

DEVELOPMENT OF AN E-TENDERING SYSTEM FOR AN ORGANIZATION

By

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CANDIDATE'S DECLARATION

It is hereby declared that this project report or any part of it has not been submitted elsewhere for the award of any degree or diploma.

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Acknowledgement

First of all, I would like to thank Almighty Allah for giving me the opportunity, strength and patience for carrying out this work and to complete this project.

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Abstract

Tendering is widely used in all over the world in all business areas such as, purchasing goods, seeking service provider, construction business etc. It is one of the fairest means of awarding contracts. Thousands of industries and business organizations have been established in Bangladesh in the last decade. Unfortunately these organizations are still working with the traditional paper based manual tendering system. The existing manual tendering system is slow, costly and time consuming. Traditional systems do not provide the interlinked information in precise and usable way. Furthermore, in tendering system there is a question about security and equal opportunity of participation in bidding.

An e-tendering system manages tenders through a web site. This can be accessed anywhere globally and has greatly improved the accessibility of tenderers. It also brings lots of opportunities including reducing costs of goods and services through aggregating purchasing volume, streamlining procedures and etc. for both the purchaser and the bidder. So definitely there is a need for a development of a web-based tendering system so that participants can get equal opportunity to submit bids via Internet. Bangladesh government has also decided to introduce e-tendering system to put an end to tender manipulation.

In this work, a complete web-based system has been developed which will give the purchaser to publish all tender notice in the Internet. The bidders have to register with the system. The bidders will be able to create their bidding profile and can apply for tender online via this system. The purchaser will examine the submitted bids and make the decision which bid is responsive/non-responsive or awarded. The awarded bidder will get an e-mail of notification of awarding. This developed e-tendering system is low cost and can be easily adopted by any organization who wants to make their tendering system online. Therefore, this web-based system can play a vital role in removing the existing difficulties of tendering system in Bangladesh.

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List of Abbreviations

Abbreviation	Description
ERD	Entity Relationship Diagram
CMS	Content Management System
SRS	Software Requirements Specifications
CRUD	Create, Retrieve, Update and Delete
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
PHP	Personal Home Pages
CSS	Cascading Style Sheets
TEC	Tender Evaluation Committee
TOC	Tender Opening Committee
HOPE	Head Of Procuring Entity
MySQL	My Structured Query Language
UML	Unified Modeling Language
XML	Extensible Markup Language
RAD	Rapid Application Development Model
DBMS	Database Management System
SDLC	System Development Life Cycle
DFD	Data Flow Diagram

Chapter 1: Introduction

1.1 Introduction

Tendering is considered to be one of the fairest means of awarding contracts and the method most likely to secure a favourable outcome for any organization in its spending of money. The basic principles of the tendering process have been applied to many business areas, such as purchasing goods, seeking service providers, business consulting, or the selection of main contractors for construction work. In various industries all over the world, all sorts of tendering method are used. With an explosive spread of the Internet and a rapid growth of information technology, tendering activity would be performed electronically through the Internet as well as other business activities. With the realization of electronic tendering through the Internet and spreading practice of international electronic tendering, the needs for international standardization are also necessary. According to such trends, the goal of this project is to develop an Internet based tendering process.

1.2 Procurement/Tendering

Procurements the overarching function that describes the activities and processes to acquire goods and services. Importantly, it is distinct from purchasing; it involves the activities for establishing fundamental requirements, sourcing activities such as market research and vendor evaluation and negotiation of contracts. It can also include the purchasing activities required to order and receive goods or services.

1.3 Procurement Process

The procurement process can be divided into five steps. Figure 1.1 shows the procurement process.



Figure 1.1: Procurement Process.

1.3.1 Business Need

One needs to understand what the fundamental business requirement and it is also important to understand the difference between a requirement and a solution. For example, the business requirement is to source some software to help to get information published on the company's intranet. An item of software to publish information on the company intranet is a solution not a requirement. The requirement is to be able to publish information on the intranet and it may be an outsourced solution is a better option. Figure 1.2 shows the business needs of an organization.



Figure 1.2: Business Need.

1.3.2 Procurement Strategy

Depending on the scale of your project, there could be a very wide range of potential solutions and approaches to your business need and a number of ways of researching the market and selecting a supplier. Figure 1.3 shows the procurement strategy of an organization.

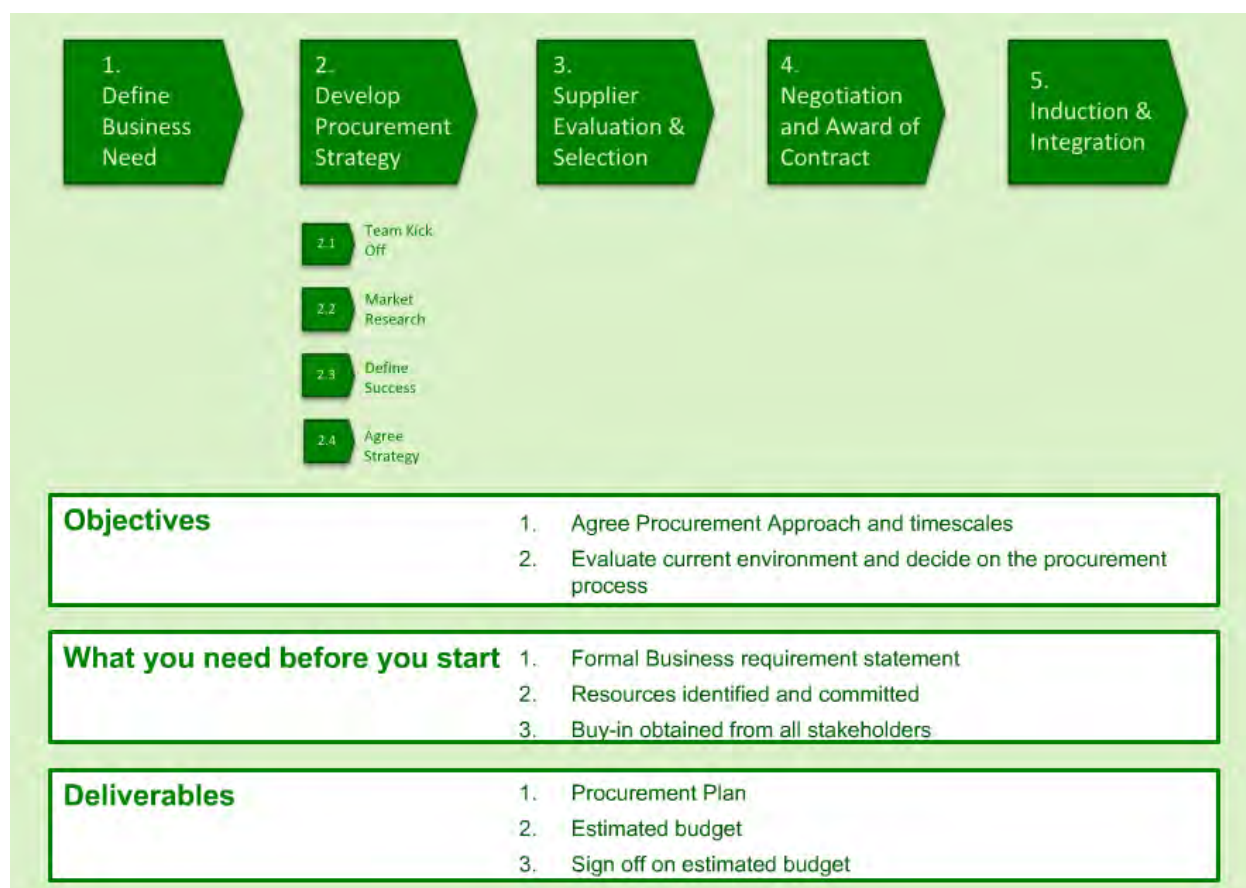


Figure 1.3: Procurement Strategy.

1.3.3 Supplier Selection and Evaluation

After researching the market and establishing organization's procurement approach, they need to evaluate the solutions available. This may involve a formal tender process or an on-line auction. Criteria for comparing different solutions and suppliers are critical. Figure 1.4 shows the supplier selection and evaluation of an organization.

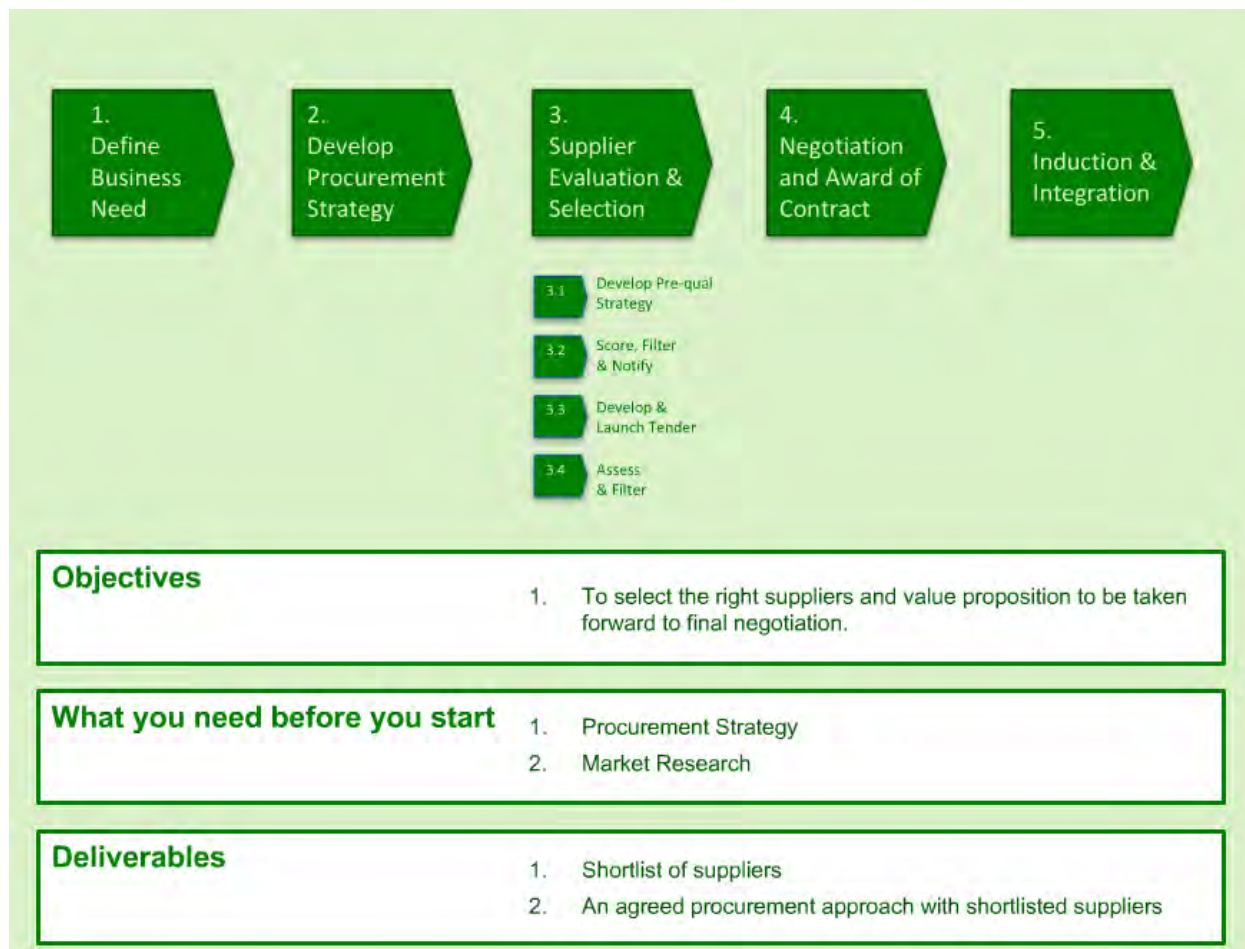


Figure 1.4: Supplier Selection and Evaluation.

1.3.4 Negotiation and Award.

When an organization have selected a supplier it is important that detailed negotiations are undertaken. This is not just about price. It is essential to consider carefully the process by which the goods or services will be ordered and approved; how they will be delivered and returned if necessary; how the invoice process will work and on what terms payment will be made. Figure 1.5 shows the negotiation and award of contract of an organization.



Figure 1.5: Negotiation and Award of Contract.

1.3.5 Induction and Integration

No goods or services should be ordered or delivered until the contract is signed. It is vital that the supplier is properly launched integrated. Figure 1.6 shows induction and integration of an organization.

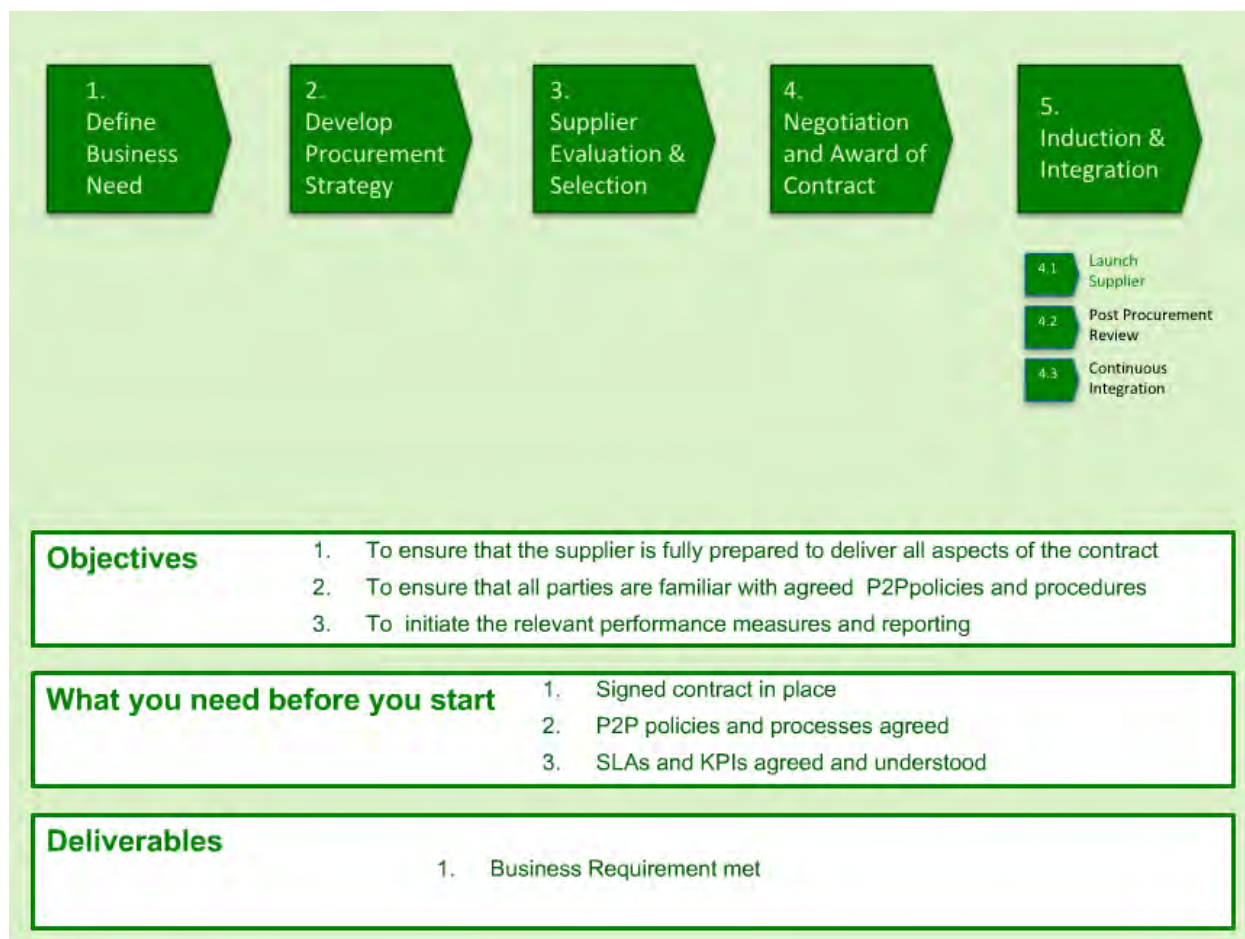


Figure 1.6: Induction and Integration.

1.4 Procurement Methods

Procurement methods are the procedures used by the procuring entity to acquire goods, services and works. These methods can be competitive and non competitive. There's a preference for using competitive methods of procurement given that they tend to promote transparency, economy and efficiency, and limit favoritism.

Procurement methods are many, and they go by different names depending on the procurement category. Most, with few exceptions, generally fall into the following types:

- i) Open Tendering,
- ii) Request for Proposals,
- iii) Two-stage Tendering,
- iv) Request for Quotations, and
- v) Single-source Procurement.

Of the above procurement methods, open tendering, request for proposals, and two-stage tendering are considered competitive procurement methods because the solicitation documents are advertised and open to any qualified firm interested in competing for the assignment. In contrast, request for quotations and single-source procurement are considered non-competitive procurement methods because the invitation to submit offers is not advertised, and it is sent only to firms or individuals specifically invited by the procuring entity.

1.5 Web-based System

Any web-based system is defined as a system that can be accessed via web browsers within a network [1]. Web-based systems need only to be installed on the server placing minimal requirements on the end user workstation. This makes maintaining and updating the system much simpler as it can be done on the server [2]. Most web based applications are far more compatible across platforms than traditional installed software [3]. Web browsers are available for a multitude of operating systems. For these reasons, many of the management systems are now being developed as web-based systems.

1.6 E-tendering System

Any system that uses information and communication technologies (ICT) in order to do business can be classified as e-Business system. In fact, e-Business is a broader definition of e-Commerce because it includes not only the buying and selling of goods and services, but also servicing customers, collaborating with business partners, conducting electronic transactions within an organization.

EU literature defines e-Commerce as follows: “Electronic commerce is about doing business electronically. It is based on the electronic processing and transmission of data, including text, sound and video. It encompasses many diverse activities including electronic trading of goods and services, on-line delivery of digital content, electronic fund transfers, electronic share trading, electronic bills of lading, commercial auctions, collaborative design and engineering, on-line sourcing, public procurement, direct consumer marketing and after-sales service. It involves both products (e.g. consumer goods, specialized medical equipment) and services (e.g. information services, financial and legal services); traditional activities (e.g. healthcare, education) and new activities (e.g. virtual malls) [4].

In this respect, e-Procurement is defined as a subset of e-Business concerning e-Commerce between private sector and public institutions where e-Commerce is intended as the activity of exchanging goods and services with some kind of payment by means of ICT.

From this point of view, it is possible to make many definitions for e-Procurement. In the simplest sense, e-Procurement means carrying out procurement decisions of the organization online through the use of the Internet. In other words, e-Procurement is about transforming the processes associated with public procurement and refers to automating corresponding processes of public institutions. [5] In other words, e-Procurement is more than simply buying online. It is changing the traditional way in which public institutions do business. e-Procurement involves the use of ICT in each step of the public procurement process from identification of the need to payment. Implementation of e-Procurement initiates automation of both internal and external processes associated with public procurement process.

As a system, e-Procurement is a Web-based purchasing system that offers the functionality of electronic ordering, electronic payment and enhanced administrative utilities to the public institutions. In general, e-Procurement systems are developed by using the Internet to streamline, manage and analyze the procurement activities. These systems range from basic ordering tools to complex systems that cover the entire tendering process. In each case, setting up an e-Procurement system involves implementing a software application that is customized based on the public procurement processes and rules. The resulting system should be accessible by each public institution through a Web browser that enables a secure and open purchasing environment.

1.7 Objectives with Specific Aims and Possible Outcome

The main goal of this project is to develop an automated e-tendering system. The specific objectives of this project are as follows:

1. To add, update and manage digital profile of bidders.
2. To provide different categories of tender this will be available for online bidding.
3. To provide e-mail alert when a new tender is published.
4. To enhance the availability of information about bidders for administrators.
5. To provide appropriate secured interfaces for both administrator and the bidders.

1.8 Scopes of the Proposed e-Tendering System

Some scopes of this software are given below:

1. Any particular organization which wants to convert their traditional tendering system in to e-tendering can use this software.
2. A bidder can have access via any browser within a network.
3. A bidder will be able to know details about a tender.
4. A bidder will get an e-mail notification every time a new tender is published.
5. A bidder will be able to sign in into the system after sign up.
6. After signing in a bidder will be able to
 - Edit personal information.
 - Create/update bidding profile.
 - Change the password.
 - View upcoming tenders.
 - Submit bid for a tender.
7. An administrator will be able to log in into the system using given password.
8. After signing in an administrator will be able to
 - Change the password.
 - Add, view, edit and delete; bidders, tender categories, tendersetc. information.
 - Grant or cancel bidders profile request.
 - View submitted tenders and awards the bid.

