizen
- Section E – Reaction towards e-tendering

The questionnaire is divided into sections in order to ease the respondents to answer based on the topic for each section. Besides that, it would be easier for me to conclude the result base on the sections. Even though the respondents have been chosen randomly for this questionnaire, it is believe that most of them are aware of government initiatives and some of the candidates have used e-government. This will reflect positively the result for the research.

The results are described in the tables below:

Section A: Respondents' Background

Table 4.1: Results for respondents' background

Category	No. of Respondents
Age range:	
15 – 25 years	142
26 – 35 years	176
36 – 45 years	60
46 – 55 years	20
56 and above	2
Race:	
Malay	200
Chinese	140
Indian	60
Others	0
Gender:	
Male	190
Female	210
Employment category:	
Banking or Finance	28
Admin	36
Education sector	105
Executive	20
Business	40
Self employed	2
Trainee	8
Student	132
Others	29

This section is to know the population of the respondents. From the table it shows that most of the respondents for this research are young citizens which are from education environment while others are divided evenly in other sectors. From the statistics, we could say that most of the respondents are from new generation which computer literate and might be using e-government.

Section B: Computer and Internet Usage

Table 4.2: Results for computer and internet usage among respondents

Category	No. of Respondents
Presence of computer at home:	
Yes	367
No	33
Computer at home with Internet connection:	
Yes	289
No	111
Frequency of Internet usage:	
[1] Never	12
[2]	14
[3] Moderate	41
[4]	189
[5] Very frequent	144
*Reasons for using Internet:	
Education	245
Business	126
Occupation	48
Entertainment	69
Others	53
*Use Internet from:	
Home	127
Work place	169
Schools	26
University	133
Cyber Café	58
Public library	11

*Respondents could tick all that apply

The assumption and result from previous section is supported by this section. In this section, we want to know the computer and Internet usage by the respondents. From Section A, most of the respondents are young citizens which shows that most of them are new generation which computer literate. Therefore, base on this table, it confirms the assumption of previous section. The statistics shows that 367 of candidates have computer at home and most of them have Internet connection with frequently used.

Section C: Usage of e-government services on the Internet

Table 4.3: Results for usage of e-government services on the Internet

Category	No. of Respondents
Usual way of contacting government offices:	
Telephone	105
In person	93
Letter	86
E-mail	65
Website/ Internet	51
Others	0
Awareness of the existence of e-government initiatives:	
Yes	266
No	134
First to know about e-government through:	
Television	183
Radio	49
Magazines	30
Colleagues	56
Internet	65
Others	17
Experience in using e-government:	
Yes	266
No	134
Level of understanding about e-government	
[1] Don't understand at all	8
[2]	38
[3] Moderate	92
[4]	166
[5] Really understand	96
Managed to find the desired information/ complete the transaction:	
Yes	147
No	119
Face difficulties when using e-government services:	
Yes	102
No	164

In Section C, we want to know how the citizens interact with the government in using the services provided. From that, we grab respondents' intention regarding e-government. We want to know the level of usage and understanding of respondents towards e-government in Malaysia. From the statistics, more than half of the respondents aware and have experience in using e-government. Among them, most of the respondents manage to find the desired information and complete the transaction in

e-government portal. Most of them also have not faced any major difficulties when using e-government services. This is due to the result from previous sections which shows that most of the respondents in this research are young citizens and computer literate. Therefore, they have no difficulties in using e-government services.

Section D: Respondents' view on the benefits of e-government services to Malaysian citizen

Table 4.4: Results for respondents' view on the benefit of e-government to the citizen

Government services on the Internet will benefit the citizens by:	Strongly disagree [1]	[2]	Moderate [3]	[4]	Strongly agree [5]
Making it easier to find information	0	0	60	120	220
Making government services available on the Internet	0	0	40	180	180
Bringing people close to government through the easiness of information searching	0	15	65	165	155
Increasing the quality of services through the Internet	41	62	75	128	92
Making the easier for people to communicate their views to government	17	34	44	160	145

Section D is to gather respondents' feedback towards e-government services base on the benefits listed. From the statistics, it shows that most of the respondents agree that e-government has provided an effective service to the citizens. From that, we could conclude that e-government ease the citizens to find information and services and increase the quality of services by government. Thus, it could tighten the relation between government and citizens.

