Information Guide for BulSU Bustos Students: A Mobile Application

A Capstone Project

Presented to

The Faculty of the College of Information and Computing Sciences

Bulacan State University, Bustos Campus

In Partial Fulfillment of the requirements for the degree of

Bachelor of Science in Information Technology with specialization in Service Management

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Chapter 1
THE PROBLEM AND ITS BACKGROUND

Introduction

The Information Guide for BulSU Bustos Students is a mobile application that functions as a student handbook, covering a wide range of topics pertaining to Bulacan State University. It is a comprehensive resource for students, including important information regarding university policies, academic norms, the national anthem, vision, and mission.

Users of this application will have access to new content such as a detailed map of the Bulacan State University – Bustos Campus, the latest version of the Philippine oath, and additional features that may be added during the development phase. The goal is to ensure that the information guide is not only thorough but also user-friendly and beneficial for all students.

To guarantee that the Information Guide for BulSU Bustos Students is comprehensive, intuitive, and advantageous for its users, several critical steps must be taken during its development and continuous improvement. These steps include gathering feedback from students and faculty, ensuring the accuracy of the information provided, and regularly updating the content to reflect the latest university policies and academic standards.

In conclusion, the Information Guide for BulSU Bustos Students is more than simply a information guide; it is a dynamic and ever-changing instrument meant to help and improve Bulacan State University students' academic experiences. By offering a comprehensive and user-friendly resource, the application hopes to provide students with the understanding and data they need to excel in their academics and university life.

Ultimately, this app aims to make navigating university life easier and more efficient,

helping students stay informed and succeed in their academic pursuits. By incorporating a user-friendly interface and regularly updating its content, the Information Guide for BulSU Bustos Students ensures that students always have access to the latest information and resources they need.

Background of the Study

In our modern educational environment, the demand for quick and reliable access to information is paramount for students to navigate their academic and campus lives efficiently. The Information Guide for BulSU Bustos Students mobile application was developed to meet this need by functioning as a comprehensive digital student handbook for Bulacan State University – Bustos Campus.

Traditional information guides, often distributed in print at the start of the academic year, face significant limitations. They can become outdated quickly and may not be readily accessible when students need them most. A mobile application addresses these issues by providing a dynamic and easily accessible resource that can be updated regularly, ensuring students always have the most current information at their fingertips.

The development of this mobile application involves meticulous planning and implementation of several critical steps to ensure it is comprehensive, user friendly and beneficial for all users. The existing application will be designed to provide detailed and up-to-date information on a variety of subjects related to the university.

The findings of this study will contribute to the growing body of knowledge on the use of information guide in higher education and provide valuable insights for university administrators, students, and other stakeholders. By understanding the specific needs and preferences of BulSU Bustos students, we can work towards developing an updated and user-

friendly student handbook that effectively supports their academic and personal development.

By understanding the specific needs and preferences of BulSU Bustos students, we can work towards developing an updated and user-friendly information guide application that effectively supports their academic and personal development.

Objective of the Study

The objective for the information guide mobile application is to enhance and implement new contents.

Some key components for the enhancing of the student handbook mobile application includes:

1. To implement a mapping system for Bulacan State University – Bustos Campus.
2.To include a domain for the mobile application effectively serves the specific needs of BulSU Bustos.
3. To design the application to be user-friendly, accessible to all users, and compatible with various mobile devices.
4. To enhance and implement new information to an already existing mobile application, we will ensure that all the information within the application is up-to-date and relevant to current times.
5. To enhance the entirety of mobile application design.
6. To evaluate the developed system using the ISO 25010 in terms of:

a. Functionality;
b. Portability;
c. Usability;
d. Reliability;
e. Performance;
f. Maintainability;

Theoretical Framework

Technology Acceptance Model (TAM): According to William R. King (2006). A statistical meta-analysis of the technology acceptance model (TAM) as applied in various fields was conducted using 88 published studies that provided sufficient data to be credible. The results show TAM to be a valid and robust model that has been widely used, but which potentially has wider applicability. A moderator analysis involving user types and usage types was performed to investigate conditions under which TAM may have different effects. The study confirmed the value of using students as surrogates for professionals in some TAM studies, and perhaps more generally. It also revealed the power of meta-analysis as a rigorous alternative to qualitative and narrative literature review methods.

Conceptual Framework

With the IPO (Input, Process, Output) model, we can clearly understand how the information guide mobile application aims to enhance the student experience by offering a reliable, user-friendly platform that meets their informational needs.

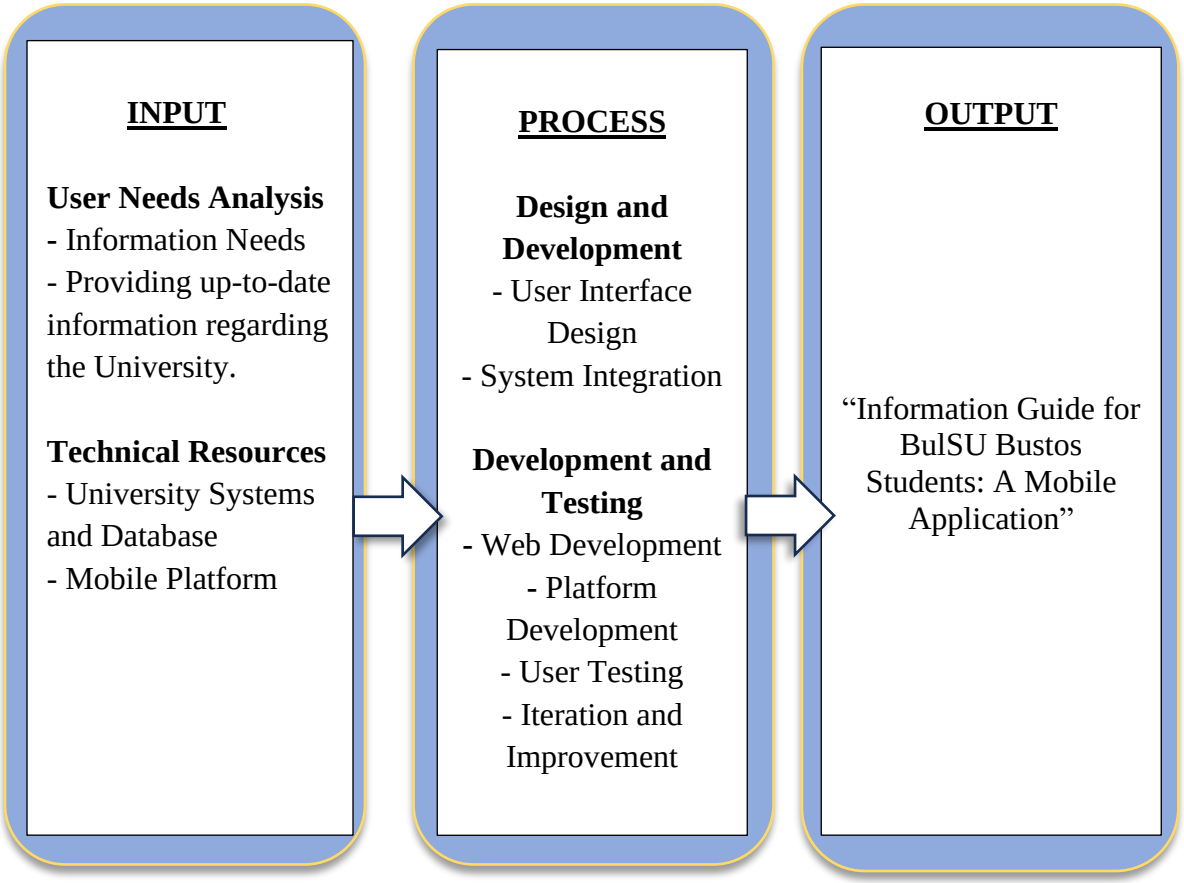

Figure 1. Conceptual Framework of the Study

Figure 1. Illustrates the conceptual framework of the study. The model is used as a research paradigm in the IPO model.