1.9 Organization of the Project Report

Chapter 1: Introduction: The first chapter of project documentation discusses about tendering system and web based tendering system at first. Then objectives and scope of the project as well as organization of the project report have been discussed.

Chapter 2: Literature Review: This chapter talks about the existing e-tendering solutions in our country.

Chapter 3: System Development Process: Rapid Prototyping Software Development Life Cycle is used for developing this application. This chapter describes the development of this project according to SDLC.

Chapter 4: System Design: In this chapter, design part of the project which includes database design, ERD, Software design, UML diagram, Activity diagram etc. are explained.

Chapter 5: Results and Discussions: This chapter describes different functional pages and modules of the project.

Chapter 6: Conclusion: Finally the last chapter of project documentation describes the conclusions and recommendations for future work and ends with references.

1.10 Summary

All the organizations all over the world need to purchase various types of products or services to meet their requirement. Tendering is considered to be one of the fairest means of awarding contracts and this method is using for a long time in all over the worlds.

Now a day's industries, business and personal worlds are dominated by a wide range of technologies and e-activities, including: computers, email, internet, web sites, etc, finding it more and more difficult to function without them. Yet, the success of any profession is described as going beyond simply exchanging electronic information. Successful implementation of ICT and innovative web-based e-solutions requires careful consideration to meet industry needs.

Chapter 2: Literature Review

2.1 Introduction

The rapid pace of technological advancement over the last three decades has transformed the traditional business process to an electronic format. Today business and governments are largely reliant on ICT to communicate and enter into contacts. One aspect of this transformation has been the adoption of electronic tendering systems or (e-tendering)

E-tendering is increasingly being adopted throughout the world. E-tendering, in its simplest form, is described as the electronic publishing, communicating, accessing, receiving and submitting of all tender related information and documentation via the internet, thereby replacing the traditional paper-based tender processed, and achieving a more efficient and effective business process for all parties invade .

In this chapter we will describe about some e-tendering systems using in Bangladesh.

2.2 Electronic Government Procurement (e-GP) of Bangladesh

Electronic Government Procurement (e-GP) [9] is the application of an efficient high quality management framework to public sector procurement, facilitated through online information and processes. e-GP has the potential to strengthen the accountability, transparency, efficiency and effectiveness of this sensitive high value government function.

For most jurisdictions, it represents both an opportunity for procurement reform and changing the way procurement is conducted. The development of e-GP depends more on getting the policy, strategic planning, management and governance components in place, rather than just the actual application of the technology.

A schematic representation of a mature example of e-GP is shown in Figure 2.1.



Figure 2.1 Schematic Representation of e-GP

e-GP is usually conducted through a common web site that allows for the registration of suppliers and buyers, and public access to procurement policy, guidelines, procurement opportunities, process stages and procurement outcomes (i.e. who won the contracts, cost, duration etc.). The procurement systems on the website can be accessed by both buyers and suppliers and allow the procurement process to be conducted online. They usually cover:

- e-Tendering: public tendering for works, goods and services
- e-Purchasing: the purchasing of high volume, low value, goods such as stationery, furniture and tools
- e-Contract Management: the development and management of contracts to assist managers to provide good quality documentation, and manage more effectively the quality of the procurement outcomes, timelines and costs. Elements of this system may be incorporated in the above systems.

There may also be other associated systems to provide information and management support such as an online procurement library containing policy statements, guidelines, document templates and procurement advice to assist in the operation of the process. The procurement systems are usually integrated with government administrative systems so that payments can be made online, and issues such as asset planning and management information can be linked to the procurement cycle.

Figure 2.2 shows the access diagram of e-GP system.

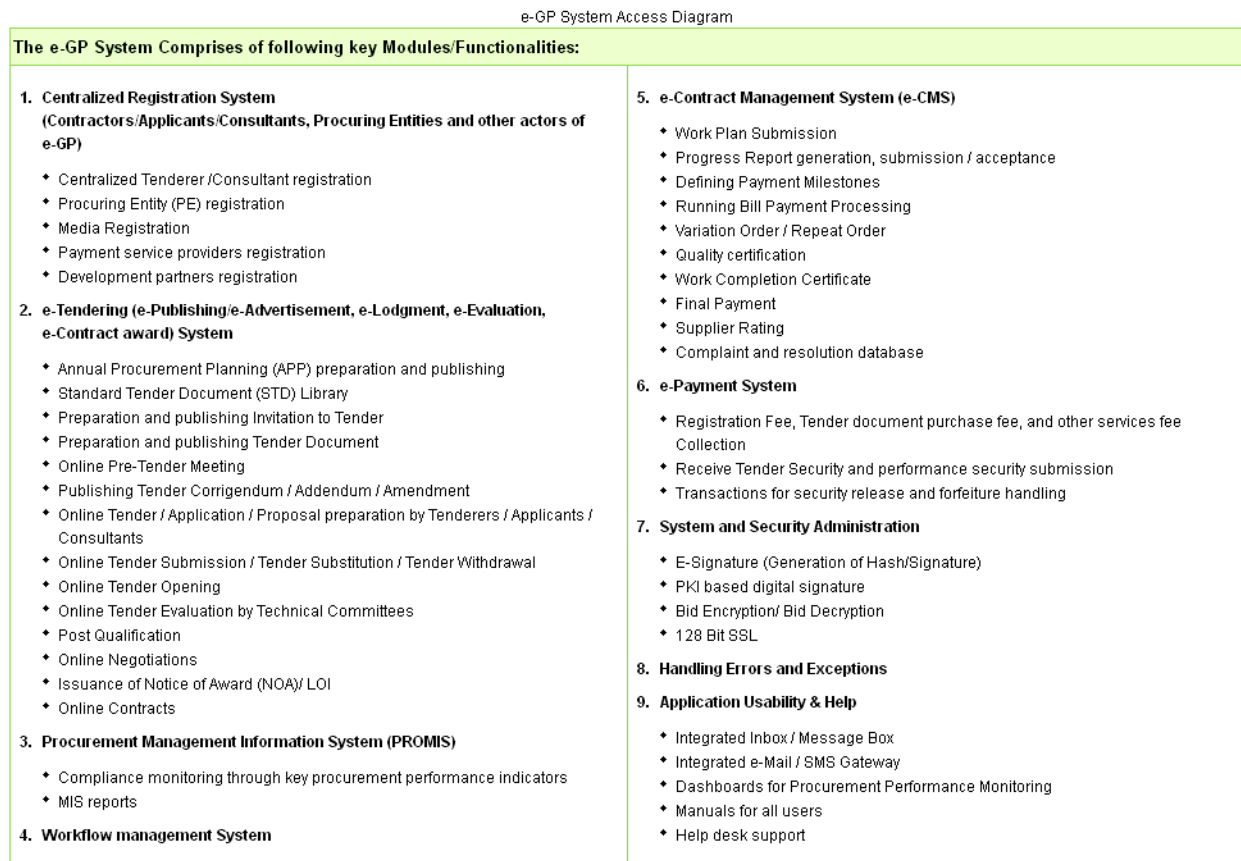


Figure 2.2: e-GP System Access Diagram

The procurement systems may also be linked to a data warehouse so that procurement trends, and information and analysis can be undertaken by both government and business to assist improved decision-making.

The e-GP systems are supported by a number of critical key components. For example, having a viable information and communication infrastructure would provide suppliers and buyers with good quality, inexpensive access to the Internet.

There is also strong support from the components of:

- government leadership and policy that sets the direction for e-GP
- legislation and regulatory process that are consistently applied and monitored
- comprehensive procurement planning and management in both the procurement agencies and in agencies across government that supports the integrity, transparency, efficiency and effectiveness of the government procurement market
- active integration of suppliers to support increased access to procurement opportunities, a fair competitive market, and a more streamlined and consistent processes.

Many of these components should be in place in supporting the current approach to government procurement.

The e-GP System has been implemented in two phases:

- **e-Tendering System:** Covering complete e-tendering processes such as centralized user registration, preparation of Annual Procurement Plan (APP), preparation of Bid\Tender document, preparation of Bids/Tenders, invitation of Tenders, sale of Tender Documents (eTD), conducting online pre-bid meeting, collection of bid\Tender security, on-line Bid\Tender submission, Bid opening & evaluation, negotiations (where applicable), and contract awards.
- **e-Contract Management System (e-CMS):** Covering complete eContract Management processes, such as preparation of work plan and its submission, defining milestone, tracking and monitoring progress, generating reports, performing quality checks, generating running bills, vendor rating and generating completion certificate.

Figure 2.3 shows the web page of e-GP system.

National e-Government Procurement (e-GP) Portal of the Government of the People's Republic of Bangladesh

Home Page | About e-GP | Contact

Type your Keyword here eTenders Search

Go To eTenders Annual Procurement Plans eContracts Debarred Tenderers Reports Off-line

Saturday, 07 Sep, 2013 23:36:56 BST

About e-Government Procurement (e-GP) System

National e-Government Procurement (e-GP) portal (i.e. <http://eprocure.gov.bd>) of the Government of the People's Rep. Bangladesh is developed, owned and being operated by the Central Procurement Technical Unit (CPTU), IME Division of Ministry of Planning. The e-GP system provides an on-line platform to carry out the procurement activities by the Public Agency Procuring Agencies (PAs) and Procuring Entities (PEs).

The e-GP system is a single web portal from where and through which PAs and PEs will be able to perform their procurement related activities using a dedicated secured web based dashboard. The e-GP system is hosted in e-GP Data Center at CPTU. The e-GP web portal is accessible by the PAs and PEs through internet for their use.

This complete e-GP solution introduced under the Public Procurement Reform (PPR) Program is being supported by the Bangladesh Bank and gradually used by all government organizations. This online platform also helps them ensuring equal access for Bidders/Tenderers and also ensuring efficiency, transparency and accountability in the public procurement process in Bangladesh.

User Login

e-mail ID:

Password:

Login Forgot Password?

New User Registration

PE User Registration

News and Events

- MOU has been signed with Trust Bank, Bank Asia

Important Messages and Support Details

- The eGP guidelines were approved by the

Figure 2.3: e-GP Web Page.

2.3 E-Tendering System of Bangladesh Bank.

The introduction of e-tender in the Bangladesh Bank (BB) [10] has made possible fair, free and fearless participation of tenderers in the bidding process eliminating domination of muscle power and shortening the procurement cycle. In this system all tender notice of BB will be published via Internet, after registration bidders will receive email alert for the system, and bidders will participate the bid online.

Sign In

Already registered - sign in here

Email: Password:

forget your password? [click here!](#)

Not registered?

To access the service, you will need to register. Registered members enjoy:

- Access to business opportunities with Bangladesh Bank.
- Email alerts as new opportunities are published.

Figure 2.4: Bidder Login Page of BB E-tendering.

Figure 2.4 shows the bidder login page of Bangladesh Bank e-tendering system.

Since its introduction in May 2010 Bangladesh Bank has already given 350 contracts out of 400 to winning bidders for procurement of goods through e-tender replacing the cumbersome method of inviting tender and awarding contract. The practice of e-tender minimizes use of papers on tendering exercises and reduce hassles involved in communication and administration and reduce labour intensive tasks of receipt, recording and distribution of tender. In fact, this e-tender tool transforms a rigid, process driven environment into a flexible, result driven landscape.

Figure 2.5 shows Bangladesh Bank E-tendering system diagram

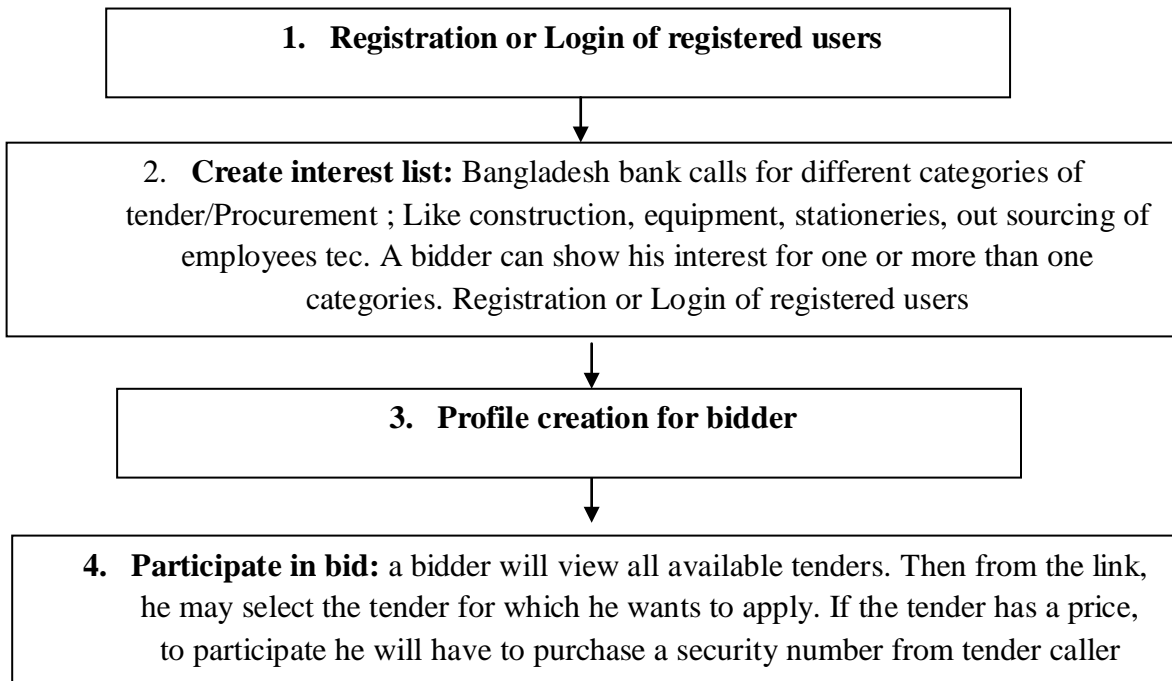


Figure 2.5: BB e-Tendering System Diagram

Chapter 3: System Development Process

3.1 Introduction

For development the e-tendering system we perform feasibility study, and gather the requirements according to the SDLC. In this chapter we also identified the main features of the developed e-tendering system and users of the system we also find out hardware and software interface, security interface.

3.2 System Development Life Cycles (SDLC)

The system development life cycle is the overall process of developing, implementing, and retiring information systems through a multistep process from initiation, analysis, design, implementation, and maintenance to disposal. The SDLC aims to produce a high quality system that meets or exceeds customer expectations, reaches completion within times and cost estimates, works effectively and efficiently in the current and planned Technology infrastructure, and is inexpensive to maintain and cost-effective to enhance.

Computer systems are complex and often (especially with the recent rise of service-oriented architecture) link multiple traditional systems potentially supplied by different software vendors. To manage this level of complexity, a number of SDLC models or methodologies have been created, such as "waterfall"; "spiral"; "Agile software development"; "rapid prototyping"; "incremental"; and "synchronize and stabilize".

SDLC is used during the development of an IT project; it describes the different stages involved in the project from the drawing board, through the completion of the project.

Systems Development Phases

The SDLC framework provides a sequence of activities for system designers and developers to follow. It consists of a set of steps or phases in which each phase of the SDLC uses the results of the previous one.

A Systems Development Life Cycle (SDLC) adheres to important phases that are essential for developers, such as planning, analysis, design, and implementation, and are explained in the section below. Figure 3.1 shows SDLC Phases.

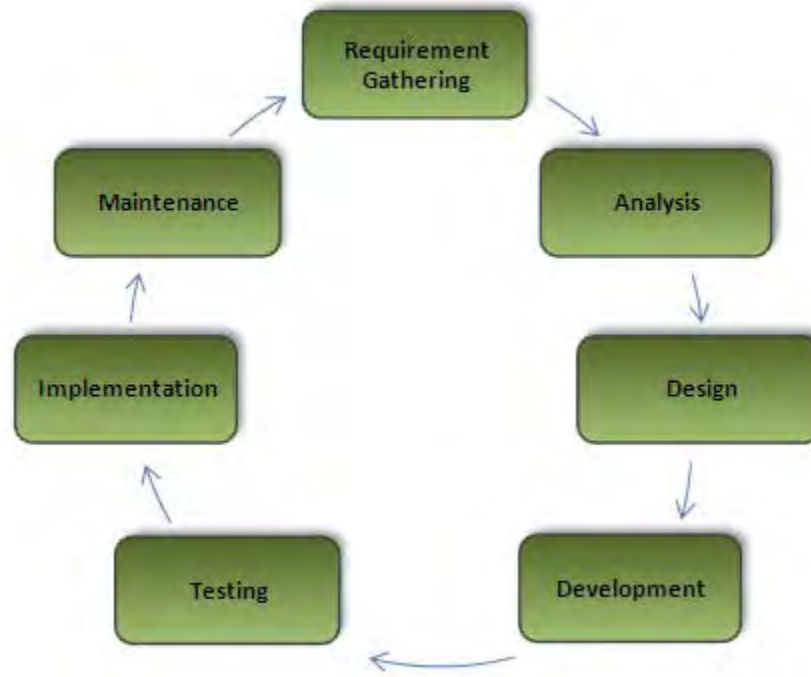


Figure 3.1: SDLC phases.

- **Requirement gathering:** in this step, the basic requirement of the project is identified and identify the problems. Describes the costs and benefits.
- **Analysis:** Defines project goals into defined functions and operation of the intended application. Analyzes end-user information needs.
- **Design:** Describes desired features and operations in detail, including screen layouts, business rules, process diagrams, pseudo code and other documentation.
- **Development:** The real code is written here.

- **Testing:** Brings all the pieces together into a special testing environment, then checks for errors, bugs and interoperability.
- **Implementation:** The final stage of initial development, where the software is put into production and runs actual business.
- **Maintenance:** During the maintenance stage of the Life-Cycle, the system is assessed to ensure it does not become obsolete. This is also where changes are made to initial software. It involves continuous evaluation of the system.

3.3 Outline of Methodology

There are many different SDLC models and methodologies, but each generally consists of a series of defined steps or phases. For any SDLC model that is used, information security must be integrated into the SDLC to ensure appropriate protection for the information that the system will transmit, process, and store.

Some SDLC models are: waterfall, fountain, spiral, build and fix, rapid prototyping, incremental, and synchronize and stabilize.

In this project we will followed the “**Rapid application development Model**”. The brief overview of the process is depicted below.

3.3.1 Rapid Application Development (RAD)

Rapid application development (RAD) is a software development methodology that uses minimal planning in favour of rapid prototyping. The "planning" of software developed using RAD is interleaved with writing the software itself. The lack of extensive pre-planning generally allows software to be written much faster, and makes it easier to change requirements.

Rapid Application Development (RAD) is a term originally used to describe a software development process first developed and successfully deployed during the mid-1970s by the New York Telephone Co's Systems Development Centre under the direction of Dan Gielan.

Following a series of remarkably successful implementations of this process, Gielan lectured extensively in various forums on the methodology, practice, and benefits of this process.

Rapid application development was a response to processes developed in the 1970s and 1980s, such as the Structured Systems Analysis and Design Method and other Waterfall models. One problem with previous methodologies was that applications took so long to build that requirements had changed before the system was complete, resulting in inadequate or even unusable systems. Another problem was the assumption that a methodical requirements analysis phase alone would identify all the critical requirements. Ample evidence attests to the fact that this is seldom the case, even for projects with highly experienced professionals at all levels.

Starting with the ideas of Brian Gallagher, Alex Balchin, Barry Boehm and Scott Shultz, James Martin developed the rapid application development approach during the 1980s at IBM and finally formalized it by publishing a book in 1991, *Rapid Application Development*.

Figure 3.2 shows Rapid Application Development Model

3.3.2 Effectiveness of RAD Model

The shift from traditional session-based client/server development to open session less and collaborative development like Web 2.0 has increased the need for faster iterations through the phases of the software development process. This, coupled with the growing use of open source frameworks and products in core commercial development, has, for many developers, rekindled interest in finding a silver bullet RAD methodology.

Although most RAD methodologies foster software re-use, small team structure and distributed system development, most RAD practitioners recognize that, ultimately, no one “rapid” methodology can provide an order of magnitude improvement over any other development methodology.

All types of RAD have the potential for providing a good framework for faster product development with improved software quality, but successful implementation and benefits often hinge on project type, schedule, software release cycle and corporate culture. It may also be of

interest that some of the largest software vendors such as Microsoft and IBM do not extensively use RAD in the development of their flagship products and for the most part, they still rely primarily on traditional waterfall methodologies with some degree of spiraling.