Section E: Reaction towards e-tendering

Table 4.5: Results for reaction towards e-tendering system

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Perception towards E-Tendering System	0	13	97	166	124
Level of acceptance of proposed E-Tendering System	0	13	97	161	129

Section E is to know the respondents' reaction towards e-tendering. The statistics shows that most of the respondents agree to have e-tendering in e-government services. This means that the development of E-Tendering System prototype will mostly accepted by citizens.

4.2 DISCUSSION

The process of collecting data through questionnaire has being done successfully where each correspondent has react mannerly to the question. Therefore, we could assume that the data collected is clean and useful. From the data collected from the respondents, we could see that the initiatives by government to introduce e-government services through Internet had give benefits to the citizen.

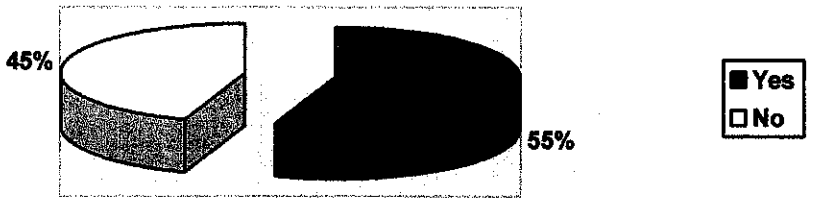

Figure 4.1: The Effectiveness of E-government Services

The Figure 4.1 shows that about 55% of respondents have agreed that e-government services are very effective in giving services. This was approved based on the analysis that, 147 out of 266 respondents who used the e-government services manage to find the desired information that they want and they are able to complete their transactions successfully, while others are not. From the statistic, we can say that citizens are more towards e-government because e-government has shown that they could be able to give services effectively.

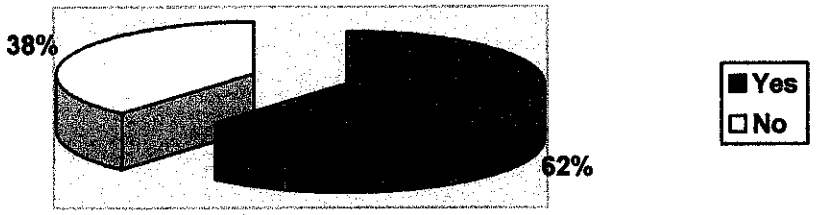

Figure 4.2: The Efficiency of E-government Services

Figure 4.2 show that e-government services provide 62% of efficiency. This was approved from the result of questionnaires which that, 164 out of 266 respondents are not face difficulties in using e-government services, while others face difficulties in using e-government services. In this context, the term of efficiency means that the application of services provided are working well without wasting time or energy. In other word, 164 respondents in the statistics are able to do the transaction through e-government without any time delay or cost consuming.