The study's input phase understands what kind of information the student needs and providing relevant and current information. Technical Resources leverages existing university system and databases to integrate with the mobile application all while deciding on

the mobile platform (Android and iOS) for app development. The process phase should create an intuitive and user-friendly interface of the mobile app ensuring the app integrates seamlessly with the university systems and databases. Web development is present in Figure 1, demonstrating how the admins can update the information guide mobile application with relevant topics regarding the University. By applying all of these phases, students should be able to access up-to-date, essential information effortlessly through a user-friendly mobile application, enhancing their overall university experience and ensuring they have the resources they need at their fingertips.

Chapter 2

REVIEW OF RELATED LITERATURE AND STUDIES

A number of published and unpublished theses were also examined and reviewed which helped provide directions in preparing the basic framework of the research.

Review of Related Literature

According to Li, Weiguang (2021). With the vigorous promotion of the construction of smart campus by the ministry of education, the development concept of smart campus will have broad application prospects. However, colleges and universities are still at the stage of digital campus and there are many problems left. It is difficult to complete the transition from digital campus to smart campus. The main problem is that the campus data has only been digitized but not informational. The purpose of this article is to study a smart campus management system based on the Internet of Things technology. This research uses the unified data collection source of face recognition terminal hardware products based on the Internet of Things technology, unified management in the background of the system, and calculates and analyzes the data to obtain valuable campus big data. This study designed and implemented a complete smart campus management system by analyzing the system design principles and design goals. This system is mainly divided into the face recognition terminal hardware and smart campus software system based on the Internet of Things. By analyzing the data generated by students and faculty and staff, it can provide a reference for campus managers to improve management quality, and help teachers and students to formulate more

efficient learning and teaching and research plans. This article tests the practicability of the system and obtains the user's satisfaction as 8.0.

According to Elsevier B.V. (2020). The availability of an online campus information system enables the students to get a better layout of education planning. It helps the university regarding well managed and strategic information management. In this paper, we describe and contextualize the model for an online campus information system for undergraduate students as well as university faculty. Information gathered employing structured interviews from a recognized University. The collected data enables us to prepare an android application for the campus information system, aims to help students as well as faculty in the best possible way.

Review of Related Studies

According to the related studies of ALFarsi, G., Jabbar, J., M Tawafak, R., Iqbal, S., Alsidiri, A., Alsinani, M. & bte Sulaiman, H. (2020). Smartphones and applications are one of the most used things in learning and management systems. They make everyone connected with society, and those who feel sorry for it, especially college students are always looking for things that benefit them at a university. In this research, there is a need to apply a new application for student education service with an easy way of managing data and generate progression on reports feedback in his or her university life. We conducted a survey with the students of Al Buraimi University College and we reached a positive result that helps in the

work. Smartphones have become pervasive and sales of all categories have many functions, in search (application of mobile-based devices in education design) to talk about applications in smart devices that serve education and take their information for management purpose and ease of use and follow them in any way.

According to related studies of Qi Wu (2021). With the popularization of mobile intelligent terminals, the demand for mobile applications of university users is more and more vigorous. The construction of campus mobile applications has become a major trend of smart campus construction in universities. In the future, the core of mobile application construction in universities should build an open ecological system with multi participation based on role-oriented service. Based on the analysis of the current situation of mobile application pain points in smart campus of universities, following the design principles of "openness, cooperation and integration", this paper constructs a reference open mobile application ecosystem architecture in universities. At the same time, it analyzes the construction of open mobile application ecosystem from three dimensions of mobile application standard, business and technology, so as to help researchers to be more flexible comprehensively and objectively analyze and solve the problems in the field of mobile application construction in universities.

According to Xiu Chen (2020). Smart education is a new direction of educational informatization, it's also a new requirement of China's educational reform and development as well as educational modernization. The development of smart education needs to build

smart campus. And the construction of smart campus needs to establish progressive construction ideas, and use advanced technology to practice and explore. On the basis of expounding the development background and connotation of the smart campus, the article takes Sichuan University as an example to systematically introduce the ideas and specific exploration and practice of its smart campus construction. That is to say, taking "building a smart campus ecosystem" as the construction concept, taking smart perception, smart integration, smart analysis and smart service as the construction path. The experience of smart campus construction in Sichuan University has a good reference significance for the construction of smart campus in Chinese universities.

Chapter III
METHODOLOGY

Research Method

The Software Development Life Cycle (SDLC) is a comprehensive framework designed to reduce the costs associated with software development while simultaneously enhancing quality and expediting production. By following a structured approach that mitigates common risks in software development projects, SDLC achieves these seemingly contradictory goals (Alexandra, 2020).

This study applied the SDLC in implementing the Information Guide for BulSU Bustos Students mobile application. The process involves several key phases: Requirements Analysis, Planning, Software Design, Software Development, Testing, and Deployment. These phases collectively enhance the mobile application, ensuring it provides up-to-date information that benefits all users at the Bulacan State University – Bustos Campus.

We employed the Agile methodology to guide the development process for the Information Guide for BulSU Bustos Students mobile application. Agile is particularly useful for verifying the accuracy of each process step and identifying areas of the existing project that need testing when issues arise.

The Agile Model is considered the most effective methodology for developing and documenting mobile applications. This approach utilizes a collection of values and principles that provide flexibility over traditional methods, making it ideal for a fast-changing environment. The Agile methodology increases the likelihood of producing a high-quality application by incorporating frequent testing throughout the production process. This continuous testing allows for the prompt identification and resolution of issues as they arise. Additionally, the creation of regular test builds and reviews further enhances the quality of the application through iterative improvement.

Moreover, Agile's iterative nature means that feedback is continuously integrated into the development cycle. This allows developers to make adjustments based on user feedback and changing requirements, ensuring the final product meets the needs of its users. Agile also promotes collaboration among cross-functional teams, leading to more innovative solutions and a cohesive development process.

