**ABSTRACT**

The advent of internet technology has enabled electronic procurement in industry which aids in the reduction of procurement costs. Among the technologies that have been praised by many stakeholders in reducing tendering cost, it is the arrival of electronic tendering (e-tendering). The aim of this research is to develop an e-tendering system for Telone Center for Learning. The study targeted procurement of college resources. The findings make an invaluable contribution to highlight the inefficiencies of traditional paper-based tendering system, barriers to the full implementation and the benefits of e-tendering. The recommendations include conducting awareness campaign of the benefits of e-tendering amongst built environment practitioners, highlighting the inefficiencies of paper-based tendering system and dealing with the barriers of e-tendering. There is also a need to formulate rules and regulations that accommodate e-tendering. In addition, promoting e-tendering system to ensure its acceptability among the stakeholders.

## 1.1 INTRODUCTION

Tendering, generally, is the process which is undertaken to obtain offers to create a contract between a client and a contractor (Tindsley & Stephenson, 2008). E-tendering is therefore defined as the process by which tender documentation, such as drawings, bills of quantities (BoQ) and specification are issued to suppliers of resources in an electronic format and via the internet. Therefore, the invitation to tender, tender award, contract administration and monitoring project performance will be all undertaken electronically online. Furthermore, tender queries, tender addendums, updates, evaluation of work for payment and notification of payments are all to be exchanged electronically on the internet via the system’s website and e-mail (Al-Lawati & Aibinu, 2008). E-tendering is the process of issuing electronic tender documentation to main contractors, sub-contractors and suppliers of college resources and receiving their responses electronically (CIOB, 2009).

## 1.2 Background

As we know in present system, procurement advertising is done through newspapers, which is causing problems like communication gap between companies and government authorities because of this problem competition is reducing, ultimately cost of project is increasing. There is no computerize system in the purchasing office so the user follows the old system to get the response of the requests. Think about it how much is difficult to fill all data in paper during in digital technology and difficult to know how much time is needed to get ordered materials from different customers held in the company.

Here are the problems on the existing system

* It is more time consuming.
* It includes wastage of man power
* It leads to tender ring
* It includes wastage of money

So, in order to overcome all these limitations and to meet all their requirements the current process is replaced with this application.

## 1.3 Problem definition

The current system needs large storage capacities, like storing rooms and archives are required to store tenders and projects documents and drawings and there is lack of security of stored data in papers; there is also time wastage and cost in exchanging information and tender documents; and there is labor intensive tasks required to issue and respond to tenders; intensive administrative tasks, such as, printing, collating, binding and distributing of tender documents to all interested contractors. In addition, paper-based method of tendering has inherent inefficiencies in many forms such as handling errors, estimating process errors, and finally errors that arise during evaluation but all these errors can be eradicated/minimized with the use of e-tendering.

## 1.4 Objectives

* To allow online bidding participation
* To allow online selection of the best bidder
* To notify bidders about tenders

## 1.5 Functionality

* Eliminate and or reduce current manual work overload
* Significantly improve efficiency of procurement process
* Enable strategic sourcing through the process of capturing spend patterns and product usage across the state.
* Provide automation to two of the current intensive manual business processes; Solicitation Release and Vendor Notification ***(Reference - workflow diagrams attached in Appendix A)***

## 1.6 Hypothesis

A number of solutions can be employed to the current system as follows:

H 0: Developing a E-tendering system

Of the above alternatives, E-tendering system is the best more modern alternate.

If partially automated, the system will be flexibly able to retrieve, update information and status quickly, when required without taking much time. Users will be able to view tenders, their bidding status and get tender notifications directly to their emails from any angle of the country.