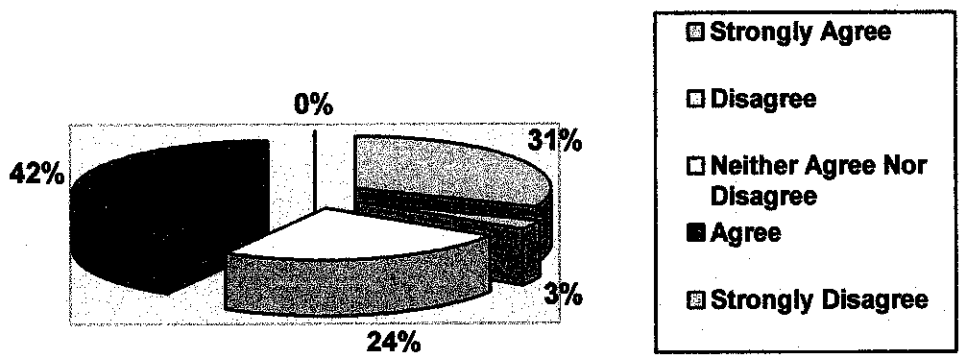

Figure 4.3: Perception towards E-Tendering System

From the statistic, we could see that most of the respondents accepted to have e-tendering system in e-government services. It is showed in Figure 4.3 where almost half of the respondents agree with the development of e-tendering system, while 31% of the respondents strongly agree to have an e-tendering system. Therefore, we can conclude that citizens in Malaysia are ready to have another services provided in the e-government portal. From this perception towards e-tendering system, I believe that e-tendering system will enhance the efficiency and effectiveness of e-government.

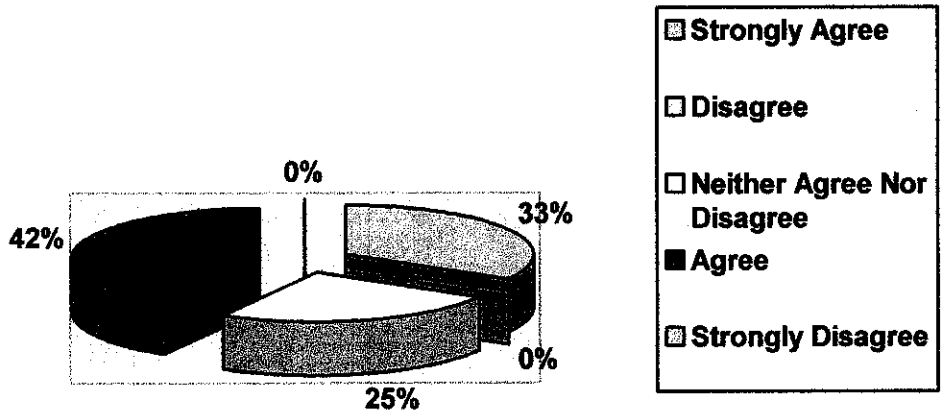

Figure 4.4: Level of Acceptance of E-Tendering System

Figure 4.4 shows that the proposed e-tendering system in e-government portal is acceptable and would benefits the government agencies as well as constructors. In other word, contractors and government would benefit from e-tendering system by having a better service in tender application. Besides that, they will also can reduce cost and improve time management. Therefore, we can conclude that respondents are able to accept the additional application; e-tendering system, in e-government in order to have better services for developing society in Malaysia.

System Prototype

The prototype system for E-Tendering System in this project is developed for contractors who have been registered with government contractor association which involves Construction Industry Development Board (CIDB) and Pusat Khidmat Kontraktor (PKK). Those contractors who have been registered in the agencies will provide authorized access to the system. They only need to get their username and password in order for them to access into the e-tendering system. Their information is limited and they need to update new information in their account created.

