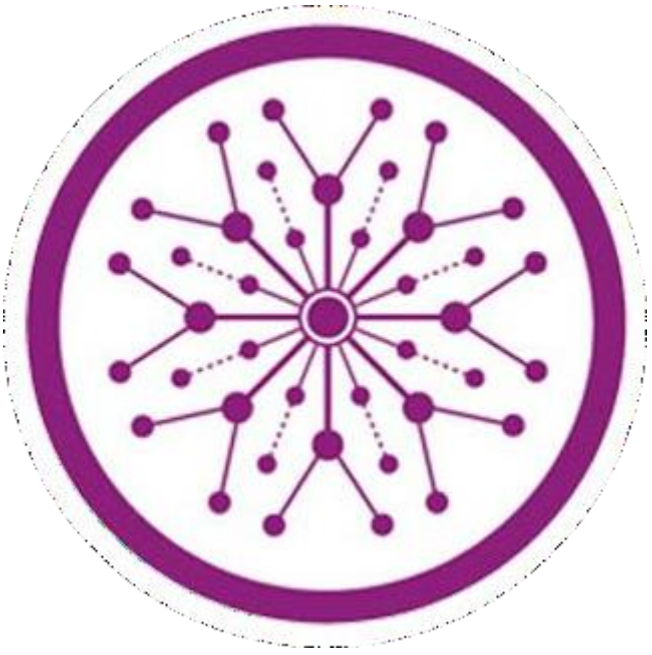
Blind Bridge

Final Year Project

Session 2019-2023

A project submitted in partial fulfillment of the degree of

BS in Information Technology



Department of Information Technology

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*The candidates confirm that the work submitted is their own and appropriate credit has been given where reference has been made to work of others.

Plagiarism Free Certificate

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Project Report

Blind Bridge

Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
ZARISH AMIN BUSHRA AMBER	1.0	05Oct 2022	Project Design and module plan	

APPROVAL

PROJECT SUPERVISOR	
Comments: _____	
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PROJECT MANAGER	
Comments: _____	
_____ _____	
Date:_____ __	Signature:_____ __

HEAD OF THE DEPARTMENT	
Comments: _____ _____	
Date:_____	Signature:_____

Dedication

This work is dedicated to my family, teachers and friends. A special feeling of gratitude to my loving parents whose words of encouragement and push for tenacity ring in my ears.I also dedicate this dissertation to my teachers and friends who have supported me throughout the process. I will always appreciate all they have done.

Acknowledgments

I am really thankful to all those who have given me constant Intellectual and moral support through my Final Year Project. I would like to acknowledge and extend my heartfelt gratitude to my project supervisor **SIR, Mr. Javaid Iqbal** for his support and intellectual guidance during the project development. He is a very responsible supervisor with plenty of patience in reading my weekly reports and listening to my demonstration presentation. His guidance has been very useful. His valuable comments critical feedback and encourage me a lot in solving many of the problems in this project. Thank you. I am thankful to all the lecturers and teaching staff who taught me for the academic material throughout these years. I must express my deepest gratitude to the Department of Computer Science & Information technology the technicians and peers for providing Information technology students with such an excellent working environment and the opportunities of learning.

Executive Summary

Navigation is an important human task that needs the human sense of vision. In this context, recent technologies developments provide technical assistance to support the visually impaired in their daily tasks and improve their quality of life. However, for the visually impaired, this information is not generally available through external intervention. In fact, to ensure that the visual impaired get the best education platform and to navigate the books they wanted to read In this context, many researchers address the issue of how to enable these individuals to overcome the inability to navigate the environment independently defined by a set of components and characteristics. In this work, we are considering to design a system that provides assistance for the visually impaired to better understand the world and get to know the world

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Chapter 1

Introduction

Chapter 1:

Introduction

This is an app for blind people for education. In this app we are providing teachers for them. This app is specifically made for visually impaired students who rely on outside assistance. These apps make life simpler for many individuals who are blind or have other visual impairments. These apps have made life easier for many blind individuals. A non-sighted person may have needed assistance from someone else toread materials that are solely in visual print.

• Background

According to the World Health Organization, there are approximately 285millionpeople who have visual impairments, 39 million of them are blind and 246millionhave decreased visual acuity. Close to 90% of the visually impaired are living low-income nations. There are 30000 visually impaired people who have been identified in Tunisia; including 13.3% of them are blind. Impaired visions cancausesevere consequences on some visual function capabilities (Jabnoun, Faouzi & Amiri 2015). These people will have trouble conducting daily living activities like walking. Vision will be required at a certain distance depending on how bad the person's sight is. Read, write, communication would also be troublesome. They will problem's in evaluating displacements and space. Every activity requires a pro long e depending well maintained visual attention. It is why it is very essential for these to understand their environment and knowing what objects or them. Knowing what is around them can also provide relief to them. There are several kinds of aids which have been created by different help the visually impaired. There is mobility aid where motions and vibrations plays huge part in guiding the blind through obstacles. Its applications included guiding canes and wheelchairs. Another method would be computer vision or artificial intelligence. The main focus of our project is to provide assistance for the impaired community by creating and developing a mobile application. The visual sense plays a primary role in guiding a sighted person through an unknown environment and assisting him or her to reach a destination safely. Unfortunately, people who are blind face difficulties in performing such tasks.Research on orientation and mobility (O&M) skills of people who are blind in known and unknown spaces (Passini & Proulx, 1988; Ungar, Blades, & Spencer, 1996) indicates that the support for the acquisition of spatial mapping and orientation skills should be supplied at two main levels: perceptual and conceptual.

Over the years, secondary O&M aids have been developed to help blind persons explore real spaces. The secondary aids represented below are not a replacement forprimary aids, such as the long cane and the guide dog. The existing inventory of O&M electronic aids encompasses more than 146 systems, products, and devices (Roentgen, Gelderblom, Soede, & de Witte, 2008). There are two types of secondary O&M aids: preplanning aids that provide the user with information before his or her arrival in the environment (e.g., verbal description, tactile maps, strip maps, physical

models, and talking tactile maps) and in-situ planning aids that provide the user with information about the environment in-situ (e.g., Sonic-guide, Talking Signs, embedded sensors in the environment, activated audio beacon using cell phone technology, and GPS).

• Motivations and Challenges

The first problem statement is the inability of visually impaired users to perceiveinformation by the sense of sight. Visually impaired people usually rely on theirsense of touch, hearing, smell and taste. They have to challenge themselves daily incoping with their impaired vision in a universe where majority of the peopleperceives their environment with vision (Koestler 1976). Hence, our project will try to to the problem. Besides that, communication and access to information is a huge problem for the visually impaired people (Arati, Sayali, Sushanta & Harshata 2015),comes to terms of utilizing a smartphone to perform some actions. Performing a call or knowing your phone's certain status using a smartphone is difficult for visuallyimpaired users. Many mobile applications developed for the visually impaired out there do not provide extra functionality like that for this category of users to access. Their sole focus is only on retrieving information of items interpreted by the mobilecamera. There are several more aspects that are yet to be explored and has potential in assisting those who are visually impaired via mobile application. Next, visually disabled people have limited accessibility to smart mobile devices' functionality (Dobosz 2017). Nowadays, most of the devices such as tablets and smartphonesrequire users to only touch on the surface of the screens (Dobosz 2017). Besides facing difficulty in navigation throughout a mobile application, starting it is a verychallenging task because it requires these visually impaired to seek for the exact position of the shortcut key or icon in order to turn on the application. Situations like that motivate this project to be developed to provide assistance to those in need. Redundancy of objects under varying conditions is also among the problems in object recognition which many researchers are concerned of. This issue is by thechanges in camera angle, lighting, and sizes. This problem will

definitely not benefitusers who are visually impaired. Blind users are unable to know or see the object toestimate the distance of it away from the phone camera. It is also very arduous to fulfill the concept of inter-class similarity (e.g. computer television. Another problemwould be the constant reliance of some object recognition applications on an accessibility setting known as “Voice Over” for iPhone users and "Talk Back” for Android users. These applications rely on the accessibility setting store turn audio outputs to the users. Without it, the users will be left wondering whether they have opened the right application or have to navigated to the right interface. Due to the fact that the settings can only be configured by accessing the built-inaccessibility option, visually impaired users will also have a hard time navigating gall the way intothe settings configuration themselves and require another person with proper visionto handle that.

- ## Goals and Objectives

First of all, an object recognition function will be built into our mobile application. The mobile application should be able to detect certain items from the camera and return an audio output to announce what it is. In order to allow the mobile camerato recognize objects, machine learning has to be involved. Tensor flow will be utilizedin this project because it serves as a platform for the expression and implementation of machine learning algorithms. Tensor flow allows expressed algorithm computations to be executed on various heterogeneous systems including mobile applications (Abadi et al. 2015). On the other hand, Python programming language will be used to train and test object recognition models for further implementation into the project’s mobile application based on a Tensor flow reference documentation which was first released in November 2015 (Abadi et al. 2015). Every object model trained will have its own label. Thus, the label text returned will be converted into speech through the Android’s Text To Speech engine. The visually impaired will then perceive the detected object through listening. Other than recognizing objects, the mobile application should also be able to detect text and return a speech output of it to the user. This enables the users to read words or sentences from anywhere including books or food packages. Android’s Text To Speech is involved in the implementation of this function. Besides that, users will be able to dial numbers from keypad to call from the mobile application but the function would have to take the visually impaired users’ senses other than sight into account. The keypad would produce sounds or even vibrations to indicate the numbers or call button which are being pressed. Moreover, there will be a voice assistant implanted into the application for users to speak out the information which they would like to acquire such as

time and phone battery status. These are all programmed using Java and the codes are tested and executed in Android Studio. This project is also very focused on providing visually impaired users an understandable navigation and unsophisticated accessibility while utilizing our mobile application. In order to achieve that, every function access button would return an audio output signifying the function which the users are about to access. It could save them time from asking for others' help to handle their device.

OBJECT:

The first objective of this project is to provide assistance for the people with visual impairment. This application aims to bring convenience into these people's life. It gives these users an opportunity to experience a different perception of their surroundings. The visually impaired can rely lesser on their other senses like touch or smell in order to recognize object with the existence of object recognition function in our application. They are able to save a little time and energy from moving closely to perceive the objects or words that they wish to have knowledge of. Another objective is to optimize the usability of a smartphone application for the people with visual impairment. The development of this mobile application will focus mainly on enabling the users to perceive through the sense of auditory (hearing) and tactile (touch). The application is supposed to return audio output during the

navigation throughout the application. For instance, if the user pressed a button, the button should indicate its function by audio. Besides that, the project aims to integrate the object recognition function with other functions which are inaccessible by the blind users on a usual mobile application. It will be an additional feature which makes our mobile application unique as there currently close to one applications out there which combines these functions together. Rather than just allowing users to recognize object with the mobile application, this mobile application's development will include several simple functions like calling or saving contacts. For example, if they face trouble or whatsoever, they can simply access this mobile application and contact someone without worrying that they may not be able to access the phone's basic application like calling. This is because the usual mobile navigation will confuse and complicate the visually impaired users, hence wasting time and risking the users' life if it is an emergency.

- # Literature Review/Existing Solutions

1.4.1 TapTapSee

TapTapSee is designed to help the blind and visually impaired identify objects they encounter in their everyday lives. Simply tap anywhere on the screen to take a picture. TapTapSee can

photograph any two or three-dimensional object at anyangle and speak the identification back to the user

1.4.2 Voice Dream Writer

Voice Dream Writer helps everyone write better: Text-to-speech proofreading reduces mistakes, phonetic and meaning search help you use the right words, and an active outline helps you organize and improve the structure of yourwriting.

1.4.3 Be My Eyes

Need a pair of sharp eyes? Or have some sight to lend? Be My Eyes is a simple, free tool to see the world better, together. Be My Eyes connects you with a global community of volunteers and company representatives who are ready at a moment's notice to help you see – to lend their eyesight and support with everyday tasks.

1.4.4 OneStep Reader

OneStep Reader 3.0 is a rapid and efficient text recognition app. Its text-to-speech, text-to-Braille, and text highlighting tools make it valuable for blind, low-vision, dyslexic, and Use it to import or take a photo of anything containing text. Take a photo and the app reads text out loud or displays it on a connected refresh-able Braille display.

• Gap Analysis

To conduct a gap analysis, these are 3 fundamental of Gap Analysis **current situation, determine your goal state, and highlight the gap between the two**. Then, you can create an action plan to bridge said gaps.

A gap analysis is an examination and assessment of your current performance for thepurpose of identifying the differences between your current state of business and where you'd like to be. It can be boiled down into a few questions:

- Where are we now?
- Where do we wish we were?
- How are we going to close the gap?

• Proposed Solution

In order to assist blind and visually impaired people in the education industry and facilitate the way finding things around the globe, we propose a E-learning mobile application that provides you the education via the auditory or somatosensory system. The developed android application named "E-collage system" is mainly used to assist the blind person in reading, detecting things

and in education as well.

- ## Project Plan

project plan is the the first step to do in any project. if we collaborate most of our time on project plan we would have to do the less practical work.

In project plan we have following steps to go.