## 1.7 Justification

The process tries to eliminate paper while shortening the time taken to submit and respond to queries. Clarifications should be issued electronically and distributed automatically to all interested parties, thus reducing the risk of errors and increasing visibility of responses to all interested parties. This increases the accuracy of tenders while reducing the cost of managing the tender process (CITAX, 2008; RICS, 2005; Brooks, 2008).The benefits of e-tendering include: simplifying the process; reduced tendering period; fast and accurate pre-qualification and evaluation, avoiding the need for double or triple entry of the same information, and the reduction in labor-intensive tasks of receipt, recording and distribution of tender documents. There is increased integrity and transparency in the tendering process, a reasonably high return on invested funds on such technology improved quality of tender specification and supplier response and provision of quality management information (Brooks, 2008; Tindsley & Stephenson, 2008; Lou & Ashalwi 2009; Oyediran & Akintola, 2011; RICS, 2005).

It is interesting to further note that e-tendering increases the level of security and authentication of the tender process. The findings are in sharp contrast to the industry continued concern that it exposes sealed bids to possible hacking which defeats the principle of sealed bids. Most e-tendering software solutions provide additional support such as archiving, document management, early warning of opportunities to suppliers, and maintenance of approved and/or potential supplier lists (Local e-gov, 2011).

## 1.8 Limitations

The benefits of using e-tendering are primarily perception based and not quantifiable (Westcott & Mayer, 2002; Egbu, Gaskell & Howes, 2001; Yang, Ahuja & Shankar, 2007). Deloitte (2004) reports that one of the key challenges to deriving benefits from e-tendering as: authorities need to invest money and time to both identify their opportunity from e-tendering and to deliver the expected benefits; the presence of internal resistance to adopting a corporate, standardized approach to tendering; change management is critical to securing buy-in; supplier concerns over the robustness of the technology and practical issues such as file sizes; a supplier education process is essential; there is choice as to the technology solution — package versus bespoke; in-house versus hosted.

## 1.9 Conclusion

**I**n conclusion the study has premised on the following aims: to investigate constraints of traditional paper-based tendering system; to further investigate the barriers facing the full implementation of e-tendering, and finally to investigate the drivers of e-tendering for Telone Center for Learning also the system is able to analyses procurement System by making use of the output reports produced by and specifically for the procurement of resources by Telone Center for Learning**.**

# CHAPTER 2:

## PLANNING PHASE

## 2.0 INTRODUCTION

The system specification is produced at the culmination of the analysis task. The function and Performance allocated the software as part of the system engineering are refined by the established a complete information of performance requirements and design constraints, appropriate validation criteria, and others data pertaining to requirements. We have used a number of information gathering methodologies in this planning phase.

## 2.1 Why Build the System

The inherent inefficiencies of the current system in many forms such as handling errors, estimating process errors, and finally errors that arise during evaluation but all these errors can be eradicated/minimized with the use of e-tendering and also the there is too much documentation in the current system which needs large storage capacities.

## 2.2 BUSINESS VALUE

This is the entire value of the business and encompasses all elements that determine the well-being and healthy of this project which includes growth of the institution.

## 2.3 INFORMATION GATHERING METHODOLOGIES

Information gathering is necessary so as to have enough understanding of the current system which leads to requirements determination. And to gather useful information, the following fact-finding techniques were employed:

### 2.3.1 Participatory

– this proved to be the most effective technique. It generally involved my personally involvement in the operational activities of the procurement system at Telone Center for learning. I observed the registration of suppliers of resources, scheduling of biddings and tender notification process and also how reports where developed. Getting personally involved helped me to identify some bottlenecks that could have otherwise gone unnoticed. It also helped me to get that much needed first-hand experience of the problems being faced by the users of the current system.

### 2.3.2 Observation and Document Review

– this involved observing those operations that I could personally get involved in during the participatory activities. This helped in verifying details gained at participatory activities. I observed all steps in the registration system and, examined and reviewed forms, records and reports used throughout the organization.

## Advantages of observation

1. observation allow the analysts to assess the general moral of workers
2. tasks that are difficult to describe are easily observed
3. first-hand information is obtained

## Disadvantages of observation

1. employees may feel uncomfortable being watched and can put up an act intended to influence the judgment of the observer
2. the method is demanding in terms of personal commitment
3. it is time consuming as analysts may take several days to come up with the correct information about the system being investigated

### 2.3.3 Interviews

I also conducted interviews with identified key employees within the board. The interviews helped to give an insight of how theleague functions, and to provide answers to questions that could not be answered by the former techniques. For staff at the same level, asked the same interview script to help me get a wide range of answers and opinions on similar topics or issues.