Since rapid application development is an iterative and incremental process, it can lead to a succession of prototypes that never culminate in a satisfactory production application. Such failures may be avoided if the application development tools are robust, flexible, and put to proper use. This is addressed in methods such as the 2080 Development method or other post-agile variants.

3.3.3 Phases of RAD

1. **Requirements Planning phase** – combines elements of the system planning and systems analysis phases of the Systems Development Life Cycle (SDLC). Users, managers, and IT staff members discuss and agree on business needs, project scope, constraints, and system requirements. It ends when the team agrees on the key issues and obtains management authorization to continue.
2. **User design phase** – during this phase, users interact with systems analysts and develop models and prototypes that represent all system processes, inputs, and outputs. The RAD groups or subgroups typically use a combination of Joint Application Development (JAD) techniques and CASE tools to translate user needs into working models. User Design is a continuous interactive process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs.
3. **Construction phase** – focuses on program and application development task similar to the SDLC. In RAD, however, users continue to participate and can still suggest changes or improvements as actual screens or reports are developed. Its tasks are programming and application development, coding, unit-integration and system testing.
4. **Cutover phase** – resembles the final tasks in the SDLC implementation phase, including data conversion, testing, changeover to the new system, and user training. Compared with traditional methods, the entire process is compressed. As a result, the new system is built, delivered, and placed in operation much sooner.



Figure 3.2: Rapid Application Development Model.

3.4 Feasibility Study

A project feasibility study is an exercise that involves documenting each of the potential solutions to a particular business problem or opportunity. The purpose of a Project Feasibility Study is to clarify the wanted outcome of the project. It is important to understand what the project will deliver. If a project is seen to be feasible from the results of the study, the project can be continued to the next stage.

In various industries all over the world, there are all sorts of tendering action being performed including public procurement of construction works, service and goods. But the existing procurement process is inefficient and with an explosive spread of the Internet and a rapid growth of information technology, the conversion of existing tendering process to an e-tendering is a requirement of time. The electronic transformation of the public procurement processes will offer the potential for significant savings from its early stages. It also brings lots of opportunities including reducing costs of goods and services through aggregating purchasing volume, streamlining procedures and etc. for both the government and the private sector.

E-tendering provides Organizations can access various goods and services from a variety of vendors whereas vendors can reach all the opportunities easier than ever before. As a result, both

Organization and vendors will benefit from a common platform where the former can get all the information to make a purchase decision.

Proposed E-Tendering will provide the following benefits

- The information and contract awards will be accessed easier and faster.
- Vendors will have a chance to present the technical and non-technical descriptions, prices and promotions related with their goods and services.
- The public procurement related processes like managing orders, managing inventories, financing, etc. will be more efficient and effective.
- Time and cost associated with business meetings will be reduced.
- The time consumed in the bureaucratic inertia will be reduced.
- New opportunities for SMEs will be formed such as increased participation in supply chain.

3.5 Requirement Gathering, Specification and Planning

Requirement gathering, specification and planning are essential parts of any project and project management. During this process, different similar software is analyzed and discussions are made with different companies about the software. The software and hardware requirements are also studied and specified in this phase. Different types of idea about the development are written up. The requirement process is completed when the specifications for the new software product are written in a formal document called the requirements specification document. In planning phase, a plan is made to develop this software with requirement specification document.

3.5.1 Identify User

Identifying the administrator and the users of software is very important. Figure 3.3 shows user hierarchy of e-tendering system. The different categories of users of the software are as follows:

System Administrator: System administrator can do anything on the site, in all pages. System administrator is responsible for updating and maintaining the database and codes of the software. In e-tendering the System Administrator is the Head of Procuring Entity (HOPE).

Administrators: An administrator is a responsible person appointed by the organization, who can approve bidders profile, can create new tenders, and change his/her own password. The administrators also can view/edit/delete/insert bidders, tender categories and register a bidder in a category.

Users (Bidders): The main Users are the registered bidders of the organization who will use this software. To bid in a tender, a bidder should have the basic computer using ability. By signing in user can see all general information and can also apply for tender, can update personal information, bidding profile and change his/her own password etc.

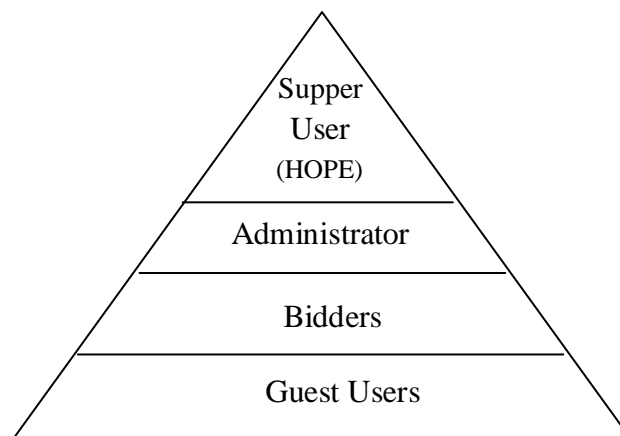


Figure: 3.3: User Hierarchy of E-Tendering System

Guest Users: these users are mainly those who will view the static pages of the website such as Home, About Us etc. This type of users will not view any other pages until they are registered. On short we may say the user before registration is a guest user.

3.5.2 Analysis of Main Features

The E-tendering System software is designed to manage full tendering system online more effectively and efficiently. An administrator can add new tenders, add/edit/delete vendors, vendors profile and tender categories using this software. Some key features of E-tendering System are discussed bellow.

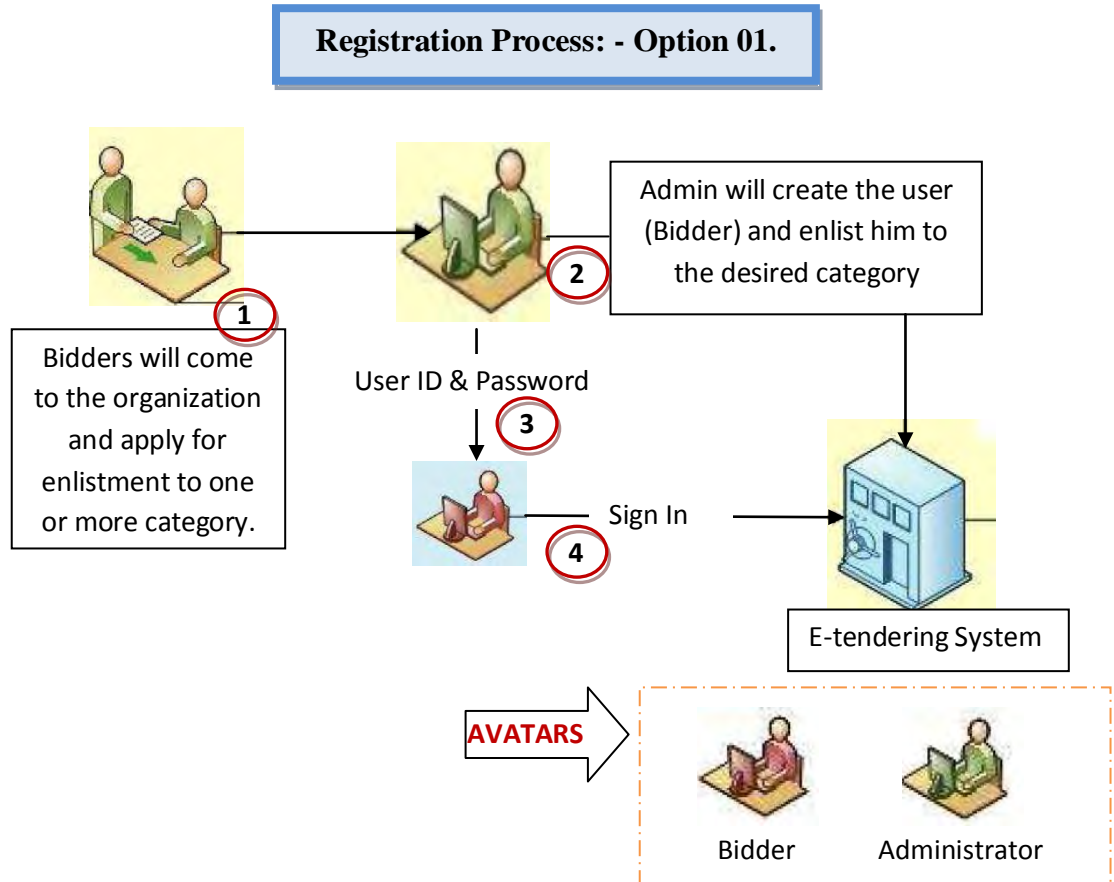


Figure 3.4: Registration Process of Bidders

Bidder Registration Process

A Bidder can register in two ways. First, the bidder will go to the organization and apply with all his papers the admin will create his user and provide a username and password by using that he will be able to sign in to the system. Second a bidder will register with a user-id, password and a valid e-mail address, a test e-mail will be sent to that email address user have to confirm that e-mail by clicking the link with the e-mail. After finishing the registration process the bidder will go to the organization and submit his paper for approval. Figure 3.4 and Figure 3.5 shows the registration process of bidders.

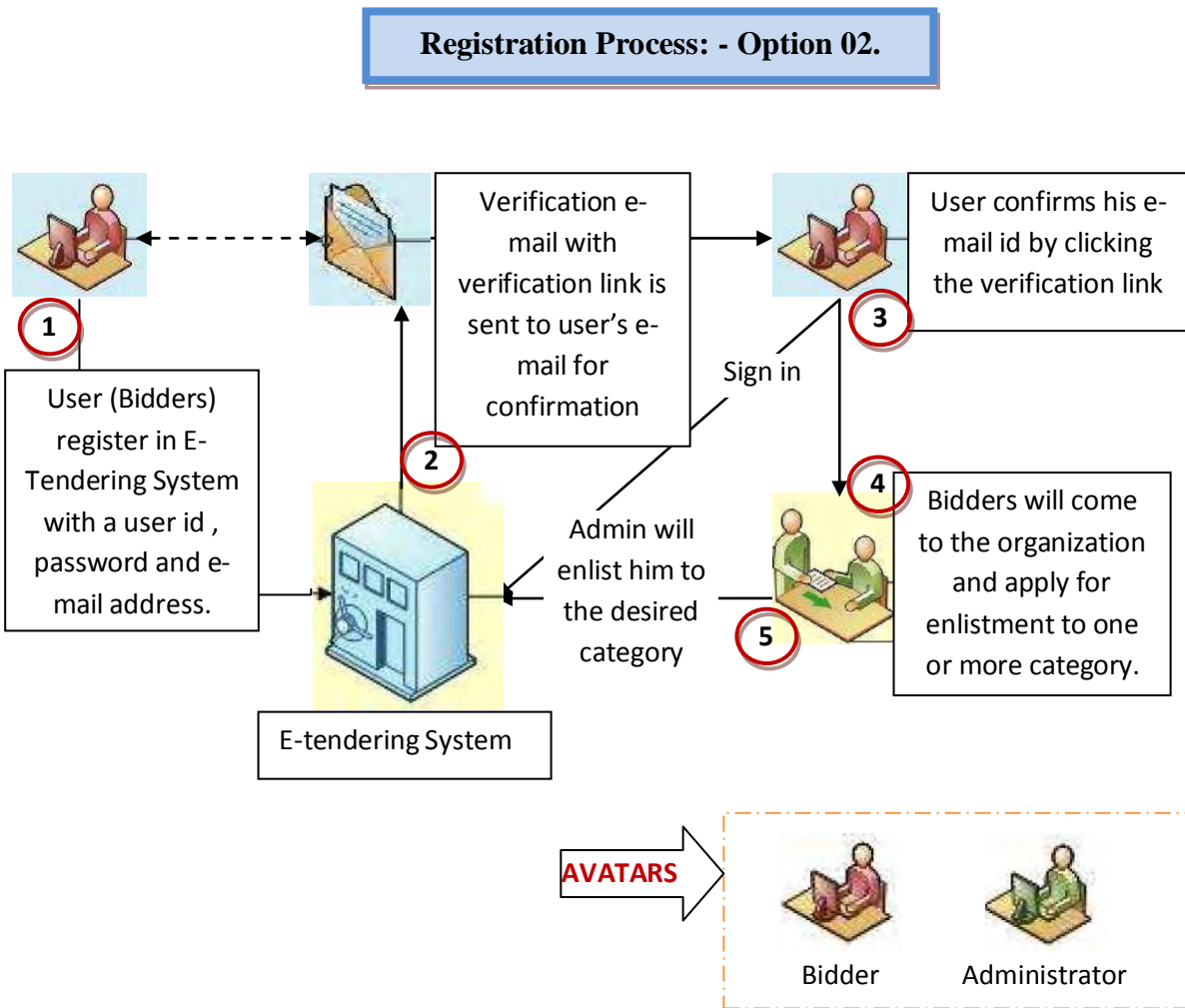


Figure 3.5: Registration Process of Bidders

Bidder and Tender Creation

Administrators have power to create bidders at first time and approve/unapproved there bidding profile. Administrators have power to change/create/delete a bidder's bidding categories. Administrators have also power to create tenders but they will not be able to change anything after creation. Only Super Admin has the power to change anything in the tender.

Tendering and Bidding System

A Bidder first applies for registration. After successful registration a bidder have to create a Bidding profile. After approval of the bidding profile by any admin a Bidder can apply for any tender. A bidder need to go to the tender page and all information about the tender is in there. He can download these documents. All information of the bidder will be displayed in the bidder profile page. Bidder can edit/update his profile. Administrator should have to approve a profile after edited. A bidder will also view the tenders he applied. Figure 3.6 shows the tendering and bidding system.

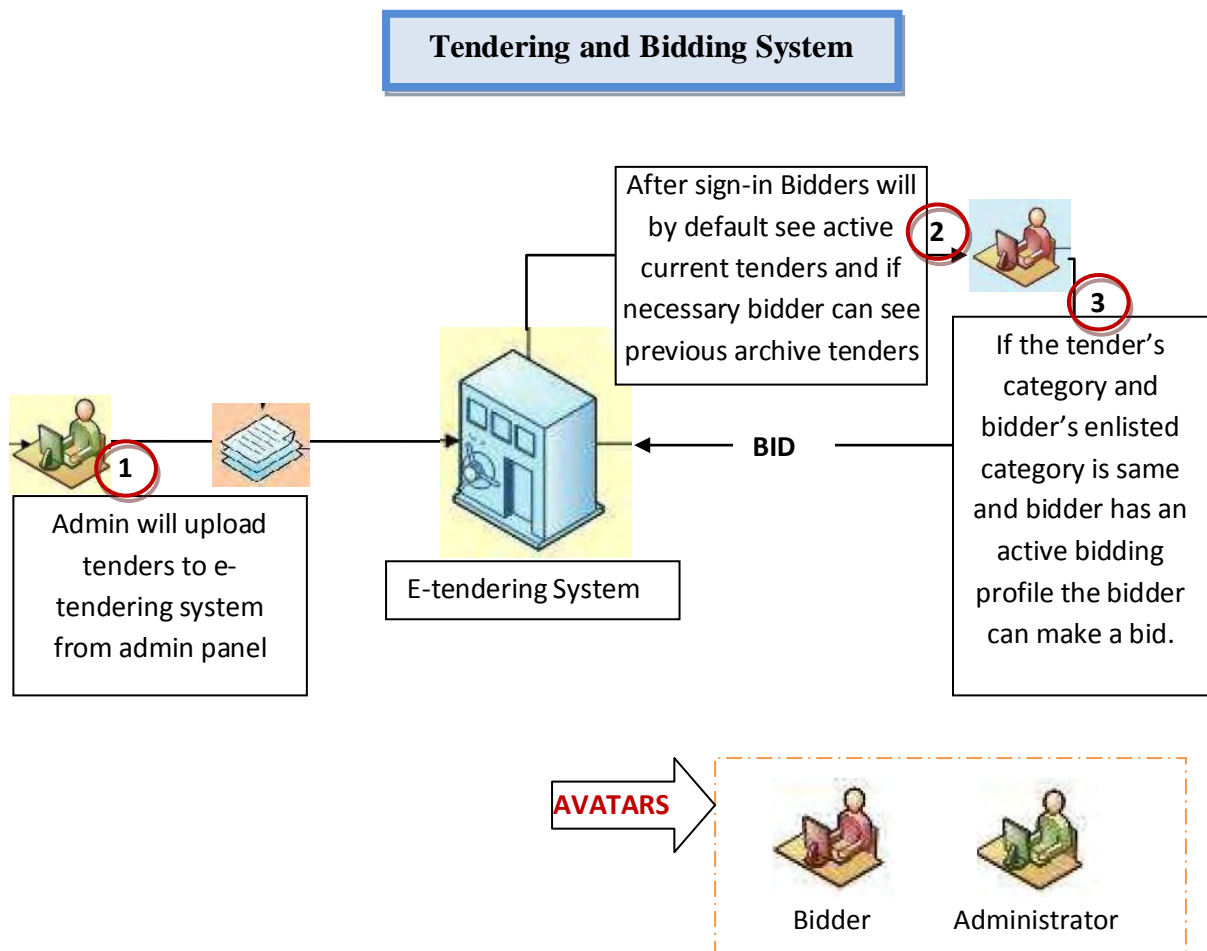


Figure 3.6: Tendering and Bidding System

Profile Creation

Every bidder has to have a valid bidding profile. A bidder will login to the system and submit all necessary papers and the administrator will approve the bidding profile. Figure 3.7 shows profile creation process of bidders.

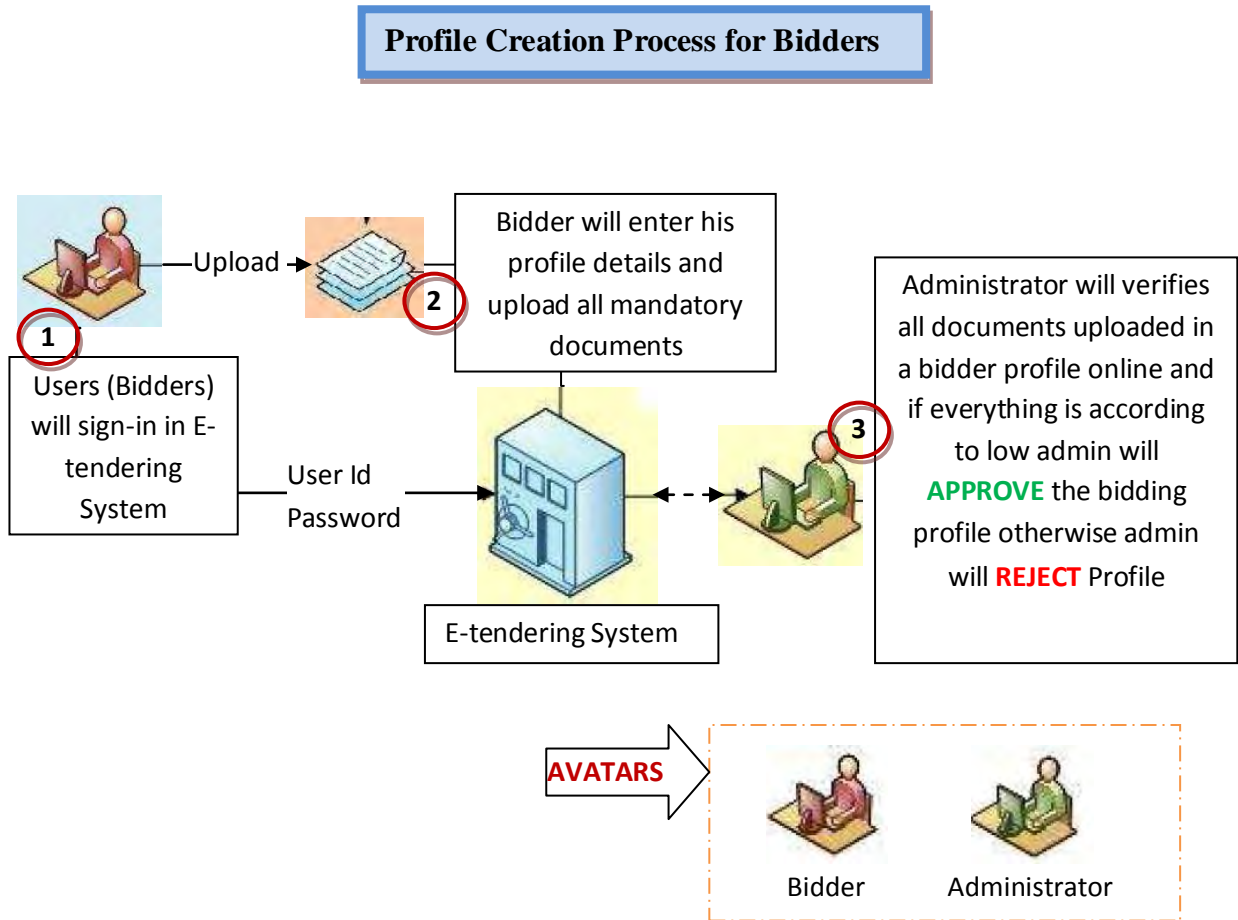


Figure 3.7: Profile Creation Process of Bidders

Control Information

After the submission time the super administrators can see how much bid are submitted in a tender and he will be able to award the tender to someone. Normal administrators or any other users have no power to view bid information. Users can only view limited information.