- project activities
- identifying the problems
- making screens
- resource optimization
- group optimization
- cost analysis
- budget analysis

- ## Work Breakdown Structure

work breakdown structure is the breaking of your work into smaller task to make it simpler to do

Project management

- Work Breakdown Structure (WBS)
- Roles & Responsibility Matrix
- Change Control System
- system architecture diagram

Documentation

- Project plan
- Literature / Markey Survey
- Requirements Analysis
- System Design
- Implementation
- Testing & Performance Evaluation
- Conclusion & Outlook
- End User Documentation
- Application Administration Documentation

- System Administrator Documentation

Group management

- group budget
- designing team
- backend team manage
- coordination between different groups

Designing application

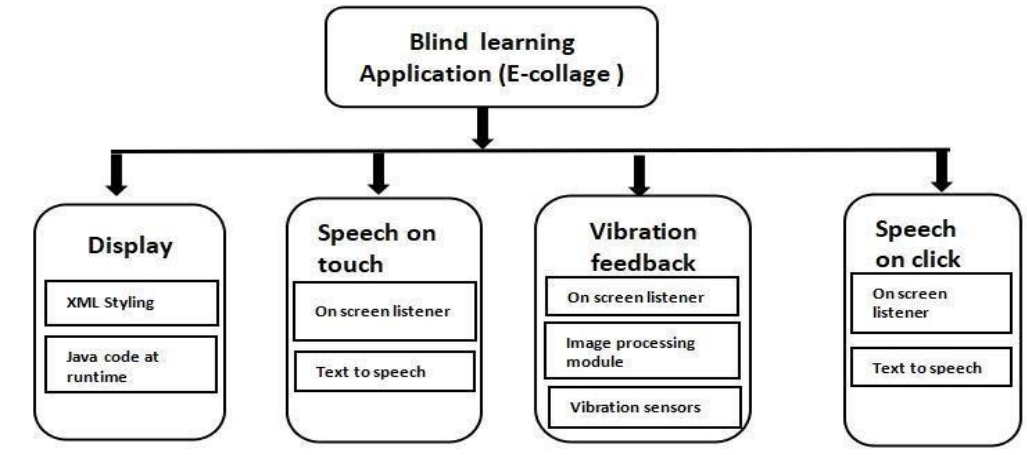
- designing screens
- courses
- student dashboard
- voice assistance
- reading corner
- contact admin

Backend development

- database is used to store record of a student

Hiring staff

- hiring teachers for the students



- **Roles & Responsibility Matrix**

WBS Deliverable	Duration (# of Days)	Responsible Team Member(s) & Role(s)
• project plan	Week 3-4	Zarish Amin
• Identification of problem	Week 5-6	Bushra Amber
• Propose solution	Week 7-8	Hassan Ali
• Project proposal	Week 1-2	
• System design	Week 6	
• Structure design	Week 7	
• Work breakdown structure		
• Gantt chart		
• System architecture diagram		
• Use cases		
• Domain model		
• Class diagram		
• ER diagram		
• Flow chart		

Gantt Chart

- project initiation
- project plan
- project execution
- testing
- closeup/ Evaluation

- ## Report Outline

These apps make life simpler for many individuals who are blind or have other visual impairments. These apps have made life easier for many blind individuals. A non- sighted person may have needed assistance from someone else to read materials that are solely in visual print.

This is an app for blind people for education. In this app we are providing teachers for them. This app is specifically made for visually impaired students who rely on outside assistance.

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

- ## Introduction

This following document cover both function and non-function requirements various characteristics dependencies references and appendix. All topics are ordered sequentially and deliver high level of descriptive format.

- ## Purpose

These apps make life simpler for many individuals who are blind or have other visual impairments. These apps have made life easier for many blind individuals. A non- sighted person may have needed assistance from someone else to read materials that are solely in visual print..

- ## Document Conventions

This document follows Calibri Format, bold faced text has been used to emphasize section and sub section heading, highlighting is to point out words in the glossaryand specialized text is used to label and recognize diagrams.

- ## Intended Audience and Reading Suggestions

This document will be read by the development team, manager, project manager, marketing staff, stakeholders, testing team and documentation writers. Ourstakeholders and company manufacturing are familiar with the hardware, company provide and embedded the operating system and distributes who will market finished the product, and may review the document to

Learn about the product so that they can understand the requirement. Project manager are familiar with SRS, others can be reviewing them.

- ## Product Scope

Out of 207.7 million people in Pakistan, an estimated 1.12 million (95% Uncertainty Interval. 1.09 million people had severe vision loss and 6.79 million people hadmoderate vision loss.

- **People using cell phones:**

Across the world almost 60% of the blind peoples uses cellphones for themselves but they stays uneducated though. Almost 75% are uneducated blind peoples across theworld. Our

app is helpful for educating blind peoples with many courses we offer.

- Student
- Teacher
- Department
- Subject
- Assessments
- Quiz
- Teacher Assessments
- Content Helps

- ## References

IEEE standard document for software requirement specification.

- # Overall Description

Navigation is an important human task that needs the human sense of vision. In this context, recent technologies developments provide technical assistance to support the visually impaired in their daily tasks and improve their quality of life. However, for the visually impaired, this information is not generally available through external intervention. In fact, to ensure that the visual impaired get the best education platform and to navigate the books they wanted to read In this context, many researchers address the issue of how to enable these individuals to overcome the inability to navigate the environment independently defined by a set of components and characteristics. In this work, we are considering to design a system that provides assistance for the visually impaired to better understand the world and get to know the world

- ## Product Perspective

A. learning will provide a platform for blind people after they successfully registerinto the system. If a user wishes to start education , he/she can send a request in application.. We are looking and expecting to update and refine the online education system the application will be beneficial if blind people want to educated.

- ## Product function

This app for blind people educational learning apps are designed to be engaging and

enjoyable for students. Knowledge augmentation, tailored learning experiences, improved engagement, access to online study material, ease of communication, and, most significantly, remote access are all advantages of a learning app.

- ## User Classes and Characteristics

Admin

- Admin can sign up
- Admin logo in
- Admin can add content
- Admin can delete content
- Admin can update/edit content
- Admin can block a use
- Admin can check feedback
- Admin can resolves the complains
- Admin can view progress
- Admin can view database

Teacher

- Teacher can sign up
- Teacher logo in
- Teacher can add content
- Teacher can delete content
- Teacher can update/edit content
- Teacher can view progress
- Teacher can view database
- Teacher assign work assignment / quiz/ activity.
- Teacher collect work assignment / quiz/ activity.

Teacher Assistance

- Teacher Assistance can sign up
- Teacher Assistance logo in
- Teacher Assistance can add content
- Teacher Assistance can delete content
- Teacher Assistance can update/edit content

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- Teacher Assistance can view progress
- Teacher Assistance can view database
- Teacher Assistance assign work assignment / quiz/ activity.
- Teacher Assistance collect work assignment / quiz/ activity.
- Teacher Assistance guide user /student.

User

- User can sign up
- User can logo in
- User can select content
- User can give feedback
- User can take quiz
- User can view progress
- User can read selected content
- User can write selected content
- User can listen selected content

- ## Operating Environment

This system will operate in browsers like Mozilla, Firefox, and Opera and for their different version also.

- It can be open on window, android and iPhone.
- The processor should be core 2 duo or above.
- The processor's speed should be 2.8 GHz or greater.
- Ram should be or greater than 512 MB.

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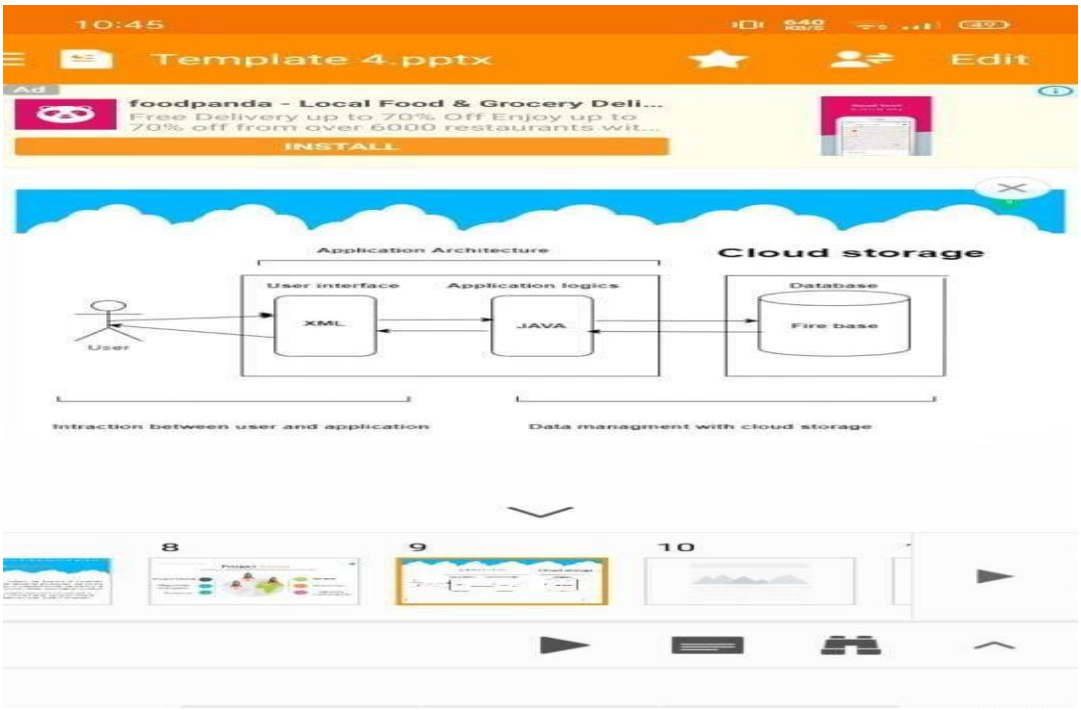
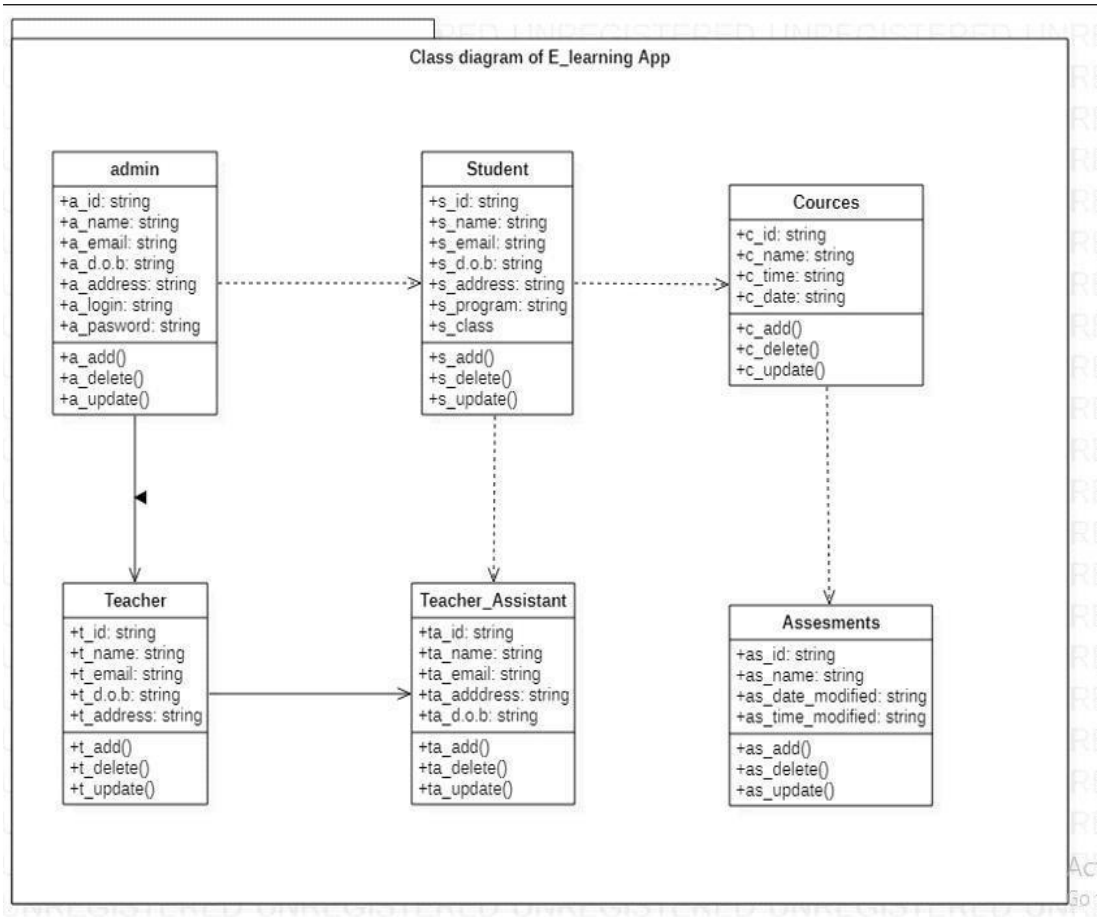


Class Diagram



- ## Design and Implementation Constraints

We are making an android application on E-college system application outline. For this App we are using Android Studio, Photo-shop for making and editing picturesand icons

Frontend

For this app for frontend we are using XML files, and we are using (SDK) software development kit, (ADT) android development tools

Backend:

For backend we are using java file in android studio, (SDK) software development kit, (JDK) java development kit, (JRE) java run time environment, Firebase to save the records, (ADT) android development tools and SQLi.

- ## User Documentation

System shall provide an online hierarchical system in our application that describes and illustrate all the system functionalities. The first time a new user accesses the system and on user to practice for using static tutorial menu.

- ## Assumptions and Dependencies

- Each user has account authorized and authenticate by admin.
- Each user have to login itself to present him/her after entry in the system, this will be done automatically. No user can share their username and password to each other.
- However, the blind people and the database will work on the server that needs to be always available.

- # External Interface Requirements

- ## User Interfaces

every activity will be created according to the designed layout which will be linked function's settings. All of the activities which will be displayed as a user interface on the mobile application will have to use that function. The function will set a content view linking to the startup layout designed in the layout folder. The startup interfacefor this prototype will look as displayed.

As this is only a welcome (startup) screen to notify users have the application, this screen will be designed to have a timeout of 2.5 seconds. After 2.5 seconds, this screen will start the homepage activity where users will be able to select actions theywould like to perform. Besides, during this startup activity.

the user interface of the application's home page after the first prototype has been developed. Every button allows users to access the respective functions as labeled. For this prototype, tapping once on the button will sound the button's function and direct users into the selected function.

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This activity uses the Android classes of Contacts Contract and Content Provider Operation to perform a direct contact registration from this application into the phone's contact list. If the input of name and phone number are not inputted, the application will return an error message in audio form notifying users that the name and phone number must not be empty. The "Register" button will sound when pressed is designed is the same as the past described buttons.

This activity is known as a Voice Assistant. Clicking the microphone image button will simply starts recording the users' voice input. Android's speech recognizer will play a part in detecting voice inputs. When the microphone button is pressed, it has a sound signifying its beginning of recording. The end of receiving the will also sound. The output of the voice command will be displayed on screen and also spoken a loudso users can perceive it. Android's text to speech synthesizer is used to allow those displayed output texts to be spoken aloud. So far, users can only request for the time

- ## Hardware Interfaces

Tools:

Before describing the initial prototype built, the tools used for building the prototype and following prototypes will be specified.

Development Environment:

The IDE (Integrated Development Environment) used to build this mobile application is Android Studio. It is designed specifically for Android development. The main programming language used in the development of this application's logic and features is Java. The design of the application's user interface is done by XML(Extensible Markup Language).

