UNIVERSITY OF THE PHILIPPINES
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Master of Information Systems

CHARMAINE B. CRUZ

COMPUTER LABORATORY MANAGEMENT SERVICES FOR PRINCE MOHAMMED BIN FAHD UNIVERSITY WEBSITE

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This Special Project titled

Computer Laboratory Management Services

for Prince Mohammad Bin Fahd University Website

is hereby accepted by the Faculty of Information and Communication Studies in partial fulfillment of the requirements for the Master of Information Systems.

Dr. Ria Mae Borromeo
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ABSTRACT

To get the job done efficiently, we rely on technology that can speed up the process of our daily routine. In our world today where computers/devices are interconnected through the Internet, innovations have been made to make our jobs easier. When it comes to data processing and recording, we no longer use methods or recording through paper forms or logbooks. The computer laboratory is a facility that caters to services in terms of computer usage, request of equipment, and monitoring the resources. Scheduling, monitoring requests, and the availability of resources is not an easy task, and it may take a certain amount of time for the person requesting the services. Hence, this research is focused on innovating the way the users (Students, Lab Instructors) acquire services and the person (Lab technicians) who cater these services. By providing a system in the form of a web application that gives access to the users to schedule a reservation, to use a computer in the laboratory, make a request for installation of software or device and check the availability of the resources. The system is developed using the Laravel web framework following the model–view–controller (MVC) pattern. PHP is used to develop web pages using Bootstrap in the front-end design. And MySQL database for the repository. In the resulting system, the lab technician can monitor the computer lab usage, reservations, request, and the inventory of the computers and devices in the laboratory. The users will just access the website and select the services that are available or provided via cellphone, computer terminal, or any device with a web browser that is connected through the Internet. Therefore, there is now no need to go directly to the laboratory technician's office or email to file a service. Just log in to the system and wait for the notification for the service.

ACKNOWLEDGMENTS

I would like to acknowledge and give my warmest thank to my thesis Adviser Dr. Ria Mae Borromeo who made this project possible. Her guidance and advice carried me through all the stages of writing and the development of my work. I would also like to thank the MIS Chair Conception Khan and all my professors Ms. Mari Angeli Crisanto, Mr. Gulshan Vasson. Mr. Gerard Ravasco, Ms. Rosangela Anne Salaya, and Mr. Juan Miguel Abriol-Santos for sharing their knowledge and teaching me in my MIS journey.

Next, I would like to thank PMU CCES Dean Dr. Ghassen Ben Brahim and Chairs Dr. Ilyes Jenhani and Dr. Majid Ali Khan, PMU Faculty especially Omair, Zeenath, Hanaa, Roxane, and Wesal, PMU I.T Admin / Lab Technician, and PMU students who participated in the users testing and evaluating my project. Your comments and suggestions help me a lot to improve my work.

I would also like to give special thanks to my husband Jobert, my children Charles, Celine, and Jaycee, my whole family, and the UBC family for their continuous support and understanding when undertaking my project. Your prayer for me was what sustained me this far.

Finally, I would like to thank God for letting me through all the difficulties. I have experienced your guidance day by day. You are the one who let me finish my degree. I will keep on trusting you for my future.

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Dedicated to:

My Parents, and Family

Chapter I

INTRODUCTION

Today, every school has a Computer Laboratory. Students use computers to create documents, applications, compute and process data, and other jobs. Courses in schools have a subject that is related to computers. The computer laboratory as a facility gives services like computer usage, equipment request, and resource monitoring. To manage resources like schedule, availability of resources, and monitoring is a task that is not easy, and it takes time to give services for the request. Thus, Computer Laboratories needs management when it comes to usage and services.

This study is focused on the users such as the Laboratory Technician, Laboratory Instructors and students, and how they acquire the services of the Computer Laboratory. The goal is to innovate the way the services, like software installation, scheduling reservations, checking of availability of resources, and other requests, by providing a system as a web application to manage the mentioned activities. With this system, it will improve the way the computer laboratory provide their services.

THE PROBLEM DOMAIN

A. Statement of the Problem

Currently, the inventory records and log files related to students that access computer laboratories are managed through Excel spreadsheets. Although, the maintenance and update of spreadsheets are easy but tends to have several serious drawbacks, as listed below:

1. Ineffectiveness about data entry errors.

2. Tediousness operations while creating presentable reports.

3. Lack of authorization and security (i.e. possibility of tampering of records).

4. Non-availability of information about records alteration/update time-stamps and user identification.

In this research study, the primary objective would be to create a system that would not only rectify all the aforementioned issues but also could be integrated into the currently available system.