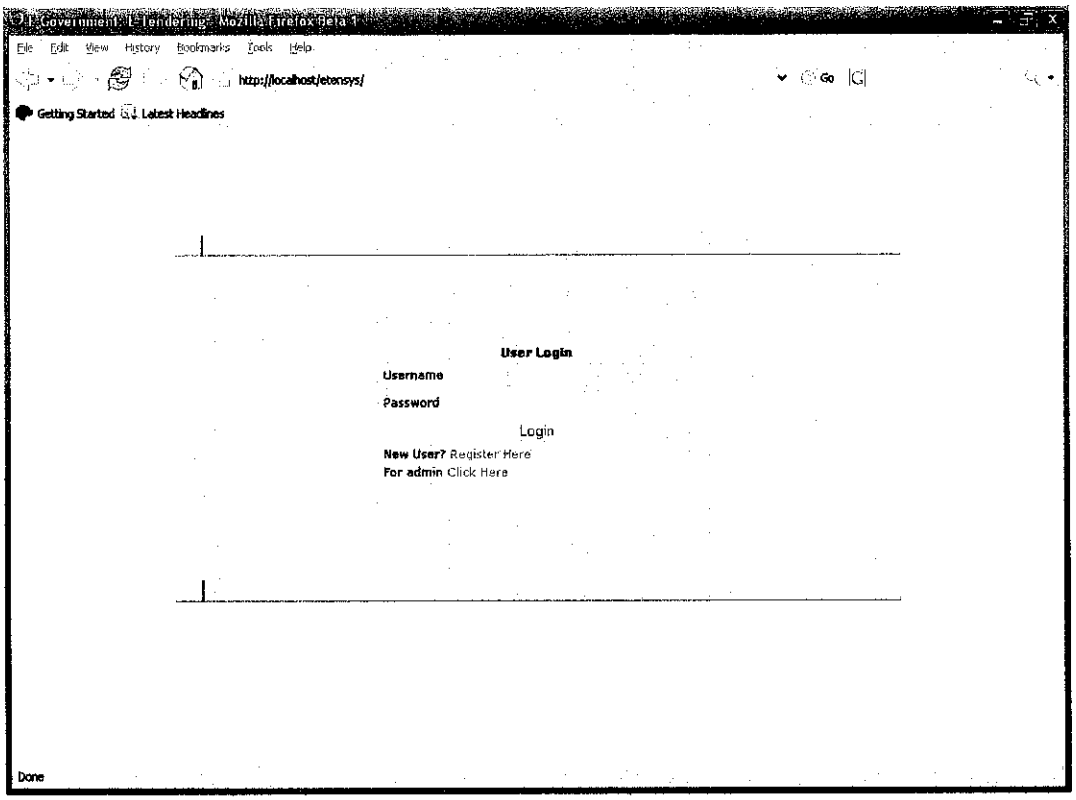

Figure 4.5: Main page for E-Tendering System

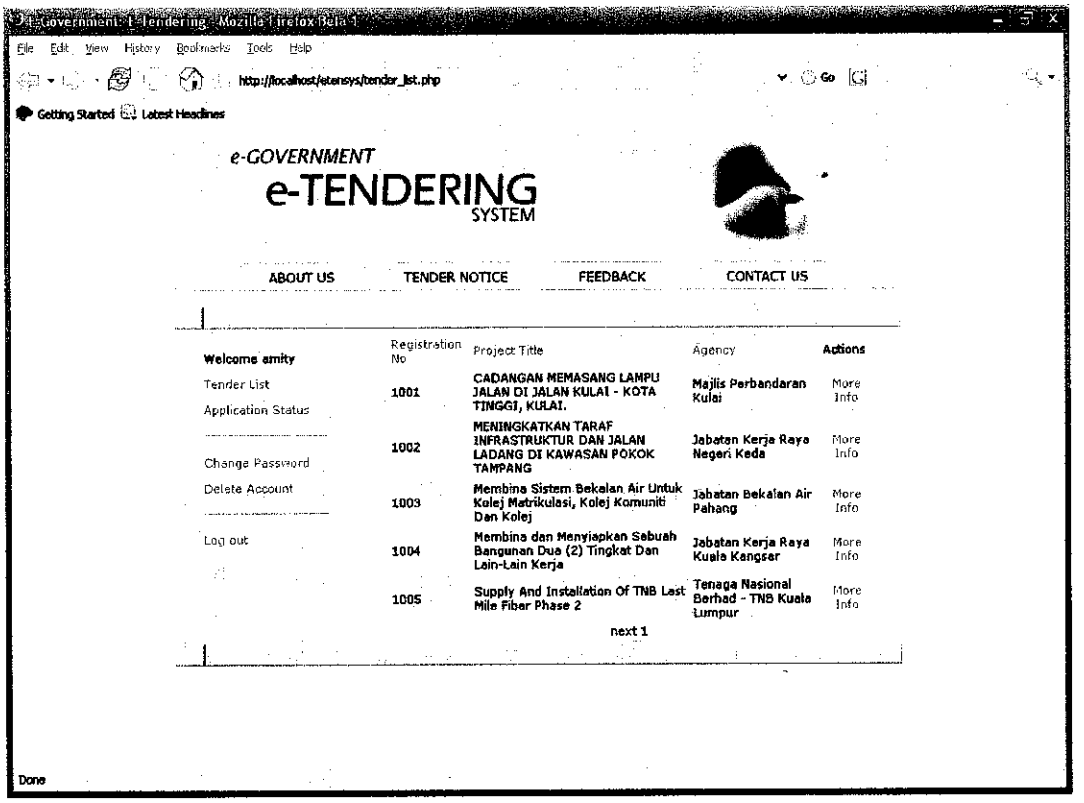

Figure 4.6: Tender List

After the contractors got their own username and password created by the administrator; in this case government agencies, they can log in into the e-tendering system to search for listed tender. Figure 4.6 shows that the tender list is listed with minimum five tenders per page. This is in order to ease the contractors to search the particular tender for them as they do not need to scroll the page till the last tender. Besides that, this basic prototype of e-tendering system only provides basic functionality for users. However, it will be enhanced in the future implementation.

Then, the contractors only need to click at 'More Info' to browse the full requirement or information for the particular tender. When the contractors satisfied with the tender, they could start the bidding for the lowest price. For those who have do the bidding, they need to go to application status page to see whether their application is pending, approved or rejected.

