DEVELOPMENT OF STUDENT AID SYSTEM (CASE STUDY OF CHRISTIAN SERVICE UNIVERSITY COLLEGE) USING IONIC FRAMEWORK

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A THESIS SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE, CHRISTIAN SERVICE UNIVERSITY COLLEGE IN **PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BSC. COMPUTER SCIENCE FACILITY OF HEALTH AND APPLIED SCIENCES**

DECLARATION

I hereby declare that this submission is my own work towards the BSc and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the dissertation was supervised in accordance with the dissertation policy of the Christian service university College.

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Head of Department Name **Signed:** **Date**

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We also place on record, our sense of gratitude to one and all, who directly or indirectly, have lent their hand in this venture.

ABSTRACT

This dissertation describes the implementation of a software system to improve the management of Christian Service University College using ionic framework and to demonstrate and evaluate its usefulness in managing the universities activities. The core set up of this project is to implement a cross-platform application that will improve the dissemination of information to students and the provision of assistance to enable students to navigate their course of study with ease. The proposed framework factors the school management problem into sub-goals: building a personal assistant model to answer user queries; thus, it allows users to ask questions in the form of a conversation and provide answers based on the training it has received; Implementation of an online library to allow lecturers to upload study materials; Allow students to download and play the uploaded files; send notifications to students; and allow students to search for upcoming events. The implemented system had a friendly user interface and can run on both desktop and mobile interfaces. The various model worked accurately, and data protection was also ensured. The system answered user queries in a human-like way. The specified goals for this project were achieved successfully. The implemented system would solve the problem of managing activities of the institution.

Contents

CHAPTER ONE

INTRODUCTION

1.1 Background

The advances in technology have made the implementation of applications that automate tasks a possibility. In this cutting edge age, an expanding number of people utilize cell phones, tablet pcs and personal digital assistants for nearly everything.

The utilization of cell phone has turned out to be basic in correspondence and getting to of data. Colleges are evolving from the conventional record framework and have been pursuing alternatives that are accessible on the web.

Researchers continue to work meticulously to improve the educational system by applying various technologies to implement applications like e-learning platforms and student's personal assistants. Christian Service University College already uses an online system to manage records. It is one of the associations that will benefit if modern technologies are leveraged to improve their current system to include a management interface with mobile support.

This thesis reports on the design of a cross-platform application that incorporates the various components in an efficient school management statement. Emphasis is placed on the development of a conversational interface to assist students, send user notifications and allows users to search for information uploaded on the schools pinboard. Also central to the project is the development of an online library that will allow users to access school resources.

In conclusion, the core purpose of designing "Christian Service University College Mobile Application" is to manage the task related to the college students and help them navigate their study with ease.

1.2 Motivation and Problem Statement

With the advancement in technology, the need for a more advanced way of managing colleges arises. The web-based approach no longer seems efficient due to the fact that most people use their portable phones more. Also, most students get overwhelmed by the demands of their daily regimes like obtaining study resources and getting information about their schedule. Fortunately, technology is helping us overcome these challenges. While there is an online system available at Christian service university, this system is not available on a mobile interface and does not include uploads of video resources or a conversational interface provide support

1.3 Objectives of the Project

The Christian service school management system will aim to:

- Provide a cross-platform interface that is available on both desktop and different mobile platforms.
- Register and authenticate students using a valid email address
- Allow lectures to upload videos, pdf and image resources.
- Allow students to download or view these resources.
- Notify users of upcoming events in real time
- Provide a conversational interface to answer user queries

1.4 Thesis Organization

The rest of the thesis is organized as follows:

Chapter 1: Introduction

This chapter provides an overview of the project work conducted, states the problem to be addressed and summarizes the objectives of this project.

Chapter 2. Literature Review

This chapter discusses research methods and results of related works. Existing systems and our proposed approach are also emphasized.

Chapter 3. Research Methodology

This chapter leverages the knowledge obtained from reviewing related work from the previous Firstly, the requirements for our project are identified and an architecture designed to show the various models to be implemented. Flow charts and block diagrams are designed to show the step by step approach used in the development

Chapter 4. System Implementation and Testing

The system implementation system discusses the coding aspect of the application. The chapter begins by discussing the different models and the technologies leverage in building these modules. The output and testing phase of the development process are also discussed and shown. Finally, the integration of the various models and interactions with each other are underscored.

Chapter 5. Conclusion and Future work

The final chapter summarizes the concluding points from the results and recommends further research that could be done in the future to improve our proposed system.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this section, a brief summary of existing works on school management system is. The strengths of various approaches are discussed.

While there exists a good representative of literature on school management systems, most of these systems focus on the registration of students and generation of report cards. This approach has already been implemented in the current Csuc website. However, most researchers are trying out various means to improve school management systems by incorporating various state of the art technologies like artificial intelligence.

2.2 Related Work

2.2.1 Online School Management System

In this paper, the researchers developed an online school management system using java and MySQL.

The system included a registration page that allowed users to login in based on their role, an interface to view all students, a notice board and an interface to allow students to access their results. They used the waterfall model in implementing their system (Lin,2011a).

While the above system provides a good interface to help administrators manage their schools, it has a number of limitations because of the approach used in the implementation. The waterfall approach used has some benefits but does not allow changing user requirements. This approach makes integrating the system an issue as testing is done after build and not incrementally
(Erande et al,2017a).

The authors also used Java and SQL in their approach. This approach makes the system available for only desktop users. The relational database approach is also difficult to manage as compared to no relational database which does not use schemas.

The notice board module implemented by this system requires the user to go through the entire list of announcements to find the announcement they are looking for. Our approach improves on this by implementing a search feature to allow users to search for the events they are interested in.

2.2.2 How an Artificially Intelligent Virtual Assistant Helps Students Navigate the Road to College

In this project, researchers convolutional deep learning reinforcement learning to help high school to provide personalized text message outreach to incoming students who need support navigating their transition to college.

This system subscribes users to the artificial assistant and provides them with support to help them with their college admissions until the user decides they would not be attending the college after all. They accessed the impact their system had on student-level outcomes using a linear probability model specification (Gehlbach et al,2017a).

The linear model probability model was out of scope in our implementation. However, we implemented a variant of their system using a conversational interface trained with a knowledge base from frequently asked questions from the current university website. Our system uses an Android app interface that replies to user queries instead of the email subscription approach proposed by these researchers.

2.2.3 Android Application for College Management System

This project implemented an android based college management application that enabled the college to decimate information easily. Their system implemented notifications and allowed teachers to upload documents for students.

This system had a lot of similarities with our proposed solution. We did make improvements to their implemented solution by using a cross-platform framework instead of targeting just android users like these researchers. Their system also allowed only documents to be uploaded. This is a drawback because most institutions do not only require documents upload but videos and other file formats as well (Sarker,2019a).

They also included authentication of users using One-time password. While this implementation is an improvement on traditional systems using static passwords, it is less secure because it requires the user to access passwords send to their mobile phone or other devices. This is not feasible because mobile numbers are sometimes transferred between users. Our approach increases security by allowing users to only register after they have confirmed their passwords by verifying their email (Avachat et al,2017a).

2.2.4 Online Registration System (A Case of Methodist University College Ghana)

The authors of this study present a student registration system for Methodist University College Ghana. Their proposed system used the waterfall approach in designing a system to replace its manual registration system (Ofori Ansa et al,2019a).

The main components of their system were designed with PHP and HTML technology. The authors of this research also used SQL database as their Relational database management system. The registration system designed as a web-based application that could be accessed through a browser.

Our proposed system varied from this system because we focused on adding additional features to the already existing registration system at Christian Service. We made the application available on both mobile platforms and web platforms, unlike these authors.

2.3 Existing System

The current system used by the Csuc University is only available on a desktop. It is not available on mobile devices. While it is way better than the manual traditional management system, there are a lot of functionalities that are yet to be implemented. Currently students have to visit the website or bulletin boards to get information on upcoming events and news updates. This approach is tedious and inefficient because most students rarely visit the website on a daily basis.

Students also have to visit administration if they have questions or require assistance. This is disadvantageous to students because it is difficult to find the right sources to contact for answers to these queries.

2.3.1 Disadvantages of the Existing System

There are a number of drawbacks with the current management systems. Some of which are elaborated below.

- The existing system is not available on a mobile interface
- Students have to visit the website for news updates and events
- The news interface available does not have a search feature to allow students to search for updates they are interested in.
- There is no way to notify students of events if they do not visit the websites or university bulletin board.
- An assistant to help student’s especially new students to navigate through their schedule easily is not available.

- Students do not have access to video materials in the current management system.

2.4 Proposed System

Our proposed system was to implement a cross-platform application that will target students using various devices including iPhone, Android and windows interface. This innovative systems will allow lecturers to upload various course materials including pdf, videos, and images. Students could access these materials with internet connectivity and just a click of a button. A pinboard with search functionalities will also be added to improve information dissemination to students. Students will also be informed of urgent events by sending notifications to their mobile devices even if the application is closed. Students who have difficulty finding their way around will also have access to a conversational bot that will answer questions they might have.

The existing website will also be integrated into our mobile application. This will allow users to access the functionalities already available like course registration from the app interface. We will ensure that the system is very secure by restricting user access based on their roles.

2.4.1 Proposed system advantages

The proposed system will ensure

- Confidentiality and Data protection by authenticating users and restricting access to base on their roles
- Get news updates and information to users in real time.
- Notify users of important events even when they have not visited the application.
- Allow lecturers to upload video and pdf slides for students
- Allow users to access the university websites from a mobile interface.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter summarizes the systematic approach followed in the implementation of this project. The procedures followed are explained in details with information on the various technologies used during the process of development.

3.2 Project Overview

During the development cycle of this project, the requirements were grouped into different modules. These tasks were completed using the agile approach of software development. The various modules were developed separately, tested individually and integrated incrementally. The different modules are marshaled below:

- Registration and Authentication Module
- Personal Assistant Module
- CSUC Pinboard Module
- Online Library Module
- Notifications Module
- Contact CSUC Module

3.3 System Requirement and Design Analysis

For the design of the architecture of the school's management systems, discussions were made between group members and inquiries made from current students of the institution. From these discussions and inquiries, a cross-platform based application was determined to be the best approach for the school management application. The functionalities mentioned were:

An intelligent bot to assist users with questions about the institution, a pinboard to display current news updates to students, a notification module to send reminders to students about events an interface to allow lecturers to upload lecture slides videos, and an interface to allow users to access the official university website from the application.

3.3.1 Functional Requirements

The system should be able to

- Register and authenticate users using a valid email address.
- Allow lecturers to upload lecture videos and slides
- Allow students to download and play video lectures
- Allow students to download pdf
- Notify users of upcoming events
- Provide an interface for users to search for news updates from the institution
- Provide a conversational interface to provide 24-hour support to students.

3.3.2 Functional Requirements

- Allow students to contact the university through the app using email
- Allow students to call CSUC Info desk through app
- Provide quick links to allow users to visit the official Csuc website through the app

3.4 System's architecture

The system architecture shows the various components and how they interact with each other in the implemented system (Ionic,2018).

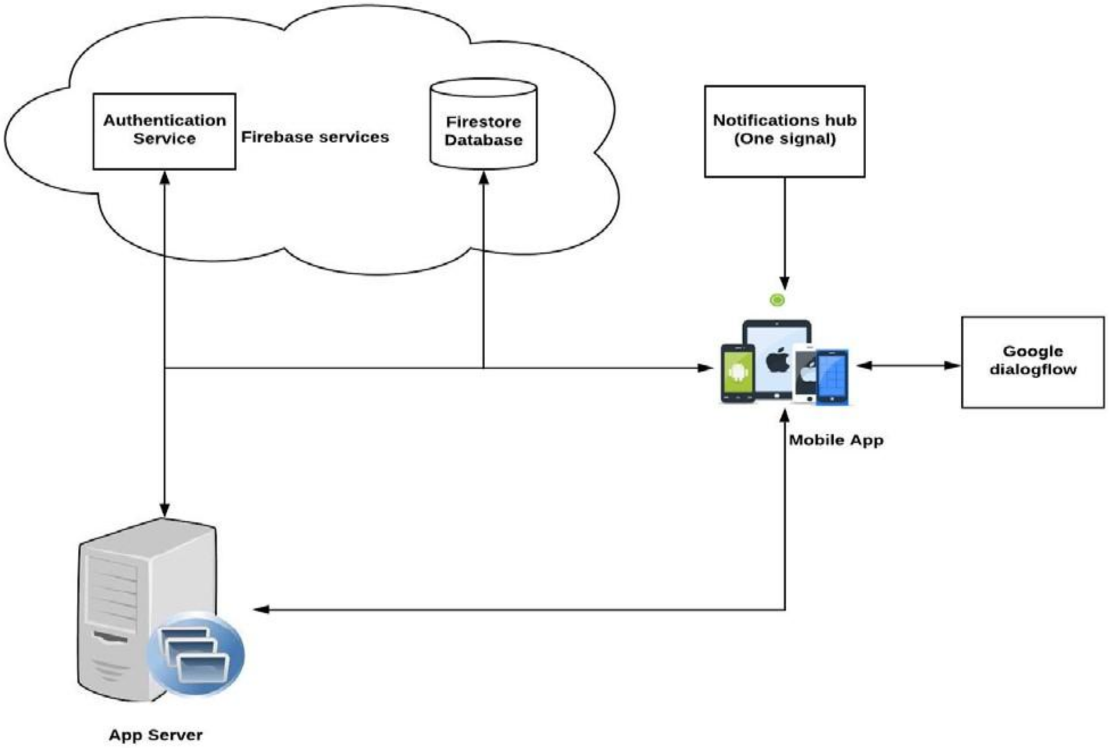


Figure .3.4 System Architecture

3.5 Flow Charts

This section shows the flow chart for the various modules. It shows the various steps followed by the system in authenticating users, granter user access and displaying contents.