Research Respondents

Chittaranjan Andrade (2020) Most research is conducted on convenience and purposive samples that may be randomly or nonrandomly drawn. A convenience sample is the one that is drawn from a source that is conveniently accessible to the researcher. A purposive sample is the one whose characteristics are defined for a purpose that is relevant to the study. The findings of a study based on convenience and purposive sampling can only be generalized to the (sub)population from which the sample is drawn and not to the entire

population. This article explains the concepts involved with the help of examples of both good and bad sampling practice. Database studies and studies with enriched designs are cited as special examples of convenience and purposive sampling. Issues related to the internal and external validity of convenience and purposive samples are explained. The importance of good sampling techniques in the design and interpretation of research is understated; this must change. This study used purposive sampling in choosing who will be the respondents that is needed to the proposed project. With this, the study will determine on how users engage themselves in the mobile application for the Information Guide for BulSU Bustos Students: A Mobile Application. The specific participants for this study are 3 IT Experts, 10 BulSU Students and Admins. The researcher decided to choose these respondents as it will benefit every respondent in Bulacan State University – Bustos Campus.

Research Instrument

Survey Questionnaire: To acquire important information, such as the opinions and thoughts about the information guide, the researchers created a survey on how well the mobile application handles to their mobile devices such as performance, usability, compatibility, functionality. The survey also includes their thoughts about how well-informed, up-to-date and how it benefits the students during their university life.

Research: The researchers collected data regarding the planned study to enable the system to work. The information that has been acquired will be useful for the development system. It also serves as a guide for gathering relevant studies.

The ISO/IEC 25010 system standard provides a framework for defining and measuring the performance of software products in terms of various quality characteristics, including functionality, performance efficiency, compatibility, usability, reliability, and security. Similarly, when employing questionnaire and Likert scale questionnaires as research instruments, adherence to ISO guidelines is crucial to ensure the quality, validity, and ethical conduct of the data collection process. By following ISO guidelines, researchers can systematically assess, measure, and improve the quality of their data collection methods, contributing to the overall rigor of the research study. This alignment with ISO standards emphasizes the reliability and integrity of the research process, similar to how ISO/IEC 25010 ensures the quality of software products.

- Questionnaire – Through the use of a questionnaire, students will be able to test the mobile application themselves and gather their thoughts about the study. Researchers may learn more about problems of the students entering the campus and the effects of technology advancements by asking focused questions and gathering data.

- Likert scale – Participants for this study can gather their thoughts regarding the information guide's usability. Researchers may measure participants' views and opinions by

gathering a variety of replies, which gives them important information about the system's strengths and weaknesses.

Requirements Analysis

The Information Guide for BulSU Bustos Students: A Mobile Application requirement analysis involves identifying the needs and expectations of the users, defining the functional and non-functional requirements, and considering the technical and operational constraints. The scope of this study includes the development of the mobile application for Android and iOS platforms that will offer so much features. We will work closely with the university admin at Bulacan State University – Bustos Campus as they will be one of the beneficiaries of the mobile application.

Functional requirements aim is to define the requirements for a mobile application that will serve as an information guide for BulSU Bustos students. The application aims to provide students with easy access to important information, resources, and services related to their academic and campus life.

Non-functional requirements highlight the most critical parts of developing an information guide mobile application is to test the performance capability of the mobile application scalability and responsiveness wise, user-friendliness design, support for accessibility features to accommodate all users. Validation involves gathering feedback through iterative loops with stakeholders to confirm the system's relevance, accuracy, and effectiveness in meeting user expectations.

Requirement Documentation

The "Information Guide for BulSU Bustos Students: A Mobile Application" has been designed to be informative and useful for students to learn and be guided on how things work in Bulacan State University – Bustos Campus. To achieve this goal, we need to establish a comprehensive set of requirements that will direct the development of the application and ensure its effectivity, usefulness and fulfills the needs of the users.

- **User Requirements**

Users will be able to download the Information Guide for BulSU Bustos Students: A Mobile Application b opening Google Play Store for Androids and App Sore for iOS. Since it's a mobile application, students do not need any form of login forms through the use of their BulSU email accounts. However, the admins of Bulacan State University – Bustos Campus will be provided their accounts in order for them to update the mobile application, two admins – Super Admin and Department Admins –

will be provided their accounts by logging in to the website that will be developed alongside the mobile application.

● **Performance Requirements**

The information guide downloaded to the user's phones will have up-to-date information and should perform well and crashes will be prevented.

● **User Requirements**

The information guide mobile application prioritizes user-friendliness and ease of navigation without confusion and prioritizes student's satisfaction.

● **Technical Requirements**

Software:

- Web Browser (Google Chrome, Brave, Firefox, Microsoft Edge, etc.) latest version is recommended.

- Programming languages for website development is HTML, PHP, and JavaScript.

- For super admin and department admin accounts, there should be a database where

their user data is stored in a database management system. SQL Server will be used.

- For mobile application development, we will decide which platform we will develop the mobile application.

Hardware:

- Phones (Android and iOS) to download and test the capabilities of the information guide mobile application.

- Desktop Computer / Laptop capable of running modern browsers and for admin purposes.

Design of Software, System and Processes

3.1 Software Development Model

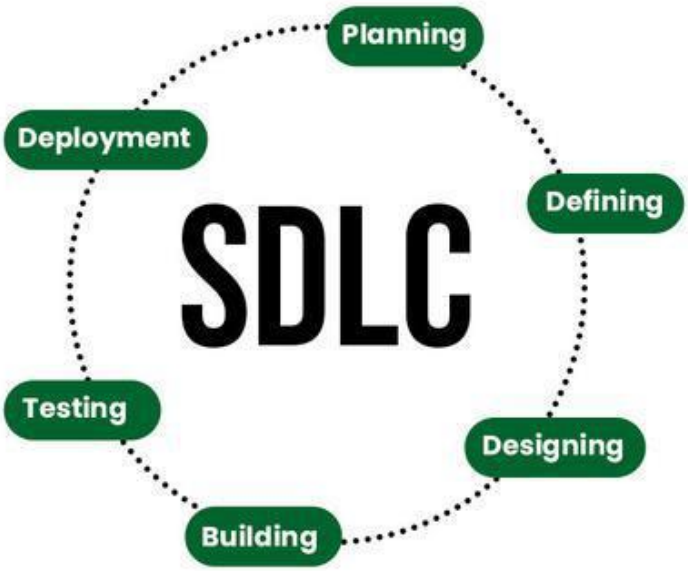

Figure 3.1 Software Development Life Cycle (Agile Model)

The development process of the "Information Guide for BulSU Bustos Students: A Mobile Application" for students begins with inception and meticulous planning. For "Information Guide for BulSU Bustos Students: A Mobile Application "system for students begins with inception and planning. To adapt the traditional Software Development Life Cycle (SDLC) for Agile methodology, this phase involves understanding Security needs through research findings, defining core functionalities, and creating user stories. A skilled development team is assembled for the project. Agile methodology's flexibility, adaptability, and user-centric

approach make it a good fit for BulSU Bustos Campus information guide mobile application development. Maintaining the performance of the mobile application to the user's mobile devices is crucial throughout the development process, ensuring seamless functionality and user experience. This iterative approach ensures that the application evolves based on user feedback and testing results, leading to a more refined and functional product.

3.2 Proposed Prototype/Model

Prototype serves as the backbone of the development phase of Information Guide for BulSU Bustos Students: A Mobile Application. This serves as the overview of the list of requirements that need to meet the good flow of system development.

Front Page – This page contains the front page of the information guide. It contains the achievements of our BulSU faculties in a carousel or slideshow format, it also includes two buttons in each side, the one on the left is a button for the navigation bar and to the right is to the next page.