B. Background and Objectives of the Project

The purpose of the study is to improve and enhance the current operation and management of the computer laboratory focused on the inventory, Students, and laboratory Faculty service requests. The current method of the said operation works by manually encoding the data with a form (print out form) or log book, and spreadsheet. The student request for service is written in the form or logbook as proof of the request. The laboratory instructors email the request then the lab technician records the request. Concerning the maintenance and inventory of the computer lab, the lab technician encodes the inventory data in a spreadsheet. The inventory and report are done at the end of the semester, printed, and submitted to the Dean.

C. Significance and Scope of the Project

The study will benefit the students, laboratory instructors, and lab technicians. It will enhance the operation of service requests and the management of computer lab resources and inventory. By providing a web service that will be linked through the website of the university, it will reduce the time needed to make the request and perform management through the inventory.

Below are the following that needs to be achieved:

1. Provide a web application that will provide the students and laboratory instructors to perform their service requests online.

2. Provide a web application for the management of inventories online.

3. Provide a faster, secure, and efficient form of monitoring, retrieving data or information, and generating reports for the management regarding student logs, laboratory instructor requests, and computer laboratory inventories.

D. Documentation of Existence and Seriousness of the Problem

1. Description of the Current System

a. Reservation to use the computer lab

Every beginning of the semester, the lab technician will receive a new schedule of the computer lab from the secretary of the department. Moreover, this schedule originates from the Registrar. This will be the basis of the lab technician in managing the computer laboratory.

The student will come to the office of the lab technician to reserve a schedule for using the computer lab. In addition, the student mentions the reason for using the lab, the equipment that needs in the lab. The lab technician will check the availability of the lab and check the equipment (for example computer, breadboard, multimeters) needed by the student if available inside the lab. If the lab is available on the requested date and time and the equipment needed the student will sign in the Log Book manually. The following data in the logbook should be complete. The Date, Student No., Name, Time Login, Time Logout, Lab Number, PC number, Equipment used, Purpose of using the lab, and Signature. The lab technician will record the student usage of the lab in an Excel file.

The lab Instructor, Professors, or other Instructors from other departments who will use the lab that is not included in their class schedule will email the lab technician to check the availability of the lab including the lab resources that they are going to use. If it is available, the lab technician will reply in the email and confirm the availability of the lab and its resources. The lab technician will record the confirmed usage of the lab of the Instructor/Professor and the resources used in the lab in an Excel file. The following data should be complete. The Date, Employee Number, Name, Time Login, Time Logout, Lab Number, Equipment used, and purpose of using the lab.

b. The request for Software Installation and Computer repair in the lab

The Lab Instructor or the Professor from other departments will email the request for Software Installation, computer repair, network problems in the lab to the lab technician. The lab technician will confirm if the request will be granted. After the request is done, the lab technician will notify thru email the lab Instructor/ Professor of the status of the request. An example of the status is done, cannot be fixed, and needs replacement. The lab technician will record the request and the status of the request in an excel file. The data should be complete. The date requested date completed the type of request, the Lab Instructor / Professor who requested, and the status of the request.

c. Inventory of the Computer Lab Resources

The Lab Technician will do the inventory every end of the semester. PMU University has three semesters. The spring, summer, and the fall semester. The lab technician will record the following data in an Excel file. For each computer lab, the following data should be complete. The Lab number, Lab Description, All the Items Description, and the total of each item description, Year Model, Processor, Memory, Operating system, Software, Computer Name, Service Tag, Status / Condition of each item, and Remarks.

At the end of the semester, the chair, the college dean will email the lab technician and ask for a record of the inventory of the computer lab resources. In reply to the email, the Lab Technician will send the requested file.

Before the start of the semester, the lab Instructor / Professor from other departments will ask the inventory of the computer lab resources for them to determine if their course for the upcoming semester will correspond to the computer lab resources.

2. Problems identified with the existing system.

The method of recording reservations, requests of the student is done by signing in the logbook. After that, the lab technician will record it in excel. It becomes redundant and it is prone to errors. For the lab instructors, they need to email the lab technician to request, software installation or to check the availability of the lab and resources they request to use. If available, the lab technician will email the lab instructor for confirmation. This also results in redundancy and is time-consuming for the lab technician when it comes to checking availability and replies for the lab instructors. At the end of the semester, the lab technician needs to create a report for the in excel. This becomes tedious and time-consuming for the lab technician when it comes to going back to the previous records of the computer laboratory in terms of the lab resources and the status of the equipment.

