



Jimma University

Jimma Institute of Technology

School of Civil and Environmental Engineering

Construction Engineering and Management Stream

**Conventional Bidding System and a New Proposed Online Bidding
Technology on the Construction Sector in Ethiopia; Comparative
Approach**

A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial
Fulfillment of the Requirements for the Degree of Masters of Science
In Civil Engineering (Construction Engineering and Management)

By

Yohannes Dejene

October, 2016
Jimma, Ethiopia

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October, 2016
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DECLARATION

This thesis is my original work and has not been presented for degree in any other university

Name

Signature

Date

This thesis has been submitted for examination with my approval as university supervisor

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ABSTRACT

Ethiopia is one of the developing countries in the world, and for this development the construction industry is playing a big role. Bidding issues are widely related to the construction industry and its participants so that striving to improve the bidding procedure of construction is in the best interest of both the public and the construction industry, in particular.

In today's construction environment, the vast majority of bidding activity happens in the traditional error prone paper based submission and evaluation process. Therefore, construction sector owners are finding themselves under increasing pressure to participate in most contracts because of the accessibility and efficiency of the current bidding system. In response to these pressures, the Ethiopian construction industry should come up with alternative bidding and procurement methods which are very accessible, efficient and time saving.

The aim of this study was to propose a web based online-bidding application on the construction sector and develop the application with the help of a software engineer, to compare it with the current conventional bidding system whether it minimize the above mentioned problems and standardizes our bidding system.

A comparative approach of research design was carried out based on questionnaire survey, interview survey and an intense review of literature to meet the aim of this study. And the relevant parts of the conventional construction bidding process were summarized and coded by using basic hypertext processor programming language to develop a new online bidding technology for the construction sector in Ethiopia.

As a result the study investigated the drawbacks of the conventional construction bidding system in our country Ethiopia, and introduced a new online bidding web application prototype which minimizes the assessed drawbacks of the conventional bidding system.

Based on the discussed results it was concluded that, the online bidding system is the best choice compared to the conventional bidding system, to perform time efficient, cost efficient, accessible and standardized bid submission and evaluation in the construction industry.

Furthermore, it is recommended that; the program should be further developed, the government should strictly consider making this suggested web-based online bidding application as a default construction bidding system, the application should be well advertised and its patent should be secured, and a training manual should be prepared on how to use the application.

Keywords: bidding, bidding process, construction bidding, conventional bidding, online bidding

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ABBREVIATIONS

AFCAP - African Community Access Programme

BD - Bidding Document

BDS - Bid Data Sheet

BOQ - Bill of Quantities

CC - Conditions of Contract

DFID - Department for International Development (UK)

EQC - Evaluation and Qualification Criteria

ERA - Ethiopian s Authority

FIDIC - International Federation of Consulting Engineers

ICB - International Competitive Bidding

ITB - Instructions to Bidders

NCB - National Competitive Bidding

PE - Procuring Entity

PPA - Public Procurement and Property Administration

SBD - Standard Bidding Document

SOR - Schedule of Requirements

CHAPTER ONE

INTRODUCTION

1.1 Background

Construction as defined by the United Nations Statistics Division is “an economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as s, bridges, dams and so forth”. It is a process that consists of the building or assembling of infrastructure in the fields of architecture and civil engineering. It comprises the building of new structures, including site preparation, as well as additions and modifications to existing ones. It also incorporates maintenance, repair, and improvements on these structures. It is the process of adding structure to real property. (CSA, 2011)

In developing countries, the construction sector generally operates with severe limitations, and is unable to meet local demands. Bid is one of the substantial and integral element of construction project management that has been the issue of attention in the construction world. Due to time and cost overruns associated with construction projects, so many projects fail to accomplish their targets and objectives. Unmanaged or unmitigated bidding and procurement procedures are one of the fundamental causes of these overruns. These issues can be managed and controlled by influencing the current system and adopting the latest procedures of bidding and procurement (Rizwan et al, 2008). Construction bidding is the process of submitting a proposal (tender) to undertake, or manage the undertaking of a construction project. The process starts with a cost estimate from blueprints and material take offs.

In Ethiopia the major purchaser of construction is the federal government. And the most common procurement method is the competitive low-bid procedure in which contracts are awarded to a responsive contractor who offers the least price. The last two decades have witnessed a huge development in project complexity and clients need and this has led to an

increasing use of alternative forms of project delivery systems. In contrast, the prequalification and bid evaluation process, quantifying and assessment of criteria, and bid submission process are still in its original form (Laychluh, 2012).

It is important to be fair to all bidders when you are calling for bids or proposals. It's not only important; it's supported by many years of case law that all bidders must be treated fairly and equitably. Whether it is for a case of toilet paper, 10 tons of pipe, engineering services or a construction project the principles of fairness need to be part of the process. When a person or company makes the decision to spend their resources to respond to a bid or proposal call in a competitive environment they expect a fair process.

A key aspect of conducting a fair bid or proposal call is the actual submission process itself. Utilizing a process that eliminates potential unintended negative consequences of process errors is demonstrably better for both the submitter and receiver.

Electronic document distribution is quickly becoming the norm for the construction industry. The advantages of distributing documents electronically are numerous including time savings, cost savings, improved staff efficiency and not the least environmental sustainability (Robertson, 2009).

Therefore, the aim of the research presented in this thesis is to investigate the conventional construction bidding process based on time savings, cost savings, efficiency, and accessibility then, forward a web based application prototype for implementing alternative online bid-submission and evaluation procedures for the construction industry of Ethiopia.

1.2 Statement of the problem

In developing countries, the most common method of awarding the contract is the least responsive bidder or price based method which is executed manually and which has inherent flaws of high competition and minimum performance (rizwan, 2008).

In Ethiopia, the vast majority of bidding activity in today's construction environment, happens in the traditional error prone paper based submission and evaluation process. Therefore, construction sector owners are finding themselves under increasing pressure to

participate in most contracts because of the accessibility and efficiency of the current bidding system. In response to these pressures, the Ethiopian construction industry should come up with alternative bidding and procurement methods which are supposed to be very accessible, efficient and time saving.

1.3 Research Questions

The research questions that this study tends to answer are:

- i. How are the drawbacks of the current bidding system affecting the construction industry?
- ii. Can an online bidding system be developed which standardizes and minimize the drawbacks of the traditional construction bidding system?
- iii. What features will make the online bidding technology better than the traditional construction bidding system?

1.4 Objectives

1.4.1. General Objectives

The general objective of this study is to propose a prototype of web based online-bidding application on the construction sector, and compare it with the traditional bidding system.

1.4.2. Specific Objectives

To address the above general objective the following specific objectives are stated:

- i. To investigate the current conventional bidding system
- ii. To propose an online bidding system that will minimize time, money and lessen the procedure.
- iii. To compare the conventional bidding system with the proposed online bidding system

1.5 Significance of the Study

The importance of this study is to analyze how the current bidding system in our country Ethiopia is affecting the construction industry, and study how the construction industry can

be improved if a newly introduced online bidding system can be developed to provide ease of access, save time, money and lessen the procedure of bidding.

Contractors and consultants can use this web application to submit more bids from their office and increase their performance. And they can also use this document to prepare a standardized bidding document.

Clients can get a contractor to perform their work with high performance and minimum cost since many contractors can participate on the bid from where ever they are if they use the suggested application.

1.6 Research Scope

The scope of the study is to forward a prototype of online bidding application by using basic knowledge of hypertext processing (PHP) programing language, That can help to improve the construction bidding practices in Ethiopia.

However, this thesis work is limited to the bid submission and ranking process of construction bidding in Ethiopia.

CHAPTER TWO

LITERATURE REVIEW

2.1 General

The construction process involves multi-organizational activity. Conflict and disputes can therefore exist at all levels in the contractual chain: between client and consultant, client and contractor, client and sub-contractor, and so on. Among many causes of disagreements in the construction project, the project delivery system selected is one of the significant elements (Abera, 2005).

In a survey conducted in the Oromiya regional state, non-existence of real competition during contractors selection; excessive time overruns; compromising quality; and escalation of the final project cost from the estimated cost were the major problems associated with the existing approach of delivering projects (Lemma, 2006).

However, allowing projects to be awarded based on the least price has inherent flaws. Delays in meeting the contract duration, increment of the final project cost due to high variations, tendency to compromise quality, and adversarial relationship among contracting parties are the major drawbacks associated with responsive low-bid award procedure. Moreover, the low-bid award system encourages unqualified bidders in the competition and in contrary it discourages qualified contractors to participate. (Thomas, 2009)

2.2. Methods of contractor selection

The evaluation and selection of contractors leading to the award of construction contracts is a vital part of the construction process. The Ethiopian Federal Law requires institutes to publicly advertise for competitive bid certain construction contracts; however, Bidding procedures are basically of two types:

- ✓ Competitive and
- ✓ Negotiated.

Most of the other procedures are either variation of, or somewhere between these two extreme types. In pure competitive method, the contract is awarded to the lowest-bidder, if

the bidder is found to be responsive. In pure negotiated method the price is negotiated with a selected contractor.

2.3. Bidding procedures

The Public Procurement Proclamation of 2009 and subsequent Directives detail the full procurement processes, rules and procedures and the procurement methods to be followed by Procuring Entities. These regulations are mandatory for projects funded by a Federal organization. The relevant parts of the bidding process are summarized here as follows: Selection of Bidders, Preparation and Issue of Bidding Documents, Bidding Period and Bid Receipt, Bid Opening, Bid Evaluation and Bid Acceptance, Contract Award and placement.

2.3.1. Selection of Bidders

Where Open Tendering is used without pre-qualification on the online web-based application the PE will ensure if the bidding documents are finalized and approved, then publish an Invitation to Bid notice on the application web page (MOFED, 2010).

Where this document is used under Restricted Tendering, (for projects whose value is above 2 million birr this could only apply to non-Federally funded projects) the bidders invited will be those included on the shortlist, and should be selected from among contractors forming part of the Employer's approved list, or as a minimum eligible through being registered in the appropriate contractors list. There is no need to publish an Invitation to Bid notice, but the bidding document should be accompanied by an invitation to bid letter. However, the Procuring Entity will advertise the opportunity, to invite companies to express interest in being invited to bid. (FFPA, 2011)

2.3.2. Pre-bid conference

If the Public Body deems it to be appropriate, it may hold a Pre-Bid Conference for prospective Bidders who received a Bidding Documents for clarification and discussion on the Bidding Documents or modification thereto. All prospective Bidders should be welcomed to attend this Pre-Bid Conference and site visits. To give all prospective Bidders the opportunity to participate in the pre-bid conference, prospective Bidders are limited to sending two representatives to Pre-Bid Conference and site visits. All the costs of attending

this conference will be borne by the prospective Bidders. The Public Body invites all prospective Bidders to submit their questions / request for The Pre-Bid Conference shall be minuted. Copies of the minute shall be delivered to all prospective Bidders who purchased the Bidding Documents to enable them prepare their Bid documents by incorporating the content of clarification or modification. (FFPA, 2011)

2.3.3. Preparation and Issue of Bidding Documents

The Procuring Entity is responsible for the preparation and issue of the Bidding Document and must use the appropriate standard bidding document. In deciding the deadline for Bid Submission, the PE should allow Bidders sufficient time for obtaining and studying the Bidding Document, preparing complete and responsive bids and submitting the bids. Procuring Entities are required to comply with the minimum bidding periods given in the Directives. Where a Bid Notice has been published, the PE must issue Bidding Documents promptly to all Bidders who request them and pay any required fees. A record must be kept of the Bidders to whom Bidding Documents have been issued. Receipts must be issued for all fees paid. Where the Bidding Document is issued to pre-qualified or short-listed bidders, the documents must be issued to all bidders at the same time and must be issued early enough to ensure compliance with the minimum bidding period. A record must be kept of the issue of all bidding documents (MOFED, 2010).

2.3.4. Bidding Period and Bid Receipt

According to the standard bidding document prepared by the FPPA 2011, The Bidder shall enclose the original and each copy of the bid, including alternative bids, if permitted in accordance with ITB, in separate sealed envelopes, duly marking the envelopes as “ORIGINAL” and “COPY.” These envelopes containing the original and the copies shall then be enclosed in one single envelope. The inner and outer envelopes shall:

- Be addressed to the Public Body in accordance with ITB
- Bear the subject of the procurement or the Project name, and procurement reference number indicated in the BDS;

The outer envelopes shall also indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared “late” pursuant to ITB. If all envelopes

are not sealed and marked as required, the Public Body shall assume no responsibility for the misplacement or premature opening of the bid

Deadline for Submission of Bids

Bidders may always submit their bids by registered post or by hand. Bids must be received by the Public Body at the address and no later than the date and time indicated in the BDS. Bear the words “**Not to be opened before the time and date for bid opening**”. The Public Body may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents, in which case all rights and obligations of the Public Body and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended. (ERA, 2011)

Late Bids

The Public Body shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB. Any Bid received by the Public Body after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder. (FFPA, 2011)

Withdrawal, Substitution, and Modification of Bids

A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization (except that withdrawal notices do not require copies).

Bids requested to be withdrawn shall be returned unopened to the Bidders. Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid. No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and expiry of the period of Bid validity specified by the Bidder on the Bid Submission Sheet or any extension thereof. (MOFED, 2010)

2.3.5. Bid Opening

According to public procurement procedure 2011, The Public Body shall conduct the Bid opening in the presence of Bidders` designated representatives who choose to attend, and

at the address, date and time specified in the BDS. The opening of the Bid shall not be affected by the absence of the Bidders on their own will. All outer envelopes shall be opened one at a time, reading out: the name of the Bidder, the presence of a bid security, if required; and any other salient points of the Bid as the Public Body may consider appropriate. Only discounts and alternative offers read out at bid opening shall be considered for evaluation. No Bid shall be rejected at Bid opening except for late Bids. The Public Body shall record the minutes of the Bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification, the presence or absence of a bid security, if one was required, and any other salient points raised in the Bid opening proceeding. The Bidders' representatives who are present shall be requested to sign the attendance sheet. The omission of a Bidder's signature on the attendance sheet shall not invalidate the contents and effect of the minutes. A copy of the minutes shall be distributed to all Bidders. Any bid document not opened and read out during the bid opening proceeding shall not be considered for further evaluation.

2.3.6. Evaluation and Comparison of Bids

Information relating to the examination, evaluation, clarification, and comparison of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders. Any effort by a Bidder to influence the PE in the examination, evaluation, and comparison of the Bids or Contract award decisions may result in the rejection of its Bid. Upon completion of the Bid Evaluation, the Tender Committee shall be requested to make a Contract Award recommendation to the head of the Procuring Entity. It is important to note that a Contract Award decision by the head of the Procuring Entity is not a contract; it is a decision to award a contract to the bidder who submitted the lowest evaluated bid. (FFPA, 2011)

2.4. Instructions to Bidders

The Instructions to Bidders (ITB) inform Bidders of the procedures that regulate the bidding process. The ITB contain standard provisions that have been designed to remain unchanged and to be used without modifying their text. The ITB clearly identify the provisions that

may normally need to be specified for a particular bidding process and require that such details be introduced through the BDS.

Conventionally the Instructions to Bidders contain information and data relating to the procedure for bidding and evaluation up to the point of contract award. Matters that will govern the performance of the Contractor, payment under any resulting contract or the rights and obligations under any resulting contract are contained in the General Conditions of Contract, Contract Data and the Contract Forms, in particular the Contract Agreement. If duplication of a subject is inevitable in the different Sections of the document, care must be exercised to avoid contradiction between clauses dealing with the same matter(s). The Instructions to Bidders are not a Contract document and, therefore, will not form a part of the Contract (MOFED, 2010).

2.5. Bid Data Sheet

The Bid Data Sheet (BDS) supplements the ITB by specifying details relevant to an individual bidding document such as its closing date or the value of bid security required. The Employer must specify in the BDS only the information that the ITB request be specified in the BDS. All information shall be provided; no clause shall be left blank.