Hardware:

The phone used to build this application is Huawei Nova 3i. The specifications are listed OS Android 9 (Pie) Model INE-LX2R CPU Octa-core (4x2.2 GHz Cortex-A73 & 4x1.7 GHz Cortex-A53) GPU Mali-G51 MP4 Internal Memory 4GB RAM, 128GB ROM External Memory microSD, up to 256 GB Dimension 157.6 x 75.2 x 7.6 mm.

External System interface:

This section describes the folder structure where the user interface designs and audio files used for returning feedback are stored in SQL data . The folders used for the user interfaces designs are drawable, layout, menu, mipmap and value. On the other hand, the audio files are stored in raw. The foldersdrawable, values and mipmap basically stores parameters which will be usedinthemain design of the user interface where all the files are located in layout or menu.

Human interface:

In this app code will be used:

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1- Java

2- Flutter

- ## Software Interfaces

- Windows 7 or higher
- Android Studio
- SQL Server 2008

- ## Communications Interfaces

The e-learning app shall use the HTTP protocol for communication over the internetand for the intranet communication will be through TCP/IP protocol suite.

- # System Features

The system is going to consist of multiple modules, each separately developed withtheir own features.

Register Account

Description and Priority

If customer/user wants to buy the product then he/she must be registered, unregistered user can't able to use our auto generate LMS. For this purpose, user/customer will register to the system.

Stimulus/Response Sequences

- User first clicks on the button or link to initiate registration process.
- System prompts the user to fill out his/her first name, last name, address, emailaddress, and their password.
- User enters fields.
- System validates the user's information.
- System creates a new account for the user.

Functional Requirements:

First step in this methodology is requirements analysis. This is the part where the project's target users will be studied in order to acquire an insight of the demanddesired by the users. The mobile application prototype will be built according totheir requirements gathered here. During the implementation of this phase, we looked in to different applications which assist the visually impaired out there and studied there views given by those applications' users. Bad reviews provided by the users will be the developers' error which our project will aim to avoid repeating

- Administrative functions
- Authentication
- External Interfaces
- Reporting Requirements
- Historical Data

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System Features:

The e-learning app features should have a development that includes all the solutions in the same educational environment for a successful learning experience: student management for all types of learning, enrolment, forums, student communities, virtual classrooms with publication of schedules, reservation of classes

- ## System Feature 1

- **Description and Priority**
  - Eliminate offline learning difficulties and improve services
  - Always stay in touch with learners.
  - Educational academies can improve student to teacher interaction.
  - No pandemic can stop you connect with your students or learners.
- Downloading e-learning applications on the smartphone will help your audience grab knowledge 24*7 and use their study hours efficiently.
  - Enhance user Personalization and improve their skills
  - Educational apps development will improve productivity.
  - Management can have better control over students' learning.
  - Educational institutes can pay attention to the needs of learners.
- Eliminates paperwork and digitizes maintenance of attendance and progresstracking reports
- Gain profits through implementing app monetization strategies, such as in-appbrand advertising, subscriptions, and redirecting to other online services

- **Stimulus/Response Sequences**

- Open the web link to system
- Click on profile button
- Click on logout button

- **Functional Requirements**
  - A system is supposed to send a notification: Functional requirement.
  - A system is supposed to do a login -> Functional requirement.
  - A system is supposed to do a log out -> Functional requirement.

- ## System Feature 2

- **Description and Priority**

System Feature partial data:

- Student Management Systems (SMS)
- Assessment Software
- Virtual Classroom Software
- Video Conferencing Software
- Massive Open Online Courses (MOOC)
- Learning Management Systems (LMS)

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- Online Tutoring Platform

- **Stimulus/Response Sequences**

  1- open the web link to system2-click on add data

  3-enter the data

- **Functional Requirements**

  The mobile application prototype will be built according to their requirements gathered here. During the implementation of this phase, we looked in to different applications which assist the visually impaired out there and studied there views given by those applications' users. Bad reviews provided by the users will be the developers' error which our project will aim to avoid repeating.

  User User with visual impairment or users who have partial visual impairment.

- ## System Feature 3 (and so on)

  System Feature Download report:

  Description and priority:

  >User can download report in PDF form just one click

  Stimulus /Responses Sequences

- Open the web link to system
- Click on profile button
- Click on logout button
- Select the report
- Download them

  Functional Requirement:

  System is online

  System Feature Upload Reports:

  Admin can upload report by just click

  Stimulus /Responses Sequences

- Open the web link to system
- Click on patient reports button
- Upload report button will occur click them

  Functional Requirement:

- System is online
- User must have active login credentials provided by system administrator C userhas internet access.
- System must ensure login credentials provided by system can perform suchoperation.

- # Nonfunctional Requirements

- **Performances Requirement**
- Software's speed of response
- Throughput
- Storage capacity.

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- Operating capabilities
- Maintenance
- Reliability characteristics of a system

- **Safety Requirements**

- Enforce secure communication
- Safeguard communication between apps.
- Ask for credentials before showing sensitive information.
- Apply network security measures.
- Use Web View objects carefully.
- Use intents to defer permissions.
- Share data securely across apps.
- Store private data within internal storage.

- **Security Requirements**

- Set a screen lock.
- Use those Privacy settings.
- Eliminate excess.
- Install security apps.
- Make privacy-friendly apps your default apps.
- Maintain security by doing these things.

- **Usability Requirements**

- Well-designed user interface (UI)
- Fast loading time.
- Strong data protection.
- Excellent user support.
- Built-in integration.

- **Reliability Requirements**

- Function
- Probability of success
- Duration
- Environment.

- **Maintainability/Supportability Requirements**

- use case
- user stories
- activity diagram
- flow diagram
- state diagram
- sequence diagram.

- **Portability Requirements**

Blind Bridge

- Availability
- Interoperability
- Performance
- Test ability
- Security
- Usability
- Functionality

- **Efficiency Requirements**

Availability

- Our system will be available at all the time so that user can facilitate 24/7
  - If there is any maintenance occur in our app we update the system inbackground this process will not severely affected

Reliability:

- System should be completely defect free
- There will be no down time and perform correctly in every scenario

Usability:

- Web interface should be easy to understand
- Guide will through the work flow

Business Rules

- If admin want to add new content then they have to sign up first.
- User has to follow the term and condition of the system.

- **Domain Requirements**

Domains sometimes represent the organization hierarchy & defined to control the edit, view & delete authorizations of administrators. Most of the entities defined in Success Factors e-learning are domain able & Administrator security is managed via giving access to only required domains.

Chapter 3

Use Case Analysis

Chapter 3: Use Case Analysis

This chapter describe about system use cases and how the different actors are interacting with the system. This system is all about use case of system and role we assign and categorize the user of solution. We describe the all terms about the use case model and use case diagram of every role.at the end we make a proper dressed use case model of our project.

• Use Case Model

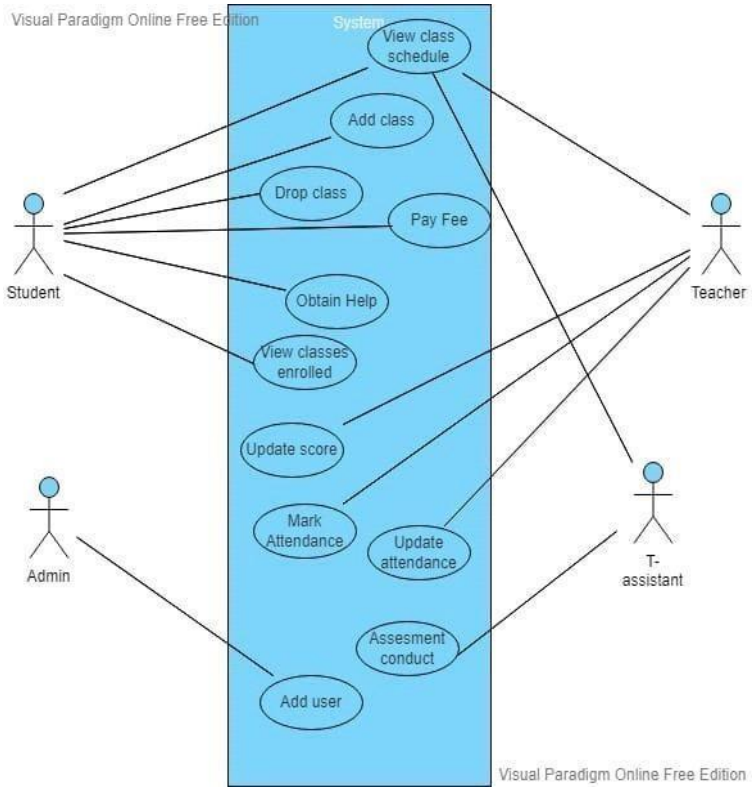
A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses. Primary form for gathering usage requirements for a new software program or task to be completed. The primary goals of a use case analysis are:

- Designing a system from the user's perspective.
- Communicating system behavior in the user's terms
- Specifying all externally visible behaviors.

Use Case Model

Our use case model contain four different end users

- Admin
- Teachers
- Teacher assistant
- Student Admin has in full control over the application he/she will manage what would happen throughout the application who can access the application , adding and drooping out peoples manages different students and the teachers portal.



Use Cases Description

Admin

- Add user
- Maintain courses
- Maintain dashboard

Teachers

- Teacher dashboard
- Class schedule manage
- Mark attendance
- Update score
- Update attendance

Teacher assistant

- Conduct assessment
- Class schedule
- Assessment manage

Student

- Student dashboard
- Add course
- Drop course
- View class enrolment
- Obtain help

• Use Cases Description

ADMIN LOGIN

Use case id	Uc-01
Use case	Login
Primary actor	Admin
Stake holder	Admin
description	Admin Login
Basic Flow	Click on login Enter requirement information Click on submit
Precondition	Internet should be available System should be working
Post Condition	Logged in
Alternate	If user enter wrong information, miss any field or other is no account associated with that email

ADMIN LOGOUT

Use case id	Uc-02
Use case	Logout
Primary actor	Admin
Stake holder	Admin
description	Admin Logout
Basic Flow	Click on logout button
Precondition	Internet should be available System should be working Admin should be logged in
Post Condition	User will be logged out
Alternate	Logout button not pressed

Add data

Use case id	Uc-03
Use case	Add data
Primary actor	Admin
Stake holder	Admin
description	Insert new data
Basic Flow	Click on add data option and then enter the data / information to be added
Precondition	Internet should be available Admin should be logged in
Post Condition	New data added successfully
Alternate	Error message will display if the internet connection is not available if admin misses any required field.l

REMOVE DATA

Use case id	Uc-04
Use case	Remove data
Primary actor	Admin
Stake holder	Admin
description	Remove data when needed
Basic Flow	Click on remove data that is unnecessary and should be removed
Precondition	Internet should be available System should be working
Post Condition	Remove data successfully
Alternate	Error message will display if connection is not fixed

VIEW REPORT

Use case id	Uc-05
Use case	View report
Primary actor	Admin
Stake holder	Admin
description	Admin can view the whole report
Basic Flow	Click on view report and the report will be shown on the screen
Precondition	Internet should be available Admin must be logged in
Post Condition	Shown on screen
Alternate	Error message displays if the internet connection is not fixed

Chapter 4

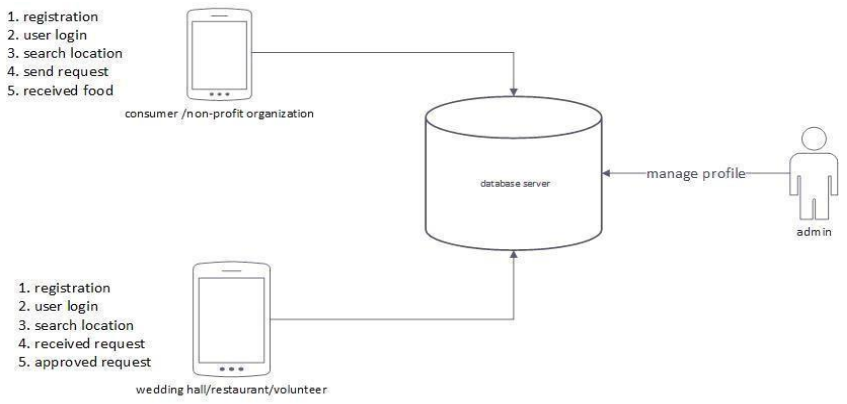
System Design

Chapter 4: System Design

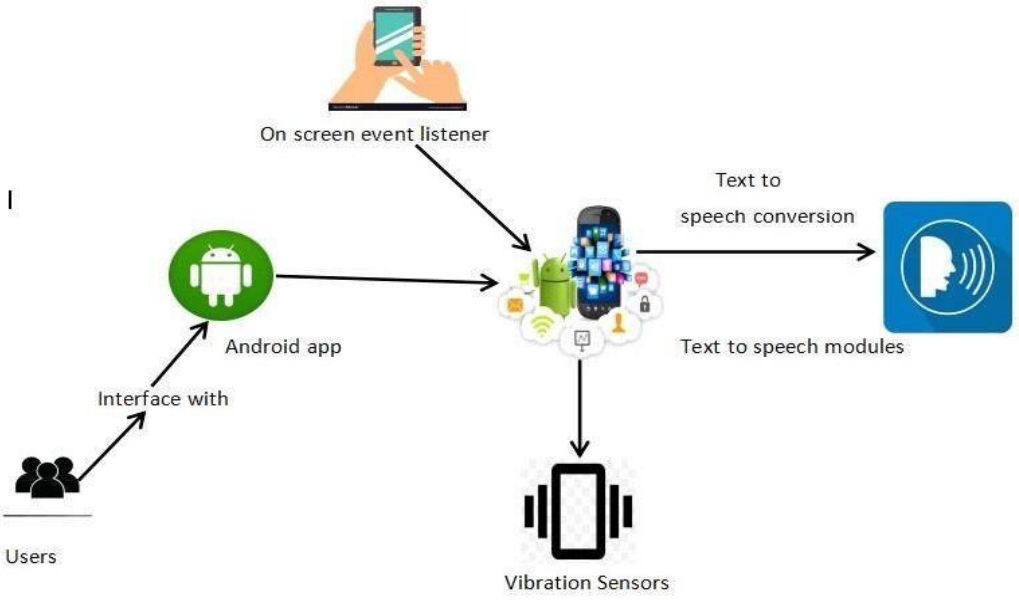
The Chapter is all about how the software is going to work and how will the processes be executed as we see we have several diagrams that shows how really is the system performing and what will be the requirements to perform the operations required tasks as well as the diagrams and data clearly describes the process and shows a great help in understanding.

