

E Tendering and Monitoring

Saif Muzaffar

Muhammad Bilal



**DEPARTMENT OF COMPUTER SCIENCES
COMSATS UNIVERSITY ISLAMABAD,
ATTOCK CAMPUS – PAKISTAN**

SESSION 2017-2021

E Tendering and Monitoring

Undertaken by

Saif Muzaffar

CIIT/FA17-BCS-102/ATK

Muhammad Bilal

CIIT/FA17-BCS-080/ATK

Supervised By:

Miss Sadia Ejaz

A DISSERTATION SUBMITTED AS A PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

**DEPARTMENT OF COMPUTER SCIENCES
COMSATS UNIVERSITY ISLAMABAD,
ATTOCK CAMPUS – PAKISTAN**

SESSION 2017-2021

UNDERTAKEN

We certify that this is my/our own work. The work has not, in whole or in part, been presented elsewhere for assessment. Where material has been used from other sources it has been properly acknowledged. If this statement is untrue, we acknowledge that we will have committed an assessment offence and shall be liable to punishable action under the plagiarism rules of HEC.

Saif Muzaffar
FA17-BCS-102

Muhammad Bilal
FA17-BCS-080

Dated:_____

Dated: _____

FINAL APPROVAL

Certified that we have read this E tendering and Monitoring project report submitted by Mr. (Saif Muzaffar, Muhammad Bilal) and it is, in our judgment, of sufficient standard to warrant its acceptance by Department of Computer Science, University of Islamabad, Attock Cantt, for the (BS/MSc degree) in Computer Science.

Committee:

1. External Examiner

(Examiner Name)

Designation

University Name

2. Supervisor

(Supervisor Name)

3. Chairperson

(Chairperson Name)

4. Dean/Director

(Dean/Director Name)

DEDICATION

I devote this undertaking to God Almighty my maker, my solid column, my wellspring of motivation, insight, information and comprehension. He has been the wellspring of my solidarity all through this program and on His wings just have I taken off. I likewise commit this work to my educators (respected teachers) who has empowered me as far as possible and whose consolation has ensured that I give it everything necessary to complete what I have begun. Much obliged to you. My adoration for all of you can never be evaluated. God favor you.

Acknowledgement

All applause is to Almighty Allah who gave to us brief part of His limitless information by temperance of which we had the option to achieve this difficult errand. We are significantly obligated to our venture boss "**Miss Sadia Ejaz**". Without her own management, exhortation and significant direction, fulfillment of this task would have been suspicious. We are profoundly obliged to them for their consolation and constant assistance during this work. What's more, we are additionally appreciative to our folks and family who have been a consistent wellspring of support for us and presented to us the estimations of trustworthiness and difficult work.

Saif Muzaffar

Muhammad Bilal

PROJECT BRIEF

PROJECT NAME	E TENDERING AND MONITORING
ORGANIZATION NAME	COMSATS UNIVERSITY ISLAMABAD, ATTOCK CAMPUS
OBJECTIVE	TO PROVIDE EASE TO CONTRACTORS MAKE REGISTER WORK DIGITALLY AND BIDING SYSTEM ONLINE AND MONITOR THE WORK ONLINE.
UNDERTAKEN BY	SAIF MUZAFFAR, MUHAMMAD BILAL
SUPERVISED BY	MISS SADIA EJAZ COMPUTER SCIENCE COMSATS UNIVERSITY ISLAMABAD, ATTOCK CAMPUS
STARTED ON	SEPTEMBER 2017
COMPLETED ON	MAY 2021
COMPUTER USED	HP (ELITEBOOK 8470P)
SOURCE LANGUAGE	JAVA, XML

OPERATING SYSTEM

WINDOW 10

TOOLS USED

ANDROID STUDIO 4.0.1

ABSTRACT

We are well aware of tendering system in Attock, which is a very hectic task for contractors. Every contractor has a very difficult and hectic job to win the bidding session, contractor has to travel miles for just the entry for bidding. So we are coming with an idea for the ease of contractors, our project will help contractors and will save the time and headache of contractors. Our project will help them and contractors will be able to apply for bidding through our project which will save the time and travel of contractors. The bidding will also be done online through application. The bidding sheet will be uploaded on our application for contractors. For whole process Construction Company have to sign up in our application. User can fill the bidding sheet online and it will save the hard work of user. The low rate bid will automatically come to the top of the list of bidders in front of PUBLIC HEALTH DEPARTMENT view. When the tender is issued to registered company then we monitor the work of the issued tender for the site where the work has been in progress by the laboratory test of the material used in the work. On the behalf of the test issued by the laboratory we have to approve/disapprove the work and then the bills are generated.

Table of Content

1	Introduction.....	15
1.1	Brief.....	15
1.2	Relevance to Course Modules.....	16
1.3	Project Background.....	17
1.4	Literature Review.....	18
1.5	Analysis from Literature Review.....	18
1.5.1	Problem identify in current portal.....	19
1.5.2	Comparative Analysis.....	19
1.6	Methodology and Software Lifecycle for this Project.....	19
1.7	Rationale behind selected methodology.....	20
2	Problem Definition.....	22
2.1	Problem Statement.....	22
2.2	Deliverables and Development Requirements.....	22
2.2.1	Software Specification.....	23
2.2.2	Hardware Requirement.....	23
2.2.3	Tools.....	23
2.3	Current System.....	24
3	Requirement Analysis.....	26
3.1	Use Case Diagram.....	26

3.1.1	Detailed Use Case Diagram	27
3.2	Requirement Specifications	27
3.3	Non-Functional Requirement	28
3.3.1	Performance	28
3.3.2	Accuracy	28
3.3.3	Maintenance	28
3.3.4	Efficiency	28
3.3.5	Integrity	28
3.3.6	User Friendly	28
3.3.7	Reliability	28
3.4	Functional Requirement	28
4	Design and Architecture	31
4.1	Life Cycle of Android Application	32
4.1.1	Active and Running State	32
4.1.2	Paused State	32
4.1.3	Stopped State	33
4.1.4	Dead or Destroyed State	33
4.2	Data Representation [Diagram + Description]	34
4.3	Process Flow / Representation	34
4.3.1	Activity Diagram	35

4.4	Design Models.....	36
4.4.1	Sequence Diagram	36
4.5	DFD Levels Diagrams.....	40
5	References	42

Table of figures

Figure 1-1 Iterative Model	20
Figure 1-2 Use case Diagram	27
Figure 1-3 System Architecture	31
Figure 1-4 Android Life Cycle.....	32
Figure 1-5 Data Flow	34
Figure 1-6 Activity Diagram.....	35
Figure 1-7 Sequence Diagram for Login	36
Figure 1-8 Sequence Diagram for Registration	37
Figure 1-9 Sequence Diagram for Tender Search.....	38
Figure 1-10 Sequence Diagram for Monitoring.....	38
Figure 1-11 Sequence Diagram for Billing.....	39
Figure 1-12 Sequence Diagram for Bidding	39
Figure 1-13 System DFD Level 0	40
Figure 1-14 System DFD Level 1 User Login.....	40
Figure 1-15 System DFD Level 2 User.	41

Chapter 1

INTRODUCTION

1 Introduction

E Tendering and monitoring is a cycle of doing whole Tendering Cycle Online including accommodation of value offer, checking of work progress, giving of bills with the end goal that Efficiency, Economy, and Speed of Internet can be saddled. We are developing an Android application that will monitor the process and progress. Contractors will be able to communicate with public health authorities through the app. Contractors will have a nice and easy interface to bid and receive bid forms. The department will be able to check progress, place bids, replay to contractors, check the progress by laboratory reports, generating the bills etc. The calculation will be done on all ends. Android apps will have many features that can make stakeholders entertain. This can save a lot of time and money for travel and traditional meetings. Most importantly, it will save energy and people will be able to spend a good time with their families.

1.1 Brief

We often get to hear that the businessmen are always busy having meetings and we usually find them on calls. Sundays and Holidays are a no for them. It is a saying that the more and the big business are the less burden you will face. But in either of these cases, there are problems. Like if the business is on small scale, the workers will have to work more. If the business is on large scale, then more people will be doing work which cost more. Literally in every case there are either labor or cost problems. So we came up with a solution. Everybody uses smart phones. Our idea is to replace some part with smartphones. We are developing an Android app that will monitor the processes and progress. The Contractor would be able to communicate with the public health department through the app. The Contractor will have a nice and easy interface to Bid and receiving the bidding sheets. While the Department will be able to check the progress, make bids, replay to contractors etc. Calculations will perform on all ends. Android application will have a lot of features to entertain the stakeholders. This will save a lot of time and money that is spent on travel and traditional meetings etc. Above all, it will save energy and people will be able to spend some quality time with their family. Furthermore, the application will have different AI based features like Recommendation system.