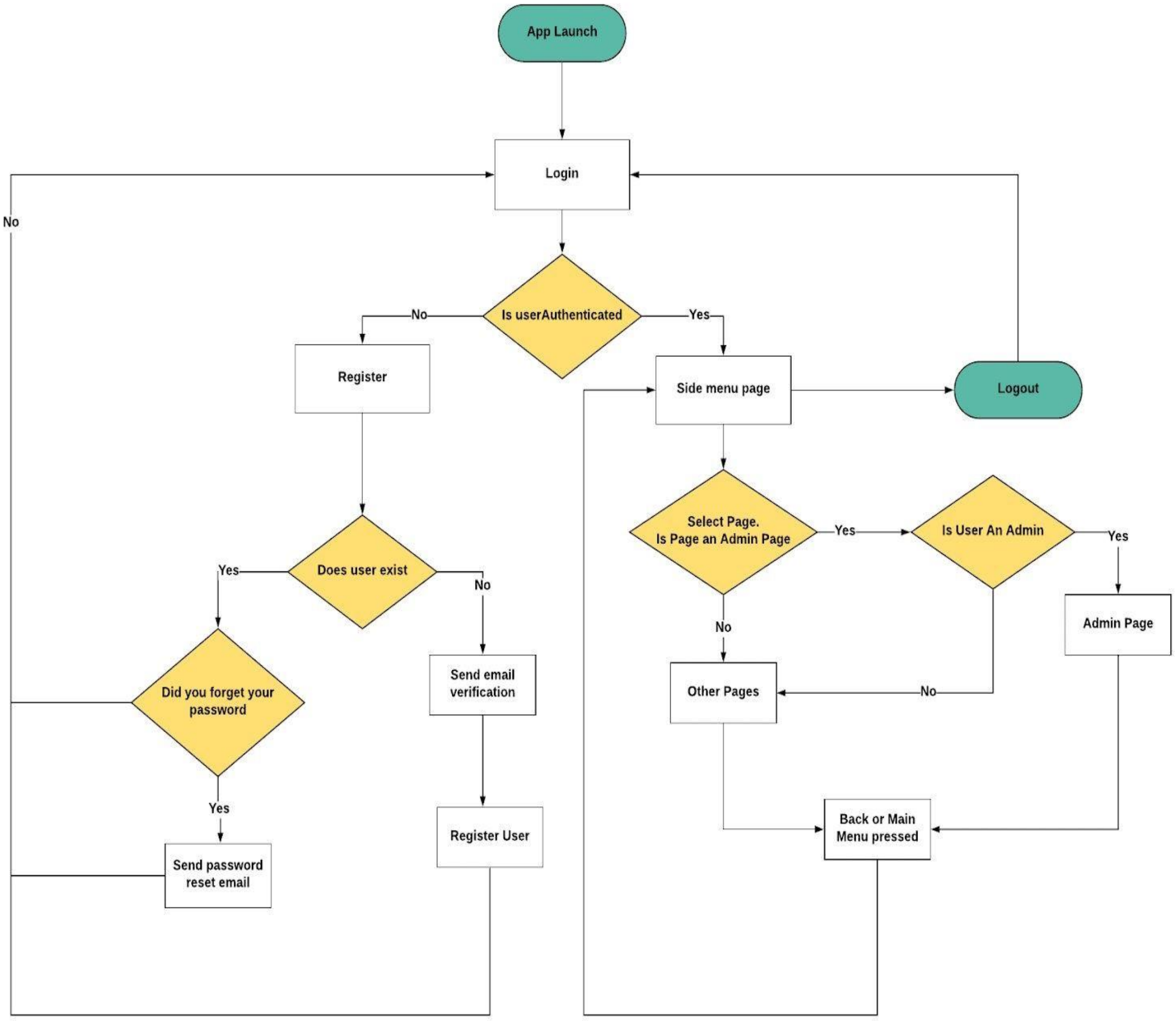
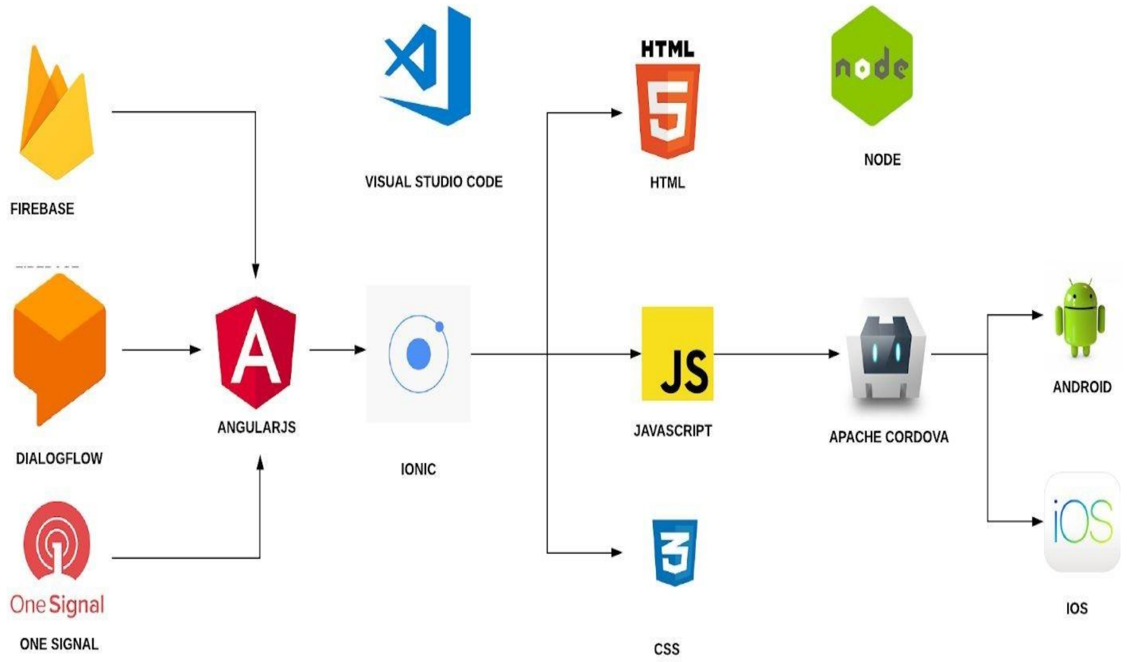


Figure 3.5 Flow Chart

3.6 Technologies Used

The various technologies used in the implementation of this project are emphasized in this section.

- Database and Authentication Services- Firebase
- Server-Side Runtime Environment - Node
- Push Notification Service- One Signal
- Chatbot Development Platform- Dialog flow
- Front End Framework- Ionic and Angular
- Web App Framework- Html, JavaScript, and CSS
- Code Editor- Visual Studio Code
- Web App Wrapper- Apache Cordova



- Platforms- Android and IOS

Figure .3.6 Ionic Display

3.7 Front End Development

For the front end development of the Christian service school management application, Ionic framework was used to handle user interface interactions in our application. Ionic framework was used because it allows the use of one code base for both IOS and Android.

To begin, Visual studio was set up and used as the editor for the application. Node is being installed to make the installation of the various plugins needed for the application easy. Ionic and Cordova was setup using npm in node. Cordova was used on top on Ionic to allow the use of native plugins in our application. The bulk of the app was written using Html, CSS, and JavaScript.

Angular was used for the core functionality of the framework. Because Ionic is built on top of Angular, most of the features from Angular like its interacting capabilities with back end web servers and external data sources were made available in our application.

The various plugins used in our applications were installed, and firebase configuration file added to allow communication with our database. An attractive side menu combined with tabbed interfaces was designed to enrich user experience. Ionic guards were implemented to allow access based on user roles and directives used to create an animated user interface to allow image upload.

Finally, both Android and IOS platforms were added to allow our applications to target these platforms.

3.7.1 Admin Page Setup

The admin page had three sub tab pages that provided administrators with an interface to upload files to the CSUC online library. The various procedures followed are underscored below.

- A drop zone directive was implemented to listen for drop events. The directive emits a file list which is uploaded to firebase storage using angular fire
- Angular fire creates a task to upload a file. We subscribed to this task to monitor the progress of the file upload.
- To enable students to have access to the resources uploaded, the path to the file was saved into firestone database when the file upload is complete.

- Other interfaces were created to allow admin to update user roles and upload files using the URL instead of the actual file. This was done by implementing a form that uploaded details to firestone on upload.

3.7.2 Online Library Setup

In order to access the resource uploaded by the administrator, a user interface was implemented to display these resources. The steps followed to implement this functionality are outlined below

- To enable users to play the videos, video gular for angular was installed and resources added to the project.
- The video gular modules were imported in our page for the HTML and CSS designs to work
- Pdf viewer package was also integrated into our project to allow users to read their lecture slides inside the application.

3.7.3 Csuc Personal Assistant Setup

The aim of this module was to create an AI agent that could answer student's queries based on data used for training. The steps marshaled below were followed.

- To help the assistant understand user queries, intents were created.
- Different intents were created and trained for different conversational scenarios
- The dialog flow backend with these intents was integrated into the ionic app.
- Queries are passed to dialog flow server using promises and ngZone used to tell angular to update the view when a response is received.

3.7.4 Notifications Setup

In order to send notifications to users, one signal was used together with google cloud messaging to design a notifications hub. The following steps were followed.

- In our created firebase project, we generated a server key and sender id from the google cloud messaging tab.
- We created an account and registered our ionic app.
- The configuration for the various platforms was set up.

- The server key and id from firebase were added and target SDK selected

  One signal was then integrated into our ionic app after the required plugins were installed.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter will summarize the processes used in the design of the school management system, elaborate on the tools used in the implementation and finally convert the system specification into reliable software.

4.2 System implementation process

Different modules were designed and tested separately. The results for the various modules are marshaled below.

4.2.1 Setting up the login and registration page

Firebase authentication and firestone database was used to authenticate the user's identity before granting access to users. Users were registered using a verified email address and granted access to pages based on their roles. Firebase authentication sdk and Ionic guards were used to control user's access to data stored in our firestone and real-time database.