Figure 1. Front page of the Information Guide for Bulsu Bustos Students: A Mobile Application

Navbar – The page is a navbar where it shows the notification bell, about, email and a link to the official Bulacan State University page.

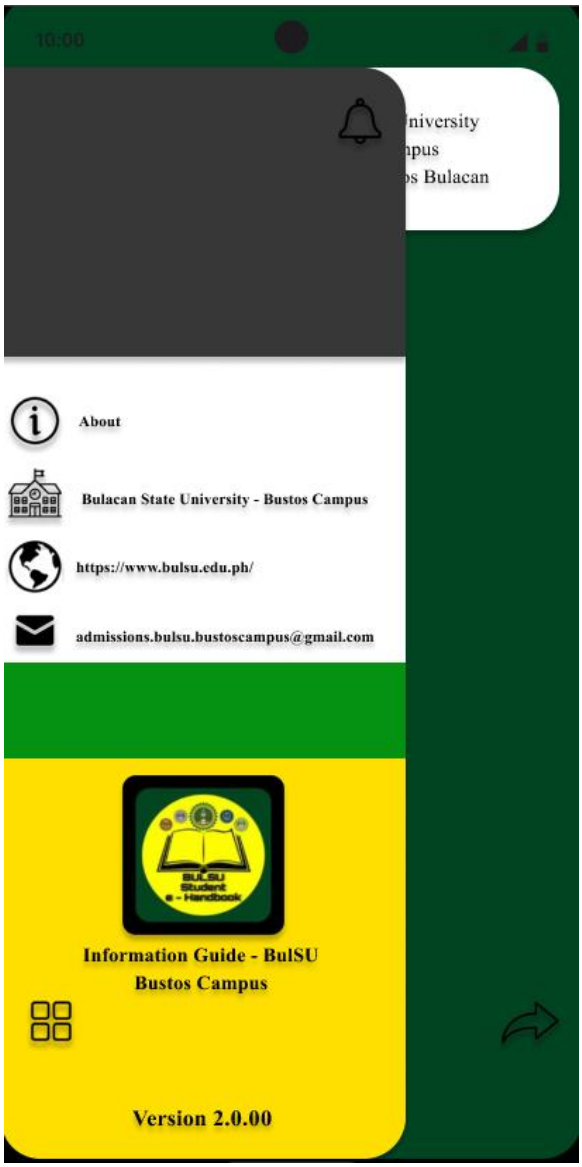

Figure 2. Navbar of Information Guide for BulSU Bustos Students: A Mobile Application.

Selection Screen – In this page, it shows that there are three buttons – Student Handbook, Procedures, and Downloadable Forms.

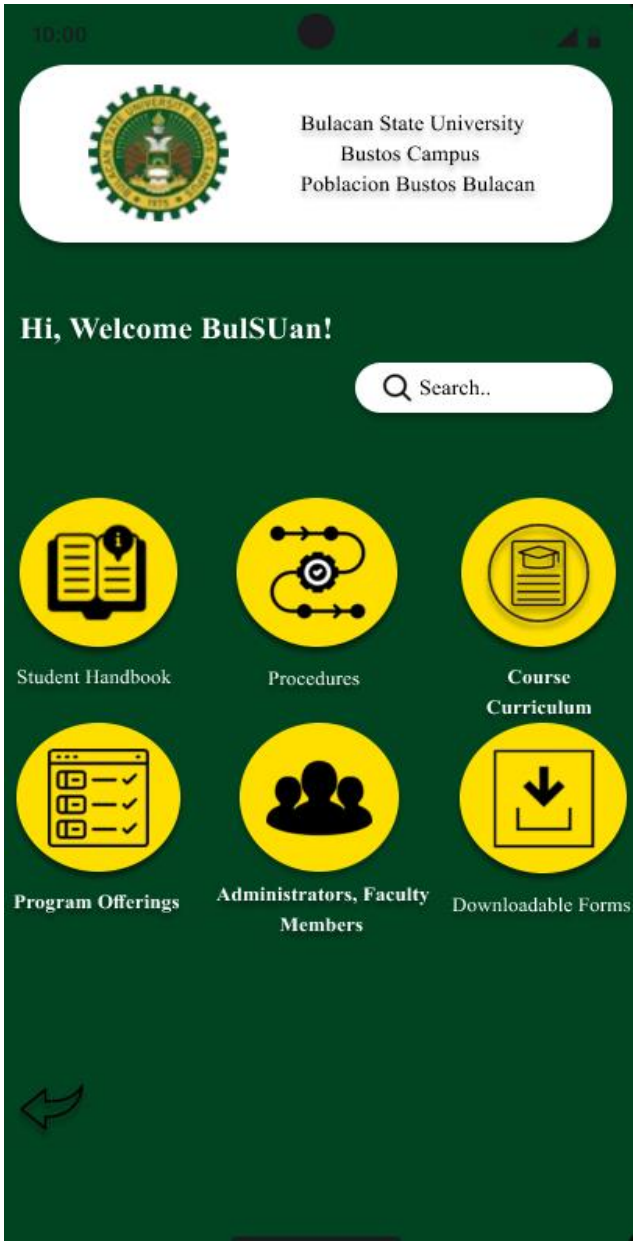

Figure 3. Selection Screen of Information Guide for BulSU Bustos Students: A Mobile Application

Student Handbook – This page features multiple selections the users can choose and learn from the information guide.