Architecture Diagram

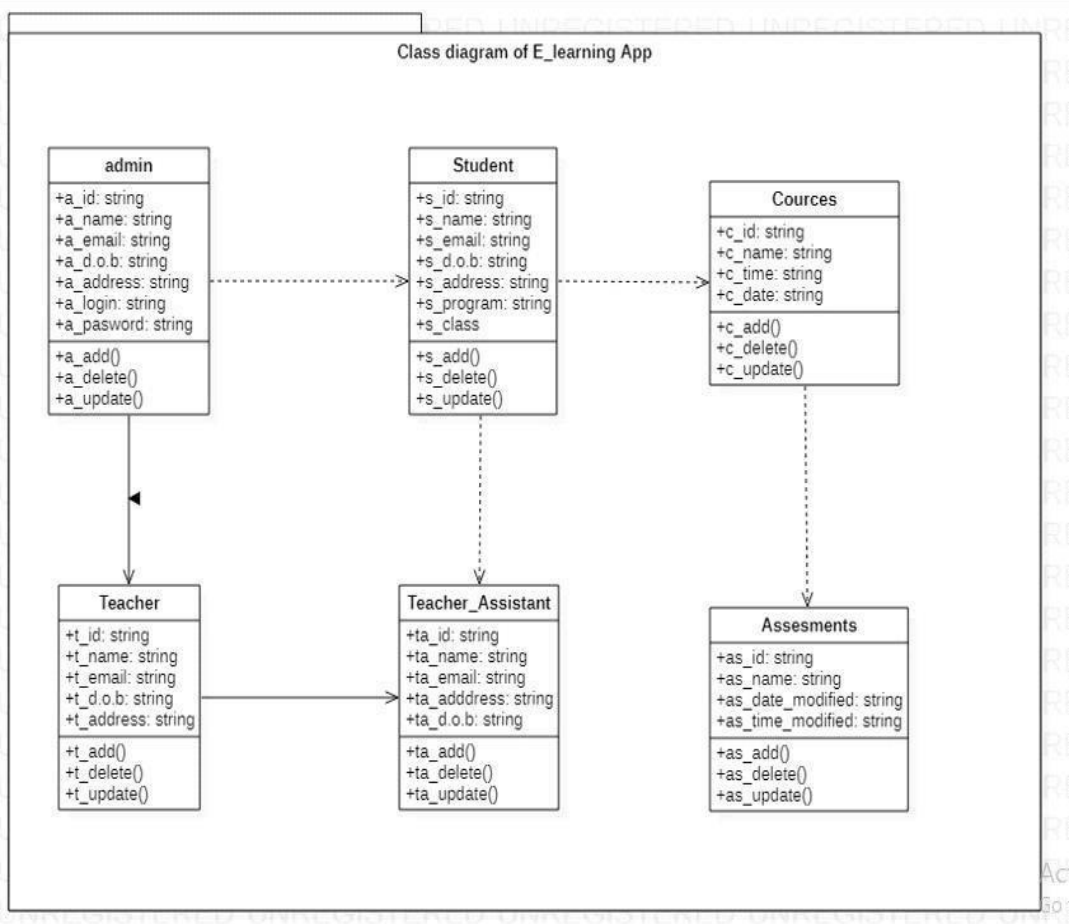
This app is built on Android Studio version 2.3.3 with apk 19, i.e. it will support android devices running operating system (OS) greater than 4.4 (kitkat). We have used Java as a logical language and XML as styling or designing language, text- to-speech module for conveying predefined text message and bitmap get pixel for obtaining pixel value of images. The system architecture of the proposed system is shown in given below diagram. This diagram shows the components used for conversion of text to speech, ways of getting input and providing output to the users. Here we have used text-to- speech module (TTS) provided by android studio for conversion of text data to speech. OnTouch event listener is used to detect movement of fingers over screen. Vibratory Sensors are responsible for shaking the device when touched. User in this figure is representing people who are going to interact with this system.



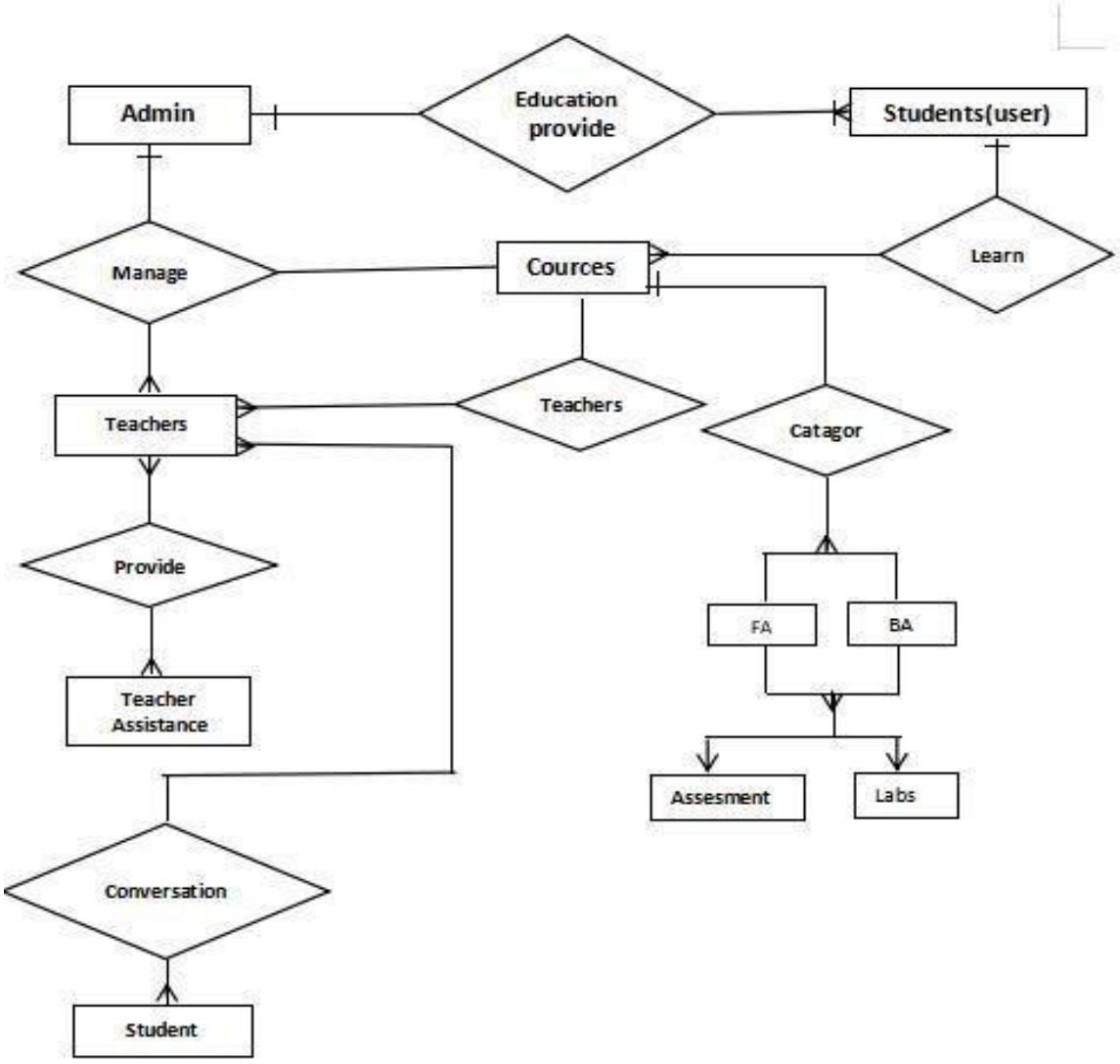
Architecture System Diagram



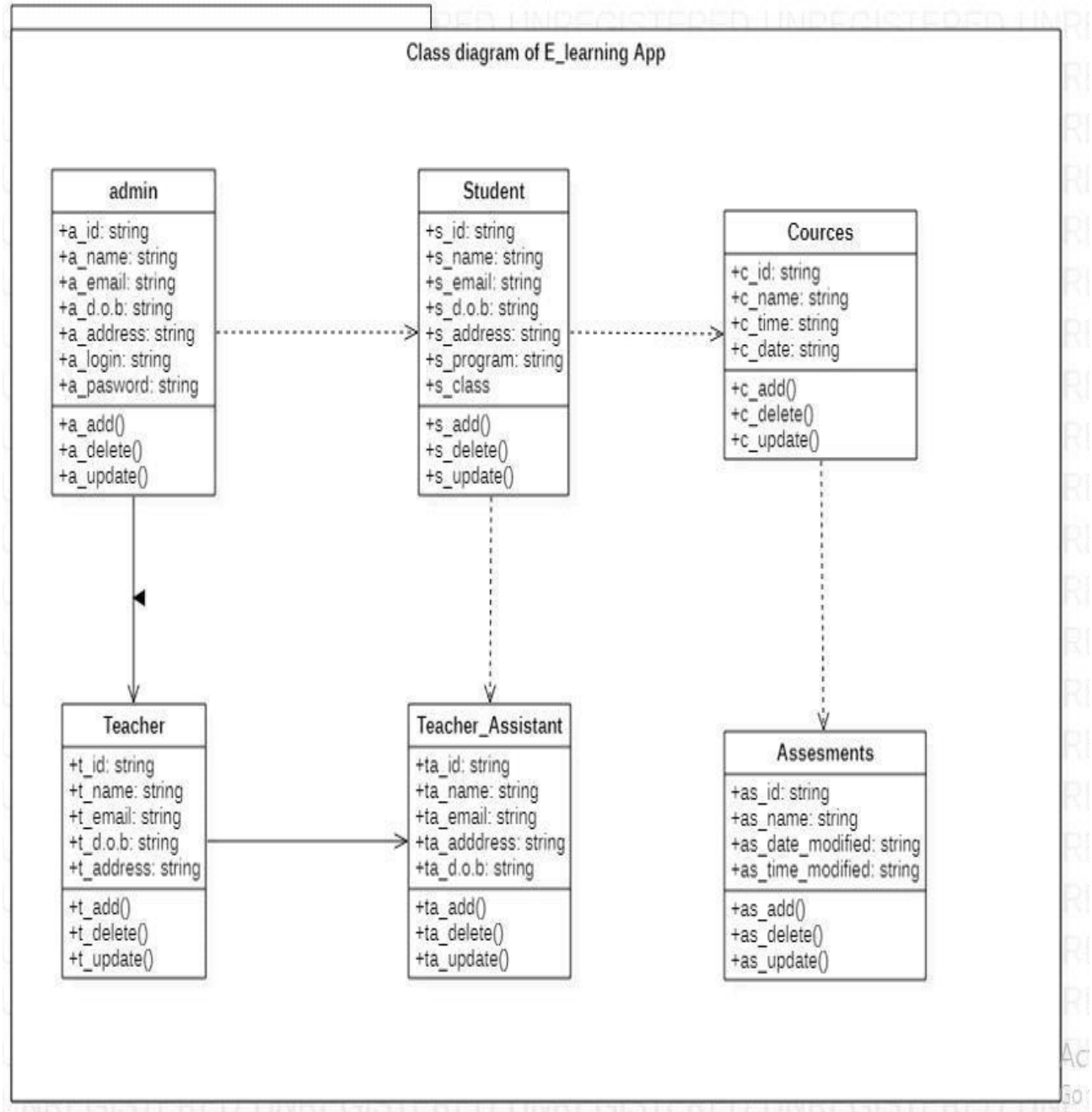
- **Domain Model**



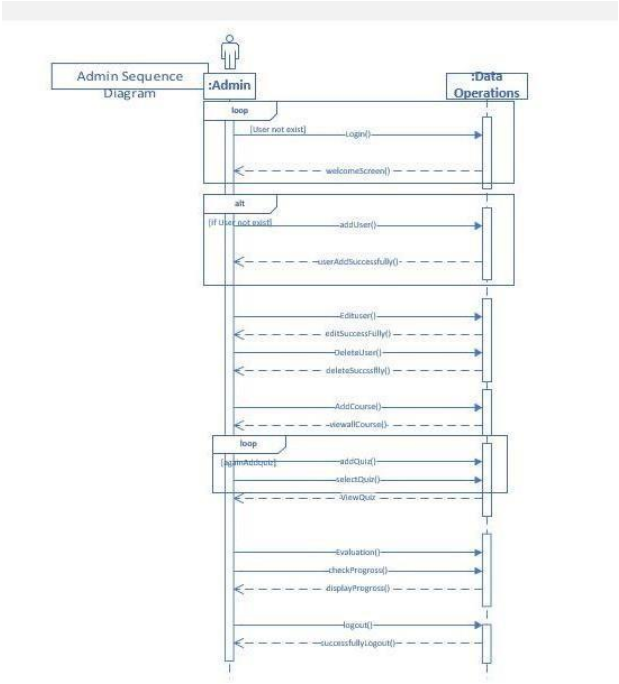
- **Entity Relationship Diagram with data dictionary**