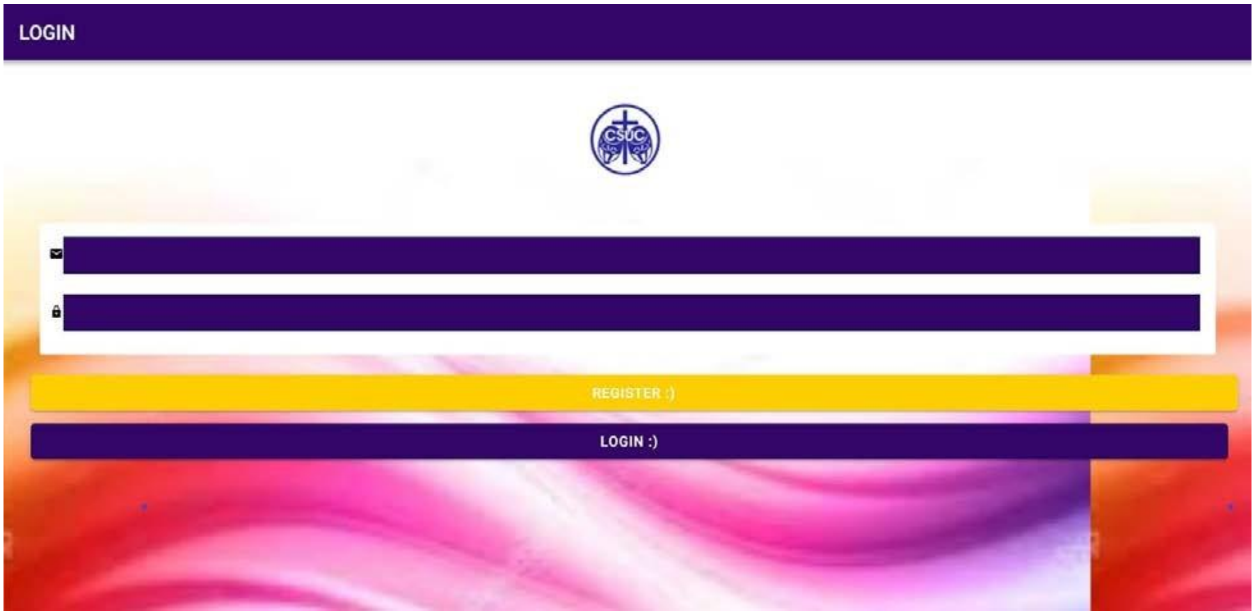
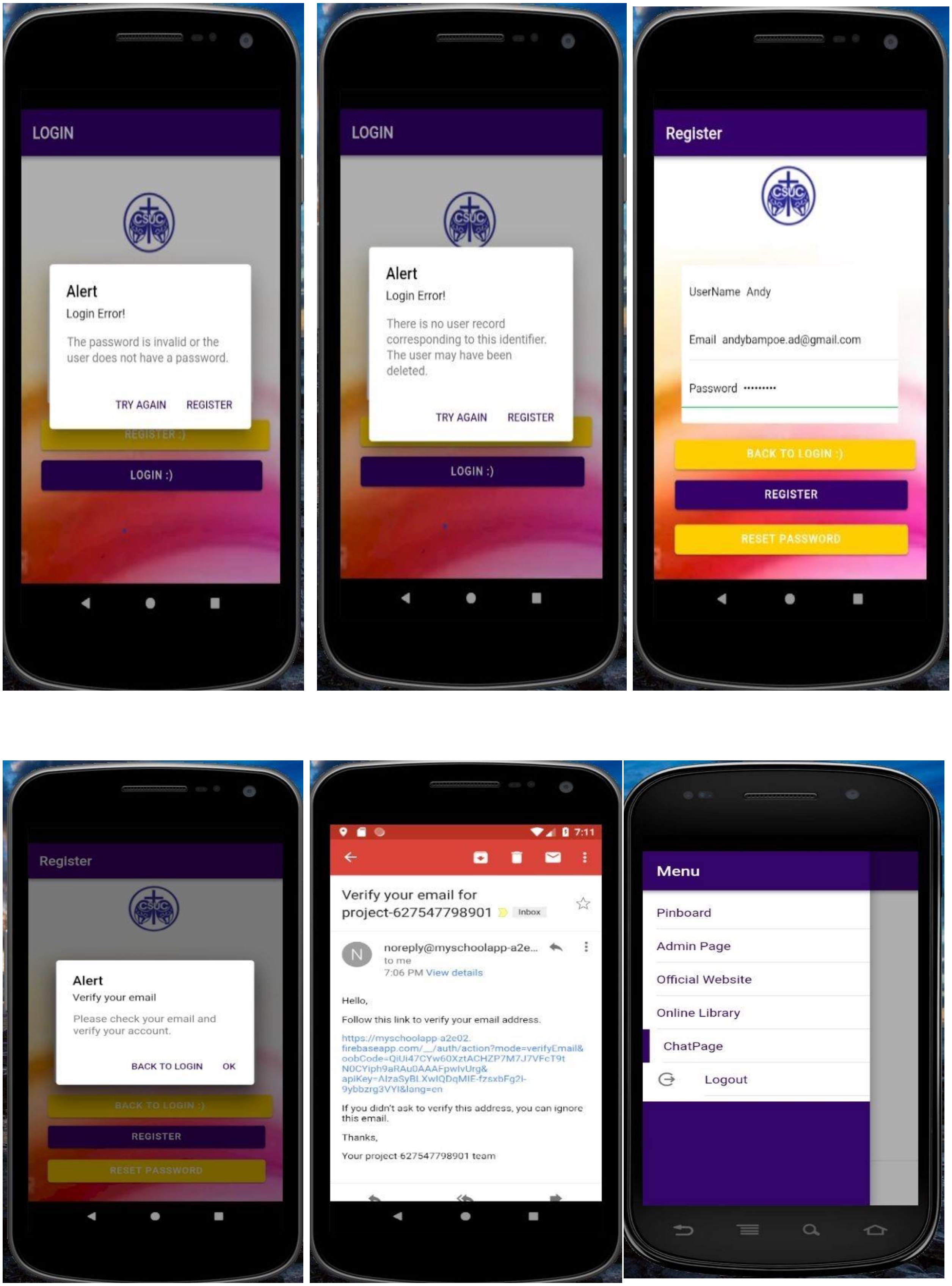


Figure.4.2.1.1 Desktop Login Page



Alert

Login Error!

The password is invalid or the user does not have a password.

TRY AGAIN REGISTER

Alert

Login Error!

There is no user record corresponding to this identifier. The user may have been deleted.

TRY AGAIN REGISTER

UserName Andy

Email andybampoe.ad@gmail.com

Password ••••••••

Alert

Verify your email

Please check your email and verify your account.

BACK TO LOGIN OK

7:11

Verify your email for project-627547798901 Inbox

noreply@myschoolapp-a2e...
to me
7:06 PM View details

Hello,

Follow this link to verify your email address.

https://myschoolapp-a2e02.firebaseapp.com/__/auth/action?mode=verifyEmail&oobCode=QiUi47CYw60XztACHZP7M7J7VFcT9tN0CYiph9aRAu0AAAFpwlvUrg&apiKey=AIzaSyBLXwIQDqMIE-fzsxbFg2I-9ybbzrg3VYI&lang=en

If you didn't ask to verify this address, you can ignore this email.

Thanks,

Your project 627547798901 team

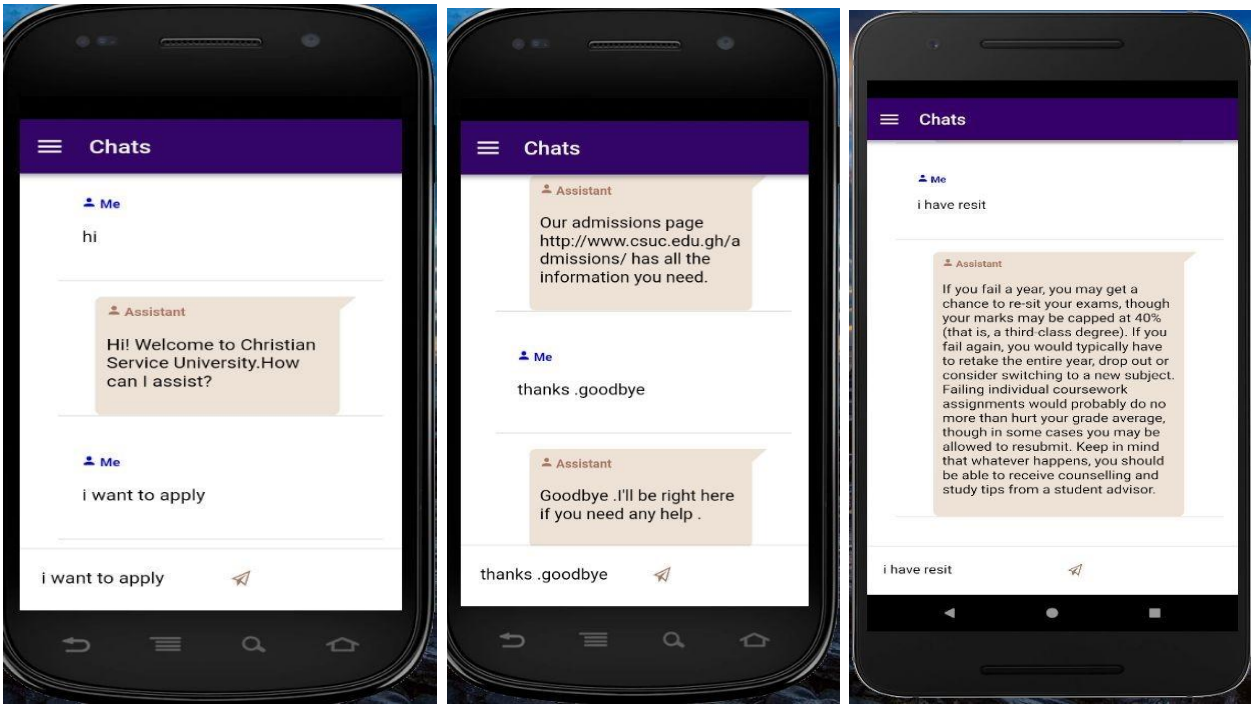
Figure.4.2.1.2. Android Login Page**.**

Figure 4.2.1.3. Email Verification

4.2.2 Setting up the artificially intelligent personal assistant.

Google's dialog flow was trained with sample phrases that a user might say when interacting with a human for information about Christian Service University.

The designed system responds to a user's query without the intervention of an actual person. Based on the input data used in training the assistant, it is able to determine the appropriate response for the question asked. The images below show the results obtained for questions asked about admission inquiries.



Me

hi

Assistant

Hi! Welcome to Christian Service University.How can I assist?

Me

i want to apply

i want to apply

Assistant

Our admissions page http://www.csuc.edu.gh/admissions/ has all the information you need.

Me

thanks .goodbye

Assistant

Goodbye .I'll be right here if you need any help .

thanks .goodbye

Me

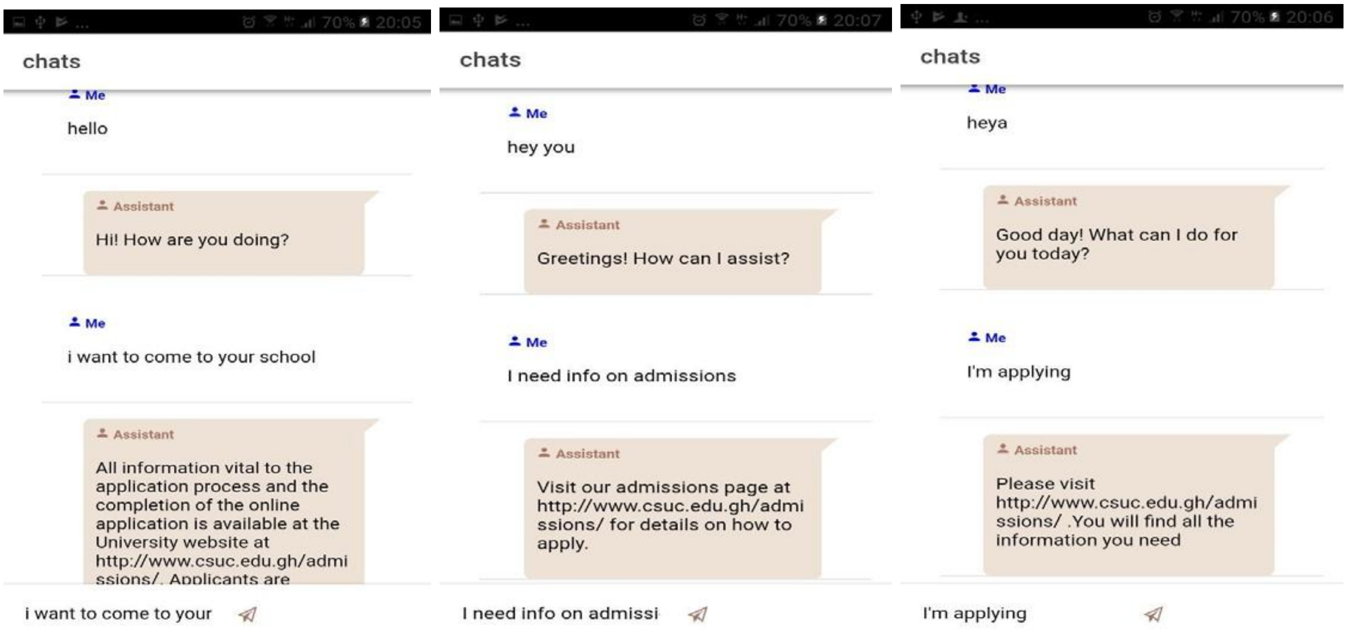
i have resit

Assistant

If you fail a year, you may get a chance to re-sit your exams, though your marks may be capped at 40% (that is, a third-class degree). If you fail again, you would typically have to retake the entire year, drop out or consider switching to a new subject. Failing individual coursework assignments would probably do no more than hurt your grade average, though in some cases you may be allowed to resubmit. Keep in mind that whatever happens, you should be able to receive counselling and study tips from a student advisor.

i have resit

Figure 4.2.2.1. Chat bot



Me
hello

Assistant
Hi! How are you doing?

Me
i want to come to your school

Assistant
All information vital to the application process and the completion of the online application is available at the University website at http://www.csuc.edu.gh/admissions/. Applicants are

i want to come to your

Me
hey you

Assistant
Greetings! How can I assist?

Me
I need info on admissions

Assistant
Visit our admissions page at http://www.csuc.edu.gh/admissions/ for details on how to apply.

I need info on admissi

Me
heya

Assistant
Good day! What can I do for you today?