We belong to a society where business is most common profession and people indulged themselves completely into it. Chances are we going to do same. So this motivates us to bring ease in this filed

by taking away the worries and problems by removing unnecessary traditional tasks that have been followed. This application of ours will shift the business on technology, change the directions of worries and give business a boost.

We all know how businesses works and everybody wants a comfortable job environment and sorted life. So who wouldn't want an app that does save time of meetings and unnecessary calculations?

1.2 Relevance to Course Modules

In Computer Science we study about theoretical aspects of computer technology and computer usages. The Principal and areas of studies in Computer Science has includes computer architecture and networking, cyber-security, database management system, human computer interaction(HCI), graphics, numerical computation, programming languages (JAVA etc.), software engineering and theories of computer's world.

This project is android base application. By mean of different modules this application is relevance to different courses like as, using JAVA programming language backend will be developed, using XML frontend will be design, and firebase database will be used for storing data, data sending or retrieving from database. There have so many relevance modules and work which is related to BCS courses if we focus on little bit thing one by one.

1.2.1.1 Android development

Android Studio is the IDE that provides Google to develop professional Android applications. It is used to develop a different variety of applications for the Android operating system. It is an IDE & platform to design a user-friendly interface by drag and drop.

1.2.1.2 Java

Java is a class-based, object-arranged programming language designed to have execution conditions that do not exceed reasonable expectations as much as possible. It is a widely used programming language. It is recommended that application engineers write it once and run it anywhere (WORA), which means that the assembled Java code can be run at all stages of helping Java without recompilation. Java applications are usually accumulated as byte code, which can be run on any Java Virtual Machine (JVM), with little attention to basic PC engineering. The

sentence structure of Java is similar to that of C and C++, but has fewer low-level offices than these two. The Java runtime provides dynamic features (for example, reflection and runtime code adjustment), which are usually inaccessible in dialects that are customary to collect. Starting in 2019, Java is one of the most famous programming dialects used by GitHub, especially for customer worker web applications, with a detailed 9 million engineers.

1.2.1.3 Report Writing Skills

This course is about learning how to write reports and other formal documentation, and, in our project, we need to write our documentation, so this course is helping a lot in this task.

1.2.1.4 Software Engineering

Software engineering is the systematic application of engineering methods in software development.

1.3 Project Background

We have a place with a general public where business is most regular calling and individuals entertained themselves totally into it. Odds are we going to do same. So this spurs us to get facilitate this recorded by taking the concerns and issues by eliminating pointless conventional undertakings that have been followed. This use of our own will move the business on innovation, change the headings of stresses and give business a lift. We as a whole skill organization works and everyone needs an agreeable employment climate and arranged life. So who wouldn't need an application that does spare season of gatherings and superfluous counts? Our task will have the option to show all the offer sheets running as of now to the contractual workers. It will make contractual worker to pay on the web or to Bid on the web. The notification will be shipped off the person who have won the offer. The person who pay the CDR can just get the notification of new Bid Sheet.

We are well aware of tendering system in Attock, which is a very hectic task for contractors. Every contractor has a very difficult and hectic job to win the bidding session, contractor has to travel

miles for just the entry for bidding. So we are coming with an idea for the ease of contractors, our project will help contractors and will save the time and headache of contractors. Our project will help them and contractors will be able to apply for bidding through our project which will save the time and travel of contractors. The bidding will also be done online through application. The bidding sheet will be uploaded on our application for contractors. For whole process Construction Company have to sign up in our application. User can fill the bidding sheet online and it will save the hard work of user. The low rate bid will automatically come to the top of the list of bidders in front of PUBLIC HEALTH DEPARTMENT view. When the tender is issued to registered company then we monitor the work of the issued tender for the site where the work has been in progress by the laboratory test of the material used in the work. On the behalf of the test issued by the laboratory we have to approve/disapprove the work and then the bills are generated.

1.4 Literature Review

We see the different websites and android apps which shows the just tender information. There is an android app of South Africa in which they just show the tender information and tell about the upcoming tenders. E-Tendering application a project of Pakistan but only for KPK. E-tendering is currently working in KPK. But not working in Punjab and other provinces but only in KPK. The reason why our project is different from others. In KPK E tendering app the user register companies and get information from the app and upcoming tenders. The user company can have bit the tender but their work cannot be monitor online.

1.5 Analysis from Literature Review

In this section, the existing E tendering applications will be explored like Welcome the user and register with app and don't give app notification and don't fill the bit sheet online. Existing websites provide information not adequate based on which we can make decision. They provide the information about the tenders.

1.5.1 Problem identify in current portal

- Electronic tendering app made by NHA department is implemented only in KPK.
- In KPK it was only implemented and have been used for several months.
- Electronic tendering app was failed to be implemented in Punjab because of Punjab projects are different from KPK.
- In current android app they just give the information about tenders
- Don't fill bit sheet online.
- The user cannot get notification about tenders or winning tender.

1.5.2 Comparative Analysis

Comparative study table:

Company	Difficult UI	Bid-sheet-filling (ONLINE)	Application Notification	PUNJAB (PHE)
E-tendering (NHA)	YES	NO	NO	NO
E-tendering (ours)	NO	YES	YES	YES

1.6 Methodology and Software Lifecycle for this Project

First of all, we will discuss about methodology of our android app. In our android app first user Register Company and login then user have a dashboard in which they get the information about tenders and fill the bit sheet online. After that there is some calculation and the user get the notification about the winning and losing tender. After the winning of the tender our system will monitor the work winned by the user and the user will update us about the work by the consulted laboratory tests by uploading them. For this we must first understand the steps that are involved in project methodology. We use iterative approach to develop this application.

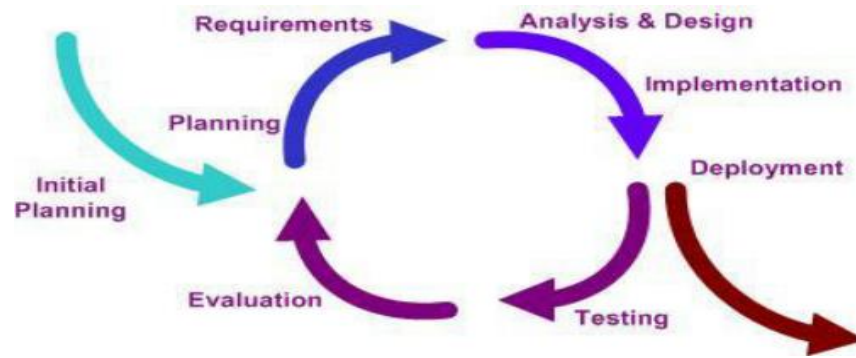


Figure 1-1 Iterative Model

1.7 Rationale behind selected methodology

In this Model, you can start with some of the software specifications and develop the first version of the software. After the first version if there is a need to change the software, then a new version of the software is created with a new iteration. Every release of the Iterative Model finishes in an exact and fixed period that is called iteration. The reasons behind this approach is that it is easy measurable and small chunks are easy to test and debug as compare to developing the whole software and then testing it, at this point debugging becomes difficult. So, we would like to work under supervisor because we want to learn more about our project and if the supervisor wants some changes or updates project then we can easily make the changes in new version.

Chapter 2

PROBLEM DEFINITION

2 Problem Definition

We belong to a society where business is most common profession and people indulged themselves completely into it. Chances are we going to do same. So this motivates us to bring ease in this filed by taking away the worries and problems by removing unnecessary traditional tasks that have been followed. This application of ours will shift the business on technology, change the directions of worries and give business a boost. We all know how businesses works and everybody wants a comfortable job environment and sorted life. So who wouldn't want an app that does save time of meetings and unnecessary calculations?

2.1 Problem Statement

The major reason is, we are very much aware of offering framework in Attock, which is a feverish undertaking for temporary workers. Each contractual worker has an exceptionally troublesome and chaotic task to win the offering meeting, contract based worker needs to travel miles for simply the passage for offering. So we are accompanying a thought for the simplicity of temporary workers, our venture will support contract based workers and will spare the time and migraine of contract based workers. Our venture will support them and temporary workers will have the option to apply for offering through our task which will spare the time and travel of temporary workers. The offering will likewise be done online through application.