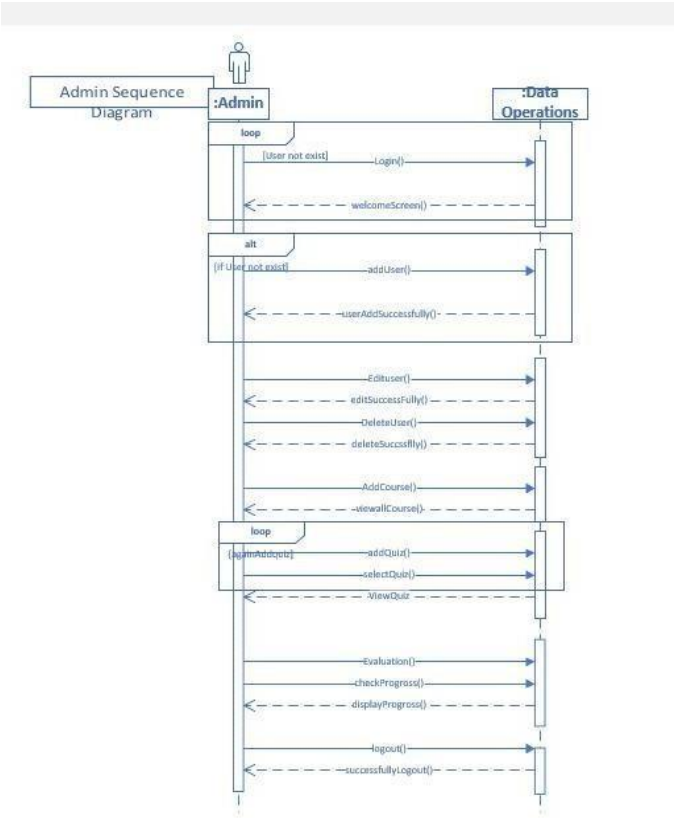
- **Class Diagram**



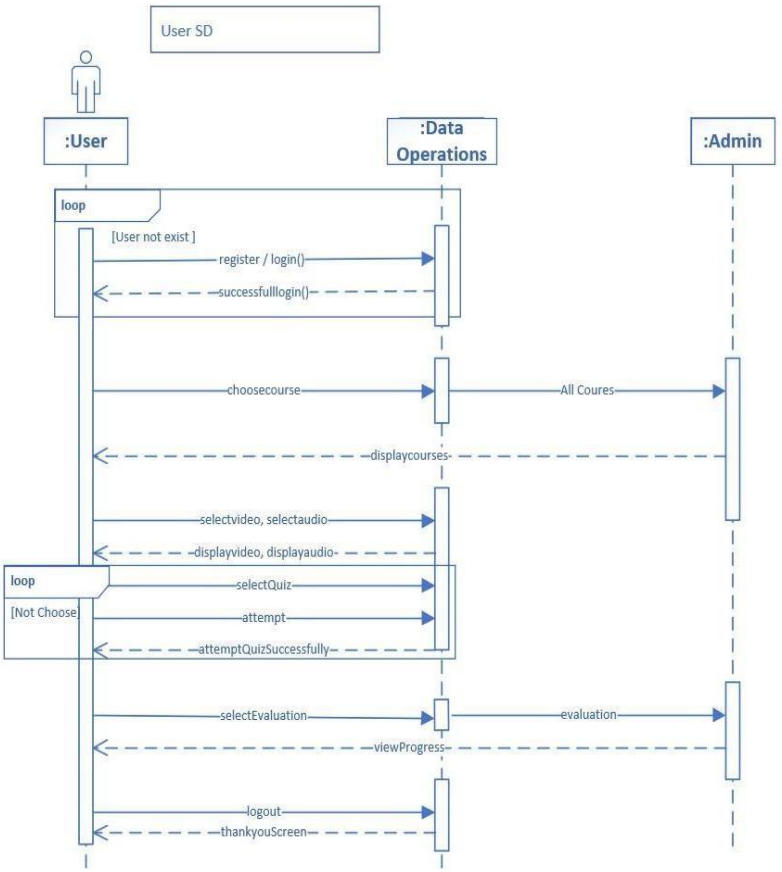
- **Sequence / Collaboration Diagram**



Admin Teacher



User



- # Operation contracts

Operation: login(id, email, psd: integer, string)
Cross References: Use Cases : Process authentication
Preconditions: Admin should be a Login
Post conditions:

- Admin instance log in was created (instance creation).
- Admin was associated with in application(association formed).
- Ad. Sign in became login (attribute modification).
- Admin was associated with a user, based on id match (association formed).

Contact Admin02= Add user
Operation: add_user(Add User(), id_ad, name, email, phone : integer, String)
Cross References: Use Cases: Insert User
Preconditions: Admin-inserting the user
Post conditions:

- Admin instance user added (instance creation)
- Admin was associated with in application (association formed)

- Adding user(attribute modification)

Contact Admin03= Edit user
Operation: (eUser() ,vUser(),ch() temp : Function, data handling)
Cross References: Use Cases: Edit user
Preconditions: Admin view the user and choose
Post conditions:

- Admin instance modifying user (instance creation)
- Admin was associated with in application (association formed)
- Edit User(attribute modification)

Contact Admin04= Delete user
Operation: (del() ,vUser(), ch(): Function,)
Cross References: Use Cases: delete user
Preconditions: Admin view the user and choose
Post conditions:

- Admin instancedelete user (instance creation)
- Admin was associated with in application (association formed)
- DeleteUser(attribute modification)

Contact Admin05= Block user
Operation: (blk() ,vUser(), ch() : Function)
Cross References: Use Cases: Edit user
Preconditions: Admin view the user and choose
Post conditions:

- Admin instance Block user (instance creation)
- Admin was associated with in application (association formed)
- Block User(attribute modification)

Contact Admin06= Edit Quiz
Operation: (vq(), eq() : Function)
Cross References: Use Cases: Edit Quiz
Preconditions: Admin view the quizzes
Post conditions:

- Admin instance Edit Quiz (instance creation)
- Admin was associated with in application (association formed)
- Edit Quiz(attribute modification)

Contact Admin07= Del Quiz
Operation: (vq(), dq(), ch() : Function)
Cross References: Use Cases: Delete Quiz
Preconditions: Admin view the quizzes
Post conditions:

- Admin instance Delete Quiz (instance creation)

- Admin was associated with in application (association formed)
- Delete Quiz (attribute modification)

Contact Admin08= Edit Video
Operation: (viewV(), eV() : Function)
Cross References: Use Cases: Edit Video
Preconditions: Admin view the Videos
Post conditions:

- Admin instance Edit Video (instance creation)
- Admin was associated with in application (association formed)
- Edit Video (attribute modification)

Contact Admin 9= Edit Audio
Operation: (vA(), eA() : Function)
Cross References: Use Cases: Edit Audio
Preconditions: Admin view the Audio
Post conditions:

- Admin instance Edit Audio (instance creation)
- Admin was associated with in application (association formed)
- Edit Audio (attribute modification)

Contact Admin10= Del Audio
Operation: (va(),chA(),delA() : Function)
Cross References: Use Cases: Del Audio
Preconditions: Admin view the Audio and choose
Post-conditions:

- Admin instance Delete Audio (instance creation)
- Admin was associated with in application (association formed)
- Del Audio (attribute modification)

Contact Admin11= Edit Course
Operation: (vCrs(), eCrs() : Function)
Cross References: Use Cases: Edit Course
Preconditions: Admin view the Course
Post-conditions:

- Admin instance Edit thee Course (instance creation)
- Admin was associated with in application (association formed)
- Edit Course (attribute modification)

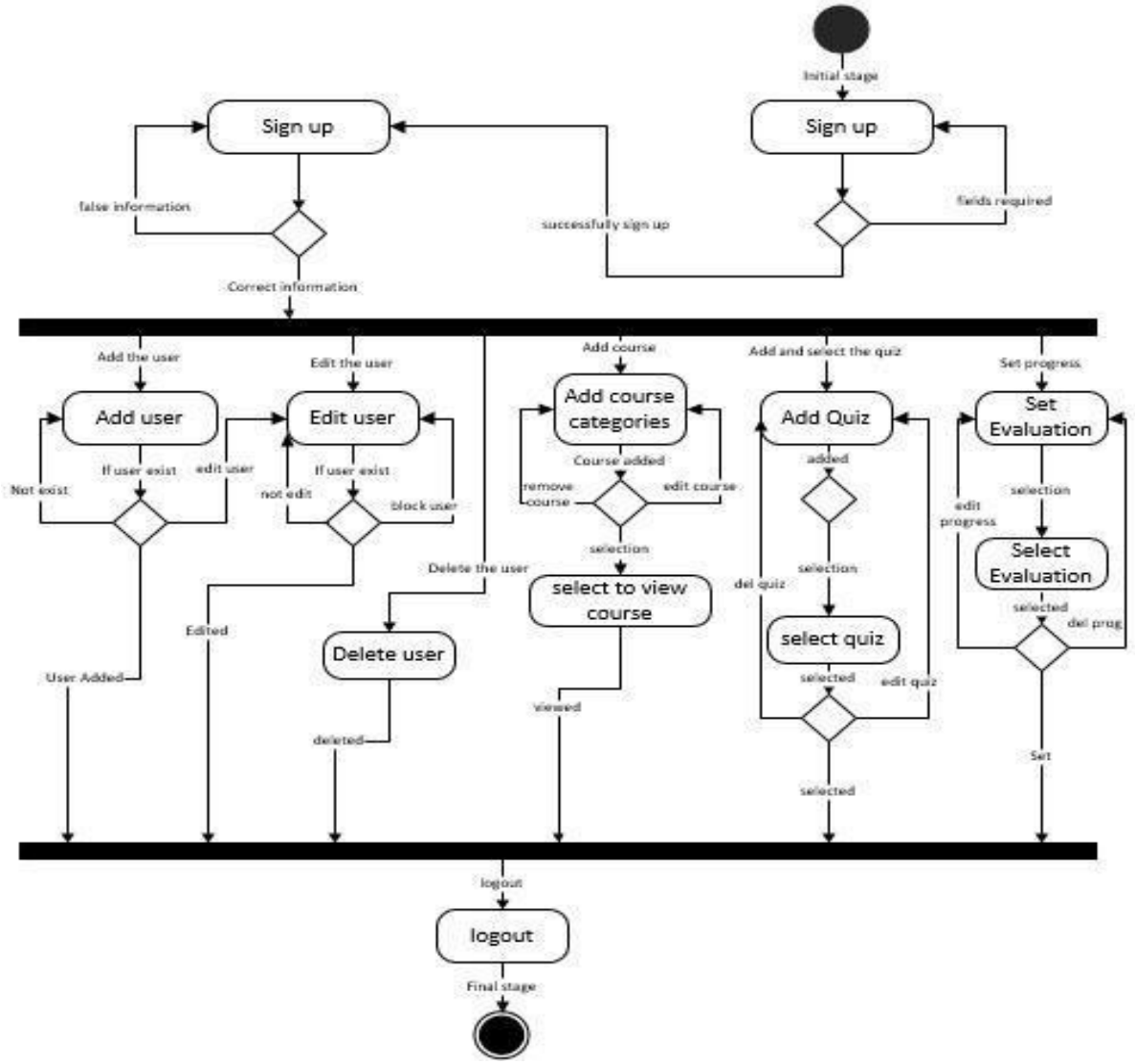
Contact Admin12= Del Course
Operation: (vCrs(), chCrs(), dCrs() : Function)
Cross References: Use Cases: Del Course

Preconditions: Admin view the Course and choose
Postconditions:

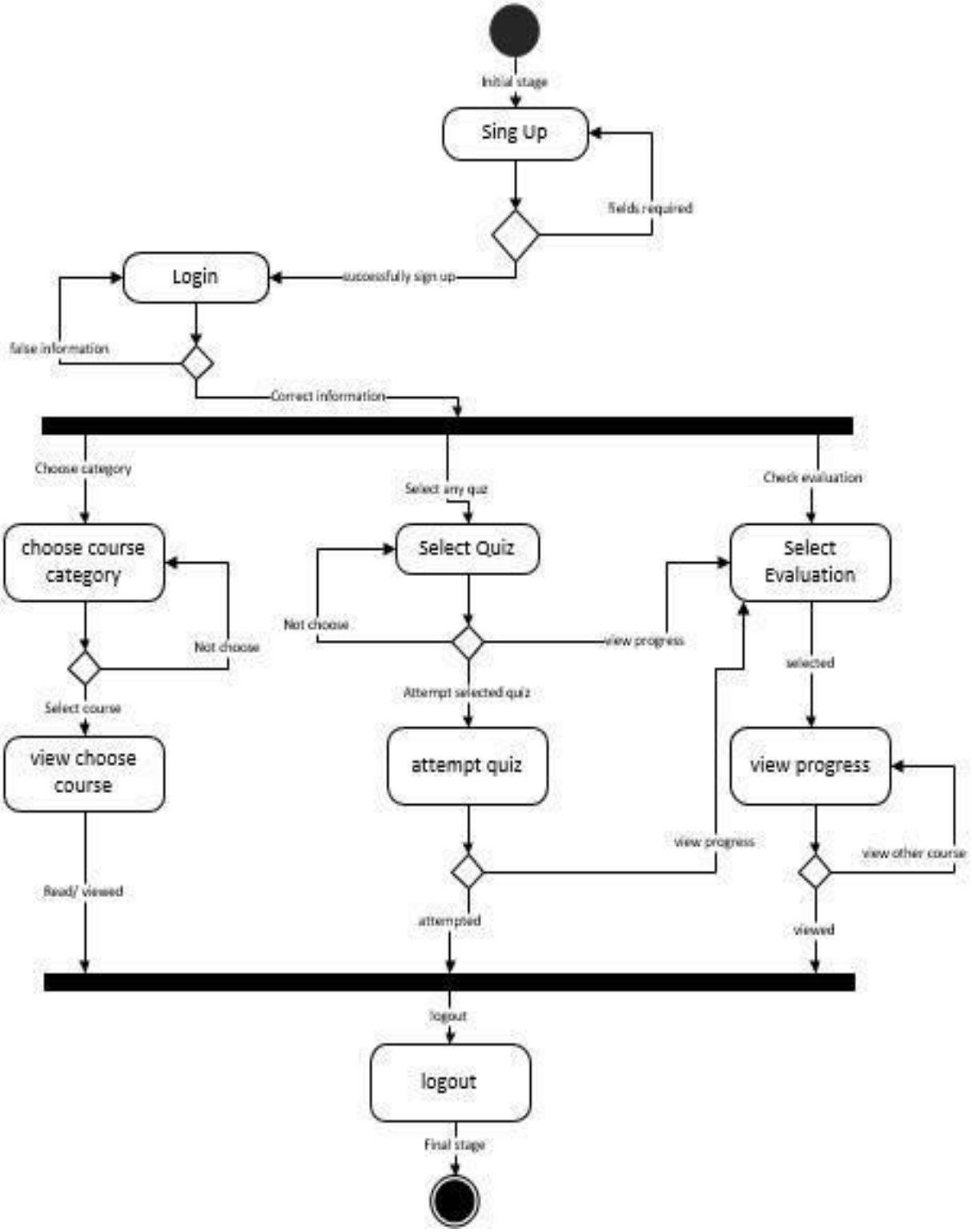
- Admin instance Delete the Course (instance creation)
- Admin was associated with in application (association formed)
- Del Course (attribute modification)