To facilitate the preparation of the BDS, its clauses are numbered with the same numbers as the corresponding ITB clause. The BDS should be prepared by the PE prior to the issue of the Bidding Document. Conventionally the BDS contains information and data relating to the procedure for bidding and evaluation up to the point of contract award. The Bid Data Sheet is not a Contract document and, therefore, will not form a part of the Contract. (ERA, 2011)

2.6. Evaluation and Qualification

The purpose of the Evaluation and Qualification Criteria (EQC) is to inform Bidders of the criteria that the Employer will use to evaluate the bids and post-qualify the bidder submitting the lowest evaluated bid. This is to ensure that the evaluation is fair and treats all Bidders in the same manner. It also should assist Bidders to prepare responsive bids which meet the PE's needs and are competitive. The Employer must prepare the minimum EQC and include it as a

part of the Bidding Documents. For the Minor Works Bidding Document this information is included within the Bid Data Sheet. Criteria are provided in the Bid Data Sheet, but the criteria must be prepared for each individual requirement, depending on the value of the potential bids, and the complexity of the assignment.

This part of the Bid Data Sheet must be drafted in conjunction with the standard instructions in Section 1, Instructions to Bidders. It is used to modify the standard instructions and to provide figures and other details for the qualification criteria, which are appropriate to the particular works contract.

Where a pre-qualification has been conducted, the wording referring to qualifying criteria should be deleted and replaced with “Not applicable.

Where no pre-qualification has been conducted, the standard wording should follow the approach indicated in the Bid Data Sheet. The criteria can be amended or deleted, if appropriate, and further criteria can be added as required. (ERA, 2011)

2.7. Bidding Forms

The Procuring Entity must include all bidding forms that the Bidder must complete and include in its bid in the Bidding Document. As specified in Section 3 of the Bidding Document, these forms are the Bid Submission Form, the Priced Schedules (Bill of Quantities or Activity Schedule, depending on the type of contract), the Bid Security Form and the Qualification Information form (MOFED, 2010).

The one Bidding Form that will require the considerable attention of the Employer or the consultant responsible for development of the Bidding Documents is the Bill of Quantities or Activity Schedule and some guidance on its preparation is given below:

2.8. Contract

Conditions of Contract the Conditions of Contract (CC) contain standard provisions that have been designed to remain unchanged and to be used without modifying their text. The CC clearly identify the provisions that may normally need to be specified for a particular bidding process and require that such provisions be introduced through the Contract Data, Section 8. The CC will form part of any resulting Contract (MOFED, 2010).

2.8.1. Contract Forms

Section 9 of the Bidding Document contains forms for the Contract Agreement, the Contract Security, and the Advance Payment Security. The purpose of including these forms in the Bidding Document is to notify the Bidders of the type and detail of the Contract they would receive in the event of an award. No input is required by the Employer when drafting the Bidding Document and there is no requirement for Bidders to submit these forms with their bids. (ERA, 2011)

2.8.2. Contract Agreement

The completed Agreement will form part of any resulting Contract. However, the details to be completed on the Agreement are specific to the successful Bidder and therefore should be left blank for inclusion in the Bidding Document.

After notification of award, the Employer shall prepare the Agreement using the Agreement Form and send it to the successful Bidder. It is rare that a major works contract is awarded on the basis of only the bid, as negotiations are normally held with the best evaluated Bidder to settle any minor matters arising from the bid or clarifications. It is good practice to conform the contract document in accordance with any agreements reached during negotiations and any modifications during evaluation. The Contract Agreement prepared should therefore incorporate any corrections or modifications to the Bid resulting from corrections of errors, selection of an alternative offer, acceptable deviations, or any other mutually-agreeable changes allowed for in the Conditions of Contract, such as changes in key personnel, subcontractors, scheduling etc. The contracting parties will then sign the conformed document. The successful Bidder should sign the Agreement and return it to the Employer. (ERA, 2011).

2.8.3. Contract Security and Advance Payment Security

The Contract Security form should be completed by the financial institution and returned to the Employer, by the Contractor with the signed Contract Agreement. Similarly, if any advance payment is specified in the contract, the Advance Payment Security should be completed by the financial institution and submitted by the Contractor to the

Employer with an invoice. Therefore, the Employer is not required to input any information to the security forms.

The bank guarantee forms are drafts for unconditional (or “on-demand”) bank guarantees, which have the merit of simplicity and of being universally known and accepted by commercial banks. The contracting community, however, strongly objects to this type of Security because the Guarantee can be called (or threatened to be called) by employers without justification. Procuring Entities and Engineers should recognise the contractual conditions governing nonperformance by the Contractor and should normally act only on the advice of the Engineer in calling a bank guarantee. Any unjustified calling of a Bank Guarantee, or unreasonable pressure exercised by an Employer, would be regarded as contrary to the spirit and basic principles of procurement. Ethiopian contractors are permitted to submit a performance bond, in place of a bank guarantee, for the contract security. Only bank guarantees are permitted for the advance payment guarantee.

The Bidder is required to provide should be detailed by the Employer in the Bidding Document. No Input of Information is required for inclusion in the Bidding Document. Input of Information will be completed by the Employer at contract award stage (ERA, 2011).

2.8.4. The Letter of Acceptance

The Letter of Acceptance does not form part of the Bidding Document. However, it is the document normally used to accept a bid, and therefore to form a contract, so it is essential that it is used correctly by Procuring Entities.

A Letter of Acceptance must not be issued prior to obtaining all required approvals, including from the Tender Committee and head of the Procuring Entity and ensuring that sufficient funds have been committed for the contract (ERA, 2011).

2.8.5. Letters to Unsuccessful Bidders

Procuring Entities are required to inform unsuccessful Bidders that their bids have been unsuccessful and to inform them of the successful Bidder and provide brief reasons why their

bid has failed. Unsuccessful Bidders must be informed of the successful Bidder at least five working days prior to contract award (ERA, 2011).

2.9. Conditions prerequisite to bidding

Before bids can be solicited, basic conditions required by the institute policies, delegations of authority, and federal and state regulations must be met. These conditions apply to competitive bidding and negotiated contracting. Before soliciting bids for any construction contract, the institute's Designated Administrator must ensure that all of the following conditions are met (ERA, 2011):

1. The commitment of funds, the scope of construction, and equipment to be acquired conform to the project scope and cost itemization in the current approved Project Planning Guide or conform to the project description in the case of minor capital improvement projects.
2. The bidding documents conform to those in the Facilities Manual or modification to the documents are approved by the Office of the General Council and Office of the President
3. For state-funded projects, the bidding documents have been approved by the Mowd, as applicable.
4. Funds are available.
5. The project complies with the most recent version of the "Amended institute Procedures for Implementation of the Environmental Quality Act."
6. The documents conform to fire and life safety requirements of the Country's Building Standard Code.
7. Independent certification is made that the design meets or exceeds energy regulations and standards.
8. The project complies with the provisions of the state's Coastal Act, if appropriate.
9. The documents conform to the institute's seismic safety policy.
10. Procedures for providing disabled access are followed.
11. Drawings and specifications for licensed hospital facilities are approved and stamped by the Office of Statewide Health Planning and Development (OSHPD). OSHPD

approves documents for the design and details of architectural, structural, mechanical, and electrical systems.

12. Drawings and Specifications for state-funded non-hospital related projects are approved and stamped by the Division of the State Architect for disabled access requirements.

13. State review of any required environmental document has been completed.

2.10. Qualification of Bidders

2.10.1. Purpose of ‘Qualification’

The purpose of any system of qualification of Contractors is to ensure that in a competitive bidding situation the winning bidder has the financial, technical and human resources available to successfully complete the works. The qualification process should be designed to ensure that the contractors whose bids are being evaluated in detail are all capable. The outcome will be to minimize the risk to the Employer of an unsuccessful project. (ERA, 2011)

2.10.2. Qualification Criteria

There are some principles which have to be followed when establishing the detailed criteria for a particular project.

Clearly the level of risk is higher for a large scale or technically complex project. Such projects are likely to have stringent qualification criteria.

For small scale projects of limited complexity there may be a policy of supporting the development of new contractors. The use of minimal qualification criteria will lead to an increase in risk to the success of the project and to both parties. The risk of failure by a contractor is often linked with cash flow problems. If there is a strategy for the development of national contractors then there may be a strategy of relaxation of stringent qualification criteria associated with adjusted payment terms (e.g. level of advance payment, retention etc.) Qualification criteria generally cover the following aspects: Legal Status, Eligibility/Registration, Financial Status, Equipment, Staffing, Experience and References, General, Specific, and Historical contract non-performance (MOFED, 2010)

2.10.3. Qualification Thresholds

Many of the qualification requirements are not seeking a yes or no answer, but require a quantitative response. The qualification document will normally set out these thresholds, which should be developed on a project by project basis to reflect the scope and nature of the project and the status and capability of potential contractors (MOFED, 2010).

Approaches to Qualification

A major Employer can adopt one of 3 approaches to qualification:

1. Pre-Qualification
2. Post Qualification
3. Pre-Qualification to an approved list

Pre-qualification: is an approach recommended by the World Bank and is a two stage process. There is an 'open' procedure for each particular project where, following advertisement, contractors can submit a pre-qualification document. After the prequalification documentation has been evaluated by the Employer those contractors who have been successful in the prequalification can then receive the main bidding documents and submit a full proposal.

Post qualification: is when all the qualification documentation forms part of the main bidding document. This is generally the case under a full open procedure where all interested contractors can submit their qualification details and proposals. The evaluation is done in stages where only those contractors passing the first evaluation of their qualification information can then have their full bid evaluated. The stages can be Administrative, Technical and financial, and may include a two envelope system with the financial envelope not being opened unless a Contractor has been successful in the earlier stages of the evaluation. This bly is the procedure followed by ERA for nationally funded projects.

A short listing procedure based on an approved list: is only really suitable for National Competitive Bidding. Periodically, say every 3 years or so, Contractors are required to submit qualification information for each category and scale of work. Following evaluation by the Employer the eligible and successful contractors go onto an approved list. Only contractors

on this list can then bid for each respective category of work and the listing is used by the Employer in order to select the short list for any particular project. Major Employers will generally develop their own approved list, with Contractor registration being a pre-requisite. If the Contractor registration system is robust then an Employer could short list Contractors directly from appropriate categories of registered Contractors.

In Ethiopia there is good familiarity with 1 and 2 above. What follows is a table providing some guidance on criteria to be considered as a minimum for each of the new 'suite' of Bidding Documents.

The listing in the table is based on current practice in ERA where some of the headings are very specifically relevant for a post qualification approach (e.g. reference to the site visit).

Note: for a particular project there are many factors to consider and the Employer and his Engineering staff or advisors must apply commercial and engineering judgment when setting out the relevant qualification criteria and the thresholds which will apply.

2.10.4. Disqualification

Disqualification is another method of determining bidder "responsibility". Disqualification may prohibit a contractor from bidding on Institute projects for a set period of time, whereas prequalification and qualification evaluate contractors for bidding on a specific project or on a predetermined value of multiple projects (MOFED, 2010).

A list of contractors that have been debarred and are not eligible to bid on public works projects as a result of violations of Labor Code provisions governing prevailing wage and apprenticeship is available on the ministry of housing construction (construction proxy.com) website. The Facility can check this list to verify if a potential bidder is eligible.

Inevitably, there will be some defective work, schedule overruns, and disputes about guarantee work on almost all projects. Before a bidder can be disqualified, however, the Facility must establish, in an objective manner that the bidder's past performance was materially deficient in the area used as the basis for disqualification.

2.10.4.1. Disqualification guidelines

1. A contractor or subcontractor who has demonstrated performance that is not responsible on current or past Institute projects may be disqualified, by the Facility, from bidding on current or future Institute work for a period of three years.
2. The period of disqualification shall be for an indefinite period for a contractor or subcontractor who has demonstrated performance that is not responsible by falsifying any information required during prequalification, qualification, bidding, or required by the contract documents.

2.10.4.2 Disqualification procedures

- I. Determine whether a contractor or subcontractor has demonstrated performance that is not responsible. The following are considered examples of performance that is not responsible and that may lead to disqualification:
 1. Falsification of any information required during prequalification, qualification, bidding, or required by the contract documents.
 2. Performance of work without the required contractor's license.
 3. Non-observance of safety requirements.
 4. Failure to meet requirements of law in employment.
 5. Failure to meet contractually agreed-to affirmative action commitments.
 6. Use of unlicensed or improperly licensed subcontractors.
 7. Substitution of a subcontractor without the Institute's written consent.
 8. Failure to submit or adhere to contractually required and agreed-upon schedules.
 9. Conviction of a criminal offense in connection with current or past contracts with any entity.
 10. Poor past performance of work on Institute projects as evidenced by continued use of defective materials, refusal to correct work not in accordance with the contract documents, termination for cause, or repeated failure to provide proper supervision required by the contract documents.

11. Use the Notice of Disqualification to notify the contractor or subcontractor of disqualification from bidding Institute work at any Facility. In the notice, list all specific examples from procedure 1, above, that serve as the basis for the determination that contractor or subcontractor performance is not responsible. Send the notice by a means that provides proof of receipt.
12. Resolve appeals. Contractors or subcontractors may file a written appeal of the Facility determination that their performance is not responsible to the Chair, Construction Review Board, with concurrent copy to the responsible Facility administrator where the original decision was made, within 10 calendar days from their receipt of the Notice of Disqualification. If written objections are received during that time period, a hearing must be established for contractors or subcontractors to demonstrate that their performance is responsible.
13. Conduct hearings. The Chair, Construction Review Board, will appoint a hearing officer to preside over the hearing in the manner detailed in the Sample Letter: Hearing on Disqualification. This letter must be sent by the hearing officer to the contractor or subcontractor, to establish a hearing, at least five calendar days before the scheduled hearing date. The decision of the hearing officer is final and not appealable within the Institute. (Article 16.21)

2.11. Bid irregularities

Examples of bid irregularities include but are not limited to the following:

- Incomplete submittals
- Unsigned bids
- Non required attachments or related documents
- Qualifications made to the bid
- Stipulations made on the Bid Form
- Discrepancies
- Submittals on unauthorized forms
- Late or mishandled bids
- Claimed mistakes

The Instructions to Bidders allows the Institute to waive nonmaterial irregularities in a bid. Generally, nonmaterial irregularities are those that substantially comply with the bid requirements and do not affect the bid price, time, or conditions. Material irregularities in the form or content of a bid affect the bid price or time and give the bidder making the irregularity an advantage or benefit over another bidder. Material irregularities may not be waived (UCOP, 1994).

2.12. Addenda

Addenda are written text and drawings, if required, that modify or interpret the bidding documents including the Drawings and Specifications issued prior to the bid deadline. Addenda are issued after the bidding documents have been issued to bidders. Response to questions raised at the pre-bid conference or at another time during the bidding period may require the issuance of addenda.

Plan holders. A plan holder is any person or entity who is known by the Facility to have received a complete set of bidding documents **and** who has provided a street address for receipt of any written pre-bid communications (e.g. addenda).

Issuing Addenda. Addenda are prepared by the Institute's Representative and the Facility. Only the Facility office that issued the bidding documents may issue addenda. Addenda are sent to plan holders by a means that provides a proof of receipt. In the case of informal bidding, addenda are sent to those who have been sent a Request for Bid.

Issue addenda so they are received by all Plan holders at approximately the same time, and are received no later than three business days prior to the bid deadline. An Addendum to change the bid deadline to a later date or to withdraw the solicitation of bids may be sent at any time before the bid deadline. (UCOP, 1994).

2.13. Online bidding

One of the ways in which e-Technology has been adopted by the construction industry is in the procurement process. Whilst there may be benefits in the use of e-technology for this process, there may also be risks. (CIC, 2010).

On-line bidding is known by several names, including ‘electronic reverse bid auctions’, ‘reverse auctions’ or simply ‘e-Auctions’. The phrases ‘on-line bidding’ and ‘e-Auctions’ are used interchangeably throughout this guidance note (www.infinitiesource.com, 2012).

The use of on-line bidding should only be used where the requirement can be ‘accurately specified’ by the client (although this is not to say the requirement cannot be complex). The on-line bidding should only take place once the brief has been fully developed (www.infinitiesource.com, 2012).

Factors other than price (e.g. Delivery, quality, etc.) Should be taken in to account by the client prior to the online bidding in order to ‘weigh’ the price bids in which to determine the overall position of bidder. The on-line bidding process should be open and transparent as a matter of good practice. There are many ways of setting up an e-Auction, which will affect the way in which a bidder will be able to view his ranking. For instance, a bidder may see his position on a graph amongst other bidders’ bids or he may see his own position only, it is up to the client to select the most appropriate e-Auction design (CIC, 2010).