Me
I'm applying

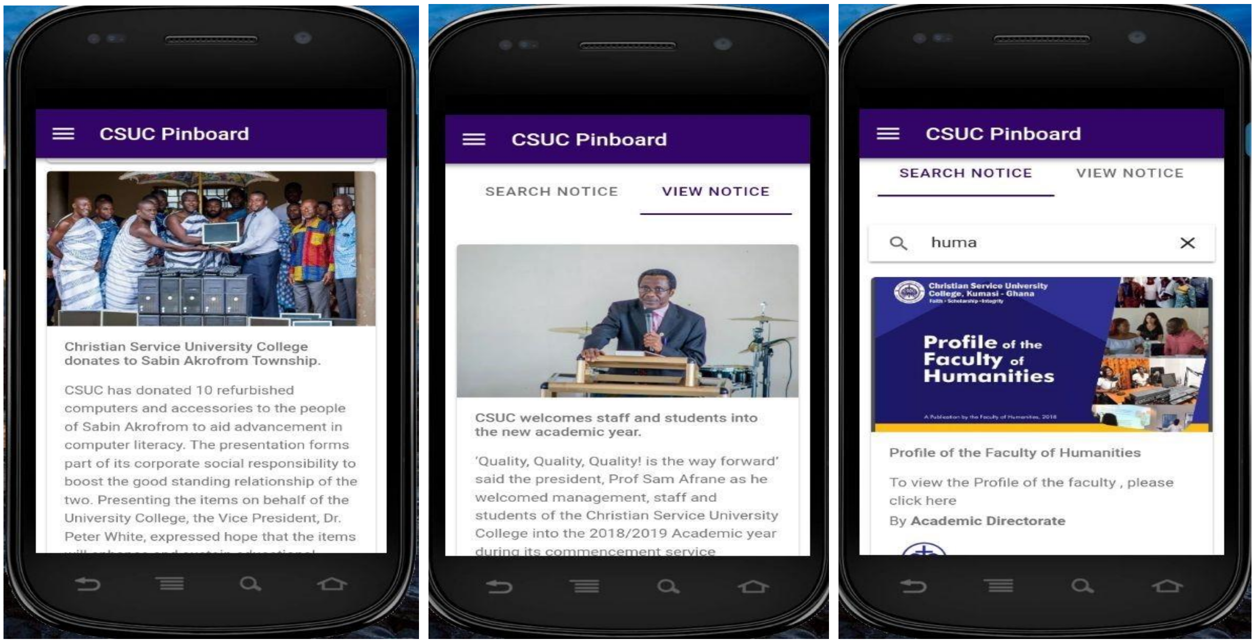
Assistant
Please visit http://www.csuc.edu.gh/admissions/ .You will find all the information you need

I'm applying

Figure 4.2.2.2 Chat bot Assistance

4.2.3 The CSUC pinboard

An interface was designed to keep students update with events and information concerning the institution. Google's firebase real-time database was created using the JSON data format to store news events online. This data was synced to the app in real time. Every time an update is made to the database, Users receive all information in real time.


CSUC Pinboard
CSUC Pinboard
SEARCH NOTICE
VIEW NOTICE
CSUC Pinboard
SEARCH NOTICE
VIEW NOTICE
Christian Service University College, Kumasi - Ghana
Faith · Scholarship · Integrity
Profile of the Faculty of Humanities
A Publication by the Faculty of Humanities, 2018

Christian Service University College donates to Sabin Akrofrom Township.

CSUC has donated 10 refurbished computers and accessories to the people of Sabin Akrofrom to aid advancement in computer literacy. The presentation forms part of its corporate social responsibility to boost the good standing relationship of the two. Presenting the items on behalf of the University College, the Vice President, Dr. Peter White, expressed hope that the items

CSUC welcomes staff and students into the new academic year.

'Quality, Quality, Quality! is the way forward' said the president, Prof Sam Afrane as he welcomed management, staff and students of the Christian Service University College into the 2018/2019 Academic year during its commencement service

huma

Profile of the Faculty of Humanities

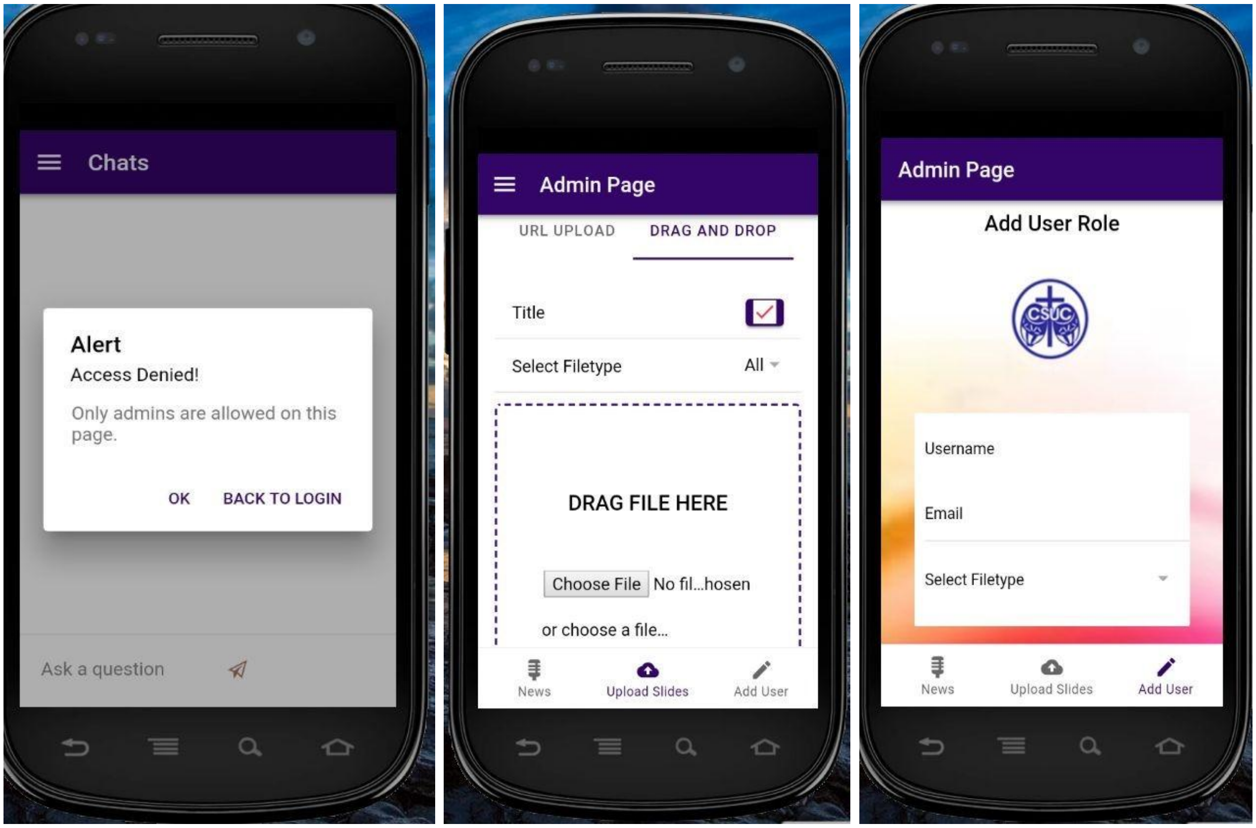
To view the Profile of the faculty , please click here

By **Academic Directorate**

Figure 4.2.3.1 News Feed

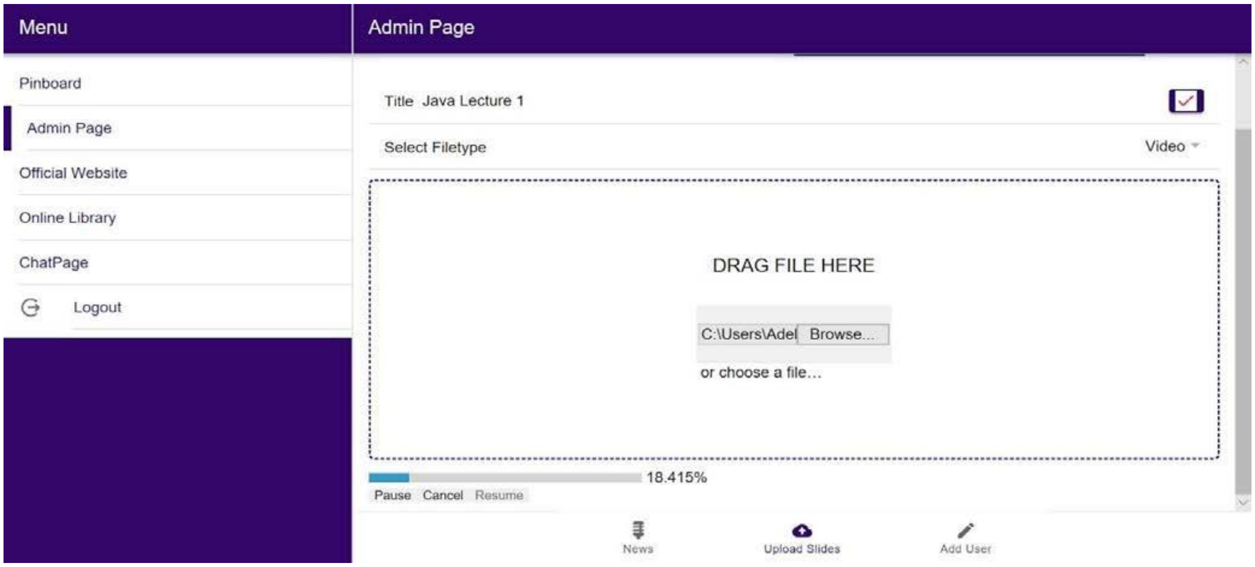
4.2.4 Setting up the Administrator page

The administrator page was implemented to manage file uploads and assign roles to other users. On registration, every user is assigned the role of a student. The administrator however can update this role to for a particular user to allow users access to the admin page. Users who have access to the admin page can upload lecture slides for students.



Alert
Access Denied!
Only admins are allowed on this page.

Figure 4.2.4.1 Admin Page.



Title Java Lecture 1

Select Filetype Video

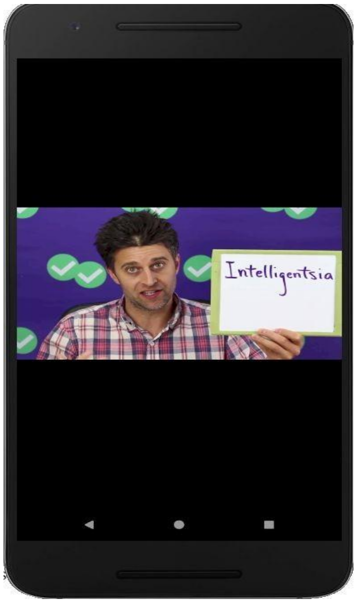
C:\Users\Adel

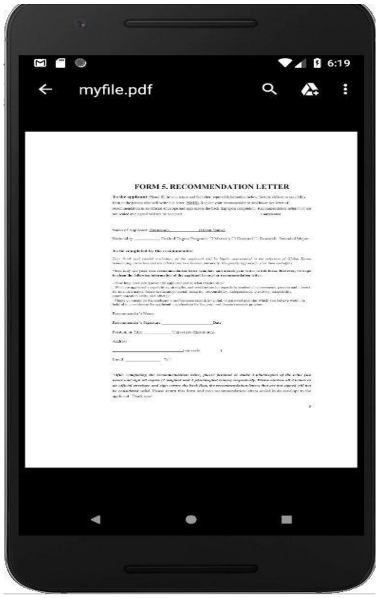
18.415%

Figure 4.2.4.2 Admin Page**.**

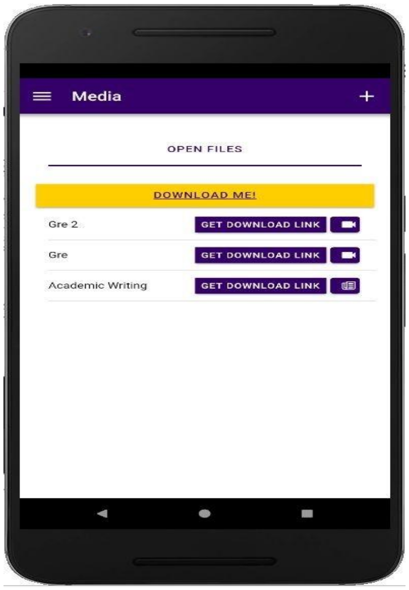
4.2.5 Setting up the online library

The online library display the files uploaded on the administrator page. This module was implemented to allow access to both video and document files. Angular video gular plugin and pdfviewer plugins were used in implementing this module. These plugins enabled users to play files inside the application. Users also had the option of downloading the files for future reference.