2.2 Deliverables and Development Requirements

The propose system we are going to developed is android base so, keeping on mind the development requirements have hardware and software requirements which is given below:

2.2.1 Software Specification

- **Operating System**

- Windows

- **Development**

- Android Studio

- **Front-End Design**

- XML

Extensible Mark-up Language (XML) used for describing data. Basic of XML syntax well be helpful for designing interactive interface, layouts and perceiving data/info feeds from internet. It is basically used for designing the whole frame of application including buttons, layouts, sidebar, searching design etc.

- **Back end**

- Java

The backend rationale will be created by utilizing java in our task. Essential structure square of android application advancement is the programming language which is java. Java gets one of the most mainstream programming advancement dialects utilized by programming designers in this day and age.

2.2.2 Hardware Requirements

- Intel i5-core with 2.7 processor
- 8.00 GB Installed memory
- Android Smart Phone

2.2.3 Tools

- Android Studio and SDK (Designing and Development)
- Star UML (for designing Diagrams)
- Database Firebase
- Java Programming language

2.3 Current System

By considering related issues there have many applications have been developed by different developers the thing is that these developed application has some constrains by mean of interactive, generalize, user-friendly and specified for specifics regions.

- **South Africa Online tenders**

In this online tender's system, the user can search the tender by the id or place in South Africa and there is a calendar in which the user and find the new upcoming tenders. But there is no bidding option online the user come to the department and fill the rates of tenders.

- **KPK NFA tender system**

KPK tender system is based on the online projects in which the user first registers their company and login their account and find the tenders in tender box. If the user wants to bid, there is also an option of bidding but after bidding the user must come to the department for their checks and finding that they win or lose the tender. The department monitor the work manually for example the department officer goes to the site and monitor the work.

Chapter 3

REQUIREMENT ANALYSIS

3 Requirement Analysis

Here, we'll clarify use case chart, practical necessities and non-useful prerequisites of proposed system. Functional requirement basically explain system its components. Functional requirements would also explain in upcoming chapters by using different pictures and diagrams. Functional requirements will also describe the behavior of the system. Non-functional requirement is a requirement that specifies existing criteria that could be used to operate system that deals with reliability etc., rather than specific behaviors that the application must do.

3.1 Use Case Diagram

A sensible image of the associations among the segments of a structure is called use case outline. A use case diagram is a technique utilized as a part of framework investigation to perceive and arrange framework necessities. We design UML (Unified Modelling Language) figures to model a framework in the simple and efficient way. UML describes several types of the diagram to cover all aspects of the framework because it is not enough to define all aspects of the system using single UML diagram.

In the user-case system diagram basically defines relationship between the user of the system (Actor) and functionality of the system. It is also known as the behavior diagram. It identifies the different users and the functionalities of the system and the relationship between them.

Use case system diagram describe the actor, use-case and the system.

- **User (Actor):** System user.
- **Use-case (Diagram):** Indicate System Functionality.
- **System:** System is the block that contains the use cases

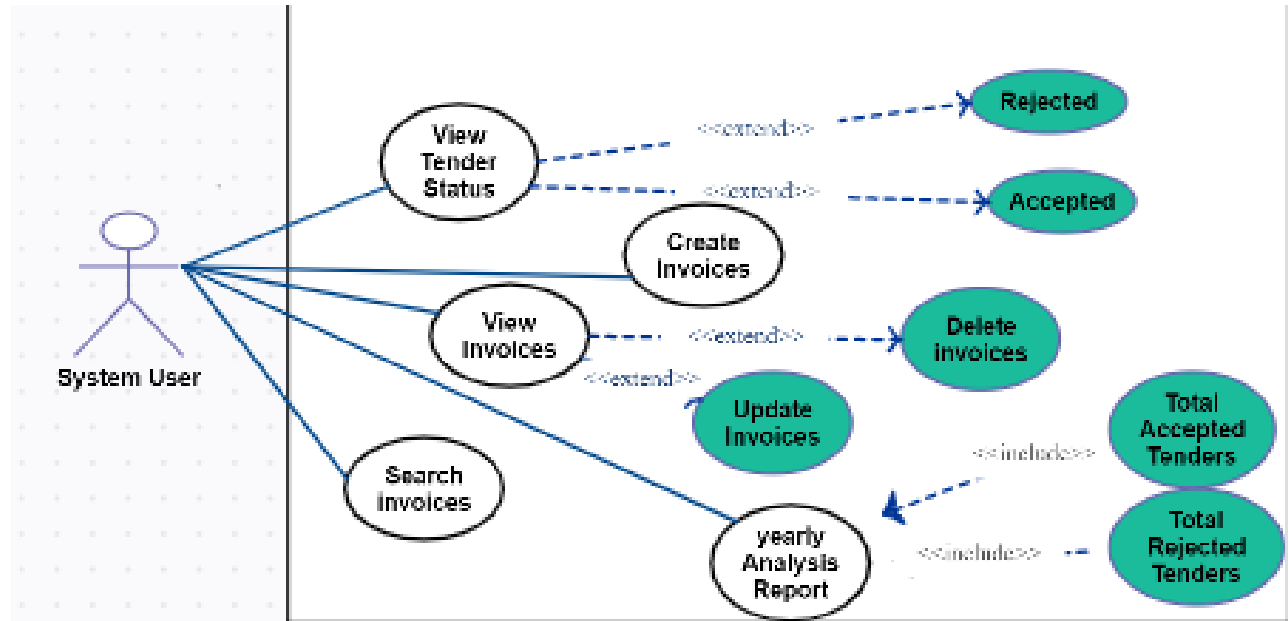


Figure 1-2 Use Case Diagram

3.1.1 Detailed Use Case Diagram

Table 0-1: User view info use case

Use Case Id	User ID
Use Case Name	View information
Actor	Company/User
Summary	System provides all information to user.
Precondition	User must have internet access.
Include	None
Extend	Tenders, Bidding, View Bid Sheet, Monitoring etc.

3.2 Requirement Specifications

Requirements specification describes about functional requirement and non-functional requirements basically explain system its components respectively. Functional requirements would also explain in upcoming chapters by using different pictures and diagrams. Functional requirements will also

describe the behavior of the system. Non-functional requirement is a requirement that specifies existing criteria that could be used to operate system that deals with reliability etc., rather than specific behaviors that the application must do.

3.3 Non-Functional Requirement

3.3.1 Performance

No delay in execution and show result quickly.

3.3.2 Accuracy

Provide authentic and concrete information's.

3.3.3 Maintenance

For maintenance it is easy to change the system according to his own requirements.

3.3.4 Efficiency

The proposed system is time efficient and gives the users required output without any delay.

3.3.5 Integrity

System stored data will accurate, good and updated.

3.3.6 User Friendly

The interface of system will be user friendly and easy to use so that all users can easily access this application and can get recommendation if not now about famous places.

3.3.7 Reliability

System will be able to be used for long time. This application must perform its intended functions and operations without experiencing failure.

3.4 Functional Requirement

If we discuss about Functional requirements, then it describe the functionality of the proposed system. E tendering app consists of different modules. Each module has its own functional requirements. Following are the given modules of the E tendering android app.

- Admin panel
- Company panel/user panel
- Calculation

- Login
- Registration
- Biding
- Monitoring

➤ **Admin**

- Admin can perform following functionalities.
- Login via email and password
- Change the password
- Delete records of users from database.
- View record of the user.
- Update/Add/Delete/View the details of users.
- Upload Bid sheet.
- Monitoring

➤ **Company/Users**

- User can perform following functionalities.
- User can view the details of Tenders.
- User can search the tenders.
- User can bid the tender.
- User can view their profile.
- User can view useful information.
- User can contact us.

➤ **Login**

- Users login to the system by entering his/her email and password to getting access of system. Without valid email they will not be able to login.

➤ **Registration**

If user want to use the application then he/she must be registered, unregistered user can't view tenders or bid sheet doesn't get recommendation. To get registered a user must enter their whole personal information which are asked by this application. Without entering the correct/real personal information user can't be registered

Chapter 4

DESIGN AND ARCHITECTURE

4 Design and Architecture

The android working framework comprises of various layers as appeared in the beneath. These layers incorporate diverse sort of utilization, various libraries, bit of Linux which is center of OS, system of use and the latter is runtime android. First layer is called android application layer in any android framework. Here we can locate some significant element like short informing administration application, maps, program, contacts, electronic mail applications, calls.