Chapter II

REVIEW OF EXISTING ALTERNATIVES

A. Assessment of existing alternatives

The current operation service request for the student is done writing the request to a form. The student needs to fill out the form and then the one in charge will record it to the logbook. The laboratory instructors can request by emailing the one in charge and recording the request again to the logbook. Computer laboratory inventories are done at the end of each semester and it is encoding in the spreadsheets. However, using a spreadsheet has a problem in maintenance when it comes to retrieving, updating, and generating reports. Using a spreadsheet is not secured and prone to tampering.

The following alternatives are listed below:

1. Purchase a commercial software similar to Excel.

2. Outsourcing software development.

Alternative no. 1 is not chosen because comparable to Excel, this application software is capable of storing records and is easy to manage but still will not enhance the capabilities of the current system.

Alternative no. 2 is not chosen. Although it can carry, the process or service that PMU want still confidentiality and security may be at risk, and in the future if there will be changes in the contract or the management of the outsourcing company could lead to instability of the business.

B. Key Features of the Proposed System

The following features that the end-users will benefit from in the proposed system:

1. There will be a timestamp and user identification for every lab usage-generated report.

2. The generated report will be provided for the inventory and lab usage.

3. Every end-user will have a different level of privilege to access a certain page.

There will be a data validation and completeness check to ensure that data entered in a specific field is in the correct format.

Chapter III

PROJECT DETAILS

A. Overview

Description of the proposed system, use case diagram

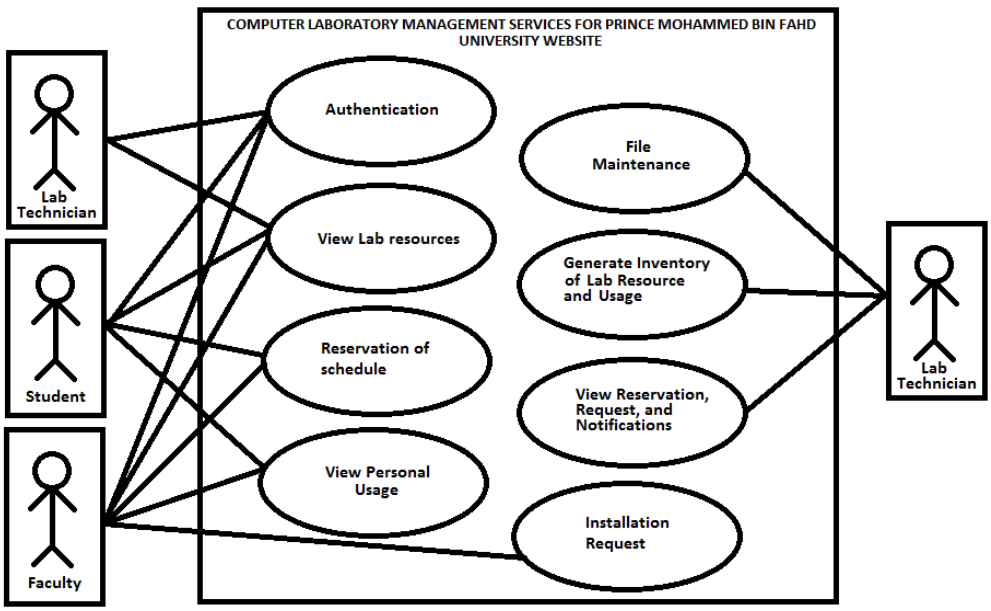

Figure 1: Use Case Diagram

In the Authentication, the users can perform the following:

- The user is authenticated before accessing the Computer Lab Services menu.
- To log in, the user must provide credentials (username and password).
- A successful login will redirect the user to a page depending on their role.

In the View Lab Resources, the users are able User will be able to view the entire computer laboratories (Lab name and lab number), resources (computers, breadboards, multimeters), and their availability (Day, Time).

In the Reservation of Schedule, the users can do the following:

- Users will be able to reserve a slot for a certain computer laboratory (Lab name and number) with its preferred time and day. In addition, the user needs to specify required resources (i.e. computers, breadboard, multimeters).
- The Faculty who wants to use the computer laboratory beyond their regular classes and for special classes must use this function.
- The Student who wants to use the computer laboratory for practice purposes and finish pending lab exercises can use this function.

In the View Personal Usage, the users can do the following:

- Users will be able to view the personal usage report of all computer labs.
- For the Student, the report includes the Date, Student Number, Name, Time Login, Time Logout, Lab number, PC number, equipment used (breadboard, multimeters, electronic kits), and purpose of using the lab.
- For the Faculty, the report includes the Date, Employee Number, Name, Time Login, Time Logout, Lab number, PC number, equipment used (breadboard, multimeters, electronic kits), and purpose of using the lab.