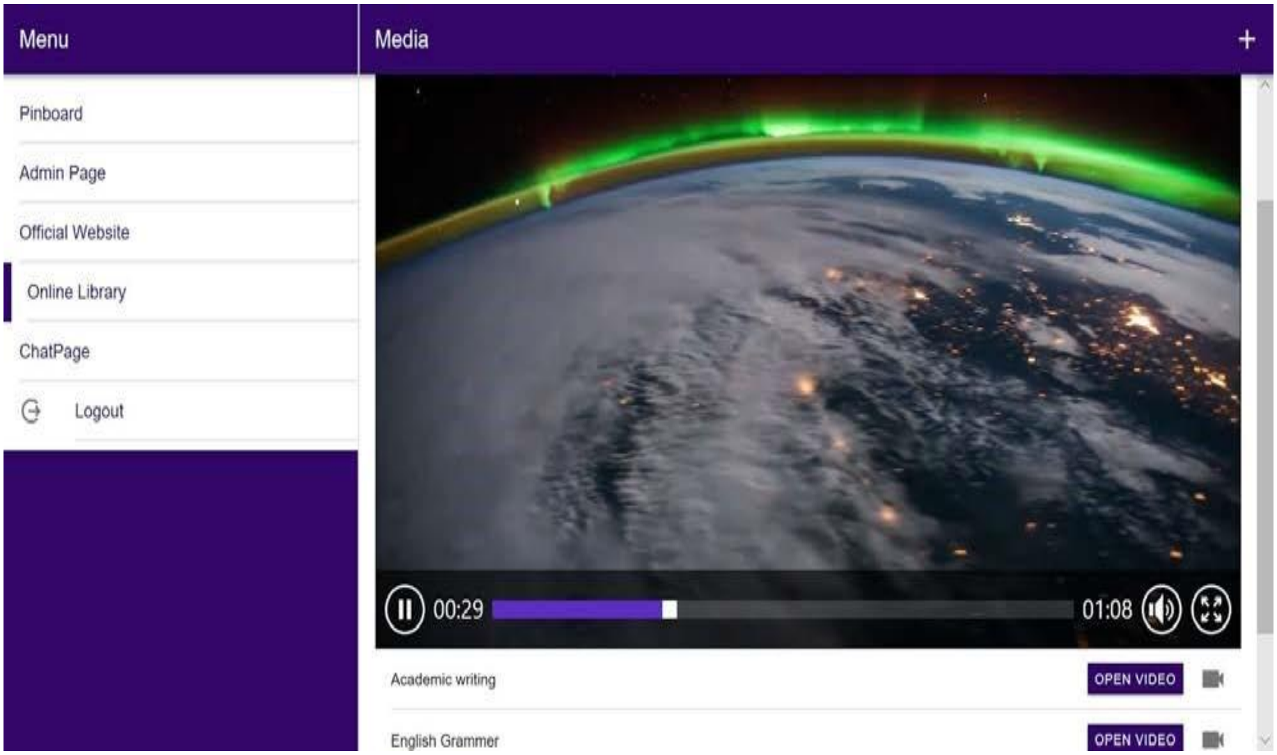


FORM 5. RECOMMENDATION LETTER



Gre 2	GET DOWNLOAD LINK
Gre	GET DOWNLOAD LINK
Academic Writing	GET DOWNLOAD LINK

Figure 4.2.5.1 Online Library



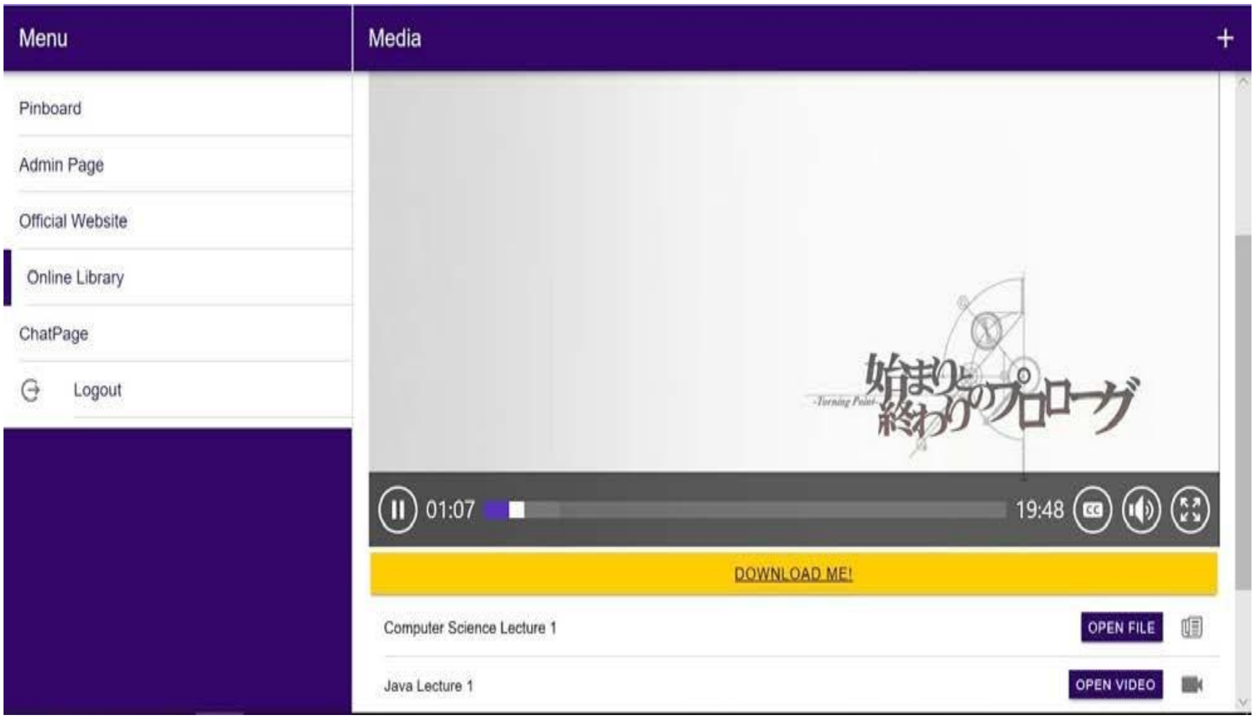
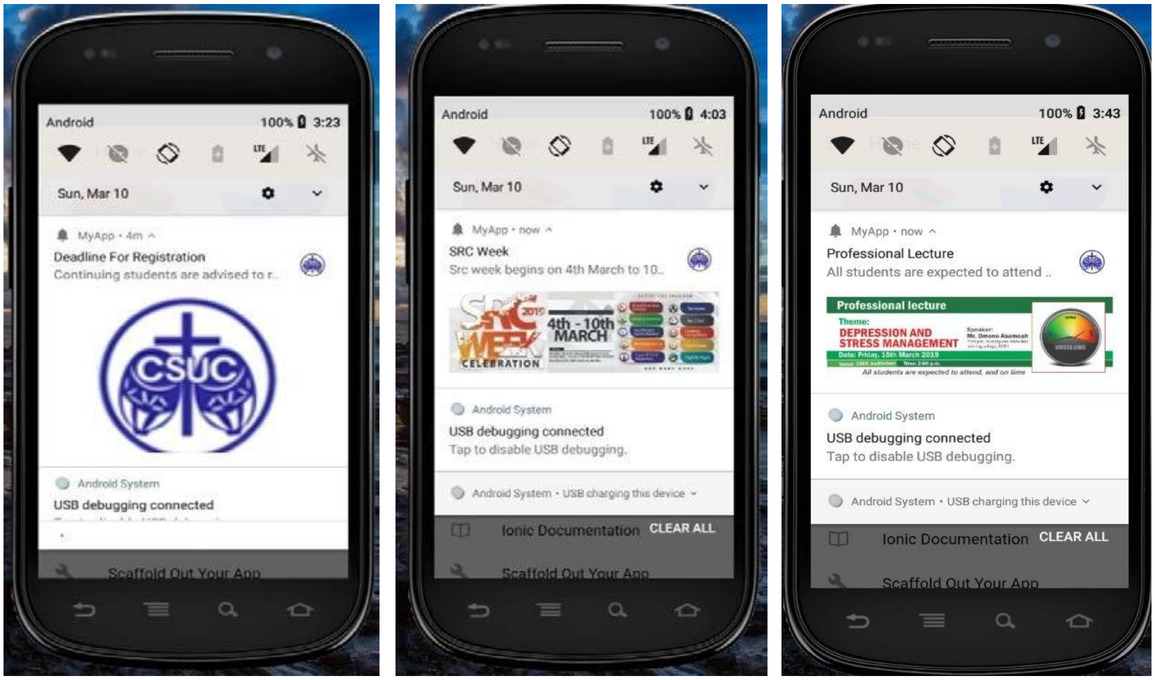


Figure 4.2.5.2 Online Library (Video)

Figure 4.2.5.3 Online Library (Video Download)

4.2.6 Setting up the notification module.

To remind students of the various events and deadlines they are supposed to meet, a notifications module was set up using ionic Cordova plugins and one signal. Reminders are sent to registered users every time there is an event.


Android 100% 3:23
Sun, Mar 10
MyApp • 4m
Deadline For Registration
Continuing students are advised to r..
Android System
USB debugging connected

Android 100% 4:03
Sun, Mar 10
MyApp • now
SRC Week
Src week begins on 4th March to 10..
Android System
USB debugging connected
Tap to disable USB debugging.
Android System • USB charging this device

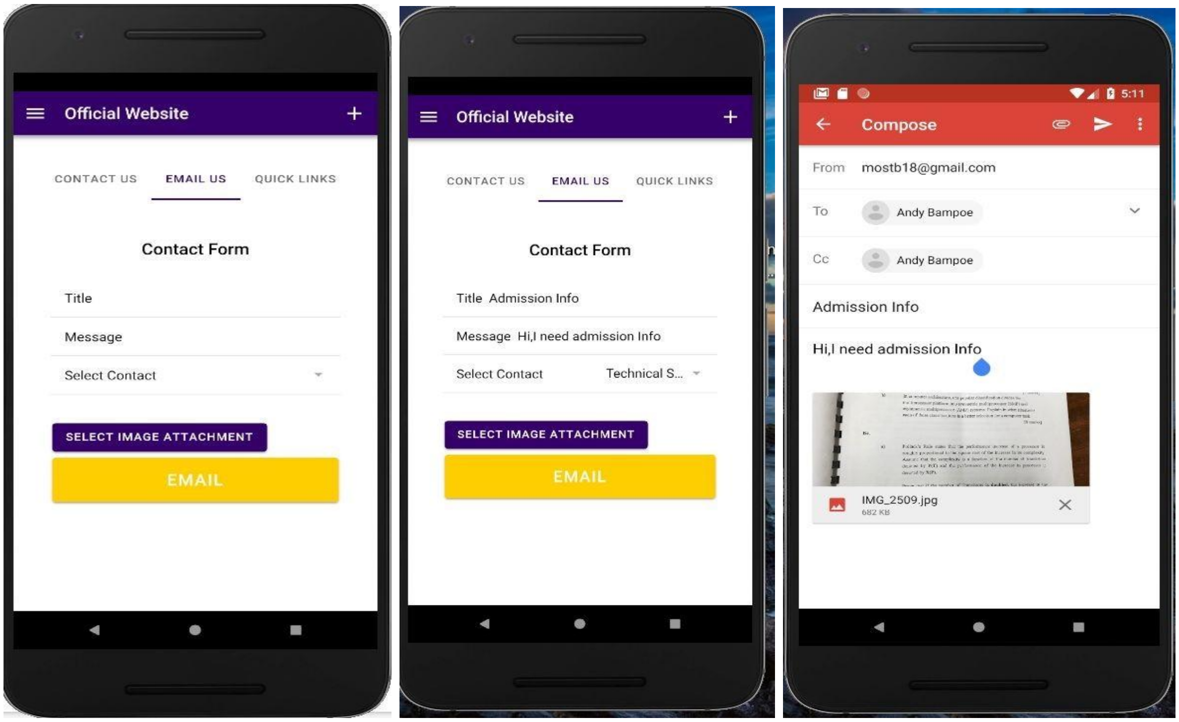
Android 100% 3:43
Sun, Mar 10
MyApp • now
Professional Lecture
All students are expected to attend ..
Android System
USB debugging connected
Tap to disable USB debugging.
Android System • USB charging this device

Figure 4.2.6.1 Downloads

4.2.7 Setting up the contact page

Ionic call number and email plugins was used to implement a contact page to allow users to contact the institution. This enabled user to send emails and make calls from the app interface without having to save the number or close the application.

Links to the official Christian service website were also embedded in the app to allow users to have access to the official website as well. This was achieved using Cordova in app browser.



Title Admission Info

Message Hi,I need admission Info

Select Contact Technical S...