On-line bidding has been used in other industries for some time but was subsequently adopted by some – usually very large portfolio – construction industry clients in purchasing not only products but also professional services and complex services including major contracts for construction that may include design elements and considerable subcontractor input. This expansion of the use of on-line bidding to include the purchase of services in the procurement of professional and complex services has faced significant opposition from many representatives of the construction industry, primarily because of the process’s apparent focus on price rather than quality or value.

Online bidding is used in reference to the ability to access a plan room (plans room, plan room) or a bid opportunity notification service. The reality is that technology has advanced

significantly and it is now possible to consider online bidding in the full context of its meaning including the complete bid submission process (www.infinitesource.com, 2012).

There are ten key elements to a complete online bidding system including:

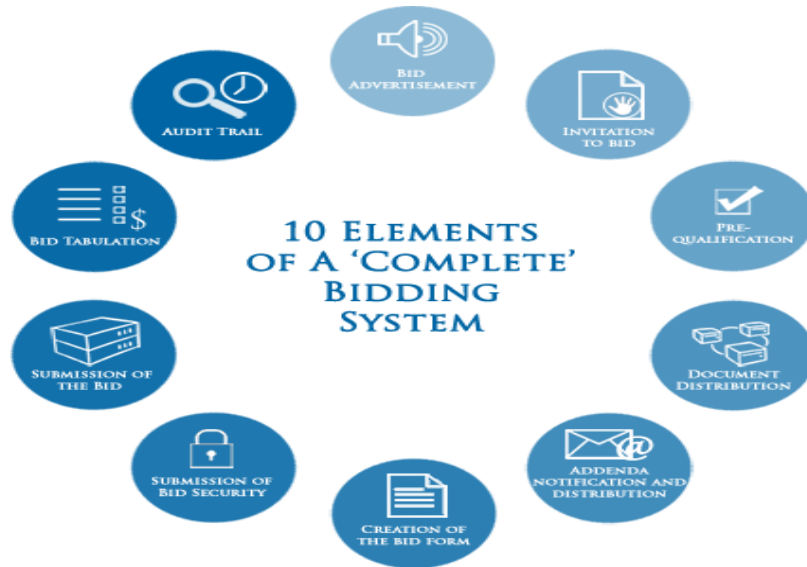


Figure 2.1: Ten elements of a complete bidding system (SEC group, 2010)

1. Bid Advertisement – If the project is not by invitation only it is important to be able to notify interested bidders that there is an opportunity to bid on.

2. Invitation to bid – For when there are bidders who are to be proactively advised of the opportunity.

3. Prequalification – For some projects the bidders must demonstrate their competence and ability to complete the work prior to being invited to submit a bid.

4. Document Distribution – Distributing the drawings, specifications and any supplementary information is an essential element of the process. When properly integrated into the system there is no possibility of missing or incomplete information being used in the formulation of a bid submission.

5. Addenda Notification and Distribution – All bidders must be quickly notified of any new addenda and be provided quick and easy access to the information to avoid delays or errors in the submission of bids.

6. Creation of the Bid Form – The system must provide the ability to securely create the bid form including all the varied elements that make up a construction bid at a minimum including; base bid, separate prices, alternate prices, unit prices, cash allowances, stipulated sums, tax clauses, bond requirements, time to completion, labour units and other required schedules.

7. Submission of Bid Security – The bid bond when specified is an integral and essential element of a complete bid submission and must be able to be included as part of the bid package.

8. Submission of the Bid – The ability for bidders to follow their normal practices when preparing the complete submission is essential. It must be a fully secure environment that offers the ability to; apply for and receive a bid bond, allow others in the bidding company to work on the submission if required, withdraw the bid prior to closing time if required and of course enter all required elements of the bid call.

9. Bid Tabulation – Once the bid closing time had been reached the recipient must be able to easily compare and evaluate the information using a tabulated set of bid responses.

10. An Audit Trail – A complete and accurate log of all the activities required to complete this process is essential to assist in avoiding and resolving issues of non-compliance or claims arising from missing or incomplete information.

These 10 elements when enabled within a secure and reliable IT infrastructure combine to form a complete bidding system that provides every participant in the process the tools and information they need to successfully complete the aspect of the bidding process that they are responsible for.

So ... as you might have already guessed, I think it is time to reframe the references to online bidding. It is much more than just the ability to view a document online or send out invitations to bid. When viewed as a system it is a more efficient and effective way to deliver online bid submissions that are complete, compliant and easily evaluated

2.13.1. Online bidding for construction projects

The integrated online bidding software is secure technology that ensures the integrity of the process while delivering all the benefits of a controlled online system (www.infinitesource.com, 2012).

Benefits

- The entire bidding process is managed consistently and correctly
 - Custom branded application maintains your corporate identity
- Typical clerical errors made by Bidders are eliminated
 - Fewer invalid or 'non-acceptable' submissions
- Automatically tabulated results are available immediately
 - No risk of transposition errors
- It is faster, easier and less expensive for all parties
 - No hardcopy bids or faxed amendments to deliver or manage the reception of

You can ensure there are no gaps in your bidding process by combining our online bidding with its notification, Invitation to Bid and online plan room features. The entire bidding process including communications with the bidders, distribution of plans, specifications and addenda as well as reception of the bids is conducted in a single application that manages every key aspect of the process.

Infrastructure

- Hosted system eliminates capital investment, software and maintenance costs
- Custom branding maintains your corporate identity

Security and Access Control

- Secure Access Key technology makes sure only the people you want to can view your documents
- Automated access management eliminates the need for administering user accounts
- Permission controls make it easy to control access by predefined groups
- Set access permission levels on documents, folders or projects

File Management

- Easy drag and drop upload simplifies the task of managing your document files
- Easily replicate the folder structure you use on your local drive
- Post any file format you use including .tiff, .pdf, .dwg, .dxf, .jpg, .gif, .doc or any other

Version Control

- Automated version control ensures everyone is working from the correct documents
- Current versions are automatically visible
- Automated new document notices for Addenda and any other new documents make sure everyone is immediately aware of any new information
- Historic versions are retained and accessible by administrators or by permission

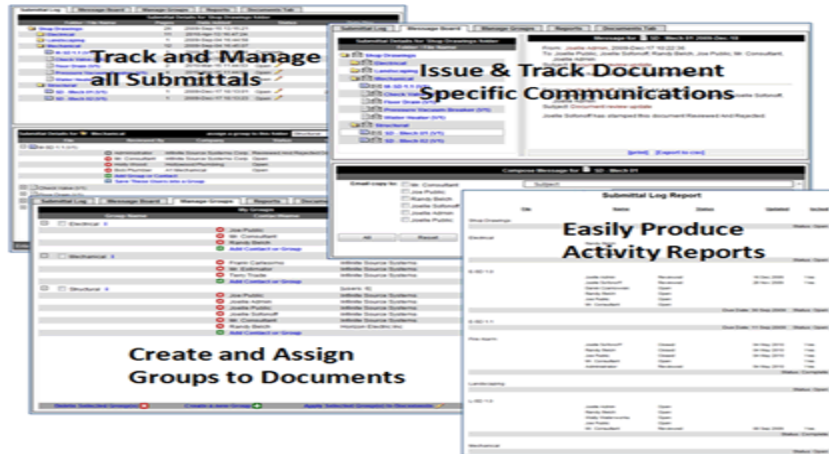


Figure 2.2: Entire bidding process (SEC group, 2010)

Multi-Purpose Document Viewer

- 2) Immediately view and work with large format .pdf, and .tif files
- 3) Zoom and pan images
- 4) On screen counting and measurement tools enable quantity takeoff
- 5) Search .pdf document text by keyword
- 6) Annotate and redline documents such as shop drawings and as built record drawings

Communication

- Automated notices for Addenda and any other new documents make sure everyone is immediately aware of any new information
- Complete Contact data management tools help automatically keep your lists up to date
- Integrated Fax and email communication make it fast and easy to distribute notices, Invitations to Bid or other project communications

Document Output

- Immediately view and work with any document online

- Download any available file for use locally
- Print to your own local printer
- Send orders for copies to a professional reprographer

2.12.2. The On-line Bidding Process

The process involved in on-line bidding varies depending upon the products and services procured, Generally speaking however, the process is as follows (CIC, 2010):

1. Bidders are pre-qualified using the criteria expressed at the outset by the contracting authority.
2. Pre-qualified bidders will be invited by the client to submit a ‘technical’ proposal containing everything (except the price) and to participate in the auction on a specific date and at a specific time. Specifications and instructions on how to participate in the auction will be provided in advance of the event. Bidders will be advised after prequalification an e-auction will take place.
3. Client will provide software and practice/training as necessary.
4. Client will review the technical proposals and resolve any qualifications and apply weighting if appropriate. In the case of weighted bids the prices submitted at the e-auction stage may be subjected to an overall weighting, which takes into account criteria other than price alone, so the display bid will not purely be based on price alone.
5. The on-line bidding exercise will usually be conducted on behalf of the client by an IT service provider. It is usually specified that bidders can only bid downwards and the minimum decrement is usually specified.
6. The bidding exercise will have a specified opening and closing time. The e-auction will close when no new bids are received and the closing time has expired. If however, a new (lower) bid is received just before the scheduled closing time, the allocated bidding time will be extended.
7. The bidders’ identities will be kept confidential during the event although the number of bidders will usually (but not always) be apparent from the screen.
8. The client may sometimes display an opening bid price; this will be an indicative guide to bidders. From this point onwards, all bids will progress downwards

during the duration of the e-auction. The clients may set the e-auction parameters so as not to allow bidders to start their bidding higher than the opening bid price.

9. Each bidder will receive feedback on its own ranking in relation to the other bidders.
10. Each bidder will be able to submit as many new bids as they wish up to the closing time of the e-auction; the rankings will be revised accordingly.
11. All bidders will be notified of their results.
12. The client will have an opportunity to review the bids to ensure that quality, service and other value adding considerations are met.
13. Once the review process has been carried out, the contract will be awarded to the successful bidder against the criteria that were established at the outset.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Study area

The study area was the capital city of Ethiopia, Addis Ababa. It is the largest city in Ethiopia. Administratively, the city is a chartered city having three layers of government: City Government at the top, 10 sub-city Administrations in the middle, and 99 kebele at the bottom. The total area of the city is about 540 square kilometer (54000 hectare). Addis Ababa lies at an altitude of 7,546 feet (2,300 meters) and located at 9°1'48"N 38°44'24"E. 9.03°N 38.74°E Coordinates.

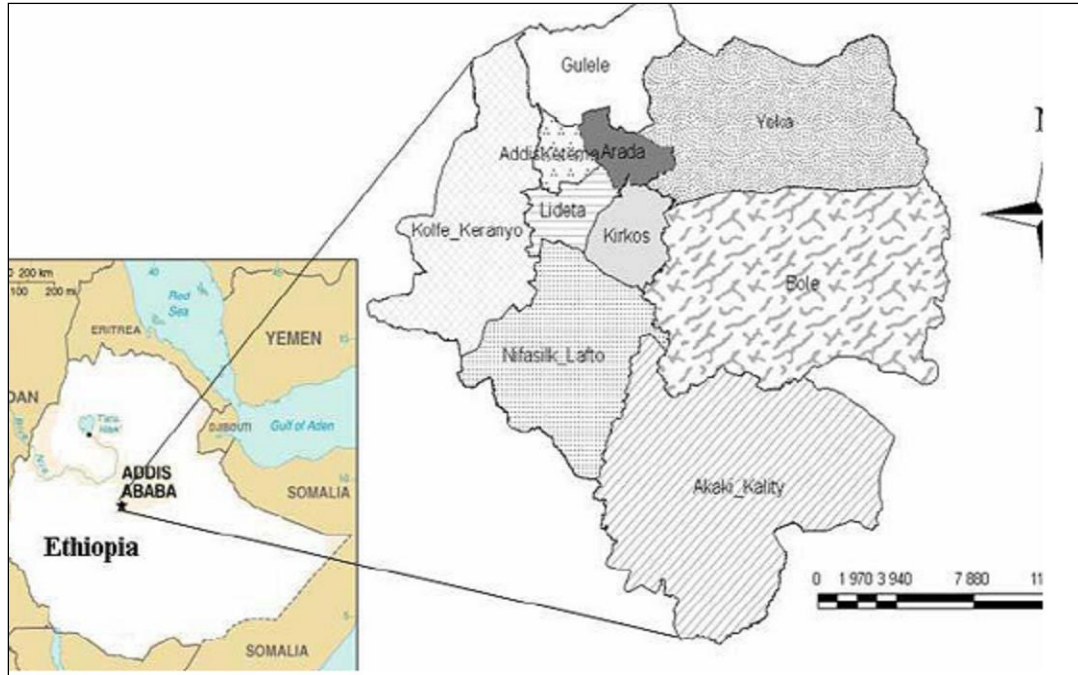


Figure 3.1: Map of Addis Ababa city (Bogale, Y. 2012)

3.2. Study Design

Hypertext preprocessor (PHP) server-side scripting programming language were used to develop the web based online-bidding application prototype and the prototype was compared with the current conventional bidding system based on time, money, procedure and efficiency by using a comparative approach of research design.

3.3. Study Population

The study populations for this research were contractors and consultants who are engaged in construction projects in Addis Ababa. The list of contractors and consultants currently involved in construction projects were obtained from ministry of urban works, and some of the respondents are listed in appendix B.

3.4. Sampling size sampling technique

The respondents included in the survey consist of a total number of 30 professionals: 10 from clients, 10 from contractors and 10 from consultants. The numbers were determined on the basis of the time available for conducting the research work, available fund for the study (project), and the consistency of the respondents.

A purposive sampling technique was employed to select the relevant sample. Contractors and consultants with grade 3 and below were chosen for this study based on their contribution in the construction industry and by putting in mind that these construction firms are organized enough and have the capacity to use the proposed web application.

3.5. Study variables

3.5.1. Dependent variable

- Online bidding and conventional bidding system.

3.5.2. Independent variable

- Ease of access,
- Time Efficiency, and
- Cost efficiency

3.6. Data collection process

The research was started with literature reviews. Based on the information acquired from literature reviews and input from various local experts, questionnaires were developed for survey exercise. Questionnaires were developed for clients, contractors, Consultants.

After the development of questionnaire and before finalizing the draft, interview surveys were conducted. Based on the suggestions questionnaires were improved. The

questionnaires were then dropped in person. Interviews also were held along the questionnaires survey to cross- check the information and obtain any extra knowledge.

The responses obtained from questionnaire survey were analyzed to investigate the current conventional bidding system in Ethiopian construction projects. Then related researches on online bidding was used to develop a new online bidding technology.

The questionnaire designed for the construction organizations contained two main types of questions. On the first part of the questionnaire, nature of the organizations were asked and general profiles of the companies were obtained. The second part consists of 10 questions about the perception of respondents on the current bidding system based on some attributes or criteria. From the answers of the respondents the merits and demerits of the conventional bidding system in our country Ethiopia, was analyzed.

3.7. Data processing and analysis

The categorized data were then coded and analyzed using Microsoft Excel software. The Relative Importance Index (RII) was calculated using the formula. The five point Likert scales (0, 1, 2, 3, and 4) is used to calculate the relative importance index for each challenges and which was then used to determine the relative ranking for the challenges.

The basic tools of analysis for the collected data to achieve the objectives of this research are summarized as follows

The Relative Importance Index method (RII) was used identify the major challenges of ongoing construction and determine the effect of the challenges of road projects in the city of Addis Ababa respectively. The relative importance index can be computed by applying the relationship as shown below [45].

$$RII = \frac{\sum W}{A * N} \dots\dots\dots\text{Equestion-1}$$

Where: W is the weight given to each factor by respondents and ranges from 1 to 5

$W = w_i * x_i$; Where: i = response category index

w_i = the weight assigned to i^{th} response = 1, 2, 3, 4, 5, respectively.

x_i = frequency of the i^{th} response of the total responses for each factors.

A is the highest weight = 5

N is the total number of respondents

All the necessary procedure of conventional bidding was coded to the application by using PHP programming language.

HTML5 was used to design the front end interface and bootstrap code was used to maintain the aesthetic effect of the interface. MySQL was used to design the back end of the interface.

For the system security the password was encrypted and a password was given to the data base. The whole system is platform independent (i.e. it was made to operate in any type of window, for e.g. Windows, Linux, Ubuntu, etc.)

The application can be installed on a PC with a minimum specification requirement of 4GB RAM and 500GB HDD. But for a fast and wide use it was recommended to use a server to install the application.