In the Installation Request, they will be able to request software installation, hardware repair, network repair, and other issues related to the computer lab.

In File Maintenance, the user will be able to add, edit, delete, update, view, and search records of software, hardware, etc. in all computer laboratories.

In the Generate Inventory of Lab Resources and Usage, the user can do the following:

- Users will be able to generate the report inventory of the entire computers lab including its resources for each lab. The following are the data that will be generated: The Lab number, Lab Description, All the Items Description, and the total of each item description, Year Model, Processor, Memory, Operating system, Software, Computer Name, Service Tag, Status, or Condition of each item and Remarks.
- The user will be able to generate the report inventory of the Lab Usage. The report includes the Date, Student Number or Employee Number, Name, Time Login, Time Logout, Lab number, PC number, equipment used (breadboard, multimeters, electronic kits), and purpose of using the lab. It can be sorted out as Student lab usage or Faculty lab usage.

B. Theoretical Framework

1. Information System Theory

Task Technology Fit

According to “theorizeit.org” Task-technology fit (TTF), the theory holds that IT is more likely to have a positive impact on individual performance and be used if the capabilities of the IT match the tasks that the user must perform (Goodhue and Thompson, 1995). Goodhue and Thompson (1995) developed a measure of task-technology fit that consists of 8 factors: quality, locatability, authorization, compatibility, ease of use/training, production timeliness, systems reliability, and relationship with users. Each factor is measured using between two and ten questions with responses on a seven-point scale ranging from strongly disagree to strongly agree.

Goodhue and Thompson (1995) found the TTF measure, in conjunction with utilization, to be a significant predictor of user reports of improved job performance and effectiveness that was attributable to their use of the system under investigation.

Although the Goodhue and Thompson (1995) model operate at the individual level of analysis, Zigurs and Buckland (1998) present an analogous model operating at the group level. Since the initial work, TTF has been applied in the context of a diverse range of information systems including electronic commerce systems, and combined with or used as an extension of other models related to IS outcomes such as the technology acceptance model (TAM). The TTF measure presented by Goodhue and Thompson (1995) has undergone numerous modifications to suit the purposes of the particular study.

According to “tlainc.com” Information, systems are designed to help users perform tasks more effectively and efficiently. Organizations spend millions of dollars on information systems to improve organizational or individual performance (Goodhue, 1995). A critical concern in information systems research has been to better understand the linkage between information systems and individual performance. Task-technology fit is a key but often overlooked construct in understanding the impact of technology on individual performance.

C. Technologies Used

Application Layer, Database layer, Client layer

1. Programming Language

PHP was used to develop the web pages for the system. According to “techterms.com”, It is the most appropriate programming language to use since HTML-embedded Web scripting language. The PHP code can be inserted into the HTML of a Web page. This allows the Web developer to write dynamically generated pages quickly and easily. PHP is an effective web scripting language that supports databases for database-driven Web sites.

2. Database Type

MySQL was used for the database. According to “techtarget.com” MySQL (now owned by ORACLE) is an Oracle-backed open-source relational database management system (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX, and Windows. Although it can be used in a wide range of applications, MySQL is most often associated with web applications and online publishing. Using MySQL will be an effective means to provide a repository because it can run on many platforms.

3. Framework

Laravel web framework was used. In the Back End development, the MVC framework was used. It allows you to reuse the code, modularizes the code, and allow multiple interfaces to be applied. Moreover, in the front-end design, the Bootstrap framework will be used. Knowledge of CSS, JavaScript, and HTML 5 can start designing your interface easily. In creating page layouts, Bootstrap has probably the best responsive grid system. It has pre-defined classes that will help you in making the grid much easier and faster to design the user interface.

4. Deployment Details

Hostinger was used for the web hosting service. The service supports Composer, Laravel, and multiple PHP versions, PHP extension, and PHP option management. It has the features, of unlimited web hosting, unlimited Solid-State Drives (SSD) disk space, and unlimited website bandwidth.

5. Platform

The system will run on any platform like Windows, Mac, Android, IOS devices as long as a web browser is installed and there is an internet connection.

D. System Design

1. Proposed Interface Design

Computer laboratory services will be added to the PMU Main page as one of the web services as shown in Fig. 2.