Second layer of android working framework design is outline work of use. It is diagram on structure which utilizes by programming engineers. Application interface is accessible for advancement reason and it comprise of fundamental instruments and use to make more intricate application in android.

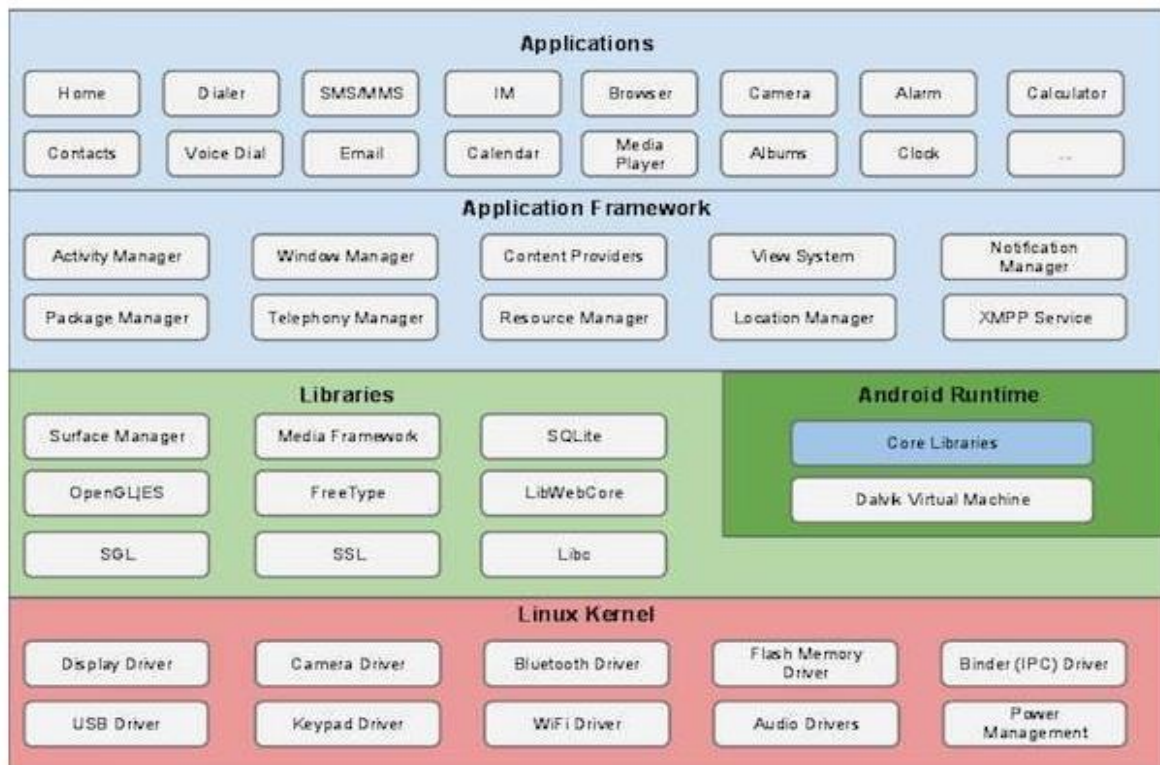


Figure 1-3: System Architecture

These layers will be used by different android system components for different components. Developer uses these available libraries for different task or reuse system functionality. Layer fourth of the system is the android runtime. It is special software which creates new processes independently for android application. The last and fifth layer is Linux kernel in android architecture. Framework is used for system's memories management, to access system file, and different inter system process of communication, power management software, networking.

4.1 Life Cycle of Android Application

Android application has four states as described below:

4.1.1 Active and Running State

In this state action runs in front and shows center around it. Client utilizes this movement and discernible totally.

4.1.2 Paused State

In paused state, the program is halfway recognizable to the client however it isn't obvious to client and centered. At the point when some other action runs which doesn't conceal the entire screen then this occurred.

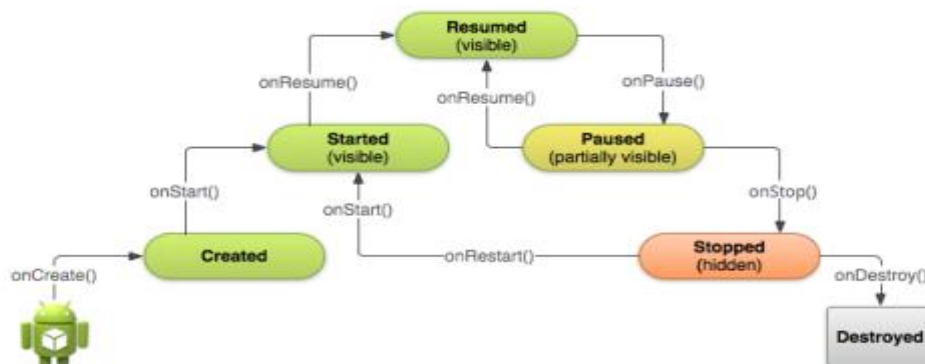


Figure 1-4: Android life cycle

4.1.3 Stopped State

Stopped state is considered when the principle screen isn't demonstrating any movement. The view is totally hazy and another movement running behind it. In this express the movement running in foundation utilizes assets like memory and so forth, yet it very well may be halted by task supervisor where we have accessible choices to clear the running application.

4.1.4 Dead or Destroyed State

When running application has not any more in memory called a wrecked state? It very well might be the application not opened at this point previously or subsequent to beginning the application is cleared from memory to spare memory assets.

In android life cycle streaming capacity have performed which is show on above figure

- Starting of an action in android telephone, it calls the `onCreate ()` work. This capacity instates the information basics and makes UI.
- **OnStar ()** capacity will be called even client have not seen the movement yet. The action is as yet halted so we should know why.
- **On Resume ()** work client can connect with movement and can see it on telephone screen. In stack the situation of movement will be on the highest point of stack. Presently application is in running state and client gives input.
- **On Pause ()** capacity could be gotten to when it is in the dynamic express; the application is prepared to continue when the client presses the home catch or one other action is running on top.
- **On Stop ()** work when action is not, at this point obvious to the client on screen, it will be entered halted state and `on Stop ()` work summoned. This may have happened when new action open and cover the entire screen. At the point when the movement has gone to completed the process of running and will going to be end.
- **On Destroy ()** capacity will be called before the action is crush. On the two cases framework conjure this get back to either movement is completing because of client totally excuse the action and the framework is briefly crushing the action because of framework arrangement changed. At the point when the action moves to demolish state, life cycle will get the `on Destroy` occasion. Life cycle will tidy up before annihilate the movement.

4.2 Data Representation [Diagram + Description]

Following are the given modules consist with product which goes to be developing. We are documenting only the salient/customer properties and methods of each and every module to keep the description more readable and simple.

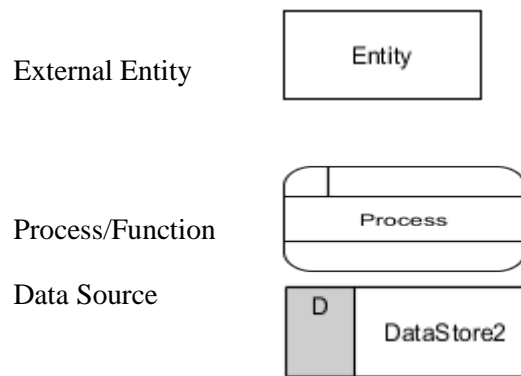


Figure 1-5: Data Flow

- **External Entity**

External entity is the user of proposed system who is interacting with the system to use different functionalities off the system.

- **Process/Function**

It is the functionality of the system

- **Data Source**

Data source is the data table in the database where the record is stored, or record is retrieved.

4.3 Process Flow / Representation

In process flow diagram we will represent DFD and Sequence diagram for all modules which is given below.

Methodology is a systematic process to make the development of software easy, in which we divide our project into different phases which are related to each other. There are many methodologies but we used Waterfall development approach.

4.3.1 Activity Diagram

Activity diagrams are graphical representations of workflow of system modules. Activity diagrams are constructed by using different number of shapes, connected with arrows. The most important shape types:

- Actions represent by rounded rectangles.
- Decisions represent by diamond shape.
- First node represents the initial node of the workflow.
- Last node represents the final node.