Download/Print Option

Bidders will be able to download their profile in PDF format. They will also be able to download the tender documents in a PDF format. The administrators also have the privilege to download any tender information or bidding information with profile of bidder in PDF format. Figure 3.8 shows tender/bid awarding system.

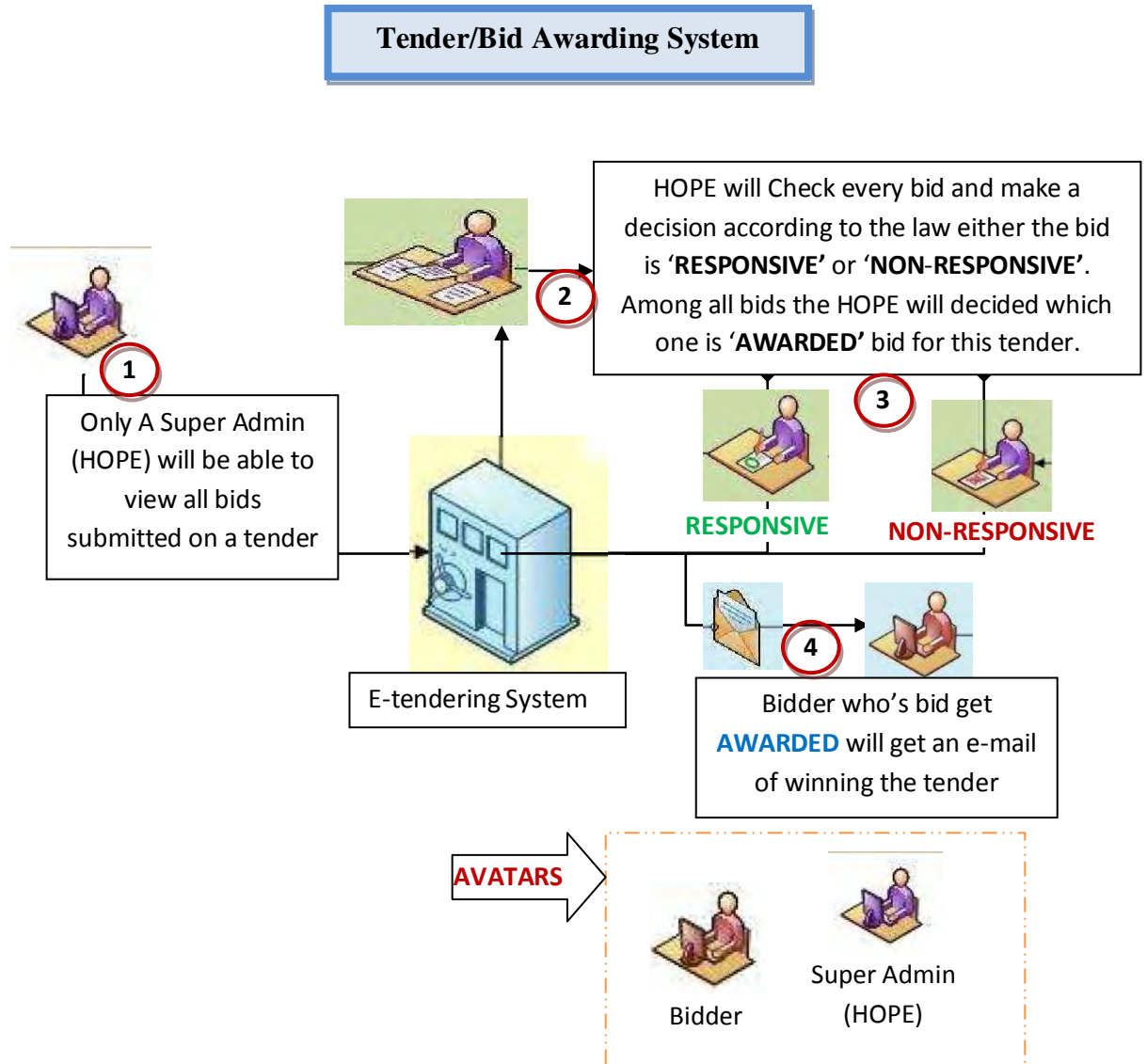


Figure 3.8: Tender/Bid Awarding System

3.5.3 Web-based Software Architecture

The developed Web-based E-tendering System works within a network (Intranet). Figure 3.9 shows the web-based software architecture. The architecture for the web based system contains three necessary components [11]:

- The Data and Data Server
- The Web Application and Web Server
- The Client Application and Client.

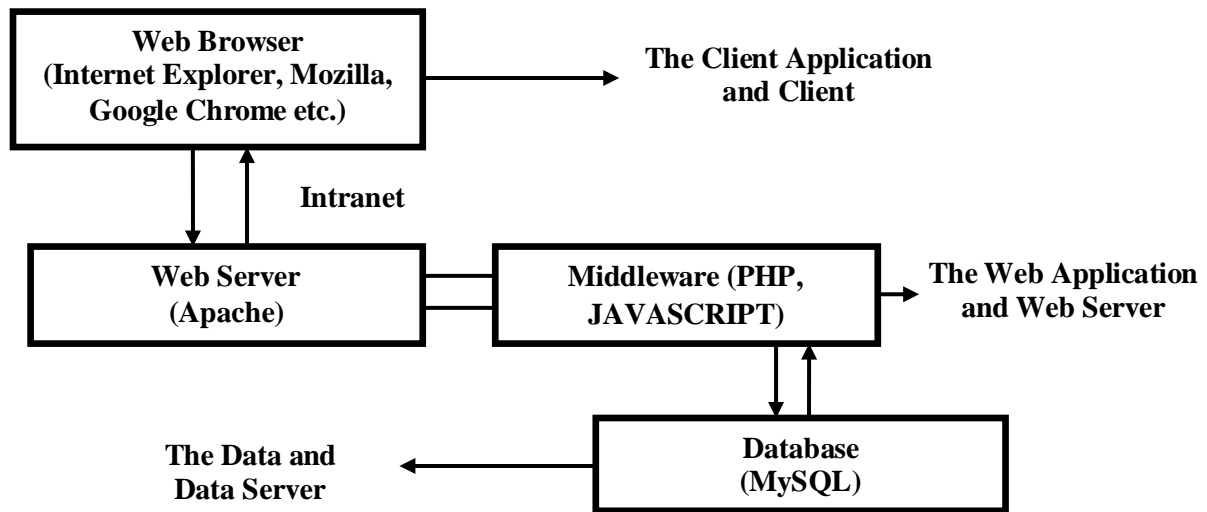


Figure 3.9: Web-based Software Architecture.

3.5.4 Hardware Interfaces

Now days, every company have computer, internet facilities and printers. To implement the e-tendering system an organization will need a domain and a database server. The software will be hosted on the web server and from anywhere this software is accessible via internet. Printer will be necessary if anyone wants to print the documents generated from the system.

3.5.5 Software Interfaces

In this project the following software are used:

Web Browsers (Microsoft Internet Explorer/Mozilla Firefox)	
Version number:	9 or later.
Source:	Microsoft Corporation.
Purpose:	To display the information on the website in a neat and organized way. And also to help one navigate around the web easily.
Definition of the Interface:	The Microsoft Internet Explorer is the software, which provides a flexible and reliable browsing experience with enhanced Web privacy features for all users.
PHP: Personal Home Pages	
Version number:	5.2.6.
Source:	PHP Group.
Purpose:	To build web pages, this works with MySQL database and Apache server.
Definition of the Interface:	PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML.
Apache HTTP Server	
Version number:	2.0.5.5.
Source:	The Apache Software Foundation.
Purpose:	In order to execute the client site of this software, the web server specified above is required as the provider of the client software at the server site.
Definition of the Interface:	The Apache HTTP Server Project is an effort to develop and maintain an open-source HTTP server for modern operating systems including UNIX and Windows NT. The goal of this project is to provide a secure, efficient and extensible server that provides HTTP services in sync with the current HTTP standards.
Adobe Dreamweaver CS4	
Version number:	CS4.
Source:	Adobe System.
Purpose:	The web development tool specified above is helpful for designing and coding the project.
Definition of the	Adobe Dreamweaver is the industry-leading web development tool,

Interface:	enabling users to efficiently design, develop and maintain standard based websites and applications.
MySQL: My Structured Query Language	
Version number:	5.0.
Source:	MySQL.
Purpose:	Required as database server.
Definition of the Interface:	MySQL is the world's most popular open source database software. With superior speed, reliability, and ease of use, MySQL has become the preferred choice of corporate IT Managers because it eliminates the major problems associated with downtime, maintenance, administration and support.
JavaScript/ECMAScript	
Version number:	1.6.
Source:	ECMA organization.
Purpose:	For opening or popping up a new window, Validation of web form (input values to make sure that they will be accepted before they are submitted to the server) etc.
Definition of the Interface:	JavaScript is an object-oriented scripting language used to enable programmatic access to objects within both the client application and other applications. It is primarily used in the form of client-side JavaScript, implemented as an integrated component of the web browser, allowing the development of enhanced user interfaces and dynamic websites.
CSS: Cascading Style Sheets	
Version number:	CSS 2.1.
Source:	World Wide Web Consortium.
Purpose:	To enable the separation of document content from document presentation, including elements such as the colours, fonts, and layout.
Definition of the Interface:	Cascading Style Sheets (CSS) is a style sheet language used to describe the presentation semantics (that is, the look and formatting) of a document written in a markup language.

3.5.6 Security Requirements

Most IT departments have security requirements for applications. Web applications are not exceptional. The requirements are often written as checklists.

- Requires password and have options to change password.
- Web and database servers should be physically secured.
- Username and password will be checked before starting every page.
- Use a secured password for the SQL Server administrator, SA.

3.5.7 Easy to Use

This system is self explanatory. So, minimum computer knowledge is required to use this software.

3.6 Design

The design phase describes how the software is constructed so that it fulfills the specifications agreed upon in the requirements specification document. It explains required features and operations in detail, including database design, software design, screen layouts and other documentation. When the design is completed it is recorded in the design specification document. There are different types of design to develop this software like ERD, UML etc. Design stage is described in details in Chapter 4.

3.7 Coding and Model Testing

In this stage, the designs are translated into code. The software is divided into separate units called modules, in order to handle the complexity of the programming process. All rules and regulations of programming language are maintained properly. Computer programs are written using Dreamweaver tool. According to the type of application, the right programming language is chosen. Different high level programming languages like PHP [11], MySQL [13], Apache [14], JavaScript [15], AJAX [15], HTML [15], XML [15], CSS [15] etc. are used for coding. In this software for managing the web contain we use a PHP CMS (Content Management System) Joomla2.5 [12]. And MVC (Model-Controller-View) technic in coding.

3.8 Integration and System Testing

During this stage, the individual modules of the software product are combined to form the integrated software product. A special testing environment is created to check for errors, bugs and interoperability.

3.9 Operational Mode

At this stage, the checked software is ready for use. If required, the modification stage will modify and enhance the system according to the difficulty.

3.10 Modification and Maintenance

After the system is in operation, various changes are made in order to fix bugs, to add new functionality, to port the software to new platforms, or to adapt the software to new technologies during the modification and maintenance phase of the system. Although it may seem that the development of the software is finished after its delivery, this is far from true. Even a successful software product need to be developed/modified to meet the changing needs of the clients.

3.11 Summery

The software development lifecycle (SDLC) is not only a great way to ensure the software to meet the needs of business and customers, but it is also essential in supporting the software once it's published. SDLC is a process used by software industry to design, develop and test high quality software. The SDLC aims to produce high quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates. SDLC is a framework to guide the development to make it more systematic and efficient. Using SDLC we will be able to tell how long it will take to complete the project, to test and deploy. Not only that, we'll have an easier time debugging and finding flaws in the software program or make enhancement to it. We have planed our development according to the standard SDLC.

We have gone through all the steps of SDLC and analyse as details as possible and made our development decisions.

Chapter 4: System Design

4.1 Introduction

The software system design describes the desired software features in detail, including database design (ER diagram), software design (UML is produced here), screen layouts and other documents. In system design, the software's overall structure is defined with a full data dictionary. These design elements are intended to describe the software in detail that helps to develop the software with minimal additional input.

4.2 E-R Diagram

An entity-relationship (E-R) diagram is a graphical representation of entities and their relationships to each other, typically used in computing in regard to the organization of data within databases or information systems. There are three basic elements in E-R diagram:

- ❖ Entities (tables) are the elements about which one seek information. Boxes are commonly used to represent entities.
- ❖ Attributes are the data one collect about the entities. Ovals are used to represent attributes.
- ❖ Relationships provide the structure needed to draw information from multiple entities. Diamonds are normally used to represent relationships.

Figure 4.1 shows E-R diagram of e-tendering system.

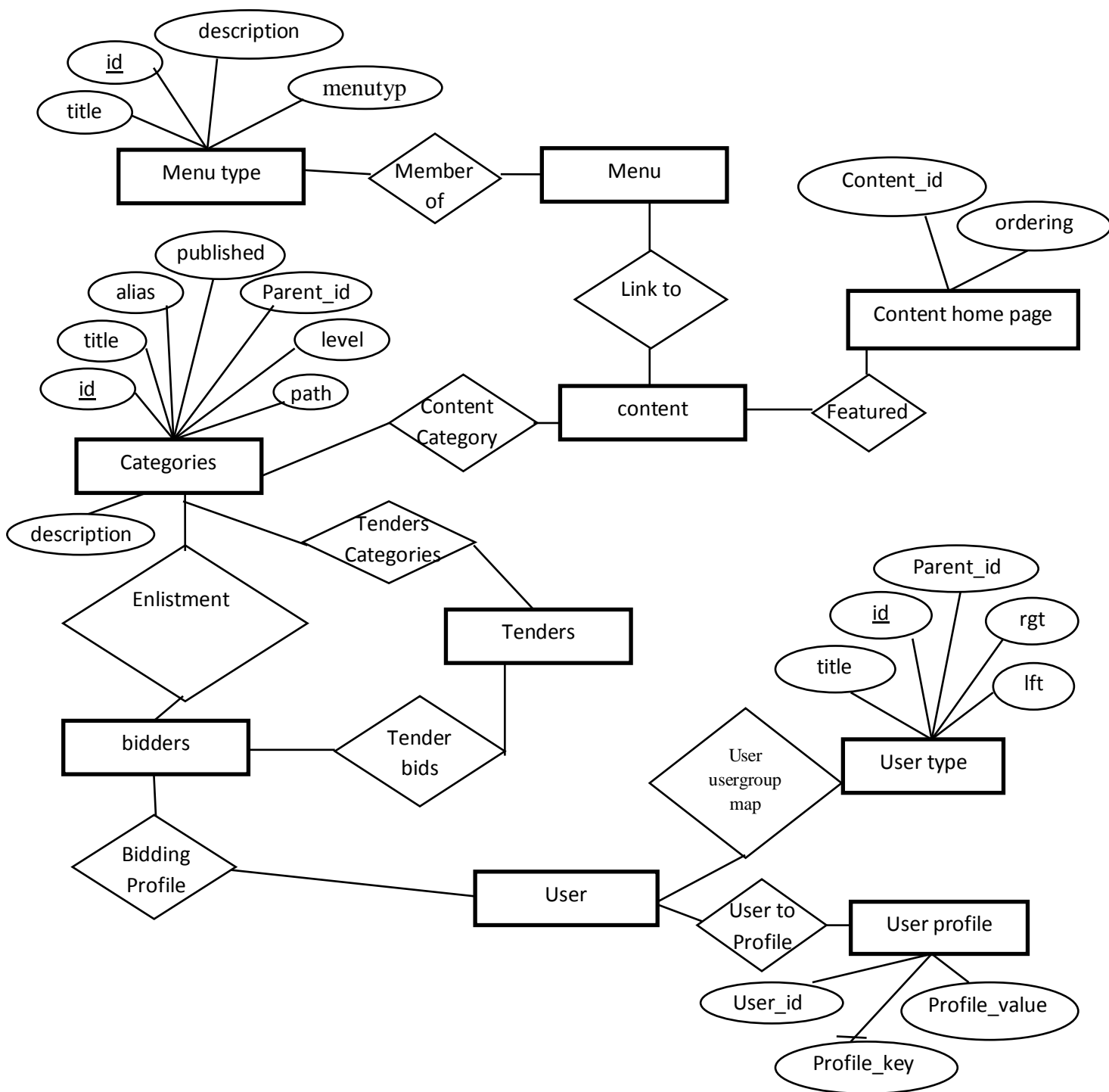


Figure 4.1: E-R Diagram

4.3 Entity diagram

4.3.1 Attributes of Entity Bidders

Figure 4.2 shows the entire Attributes of Entity bidders. Admin users can add bidders information in this table and after successful registration a registered user can also create his bidder profile.

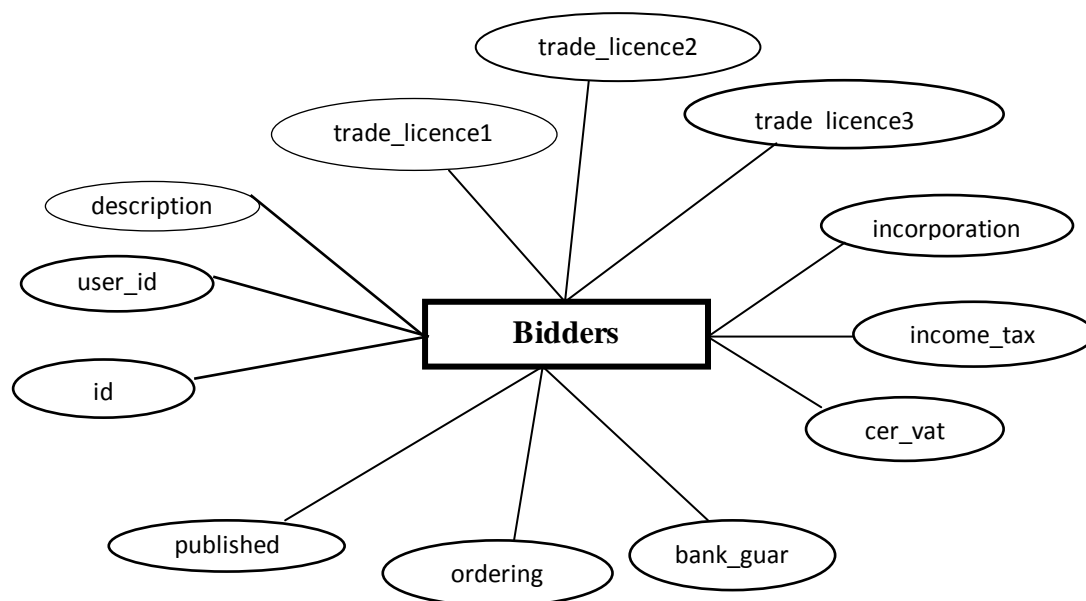


Figure 4.2: Attributes of Entity Bidders.

4.3.2 Attributes of Entity Content

Figure 4.3 shows the entire Attributes of Entity Contents. This table will help to show contents in static pages. Admin users can add/edit/delete information in this table.

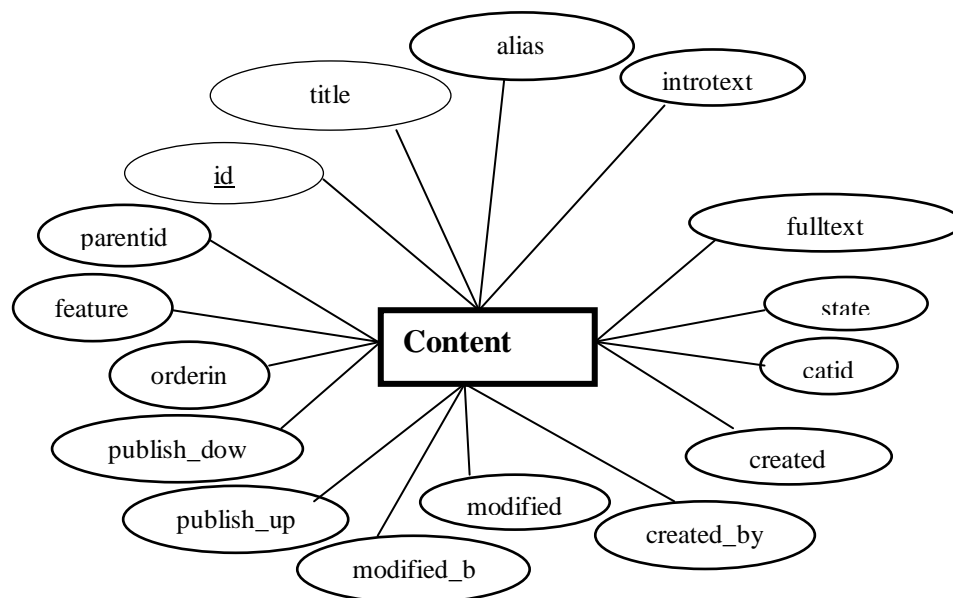


Figure 4.3: Attributes of Entity Content.