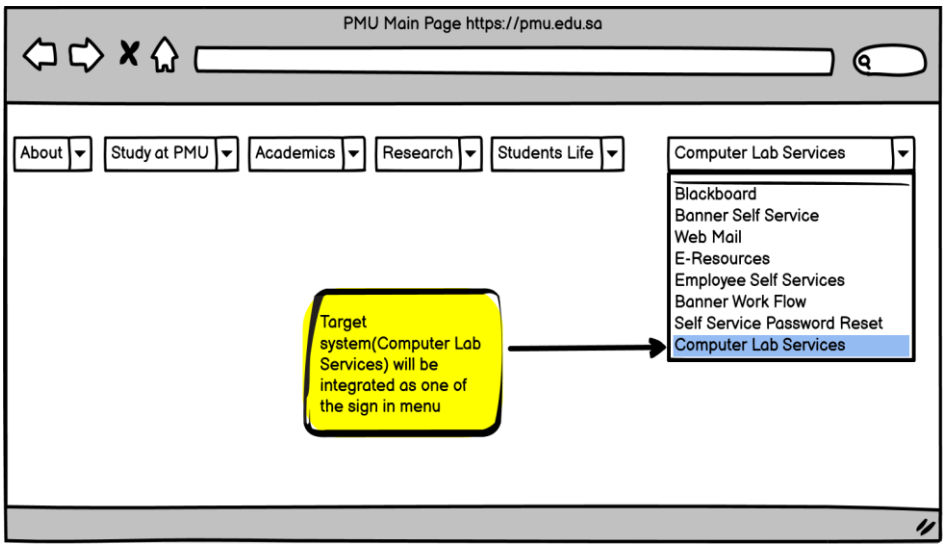

Figure 2: PMU Main Page

This feature can be used by faculty, students and lab technicians as shown in Fig. 3.

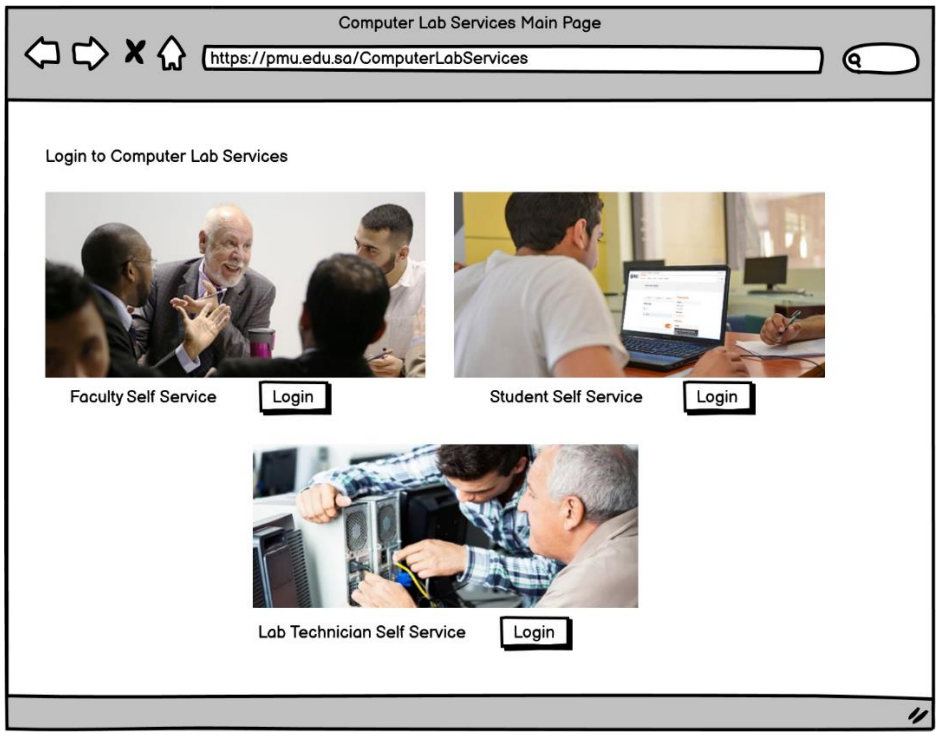

Figure 3: Computer Lab Services Main Page

The page depicted in Fig. 4 serves as login page for the users.

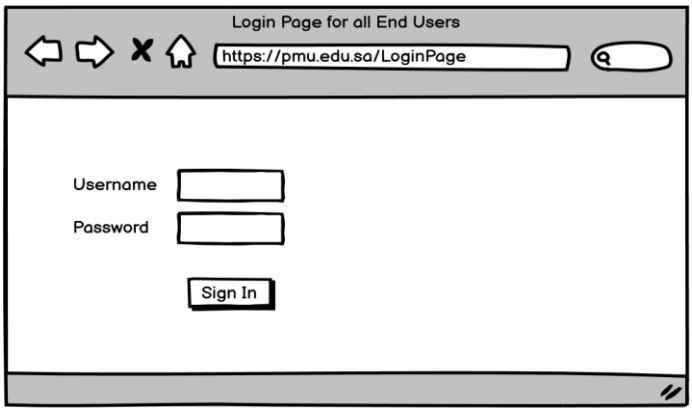

Figure 4: Login Page for Student, Faculty, and Lab Technician

This page allows the student to view lab resources, reservation and personal usage.