• Activity Diagram

Teacher

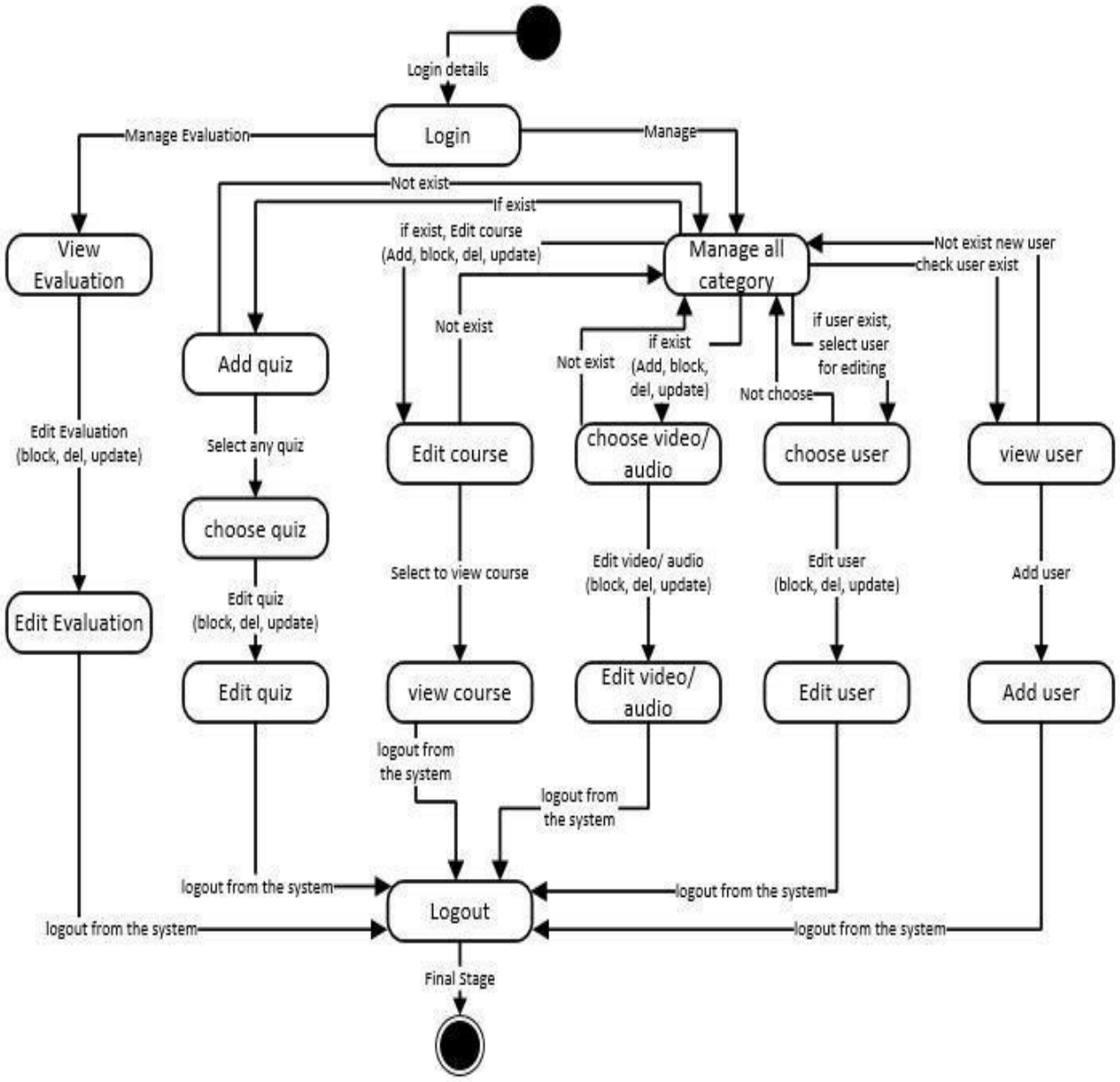


User

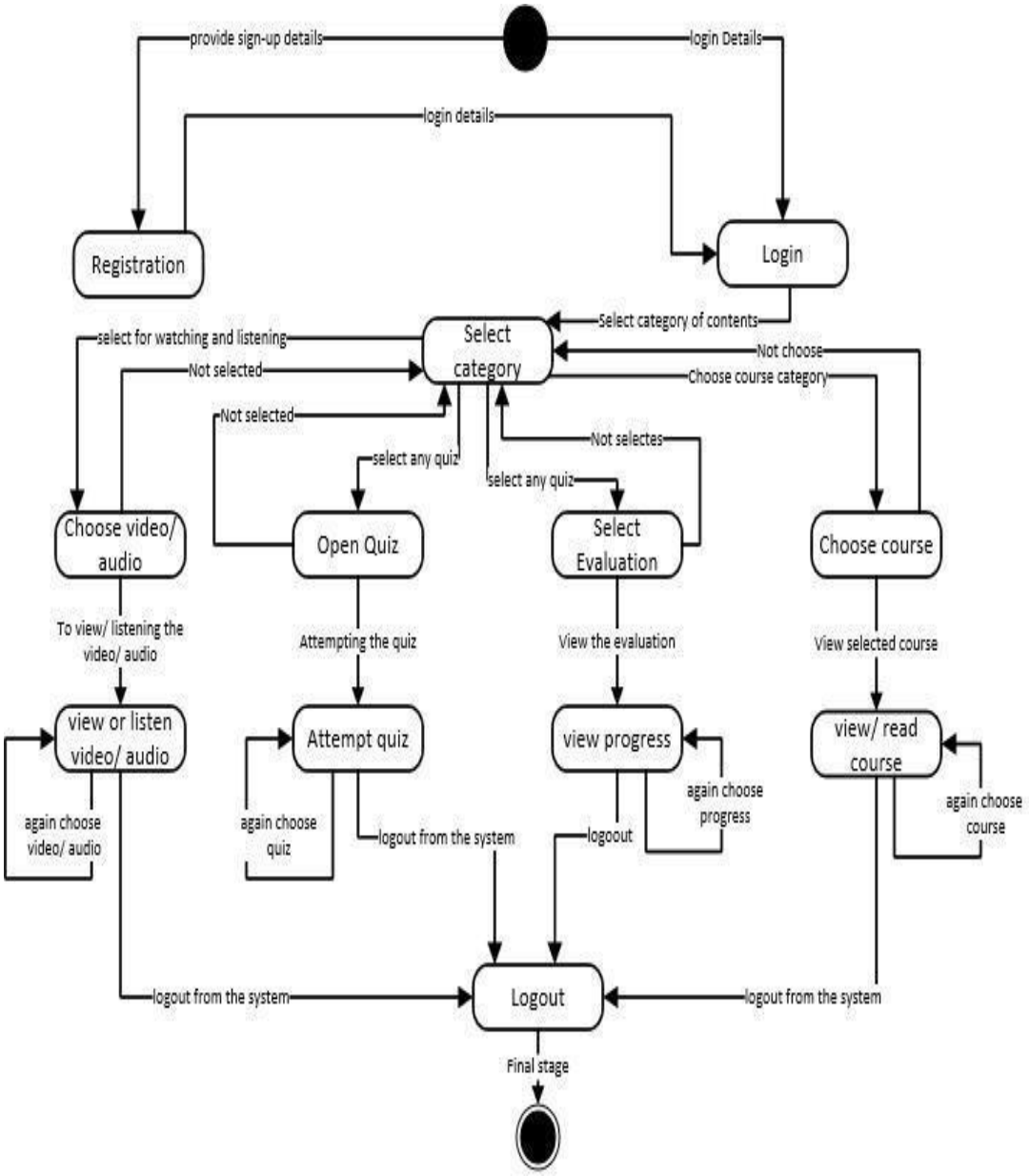

Initial stage
Sing Up
fields required
successfully sign up
Login
false information
Correct information
Choose category
Select any quiz
Check evaluation
choose course category
Select Quiz
Select Evaluation
Not choose
Not choose
view progress
selected
Select course
Attempt selected quiz
view choose course
attempt quiz
view progress
view progress
view other course
Read/ viewed
attempted
viewed
logout
logout
Final stage