4.3.3 Attributes of Entity Menu

Figure 4.4 shows the Attributes of Entity Menu. Admin users can add Menu in this table. Up on this menu the navigation of the site will work.

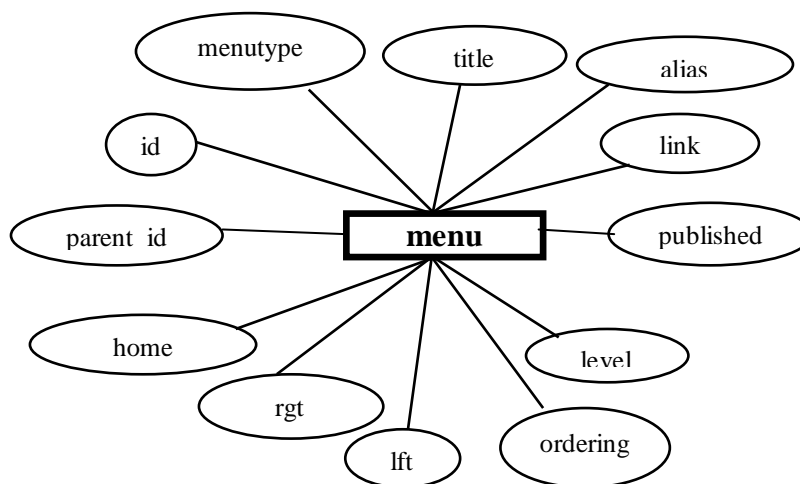


Figure 4.4: Attributes of Entity Menu.

4.3.4 Attributes of Entity Tenders

Figure 4.5 shows the Attributes of Entity tender information. Admin users can add tenders and the registered users who has a valid bidder profile can see this tenders.

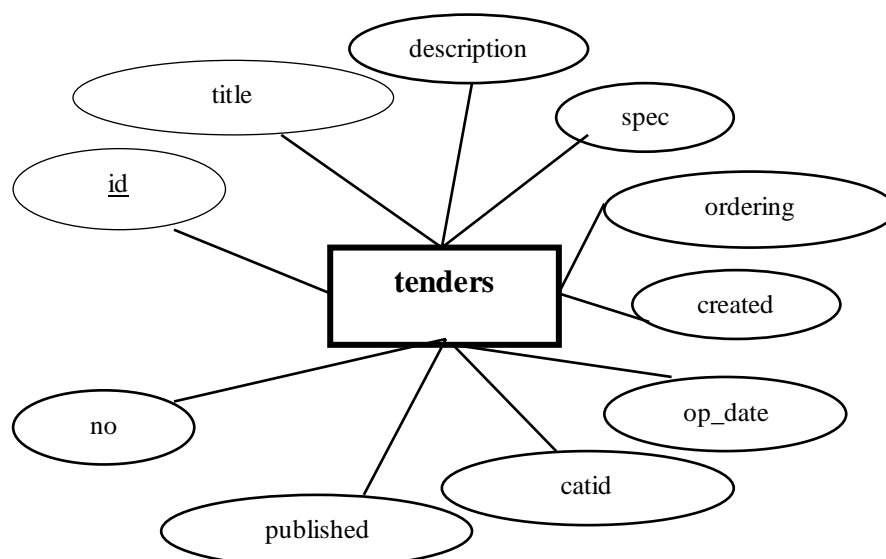


Figure 4.5: Attributes of Entity Tender.

4.3.5 Attributes of Entity Tender Bids

Figure 4.6 shows the Attributes of Entity Tender Bids. Registered bidders will apply in tender with their financial offers and the information will stored in this table. When admin users open/evaluate the tenders and award the tender they will also access this table.

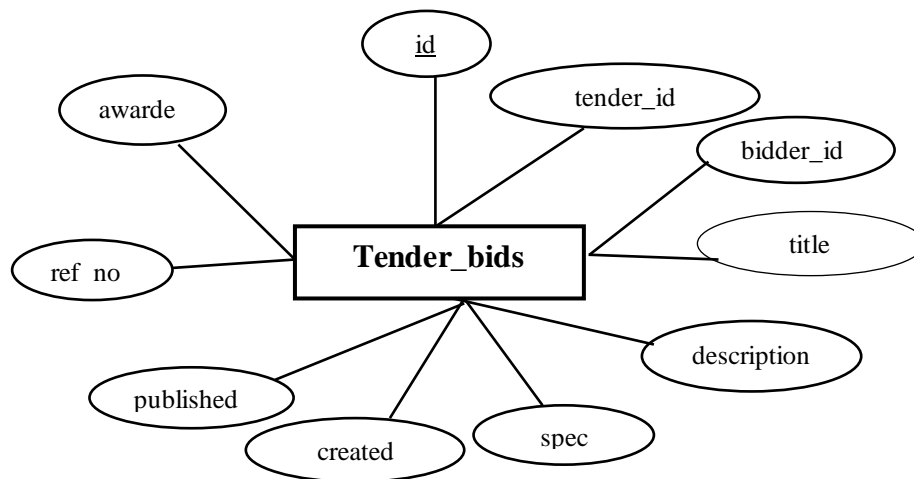


Figure 4.6: Attributes of Entity tender bids.

4.3.6 Attributes of Entity User

Figure 4.7 shows the Attributes of Entity user. All type of users are manage from this single table.

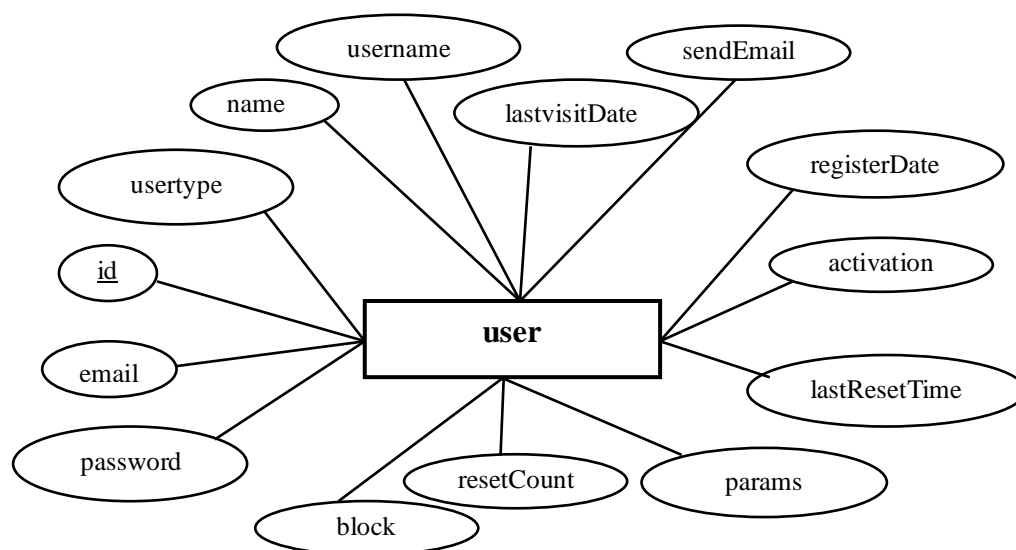


Figure 4.7: Attributes of Entity User.

4.4 Database Tables

A database is a collection of information, organized in such a way that a computer program can quickly select desired pieces of data. Databases are designed to offer an organized mechanism for storing, managing and retrieving information. This includes detailed specification of data elements, data types, indexing options and other parameters residing in the DBMS data dictionary. Many models and languages are used for design of the database. To design the database the Entity-Relationship (ER) Diagram is used.

1. **Bidders Table:** The name of this entity set is bidders. This table contents a bidder's profile information like- Trade-license, TIN etc.
2. **Categories:** The name of this entity set is categories. This entity will show the categories of bidder. Id, title, alias, description, published, parent_id, lft, rgt, level, path, extension are the attributes of this entity set.
3. **Bidders Category:** The name of this entity set is bidder_categories. id, user_id, catid and published are the attributes of this entity set.
4. **Content:** The name of this entity set is content. This table is using for displaying the html pages of the site.
5. **Content in Home page:** The name of this entity set is content_frontpage. this table consists of content_id, ordering.
6. **Menu:** The name of this entity set is menu. This table is displaying the menu for the web site.
7. **Menu Types:** The name of this entity set is menu_types. id, menutype, title and description are the attributes of this entity set.
8. **Tenders:** The name of this entity set is tenders. This entity is used for keeping all tender information.
9. **Tenders Bids:** The name of this entity set is tender_bids. This table is used for keeping record about all bids .
10. **User Type:** The name of this entity set is usergroup. Usergroup entities are consist of Id, parent_id, left, right and Title.
11. **User :** The name of this entity set is user. This table is used for keeping the information about all users of this system.

12. **User Profile information:** The name of this entity set is user_profiles. This table will content user profile details information (such as address, phone no, city, postal_code etc.). Entities of this tables are: user_id, profile_key and profile_value
13. **User to Useertype map:** The name of this entity set is user_usergroup_map. Entities of this table consist of user_id and , group_id etc.

4.5 Data Dictionary

Data Dictionary describes the table format which is used in database design. The following tables are used in database design.

Table 4.1: Bidders Information

Fields	Domains	Constraints	Description
<u>Id</u>	int(10)	Primary key	Auto increment
User_id	int(10)	Foreign Key	Id of user table*
Description	Text	Not null	Profile description of bidder
trade_licence1	varchar(255)	Not null	Trade license page 1
trade_licence1	varchar(255)	Not null	Trade license page 2
trade_licence1	varchar(255)	Not null	Trade license page 3
incorporation_cer	varchar(255)	Not null	Incorporation Certificate
income_tax	varchar(255)	Not null	Income tax Certificate
cer_vat	varchar(255)	Not null	Vat Certificate
bank_guaranty	varchar(255)	Not null	Latest Bank Guaranty Certificate
Ordering	int(11)	Not null	Ordering
published	int(4)	Not null	Status

*User_id will be the primary key of User table.

Table 4.2: Categories

Fields	Domains	Constraints	Description
<u>id</u>	int(10)	Primary key	Auto Increment
title	varchar(255)	Not null	Category title
alias	varchar(255)	not null	Category alias.
description	mediumtext	not null	Category description.
published	tinyint(1)	not null	Status

parent_id	int(10)	not null	Id of parent, default -0*
left	int(10)	not null	Id of left node, default -0*
right	int(10)	not null	Id of right node, default -0*
level	int(10)	not null	Level of category, default-0 *
path	varchar(255)	not null	Path from root to category

*Parent_id will be a category id, if parent_id is selected left, right, level and path will be automatically updated.

Table 4.3: Bidders Category

Fields	Domains	Constraints	Description
<u>Id</u>	int(10)	Primary key	Auto increment
User_id	Int(11)	Foreign Key	Id of user table*
Catid	Int(11)	Foreign Key	Id of Categories table*
published	tinyint(4)	Not null	Default-0

*Foreign keys are taken from “User” table.

**Foreign key is taken from “Categories” table.

Table 4.4: Content

Fields	Domains	Constraints	Description
<u>id</u>	int(10)	Primary key	Auto Increment
title	varchar(255)	not null	Name of Content
alias	varchar(255)	not null	Alias of Content
introtxt	mediumtext	not null	Intro text of content
fulltext	mediumtext	not null	Full text of content
state	tinyint(3)	not null	default '0'
catid	Int(10)	Foreign Key	Id of Categories table*
created	datetime	not null	default '0000-00-00 00:00:00'
created_by	Int(10)	Foreign Key	Id of user table*
modified	datetime	not null	default '0000-00-00 00:00:00'
modified_by	Int(10)	Foreign Key	Id of user table*
publish_up	datetime	not null	default '0000-00-00 00:00:00'
publish_down	datetime	not null	default '0000-00-00 00:00:00'
parentid	Int(10)	Not null	Id of this table*

ordering	Int(10)	Not null	Ordering
featured	tinyint(3)	Not null	Default '0' ; set a value if it is featured*

*Foreign keys are taken from “User” table.

**Foreign key is taken from “Categories” table.

***Parent_id will be a id of this table.

****Value of featured is default 0, it will be 1 when the content is featured.

Table 4.5: Content in Home page

Fields	Domains	Constraints	Description
content_id	int(11)	Foreign Key	Id of content table*
ordering	int(11)	Not null	Ordering

*Foreign keys are taken from “content” table.

Table 4.6: Menu

Fields	Domains	Constraints	Description
<u>id</u>	int(11)	Primary key	Auto Increment
menutype	varchar(24)	Foreign Key	Id of menu_types table*
title	varchar(255)	Not null	Title of menu
alias	varchar(255)	Not null	Alias of menu
link	varchar(1024)	Not null	The actually link the menu item refers to.
published	tinyint(4)	Not null	The published state of the menu link
parent_id	int(10)	Not null	Default ‘0’
level	Int(10)	Not null	Default ‘0’
ordering	int(10)	Not null	The relative ordering of the menu item in the tree.
lft	Int(10)	Not null	Left node of current menu
rgt	Int(10)	Not null	Right node of current menu
home	tinyint(3)	Not null	Indicates if this menu item is the home or default page.

*Foreign keys are taken from “menu_types” table.

Table 4.7: Menu Types

Fields	Domains	Constraints	Description
id	int(10)	Primary key	auto increment
menutype	varchar(24)	Not null	Menu type
title	varchar(48)	Not null	Name of menu type
description	varchar(255)	Not null	Description of menu type

Table 4.8: Tender

Fields	Domains	Constraints	Description
id	int(10)	Primary key	Auto increment
title	varchar(222)	Not null	Title of tender
description	text	Not null	Description of tender
spec	text	Not null	Specification of the tender.
ordering	Int(11)	Not null	Order in the table
created	datetime	Not null	default '0000-00-00 00:00:00'
op_date	datetime	Not null	default '0000-00-00 00:00:00'
catid	Int(10)	Foreign Key	Id of category table*
published	Int(4)	Not null	Status of the tender
no	varchar(255)	Not null	Tender no

*Foreign keys are taken from “Category” table.

Table 4.9: Tender bids

Fields	Domains	Constraints	Description
id	int(11)	Primary key	Auto increment
tender_id	int(11)	Foreign Key	tender Id*
Bidder_id	int(11)	Foreign Key	Bidder id*
title	varchar(255)	Not null	Title of bid.
description	Text	Not null	Description about the bid
spec	Text	Not null	Specification about bid
created	datetime	Not null	default '0000-00-00 00:00:00'. Submission date
published	Int(4)	Not null	Status of the bid
ref_no	Varchar(255)	Not null	Ref. no of the bid

awarded	Int(4)	Not null	Value will be 1 if the bid is approved by the TEC comity
----------------	---------------	-----------------	---

*Foreign keys are taken from “Tender table” table.

*Foreign keys are taken from “Bidder table” table.

Table 4.10: User Type

Fields	Domains	Constraints	Description
id	int(10)	Primary key	Auto increment
parent_id	int(10)	Not null	Default 0
lft	Int(11)	Not null	Left node of this node in the tree
rgt	Int(11)	Not null	Right node of this node in the tree
title	varchar(100)	Not null	Title of user type

Table 4.11: User

Fields	Domains	Constraints	Description
id	int(10)	Primary key	Auto increment
name	varchar(255)	Not null	Full name
username	varchar(150)	Not null	User name
email	varchar(100)	Not null	e-mail address of user
password	varchar(100)	Not null	Password of user
Usertype	Varchar(25)		User type
block	Int(4)	Not null	Status of user
sendEmail	int(4)	Not null	default '0'
registerDate	datetime	Not null	Registration date
lastvisitDate	datetime	Not null	Last visited date
activation	varchar(100)	Not null	Activation
params	text	Not null	Paramitter
lastResetTime	datetime	Not null	Date of last password reset
resetCount	int(11)	Not null	Count of password resets since lastResetTime

Table 4.12: User Profile Information

Fields	Domains	Constraints	Description
---------------	----------------	--------------------	--------------------

user_id	int(10)	Foreign Key	user Id*
profile_key	varchar(100)	Not null	Profile Key
profile_value	varchar(255)	Not null	Value of the profile key
ordering	int(10)	Not null	ordering

*Foreign keys are taken from “user” table.

Table 4.13: User To Usertype Map

Fields	Domains	Constraints	Description
user_id	int(10)	Foreign Key	user Id*
group_id	int(10)	Foreign Key	User type id*

*Foreign keys are taken from “user” table.

*Foreign keys are taken from “usertype” table.

4.6 Database Schema Diagram

Figure 4.8 shows the schema diagram of e-tendering system.

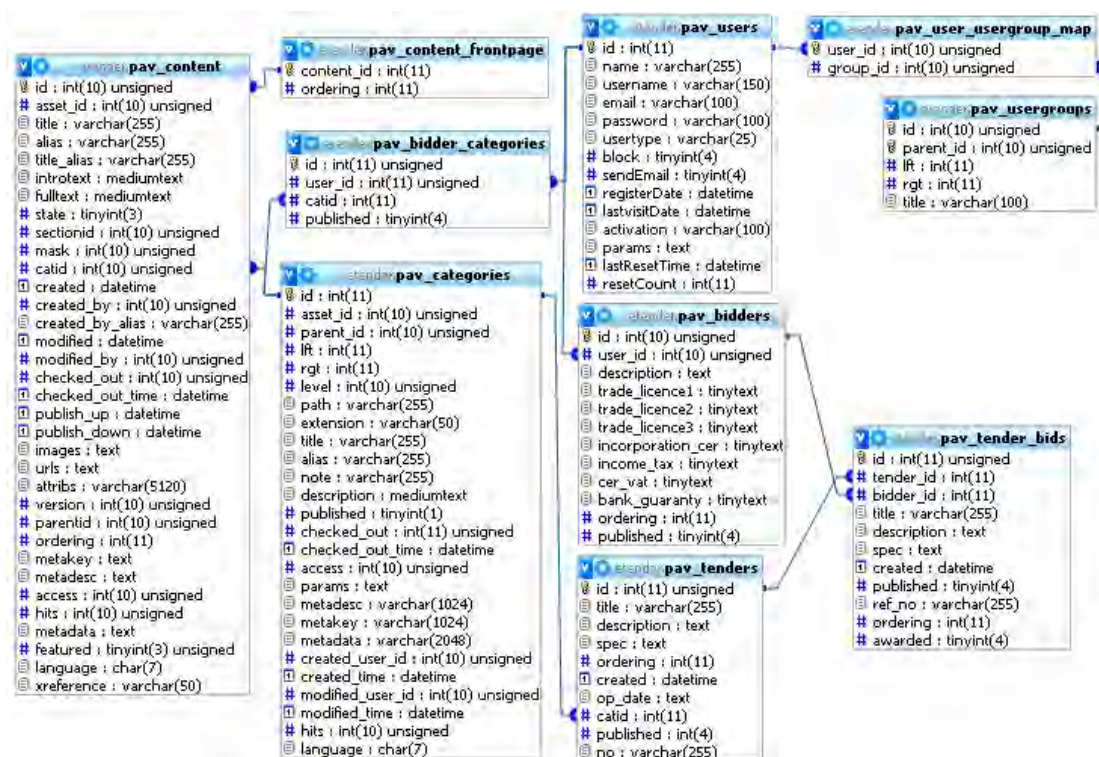


Figure 4.8: Schema Diagram

4.7 Software Design

Software design is a process of problem-solving and planning for a software solution. Model-View and Controller analysis and design (MVC) are implemented during the software design. Each controller controls the flow of data and control via model to views. Views are basically controls the graphical user interface which works via the controller and models are handling the full database actions. Data are passing in view through models. There are a number of different notations for representing these flows, such as the Unified Modeling Language (UML). Different diagrams are used to help visualizing the whole development process.