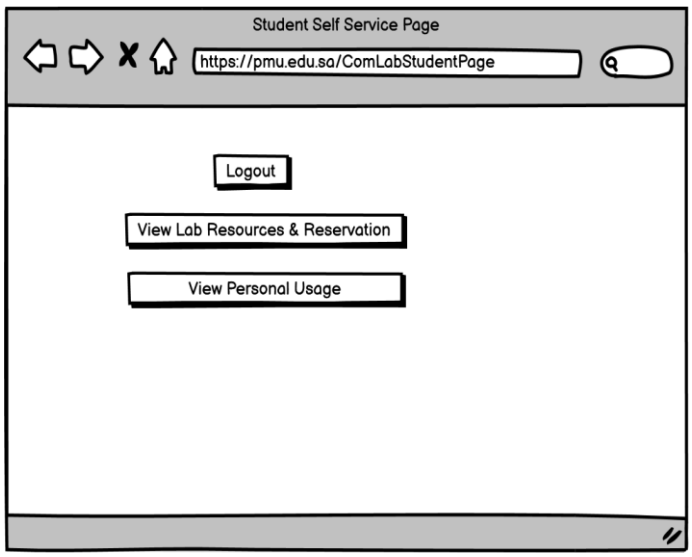

Figure 5: Student Self Service Page

This page allows the Faculty to view the lab resources, reservation, request installation and view personal usage

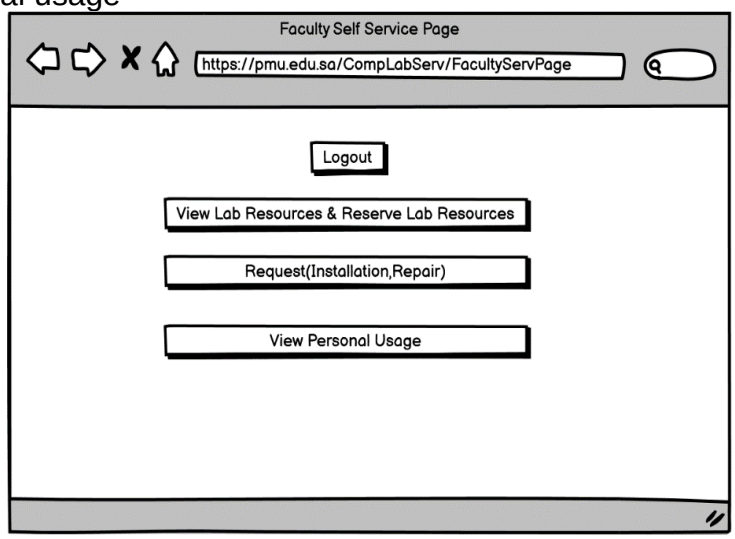

Figure 6: Faculty Self Service Page

This page allows the students, faculty and lab technician to view the lab resources and reservation.