- # State Transition Diagram

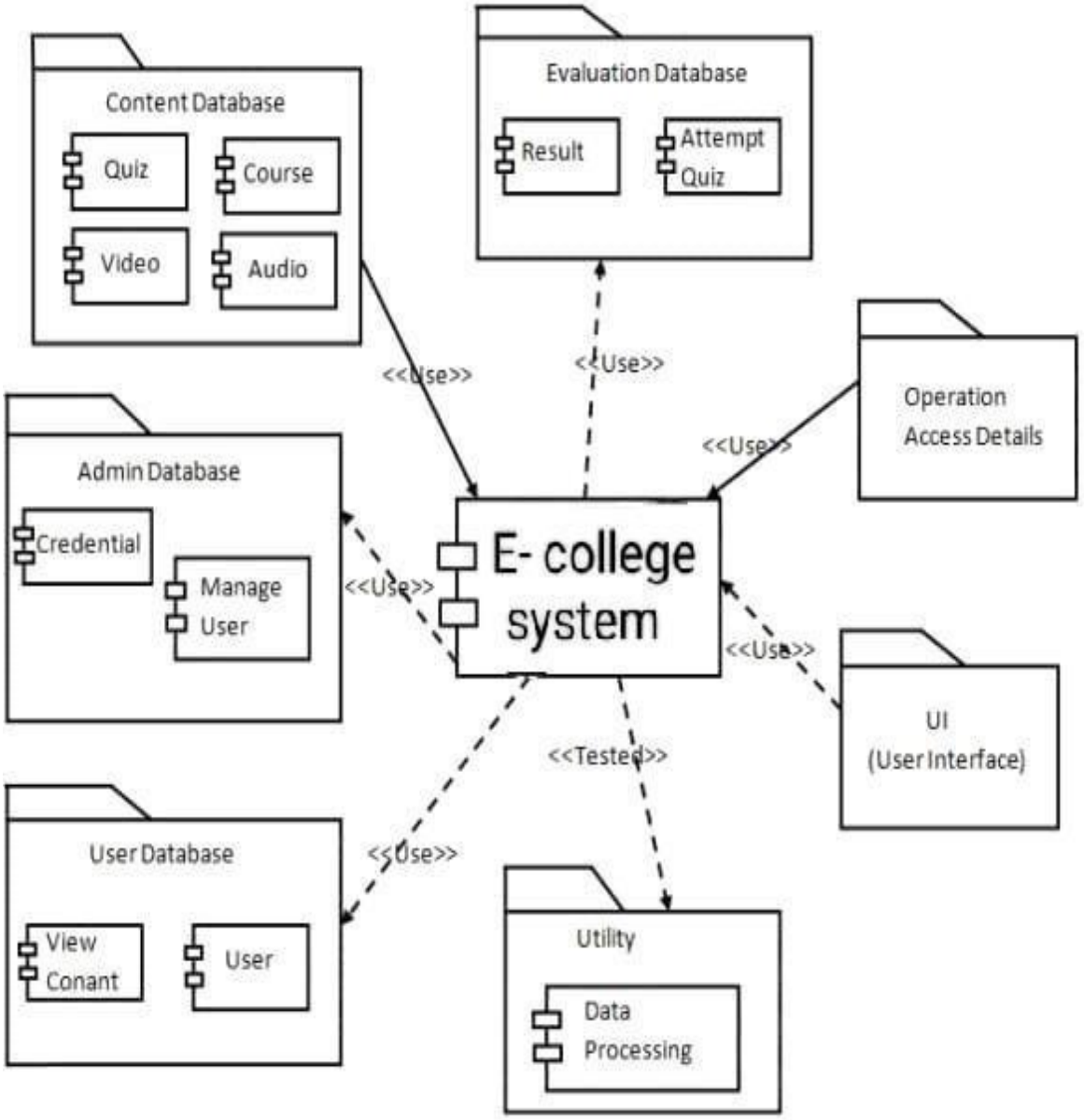
Teacher



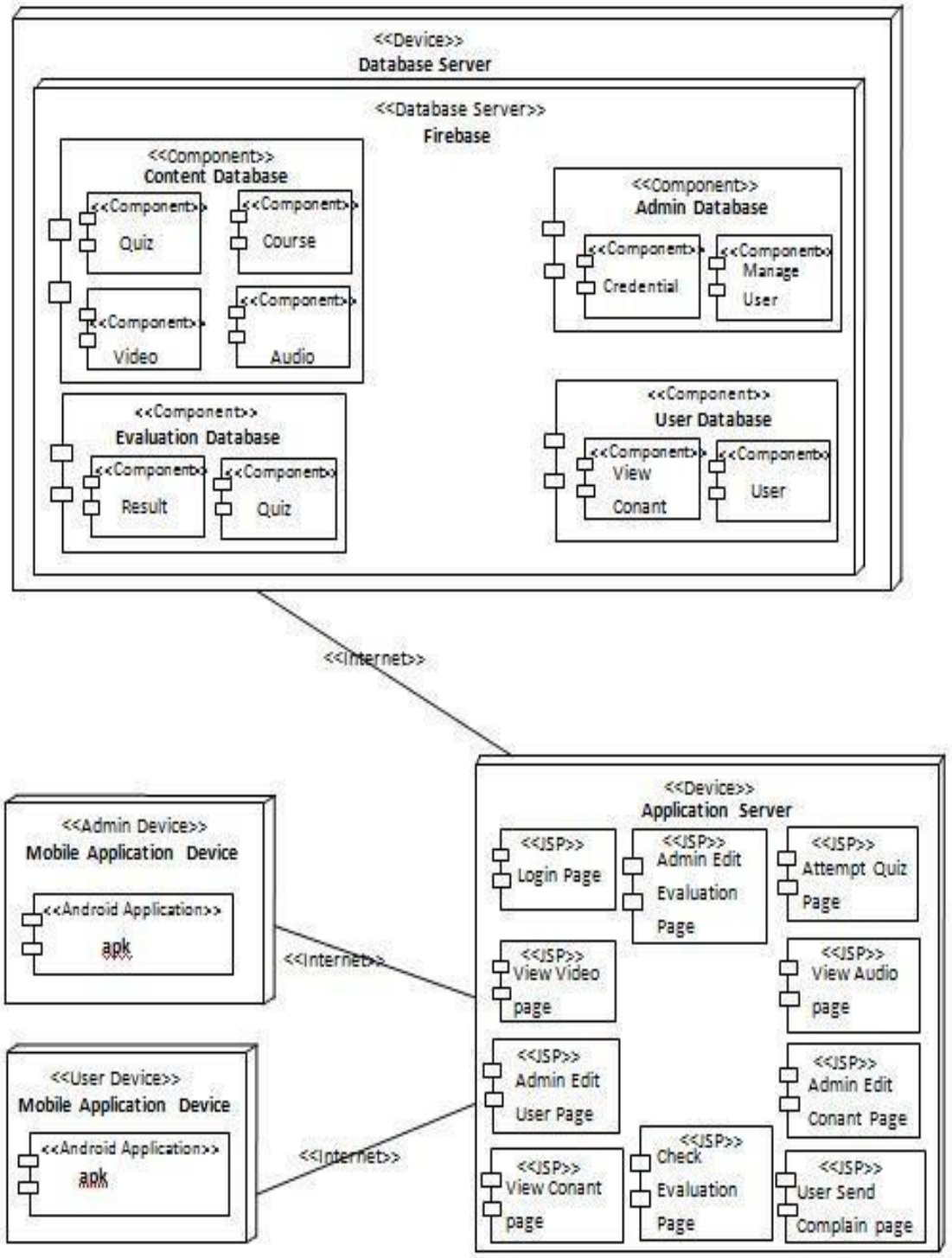
User/student



- **Component Diagram**

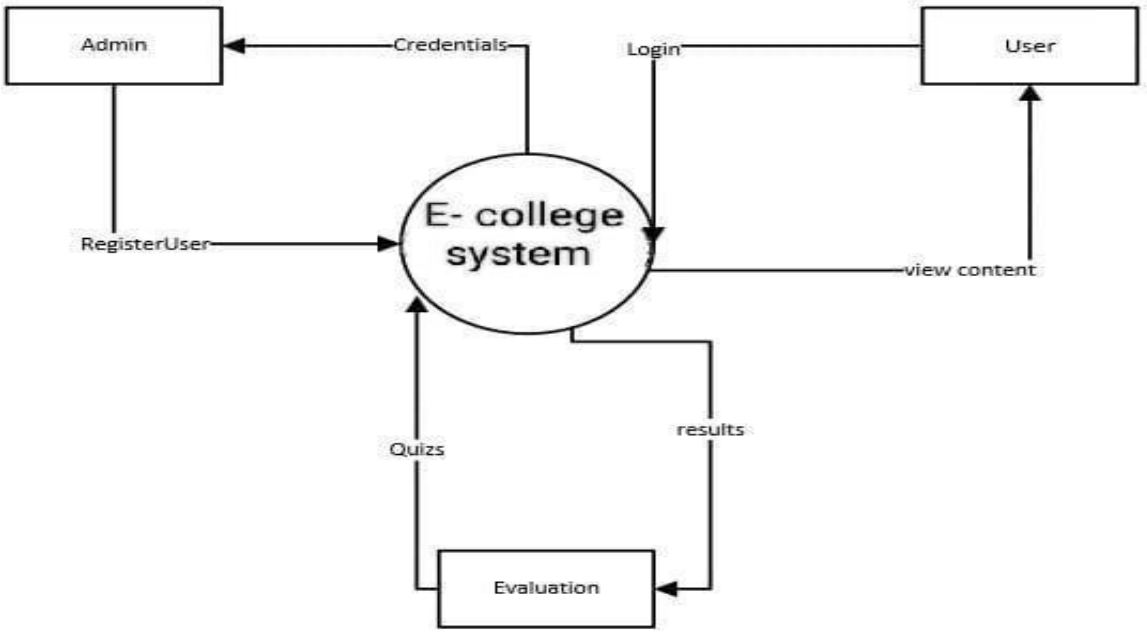


- **Deployment Diagram**



- **Data Flow diagram** *(Only if structured approach is used - Level 0 and 1)*

DFD Level 0:



DFD Level 1:

Figure 1 shows the DFD level 1,

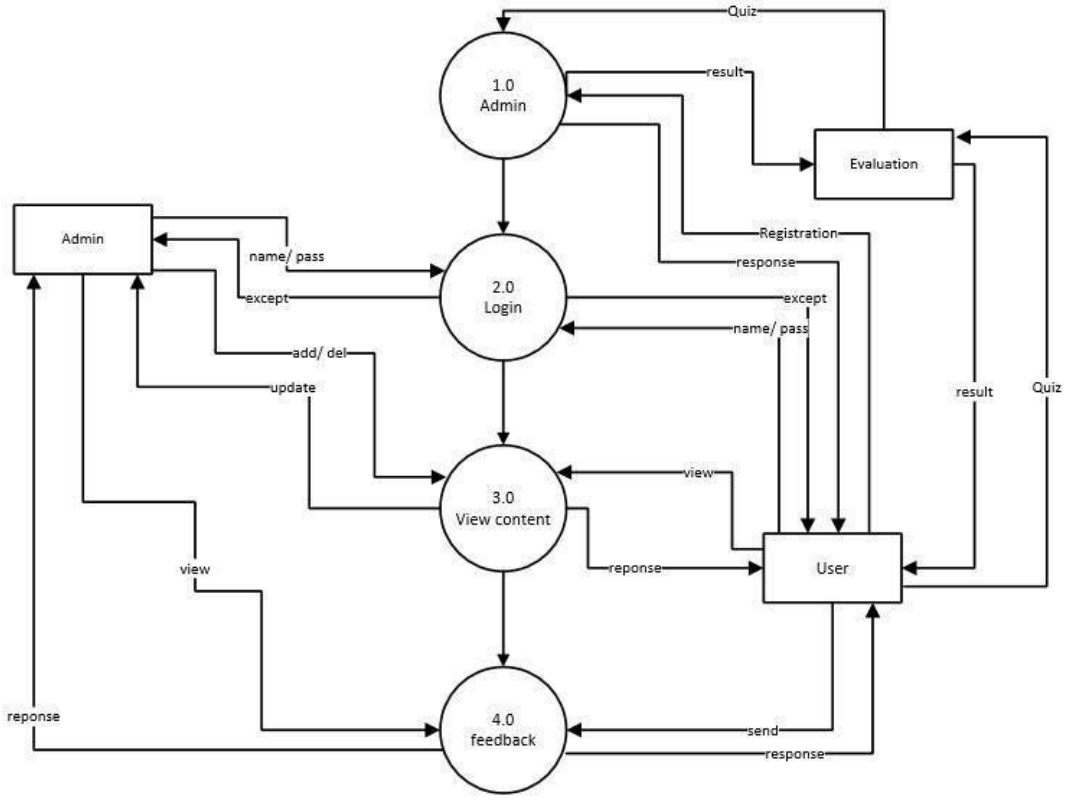


Figure 3: DFD level 1 for BLIND BRIDGE

Chapter 5

Implementation

Chapter 5: Implementation

- **Front-end and back-end:**
- **Java , firebase**
- **Hardware Requirement:**

  i3 Processor Based
  Computer1GB-RAM
  80 GB Hard Disk
  Monitor
  Internet Connection
  Android Device/ IOS

- **Software Requirement:**

  Windows 7 or higher
  Android Studio
  firebase

• Important Flow Control/Pseudo codes

Services that this application will provide are the following:
There are four types of users

- Admin
- Teacher
- Teacher assistance
- User/student

• Components, Libraries, Web Services and stubs

- Gson. Gson is a Java library used for serializing and desterilizing Java objects from and into JSON.
- Retrofit. From their site: "Retrofit turns your REST API into a Java interface.” ...
- Event Bus.
- Active Android.
- Universal Image Loader

• Deployment Environment

In Deployment environment we work on android studio for build our android based application.

• Tools and Techniques

Tool	Android Studio
Languages	JAVA, XML
Data base	Firebase

- ## Best Practices / Coding Standards

- Testing on android studio
- Use java language
- Use xml language

- ## Version Control

Now we just working on version 1 after the passage of time we changed the version. From the start of the project number of versions updated and finalized now version below.

Android Studio Bumblebee | 2021.1.1 Patch 2
Build #AI-211.7628.21.2111.8193401, built on February 17, 2022
Runtime version: 11.0.11+9-b60-7590822 amd64
VM: OpenJDK 64-Bit Server VM by Oracle Corporation
Windows 10 10.0
GC: G1 Young Generation, G1 Old Generation
Memory: 1280M
Cores: 4
Registry: external.system.auto.import.disabled=true
Non-Bundled Plugins: Dart (211.7808), io.flutter (65.2.2)

Chapter 6

Testing and Evaluation

Chapter 6: Testing and Evaluation

Talking about the testing phase we do with our project. during testing we test the User inter phase and let the user try itself and give their opinion in this. The Testing scenario was indeed wonderful experience and we get positive reviews from the end users too.

• Use Case Testing

Main Success Scenario Step Description
Actor
System
Enter Agent Name & Password
Validate Password
Allow Account Access
Extensions
Password not valid Display Message and ask for re-try 4 times Password not valid 4 times Close Application

- Consider the first step of an end to end scenario for a login functionality for our web application where the Actor enters email and password.
- In the next step, the system will validate the password
- Next, if the password is correct, the access will be granted
- There can be an extension of this use case. In case password is not valid system will display a message and ask for re-try four times
- If Password, not valid four times system will ban the IP address.

• Boundary value analysis

Following password field accepts minimum 6 characters and maximum 10 characters
That means results for values in partitions 0-5, 6-10, 11-14 should be equivalent
Enter Password:

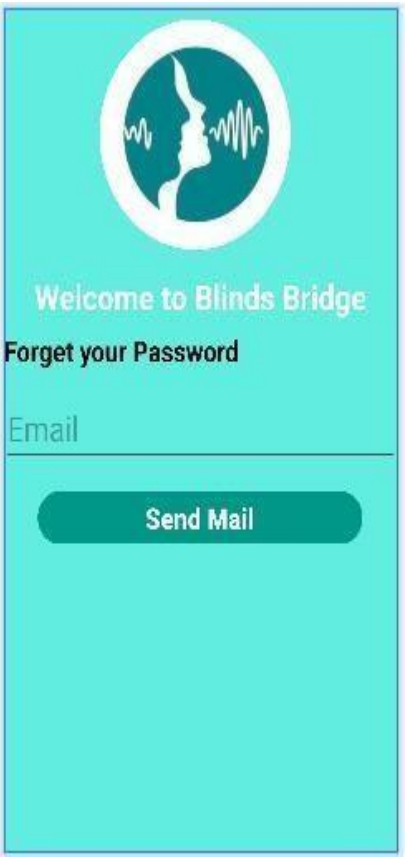
Test Scenario #	Test Scenario Description	Expected Outcome
1	Enter 0 to 5 characters in password field	System should not accept
2	Enter 6 to 10 characters in password field	System should accept
3	Enter 11 to 14 character in password field	System should not accept

- **Data flow testing**

```
1. read x;
2. If(x>0)
3. a= x+1
4. if (x<=0) {
5. if (x<1)
6. x=x+1; (go to 5)
else
7. a=x+1
8. print a;
```

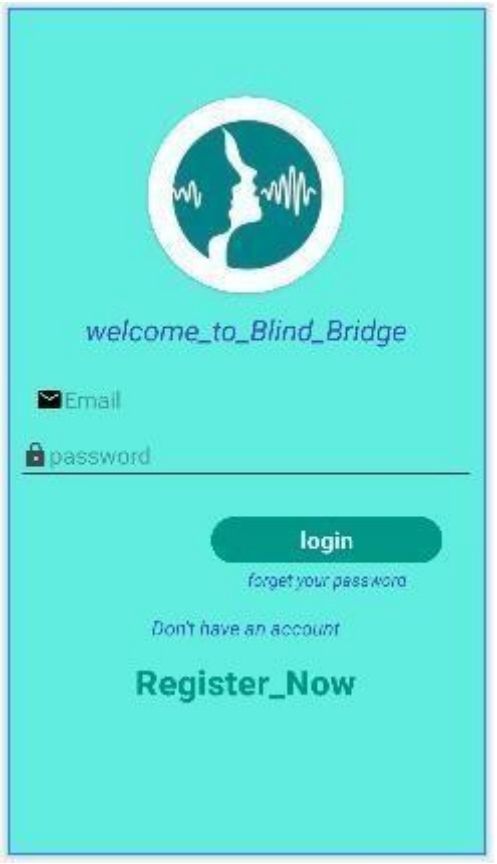
(1, (2, t), x), (1, (2, f), x)
(1, 3, x)
(1, (4, t), x), (1, (4, f), x)
(1, (5, t), x), (1, (5, f), x)
(1, 6, x)
(1, 7, x)
(6,(5, f)x), (6,(5,t)x)
(6, 6, x)
(3, 8, a), (7, 8, a).

In this code, we have a total 8 statements, and we will choose a path which covers all the 8 statements. As it is evident in the code, we cannot cover all the statements in a single path because if statement 2 is true then statements 4, 5, 6, 7 not covered, and if statement 4 is true then statement 2 and 3 are not covered.
So, we are taking two paths to cover all the statements.
1. x= 1
Path - 1, 2, 3, 8
Output = 2
When we set value of x as 1 first it come on step 1 to read and assign the value of x (we took 1 in path) then come on statement 2 (x>0 (we took 2 in path)) which is true and it comes on statement 3 (a= x+1 (we took 3 in path)) at last it comes on statement 8 to print the value of x (output is 2).
2. Set x= -1
Path = 1, 2, 4, 5, 6, 5, 6, 5, 7, 8
Output = 2
When we set the value of x as ?1 then first, it comes on step 1 to read and assign the value of x (we took 1 in the path) then come on step number 2 which is false because x is not greater than 0 (x>0 and their x=-1). Due to false condition, it will not come on statement 3 and directly jump on statement 4 (we took 4 in path) and 4 is true (x<=0 and their x is less than 0) then come on statement 5 (x<1 (we took 5 in path)) which is also true so it will come on statement 6 (x=x+1 (we took 6 in path)) and here x is incremented by 1.
So,
x=-1+1
x=0
There is value of x become 0. Now it goes to statement 5(x<1 (we took 5 in path)) with value 0 and 0 is less than 1 so, it is true. Come on statement 6 (x=x+1 (we took 6 in path))
x=x+1
x= 0+1
x=1



There x has become 1 and again goes to statement 5 (x<1 (we took 5 in path)) and now 1 is not less than 1 so, condition is false and it will come to else part means statement 7 (a=x+1 where the value of x is 1) and assign the value to a (a=2). At last, it come on statement 8 and print the value (Output is 2).