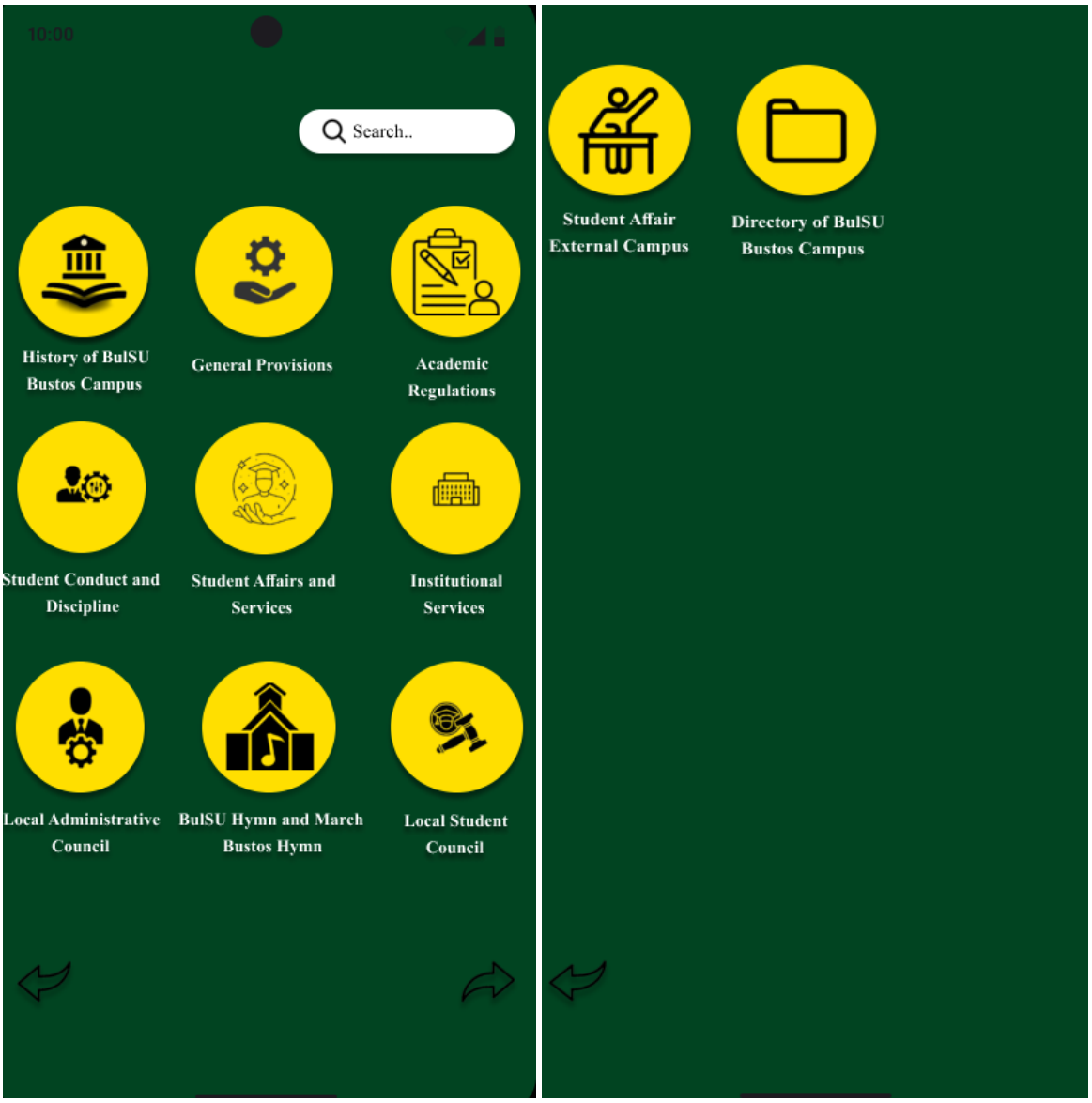

Figure 4 & 5 Shows the entire content of the "Student Handbook" button that represents the information guide for Information Guide for BulSU Bustos Students: A Mobile Application.

Procedure Content - This page features guides for the University purposes such as Enrollment, Adding Subjects and so on.

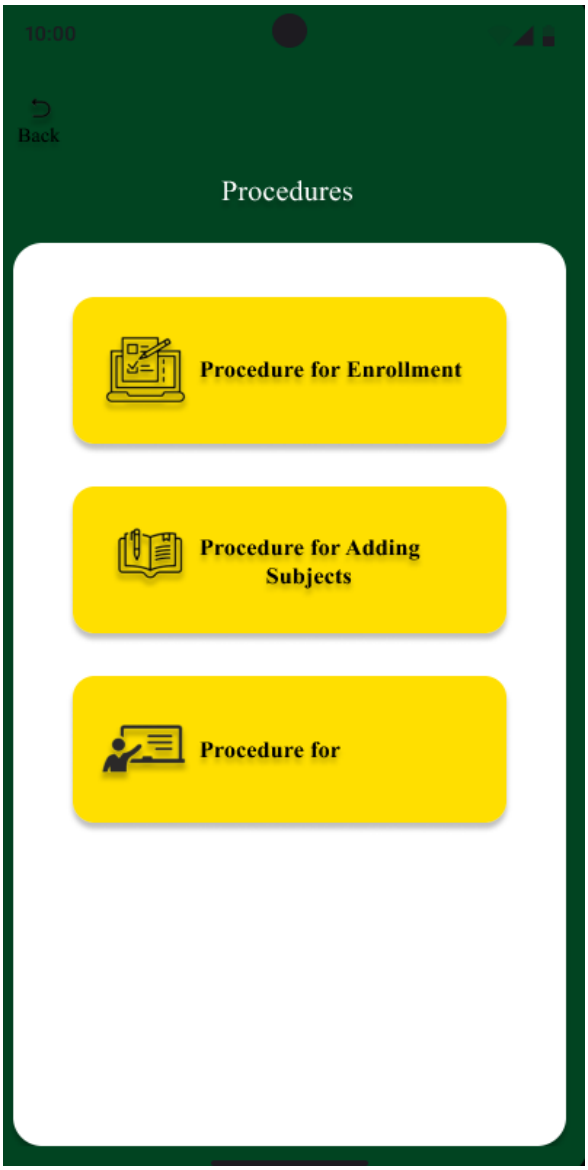

Figure 6 Shows the entire content of the "Procedure" page that represents the information guide for Information Guide for BulSU Bustos Students: A Mobile Application.

Course Curriculum - This page features courses that is available within Bulacan State University – Bustos Campus.

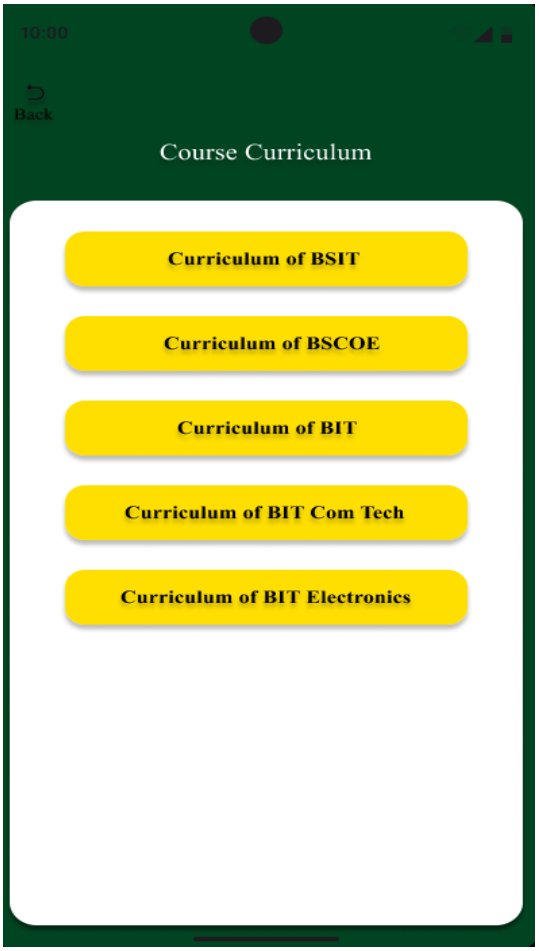

Figure 7 Shows the entire content selection of the "Course Curriculum" page that represents the information guide for Information Guide for BulSU Bustos Students: A Mobile Application.

Program Offering - This page features course programs that is available within Bulacan State University – Bustos Campus.

Figure 8 Shows the entire content selection of the "Program Offering" page that represents the information guide for Information Guide for BulSU Bustos Students: A Mobile Application.

Administrators, Faculty Members - This page features department admins and faculty members.

Figure 9 Shows the entire content selection of the "Administrators, Faculty Members" page that represents the information guide for Information Guide for BulSU Bustos Students: A Mobile Application.

Downloadable Forms - This page features available forms that is downloadable and for users to print out and filled out.