The system was made to allow a user to enter a correct password, user name and email address three times trial only. If a user inserts an in correct username, password or email the system will lock the user out for 30 minutes so that he/she can try again after 30 minutes. A user who tries to enter a falsified data will be locked out from the system permanently.

The entire bidding process including communications with the bidders, distribution of plans, specifications and addenda as well as reception of the bids were made to be conducted in a single application that manages every key aspect of the process.

System functionalities of the web-based online bidding application prototype were semi manual (some part the result will be done by people for example document validity, technical document and other). It will allow bidder to submit their bid from wherever they are, check whether the company is registered or not, compare financial bid and rank then finally the company can check all document validity and notify the bidder result on system

The program were made to Lock all admin (procuring entity) login until the bid is closed for the sake of confidentiality and transparency. The overall design algorithm of the web based application is showed on the figure below

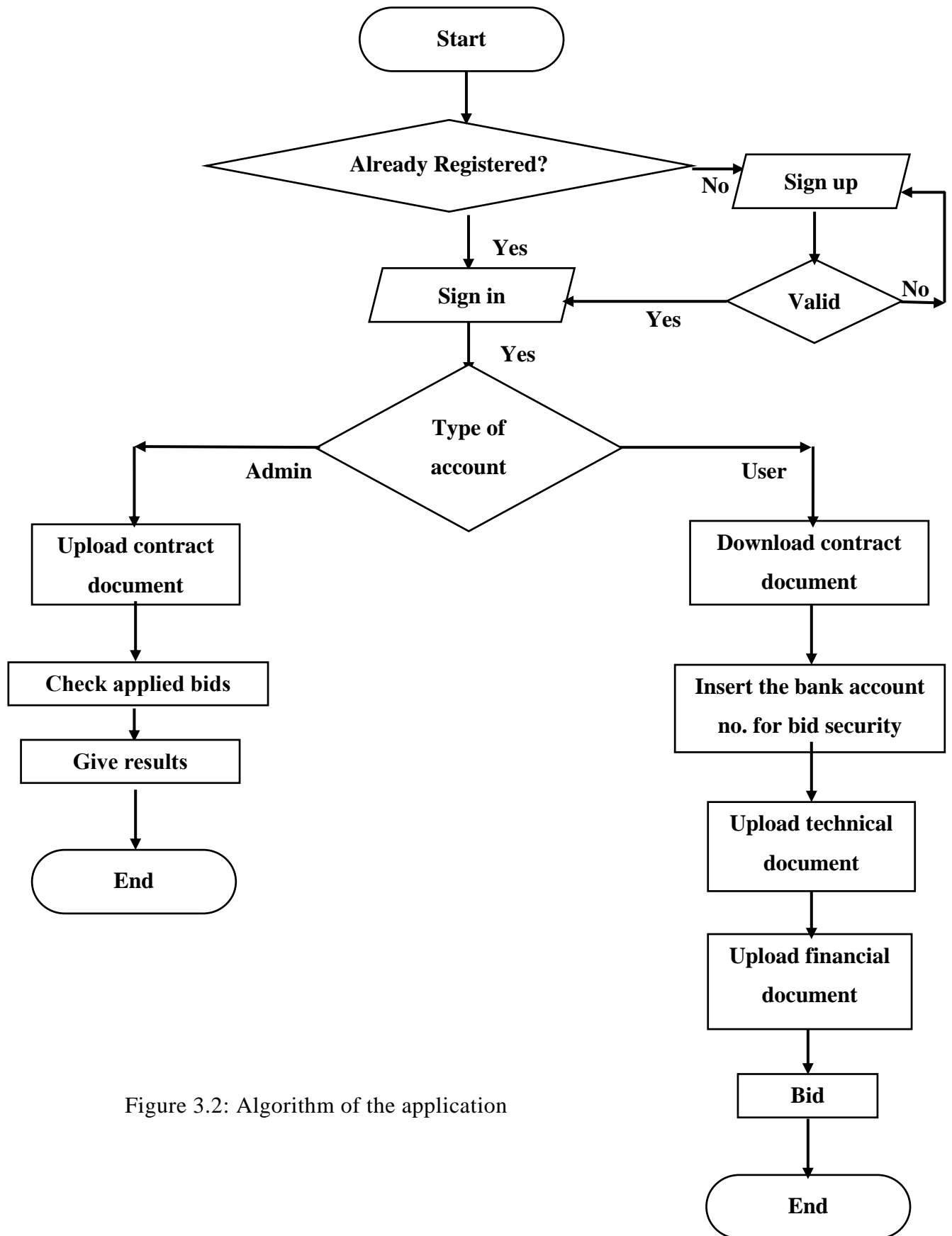


Figure 3.2: Algorithm of the application

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Investigation of the conventional bidding system

Respondents were asked to describe how the current conventional bidding system is affecting the construction industry based on time, based on cost, and based of ease of access through questionnaire survey.

Therefore based on the responses of the respondents the factors were analyzed and ranked by using relative importance index method as shown below.

4.1.1. Questioner summary on time efficiency

The respondents responded through the questionnaires' distributed for them that The conventional bidding system takes minimum of 4 hours to rank financial proposals and up to a week and above to compare the technical documents of the participants for a specific bid. The respondents also stated that It takes at least a minimum of 1 week to prepare the bid documents since there is too much work to be done and there are different processes that takes time from buying the bidding document to submitting the documents. If the bidder is out of town it is also time taking to come to the place where the bid is going to be submitted and opened. Therefore the factors were analyzed and ranked by using a relative importance index as shown below.

Table 4.1: factors affecting time efficiency

	client					RII	Rank	contractor					RII	Rank	consultant					RII	Rank	OVER ALL RII	RANK
	1	2	3	4	5			1	2	3	4	5			1	2	3	4	5				
time efficiency																							
preparing bid document	0	0	0	1	6	3.4	2	0	0	0	2	8	4.8	1	0	0	0	3	7	4.7	1	4.30	1
transportation ranking submitted bids	7	0	0	0	0	0.7	3	0	0	3	3	4	4.1	2	0	0	0	6	4	4.4	2	3.07	2
	0	0	0	0	7	3.5	1	10	0	0	0	0	1	3	10	0	0	0	0	1	3	1.83	3

As we can see from the above table, the selected clients responded that from the parameters given to assess the time efficiency, ranking submitted bids and preparing the bid documents are the factors which takes much time with a respective RII value of 3.5 and 3.4. And transportation have the least effect with RII value of 0.7.

Whereas the contractors responded that preparing bid document to submit the bid in time and transportation to submit the bid are the factors which takes much time with RII value of 4.8 and 4.1 respectively. The consultants responded that preparing bid document to submit the bid in time and transportation to submit the bid are the factors which takes much time with RII value of 4.7 and 4.4 respectively. And since the contractors and consultants should be available while the submitted bids are opened and where ranking is performed, the time it takes to rank the submitted bids by the PE have an effect on the time efficiency even though the contractors stated it as the least factor as compared with the other factors with RII value of 1.

4.1.2. Questioner summary on cost efficiency

When we come to the cost parameter the respondents responded that, on the traditional bidding system bidders will spend a minimum of 100 birr and they said that it may range to 2000 birr to buy bid document for submitting their proposal. Since bids must be submitted in three copies (1original and 2copies) it have printing and copying cost, even though it differs on how many pages that are going to be prepared with deferring the bid type, a bidder will spend at least 500 birr. In the conventional bidding system procuring entities should at least post an invitation to bid notice and posting on the newspaper costs a minimum of 700birr. If bidders are out of town there is a transportation cost to buy and open the bid document which depends on how far they are from the place the bidding is going to be executed.

Table 4.2: factors affecting cost efficiency

	client					RII	rank	contractor					RII	RANK	consultant					RII	Rank	OVERALL RII	rank	
	1	2	3	4	5			1	2	3	4	5			1	2	3	4	5					
cost efficiency																								
copying and printing cost	0	0	0	2	5	3.3	1	0	0	0	3	7	4.7	1	0	0	1	3	6	4.5	1	4.17	1	
transportation cost	7	0	0	0	0	0.7	3	0	0	4	3	3	3.9	3	0	4	1	4	1	3.2	3	2.60	3	
buying bid document cost	7	0	0	0	0	0.7	3	0	0	1	3	6	4.5	2	0	0	1	5	4	4.3	2	3.17	2	
postage cost	0	0	0	3	4	3.2	2	10	0	0	0	0	1	4	10	0	0	0	0	1	4	1.73	4	

As we can see from the above table, the selected clients responded that from the parameters given to assess the cost efficiency, copying and printing cost and cost for posting the introduction to bid notices are the factors which have high cost with a respective RII value of 3.3 and 3.2. And transportation and costs for buying bid document have the least cost for the clients with RII value of 0.7.

Whereas the contractors responded that copying and printing cost have the first place cost wise with RII value of 4.7 and costs for buying the bid documents varies according to the project complexity and they stated it as a second big factor for cost efficiency with RII value of 4.5. The other factor affecting the cost efficiency of bidding is transportation cost which depends on the distance of the place where the contractor travels to buy and submit bid documents and it lies in the third place with RII value of 3.9, and since it is not the contractors responsibility to post the introduction to bid notice, postage cost was not considered.

The consultants responded that copying and printing cost have the first place with RII value of 4.5 and costs for buying the bid documents varies according to the project complexity and they stated it as a second big factor for cost efficiency with RII value of 3.2. The other factor affecting the cost efficiency of bidding is transportation cost which depends on the distance of the place where the contractor travels to buy and submit bid documents and it

lies in the third place with RII value of 4.3, and since it is not the contractors responsibility to post the introduction to bid notice, postage cost was not considered.

4.1.3. Questioner summary on ease of access

The respondents also stated that the current bidding system commands procuring entities to publish an invitation to bid notice on at least a newspaper. And since there is no newspaper that is being distributed nationwide and we have many contractors and consultants in different nations they concluded that the reach for inviting bidders for all qualified contractors in the country is a big question. Therefore, since it's a competition and the competition we have now is not giving a chance for all contractors and consultants nationwide it is not fair if ease of access is considered.

The respondents were also asked where they get the information about the bid notice. And 90% of the respondents responded that they hear about bid notices on the newspaper. But they responded that most of the time they will see about the bid notice after 2 or 3 days passed or maybe they will miss the information because it is hard to check the newspaper every day.

From both the open and closed questionnaire Respondents were asked to describe their views about the bid submission and ranking process of our current bidding system. Parameters were given in the questionnaire based on confidentiality, based on documentation and based on information gap.

The respondents said the bidding system has poor submission process based on confidentiality because they said the system have high exposure for favourism and corruption since bidders can communicate with the procuring entity privately so, that they can falsify or arrange their documents in such a way that they can win the bid.

The respondents said the bidding system has poor evaluation process based on documentation because since bid submission requires many forms to be filled and submitted if even one document or information is left out while submission of the bid document the bid may get disqualified.

The respondents said the bidding system has poor bid evaluation process based on information gap because, if bidders forgot or fail to perform any task that was written on the instruction to bidders will make bidders to be disqualified.

The respondents were asked through interview which method they will choose if an online bidding application can be developed. And all of the respondents answered that they would prefer the online bidding system and they also suggested some features to be incorporated on the application.

Table 4.3: Factors affecting ease of access

	client					RII	rank	contractor					RII	RANK	consultant					RII	Rank	OVERALL RII	RANK	
	1	2	3	4	5			1	2	3	4	5			1	2	3	4	5					
ease of access																								
accessibility of bidding	0	0	0	0	7	3.5	1	0	0	0	1	9	4.9	1	0	0	0	0	1	0	5	1	4.47	1
procedure	0	0	2	5	0	3.3	2	0	0	0	3	7	4.7	2	0	0	1	2	7	4.6	2	4.18	2	
documentation	0	0	1	2	4	3.1	3	8	2	0	0	0	1.2	3	5	2	3	0	0	1.8	3	2.03	3	
confidentiality	3	4	0	0	0	1.1	4	9	1	0	0	0	1.1	4	7	3	0	0	0	1.3	4	1.17	4	

As we can see from the above table all the respondents agreed that accessibility of bidding, procedure of bidding, documentation and confidentiality of submitted data's affect the ease for access of the current conventional bidding system with an overall RII of 4.47, 4.18, 2.03 and 1.17 respectively.

4.2. The proposed web based online bidding application Prototype

This online bidding web based application was developed by the researcher using a hypertext processor programming language. The application was designed to address the above mentioned problems from the questionnaires' and to standardize the conventional bidding system without altering the rules of procurement law. The different features of the application have been discussed as follows:

4.2.1 The application Home page

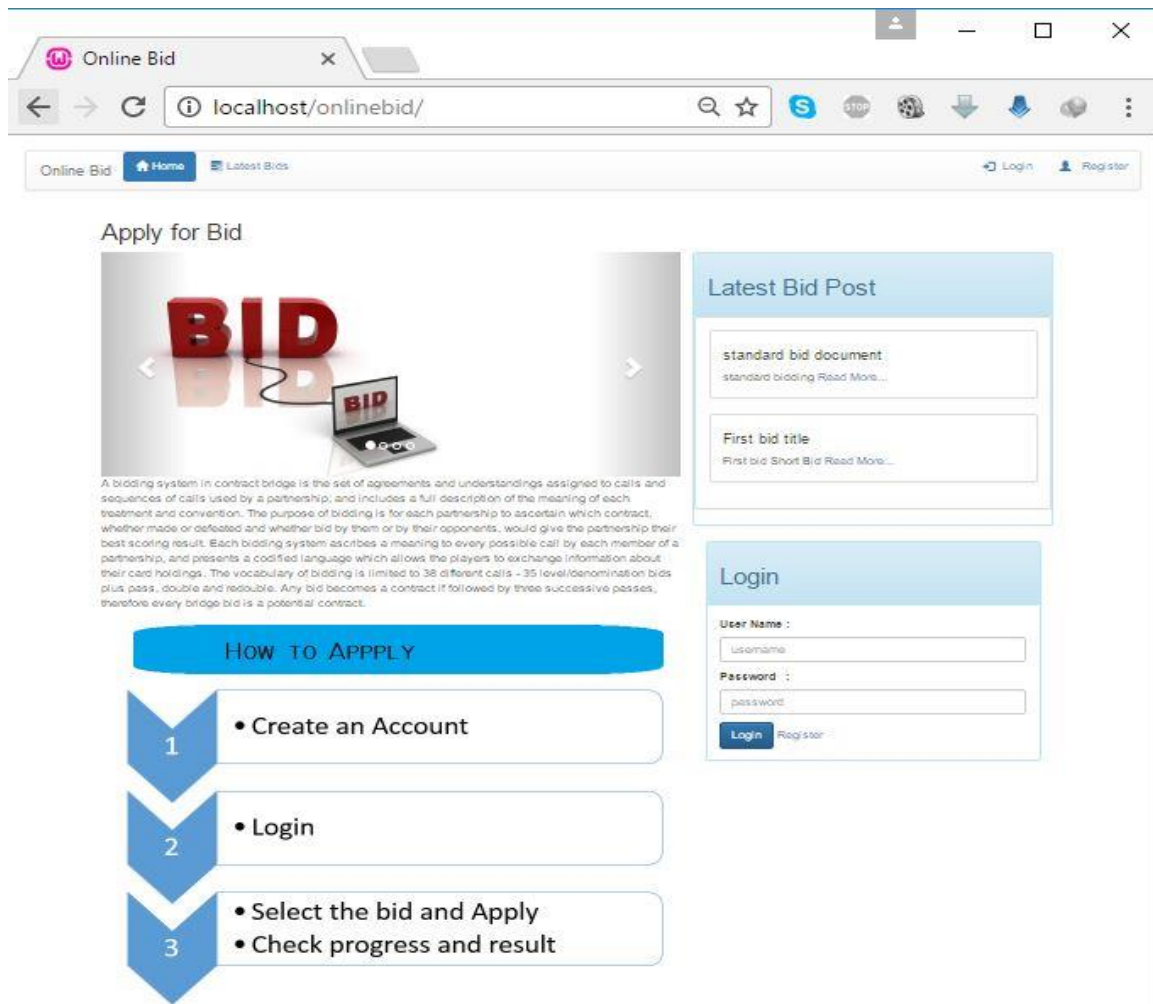


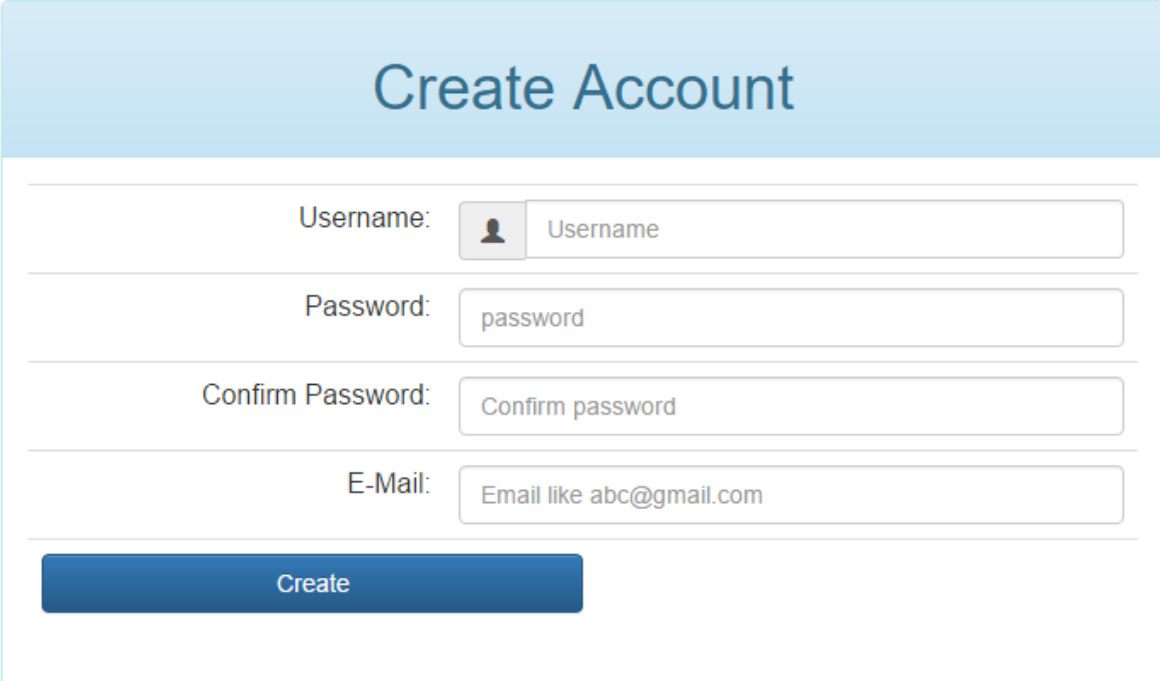
Figure 4.1: Home page

The home page consists register, login, logout, latest bid post, and how to apply features. To enter to the homepage users must follow the address which is <http://onlinebid.com>, it

was designed for users to register and if registered to login, to see if there are bids posted on the web or to apply for a bid, and it also incorporates a guide how to apply for a bid.

4.2.2. Registration to use the web application

This page was designed for any user to register to the application's database. Users should start by pressing the registration button on the home page then choose a user name, if users do not choose a username or if the username is already used by another user they will be asked to insert the username. Then choose password and confirm the password they enter. If users do not enter a password or if they did not confirm the password the program will ask them to insert the password and confirm it. After that they have to enter a valid email address, if users did not enter an email address or if the email address they entered is not valid the program will ask them to enter the email address again. Then the application will create an account. (see appendix A, for the algorithm)



The image shows a web form titled "Create Account". The form is contained within a light blue bordered box. At the top of the box is a header with the text "Create Account" in a dark blue font. Below the header, there are four input fields, each with a label to its left and a text box to its right. The first field is labeled "Username:" and has a small icon of a person next to it; the text box contains the word "Username". The second field is labeled "Password:" and the text box contains the word "password". The third field is labeled "Confirm Password:" and the text box contains the text "Confirm password". The fourth field is labeled "E-Mail:" and the text box contains the text "Email like abc@gmail.com". Below these four fields is a solid blue button with the word "Create" written in white text.

Figure 4.2: Registration page

4.2.3. Logging in to the application

There are two type of users in this application, the first one is the bidder and the second one is the procuring entity (client). Both users will have different username and password and the pages also differ in both cases because the page designed for admin users have more features than the normal users (see appendix A, for the algorithm)

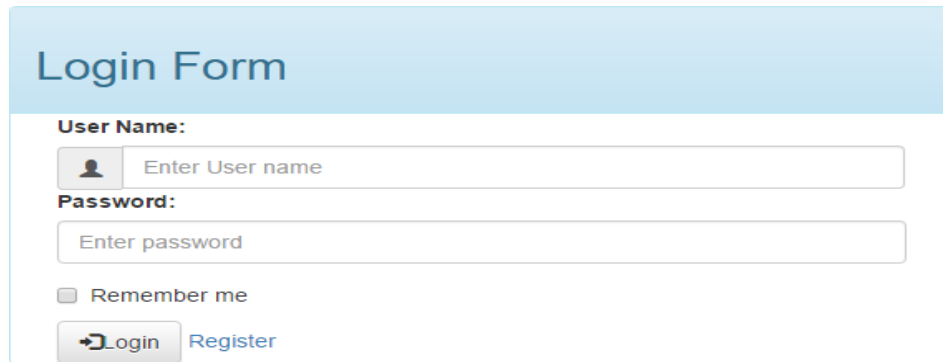


Figure 4.3: Login page

I. User (bidders) interface

This page was designed to use the web page for submission of bids for users who have already registered on the system. To login, users should start by pressing the login button from the home page then they have to enter username and password they used when they register. If password and username they enter is not correct the program will ask them to enter username and password again. If they enter correctly they will be logged in to this page. (see appendix A, for the algorithm)

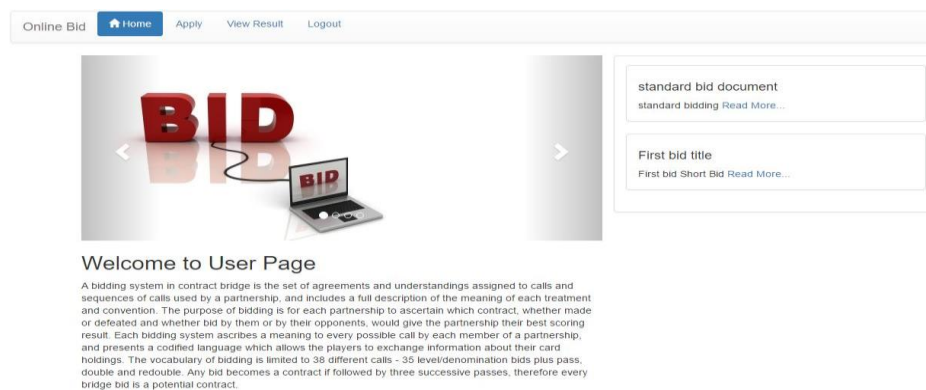


Figure 4.4: User page

II. Admin (Procuring entity) page

This page was designed for administrator (procuring entity) user only it will be used to post bids, to see submitted bids, and to add results. To enter into the admin page users should login by entering the username and password provided for admins. If they do not log in using an admin password, the system will ask them to log in. if they log in correctly the system will take them to the page which incorporates the home, post bid, applications, add results, and view result options. (See appendix A, for the algorithm)

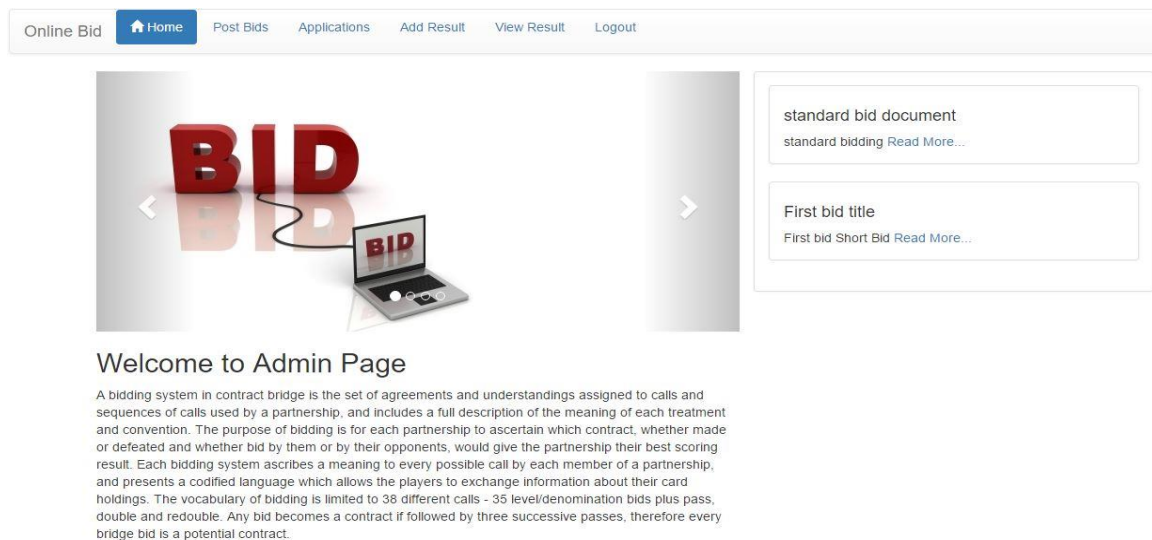


Figure 4.5: Admin page

4.2.4. Posting bid on the application

Since it's the PE's duty to post a bid, to enter to this page users must login by using administrator user name and password which is given for PE's by the owner of the application.

After logging in, the admin can post bids for bidders by pressing the post bid button on the admin page and entering the bid title, bid closing date, bid opening date, postdate, and by uploading the bid document. Since it is designed to post the bid if and only if all the fields on the page are filled, users should provide the asked information on all the fields (shown in the figure below) otherwise the system will ask them to enter the left out field to proceed. (See appendix A, for the algorithm)

The image shows a web form titled "Post Bid" with a light blue header. The form contains the following fields:

- Bid Id:** A text input field with the placeholder text "Bid Id".
- Bid Title:** A text input field with the placeholder text "Title".
- Bid closing date:** A date input field with the placeholder text "mm/dd/yyyy".
- Bid opening date:** A date input field with the placeholder text "mm/dd/yyyy".
- Posted on:** A date input field with the placeholder text "mm/dd/yyyy".
- Bid Document:** A file upload field with a "Choose File" button and the text "No file chosen".
- Short Bid Description:** A large text area with the placeholder text "Short Bid Description.....".

Figure 4.6: Post bid page

4.2.5. Applying for bid using the application

This page was designed for users to submit their bid. It have incorporated all the steps which are asked by the federal procuring plan agency. After logging in to the application bidders must check for the bid they want to participate on the latest bid page so that they will enter the bid id because they will be asked to inter the bid id they want to participate on. After that, users must select their grade as a contractor or consultant firm then name of qualified contractors or consultants will be listed out by the system which was gathered from the ministry of urban works and development so users will select their company's name from the listed out names with respect to their grade. If their company's name is not listed it means they are not qualified as a contractor or consultant so they should contact the MOWUD office to be registered as a qualified contractor or consultant, or else they cannot continue for submitting their bid. But if they are in the listed names they will continue to the next step which is entering a valid telephone no and email address. (See

appendix A, for the algorithm) Users then should proceed to the next step which is adding the important bidding documents, which are:

I. Bid security

Bidders must enter the secret code for the bank transfer they made to the procuring entity's office for the bid security on the field that asks bank account no. Users can use mobile banking to transfer the money from wherever they are so that they can proceed to the next step. Unless the bid security is submitted they cannot continue on submitting their bids. Since the procuring entity will post their bank account number on the bid document they posted, confidentiality will not be a question.

II. Technical proposal

Bidders should submit their technical proposal by preparing their document in pdf. Format because the system was made to recognize files which is in pdf format for the sake of uniformity and formatting. Bidders should lock their document for editing, add their signature and insert their stamp as a water mark before submitting so that it will be confidential and will not be altered.

III. Financial proposal

The system will make bidders to choose their financial document so Bidders should know the location where they save their financial document and it should be submitted in pdf format. Bidders should lock their document for editing before submitting so that it will not be altered and they should also add their signature and company stamp as a watermark for the sake of confidentiality.

IV. VAT and TIN

Bidders must be registered for value added tax (VAT) and they should have a TIN no. to participate in the bidding. This documents will be submitted in separate panel and in pdf format just like the technical and financial documents. Since the documents will be cross checked and any submitted documents found to be falsified will be disqualified and will be blocked from the system for further use.

V. License

Bidders must be licensed as a contractor or consultant with respect to their grade. And bidders should scan it and submit to the filed which asks for license, in pdf format. The license will also be cross checked for confidentiality.

Therefore bidders can apply for a bid eventually, if they submit all the documents asked by the stated fields on the page. The system was designed to make submission of documents easy and fast.

Apply for Bid

Bid :
Select Bid ▼

Grade :
Grade 1 ▼

Grade 1 Contractor List :
Select You Company ▼

Telephone :
Telephone

E-Mail :
company email

Bank Receipt No. :
Bank Receipt No.

Technical Proposal:
Choose File No file chosen

Financial Proposal:
Choose File No file chosen

VAT:
Choose File No file chosen

TIN:
Choose File No file chosen

License:
Choose File No file chosen

Apply

Figure 4.7: Apply for bid page

4.2.6. Viewing applied bids using the application

To view an application users must login by using admin user name and password because the page is designed for admin users only and it must be in the presence of bidders' designated representatives who choose to attend, and at the address, date and time specified in the BDS. Then after logging as an admin the PE can see applications from bidders by pressing the application button on the admin page and entering the bid title. (See appendix A, for the algorithm)

Applications on										
Company Name	Grade	Phone	Email	Receipt No	Technical	Finacial	VAT	TIN	License	
AW-HARIM Construction	Grade 4	0912794528	yohannesdejene83@gmail.com	1230	view technical	view finacial	view VAT	view TIN	view license	
Bamacon Engineering P.L.C.	Grade 1	1233	michaelagonafir@yahoo.com	123	view technical	view finacial	view VAT	view TIN	view license	
Afro Tsion Construction P.L.C. (Sisay Desta G/Yesus)	Grade 1	0912794528	ydejene6@gmail.com	1234	view technical	view finacial	view VAT	view TIN	view license	

Figure 4.8: Application viewing page

4.2.7. Bid evaluation and ranking applied bids using the application

This page was designed only for administrator (PE) users. Users should provide administrator password and username which will be given by the owner of the application, since the system locks out all administrator users until the bid opening date provided, the administrator will give the rank in the presence of bidders' designated representatives who choose to attend, and at the address, date and time specified in the BDS. After they login as an admin, they will choose the winner's company name by pressing the add result button.

Then the financial and technical weighted percentage should also be entered to post the result.

The system was designed to read the date and time from network so that changing the date and time on the personal computer will not alter the opening date. (See appendix A, for the algorithm)

The screenshot shows a form titled "Add Bid Result". It contains the following fields:

- Bid Title:** A dropdown menu with "Select Bid" as the placeholder.
- Company:** A text input field with "Company" as the placeholder.
- Rank:** A text input field with "Rank" as the placeholder.
- Result:** Two text input fields, one for "Technical(%)" and one for "Finacial(%)".
- Save:** A blue button.

Figure 4.9: Adding bid result page

4.2.8. Viewing result on the application for the bids submitted

To view a result users must login first then by pressing result button from the user page they have to enter the bid title they want to see the result for in that case the system will show a tabulated result to the respective bid. (See appendix A, for the algorithm)

The screenshot shows a search interface for viewing bid results. It includes a "Bid id" dropdown menu with "Select Bid" as the placeholder and a blue "Search" button. Below this is a table titled "Result Of standard bid document".

Company	Technical(%)	Finacial(%)	Total(%) out of 100	Rank
bamacon	65	35	100	1
afro tsion	69	31	100	3
Aser construction PLC.	55	45	100	4

Figure 4.10: Result viewing page

4.3. Functionalities of the application

4.3.1. Selection of Bidders

Where Open Tendering is used without pre-qualification on the online web-based application the PE will ensure if the bidding documents are finalized and approved, then publish an Invitation to Bid notice on the application web page.

Where Open Tendering is used with pre-qualification on the online web-based application the bidders will be those selected during the pre-qualification process and contacted

In the case of the online bidding application, for projects whose value is above 2 million birr the Procuring Entity will advertise the opportunity to invite companies to express interest in being invited to bid on its web page and the bidders invited will be those included on the shortlist, and will be selected as qualified through being registered on the database in the appropriate contractors list. There is no need to publish an Invitation to Bid notice.