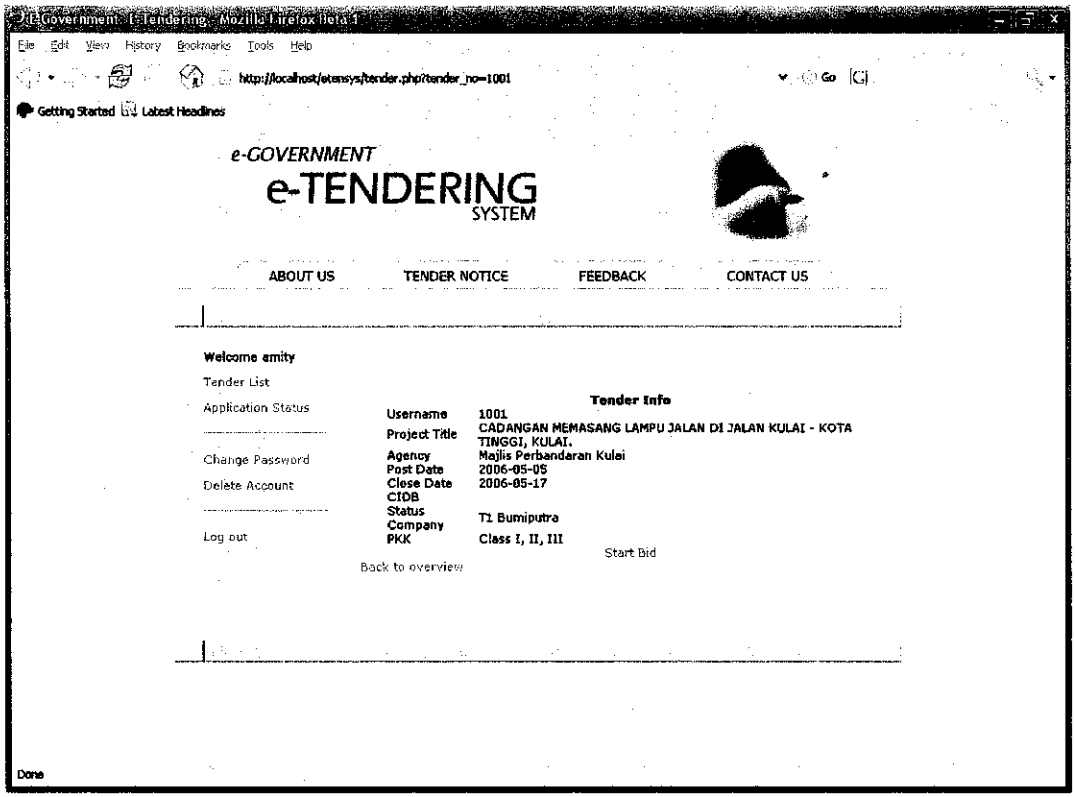

Figure 4.7: Start bid page

CHAPTER 5
CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

The rapid changes that happen in other countries facing towards globalization have made most countries choose to use e-government in order to serve their citizens better in future. Therefore, Malaysia as a developing country in Asia-Pacific region has boost up the development towards information and communication technology (ICT). Thus, Malaysia recently has launched its e-government which called myGovernment. Most services and information regarding government has been centralized using myGovernment. Hence, the additional application like e-tendering system is proposed in order to enhance the efficiency and effectiveness of e-government in Malaysia especially.

Through this project, there are two objectives to be met. The first objective is to perform a study and research about e-government. The data and information gathered from the study and research are used to develop the prototype. The study and research is mainly about; e-government and e-tendering, concept and functionalities. The information was gathered from variety of sources such as Internet, books and performing survey. It is the prerequisite for the second objective which is to develop a simple prototype of e-government portal with enhancement with e-tendering system. The data and information gathered are mainly used to develop a simple prototype to show how the e-government with e-tendering system enhancement works for users.

Rapid Application Development (RAD) is used for the methodology as the based in development process in order to develop a prototype in exact duration of period. RAD is a method which includes prototype in its phase of development before proceed into a completion phase. For that, RAD is merely suitable for this project which involve in developing a prototype. Besides that, RAD is suitable for short duration project.

Analysis, design and implementation were done in one phase in order to develop a prototype. Before proceeding to a complete system those phases will continuously rotate. This will make sure that the system is fully operated before hand in to end-users. For this project a basic prototype is being developed which needs more enhancement in the future. Therefore, the prototype is implanted with feedback function where users can put any comments or complaints regarding the website for future enhancement. This process will continue until a complete system is developed.