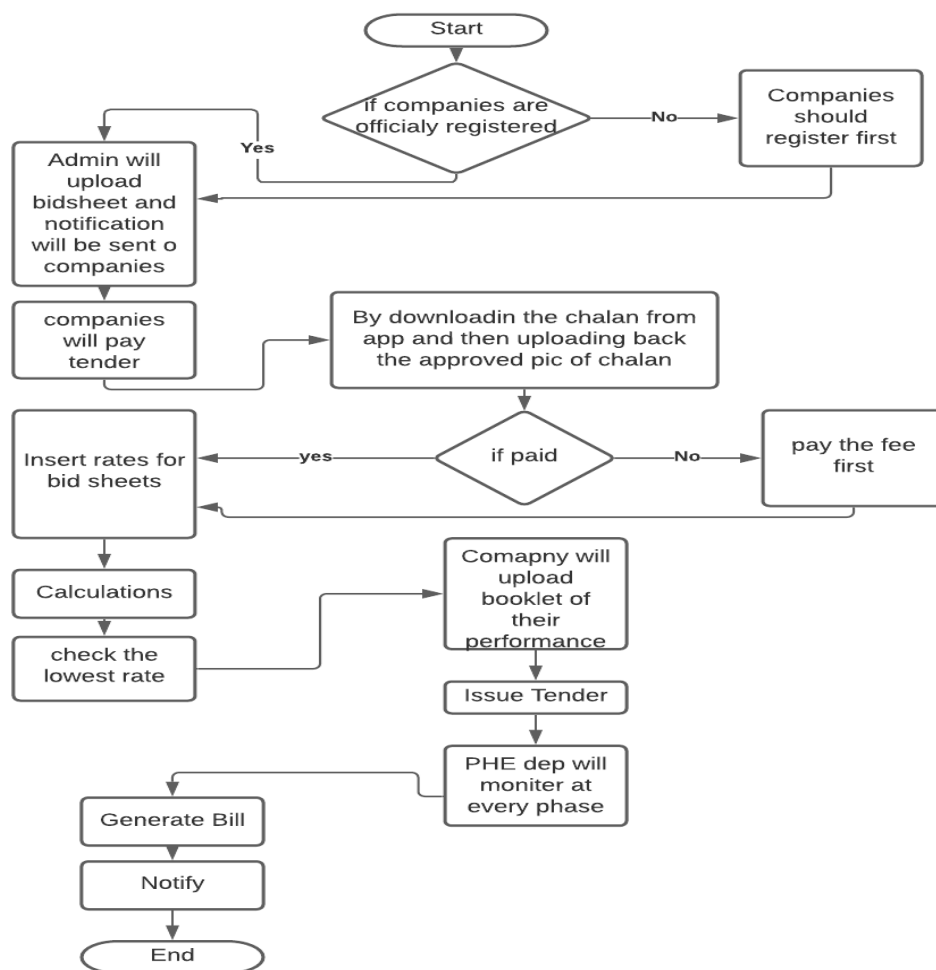


Figure 1-6 Activity Diagram

4.4 Design Models

4.4.1 Sequence Diagram

Sequence diagram is basically representing the interaction of different object in a specific order. It describes the sequence of the exchange of messages between the objects.

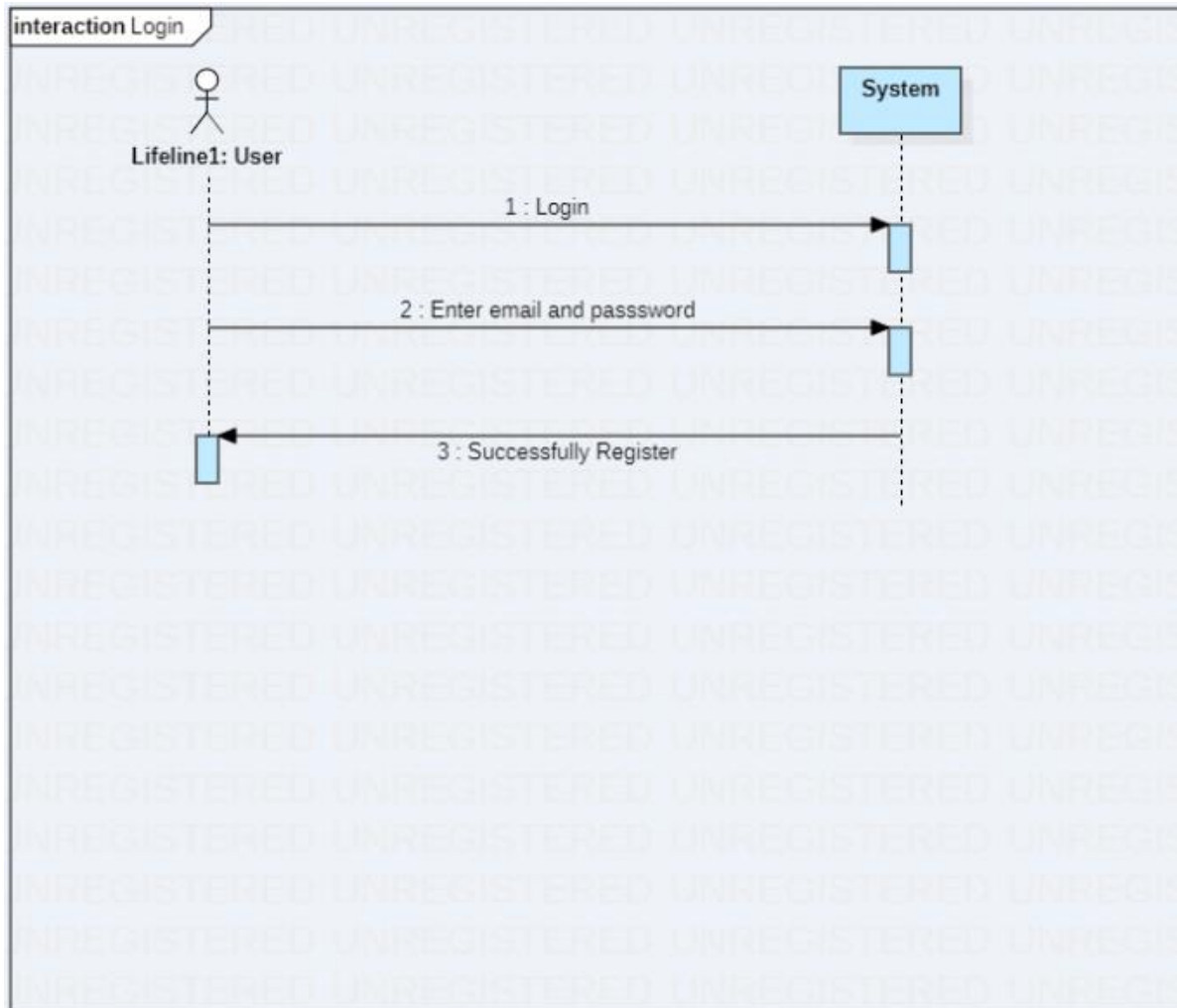


Figure 1-7 Sequence Diagram for login

User goes to login area. After the authentication from database user login in the system and have different option to perform different task as describe in above Fig.