Advantages interviews

1. the researcher can get more detailed and first-hand information about a topic or event
2. the interviewer can observe the reactions of the interviewees and is able to probe for clarification for answers
3. interview is flexible since the interviewer can modify questions that interviewees have not understand so that they understand them and therefore response is immediate

## Disadvantages of interviews

1. they are time consuming
2. they require certain skill to get maximum information, that is the interviewer must be a good communicator
3. interview is difficult to organize because of employees’ busy schedule
4. for retrieval of maximum information, interviewees must be assured of discussing in privacy

### 2.3.4 Questionnaire

Questionnaires were presented to staff at the board. The purpose was to gain some preview into the already existing system through the users’ opinion. A date was set for the return of the questionnaire

## Advantages of questionnaires

1. Respondents completed questions at their convenience, as there was ample time for them to think about the questions before responding and thus allowing them to give comprehensive answers.
2. It was easier to arrange and conduct as compared to interviews as there is no personal monitoring.
3. It saves time as it was distributed to many respondents’ con-currently
4. Anonymity was maintained which enhanced the chances of genuine responses, as there was no room for intimidation by other employees.

## Disadvantages of questionnaires

1. The return rate did not match the number of questionnaires handed out.
2. Questionnaires were time consuming as the response was not immediate as in the case with interviews
3. There are no guarantees that respondents would answer all questions posed as some questions came back unanswered or poorly answered.

The fact-finding techniques helped me to achieve a high-level understanding of the current system, which is described below

## 2.4 TANGIBLE BENEFITS

Less telephone cost due to the use of web application it will be less expensive than using a phone

Less stationery cost, use of hard copies used to register suppliers will be eliminated by online registration

Reduced staff cost: the cost paying extra staff is cut by the new system thus allowing funds to be diverted to other activities.

Reduction in staff working time: due to computer’s supreme and massive calculating information processing speed power the system is going to guarantee the staff a reduction in work.

## 2.5 INTANGIBLE BENEFITS

Expected increase in production due to improved efficiency user friendly fast query process, fixture making without human effort, online results updates,

Increased job satisfaction and motivation: elimination of long and tedious task by simple and fast computer routines will generally lead to greater motivation in the work place.

## 2.6 FEASIBILITY STUDY

“Are the necessary components in place for the initiation of the project?”

Before embarking on project, it is essential to verify whether it is feasible to carry out that project. The feasibility can be characterized into technical, economic and operational. This feasibility analysis enables the analyst to provide justification on whether the proposed desired objectives can be achieved within the prevailing economic, financial, organizational and technological constraints and a descriptive comparison between the benefits and the costs.

## 2.6.1 Technical Feasibility: could it be done?

The proposed system will be characterized by new technology and thus it is essential to validate its technical feasibility. The extent of the successful development and implementation of the system also depend on the availability of technical expertise. An analysis of the current infrastructure at Telone Center for Learning shows that it is sufficient enough for the system to be said to be technically feasible to develop and implement.

The following are some of the reasons that verify the technical feasibility of the system: - There is a fully fledged network system at Telone Center for Learning that has at least a servers operating well below their actual capacity.

* The developer who is going to be responsible for the creation and deployment of the system has the necessary technical expertise to carry out the project.
* Most of the users are computer literate and have practical experience working with computers and should not have minimum problems with running the system.

# Hardware And Software Requirements

The following list of hardware and software is required to run the new system:

Minimum Hardware Requirements

-Two servers (one main server and other for back-up), UPS batteries.

-Networking equipment (hubs, routers, network cables and sockets)

-For any sever upgrade ML150 G9 SERVER will be recommended

## Minimum Software Requirements

- Apache http server 2.0.8

-PhpMyAdmin

-MySQL 5.0.5b

-Other hosting utility can be Internet Information services

Wamp server or XAMPP can substitute items second to penultimate.