4.8 UML Diagram

The Unified Modeling Language (UML) is graphical notation system for representation the analysis and design. UML is the industry-standard language for the specification, visualization, construction, and documentation of the components of software systems. UML helps to simplify the process of software design, making a model for construction with a number of different views. One of the great merits of UML is the way it helps open up the development process which is called use cases. These serve to identify principal roles (actors) in the system, boundaries, actions, and so on. UML Use Case Diagrams can be used to describe the functions of a system in a horizontal way.

4.8.1 Use Case Diagram

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. It is a set of scenarios that describes an interaction between a user and a system. The two main components of a use case diagram are use cases and actors. It can be shown by the Figure 4.9.

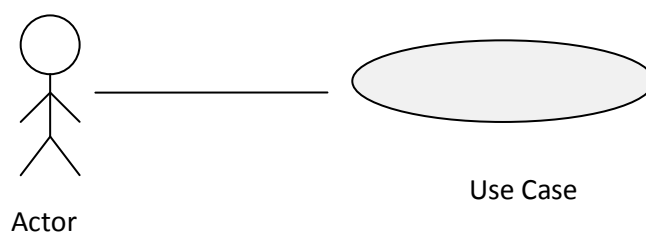


Figure 4.9: Actor and Use Case.

An actor represents a person, organization, or external system that will interact with this system. The symbols of actors are drawn as stick figures. A use case is an external view of the system that represents some actions the user might perform in order to complete a task and is drawn as a horizontal ellipse. Lines are used to represent the relationships between these elements.

4.8.2 Use Case Diagram of User (Bidder)

Figure 4.10 shows the use case diagram for bidder.

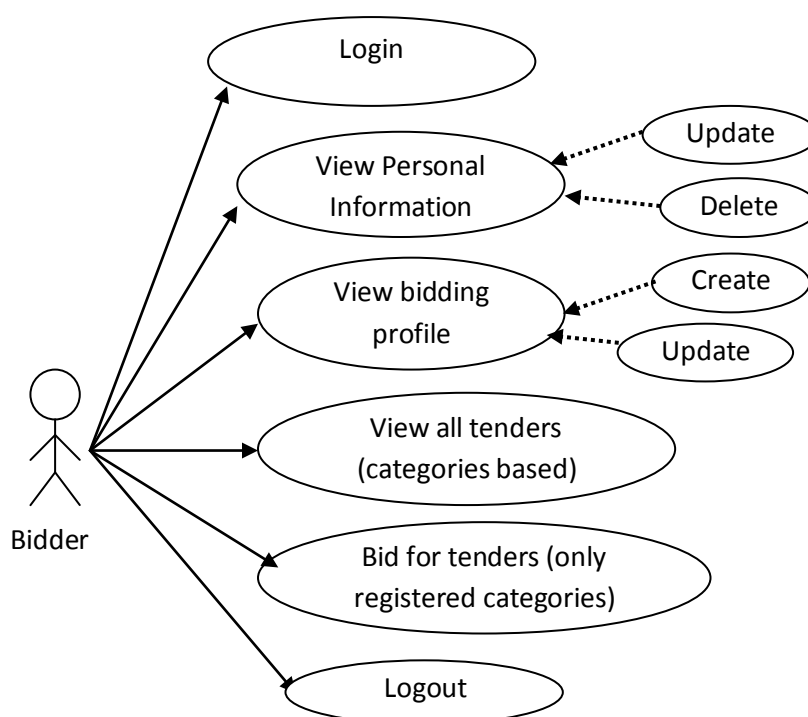


Figure 4.10: Use Case Diagram of Bidder.

4.8.3 Use Case Diagram of Administrators

Figure 4.11 shows the use case diagram of administrators. Admin can log in his/her account and can insert, update and delete the required information for the system. He/she can also logout from the account.

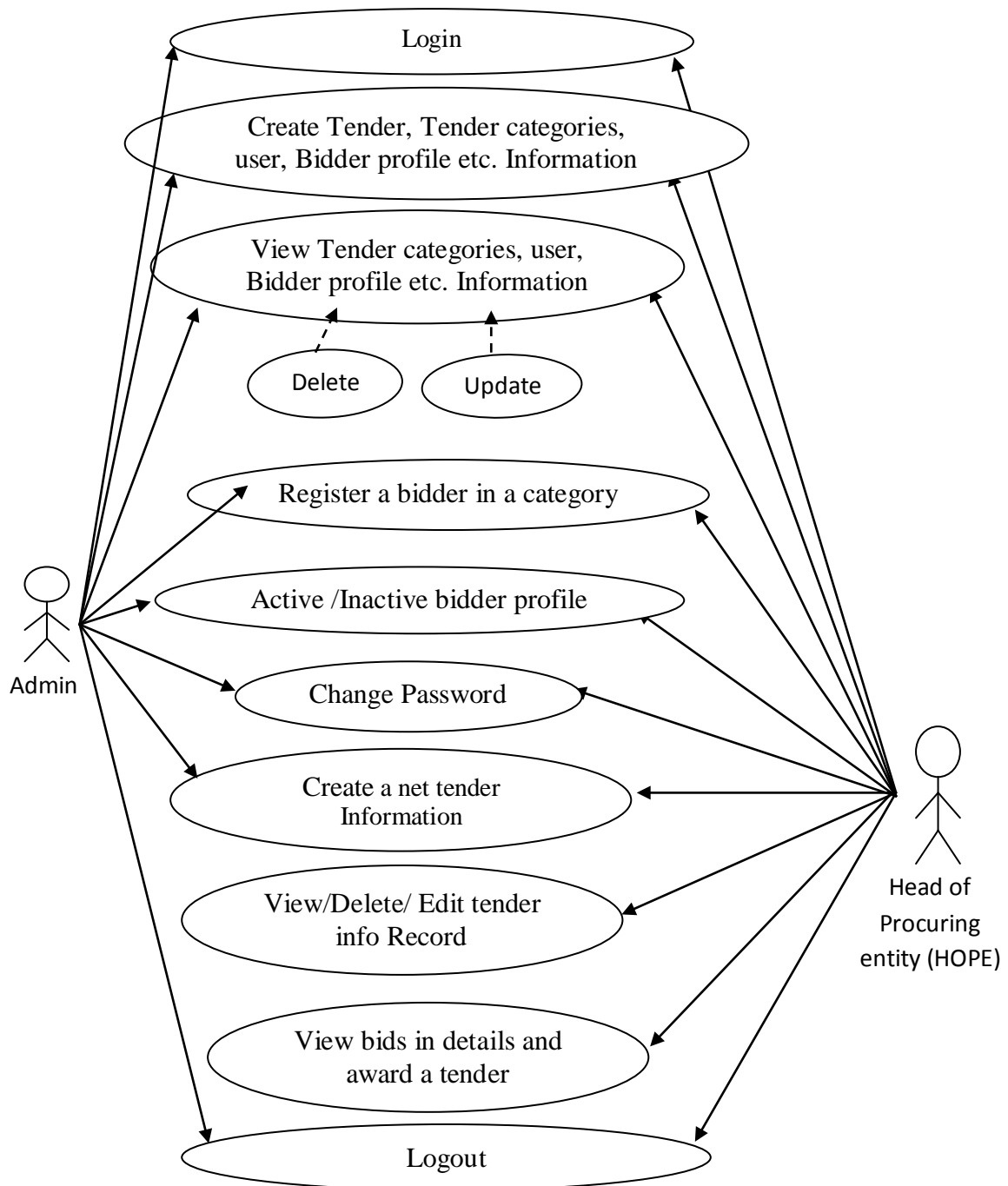


Figure 4.11: Use Case Diagram of Administrators.

4.9 Activity Diagram

An activity diagram illustrates the dynamic nature of a system by modeling the flow of control from activity to activity. An activity represents an operation of some classes in the system that results in a change in the state of the system. Typically, activity diagrams are used to model workflow or business processes and internal operation. Activity diagrams can show activities that are conditional or parallel.

4.9.1 Activity Diagram of Tendering

Figure 4.12 shows the activity diagram of tendering. In this case, bidders apply for tender, administrator (HOPE) can check all bids and his/her ability to fulfill demand, then choose the appropriate bidder and award the tender.

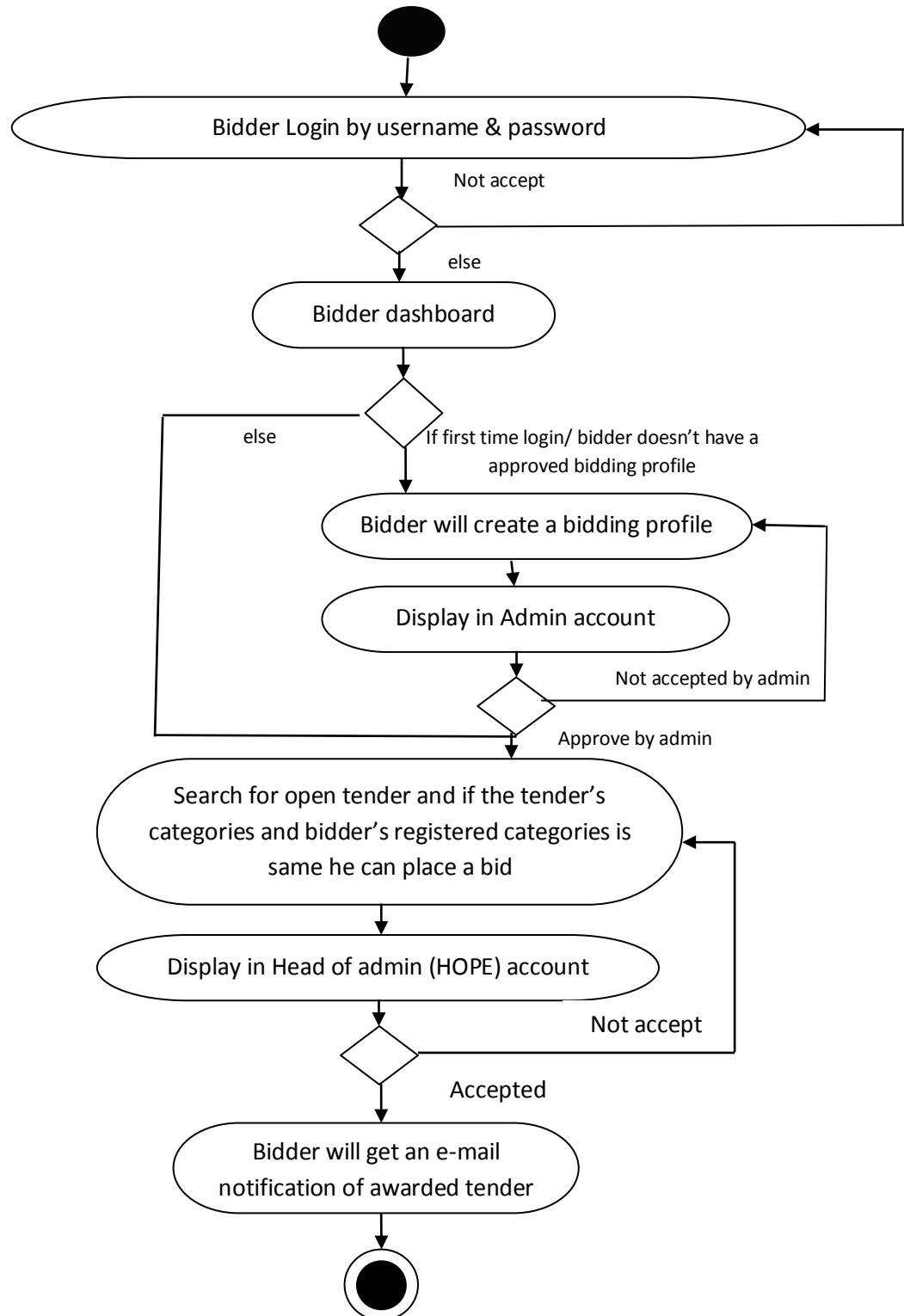


Figure 4.12: Activity Diagram of Tendering

4.10 Summery

The design of a database is crucial so that the database can function accurately or precisely. A good design of a database facilitates data managements and valuable information generator. A poor designed database tends to have errors, data redundancy, inaccuracy, can also be time consuming etc. proper or good design must be taken into consideration so to avoid redundancy, inaccuracy , errors etc as users would like to have a more efficient and reliable database that performs to the best or as expected.

For this project we create a database which contents 13 tables. All tables are well designed and redundant free. We use strong entity set for most of the tables. Developing a database without an ERD is as building a house without a building plan. It might be doable because you think that simply laying a brick one over another is enough to build something.

In this project we build a E-R diagram which contents details entity, entity set, relationship between entities and key constraints so that the database become more easier and meaningful to everybody.

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the UML, activity diagrams are intended to model both computational and organizational processes (i.e. workflows). Activity diagrams show the overall flow of control.

Chapter 5: Results and Discussions

5.1 Introduction

The developed E-Tendering System has different essential features. Screen shot of some of the main features are explained below.

5.2 Home Page

The home page is very simple. It contains sign-in/Sign-up link and the menu of some static pages. From this page a bidder/user can find Sign-in/Sign-up link, contact information and software related information. Figure 5.1 shows the Home page.

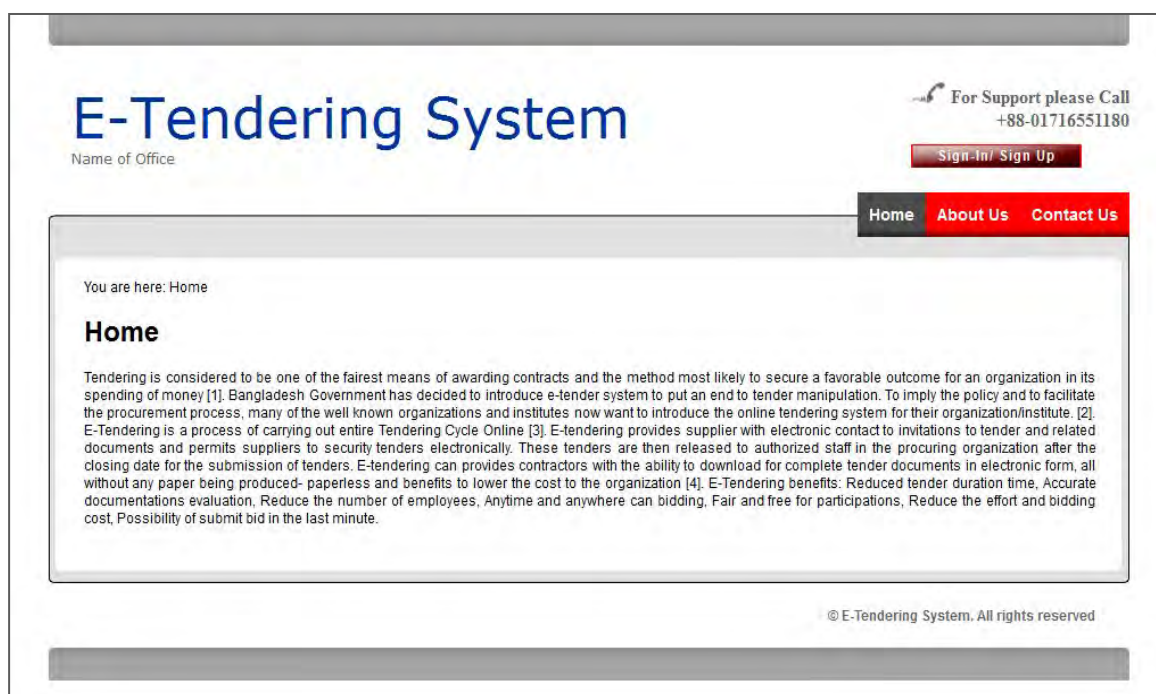


Figure 5.1: Home Page.

5.3 Sign Up Page

Users (Bidders) can fill up the necessary information in signup page and may create a new user. Username must be unique. After clicking the submit button an e-mail will be sent to the given email address with an activation link. By clicking that link a user have to verify the signup process. After successful registration, user can view his/her given information. He will be able to change his information. Figure 5.2 shows the sign up page.

E-Tendering System
Name of Office

For Support please Call
+88-01716551180

Sign-In/ Sign Up

Home About Us Contact Us

You are here: Home
User Registration

* Required field

Name: *

Username: *

Password: *

Confirm Password: *

Email Address: *

Confirm email Address: *

Figure 5.2: Sign Up Page (User).

5.4 Sign In Page

Successfully registered Users (Bidders) will be able to login from this page. A user (Bidder) will be able to get his username and password if he forget/lost his/here username and password. Figure 5.3 shows the sign in page.

E-Tendering System
Name of Office

For Support please Call
+88-01716551180

Sign-In/ Sign Up

Home About Us Contact Us

You are here: Home

User Name

Password

Remember me

Log in

- [Forgot your password?](#)
- [Forgot your username?](#)
- [Don't have an account?](#)

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Figure 5.3: Sign In Page (User).

5.5 User (Bidder's) Home Page

After signing in, users (Bidder) will automatically move to this page. This page contains three menus. First one (My Profile) is create/update/manage the bidding profile of the bidder. Second one (Search New Tender) is searching and applying for new tenders. The last one (My Bids) will show the status of all bids that a bidder submitted. Figure 5.4 shows the user home page.

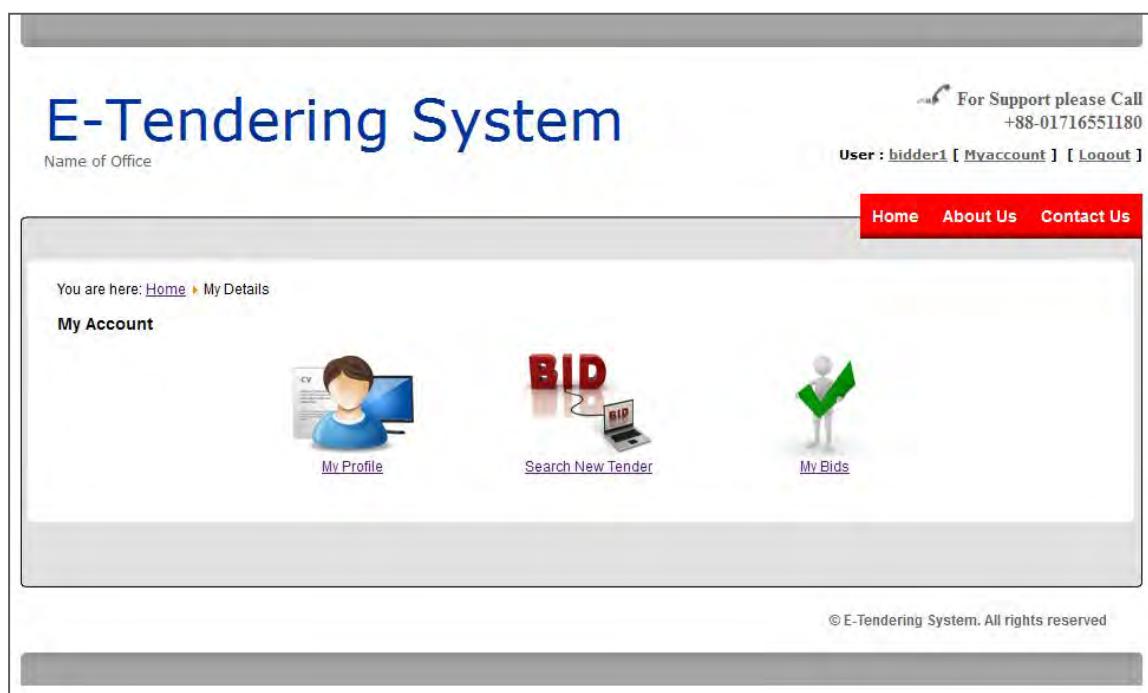


Figure 5.4: Index of User (Bidder).

5.6 Bidder's Profile Page

Users (Bidders) will manage their bidding profile from this page. Every bidder must have an admin approved bidding profile to make a bid. After first time login a Bidder have to create his profile by posting his necessary information. Figure 5.5.1 shows the bidder's profile creation form.

Add New Bidders

Bidder Profile Id 0

Company Description

B *I* U ABC Styles Paragraph

Path: p
[Toggle editor](#)

Upload Trade Licence Page 1 (file size should be within 200KB)

Upload Trade Licence Page 2 (file size should be within 200KB)

Upload Trade Licence Page 3 (file size should be within 200KB)

Upload Incorporation Certificate (file size should be within 200KB)

Upload Income Tax (Latest) Certificate (file size should be within 200KB)

Upload vat (Latest) Certificate (file size should be within 200KB)

Upload Bank Guaranty Certificate (file size should be within 200KB)

Figure 5.5.1: New Profile Creation Form.

After sending the Profile Creation request administrator must approve the profile. After administrator's approval a bidder can change his profile if needed. Figure 5.5.2 shows the edit profile form.