4.3.2. Pre-bid conference

The online bidding web application sends a written notice through email for bidders to attend the Pre-Bid Conference and to gain access to the relevant site or sites. Notice will include time, date, and address where Pre-Bid Conference and site visits will be organized.

4.3.3. Preparation and Issue of Bidding Documents

The online bidding application incorporates a manual on how to prepare a standard bidding document and it will enable qualified bidders to download bidding documents made and uploaded by the procuring entity without any cost.

4.3.4. Bidding Period and Bid Receipt

In the case of the online bidding application, bidders will upload their bidding documents in pdf. Format after registering on the application. A bid cannot be submitted unless all of the fields on the bid application page are filled.

Bidders should lock their document for editing, add their signature and insert their stamp as a water mark before submitting so that it will be confidential and will not be altered.

Deadline for Submission of Bids

In the case of online bidding application bidders may always submit their bids in pdf format and must be uploaded within the time frame given for bidding, otherwise access for bidding will be closed by the server

Late Bids

The online bidding application will close access for bidding when the scheduled deadline of bidding pass. So there will be no late bids.

Withdrawal, Substitution, and Modification of Bids

Since a bidder cannot withdraw or modify a bid once it is uploaded on the online bidding application, the bidder have to send a withdrawal or modification request through email for the PE before the bid dead line, then the PE will make the uploaded bid void so that the bidder can upload the new modified document.

4.3.5. Bid Opening

The online bidding application will lock all admin (procuring entity) until the bid is closed so that the admin cannot review the uploaded bids until the bid deadline is closed. Uploaded bids by the bidders will be available for review after the bidding is closed then the PE can review and give results. Bid opening will be held in the presence of Bidders' designated representatives who choose to attend, and at the address, date and time specified in the BDS

4.3.6. Comparison of Bids

The online bidding application will verify contractors name from the list provided by the government and it will lock out all admins not to review the application until the bid is closed, for confidentiality. Since all the documents submitted will be verified for originality, any effort by a Bidder to fortify the documents submitted may result in rejection of bids and they will be locked out from the system not to login again.

Bidders should write their issue on the subject of their email because emails without a subject and emails with subject except clarification will be rejected to avoid contacts between bidders and the PE. Any effort by a bidder to influence the PE in the examination,

evaluation, and comparison of the Bids or Contract award decisions may result in the rejection of its Bid and since it will be recorded they may face corruption charges too.

4.4. The proposed online bidding application vs. the conventional bidding system

In addition to the questioner survey and literature studies, the researcher tried to demonstrate the developed application by connecting users on the same server and use the application to submit and rank their bids.

4.4.1. Time benefit

As we can see from the analysis of the questionnaires result, it takes longer time to execute bidding in the conventional bidding system because of preparation of bid documents, transportation to buy and submit the bid documents and ranking of submitted bids.

But from the demonstration of the proposed online bidding application:

- Bid documents will be digitalized so that it takes less than a day to prepare bid documents.
- There will be no transportation since submission of bids will be online and it can be executed in less than 10 minutes once all the necessary documents are prepared
- Ranking of the submitted bids will be drawn automatically in ascending order as soon as the bid opening date reached.

4.4.2. Cost benefit

From the analysis of questionnaires we have seen that there are costs in the conventional bidding system such as: copying and printing cost, costs to buy bid documents, transportation cost to buy and submit bid documents and postage costs.

Whereas from the demonstration of the proposed online bidding application:

- There will be no copying and printing cost since all bid data's will be processed digitally

- Bidders can easily download bid documents by registering in to the application so that there will be no cost for buying bid documents except the cost for the internet data which is very minimum
- Since all bidders can download bid documents and submit their bid proposal from where ever they are by using an internet connection, there will be no transporting weather to buy bid documents or submit bid proposals which means there will be no transportation cost.
- Procuring entities can post any introduction to bid notices by being charged only for the data they used for the internet so that postage cost can be minimized to almost zero birr.

4.4.3. Ease of access

The questionnaire investigation on the ease of the conventional bidding system for access shows that it have inherent flaws in accessibility, procedure, documentation, and confidentiality.

When we come to the proposed online bidding application it was demonstrated that:

- Bids can be accessible to bidders where ever there is an internet connection.
- Bidding procedures has been managed in a single database.
- There is a good documentation since all the submitted bids will be stored on the applications database
- Confidentialities of all the data's can be cross checked with the respected government authorities

Table 4-4: Online bidding vs. conventional bidding summary

Online bidding	Conventional bidding
Time benefits: reduction in paperwork, postage, photocopy	Take longer time to execute, Too much paper work, postage, photocopy
Cost benefits: reduction in cost of printing and photocopying	Cost of printing and copying
High Ease of access and speed of communication to multiple bidders	Ease of access and speed of communication are low
Better efficiency in the process	Not efficient
more than one bid can be submitted by a bidder in one place	Only one bid at a time and place
Preferred bidders are all contained within a single database	Identity of bidders are not well known
Bidders can be monitored	Monitoring will be hard
standardize the procurement process	Not standardized
Good control of bidders' submissions	Bidder's submission may disappear or altered
Easy comparison of bids	Comparison of bids will take time
Confidence in validity and integrity of contractual documentation is better	Confidentiality of contractual paper is less
Audit trail for documentation	Difficulty of documentation

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

As we can see from the result and discussion, if bidders use the proposed online bidding application prototype, all submission of the bid document will be in digital form which reduces the paperwork, copy and print cost and time. Once the bidding document is prepared Bidders can submit their bids in less than 10 minutes.

Costs for buying bid documents, printing and copying, posting an invitation to bid notice, and transportation will be reduced to almost zero birr while using the suggested application.

The proposed online bidding application will make sure for qualified bidders all around the nation to have access to bid in many construction projects from wherever they are which will make bidding to be easily accessed, fair and competitive.

All bids submitted through the online bidding application will be copied to the application database. So in the event of a dispute, the owner can retrieve the copied bid from the database to determine exactly how many pages were submitted by the bidder. This process eliminates the “he said – she said” argument between the owner and the bidder and quickly verifies what was contained in the bid. No dispute, no costly law suit.

The proposed Online Bidding application prototype ensures there is only one bid form available to bidders at any given time. Whenever a change is made to the bid form, or any part thereof, the bid calling authority deletes any previous version of the bid from the system ensuring that all bidders complete the same bid form and all bids are submitted compliant and on an equal basis.

Therefore, changing our manually operated bidding system by the suggested online bidding system will: save time, reduce cost, create a safe and efficient bidding environment, lessen procedure, Make construction bidding easily accessible, reduce paper work, Make

recording of data digital, and easy to store, give chance for every competitive bidders, Make sure the existence of a real competition during contractor selection, Make bid notice available anyplace where there is access of z internet and, Standardize the bidding system to walk with the era we are in which is technologically oriented.

In general, if a client wishes to cope with these new developments and invite acceptable bidders, it is necessary to consider the online bidding system as the best choice to change our conventional system and take the construction industry to the level of our fast development.

5.2. Recommendation

Based on these research findings, the researcher recommends that:

- The government should strictly consider making this suggested web-based online bidding application as a default construction bidding system,
- The application should be well advertised and its patent should be secured.
- The program should be further developed to make the bidding process fully automatic,
- Clients should consider using this application to save their time, money and to get high competition in order to get a high performance from contractors and clients.
- A training manual should be prepared on how to use the application
- Owners who want to use this proposed application should make sure the availability of fast internet access

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ANNEX 1

General

Questionnaires were distributed to different organizations involved in the construction business. The organizations were selected purpose based for contractors with grade 1,2 and 3 based on their contribution in the construction industry and by putting in mind that these construction firms are organized enough and have the capacity to use the proposed web application.

A total of 30 questionnaires, to construction organizations (clients, contractors and consultants) were distributed, out of which 27 are collected from volunteer respondents. Table below shows the summary of number of rate of responses by major stockholders.

Table: Questioner rate of responses

No	Participants	Distributed in number	Returned in number	Response rate in %
1	Clients	10	7	70
2	Contractors	10	10	100
3	Consultants	10	10	100
	Total	30	27	90

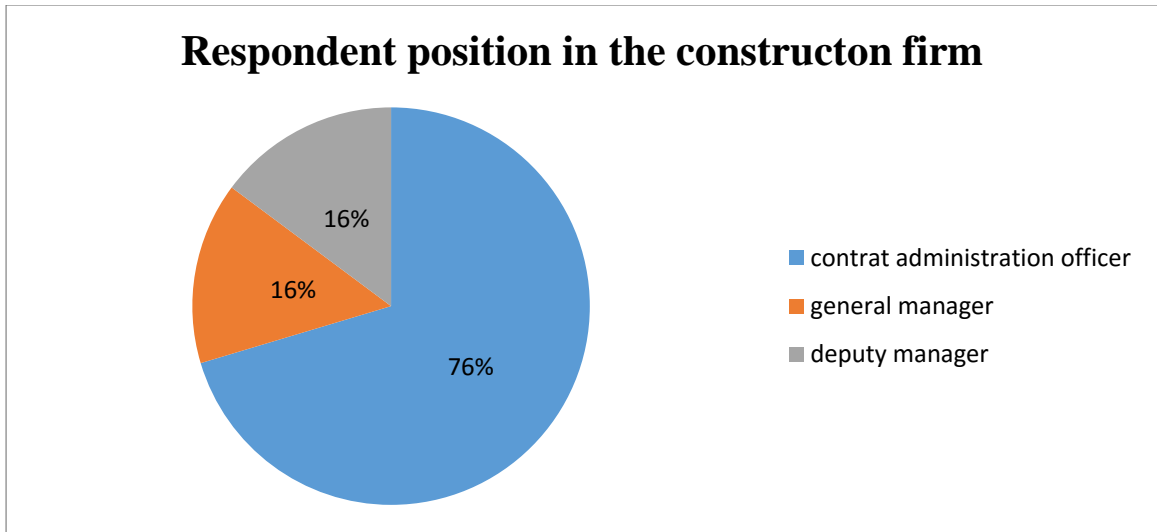


Figure: Respondent position in the organization

As we can see from the Figure above, based on the questioner survey 76% of the respondents were contract administrators, 16% general managers, and 16% deputy manager

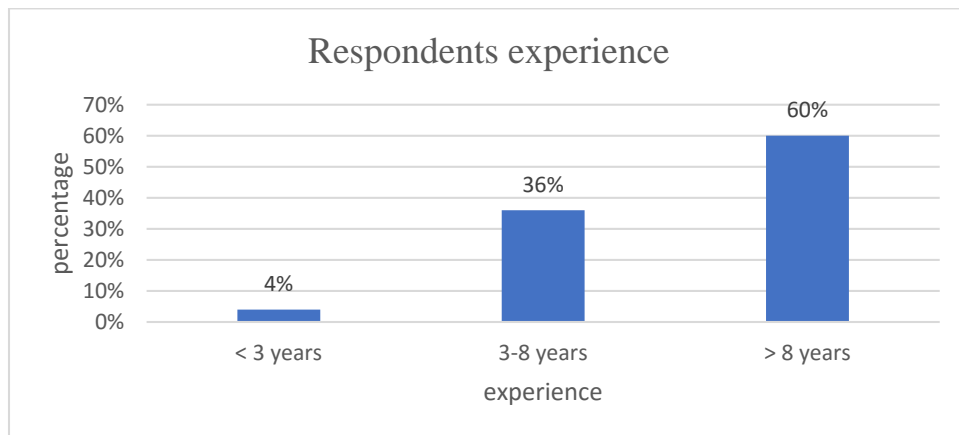


Figure 4.2: Experience of the respondents in Addis Ababa construction projects

Figure above shows the overall experience of the respondents in the selected construction firms. In the Figure, 4% of the respondents found to have a work experience of 3 years and below and 36% of the respondents had 3-8 years of work experience. Similarly, the remaining 60% of the respondents were found to have a work experience of 8 years and above.


```

        </td>
        <td>
            <input id="password" type="password" name="password" placeholder="password" class="form-control"/>
        </td>
    </tr>
    <tr>
        <td style="text-align:right;">
            Confirm Password:
        </td>
        <td>
            <input id="password" type="password" name="confpassword" placeholder="Confirm password" class="form-control"/>
        </td>
    </tr>
    <tr>
        <td style="text-align:right;">
            E-Mail:
        </td>
        <td>
            <input id="email" type="email" name="email" class="form-control" placeholder="Email like abc@gmail.com"/>
        </td>
    </tr>
    <tr>
        <td colspan="2">
            <input style="width:50%;float:center;" class="btn btn-primary" type="submit" name="submit" value="Create"/>
        </td>
    </tr>
    </table>
</form>
</div>
</div>
</center>
</div>
<div class="container">
</div>

```

```

<?php
require('dbconnect.php');
// If the values are posted, insert them into the database.
if (isset($_POST['username']) && isset($_POST['password'])){
    $username = $_POST['username'];
    $email = $_POST['email'];
    $password = $_POST['password'];
    $cpassword = $_POST['confpassword'];
    echo "Account Creating";
    if($password != $cpassword){
        echo "Password must match";
    }
    $query = "INSERT INTO `useraccount` (username, password, email) VALUES ('$username', '$password', '$email')";

    if ($conn->query($query) === TRUE) {
        //echo "New record created successfully";
    } else {
        echo "Error: " . $query . "<br>" . $conn->error;
    }

    $result = mysqli_query($conn, $query);
    if($result){
        echo "User Created Successfully.";
    }
    else{
        echo " User Not Created Successfully.".$result;
    }
}

?>

</body>
</html>

```



```

        </ul>
    </div>
</nav>
</div>
<div class="container">
<div class="panel panel-info" style="width:50%;margin-left:20%">
<div class="panel-heading"><h2>Login Form</h2></div>
<form action="login.php" method="POST" style="width:90%;margin-left:5%">
    <label for="uname">User Name:</label>
    <div class="input-group">
        <span class="input-group-addon glyphicon glyphicon-user" id="sizing-addon2"></span>
        <input type="text" class="form-control" placeholder="Enter User name" aria-describedby="sizing-addon2" name="uname" id="uname"
        </div>
    <div class="form-group">
        <label for="pwd">Password:</label>
        <input type="password" class="form-control" id="pwd" name="pwd" placeholder="Enter password">
    </div>
<div class="checkbox">
    <label><input type="checkbox"> Remember me</label>
</div>
<button type="submit" class="btn btn-default" name="submit"><span class="glyphicon glyphicon-log-in"></span>Login</button>
<a href="createaccount.html">Register</a>
</form>
</div>
</div>
<?php
require('dbconnect.php');
session_start();
$_SESSION['login_user']="";
if(isset($_POST['submit']))
{
    $userName=$_REQUEST['uname'];
    $password=$_REQUEST['pwd'];
    $sql="SELECT * FROM useraccount where username='".$userName'";

    $result_set=mysqli_query($conn,$sql);

    if($row=mysqli_fetch_array($result_set))
    {
        $pwd= $row['password'];
        $level=$row['level'];
        if($password==$pwd){
            $_SESSION['login_user'] = $userName;
            if($level==2){
                header("Location:admin/index.php");
            }
            else{
                header("Location:user/index.php");
            }
        }
        else{
            echo "<center><h2 style='color:red'>Inconnect Password!!</h2></center>";
        }
    }
    else{
        echo "<center><h2 style='color:red'>Inconnect User Name!!</h2></center>";
    }
}
}>
</body>
</html>