From mostb18@gmail.com

To Andy Bampoe

Cc Andy Bampoe

Admission Info

Hi,I need admission Info

IMG_2509.jpg
682 KB

Figure 4.2.7.1 Help Desk

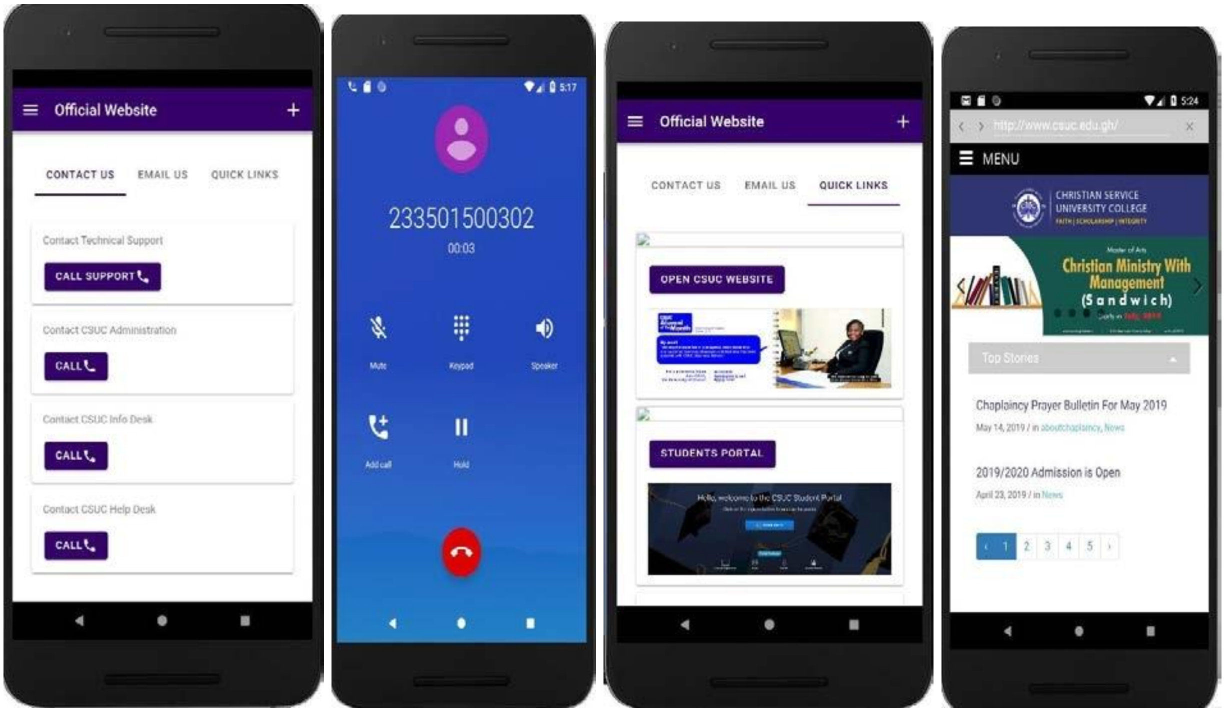


Figure 4.2.7.2 Website

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

Given the complexity of the educational structure, it is clear that not all challenges can be addressed in the scope of this project. This section will summarize the possible improvements that can be made to increase the benefits obtained from this application.

5.2 Conclusion

The scope of this project was to provide a friendly mobile android application to manage a Christian service university. The requirements that were outlined has been completed by incorporating new ideas and features.

In summary, it can be considered that the set goals for this project have been accomplished diligently.

Finally, we are confident that this application will be beneficial to the academic institution.

5.3 Challenges and Assessment

During the implementation of this project, there were a few hurdles along the way. The main challenges emphasized below.

- Moving from Ionic version 3 to version 4. Initially, at the rudimentary stages of development, we were using version 3 of ionic. We had to refactor our code because most of the plugins were no longer supported by ionic for that version. This caused a little drawback in our schedule.
- Although we used the approach in our development, some of the plugins did not work for the web interface because Cordova only supports mobile interfaces.

Interfaces that made use of Cordova plugins are not available in the web application.

- The IOS version of the application could not be tested because we did not have a MacBook available. However, we performed a test with ionic lab to make sure everything was displayed perfectly in the user interface.

5.4 Recommendations and future work

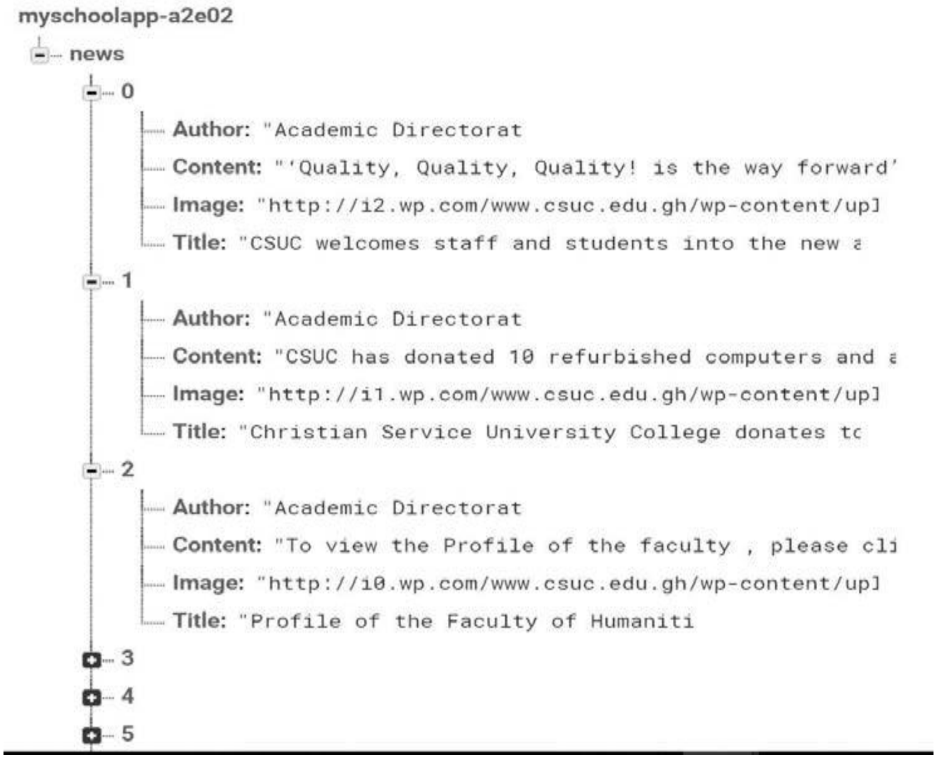
The main focus of this work has been focusing on helping students navigate their study with ease. The most pressing issue was to make study resources and information available to students.

This project has the potential to not only make courses readily available also move the entire curriculum online and enable the students to take their entire degree from the comfort of their rooms.

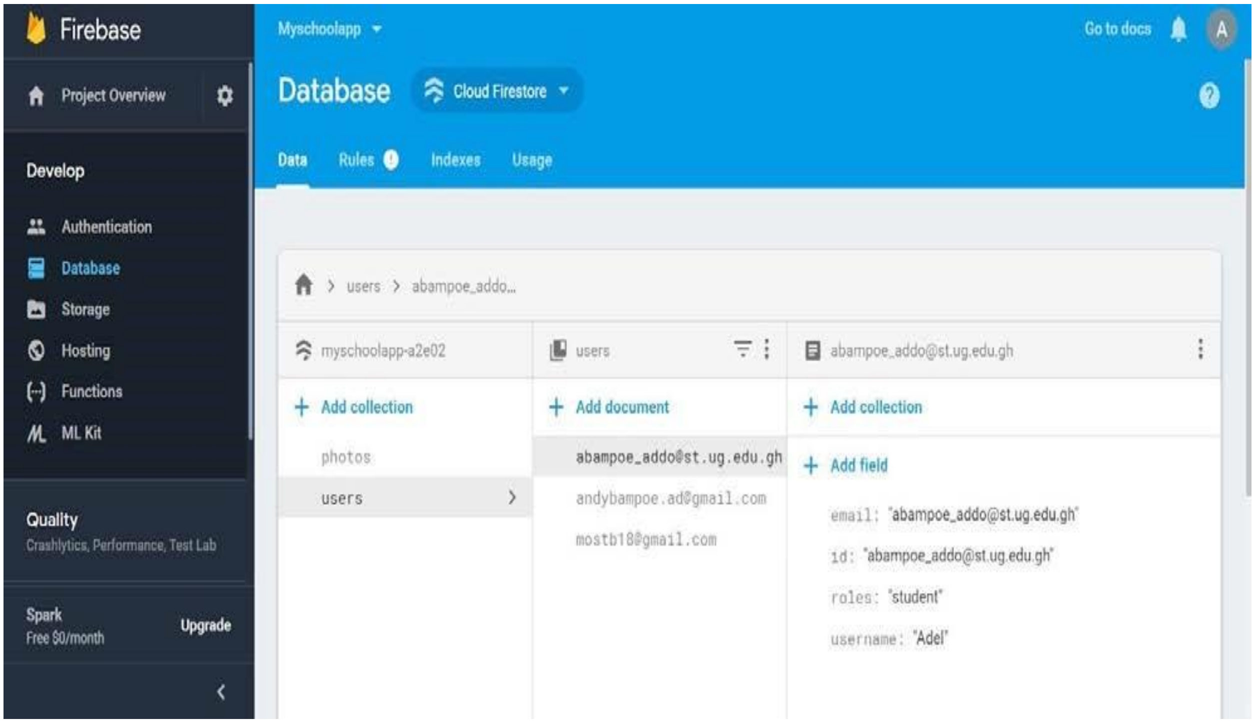
In the future students will be allowed to register and take courses online and have their records readily available inside the app. Students will also have their queries answered in real time with the use of a chat pool, where Chatbot cannot answer students the chat pool will address the issue with stand by personal.

APPENDICES I

Firebase Database Setup



```
myschoolapp-a2e02
⊟-- news
    ⊟-- 0
        |-- Author: "Academic Directorat
        |-- Content: "‘Quality, Quality, Quality! is the way forward’
        |-- Image: "http://i2.wp.com/www.csuc.edu.gh/wp-content/upl
        └-- Title: "CSUC welcomes staff and students into the new a
    ⊟-- 1
        |-- Author: "Academic Directorat
        |-- Content: "CSUC has donated 10 refurbished computers and a
        |-- Image: "http://i1.wp.com/www.csuc.edu.gh/wp-content/upl
        └-- Title: "Christian Service University College donates tc
    ⊟-- 2
        |-- Author: "Academic Directorat
        |-- Content: "To view the Profile of the faculty , please cli
        |-- Image: "http://i0.wp.com/www.csuc.edu.gh/wp-content/upl
        └-- Title: "Profile of the Faculty of Humaniti
    ⊞-- 3
    ⊞-- 4
    ⊞-- 5
```

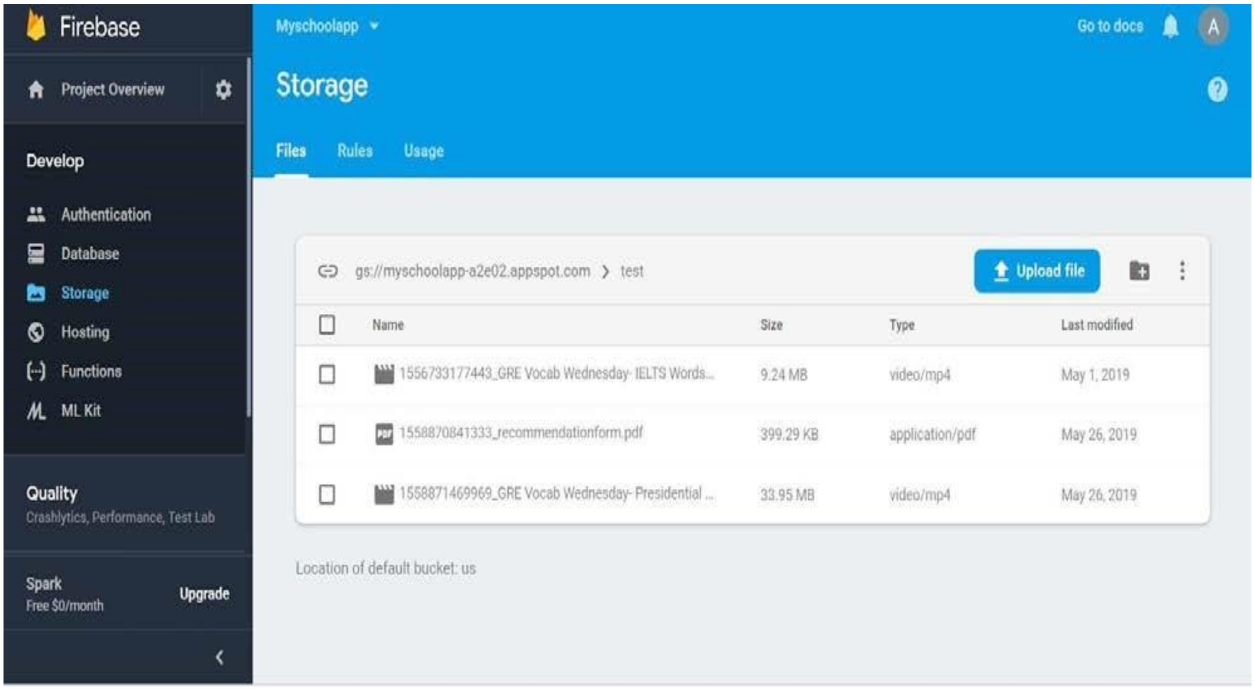


photos
users

abampoe_addo@st.ug.edu.gh
andybampoe.ad@gmail.com
mostb18@gmail.com

email: "abampoe_addo@st.ug.edu.gh"
id: "abampoe_addo@st.ug.edu.gh"
roles: "student"
username: "Adel"

APPENDICES I



gs://myschoolapp-a2e02.appspot.com › test

□	Name	Size	Type	Last modified
□	1556733177443_GRE Vocab Wednesday- IELTS Words...	9.24 MB	video/mp4	May 1, 2019
□	1558870841333_recommendationform.pdf	399.29 KB	application/pdf	May 26, 2019
□	1558871469969_GRE Vocab Wednesday- Presidential ...	33.95 MB	video/mp4	May 26, 2019