## 2.6.2 Economical feasibility

Can the expected benefits outweigh the costs to be incurred by the system?

Does the team have sufficient resources to finance the proposed system?

The internet allows for the download of open source developer tools such as the ones which are being used to create the system. This means little or no money is required for the purchase of software. In as far as hardware is concerned, it has been mentioned already that Telone has the necessary infrastructure in place but it is just that it is not fully utilizing the resources. A survey was also conducted to examine the extent to which the benefits outweigh the costs and the developer was able to come up with the following cost benefit analysis:

## 2.6. Operational feasibility

This defines acceptability of the system by users as a solution to their current problems. This also defines the friendliness of the system to users, thus ease of use. In exploring operational feasibility, the PIECES (performance, information, economy, control, efficiency, services) framework is used.

**Performance**- the new system will provide adequate response time

**Information-**the new system will provide accurate, useful and timely information to users and management.

**Economy** -the current manual system provides cost ineffective information to the business because there are high time costs incurred in retrieving information. The new system will provide timely information and help reduce telecommunication costs.

**Control-** the current manual system is prone to fraud and has no guaranteed security. The new system offers effective control to protect` against fraud and unauthorized access. It reduces the number of errors made during data entry.

**Efficiency-** the new system will take lesser time to process information and to produce more accurate results, thereby making it more efficient than the current one.

**Services-** the new system will provide more reliable services, which are flexible.

## 2.7 RISK ANALYSIS.

It helps us access threats to the company, provided input into how to manage this risks and to enable us to communicate more effectively with the clients about how best to deal with risks

## 2.8 WORK PLAN: Project Activities

**Gantt Chart.**

Task description

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Project proposal |  |  | | | | |
| Feasibility report |  |  |  | | | |
| System analysis |  | |  |  | | |
| System design |  | | |  |  | |
| Implementation |  | | | |  |  |
| Evaluation and  Maintenance |  | | | | |  |
| Documentation |  | | | | | |

## 2.9 CONCLUSION

This Chapter helped us to see the feasibility of developing a new system with the information gathering methodologies and we now moving to Planning Phase.

# **CHAPTER 3:**

## **ANALYSIS PHASE**

## 3.0 Introduction

After analyzing the requirements of the work to be performed, the next step is to consider the problem and understand its content. Studying the existing system is the first step and the other is understanding the requirements and domain of the system.

## 3.2 DATA ANALYSIS-DFDs,

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## 3.3 Overview of Proposed System:

The motto of the new system will be AAA, 'Anyone, Anytime, Anywhere'. That what it really is? The "E-Tender" is online auction house so the bidder doesn't need to go anywhere, instead they can take part in the auction just sitting in the comfort of their living room, be it during the day or night.

Need for new system

❖ To automate the bidding process and provide the tender details online: ✔ The tenders should be able to make a bid online. All the important details of the tenders should be made available online. Tender and procure notices should be displayed as well.

❖ To check the status of Tenders

✔ Such a facility will enable the contractors to know the status Allocated/Non-Allocated) of the tenders easily and quickly.

❖ Faster retrieval of information:

✔ Retrieval of information becomes easier compared to the manual system. Details regarding bidders, feedback, documents etc. are available easily.

## 3.3 WEAKNESSES OF THE CURRENT SYSTEM

The problem with public auction is that the participation of the general public is very limited. This public auction is managed manually and involves lot of paper work. Another headache of the current system is to track each bidding process and to make it finish in financial settlement.

In present, there is no any process online for issue a new bidder. But all process work offline on paperwork. If any new buying is issue then organization gives an advertisement in TV, newspaper or any other resources. Newspaper contains only few details of materials, if any more detail required then suppler physically visit the organization. Manual procurement transactions can take up to 20-30 days to process, including all the time spent exchanging paperwork and contacting suppliers etc. An integrated e-Procurement solution can be used to simplify the procurement process.

**Generally existing System:**

❖ No Automated Bidding Process: The bidding process is completely manual and so very time consuming. There is no provision for online bidding.

❖ Security: The manual process is not very secure. In the new system, the passwords are generated so only the members know their passwords.