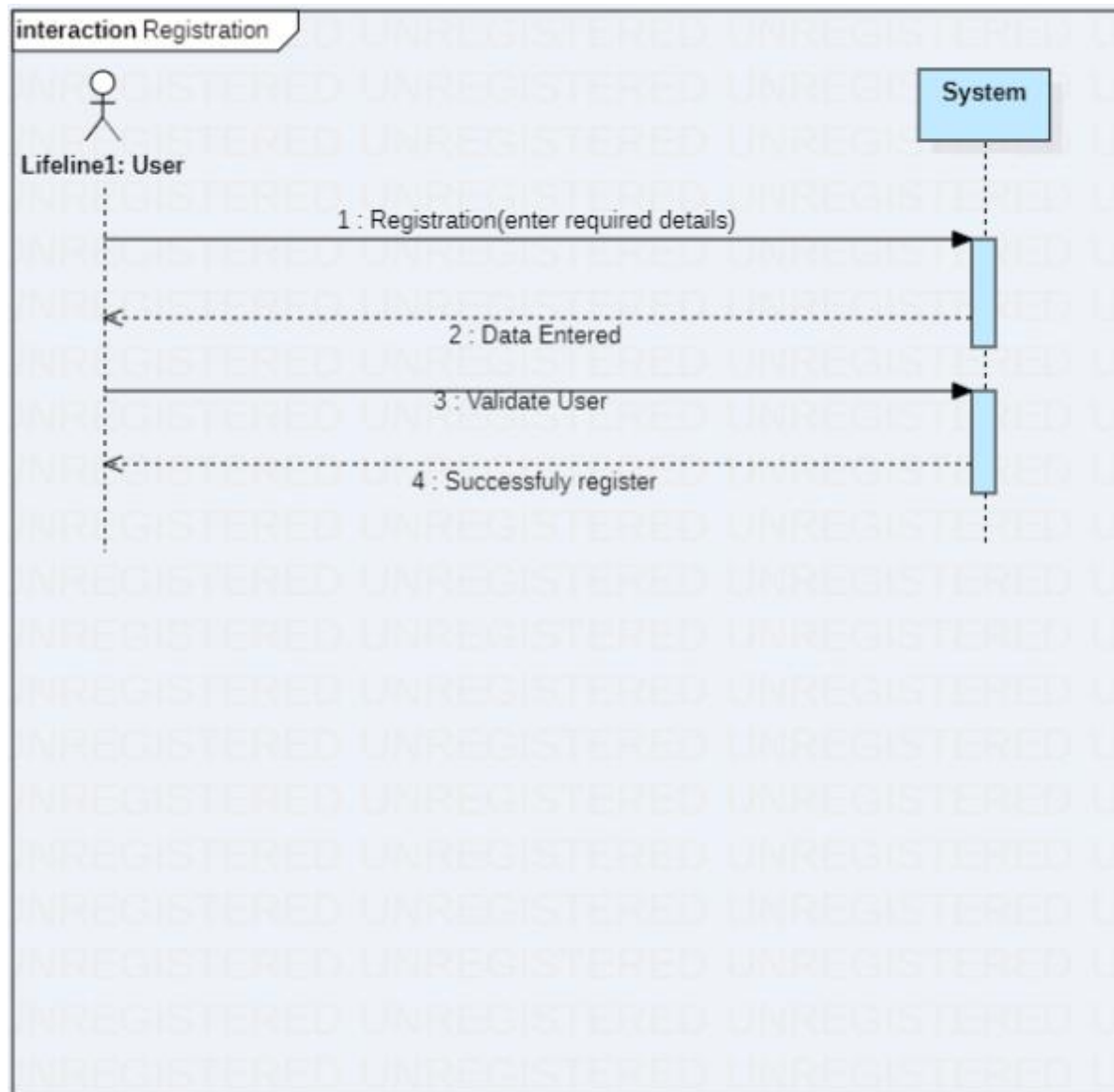


Figure 1-8 Sequence Diagram for Registration

User goes to register area. After the registration complete from database user login in the system and have different option to perform different task as describe in above fig.