Edit Bidder's Profile

Bidder Profile Id 98

Company Description

B *I* U ABC Styles Paragraph

Path: p > span
[Toggle editor](#)

Upload Trade Licence Page 1 (file size should be within 200KB)

Figure 5.5.2: Edit Profile Form.

5.7 Search New Tender Page

Users (Bidders) will be able to search tenders from this page. This page has filtering options. By Default this page will show all open/activated tenders, but if a user wants to search tenders of a particular category he have to select the category from the list. Bidders will also able to view the old/archived tenders by changing the published option. Figure 5.6 shows the new tender page.

The screenshot shows the 'E-Tendering System' interface. At the top right, there is a support contact number: 'For Support please Call +88-01716551180'. The user is logged in as 'bidder1' with options for 'Myaccount' and 'Logout'. A red navigation bar contains 'Home', 'About Us', and 'Contact Us'. Below this, a breadcrumb trail reads 'You are here: Home > My Details > New Bid'. A search filter bar includes 'Select Category : - Select Category -' and 'Published'. The main content area lists four tenders:

Tender Title	Ref	remaining Dayes	Bid Now	Opening Date& Time
supply for micr	RFQ-12-1	13	Bid Now	2013:09:18 12:00
supply for computer	RFQ-12-1	15	Bid Now	2013:09:20 12:15
Supply for Server	server/rfq-01/2013	20	Bid Now	2013:09:25 12:15
Supply for Workstation	workstation/01/2013	56	Bid Now	2013:10:31 02:30

Figure 5.6: New Tender page.

5.8 Tender Details Page

Users (Bidders) will be able to view the tender details page by clicking on any individual tender. If the bidder is registered for that tender category he will be able to bid on this tender by clicking the top bid now button. A bidder can also download the tender details document in pdf format by clicking download pdf button. Figure 5.7.1 shows the tender Details page and Figure 5.7.2 shows download pdf options.

You are here: Home

[Bid Now](#) [Download Pdf](#) [Close](#)

Reff: RFQ-12-1 Date: 2013-02-05 10:32:12

কোটেশন/দরপত্র আহ্বানের বিজ্ঞপ্তি

বাংলাদেশের অভ্যন্তরে অবস্থিত জনতা ব্যাংক লিমিটেড, বিতরণীয় কার্যালয়, ঢাকা-উত্তর এর আওতাধীন কাওরান বাজার কর্পোঃ শাখার জন্য ১টি Canon CR-50 MICR Scanning Machine সরবরাহ ও সংস্থাপনের লক্ষ্যে সংশ্লিষ্ট বিষয়ে অভিজ্ঞ প্রতিষ্ঠানসমূহের নিকট হতে কোটেশন/দরপত্র আহ্বান করা যাচ্ছে।

কোটেশন/দরপত্রের শর্তাবলীঃ

- আম্বহী দরদাতা প্রতিষ্ঠানসমূহকে MICR Machine এর স্পেসিফিকেশন (আন্তর্জাতিক মানের ব্র্যান্ড) এর একক মূল্য, প্রতিটির বাৎসরিক মেরামত ও রক্ষণাবেক্ষণ ব্যয় উল্লেখপূর্বক কোটেশন/দরপত্রদাখিল করতে হবে।
- অনিবার্য কারণবশতঃ নির্ধারিত সময় ও তারিখে দরপত্র গ্রহন ও খোলা সম্ভব না হলে পরবর্তী কমদিবসে নির্ধারিত স্থানে ও সময়ে কোটেশন গ্রহন ও খোলা হবে। এ বিষয়ে আলাদা কোন নোটিশ প্রদান করা হবে না।
- কোটেশন সংক্রান্ত কোন তথ্যাবলী প্রয়োজনে নিম্নস্বাক্ষরকারীর দপ্তর হতে জানা যাবে।
- কোটেশনের কার্যক্রম "পাবলিক প্রকিউরমেন্ট বিধিমালা, ২০০৮ এর বিধান অনুযায়ী পরিচালিত হবে।
- গলা সীলমোহরকৃত কোটেশন খামের উপরে " RFQ NO: 14(MICR) ", প্রপকের ঠিকানা ও Do Not Open Before "24/01/2013 " লিখে নিম্নলিখিত কাগজ-পত্র অন্তর্ভুক্ত করে (১. Quotation Proposal Letter ২.বৈধ স্টেম্প লাইসেন্স ৩. আয়কর সনাক্তকরণ নম্বর ৪. ভ্যাট নিবন্ধন নম্বর এবং ৫. ব্যাংক সলভেন্সী সার্টিফিকেট) আসামী ২৪/০১/২০১৩ তারিখ বেলা ১২:০০ ঘটিকার মধ্যে এই কার্যালয়ে বসিত দরপত্র বাল্লে ফেলাতে হবে এবং একই দিনে বেলা ১২:১৫ ঘটিকার সময়

Figure 5.7.1: Tender details page.

E-Tendering System

Name of Office

You are here: Home

Reff: RFQ-12-1

[Terms and Conditions for Supply of Goods](#)

For Support please +88-017165...

User : bidder1 [Myaccount] [Log Out]

[Home](#) [About Us](#) [Contact Us](#)

[Bid Now](#) [Download Pdf](#) [Close](#)

Date: 2013-02-05 10:32:12

Opening RFQ-12-1.pdf

You have chosen to open:

RFQ-12-1.pdf
which is: Adobe Acrobat Document (25.9 kB)
from: http://localhost.

What should Firefox do with this file?

Open with Adobe Reader (default)

Save File

Do this automatically for files like this from now on.

[OK](#) [Cancel](#)

Figure 5.7.2: Pdf download option for a Tender details page.

5.9 Bidding Page

Users (Bidders) will be able to submit bid from this page by providing some information. User profile will attached automatically with the bid. Figure 5.8 shows the Bidding form.

Figure 5.8: Bidding Form.

5.10 My Bids Page

Users (Bidders) will be able to see his/her submitted bids. They will also be able to view details of that bid. Figure 5.9.1 shows the My Bids page and Figure 5.9.2 shows the details page of a bid.

Bid ID	Bid Title	Tender Title	Status
3	title	fdasfsa	AWARDED
4	My Approve Bids	fdasfsa	AWARDED
5	My Approve Bids	Supply for online UPS	AWARDED
6	My Bidder Profile	Supply for online UPS	AWARDED

Figure 5.9.1: My Bids Page.


Home About Us Contact Us	
You are here: Home	
 Close	
Tender Details Documents (Supplied by Purchasure)	
Ref: online UPS/01/2013	Date: 2013-02-07 10:35:38
<u>Terms and Conditions for Supply of Goods and Payment For 10(Ten) pieces 2000VA Online UPS for our Ref No:online UPS/01/2013 Dated: 30-07-2012</u>	
<ol style="list-style-type: none"> 1. Terms and Conditions contained herein shall be binding upon both the Procuring Entity and the Supplier for the purpose of administration and management of this Contract. 2. Implementation and interpretation of these Terms and Conditions shall, in general, be under the purview of the Public Procurement Act, 2006 and the Public Procurement Rules, 2008. 3. The Supplier shall have to complete the delivery in all respects within 10(Ten) days of issuing the Purchase Order in conformity with the Terms and Conditions. 4. The Supplier shall be entitled to an extension of the Delivery Schedule if the Procuring Entity delays in receiving the Goods and related services or if Force Majuro situation occurs or for any other reasons acceptable to the Procuring Entity on justifiable grounds duly recorded. 	

Figure 5.9.2: Details of a Bid Page.

5.11 Administrator Login Page

This page is for signing in for both admin users and super admin (HOPE). Figure 5.10 shows the administrative login form.

Administration Login

Use a valid username and password to gain access to the administrator backend.

[Go to site home page.](#)



User Name

Password

Language



Figure 5.10: Admin login Form.

5.12 Administrator Home Page

This is the admin home page. There are two type of administrator user levels; Admin users, Head of procuring Entity (HOPE). A admin user will be able to manage bidders, will be able to create bidders and bidding category they will also manage bidders bidding profiles, create

new tenders on this system we will call them ‘Administrator’. On the other hand a HOPE will get not only all the privilege that an admin user has but also the bid management. HOPE will be able to view all bids that been submitted in a tender. HOPE will provide the decision of the bid (Awarded, Responsive and Not-Responsive). In this system we call this type of user as ‘Super admin’. Figure 5.11 shows the home page for both type administrators.

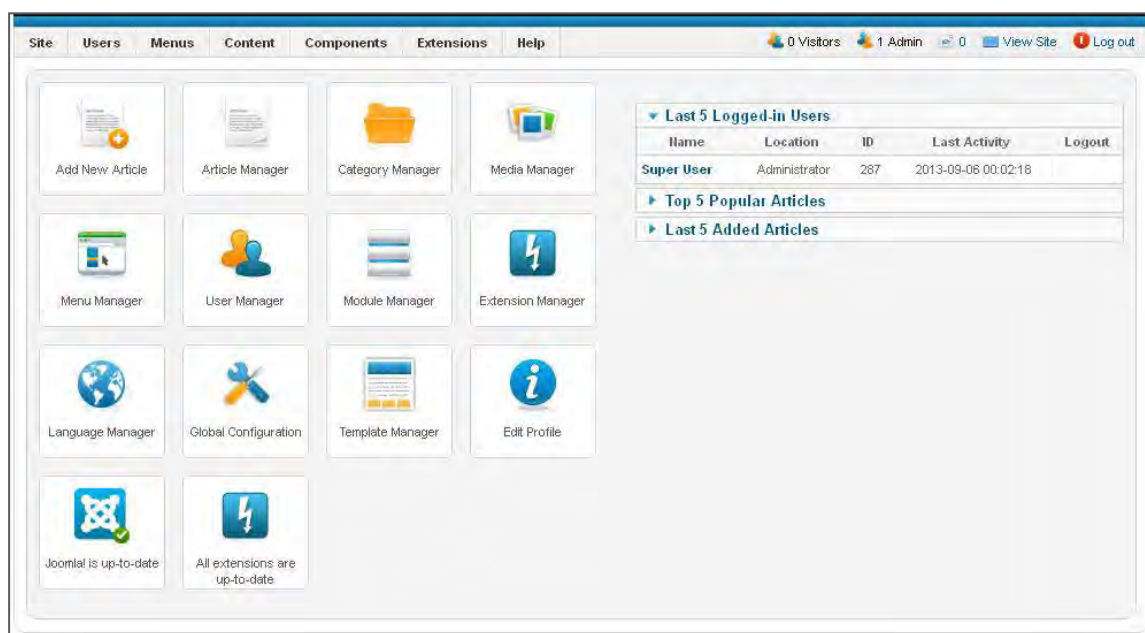


Figure 5.11: Home Page for Administrator.

5.13 User Management Pages

Any administrator can see the users of the site. All users of the website will display in the page. From this page admin can create/edit/delete users. Admin can also make the users active/inactive. If a user is inactive he will be a user of this system but he will not be able to log-in. Figure 5.12.1 shows the user management page for administrator, Figure 5.12.2 shows the new user creation form and Figure 5.12.3 shows the edit user form.

User Manager: Users

Users | User Groups | Viewing Access Levels | User Notes | Note Categories

Search Users Search Reset Filter Users by: - State - - Active - - Group - - Registration Date -

<input type="checkbox"/>	Name	User Name	Enabled	Activated	User Groups	Email	Last Visit Date	Registration Date	ID
<input type="checkbox"/>	adminuser	adminuser	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Administrator	adminuser@admin.com	2013-06-13 14:53:45	2013-06-13 14:47:27	290
<input type="checkbox"/>	bidder1	bidder1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registered	shpavel@yahoo.com	2013-09-05 20:03:02	2013-01-30 15:02:13	289
<input type="checkbox"/>	bidder2	bidder2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registered	bidder2@etender.com	2013-09-04 15:42:42	2013-09-04 14:48:34	291
<input type="checkbox"/>	bidder3	bidder3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Registered	bidder3@etender.com	2013-09-04 15:02:49	2013-09-04 14:49:14	292
<input type="checkbox"/>	pavel	pavel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Administrator	shpavel62@gmail.com	2013-06-13 12:30:03	2013-01-23 16:12:15	288
<input type="checkbox"/>	Super User	admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Super Users	s_h_pavel@yahoo.com	2013-09-06 00:02:18	2013-01-20 16:31:24	287

Figure 5.12.1: User management Page for admin.

User Manager: Add New User

Save Save & Close Save & New Cancel

Account Details

Name

Login Name

Password

Confirm Password

Email

Registration Date

Last Visit Date

Last Reset Date

Password Reset Count 0

Receive System emails No Yes

Block this User No Yes

Basic Settings

Backend Template Style

Backend Language

Frontend Language

Editor

Help Site

Time Zone

User Profile

Figure 5.12.2: Add new User Form.

Figure 5.12.3: Edit User Form.

Administrators can also create/update/delete user groups/levels of users. Figure 5.12.4 shows the user Groups management page for administrator.

Group Title	Users in group	ID
Public		1
Manager		6
Administrator	2	7
Registered	3	2
Author		3
Editor		4
Publisher		5
Super Users	1	8

Figure 5.12.4: User Group Management Page for Admin.

Administrators can also create/update/delete user access levels. Figure 5.12.5 shows the user access level management page for administrator. There are mainly three type of access level. Firstly public access level is for all who are visiting the system. They will be able to visit only

the static pages of the system. Second access level is registered this type of users are those who are registered in this system. This users will be able to visit any pages except that are not the administrator pages. In this system this users are 'Bidders'. Finally the third access level is for the administrators.

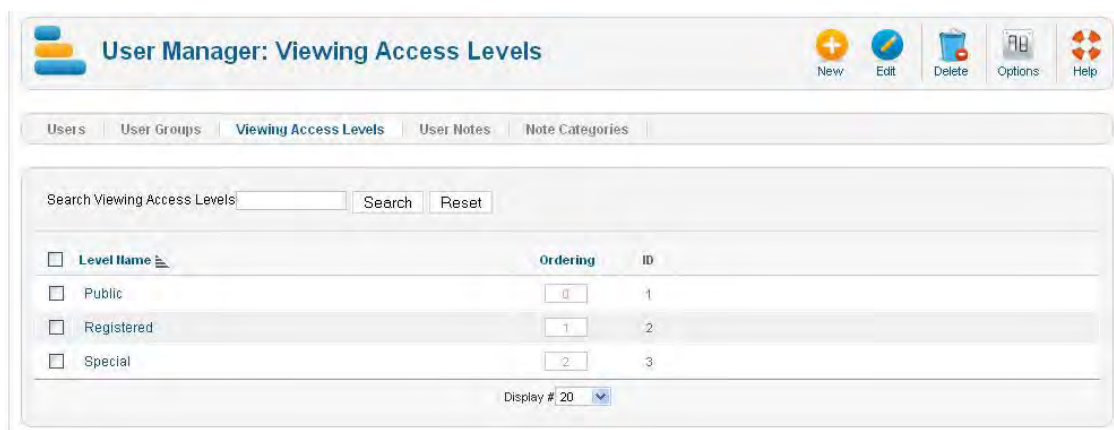


Figure 5.12.5: Access Levels of Users Page for Admin.

5.14 Bidder Management Pages

From this pages administrator will be able to manage bidder's profile, bidding categories and bidders enlistment to category. Figure 5.13.1 shows the bidding category management page; Figure 5.13.2 shows add new bidding category form and Figure 5.13.3 shows the edit bidding category form. From this page admin will be able to create/update/delete bidding categories. Admin will also able to publish/un-publish any category. These are the categories for tender.



Figure 5.13.1: Bidding Category Management Page.

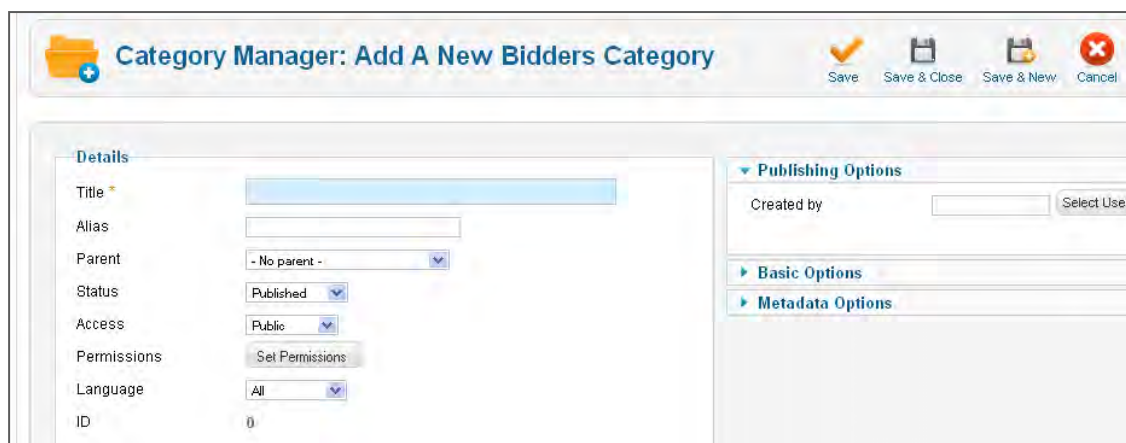


Figure 5.13.2: Add a new Bidding Category Form.



Figure 5.13.3: Edit Bidding Category Form.

Figure 5.13.4 shows the bidder's profile management page; Figure 5.13.5 shows add new bidder's profile form and Figure 5.13.6 shows edit bidder's profile form. From this page admin will be able to create/update/delete bidding profiles for any bidder. The most important part of this page is when ever any bidder create/edit his bidding profile admin must approve/publish his profile from this page otherwise the bidder will not be able to view there profile.



Figure 5.13.4: Bidders Profile Management Page.

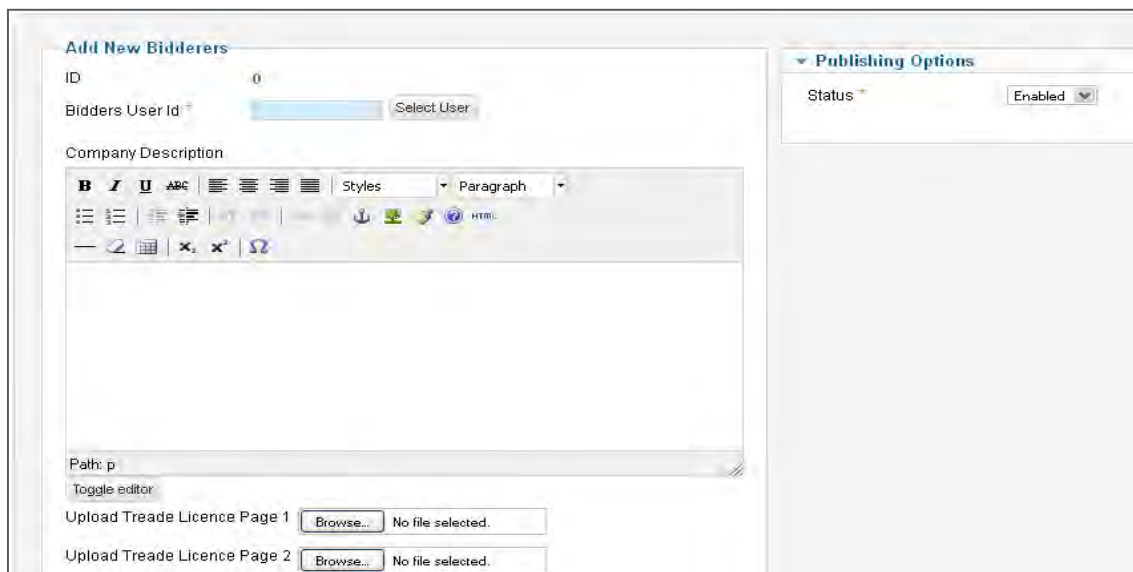


Figure 5.13.5: New Bidder's Profile Creation Form.