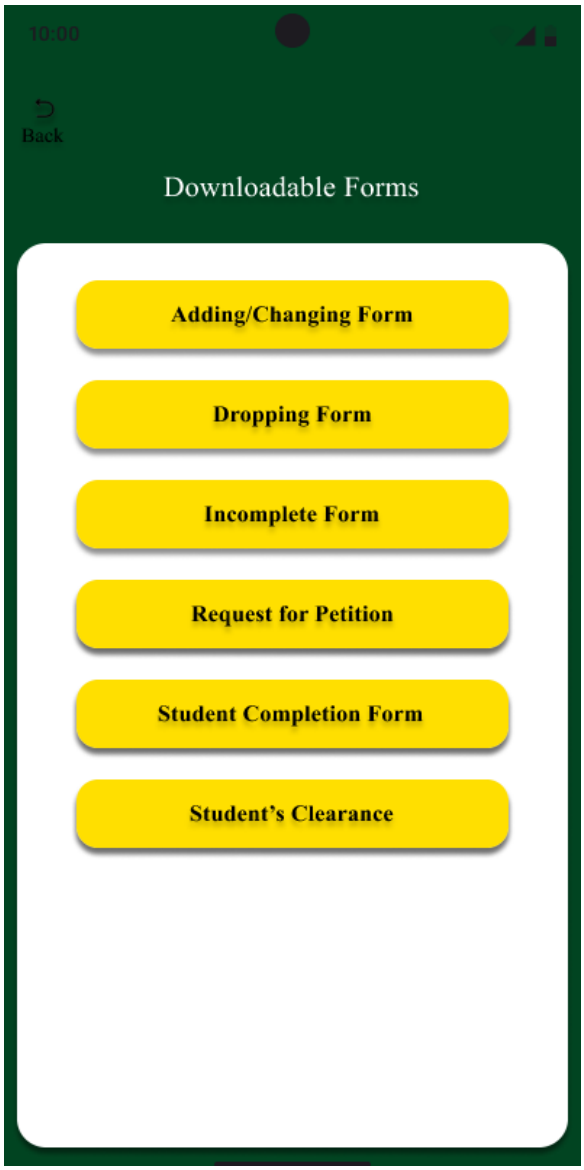

Figure 10 "Downloadable Forms" page that represents the information guide for Information Guide for BulSU Bustos Students: A Mobile Application.

Search Function – This search function allows user to search what they want to find depending on the page they are in.

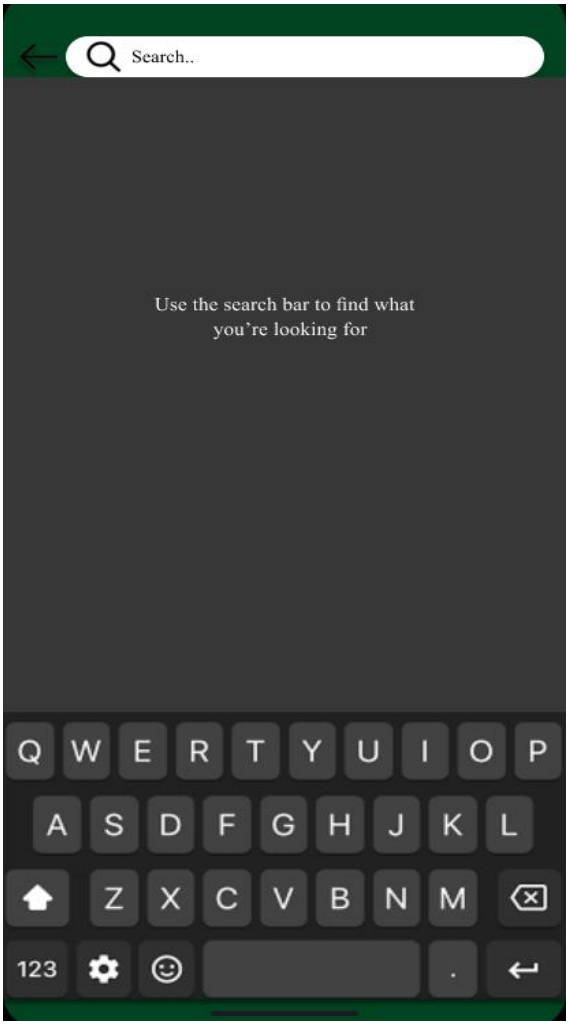

Figure 11 "Search" function that will be used for Information Guide for BulSU Bustos Students: A Mobile Application.

Super Admin & Department Admins – In the website there are two options for admins to choose from – Super Admin and Department Admins.

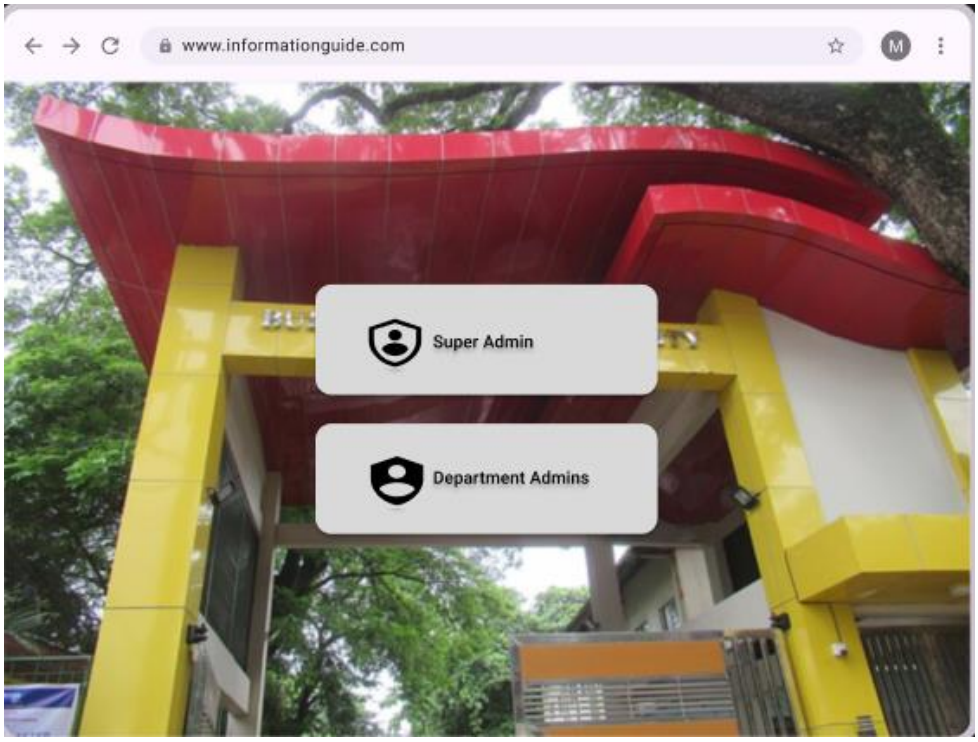

*Figure 12 "*Super Admin & Department Admins*" interface for Super Admin and Department Admins for BulSU Bustos Students: A Mobile Application.*

Department Admin Login – In this website, Department Admins will need to login first before they can modify the mobile application.