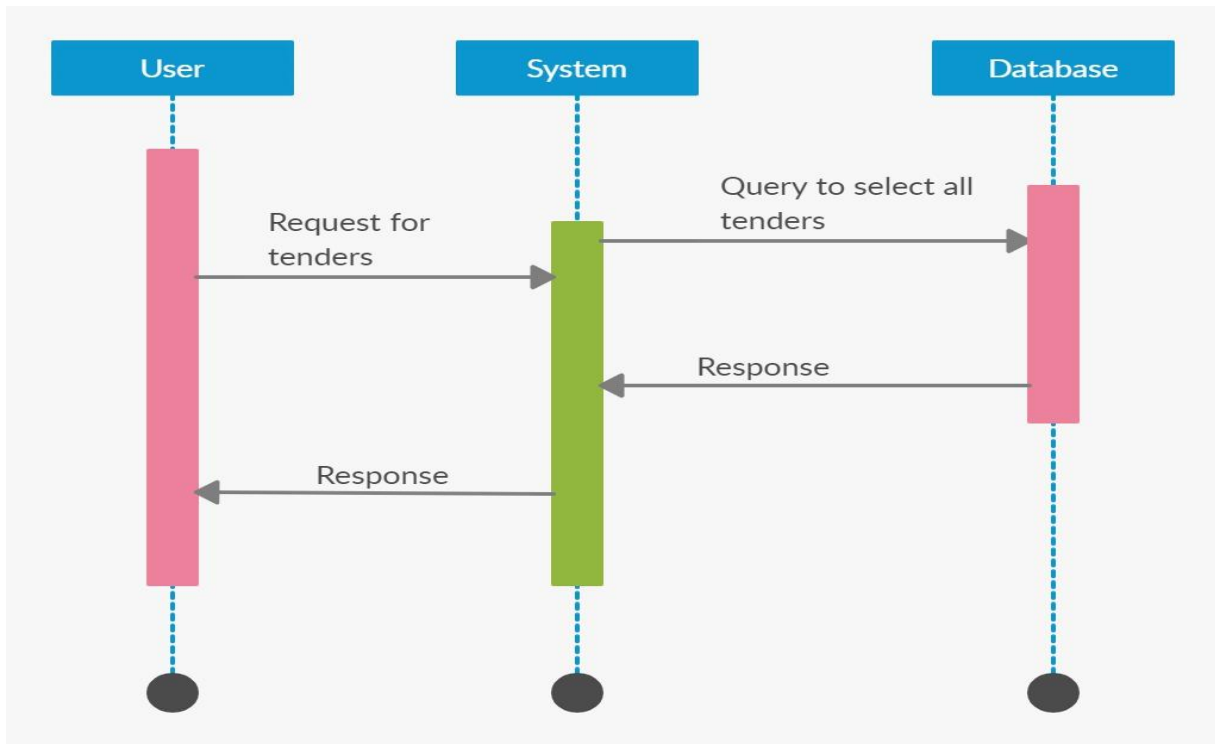


Figure 1-9 Sequence Diagram for Tender Search

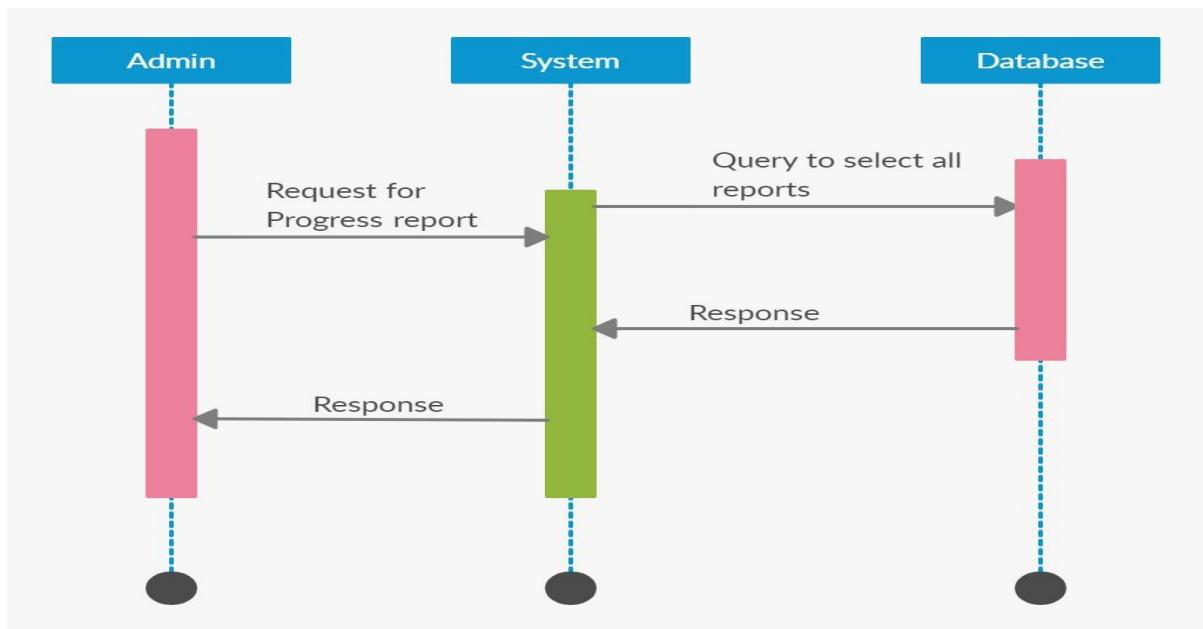


Figure 1-10 Sequence Diagram for Monitoring

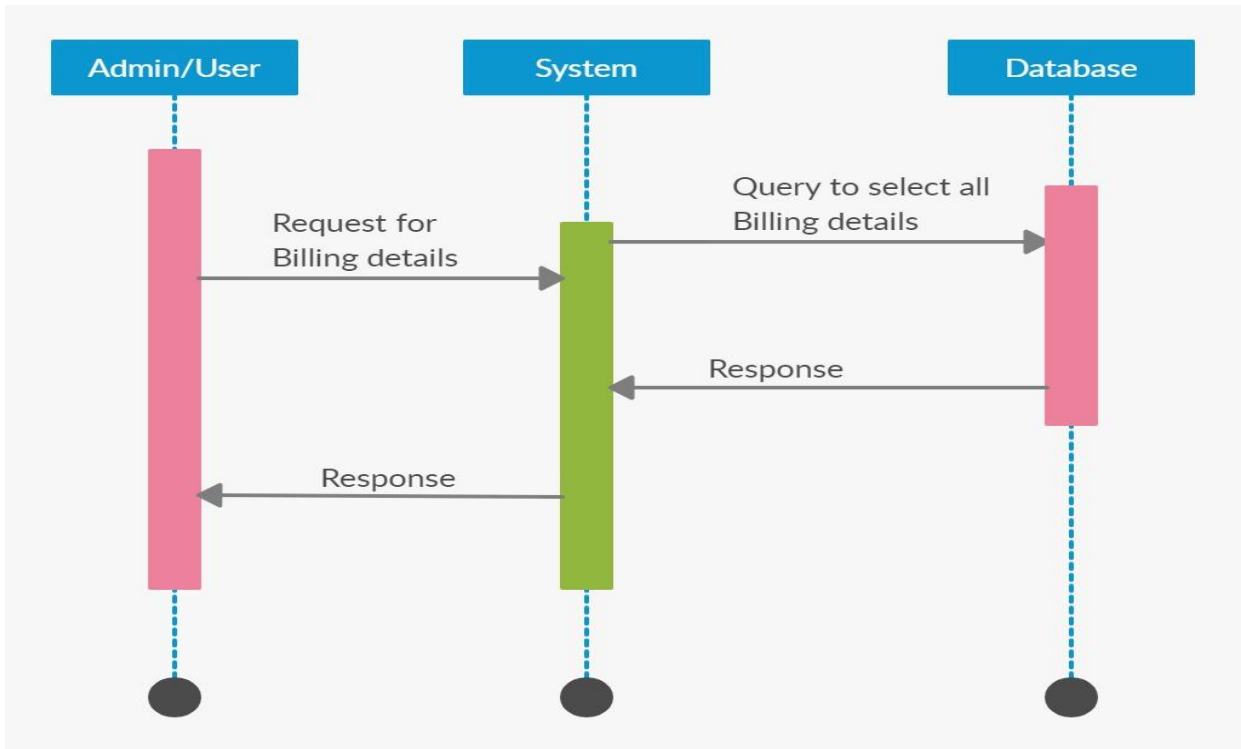


Figure 1-11 Sequence Diagram for Billing

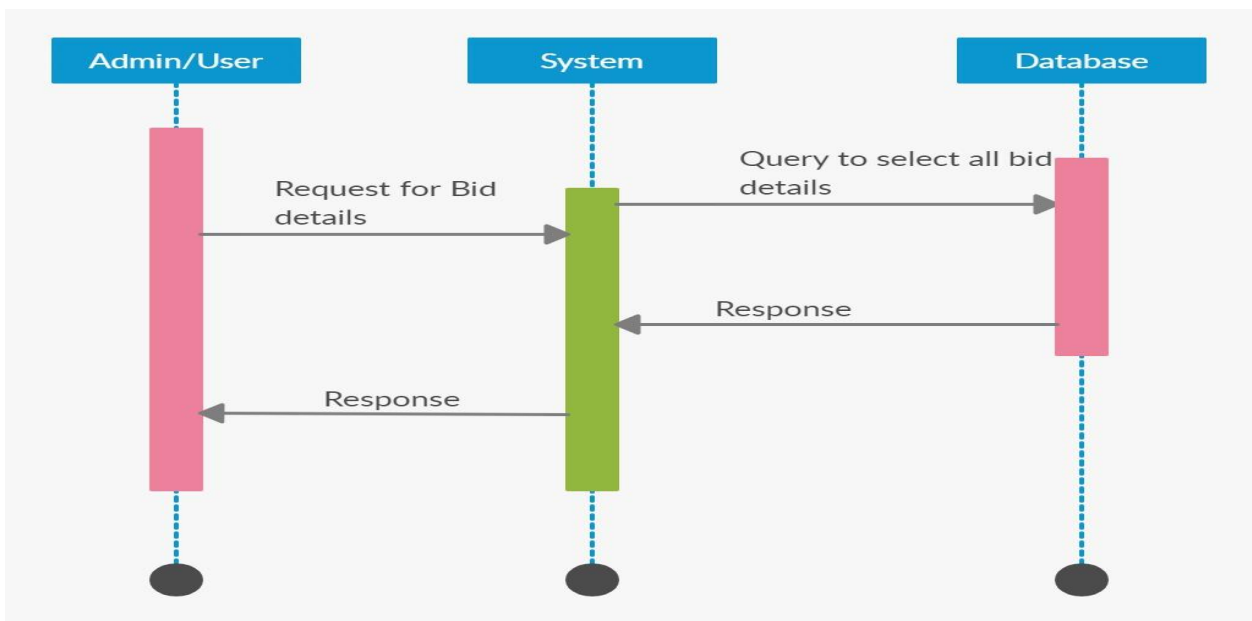


Figure 1-12 Sequence Diagram for Bidding

4.5 DFD Levels Diagrams

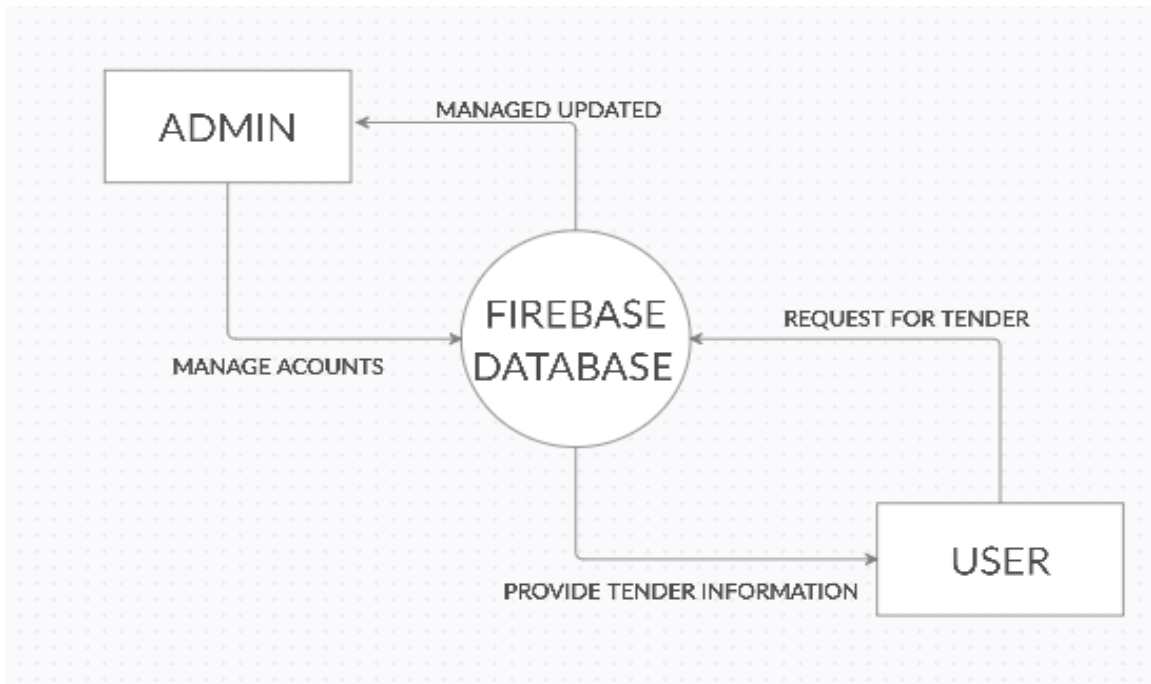


Figure 1-13: System DFD level 0

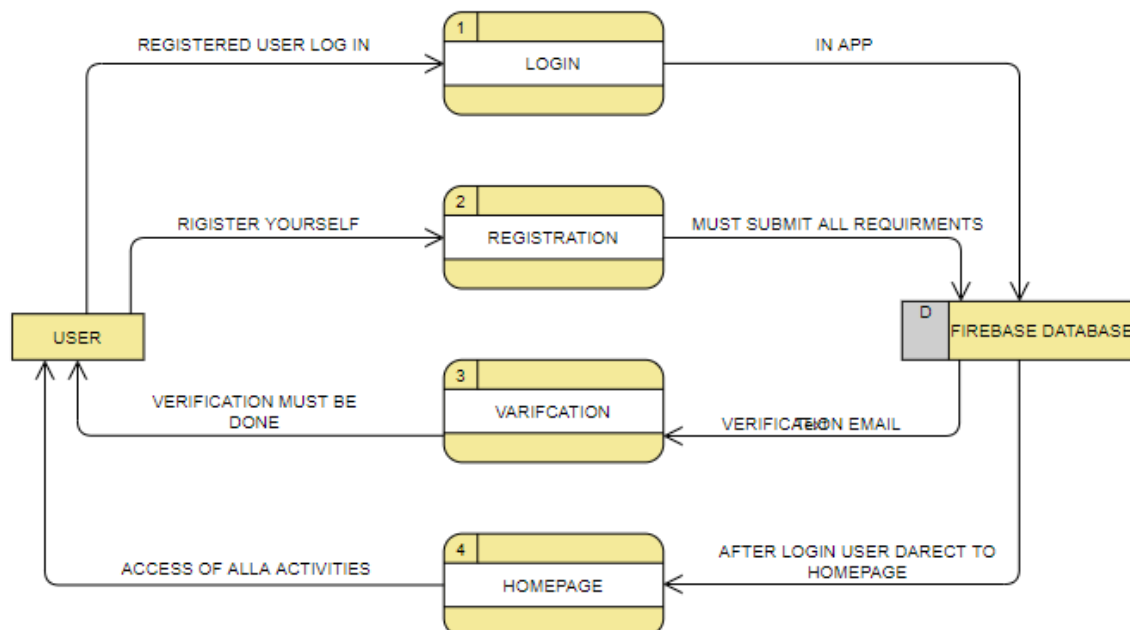


Figure 1-14: System DFD level 1 User Login

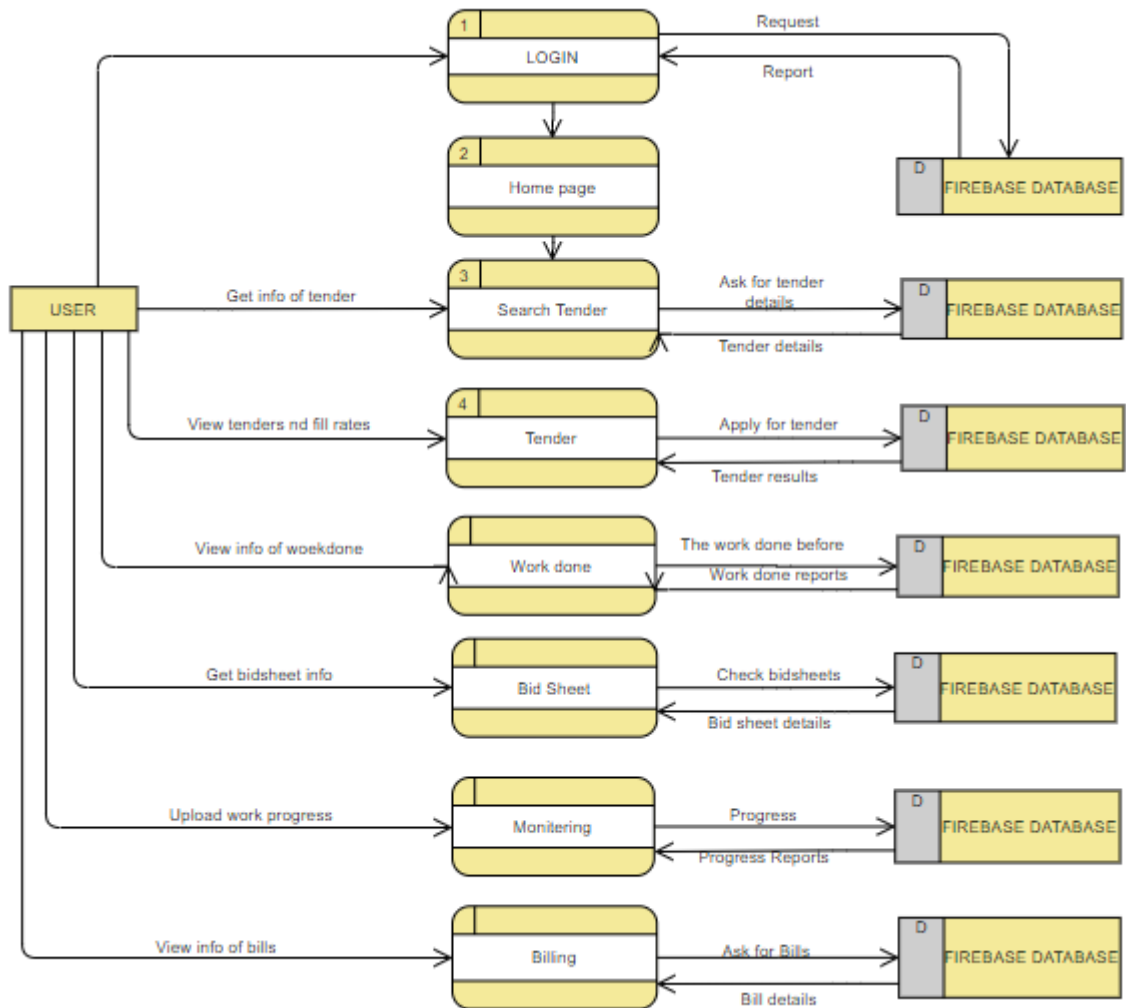


Figure 1-15: System DFD level 2 User

5 References

1. https://www.google.com/search?q=submitted+to+higher+education+commission+pakistan&rlz=1C1CHBD_enPK921PK921&oq=submitted+to+higher+education+commission+pakistan&aqs=chrome..69i57.15562j1j7&sourceid=chrome&ie=UTF-8
2. <https://www.javatpoint.com/>
3. https://en.wikipedia.org/wiki/Main_Page
4. <http://www.arabou.edu.sa/en/>
5. www.youtube.com

ORIGINALITY REPORT

9%

SIMILARITY INDEX

5%

INTERNET SOURCES

0%

PUBLICATIONS

7%STUDENT PAPERS

PRIMARY SOURCES

1**Submitted to Higher Education Commission
Pakistan**

Student Paper

2%

2**www.javatpoint.com**

Internet Source

1%

3**en.wikipedia.org**

Internet Source

1%