During the data collection, a survey was performed to get citizens feedback towards e-government as well as e-tendering system. The result is quite positive towards e-government as well as e-tendering system. Most respondents who are from computer literate have no problems in using e-government. Most of them have experience in using e-government and they also could accept if there will be an additional service to e-government services; in this case e-tendering system.

However, there are limitations in doing the survey. This is because there will be an assumption that if the respondents are not involve fully in using the e-government services, the data could not be accurate. Besides that, the survey is done by using e-mail and university network which afraid to have inaccurate information since there is no monitoring during the survey.

In a short period of time in developing the prototype, it is hard to have an integration between main agencies involve in tendering process. The integration is to have a centre database which includes vendors' information from some agencies such as Construction Industry Development Board (CIDB) and Pusat Khidmat Kontraktor (PKK). Therefore, the prototype is developed with manually collect data from those agencies which is not effective in serving the users in future.

Besides that, the prototype is not implanted with decision support system which will do the analysis for the bidding process. Therefore, the government agencies need to verify and analysis manually the bids from vendors who want the tender listed. Even though e-tendering system's objective is to ease the tendering process and reduce the cost, to do a manually analysis is not efficient. Yet, it is still a basic prototype with basic functionality. Therefore, there are some recommendations listed in order to enhance the e-tendering system in future.

In conclusion, E-Tendering System is an enhancement for e-government portal to serve citizens better. The impact could increase the government's credibility and improve the performance. Therefore, with on going enhancement of prototype system, it is believe that e-tendering system will be much better time to time.

5.2 RECOMMENDATION

As for the prototype system which in on going enhancement, e-tendering system also requires certain upgrades based on the feedback in order to provide a better and more reliable service to end-users. Some enhancements could be considered in future are as below:

- System should be integrated directly in real time basis with government agencies which are Construction Industry Development Board (CIDB) and Pusat Khidmat Kontraktor (PKK). The purpose to integrate the system with those agencies is to link one database in one agency to another database in another agency in order to get the actual data regarding contractor information, tender information, latest announcement and others.