- ## Unit testing



Writing Unit Tests:
We'll be Unit Testing the following classes:
SharedPreferencesHelper
EmailValidator
Navigate to: app/java/com(test) and expand all the folders under com(test).
Create a new java file and name it EmailValidatorTest.java
Here we will be testing our EmailValidator class. We have to come up with all the input cases we can think of. What all can the user enter in the email input field:
Correct Input: test@gmail.com
Email with subdomain: test@gmail.co.uk
Without .com: test@gmail
With extra characters: test@gmail..com
With no username: @gmail.com
Empty Input:
Null value: this can occur if we initialize the string from this field to be null. It doesn't hurt to have a test case for null check in place.
While the 1st and the 2nd test cases must pass, rest of the inputs are invalid and hence the tests must fail. Let's write the tests for all of them:
Test Cases
Correct Input

```
@Test
public void emailValidator_CorrectEmailSimple_ReturnsTrue()
 {
   assertTrue(EmailValidator.isValidEmail("name@email.com"));
}
```

2. Email with subdomain

```
@ Test
public void emailValidator
_CorrectEmailSubDomain_ReturnsTrue() {

assertTrue(EmailValidator.isValidEmai
      l("name@email.co.uk"));
}
```

3. Without .com:

```
@Test
public void emailValidator_InvalidEmailNoTld_ReturnsFalse() {
 assertFalse(EmailValidator.isValidEmail("name@email"));
}
```

4. With extra characters:

```
@Test
public void emailValidator_InvalidEmailDoubleDot_ReturnsFalse() {
   assertFalse(EmailValidator.isValidEmail("name@email..com"));
}
```

5. With no username:

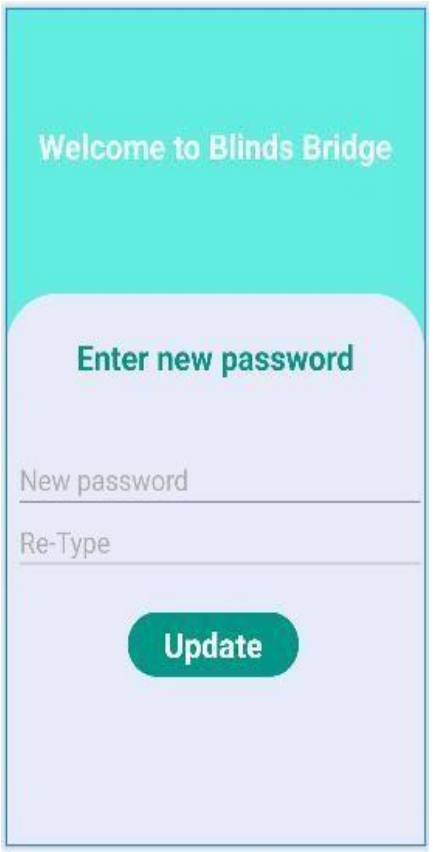
```
@Test
public void emailValidator_InvalidEmailNoUsername_ReturnsFalse() {
  assertFalse(EmailValidator.isValidEmail("@email.com"));
}
```

6. Empty Input:

```
@Test
public void emailValidator_EmptyString_ReturnsFalse(
{
   assertFalse(EmailValidator.isValidEmail(""));
}
```

7. Null value check:

```
@Test
public void emailValidator_NullEmail_ReturnsFalse() {
   assertFalse(EmailValidator.isValidEmail(null));}
```



- ## Integration testing

We have Android application with a login screen that takes a username and password and validates them against a backend server.

- ## Performance testing

Sure! Here's an example of how you can perform performance testing on an Android application:

1. Identify Performance Metrics: Determine the key performance metrics that you want to measure, such as response time, CPU usage, memory consumption, battery consumption, network latency, and throughput.

2. Test Environment Setup: Set up the testing environment by creating a dedicated test device or emulator with the desired specifications. Install the Android application that you want to test on the test device.

3. Performance Testing Tools: Choose a performance testing tool that suits your requirements. Some popular tools for Android performance testing include:

- **Android Profile:** It is a built-in tool in Android Studio that provides real-time data on CPU, memory, and network usage.
- **Apache JMeter:** A widely used open-source tool for load testing and performance measurement.
- **Monkey-Runner:** A tool provided by the Android SDK that allows you to automate user interactions and capture performance data.
- **Calabash:** A cross-platform mobile automation tool that supports performance testing.
- **Firebase Test Lab:** A cloud-based testing infrastructure provided by Google, which includes performance testing capabilities.

4. Define Test Scenarios: Determine the scenarios you want to test. For example, simulate a specific number of concurrent users, perform specific actions within the app, or simulate different network conditions.

5. Test Execution: Run your performance tests using the selected tool and capture the performance metrics. For example, you can launch the Android Profiler in Android Studio to monitor CPU and memory usage in real-time while interacting with the app. Alternatively, you can use tools like JMeter to simulate multiple users and measure response time and throughput.

6. Analyze Results: Analyze the collected performance data and identify any performance bottlenecks or areas for improvement. Look for patterns in resource usage, response times, or any other metrics you are measuring. Identify any memory leaks, high CPU usage, slow network requests, or inefficient algorithms.

7. Iterative Testing and Optimization: Based on the insights gained from analyzing the results, make necessary optimizations to the application code or infrastructure and rerun the performance tests. Repeat this process until you achieve satisfactory performance levels.

Remember that performance testing is an iterative process, and it's important to conduct tests under different scenarios to cover a wide range of user scenarios and device configurations.

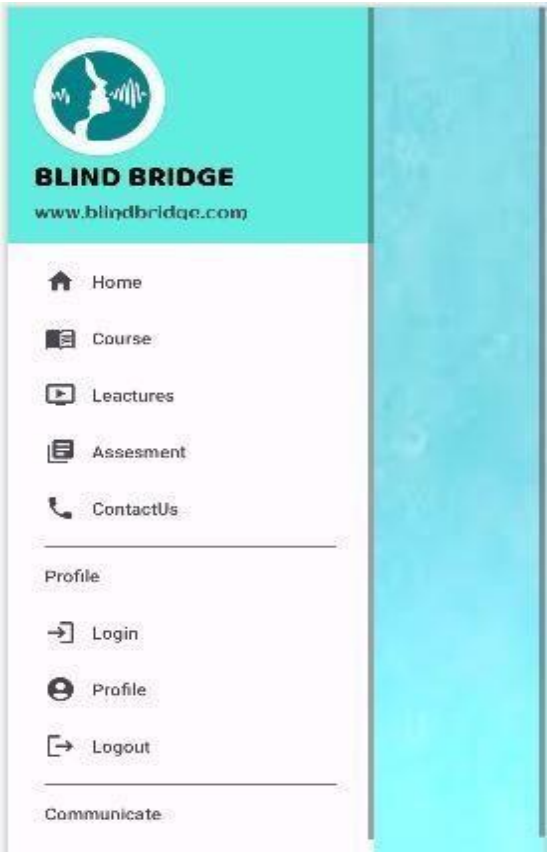
Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

• Project Summary

Navigation is an important human task that needs the human sense of vision. In this context, recent technologies developments provide technical assistance to support the visually impaired in their daily tasks and improve their quality of life. However, for the visually impaired, this information is not generally available through external intervention. In fact, to ensure that the visual impaired get the best education platform and to navigate the books they wanted to read In this context, many researchers address the issue of how to enable these individuals to overcome the inability to navigate the environment independently defined by a set of components and characteristics. In this work, we are considering to design a system that provides assistance for the visually impaired to better understand the world and get to know the world



• Achievements and Improvements

Achievements and improvements in an Android project can vary depending on the specific goals and objectives of the project. However, here are some common achievements and improvements that you can aim for in an Android project:

1. Successful App Launch: The successful launch of your Android app on the Google Play Store or any other platform is a significant achievement. It indicates that your app is ready for users to download and use.

2. User Adoption and Engagement: Tracking user adoption and engagement metrics, such as the number of app installs, active users, and user retention, is crucial. Achieving a high number of downloads and active users demonstrates the popularity and value of your app.

3. Positive User Reviews and Ratings: Encouraging users to provide positive reviews and ratings on the app store can greatly enhance your app's reputation. It signifies user satisfaction and helps attract new users.

4. Bug Fixes and Stability: Regularly addressing and fixing bugs reported by users helps improve the stability and reliability of your app. Minimizing crashes, freezes, and other issues leads to a better user experience.

5. Performance Optimization: Continuously optimizing your app's performance can make it faster, more responsive, and consume fewer system resources. Users appreciate apps that are efficient and responsive.

6. Feature Enhancements: Adding new features and functionality to your app based on user feedback and market trends can help keep it relevant and competitive. Regularly updating your app with valuable features enhances the user experience.

7. Integration with Third-Party Services: Integrating your app with popular third-party services such as social media platforms, payment gateways, and cloud services can enhance its functionality and appeal to a broader user base.

8. UI/UX Improvements: Enhancing the user interface (UI) and user experience (UX) design of your app can make it more visually appealing, intuitive, and user-friendly. It should be easy for users to navigate and interact with your app.

9. Performance Monitoring and Analytics: Implementing performance monitoring and analytics tools can provide valuable insights into how users are interacting with your app. This data can help identify areas for improvement and guide future updates.

10. Continuous Updates and Support: Providing regular updates and ongoing support for your app demonstrates your commitment to its success. Responding to user feedback and promptly addressing issues helps maintain user satisfaction.

Remember that every Android project is unique, and the specific achievements and improvements will depend on your project's goals, target audience, and market conditions.

• Critical Review

To provide a critical review of an Android project, it would be helpful to have more specific information about the project itself. However, I can provide you with a

general framework and key areas to consider when conducting a critical review. Here are some aspects to evaluate:

1. Functionality:
2. User Interface (UI) and User Experience (UX
3. Performance:
4. Code Quality:
5. Error Handling and Exception Management:
6. Security:
7. Testing and Documentation:
8. Third-party Dependencies:
9. Scalability and Future Extensibility:
10. Compliance and App Store Guidelines:

- ## Future Enhancements/Recommendations

Sure! Here are some future enhancements/recommendations for Android:

1. Improved Performance: Continuously optimize the operating system to enhance overall performance, including faster app launch times, smoother animations, and reduced system resource consumption.

2. Enhanced Battery Life: Develop more efficient power management techniques to prolong battery life. This could involve optimizing background processes, improving battery usage analytics, and implementing power-saving features.
3. Enhanced Privacy and Security: Strengthen Android's security features to protect user data and privacy. This may include stricter app permissions, improved encryption standards, and enhanced protection against malware and hacking attempts.
4. Seamless Cross-Device Integration: Enable seamless integration between Android devices, allowing users to effortlessly switch between smartphones, tablets, wearables, and other devices without losing their progress or data.

5. Advanced AI Integration: Integrate artificial intelligence capabilities throughout the Android system to provide personalized user experiences, improve predictive typing, enhance voice assistants, and enable intelligent automation features.
6. Improved App Distribution: Enhance the app distribution process on the Google Play Store by streamlining the app review and approval process, providing better discoverability options for new and niche apps, and improving app update mechanisms.
7. Smarter Notification Management: Develop intelligent notification management tools to reduce clutter and provide more contextually relevant notifications to users. This could involve improved grouping, prioritization, and customization options.
8. Better Accessibility Features: Continuously improve accessibility features to make Android more inclusive and user-friendly for individuals with disabilities. This may involve enhancements to screen readers, voice commands, gesture controls, and other accessibility tools.
9. Native Desktop Mode: Introduce a native desktop mode similar to Samsung DeX, allowing users to connect their Android devices to external monitors and use them as full-fledged desktop computers with a keyboard and mouse.
10. Enhanced Multitasking: Implement advanced multitasking features, such as split-screen multitasking for more than two apps, floating windows, and improved app switching mechanisms.
11. Improved Gestures and Navigation: Refine gesture-based navigation systems to provide more intuitive and seamless navigation throughout the Android interface, reducing the reliance on physical buttons.
12. Increased Customization Options: Offer users more customization options for the user interface, including themes, icon packs, fonts, and widgets, allowing them to personalize their Android experience to a greater extent.

Appendices

Appendix A: Information / Promotional Material

In Appendix we add promotional material about our application and application. We add these for promote our application.

- **Broacher**

- **Flyer**

- **Standee**

- **Banner**

Appendix [no.]: Blind Bridge

Admin

Login

if the user wants to login he/she must be register and after that it must be valid when you enter in the login screen

stimulus/ response sequence

- enter your email
- enter your password
- click on sign in

Registration

if a admin want to login to the app they have must register into the portal
user first clicks on the registration button to in initiate registration into the portal.

stimulus/ response sequence

user first clicks on the registration button to initiate registration process.
system prompts the user to fill out his/her details provided by system during registration**.**
1- user enters fields.
2- system validates the user information.
3- system creates a new account for the user.

Patient dashboard:

After logging admin front page open

Stimulus /response sequence:

Find teacher.
Find student.
Check the assessment of teacher/student.
Find a course
book library
Confirm Enrollment
teach your student
Data of student
Grades of student.

Data of Teacher/Student :

here Admin check update delete and enter student/Teacher ,see her everything about teacher/student portal and also drop the mail for teacher/student about there activities.

Stimulus/Response Sequences:

Mail drop for student/teacher about upcoming activities/assessment.

A.5. Search students:

- by course
- by grade
- by gender
- by name

A.6. Search Teacher:

- by course
- by grade
- by gender
- by name

Appendix [no.]: Blind Bridge

Teacher

login

if the user wants to login he/she must be register and after that it must be valid when you enter in the login screen

stimulus/ response sequence

- enter your email
- enter your password
- click on sign in

Registration

if a teacher want to login to the app they have must register into the portal
user first clicks on the registration button to in initiate registration into the portal.

stimulus/ response sequence

user first clicks on the registration button to initiate registration process.
system prompts the user to fill out his/her details provided by system during registration.
1- user enters fields.
2- system validates the user information.

3- system creates a new account for the user.

Patient dashboard:

After logging Teacher front page open

Stimulus /response sequence:

Find a course
book library
Confirm Enrollment
teach your student
Data of student
Grades of student.

Data of student :

here Teacher check update delete and enter student grades and assessment ,see her assessment and also drop the mail for student about there result and grades

Stimulus/Response Sequences:

Mail drop for student about there assessment.

A.5. Search students:

- by course
- by grade
- by gender
- by name

Appendix [no.]: Blind Bridge

Student

login

if the user wants to login he/she must be register and after that it must be valid when you enter in the login screen

stimulus/ response sequence

- enter your email
- enter your password
- click on sign in

Registration

if a students want to login to the app they have must register into the portal
user first clicks on the registration button to in initiate registration into the portal.

stimulus/ response sequence

user first clicks on the registration button to initiate registration process.
system prompts the user to fill out his/her details provided by system during registration.
1- user enters fields.
2- system validates the user information.
3- system creates a new account for the user.
Patient dashboard:
After logging Student front page open

Stimulus /response sequence:

Find a course
book library
Confirm Enrollment
Check your grades
Chat with teacher assistant.

Confirm Enrollment:

here student confirm an subject enrollment ,see her course and also chat with Teacher Assistant

Stimulus/Response Sequences:

chat with Teacher Assistant an confirm your task.

A.5. Search course:

- by subject
- by grade
- By Teacher Name

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Reference and Bibliography

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