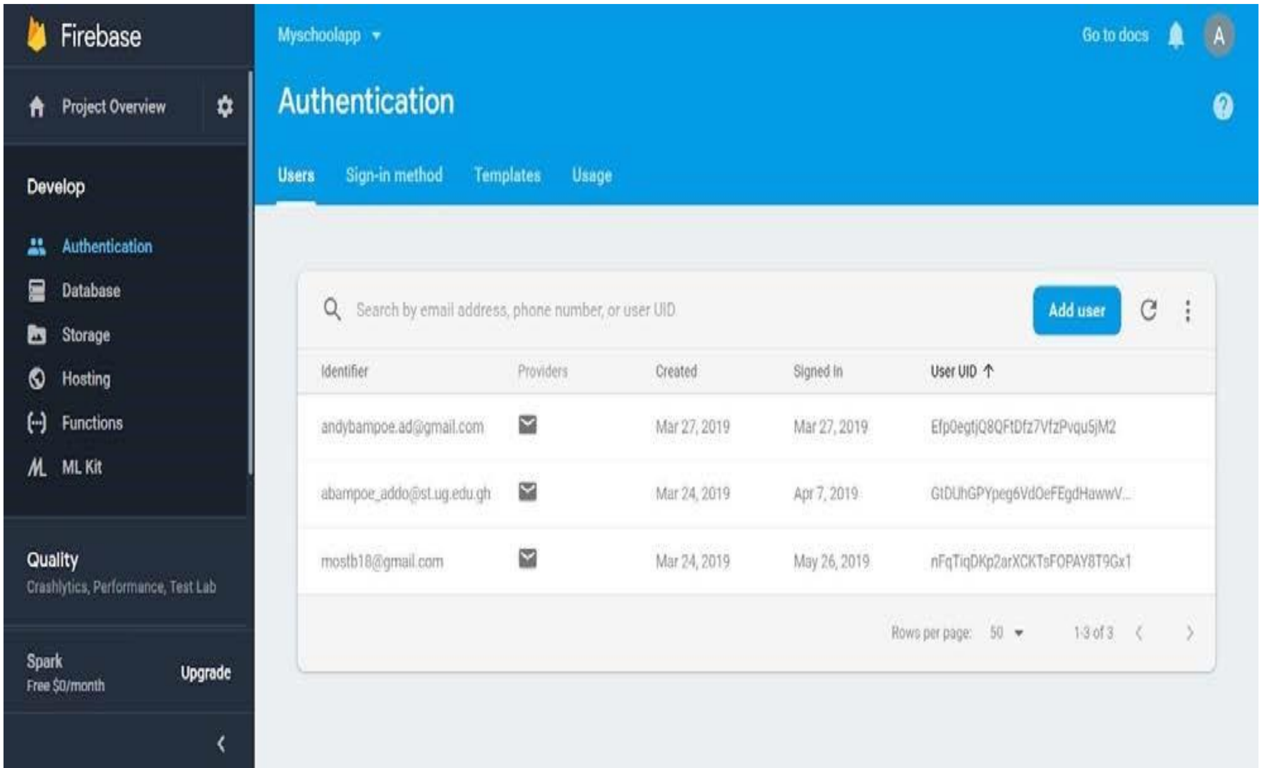
Location of default bucket: us

Firebase Database.

Firebase authentication.

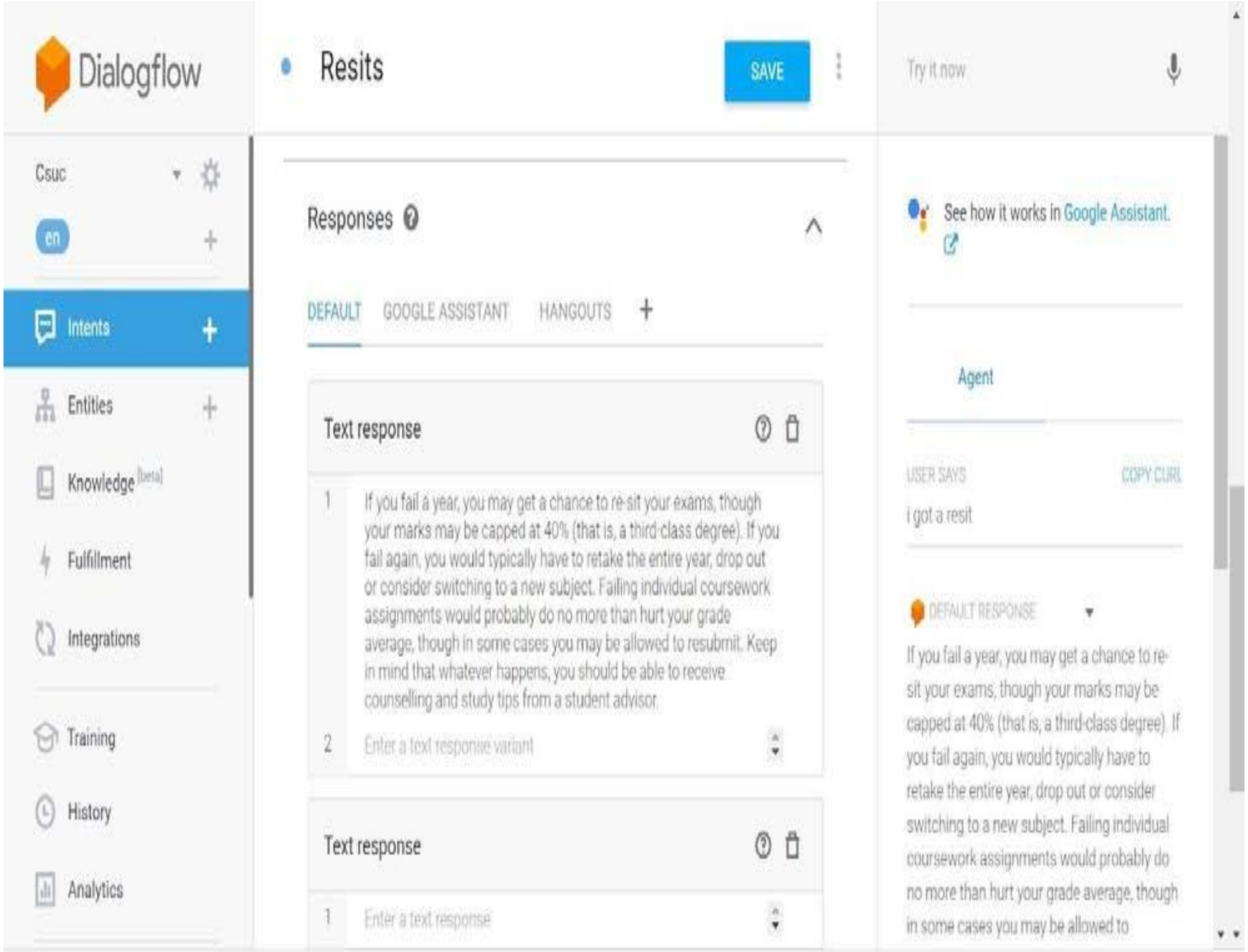
APPENDICES I

Dialog flow Chatbot Training



Identifier	Providers	Created	Signed In	User UID ↑
andybampoe.ad@gmail.com	✉	Mar 27, 2019	Mar 27, 2019	Efp0egtjQ8QFtDfz7VfzPvqu5jM2
abampoe_addo@st.ug.edu.gh	✉	Mar 24, 2019	Apr 7, 2019	GtDUhGPYpeg6Vd0eFEgdHawwV...
mostb18@gmail.com	✉	Mar 24, 2019	May 26, 2019	nFqTiqDKp2arXCKTsFOPAY8T9Gx1

Rows per page: 50 1-3 of 3



Resits

Text response

1 If you fail a year, you may get a chance to re-sit your exams, though your marks may be capped at 40% (that is, a third-class degree). If you fail again, you would typically have to retake the entire year, drop out or consider switching to a new subject. Failing individual coursework assignments would probably do no more than hurt your grade average, though in some cases you may be allowed to resubmit. Keep in mind that whatever happens, you should be able to receive counselling and study tips from a student advisor.

2 Enter a text response variant

Text response

1 Enter a text response

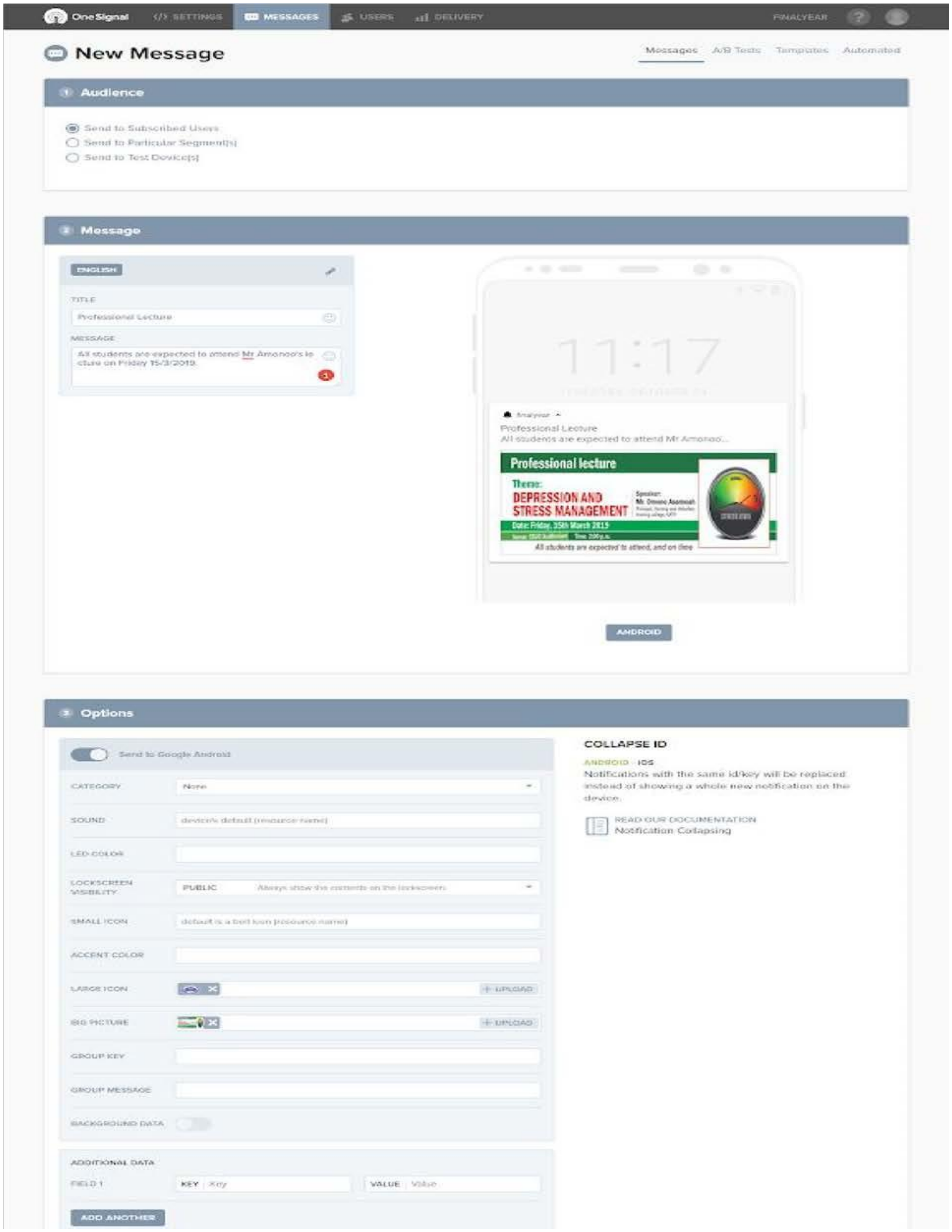
USER SAYS

i got a resit

DEFAULT RESPONSE

If you fail a year, you may get a chance to re-sit your exams, though your marks may be capped at 40% (that is, a third-class degree). If you fail again, you would typically have to retake the entire year, drop out or consider switching to a new subject. Failing individual coursework assignments would probably do no more than hurt your grade average, though in some cases you may be allowed to

APPENDICES I



New Message

1 Audience

● Send to Subscribed Users
○ Send to Particular Segment(s)
○ Send to Test Device(s)

2 Message

TITLE: Professional Lecture

MESSAGE: All students are expected to attend Mr Amonoo's lecture on Friday 15/3/2019.

Finalyear
Professional Lecture
All students are expected to attend Mr Amonoo...

3 Options

Send to Google Android

CATEGORY: None

SOUND: device's default (resource name)

LED COLOR:

LOCKSCREEN VISIBILITY: PUBLIC Always show the contents on the lockscreen

SMALL ICON: default is a bell icon (resource name)

ACCENT COLOR:

LARGE ICON:

BIG PICTURE:

GROUP KEY:

GROUP MESSAGE:

BACKGROUND DATA:

ADDITIONAL DATA

FIELD 1 KEY Key VALUE Value

COLLAPSE ID

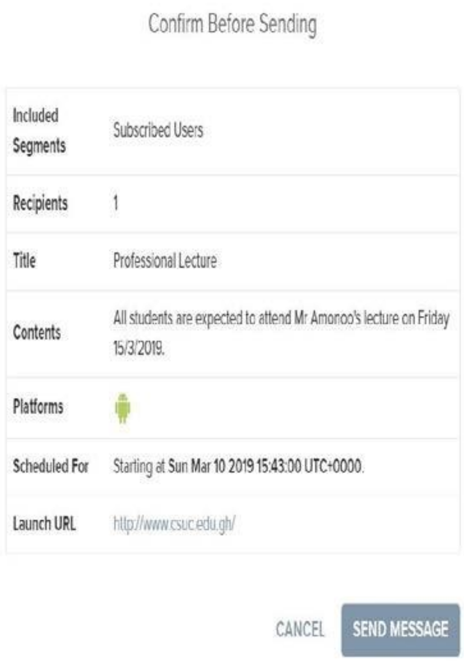
ANDROID IOS

Notifications with the same id/key will be replaced instead of showing a whole new notification on the device.