❖ Not as Accurate and Fast: Retrieving information is slower as everything is managed manually. Since, everything is managed manually; there might be a lack of accuracy.

❖ No Searching Facility: There are no searching facilities for bidders such as quick search mechanism in the existing system.

❖ It consume more personal power and material wastage like paper, pink related to printing documents for the sake of procurement guideline for employment.

❖ The existing system has a problem of keeping the records separately because of using a file-based system.

❖ Users are using Word or Excel to record companies’ names and personal details, writing one record many times in different sheets which leads to inconsistency of data. Consequently, users are facing the problem of getting reports on time because of searching the information related to one tender in different files.

❖ The existing system has many problems associated with it, for instance: it wastes time for recording the process of tender information.

❖ In the existing system, the process of evaluating tenders takes a lot of time to do analysis and to compare documents as they (users) write down and also remember they have to search for the documents they want manually.

❖ It is hard to get reports on time because they have to write manually. In other words, each record they keep is not in the format of reports, and at the time of issuing the report, they have to type it manually.

❖ Bidders who need to sell the things, he attends the place of bidding.

❖ It covers only limited Area, Bidders far from the organization will not participate.

❖ Limited Bidders and Sellers.

## 3.4 STRENGTHS OF THE CURRENT SYSTEM

* Physical attendance of the bidders avoids ghost bidders
* No technical labour is required to use the paper based system

## 3.5 EVALUATION OF ALTERNATIVES

The general objective is to automate the procurement system

The main objective of this project is as follows

1. This portal will gives procuring /purchasing of product online.

2. Implementing online creation, editing of bids.

3. Implementing viewing, applying for bids by Sellers.

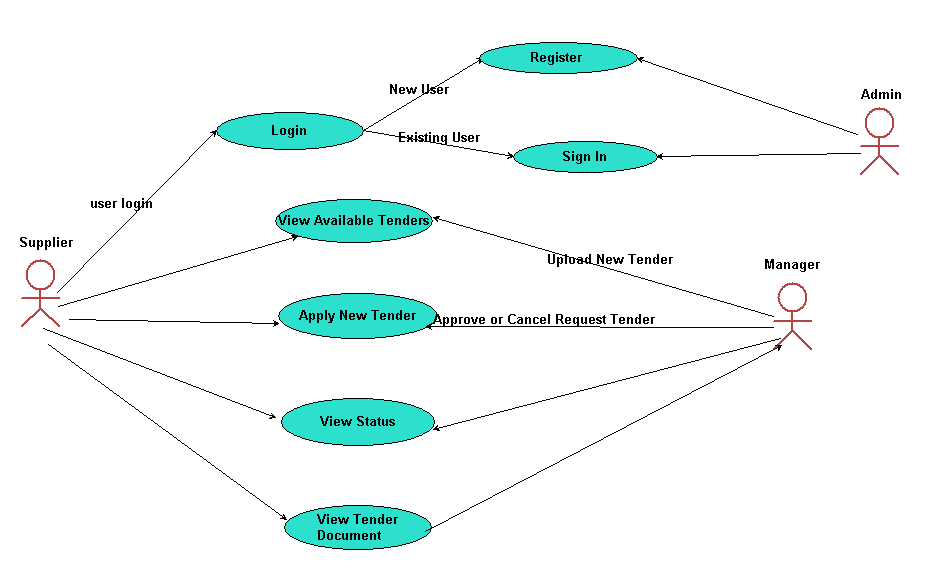
4. Design a database which is able to keep every transaction related to tender process.

5. The user will be able to generate a report they need on time because every record will be saved in database.

6. Implement the level of security so that every user will be able to access the information according to their role in the system.

## 3.6 REQUIREMENTS ANALYSIS-Use case diagrams

The new system will facilitate procurement system and receive the response for online method and the tenderer, system have its own account.