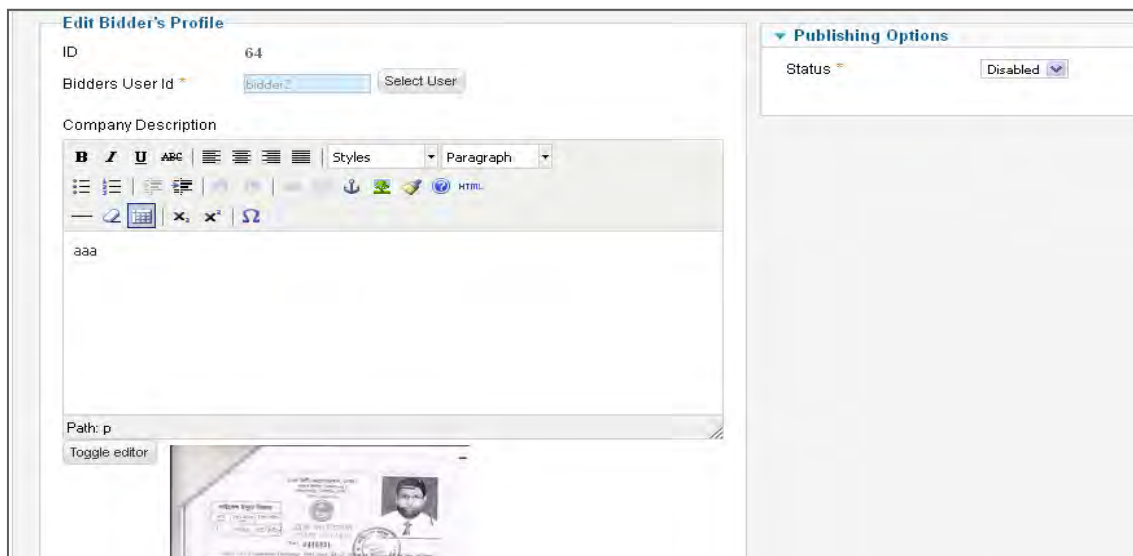


Figure 5.13.6: Edit Bidder's Profile Form.

Figure 5.13.7 shows all bidder's enlisted category page; Figure 5.13.8 shows add new bidder's enlisted category form and Figure 5.13.9 shows edit bidder's category form. From this page admin will be able to enlist or remove a bidder to any category. A bidder will only bid on those categories for which he is enlisted. The organization may take some yearly fee for enlistment.

Id	Bidder's user Name	Bidder's Categories	Status
1	bidder2	electrical	✓
2	bidder1	Request For Quotation (RFQ)	✓
3	bidder3	electronics	✓
4	bidder1	electronics	✓

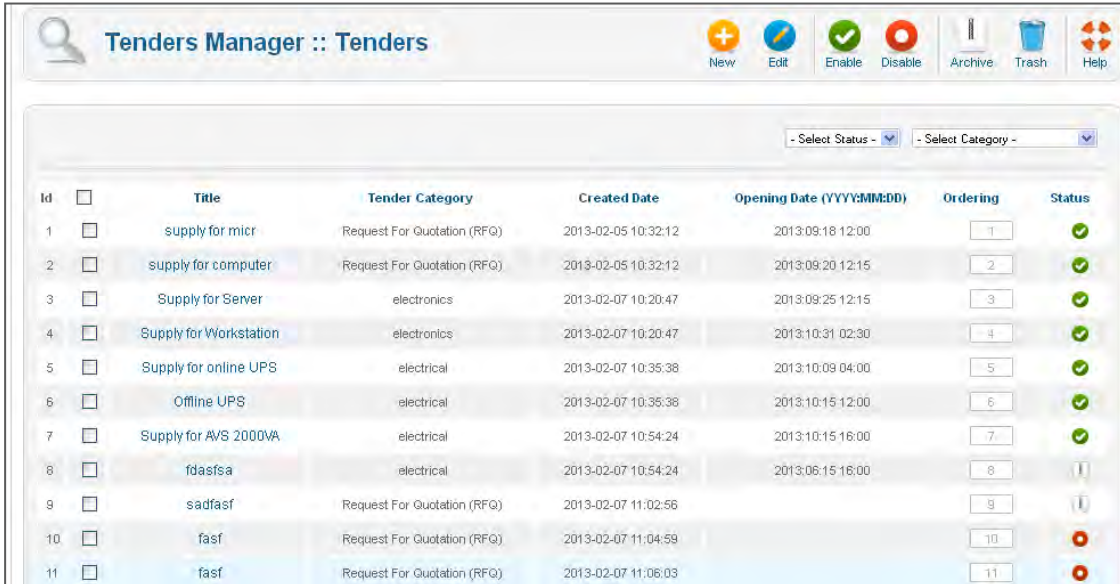
Figure 5.13.7: Bidders to Categories Page.

Figure 5.13.8: New Bidders to Categories Form.

Figure 5.13.9: Edit Bidders to Categories Form.

5.15 Tenders Management Pages

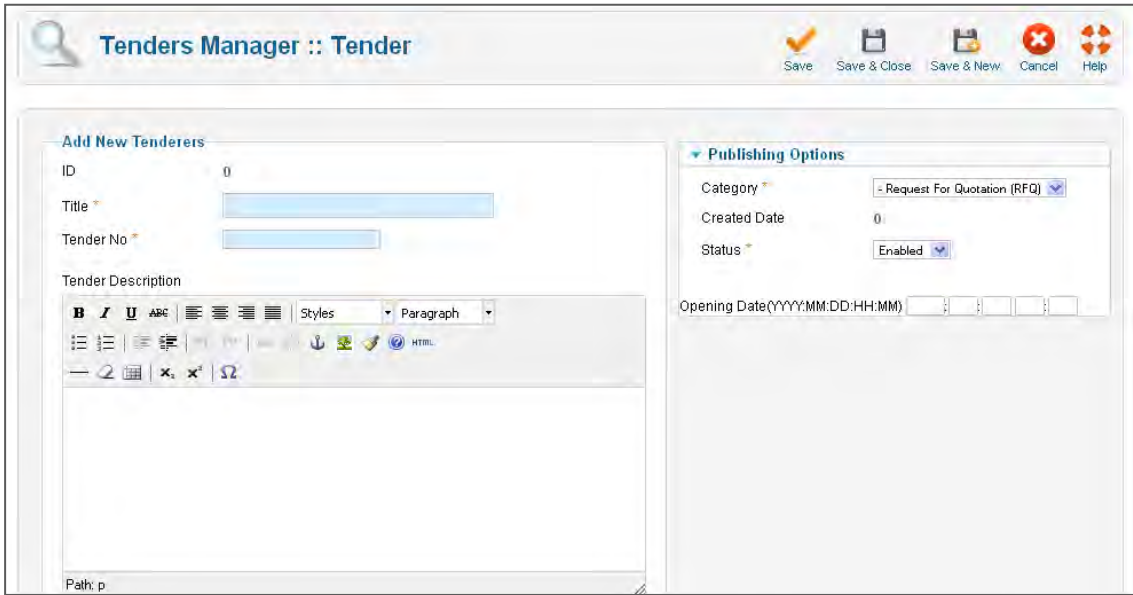
Administrator can create/edit/delete tenders. This tender will be shown to the bidders for bid. The tenders will show in bidder's search tender menu until the deadline of bid submission is over. After the deadline is over the tender will automatic goes to archive. Figure 5.14.1 shows the tender management page; Figure 5.14.2 shows add new tender form and Figure 5.14.3 shows the edit tender form.



The screenshot shows the 'Tenders Manager :: Tenders' page. It features a toolbar with icons for New, Edit, Enable, Disable, Archive, Trash, and Help. Below the toolbar are two dropdown menus for 'Select Status' and 'Select Category'. The main content is a table with the following columns: Id, Title, Tender Category, Created Date, Opening Date (YYYY:MM:DD), Ordering, and Status. The table contains 11 rows of tender data.

Id	Title	Tender Category	Created Date	Opening Date (YYYY:MM:DD)	Ordering	Status
1	supply for micr	Request For Quotation (RFQ)	2013-02-05 10:32:12	2013:09:18 12:00	1	✓
2	supply for computer	Request For Quotation (RFQ)	2013-02-05 10:32:12	2013:09:20 12:15	2	✓
3	Supply for Server	electronics	2013-02-07 10:20:47	2013:09:25 12:15	3	✓
4	Supply for Workstation	electronics	2013-02-07 10:20:47	2013:10:31 02:30	4	✓
5	Supply for online UPS	electrical	2013-02-07 10:35:38	2013:10:09 04:00	5	✓
6	Offline UPS	electrical	2013-02-07 10:35:38	2013:10:15 12:00	6	✓
7	Supply for AVS 2000VA	electrical	2013-02-07 10:54:24	2013:10:15 16:00	7	✓
8	fdasfa	electrical	2013-02-07 10:54:24	2013:06:15 16:00	8	!
9	sadfasf	Request For Quotation (RFQ)	2013-02-07 11:02:56		9	!
10	fasf	Request For Quotation (RFQ)	2013-02-07 11:04:59		10	✗
11	fasf	Request For Quotation (RFQ)	2013-02-07 11:06:03		11	✗

Figure 5.14.1: Tender Management Page.



The screenshot shows the 'Add New Tenders' form in the 'Tenders Manager :: Tender' interface. The form includes a toolbar with icons for Save, Save & Close, Save & New, Cancel, and Help. The form is divided into two main sections: 'Add New Tenders' and 'Publishing Options'.

Add New Tenders:

- ID: 0
- Title: [Text Input]
- Tender No: [Text Input]
- Tender Description: [Rich Text Editor with toolbar]

Publishing Options:

- Category: - Request For Quotation (RFQ)
- Created Date: 0
- Status: Enabled
- Opening Date (YYYY:MM:DD:HH:MM): [Date and Time Input]

Figure 5.14.2: Add Tender Form.

Figure 5.14.3: Edit Tender Form.

5.16 View Bids Page

Administrator will not be able to view the bids on a particular tender. Only the super admin (HOPE) will be able to view the bids on a particular tender. A super admin will also make the decision about the bid. He will check all aspects and mark the bid 'Responsive', 'Not-Responsive' or if it is the bid that is chosen by the hope he will mark it as 'Awarded'. If the admin marked as the bid 'Awarded' the owner (Bidder) will get an e-mail about it. Figure 5.15.1 shows the bids management page; Figure 5.15.2 shows all bids of a particular tender and Figure 5.15.3 shows the bid details page and options to mark the bid.

Id	Title	Tender Category	Created Date	Opening Date (YYYY:MM:DD)	Number of Bids	Ordering	Status
1	supply for mlcr	Request For Quotation (RFQ)	2013-02-05 10:32:12	2013-09-18 12:00	No Bids Submitted	1	✓
2	supply for computer	Request For Quotation (RFQ)	2013-02-05 10:32:12	2013-09-20 12:15	supply for computer	2	✓
3	Supply for Server	electronics	2013-02-07 10:20:47	2013-09-25 12:15	No Bids Submitted	3	✓
4	Supply for Workstation	electronics	2013-02-07 10:20:47	2013-10-31 02:30	No Bids Submitted	4	✓
5	Supply for online UPS	electrical	2013-02-07 10:35:38	2013-10-09 04:00	Supply for online UPS	5	✓
6	Offline UPS	electrical	2013-02-07 10:35:38	2013-10-15 12:00	No Bids Submitted	6	✓
7	Supply for AVS 2000VA	electrical	2013-02-07 10:54:24	2013-10-15 16:00	No Bids Submitted	7	✓
8	fdasfsa	electrical	2013-02-07 10:54:24	2013-06-15 16:00	fdasfsa	8	⊘
9	sadfasf	Request For Quotation (RFQ)	2013-02-07 11:02:56		No Bids Submitted	9	⊘
10	fasf	Request For Quotation (RFQ)	2013-02-07 11:04:59		No Bids Submitted	10	⊘
11	fasf	Request For Quotation (RFQ)	2013-02-07 11:06:03		No Bids Submitted	11	⊘

Figure 5.15.1: Bids Management Page.

Followings are the Bids of this tender

ID	<input type="checkbox"/>	Title	Bidder's Name	Created Date	Ordering	Status
5	<input type="checkbox"/>	My Approve Bids	bidder1	2013-06-13 11:24:34	4	✔
6	<input type="checkbox"/>	My Bidder Profile	bidder1	2013-06-13 11:25:36	5	✔

Display # 20

Figure 5.15.2: All Bids of a Particular Tender Page.

Bids Manager :: Bid Save Download PDF Close Help

Tender Details Documents (Supplied by Purchase)

Ref: online UPS/01/2013 Date: 2013-02-07 10:35:38

Terms and Conditions for Supply of Goods and Payment For 10(Ten) pieces 2000VA Online UPS for our Ref No:online UPS/01/2013 Date: 30-07-2012

- Terms and Conditions contained herein shall be binding upon both the Procuring Entity and the Supplier for the purpose of administration and management of this Contract.
- Implementation and interpretation of these Terms and Conditions shall, in general, be under the purview of the Public Procurement Act, 2006 and the Public Procurement Rules, 2008.

ID: 5

Status:

Figure 5.15.3: Bid Details Page with Options Form.

5.17 Home Page Menu Management Page

Administrators can create/update/delete menus that are showing in the web-pages. Administrators also will be able to show the contents in the menus. Figure 5.16.1 shows the menu management pages; Figure 5.16.2 shows add new menu item form and Figure 5.16.3 shows the edit menu item form.

<input type="checkbox"/>	Title	Status	Ordering	Access	Menu Item Type	Home	Language	ID
<input type="checkbox"/>	Home (Alias: home)	<input checked="" type="checkbox"/>	1	Public	Articles > Featured Articles	<input checked="" type="checkbox"/>	All	101
<input type="checkbox"/>	About Us (Alias: about-us)	<input checked="" type="checkbox"/>	2	Public	Articles > Single Article	<input type="checkbox"/>	All	102
<input type="checkbox"/>	Contact Us (Alias: contact-us)	<input checked="" type="checkbox"/>	3	Public	Contacts > Single Contact	<input type="checkbox"/>	All	103

Figure 5.16.1: Menu Management Page.

Details

Menu Item Type

Menu Title

Alias

Note

Link

Status

Access

Menu Location

Parent Item

Ordering

Target Window

Default Page No Yes

Language

Template Style

Link Type Options

Link Title Attribute

Link CSS Style

Link Image

Preview

Add Menu Title No Yes

Page Display Options

Metadata Options

Module Assignment for this Menu Item

Figure 5.16.2: Add New Menu Item Form.

Figure 5.16.3: Edit Menu Item Form.

5.18 Content Management Page

Administrator can create/edit/delete new contents in the website. There are no needs to change any html or php code to change the text/image showing in the web. All contents are manageable from the admin panel. There are three types content in this system first one is Category. The content category is content one or more same type of contents. Figure 5.17.1 shows the categories management page from this page admin will be able to create, edit, delete, publish and un-publish a category. Figure 5.17.2 shows create new category form and Figure 5.17.3 shows the edit category form.

	Title	Status	Ordering	Access	Language	ID
<input type="checkbox"/>	Uncategorised (Alias: uncategorised)		1	Public	All	2
<input type="checkbox"/>	site (Alias: site)		2	Public	All	8

Figure 5.17.1: Category Management Page.

Figure 5.17.2: Add New Category Form.

Figure 5.17.3: Edit Category Form.

The second part of contents is article. An article is that type of content which shows in a page. To display something in a page we have to create a new article of that and linked with a menu. Figure 5.17.4 shows the article/content management page from this page admin will be able to

create, edit, delete, publish and un-publish a article/content. Figure 5.17.5 shows create new article form and Figure 5.17.6 shows the edit article form.

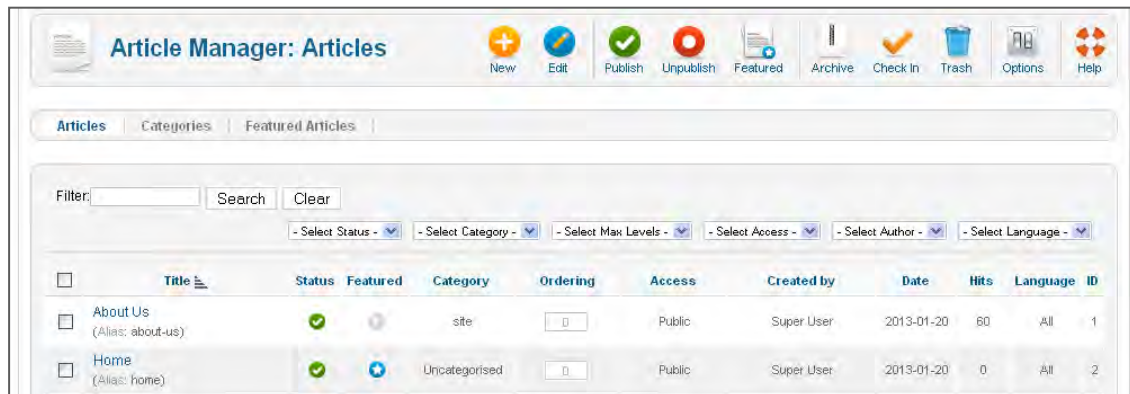


Figure 5.17.4: Article/content Management Page.

The screenshot shows the 'Article Manager: Add New Article' form. At the top, there is a navigation bar with icons for Save, Save & Close, Save & New, and Cancel. The form is divided into two main sections: 'New Article' and 'Publishing Options'.

New Article Section:

- Title:
- Alias:
- Category:
- Status:
- Access:
- Permissions:
- Featured:
- Language:
- ID:

Article Text Section:

Rich text editor with a toolbar containing: Bold (B), Italic (I), Underline (U), ABC, Bulleted List, Numbered List, Indent Left, Indent Right, Styles (Paragraph selected), Paragraph, Undo, Redo, Link, Unlink, Image, Video, Table, and HTML.

Publishing Options Section:

- Created by:
- Created by alias:
- Created Date:
- Start Publishing:
- Finish Publishing:

Other Options:

- Article Options
- Configure Edit Screen
- Images and links
- Metadata Options

Figure 5.17.5: Add New Article/Content Form.

Article Manager: Edit Article

Save Save & Close Save & New Save as Copy Close

Edit Article

Title

Alias

Category

Status

Access

Permissions

Featured

Language

ID

Article Text

B I U ABC Styles Paragraph

Tendering is considered to be one of the fairest means of awarding contracts and the

Publishing Options

Created by

Created by alias

Created Date

Start Publishing

Finish Publishing

Revision

Article Options

Configure Edit Screen

Images and links

Metadata Options

Figure 5.17.6: Edit Article/Content Form.

The third part of content management is featuring a content/article. If a content/article is featured it will show in the home page of the website. Figure 5.17.7 shows the article/content featuring management page.

Article Manager: Featured Articles

New Edit Publish Unpublish Archive Check In Remove Trash Options Help

Articles Categories **Featured Articles**

Filter: Search Clear

<input type="checkbox"/>	Title	Status	Category	Ordering	Access	Created by	Date	Hits	Language	ID
<input type="checkbox"/>	Home (Alias: home)	<input checked="" type="checkbox"/>	Uncategorised	<input type="text" value="1"/>	Public	Super User	2013-01-20	0	All	2

Display # 20

Figure 5.17.7: Featuring a Content/Article Page.

Chapter 6: Conclusion

6.1 Conclusion

E-tendering is one of the e-Government initiative, which perceived to be an alternative that leads to better and more effective procurement management by overcoming many traditional paper-based problems. E-tendering system brings essential benefits for both the purchaser and the bidders. It provides an open purchasing environment that facilitates interoperability between them in order to conduct tendering activities.

In this study, detailed analysis of tendering process is done and according to the findings modules has been developmental. The resulting system is a web-based tendering system designed to connect organization as buyer and businesses as sellers. Among the most important functionalities of the system are providing immediate responses through e-mail communication, verification of documents and online tender awarding. In addition, this system offers the potential for significant savings such as decrease in costs associated with publishing and getting information, increase in competition, improvements in transparency in public administration and enhancements in the overall quality of tendering management throughout savings in terms of cost and time.

The developed e-tendering system is a web-based system which is very user friendly. The administrators (admin user and the head of procuring entity, HOPE) can create, approve/reject bidders and their profiles. The administrators can also manage tenders. Only the HOPE will be able to view the bids submitted on a tender. And HOPE will publish the decision of TEC (Tender Evaluation Committee). Thus, the security of the system has been maintained.

E-tendering system is a multi-user system, which can be used by a number of users simultaneously. Every user has own user id and password. Personal information can be only accessed by that user. Bidders will be able to view/update their profile and can bid in tenders. This software will also provides the information about the company and their contact details. This software is integrated with a dynamic company website.

6.2 Future Works

The developed project can be enhanced in a variety of ways.

Firstly: this system should be multilingual. The purchaser some time invites international tenders and as it is a web based system any one from anywhere can access it. The multi language system will helpful to understand all level of bidders. In this software we use a multilingual platform there are options to install new language.

Secondly for further enhancement there should two new modules one is for TOC (Tender Opening Committee) and another is TEC (Tender Evaluation Committee). The TOC will open the bids and made a preliminary list of sequential lowest bidder. In TEC module members will sign in and provide marks and decision in every bid. The HOPE will get aggregated point chart and declare the final decision. Using this module the entire decision process will be paperless online based system.

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Appendix A

Sitemap for Bidders (User)