```

2. User page Algorithm

```
        <li><a href="apply.php">Apply</a></li>
        <li><a href="viewresult.php">View Result</a></li>
        <li><a href=" ../logout.php">Logout</a></li>
    </ul>
</div>
</nav>
</div>
<div class="container">
    <div style="width:60%;float:left;background:white;">
        <div id="myCarousel" class="carousel slide" data-ride="carousel">
            <!-- Indicators -->
            <ol class="carousel-indicators">
                <li data-target="#myCarousel" data-slide-to="0" class="active"></li>
                <li data-target="#myCarousel" data-slide-to="1"></li>
                <li data-target="#myCarousel" data-slide-to="2"></li>
                <li data-target="#myCarousel" data-slide-to="3"></li>
            </ol>

            <!-- Wrapper for slides -->
            <div class="carousel-inner" role="listbox">
                <div class="item active">
                    
                </div>

                <div class="item">
                    
                </div>

                <div class="item">
                    
                </div>

                <div class="item">
                    
                </div>
            </div>
        </div>
</div>
<?php
    include('../session.php');
?>

<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href=" ../bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href=" ../bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src=" ../bootstrap/js/bootstrap.min.js"></script>
<style type="text/css">
    .bs-example{
        margin: 20px;
    }
</style>
</head>
<body>
<div class="bs-example">
    <nav role="navigation" class="navbar navbar-default">
        <!-- Brand and toggle get grouped for better mobile display -->
        <div class="navbar-header">
            <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
                <span class="sr-only">Menu</span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
            </button>
            <a href="#" class="navbar-brand">Online Bid</a>
        </div>
        <!-- Collection of nav links, forms, and other content for toggling -->
        <div id="navbarCollapse" class="collapse navbar-collapse">
            <ul class="nav nav-pills">
                <li class="active"><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
            </ul>
        </div>
    </nav>
</div>
</body>
</html>
```



```

<!-- Left and right controls -->
<a class="left carousel-control" href="#myCarousel" role="button" data-slide="prev">
  <span class="glyphicon glyphicon-chevron-left" aria-hidden="true"></span>
  <span class="sr-only">Previous</span>
</a>
<a class="right carousel-control" href="#myCarousel" role="button" data-slide="next">
  <span class="glyphicon glyphicon-chevron-right" aria-hidden="true"></span>
  <span class="sr-only">Next</span>
</a>
</div>
<h2>Welcome to User Page</h2>
<p style="justify">
  A bidding system in contract bridge is the set of agreements and understandings assigned to calls and sequences of calls used by a partnership, and includes a
  Each bidding system ascribes a meaning to every possible call by each member of a partnership, and presents a codified language which allows the players to exc
</p>
</div>
<div style="width:40%;float:right">
  <div class="container" style="width:100%;">
    <div class="panel panel-default">
      <div class="panel-body">
        <?php
          require('dbconnect.php');
          $sql="SELECT * FROM bidpost order by publishDate desc limit 5";
          $result_set=mysqli_query($conn,$sql);
          while($row=mysqli_fetch_array($result_set))
          {
            ?>
            <div class="panel panel-default">
              <div class="panel-body">
                <?php
                  echo readMoreFunction("<h4>".$row['title']."</h4>".$row['description'],'viewbid.php',"bidid",$row['id']);
                ?>
              <br>
            </div>
          }
        </div>
      </div>
    </div>
  </div>
</div>
</div>
</div>
</div>
</div>
</body>
</html>
<?php
  /*****
  Purpose      : function to truncate text and show read more links.
  Parameters   : @$story_desc : story description
  @$link      : story link
  @$targetFile : target redirect file name
  @$id        : story id
  Returns     : string
  *****/
function readMoreFunction($story_desc,$link,$targetFile,$id) {
  //Number of characters to show
  $chars = 50;
  $story_desc = substr($story_desc,0,$chars);
  $story_desc = substr($story_desc,0,strlen($story_desc,' '));
  $story_desc = $story_desc." <a href='$link?$targetFile=$id'>Read More...</a>";
  return $story_desc;
}
?>

```

3. Admin page algorithm

```
k?php
    include('../session.php');
  }
  <!DOCTYPE html>
  <html lang="en">
  <head>
  <meta charset="UTF-8">
  <title>Online Bid</title>
  <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
  <link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
  <script src="../bootstrap/js/bootstrap.min.js"></script>
  <style type="text/css">
    .bs-example{
      margin: 20px;
    }
  </style>
  </head>
  <body>
  <div class="bs-example">
    <nav role="navigation" class="navbar navbar-default">
      <!-- Brand and toggle get grouped for better mobile display -->
      <div class="navbar-header">
        <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
          <span class="sr-only">Menu</span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
        </button>
        <a href="#" class="navbar-brand">Online Bid</a>
      </div>
      <!-- Collection of nav links, forms, and other content for toggling -->
      <div id="navbarCollapse" class="collapse navbar-collapse">
        <ul class="nav nav-pills">
          <li class="active"><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
          <li><a href="bidpost.php">Post Bids</a></li>
```

```
          <li><a href="applications.php">Applications</a></li>
          <li><a href="addresult.php">Add Result</a></li>
          <li><a href="viewresult.php">View Result</a></li>
          <li><a href="../logout.php">Logout</a></li>
        </ul>
      </div>
    </nav>
  </div>
  <div class="container">
    <div style="width:60%;float:left;background:white;">
      <div id="myCarousel" class="carousel slide" data-ride="carousel">
        <!-- Indicators -->
        <ol class="carousel-indicators">
          <li data-target="#myCarousel" data-slide-to="0" class="active"></li>
          <li data-target="#myCarousel" data-slide-to="1"></li>
          <li data-target="#myCarousel" data-slide-to="2"></li>
          <li data-target="#myCarousel" data-slide-to="3"></li>
        </ol>

        <!-- Wrapper for slides -->
        <div class="carousel-inner" role="listbox">
          <div class="item active">
            
          </div>

          <div class="item">
            
          </div>

          <div class="item">
            
          </div>

          <div class="item">
            
          </div>
        </div>
      </div>
    </div>
  </div>
```

```

</div>

<!-- Left and right controls -->
<a class="left carousel-control" href="#myCarousel" role="button" data-slide="prev">
  <span class="glyphicon glyphicon-chevron-left" aria-hidden="true"></span>
  <span class="sr-only">Previous</span>
</a>
<a class="right carousel-control" href="#myCarousel" role="button" data-slide="next">
  <span class="glyphicon glyphicon-chevron-right" aria-hidden="true"></span>
  <span class="sr-only">Next</span>
</a>
</div>
<h2>Welcome to Admin Page</h2>
<p style="justify">
A bidding system in contract bridge is the set of agreements and understandings assigned to calls and sequences of
Each bidding system ascribes a meaning to every possible call by each member of a partnership, and presents a codi

</p>
</div>
<div style="width:40%;float:right">
<div class="container" style="width:100%;">
<div class="panel panel-default">
<div class="panel-body">
<?php
require('dbconnect.php');
$sql="SELECT * FROM bidpost order by publishDate desc limit 5";
$result_set=mysqli_query($conn,$sql);
while($row=mysqli_fetch_array($result_set))
{
?>
<div class="panel panel-default">
<div class="panel-body">
<?php
echo readMoreFunction("<h4>".$row['title']. "</h4>".$row['description'], "viewbid.php", "bidid", $row['id']);
?>
<br>

```

```

<br>
</div>
</div>
<?php } ?>
</div>
</div>
</div>
</div>
</div>
</body>
</html>
<?php
/*****
Purpose      : function to truncate text and show read more links.
Parameters   : @$story_desc : story description
@$link       : story link
@$targetFile : target redirect file name
@$id         : story id
Returns      : string
*****/
function readMoreFunction($story_desc,$link,$targetFile,$id) {
//Number of characters to show
$chars = 50;
$story_desc = substr($story_desc,0,$chars);
$story_desc = substr($story_desc,0,strlen($story_desc, ' '));
$story_desc = $story_desc." <a href='$link?targetFile=$id'>Read More...</a>";
return $story_desc;
}
?>

```


4. Upload bid page algorithm

```
<?php
    include('../session.php');
?>
<html>
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="../bootstrap/js/bootstrap.min.js"></script>
<style type="text/css">
    body{
        padding-top: 70px;
    }
</style>
<link rel="stylesheet" type="text/css" href="bootstrapcss.css"/>
</head>
<body>
<nav role="navigation" class="navbar navbar-default navbar-fixed-top">
    <div class="container">
        <!-- Brand and toggle get grouped for better mobile display -->
        <div class="navbar-header">
            <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
                <span class="sr-only">Toggle navigation</span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
            </button>
            <a href="#" class="navbar-brand">Online Bid</a>
        </div>
        <!-- Collection of nav links and other content for toggling -->
        <div id="navbarCollapse" class="collapse navbar-collapse">
            <ul class="nav nav-pills">
                <li><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
                <li><a href="bidpost.php">Post Bids</a></li>
            </ul>
        </div>
    </div>
</nav>
```


5. Apply for bid page algorithm

```
<?php
    include('../session.php');
?>
<html>
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="../bootstrap/js/bootstrap.min.js"></script>
<style type="text/css">
    body{
        padding-top: 70px;
    }
</style>

<link rel="stylesheet" type="text/css" href="bootstrapcss.css"/>
<script type="text/javascript">
    function showGrade(){
        var selctedGrade=document.getElementById('grade');
        var gradeComp=selctedGrade.options[selctedGrade.selectedIndex].value;
        if(gradeComp == "Grade 1"){
            document.getElementById('p1').style.visibility='visible';

            document.getElementById('p2').style.visibility='hidden';
            document.getElementById('p3').style.visibility='hidden';
            document.getElementById('p4').style.visibility='hidden';
            document.getElementById('p5').style.visibility='hidden';
            document.getElementById('p6').style.visibility='hidden';
        }else if(gradeComp == "Grade 2"){
            document.getElementById('p2').style.visibility='visible';

            document.getElementById('p1').style.visibility='hidden';
            document.getElementById('p3').style.visibility='hidden';
            document.getElementById('p4').style.visibility='hidden';
```

```
            document.getElementById('p5').style.visibility='hidden';
            document.getElementById('p6').style.visibility='hidden';
        }
        else if(gradeComp == "Grade 3"){
            document.getElementById('p3').style.visibility='visible';

            document.getElementById('p1').style.visibility='hidden';
            document.getElementById('p2').style.visibility='hidden';
            document.getElementById('p4').style.visibility='hidden';
            document.getElementById('p5').style.visibility='hidden';
            document.getElementById('p6').style.visibility='hidden';
        }
        else if(gradeComp == "Grade 4"){
            document.getElementById('p4').style.visibility='visible';

            document.getElementById('p1').style.visibility='hidden';
            document.getElementById('p3').style.visibility='hidden';
            document.getElementById('p2').style.visibility='hidden';
            document.getElementById('p5').style.visibility='hidden';
            document.getElementById('p6').style.visibility='hidden';
        }
        else if(gradeComp == "Grade 5"){
            document.getElementById('p5').style.visibility='visible';

            document.getElementById('p1').style.visibility='hidden';
            document.getElementById('p3').style.visibility='hidden';
            document.getElementById('p4').style.visibility='hidden';
            document.getElementById('p2').style.visibility='hidden';
            document.getElementById('p6').style.visibility='hidden';
        }
        else if(gradeComp == "Grade 6"){
            document.getElementById('p6').style.visibility='visible';

            document.getElementById('p1').style.visibility='hidden';
            document.getElementById('p3').style.visibility='hidden';
            document.getElementById('p4').style.visibility='hidden';
```

```

        document.getElementById('p4').style.visibility='hidden';
        document.getElementById('p5').style.visibility='hidden';
        document.getElementById('p2').style.visibility='hidden';
    }
    else{
        document.getElementById('p6').style.visibility='visible';

        document.getElementById('p1').style.visibility='hidden';
        document.getElementById('p3').style.visibility='hidden';
        document.getElementById('p4').style.visibility='hidden';
        document.getElementById('p5').style.visibility='hidden';
        document.getElementById('p2').style.visibility='hidden';
    }
    return false;
}
}
</script>
</head>
<body>
<nav role="navigation" class="navbar navbar-default navbar-fixed-top">
  <div class="container">
    <!-- Brand and toggle get grouped for better mobile display -->
    <div class="navbar-header">
      <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
        <span class="sr-only">Toggle navigation</span>
        <span class="icon-bar"></span>
        <span class="icon-bar"></span>
        <span class="icon-bar"></span>
      </button>
      <a href="#" class="navbar-brand">Online Bid</a>
    </div>
    <!-- Collection of nav links and other content for toggling -->
    <div id="navbarCollapse" class="collapse navbar-collapse">
      <ul class="nav nav-pills">
        <li><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
        <li class="active"><a href="apply.php">Apply</a></li>

```



```

        <li><a href="viewresult.php">View Result</a></li>
        <li><a href=" ../logout.php">Logout</a></li>
    </ul>
</div>
</div>
</nav>
<?php
    require('dbconnect.php');
    $target_dir = "../uploads/";
    // Check if image file is a actual image or fake image
    if(isset($_POST["submit"])) {
        $target_file1 = $target_dir . basename($_FILES["technical"]["name"]);
        $target_file2 = $target_dir . basename($_FILES["finacial"]["name"]);
        $target_file3 = $target_dir . basename($_FILES["vat"]["name"]);
        $target_file4 = $target_dir . basename($_FILES["tin"]["name"]);
        $target_file5 = $target_dir . basename($_FILES["license"]["name"]);
        $uploadOk = 1;
        $imageFileType1 = pathinfo($target_file1,PATHINFO_EXTENSION);
        $imageFileType2 = pathinfo($target_file2,PATHINFO_EXTENSION);
        $imageFileType3 = pathinfo($target_file3,PATHINFO_EXTENSION);
        $imageFileType4 = pathinfo($target_file4,PATHINFO_EXTENSION);
        $imageFileType5 = pathinfo($target_file5,PATHINFO_EXTENSION);
        $cname="not selected";
        if($_POST['cname1'] != "g1"){
            $cname = $_POST['cname1'];
        }else if($_POST['cname2']!= 'g2'){
            $cname = $_POST['cname2'];
        }
        else if($_POST['cname3']!= 'g3'){
            $cname = $_POST['cname3'];
        }
        else if($_POST['cname4']!= 'g4'){
            $cname = $_POST['cname4'];
        }
        else if($_POST['cname5']!= 'g5'){

```

```

            $cname = $_POST['cname5'];
        }else if($_POST['cname6']!= 'g6'){
            $cname = $_POST['cname6'];
        }
        }

        $phone = $_POST['phone'];
        $email = $_POST['email'];
        $breceipt = $_POST['receipt'];
        $grade = $_POST['grade'];
        $bid = $_POST['bid'];

        $sqlbid="SELECT * FROM bidpost where id='$bid'";
        $resultbid=mysqli_query($conn,$sqlbid);

        if($row=mysqli_fetch_array($resultbid))
        {
            $bid = $row['bidId'];
        }

        // Check if file already exists
        if (file_exists($target_file1) ||file_exists($target_file2) ||file_exists($target_file3)
            ||file_exists($target_file4) ||file_exists($target_file5) ) {
            echo "<h2 style='color:red'>Sorry, file already exists please rename or change the file .</h2>";
            $uploadOk = 0;
        }
        // Check file size
        if ($_FILES["technical"]["size"] > 5000000) {
            echo "<h2 style='color:red'>Sorry, your file is too large.</h2>";
            $uploadOk = 0;
        }
        // Allow certain file formats
        if($imageFileType1 != "pdf" && $imageFileType2 != "pdf" && $imageFileType3 != "pdf"
        && $imageFileType4 != "pdf" && $imageFileType5 != "pdf" ) {
            echo "<h2 style='color:red'>Sorry, only PDF files are allowed.</h2>";
            $uploadOk = 0;