4**Submitted to University of Greenwich**

Student Paper

1%

5**www.coursehero.com**

Internet Source

<1%

6**Submitted to Arab Open University**

Student Paper

<1%

7**Submitted to Asia Pacific University College of
Technology and Innovation (UCTI)**

Student Paper

<1%

8**Submitted to MCC Training Institute**

Student Paper

<1%

9	Submitted to Frederick University Student Paper	<1 %
10	Submitted to Majan College Student Paper	<1 %
11	Submitted to Visvesvaraya Technological University, Belagavi Student Paper	<1 %
12	Submitted to Universitas Atma Jaya Yogyakarta Student Paper	<1 %
13	www.ubicc.org Internet Source	<1 %
14	Submitted to University of Northampton Student Paper	<1 %
15	Submitted to London School of Commerce Student Paper	<1 %
16	Submitted to Rivers State University of Science & Technology Student Paper	<1 %
17	open.library.ubc.ca Internet Source	<1 %
18	www.mdpi.com Internet Source	<1 %
19	trap.ncirl.ie Internet Source	<1 %

20	Submitted to University of Teesside Student Paper	<1%
21	Submitted to Vaal University of Technology Student Paper	<1%
22	intanariestyawuri.wordpress.com Internet Source	<1%
23	text-id.123dok.com Internet Source	<1%
24	utpedia.utp.edu.my Internet Source	<1%

Exclude quotes On

Exclude matches Off

Exclude bibliography On