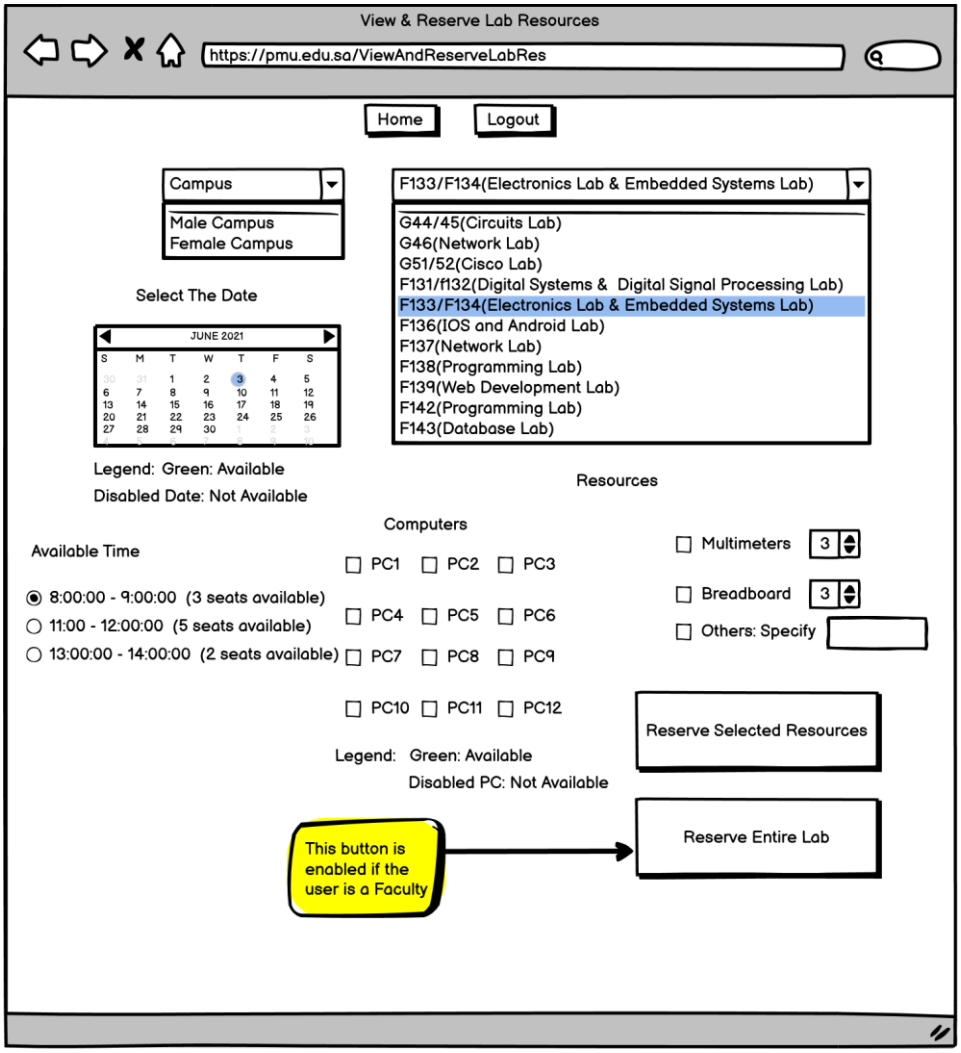

Figure 7: View Lab Resources and Reservation for students, Faculty, and Lab Technician

This page will serve for the faculty and student to view the personal usage.

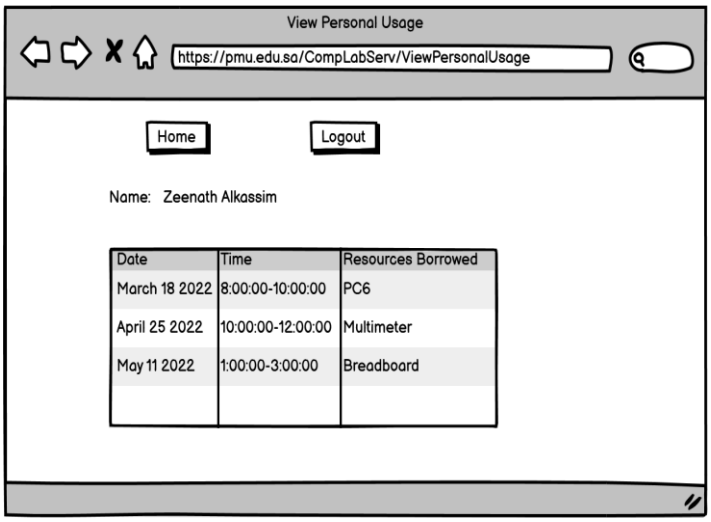

Figure 8: View Personal Usage for Student and Faculty

This page will serve the faculty with the request for installation or repair.