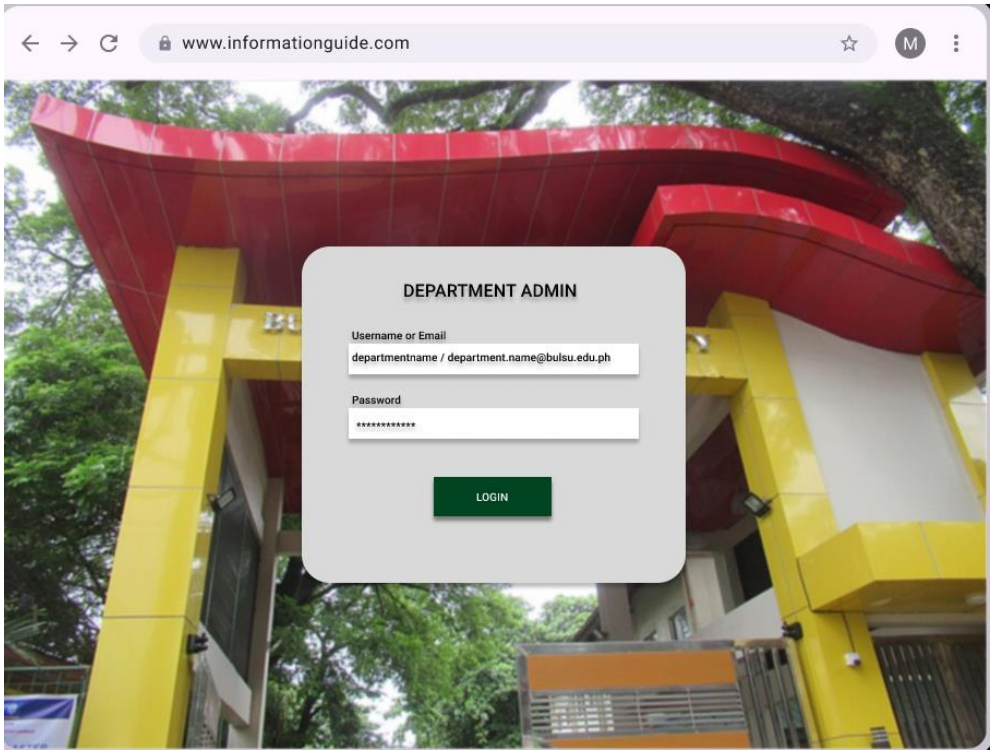

*Figure 13 "*Department Admin Login*" interface for Super Admin and Department Admins for BulSU Bustos Students: A Mobile Application.*

Department Admin Home Page – Once a Department Admin has logged in, they will be redirected to the home page for Information Technology. The Department displayed in the middle of the website is for viewing only and is needed to proceed to "Settings" in the navbar to edit.

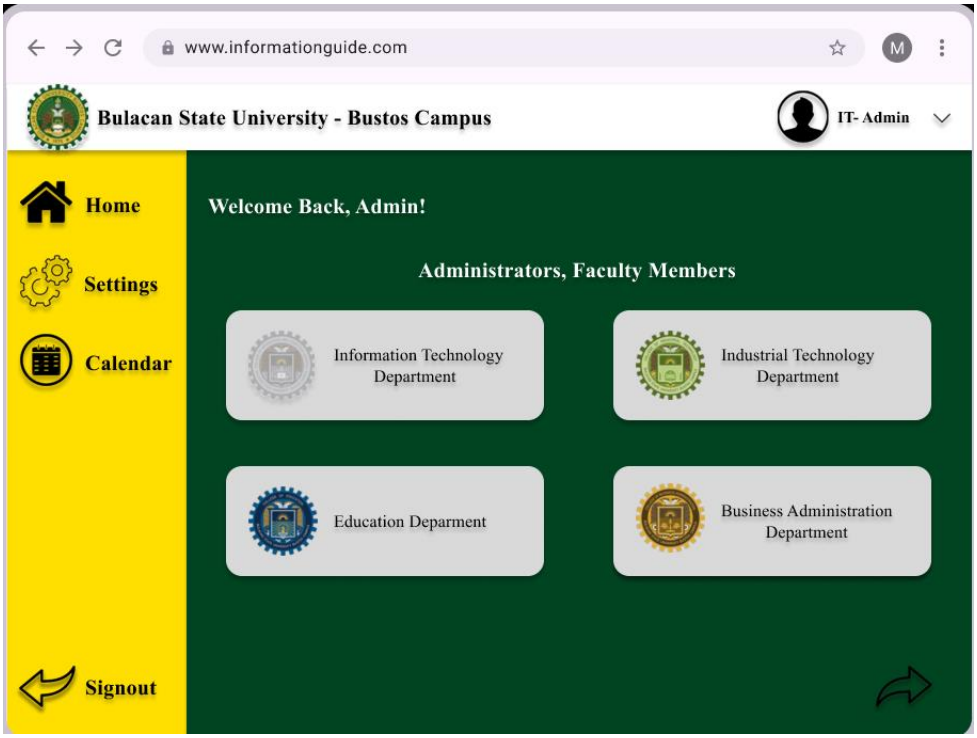

*Figure 14 "*Department Admin Home Page*" interface for Department Admins for BulSU Bustos Students: A Mobile Application.*

Department Admin Settings – When the admin has clicked on "Settings" in the navbar. Then they can only edit only from their respective department.

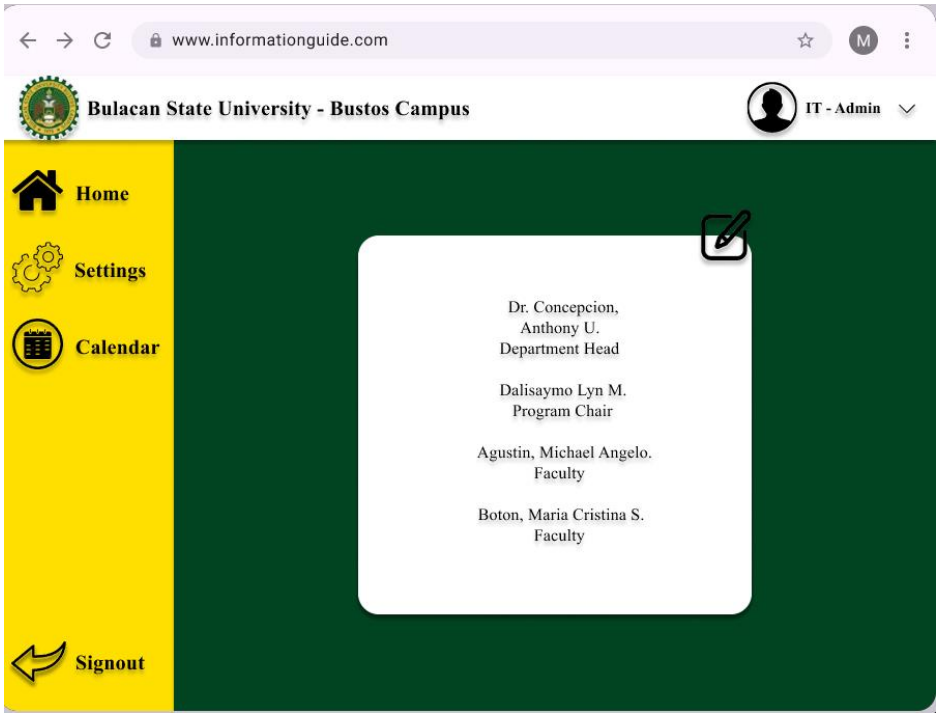

*Figure 15 "*Department Admin Settings*" interface for Department Admins to edit for BulSU Bustos Students: A Mobile Application.*