- E-tendering system could also be embedded with decision support system (DSS) that could provide a decision for government to award tender to the potential contractor or buyer. This is in order to ease government to make a decision with precise analysis done by an intelligent agent. The analysis could be in charts which show the price differential, company's statistics and etc.

- A further study regarding mobile government (m-government) should be done in order to create a new based in serving the citizens. M-government is newly approach in serving citizens. Therefore, an early study could help in development for future.

- System should be design more interactive and informative. The interface of the system should be designed more interactive by adding some multimedia elements such as animated graphic and updated tender price chart. Other than that, some educational information should also be included in the system in order to attract more traders to use the system.

- The system should also be tested by personal that involved in the area as they are more familiar with the tendering process. The potential persons are such as contractors and government's personnel that working in CIDB or PKK. Their views are important to determine any issues with the system design and its functionality from users' point of view.

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APPENDIX

QUESTIONNAIRE

This questionnaire is delivered as for my study regarding Final Year Project entitled E-Government: E-Tendering System. Therefore, I need to get your feedback regarding this topic.

E-Government is one of the government initiatives to serve the citizen better in future. With this initiative, I want to propose one of the services in government agencies which is tendering. E-Tendering System will append in E-Government portal in order to ease the conventional tendering process.

SECTION A: BACKGROUND

Age: _____ years

Race
- ☐ Malay
- ☐ Chinese
- ☐ Indian
- ☐ Others

Gender
- ☐ Male
- ☐ Female

Employment category
- ☐ Banking or Finance
- ☐ Admin
- ☐ Education sector
- ☐ Executive
- ☐ Business
- ☐ Self employed
- ☐ Trainee
- ☐ Student
- ☐ Others

SECTION B: COMPUTER AND INTERNET USAGE

1. Do you have computer at home?
   - ☐ Yes
   - ☐ No

2. Do the computer at home with Internet connection?
   - ☐ Yes
   - ☐ No

3. How frequent you use Internet?

[1]	[2]	[3]	[4]	[5]
Never		Moderate		Very frequent

4. For what reason do you use Internet?(tick all that apply)
   - ☐ Education
   - ☐ Business
   - ☐ Occupation
   - ☐ Entertainment
   - ☐ Others

5. Where do you usually use Internet?(tick all that apply)
   - ☐ Home
   - ☐ Work place
   - ☐ Schools
   - ☐ University
   - ☐ Cyber café
   - ☐ Public library

SECTION C: USAGE OF E-GOVERNEMT SERVICES

1. How do you usually contact government offices?
   - ☐ Telephone
   - ☐ In person
   - ☐ Letter
   - ☐ E-mail
   - ☐ Website / Internet
   - ☐ Others

2. Do you aware of the existence of e-government initiatives?
   - ☐ Yes
   - ☐ No

3. How do you firstly know about e-government?
   - ☐ Television
   - ☐ Radio
   - ☐ Magazines
   - ☐ Colleagues
   - ☐ Internet
   - ☐ Others

4. Have you experience using e-government?
   - ☐ Yes
   - ☐ No

5. Do you understand about e-government?

[1]	[2]	[3]	[4]	[5]
Don't understand at all		Moderate		Really understand

6. If yes (Q4), do you manage to find the desired information or complete any transaction?
   - ☐ Yes
   - ☐ No

7. If yes (Q4), do you face difficulties when using e-government services?
   - ☐ Yes
   - ☐ No

SECTION D: BENEFITS OF E-GOVERNMENT TO MALAYSIAN

Government services on the Internet will benefit citizens by:

1. Making it easier to find information

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree

2. Making government services available on the Internet

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree

3. Bringing people close to government through the easiness of information searching

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree

4. Increasing the quality of services through the Internet

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree

5. Making the easier for people to communicate their views to government

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree

SECTION E: E-TENDERING

1. Perception towards E-Tendering System

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree

2. Level of acceptance of proposed E-Tendering System

[1]	[2]	[3]	[4]	[5]
Strongly disagree		Moderate		Strongly agree