```


6. Ranking/ adding result page algorithm

```
<?php
    include('../session.php');
?>
<html>
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="../bootstrap/js/bootstrap.min.js"></script>
<style type="text/css">
    body{
        padding-top: 70px;
    }
    .bs-example{
        margin: 20px;
    }
</style>
<link rel="stylesheet" type="text/css" href="bootstrapcss.css"/>
</head>
<body>
<div class="bs-example">
<nav role="navigation" class="navbar navbar-default navbar-fixed-top">
    <div class="container">
        <!-- Brand and toggle get grouped for better mobile display -->
        <div class="navbar-header">
            <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
                <span class="sr-only">Toggle navigation</span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
            </button>
            <a href="#" class="navbar-brand">Online Bid</a>
        </div>
        <!-- Collection of nav links and other content for toggling -->

        <div id="navbarCollapse" class="collapse navbar-collapse">
            <ul class="nav nav-pills">
                <li><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
                <li><a href="bidpost.php">Post Bids</a></li>
                <li><a href="applications.php">Applications</a></li>
                <li class="active"><a href="addresult.php">Add Result</a></li>
                <li><a href="viewresult.php">View Result</a></li>
                <li><a href="../logout.php">Logout</a></li>
            </ul>
        </div>
    </div>
</nav>
</div>
<div class="container">
    <div class="panel panel-info">
        <div class="panel-heading">
            <h2>Add Bid Result</h2>
        </div>
        <div>
            <center>
                <form action="addresult.php" method="POST" enctype="multipart/form-data">
                    <table class="table">
                        <tr>
                            <td>Bid Title:</td>
                            <td>
                                <?php
                                    require('dbconnect.php');
                                    $query = "SELECT title,id FROM bidpost order by publishDate DESC limit 10";
                                    $result_set=mysqli_query($conn,$query);
                                    echo '<select class="form-control" name = "bid" style="width:300px">';
                                    echo "<option>Select Bid</option>";
                                    while($row=mysqli_fetch_array($result_set))
                                    {
                                        echo "<option value = '{$row['id']}'";
                                        echo ">{$row['title']}</option>";
                                    }
                                </td>
                            </tr>
                        </table>
                    </center>
                </form>
            </div>
        </div>
    </div>
</div>
```

```

        echo "</select>";
    }
}
</td>
</tr>
<tr>
<td>Company: </td>
<td>
<input id="company" type="text" name="company" placeholder="Company" class="form-control" style="width:500px"/>
</td>
</tr>
<tr>
<td>
<?php
require('dbconnect.php');
?>
<td>Rank: </td>
<td>
<input id="rank" type="text" name="rank" placeholder="Rank" class="form-control" style="width:500px"/>
</td>
</tr>
<tr>
<td>Result: </td>
<td>
<div style="width:210px;float:left;">
<input id="technical" type="text" name="technical" placeholder="Technical(%)" class="form-control" style="width:200px;float:left;"/>
</div>
<div style="width:210px;float:left;">
<input id="finacial" type="text" name="finacial" placeholder="Finacial(%)" class="form-control" style="width:200px;float:right;"/>
</div>
</td>
</tr>
<tr>
<td colspan="2">
<input class="btn btn-primary" type="submit" name="submit" value="Save" style="width:300px;"/>
</td>
</tr>
</div>
</div>
<?php
// Check if image file is a actual image or fake image
if(isset($_POST["submit"]))
{
    $bid = $_POST['bid'];
    $company = $_POST['company'];
    $rank = $_POST['rank'];
    $technical = $_POST['technical'];
    $finacial = $_POST['finacial'];

    $sql="SELECT * FROM result where bidid='$bid' and rank=$rank";
    $result_set=mysqli_query($conn,$sql);
    $rowcount=mysqli_num_rows($result_set);
    if($rowcount ==0){
        $total= $technical + $finacial;
        $query = "INSERT INTO `result` (bidid, companyid, companyname, rank,technical,finacial,total)
VALUES ('$bid', '$company', '$company', '$rank','$technical', '$finacial','$total')";
        $result = mysqli_query($conn, $query);
        if($result){
            echo "<h2 style='color:green'>Bid Result Successfully Added.</h2>";
        }
        else{
            echo "<h2 style='color:red'>Bid Result Not Successfully Added.</h2>";
        }
    }
    else{
        echo "<h2 style='color:red'>Rank Already Added in this Bid Added.</h2>";
    }
}
?>
</body>
</html>

```

7. View Result page algorithm

```
        </button>
        <a href="#" class="navbar-brand">Online Bid</a>
    </div>
    <!-- Collection of nav links and other content for toggling -->
    <div id="navbarCollapse" class="collapse navbar-collapse">
        <ul class="nav nav-pills">
            <li><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
            <li><a href="bidpost.php">Post Bids</a></li>
            <li><a href="applications.php">Applications</a></li>
            <li><a href="addresult.php">Add Result</a></li>
            <li class="active"><a href="viewresult.php">View Result</a></li>
            <li><a href="..logout.php">Logout</a></li>
        </ul>
    </div>
</div>
</div>
</nav>
</div>
<center>
    <form action="viewresult.php" method="POST" enctype="multipart/form-data">
        <label>Bid id : </label>
        <?php
            require('dbconnect.php');
            $query = "SELECT title,id FROM bidpost order by publishDate DESC limit 10";
            $result_set=mysqli_query($conn,$query);
            echo '<select class="form-control" name = "bidno" style="width:300px">';
            echo "<option>Select Bid</option>";
            while($row=mysqli_fetch_array($result_set))
            {
                echo "<option value = '{$row['id']}'>";
                echo ">{$row['title']}</option>";
            }
            echo "</select>";
        >
        <input class="btn btn-primary" type="submit" name="submit" value="Search" style="width:200px;"/>
    </form>
</center>
```

```
<?php
    include('../session.php');
?>
<?php
    require('dbconnect.php');
?>

<html>
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href="..bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href="..bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="..bootstrap/js/bootstrap.min.js"></script>

<style type="text/css">
    body{
        padding-top: 70px;
    }
    .bs-example{
        margin: 20px;
    }
</style>

    <link rel="stylesheet" type="text/css" href="bootstrapcss.css"/>
</head>
<body>
<div class="bs-example">
<nav role="navigation" class="navbar navbar-default navbar-fixed-top">
    <div class="container">
        <!-- Brand and toggle get grouped for better mobile display -->
        <div class="navbar-header">
            <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
                <span class="sr-only">Toggle navigation</span>
                <span class="icon-bar"></span>
```

```

</center>
<?php
if(isset($_POST["submit"])) {
$bidno = $_POST['bidno'];
require('dbconnect.php');
$sql="SELECT * FROM result where bidid='$bidno'";
$result_set=mysqli_query($conn,$sql);
$sqlbid="SELECT * FROM bidpost where id='$bidno'";
$resultbid=mysqli_query($conn,$sqlbid);
?>
<div class="container">
<div class="panel panel-info">
<div class="panel-heading">
<h2>Result Of <?php if($row=mysqli_fetch_array($resultbid))
{ echo $row['title'];}?></h2>
</div>

<table summary="Example table" class="table table-hover">

<thead>
<tr>
<th>Company</th>
<th>Technical(%)</th>
<th>Finacial(%)</th>
<th>Total(%) out of 100</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<?php
$bid='';
$rowcount=mysqli_num_rows($result_set);
if($rowcount ==0){
$bid= "<b style='color:red'>There is no Bid Result on Selected Bid</b>";
}else{

```

```

while($row=mysqli_fetch_array($result_set))
{?>
<td><?php echo $row['companyname'] ?></td>
<td><?php echo $row['technical'] ?></td>
<td><?php echo $row['finacial'] ?></td>
<td><?php echo $row['total'] ?></td>
<td><?php echo $row['rank'] ?></td>
</tr>
<?php } } ?>
<!-- more rows here... -->
</tbody>
<tfoot>
<tr>
<td colspan="5">
<?php echo $bid;?>
</td>
</tr>
</tfoot>
</table>
</div>
</div>
</div>
</body>
</html>

```


8. Application viewing page algorithm

```
<?php
    include('../session.php');
?>
<html>
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="../bootstrap/js/bootstrap.min.js"></script>
<style type="text/css">
    body{
        padding-top: 70px;
    }
    .bs-example{
        margin: 20px;
    }
</style>
<link rel="stylesheet" type="text/css" href="bootstrapcss.css"/>
</head>
<body>
<div class="bs-example">
<nav role="navigation" class="navbar navbar-default navbar-fixed-top">
    <div class="container">
        <!-- Brand and toggle get grouped for better mobile display -->
        <div class="navbar-header">
            <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
                <span class="sr-only">Toggle navigation</span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
            </button>
            <a href="#" class="navbar-brand">Online Bid</a>
        </div>
        <!-- Collection of nav links and other content for toggling -->

        <div id="navbarCollapse" class="collapse navbar-collapse">
            <ul class="nav nav-pills">
                <li><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
                <li><a href="bidpost.php">Post Bids</a></li>
                <li class="active"><a href="applications.php">Applications</a></li>
                <li><a href="addressresult.php">Add Result</a></li>
                <li><a href="viewresult.php">View Result</a></li>
                <li><a href="./logout.php">Logout</a></li>
            </ul>
        </div>
    </div>
</nav>
</div>
<center>
    <form action="applications.php" method="POST" enctype="multipart/form-data">
        <label>Bid id : </label>
        <input id="bidno" type="text" name="bidno" placeholder="Bid No." class="form-control" style="width:300px"/>
        <input class="btn btn-primary" type="submit" name="submit" value="Search" style="width:200px;"/>
    </form>
</center>
<?php
    if(isset($_POST["submit"])) {
        $bidno = $_POST['bidno'];
        require('dbconnect.php');
        $sql="SELECT * FROM CompanyInfo where bidId='$bidno'";
        $result_set=mysqli_query($conn,$sql);
        $sqlbid="SELECT * FROM bidpost where id='$bidno'";
        $resultbid=mysqli_query($conn,$sqlbid);
    }
    >
<div class="container">
<div class="panel panel-info">
    <div class="panel-heading">
        <h2>Applications on <?php if($row=mysqli_fetch_array($resultbid))
            { echo $row['title'];}></h2>
    </div>
</div>
```

```

<table summary="Example table" class="table table-hover">
  <thead>
    <tr>
      <th>Company Name</th>
      <th>Grade</th>
      <th>Phone</th>
      <th>Email</th>
      <th>Receipt No</th>
      <th>Technical</th>
      <th>Finacial</th>
      <th>VAT</th>
      <th>TIN</th>
      <th>License</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <?php
      $bid='';
      $rowcount=mysqli_num_rows($result_set);
      if($rowcount ==0){
        $bid= "<b style='color:red'>There is no Bid on this Id ".$bidno."</b>";
      }else{
        while($row=mysqli_fetch_array($result_set))
        {?>
          <td><?php echo $row['companyName'] ?></td>
          <td><?php echo $row['grade'] ?></td>
          <td><?php echo $row['telephone'] ?></td>
          <td><?php echo $row['email'] ?></td>
          <td><?php echo $row['bankreciept'] ?></td>
          <td>
            <?php
            $technical = '../uploads/'.$row['technical'];
            $finacial = '../uploads/'.$row['finacial'];
            $vat = '../uploads/'.$row['vat'];

```

```

          $finacial="#";
        }
        if($vat=="../uploads/"){
          $vat="#";
        }
        if($tin=="../uploads/"){
          $tin="#";
        }
        if($license=="../uploads/"){
          $license="#";
        }
      }
    }
    <a href=?php echo "\"".$technical."\""; ?> target="_blank"> <span class="glyphicon glyphicon-download-alt"></span> view technical</a></td>
    <td><a href=?php echo "\"".$finacial."\""; ?> target="_blank"> <span class="glyphicon glyphicon-download-alt"></span> view finacial</a></td>
    <td><a href=?php echo "\"".$vat."\""; ?> target="_blank"> <span class="glyphicon glyphicon-download-alt"></span> view VAT</a></td>
    <td><a href=?php echo "\"".$tin."\""; ?> target="_blank"> <span class="glyphicon glyphicon-download-alt"></span> view TIN</a></td>
    <td><a href=?php echo "\"".$license."\""; ?> target="_blank"> <span class="glyphicon glyphicon-download-alt"></span> view license</a></td>
  </tr>
<?php } } ?>
<!-- more rows here... -->
</tbody>
<tfoot>
  <tr>
    <td colspan="5">
      <?php echo $bid;?>
    </td>
  </tr>
</tfoot>
</table>
</div>
</div>
</body>
</html>

```

9. Bid posting page algorithm

```
include('../session.php');
?>
<html>
<head>
<meta charset="UTF-8">
<title>Online Bid</title>
<link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
<link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="../bootstrap/js/bootstrap.min.js"></script>
<style type="text/css">
  body{
    padding-top: 70px;
  }
  .bs-example{
    margin: 20px;
  }
</style>
<link rel="stylesheet" type="text/css" href="bootstrapcss.css"/>
</head>
<body>
<div class="bs-example">
<nav role="navigation" class="navbar navbar-default navbar-fixed-top">
  <div class="container">
    <!-- Brand and toggle get grouped for better mobile display -->
    <div class="navbar-header">
      <button type="button" data-target="#navbarCollapse" data-toggle="collapse" class="navbar-toggle">
        <span class="sr-only">Toggle navigation</span>
        <span class="icon-bar"></span>
        <span class="icon-bar"></span>
        <span class="icon-bar"></span>
      </button>
      <a href="#" class="navbar-brand">Online Bid</a>
    </div>
    <!-- Collection of nav links and other content for toggling -->
    <div id="navbarCollapse" class="collapse navbar-collapse">

      <ul class="nav nav-pills">
        <li><a href="index.php"><span class="glyphicon glyphicon-home"></span> Home</a></li>
        <li class="active"><a href="bidpost.php">Post Bids</a></li>
        <li><a href="applications.php">Applications</a></li>
        <li><a href="addresult.php">Add Result</a></li>
        <li><a href="viewresult.php">View Result</a></li>
        <li><a href="logout.php">Logout</a></li>
      </ul>
    </div>
  </div>
</nav>
</div>
<div class="container">
  <div class="panel panel-info">
    <div class="panel-heading">
      <h2>Post Bid</h2>
    </div>
    <form action="uploadbids.php" method="POST" enctype="multipart/form-data" style="width:50%">
      <table class="table">
        <tr>
          <td>Bid Id: </td>
          <td>
            <input id="bidid" type="text" name="bidid" placeholder="Bid Id" class="form-control" style="width:500px"/></td>
        </tr>
        <tr>
          <td>Bid Title: </td>
          <td>
            <input id="title" type="text" name="title" placeholder="Title" class="form-control" style="width:500px"/></td>
        </tr>
        <tr>
          <td>Bid closing date: </td>
          <td>
            <input id="closingdate" type="date" name="closingdate" placeholder="closingdate" class="form-control" style="width:300px"/>
          </td>
        </tr>
      </table>
    </form>
  </div>
</div>
```

APPENDIX B

Questionnaire

The aim of this questionnaire is to assess the current conventional bidding system. The research is conducted for fulfilling the requirements for the degree of MSc in Construction Engineering and Management at Jimma University. This questionnaire is required to be filled with exact relevant facts as much as possible.

This questionnaire consists of four parts:

PART ONE: A. General Information

B. Basic questions on conventional bidding system for construction projects.

PART TWO: Interview Survey

All information provided in this questionnaire will be treated with strict confidentiality and allowed to serve only for the purpose of the academic research under consideration. Interested participants of this study will be given feedback on the overall research results after the completion of the research work.

Sincerely yours,

Yohannes Dejene

yohannesdejene83@gmail.com

Msc.CEM Department of civil engineering Jit, Jimma University

PART ONE

A. General Information

Please put (✓) and/or fill in the blanks as appropriate

1. Name of Organization: _____

2. Type of Organization:

Client Contractor Consultant

Other, Please specify: _____

3. Current Job title in the organization/company:

Project Manager Site Engineer Project Coordinator

Resident Engineer

Other, Please specify: _____

4. Years of experience of the construction Projects in Addis Ababa:

< 3years 3-8years > 8years

B. Basic information on conventional bidding process

1. What is the minimum amount (in birr) u paid for buying a bid document?

2. How much time does it usually take to compare the submitted bids on the bid opening date?

3. From where do you usually get the information about invitation of a bid notice?

4. How many days or time does it take to execute bidding in the current bidding system?

5. What is the average cost you spend for preparing and submitting bids?

6. Do you think the current manually operated bidding procedure is standardized?

Yes No

7. Have you experienced disappearing of submitted bids??

Yes No

8. Do you think submitted bids can be altered in the current system (is there any favoritism or corruption)?

Yes No

9. Do you think the bids submitted will be documented appropriately?

Yes No

10. Do you think all papers submitted by bidders are confidential?

Yes No

11. Do you think comparison of bids will take time since it is being executed manually?

Yes No

Part two

Interview Survey

Name of organization _____

1. If an online bidding system can be developed to make the current bidding procedure online and automatic which one would you prefer?

- The conventional bidding system
- The online bidding system

2. What features does you recommend to be incorporated in the online bidding system?
Explain

3. What measures do you want to be taken to make the online bidding better from the current bidding system based on time, cost, procedure and confidentiality?

4. How often did you check for an invitation for bid notice on the newspaper?

Thank you for your cooperation!

APPENDIX C

List of Some of the Respondents (Name of Organizations Only)

List of Contractors

1. Esayas Yirga building Contractor
2. GBMW Conseruction
3. Webcon construction plc
4. Gift CONSTRUCTION PLC
5. Kasim Bati Construction
6. WASK Engineering
7. Acton Engineering
8. Housing corporation

List of Consultants

1. MTSY Consulting Engineer's P.l.c
2. Gandy consulting engineers plc
3. Eng. ZewdieEskinder&Co.plc
4. WASK Engineering
5. Acton Engineering
6. Housing corporation
7. Manadement science for health