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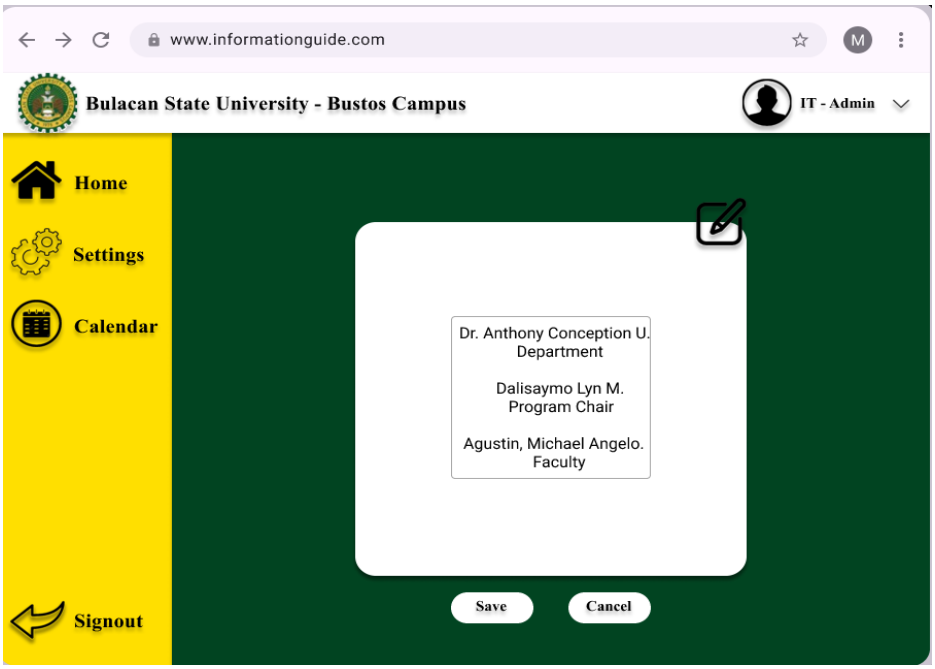

*Figure 16 "*Department Admin Settings*" interface for Department Admins to edit and save changes for BulSU Bustos Students: A Mobile Application.*

Calendar – This page in the website shows the calendar.

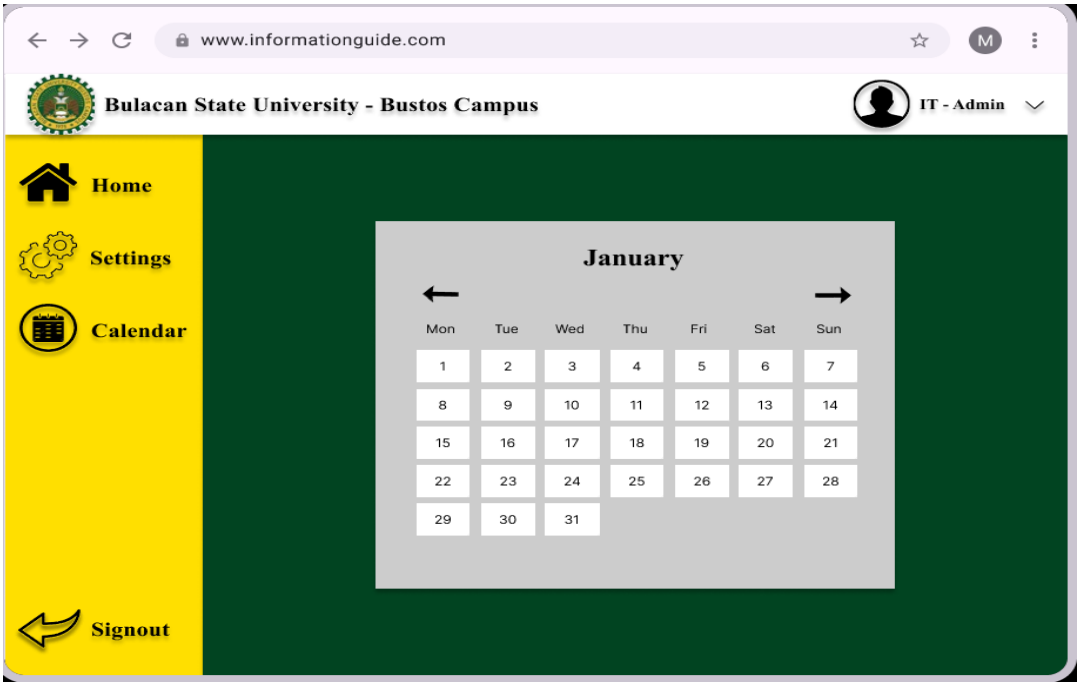

Figure 17 "Calendar" interface for Department Admins for BulSU Bustos Students: A Mobile Application.

Development and Testing

For the system testing, the clients will test the information guide mobile application with 3 IT Experts and 10 BulSU Students, test the overall functionality, maintainability and performance of these systems. Continuous monitoring, feedback and risk management will ensure the mobile application and website's effectiveness and address any concerns. The

feedback from this testing will be put into use to improve the information guide mobile application. Including the University information and admin capabilities.

Implementation Plan

Prior to implementation, the researchers must settle with the client about the Information Guide for BulSU Bustos Students: A Mobile Application. Additionally, they must meet and settle deliverables. The Information Guide will be deployed. The information guide aims to provide up-to-date information regarding BulSU Bustos Campus, academic norms, fillable forms for students to fill out for their concerns. The information guide mobile application will be downloadable in user's mobile devices via Google Play Store or App Store allowing all students to learn more about Bulacan State University, their courses, curriculum and so on. The administrative website will be used by Super Admin and Department Admins for them to edit the mobile application once new information is available in the future.

References:

Alexandra. (2020). Software Development Life Cycle (SDLC) works by reducing the price of developing software while both increasing quality and speeding up production. *Journal of Software Engineering*, 32(3), 120-135.

Li, W. (2021). *Study on Smart Campus Management System Based on Internet of Things Technology*.

ALFarsi, G., Jabbar, J., M Tawafak, R., Iqbal, S., Alsidiri, A., Alsinani, M. & bte Sulaiman, H. (2020). *Mobile Application System Supported BUC Students Services and Learning*. International Association of Online Engineering. Retrieved July 22, 2024 from https://www.learntechlib.org/p/217829/.

Qi Wu (2021) Research on the Construction of University Smart Campus Based on Open Mobile Application Ecosystem https://doi.org/10.1145/3474995.3474996

Xiu Chen (2020) Exploration and Practice of the Construction of Smart Campus——Taking Sichuan University as an Example https://doi.org/10.1145/3429630.3429647

Chittaranjan Andrade (2020) The Inconvenient Truth About Convenience and Purposive Samples https://journals.sagepub.com/doi/full/10.1177/0253717620977000