READ OUR DOCUMENTATION
Notification Collapsing

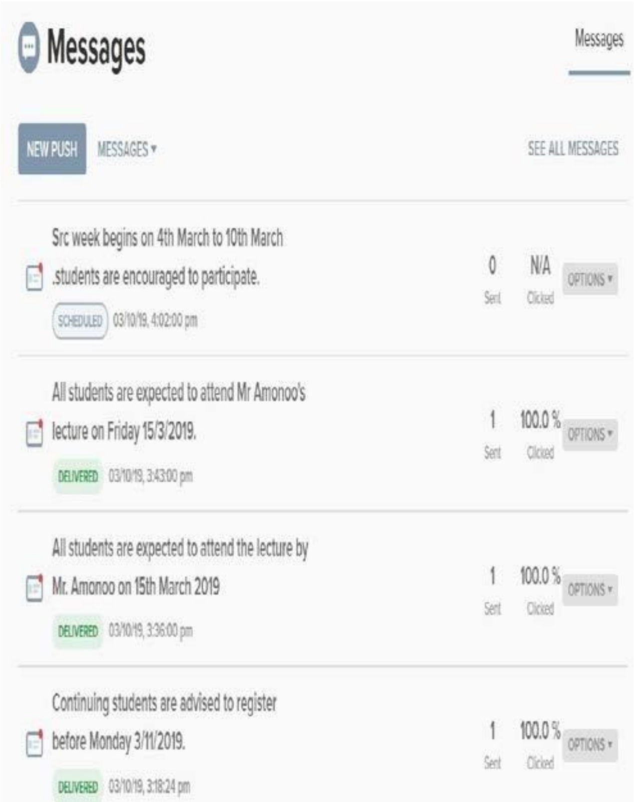
One Signal Notification

One Signal Message



Confirm Before Sending

Included Segments	Subscribed Users
Recipients	1
Title	Professional Lecture
Contents	All students are expected to attend Mr Amonoo's lecture on Friday 15/3/2019.
Platforms	
Scheduled For	Starting at Sun Mar 10 2019 15:43:00 UTC+0000.
Launch URL	http://www.csuc.edu.gh/



Src week begins on 4th March to 10th March .students are encouraged to participate.
SCHEDULED 03/10/19, 4:02:00 pm
0 Sent N/A Clicked OPTIONS ▾

All students are expected to attend Mr Amonoo's lecture on Friday 15/3/2019.
DELIVERED 03/10/19, 3:43:00 pm
1 Sent 100.0 % Clicked OPTIONS ▾

All students are expected to attend the lecture by Mr. Amonoo on 15th March 2019
DELIVERED 03/10/19, 3:36:00 pm
1 Sent 100.0 % Clicked OPTIONS ▾

Continuing students are advised to register before Monday 3/11/2019.
DELIVERED 03/10/19, 3:18:24 pm
1 Sent 100.0 % Clicked OPTIONS ▾

Page_______________________________________

APPENDICES II

Login page html code

```
<ion-header>
  <ion-toolbar color="gold">
    <ion-buttons slot="start">
      <ion-menu-button></ion-menu-button>
    </ion-buttons>
    <ion-title color="light">
   LOGIN
    </ion-title>
  </ion-toolbar>
</ion-header>
<ion-content padding>
  <ion-row class="login-logo">
    <ion-col>  <img src="assets/imgs/csuc_logo1.png" /></ion-col>
  </ion-row>
  <ion-row class="login-form">
    <ion-col>
      <ion-list inset>
         <ion-item>
          <ion-label><ion-icon name="mail"></ion-icon></ion-label>
          <ion-input color="light" [(ngModel)]="email"></ion-input>
        </ion-item>
        <ion-item>
          <ion-label><ion-icon name="lock"></ion-icon></ion-label>
          <ion-input color="light" type="password" [(ngModel)]="password"></ion-input>
        </ion-item>
      </ion-list>
        <ion-button  color="warning" routerLink="/register"
         primary class="login-button">Register :)</ion-button>
        </ion-col>
     <ion-row>
     <ion-col>
      <ion-button color="secondary" (click)="signin(email, password)"
       primary class="login-button">Login :)</ion-button>
    </ion-col>
  </ion-row>
    </ion-col>
  </ion-row>
</ion-content>
```

Login page module code

```
import { NgModule } from '@angular/core';
import { CommonModule } from '@angular/common';
import { FormsModule } from '@angular/forms';
import { Routes, RouterModule } from '@angular/router';

import { IonicModule } from '@ionic/angular';

import { LoginPage } from './login.page';

const routes: Routes = [
  {
    path: '',
    component: LoginPage
  }
];
@NgModule({
  imports: [
    CommonModule,
    FormsModule,
    IonicModule,
    RouterModule.forChild(routes)
  ],
  declarations: [LoginPage]
})
export class LoginPageModule {}
```

Login page Css code

```
$white: #FFFFFF;
$grey: #9e9e9e;
$preload-image-bg: rgba(darken($white, 10), .25);
$spinner-size: 28px;
$spinner-color: $grey;
     :host {
     //
        ion-slides {
            height:200px;
           }
           ion-slide img {
             height: 0px !important;
             width: 500px   !important        ;
           }
           ion-button  {
          //  height: 0px !important;
            width: 100%   !important        ;
          }
        ion-content {
        //  background: var(--ion-color-primary);
         // background-image: url("/assets/imgs/index.jpg");
          display: flex;
          flex-direction: column;
         /// --ion-background-color:rgb(47, 133, 233);
         --background:  url('/assets/imgs/image4.jpg' )  blue;
        }
        ion-toolbar {
          background-color: var(--ion-color-secondary);
          --background:   var(--ion-color-secondary);
          }
        ion-row {
          align-items: center;
          text-align: center;
         // background-color: var(--ion-color-primary);
        }
        ion-item {
            border-radius: 30px !important;
            padding-left: 10px !important;
            margin-bottom: 10px;
           //background-color: var(--ion-color-secondary);
         // --background: url('/assets/images/index.jpg') ;
            opacity: 5;
            font-size: 0.9em;
        }
        ion-item {
          //  margin: 2;
         //  background-color: var(--ion-color-secondary);
        }
        ion-input {
        //  margin: 2;
         background-color: var(--ion-color-secondary);
      }
        ion-list {
            margin: 2;
          // background-color: var(--ion-color-secondary);
        }
        .login-logo {
          flex: 2;
         // background-color: var(--ion-color-gold);
        }
          .login-form {
            flex: 1;
           // background-color: var(--ion-color-gold);
        }
          .create-account {
          //background-color: var(--ion-color-primary);
          text-decoration: underline;
          background:none ;
        }
    }
```

Login page code

```
import { Component, OnInit } from '@angular/core';
import { Router } from '@angular/router';
import { AngularFireAuth } from 'angularfire2/auth';
import { AlertController } from "@ionic/angular";
import { prepareSyntheticListenerFunctionName } from '@angular/compiler/src/render3/util';
@Component({
 selector: 'app-login',
 templateUrl: './login.page.html',
 styleUrls: ['./login.page.scss'],
})
export class LoginPage implements OnInit {
 async presentAlert(error) {
  const alert = await this.alertCtrl.create({
   header: 'Alert',
   subHeader: 'Login Error!',
   message: error,
   buttons: [
    {
     text: 'Try Again',
    // role: 'ok',
     handler: () => {
      this.router.navigate(['/login']);
     }
    },
    {
     text: 'Register',
     handler: () => {
      this.router.navigate(['/register']);
     }
    }
   ]
  });
   alert.present();
 }
 constructor(private router: Router,public alertCtrl: AlertController,
 public angularFireAuth: AngularFireAuth) { }
 ngOnInit() {
 }
  signin(username, password) {
  this.angularFireAuth.auth.signInWithEmailAndPassword(username, password)
   .then((user) => {
    if(user) {
     // Redirect the user here
    // this.router.navigateByUrl('/menu/chat');
     this.router.navigate(['/menu/chat']);
    }
   })
   .catch((error) => {
      var errorCode = error.code;
    var errorMessage = error.message;
    this.presentAlert(errorMessage);
   });
  }
login(username, password) {
 this.angularFireAuth.auth.signInWithEmailAndPassword(username, password)
  .then((user) => {
   if(user) {
    // Redirect the user here
    this.router.navigate(['/menu/online']);
   }
  }).catch()
  {
    this.presentAlert("User does not exist");
   //this.router.navigate(['/register']);
  };
 }
}
```

Menu Page Module Code

```
import { NgModule } from '@angular/core';
import { CommonModule } from '@angular/common';
import { FormsModule } from '@angular/forms';
import { Routes, RouterModule } from '@angular/router';

import { IonicModule } from '@ionic/angular';

import { AdminGuard } from '../../guards/admin.guard';
import { MenuPage } from './menu.page';

const routes: Routes = [
  {
    path: '',
    component: MenuPage,
    children: [
      { path: 'online', loadChildren: '../online/online.module#OnlinePageModule' },
      { path: 'withtabs', loadChildren:
'../withtabs/withtabs.module#WithtabsPageModule',canActivate: [AdminGuard]},

      { path: 'chat', loadChildren: '../chat/chat.module#ChatPageModule'  },
      { path: 'mediadetails', loadChildren:
'../mediadetails/mediadetails.module#MediadetailsPageModule' },
      { path: 'getmedia', loadChildren: '../getmedia/getmedia.module#GetmediaPageModule' },
      { path: 'notify', loadChildren: '../notify/notify.module#NotifyPageModule' },
      //{ path: 'mediadetails/getmedia/:id', loadChildren:
'../getmedia/getmedia.module#GetmediaPageModule' },
    // {path: 'getmedia/:id', loadChildren: '../detail/detail.module#DetailPageModule'}



  ]
  }
];

@NgModule({
  imports: [
    CommonModule,
    FormsModule,
    IonicModule,
    RouterModule.forChild(routes)
  ],
  declarations: [MenuPage]
})
export class MenuPageModule {}
```

Menu Page Html Code

```
<ion-split-pane >
 <ion-menu contentId="content" >

  <ion-header>
   <ion-toolbar color="secondary">
    <ion-title>Menu</ion-title>
   </ion-toolbar>
  </ion-header>

  <ion-content color="secondary">
   <ion-list>
    <ion-menu-toggle auto-hide="false" *ngFor="let p of pages">
     <ion-item [routerLink]="p.url" routerDirection="root" [class.active-
item]="selectedPath.startsWith(p.url)">
      <ion-label color="secondary">
       {{ p.title }}
      </ion-label>
     </ion-item>
    </ion-menu-toggle>

    <ion-item tappable routerLink="/login" routerDirection="root">
     <ion-icon name="log-out" slot="start"></ion-icon>
     <ion-label color="secondary">
     Logout
    </ion-label>
    </ion-item>

   </ion-list>

  </ion-content>

 </ion-menu>

 <ion-router-outlet id="content" main></ion-router-outlet>

</ion-split-pane>
```

News Page module Code

```
import { NgModule } from '@angular/core';
import { CommonModule } from '@angular/common';
import { FormsModule } from '@angular/forms';
import { Routes, RouterModule } from '@angular/router';

import { IonicModule } from '@ionic/angular';

import { NewsPage } from './news.page';

const routes: Routes = [
  {
    path: '',
    component: NewsPage
  }
];

@NgModule({
  imports: [
    CommonModule,
    FormsModule,
    IonicModule,
    RouterModule.forChild(routes)
  ],
  declarations: [NewsPage]
})
export class NewsPageModule {}
```

News Page html Code

```
<ion-header>
  <ion-toolbar color="primary">
    <ion-buttons slot="start">
      <ion-menu-button></ion-menu-button>
    </ion-buttons>
    <ion-title color="light">Admin Page</ion-title>
  </ion-toolbar>
</ion-header>

<ion-content padding>
  My first tab content
</ion-content>
```

REFERENCES

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3. "Ionic (mobile app framework)", En.wikipedia.org, 2018. [Online]. Available: https://en.wikipedia.org/wiki/Ionic_(mobile_app_framework). [Accessed 22 April 2019].

4. Lin.J, 2011a "Universal School Online Registration Management System Research and Design", Energy Procedia, vol. 13, pp. 9190-9197, Available: 10.1016/j.egypro.2011.12.714.

5. Ofori Ansa.H, Boateng.V, Owusu Mensah, Gborgla.J, Bemile R. K and Gyebi Twum.E, 2019a "Online Registration System (A Case of Methodist University College Ghana)", IJRIT International Journal of Research in Information Technology, [Accessed 22 April 2019].

6. Sarker.A, 2016a "Online School Management System". [Accessed 7 April 2019