*Use Case Diagram*



***Requirements***

|  |  |
| --- | --- |
| **Hard Ware** | **Hard Ware Component** |
| Processor | Cor i3 above 2.3 GHZ |
| Hard disk | 200 GB |
| Ram | 2 GB |

***Table 2. Software Requirements***

|  |  |
| --- | --- |
| Text  Editor | Note pad, Sublime, Dream Weber, WYSIWYG |
| Server | Apache |
| Front end and Backend | HTML and PHP |
| Operating system and Browser Windows OS, any browser |  |

## 3.7 Conclusion

It is obvious from the choices researched during the analysis phase and those existing solutions examined above that none have met the requirements Telone demands, and conclusively a bespoke web application developed solely for Telone is justified. Analysis of all this information will help the developer to come up with a system to meet the user requirements. In the next phase the system developer will start the design of the new system.

# **CHAPTER 4**

## **DESIGN PHASE**

## 4.0 INTRODUCTION

This system is developed through object-oriented methodology approach. Object oriented methodology allowing the system to have Object Oriented property that is data abstraction, inheritance, polymorphism and class and objects. Generally the system uses this methodology to make the system effective, efficient and easily understandable.

## 4.1 SYSTEM DESIGN

This system has different type of class type architecture such as user interface, process/control, business/domain, persistence and system layers and also different type of system modeling techniques that are used for the implementation of the system such as class, component and deployment modeling.

The system design processes the idea and converting into a solid design.

❖ To make the system simple to understand

❖ To easily code the system

❖ To see how a real system works

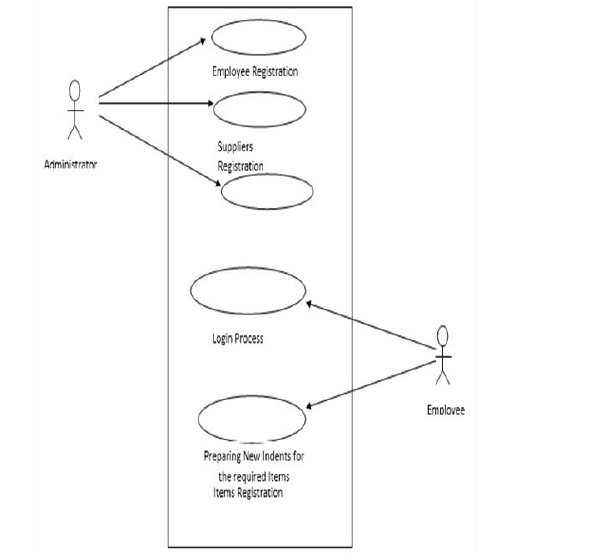
❖ To specify objects, operations of the system clearly

## 4.2 SYSTEM INPUTS

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

* What data should be given as input?
* How the data should be arranged or coded?
* The dialog to guide the operating personnel in providing input.
* Methods for preparing input validations and steps to follow when error occur.

## 4.3 SYSTEM PROCESSES



## 4.4 SYSTEM OUTPUTS

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system’s relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

2.Select methods for presenting information.

3.Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

* Convey information about past activities, current status or projections of the
* Future.
* Signal important events, opportunities, problems, or warnings.
* Trigger an action.

Confirm an action.

## 4.5 ARCHITECTURE DESIGN

## 4.6 PHYSICAL DESIGN

## 4.7 DATABASE DESIGN-

Sequence diagram,



## class diagrams

## ,table and their fields

## 4.8 INTERFACE DESIGN

## 4.9 Conclusion

# **CHAPTER 5:**

## IMPLEMENTATION AND TESTING

## 5.0 IMPLEMENTATION: INTRODUCTION

## 5.1 Coding and Construction

## 5.2 TESTING

## 5.3 SECURITY

## 5.4 INSTALLATION

## 5.5 TRAINING

## 5.6 Maintenance

## 5.7 System evaluation

## 5.8 File conversion and System changeover

## 5.9 System review

## 5.10 RECOMMENDATIONS

## 5.11 CONCLUSION

## APPENDIX: User Manual

## APPENDIX A

## Sample Interview Questions

## Sample Observation sheets

## Sample questionnaire questions

## APPENDIX B

## 1) Sample program code

## Bibliography