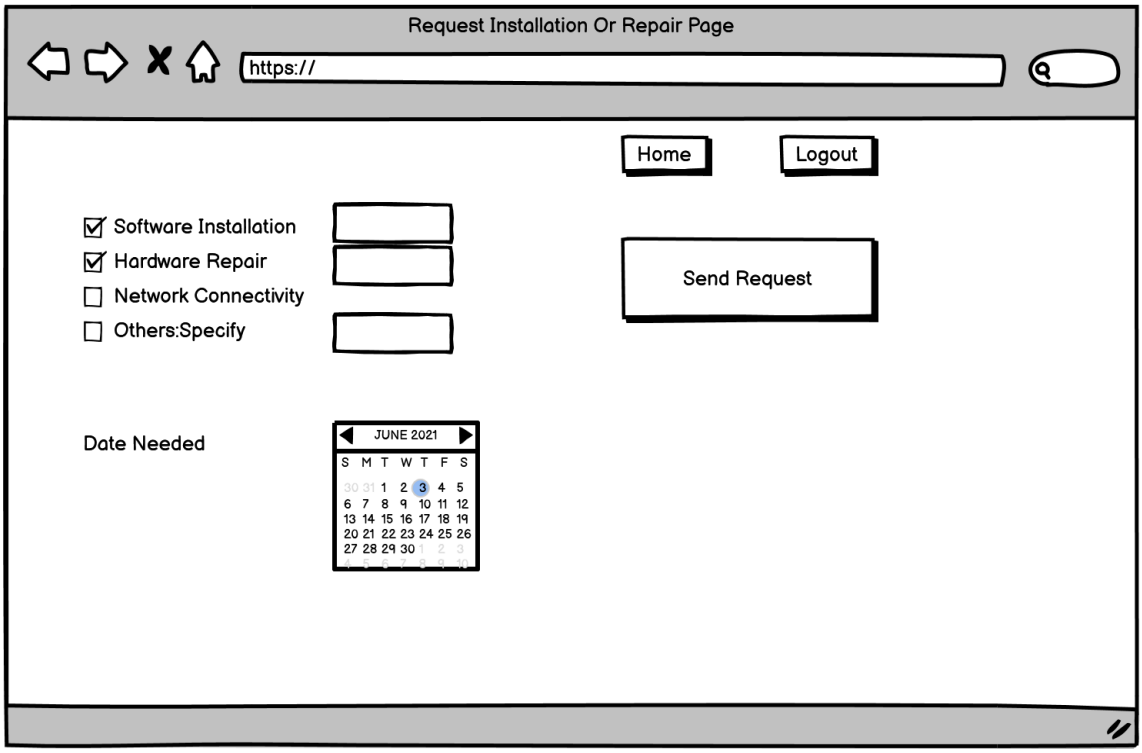

Figure 9: Request Installation or Repair Page for Faculty

This page will be exclusive for the lab technician. Here the lab technician can view reservations, request, lab resources, and generate the inventory of the lab resources and lab usage.

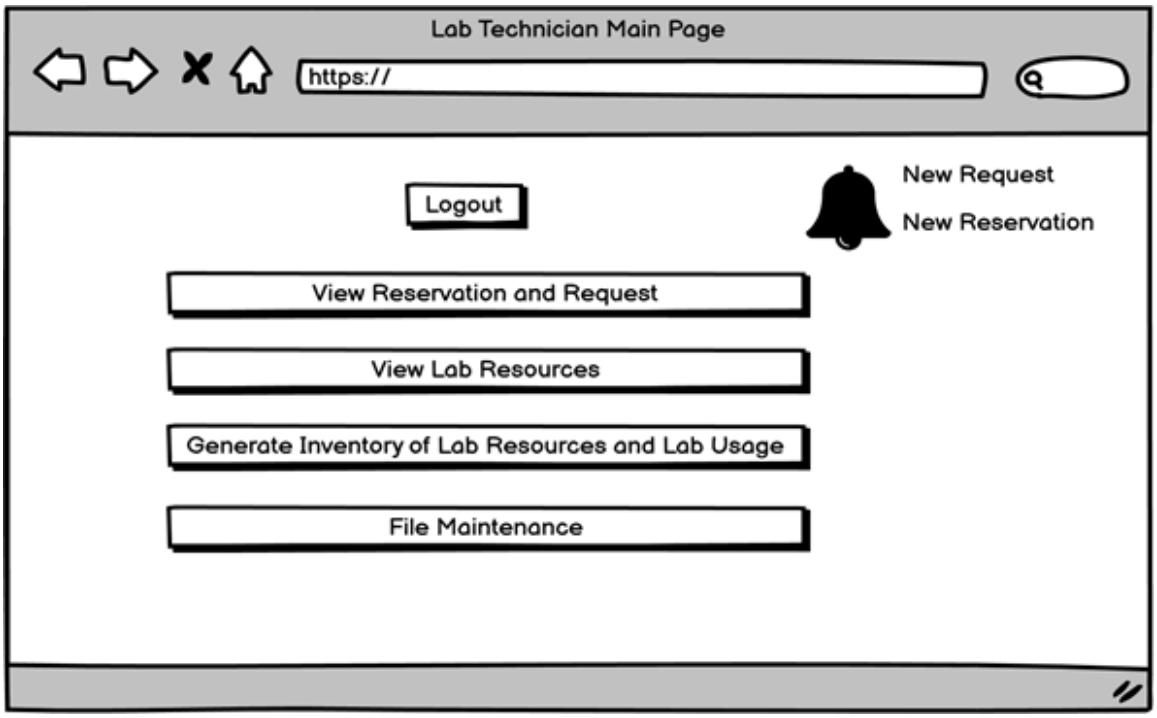

Figure 10: Lab Technician Main Page

This page allows the lab technician to view the reservation and request.

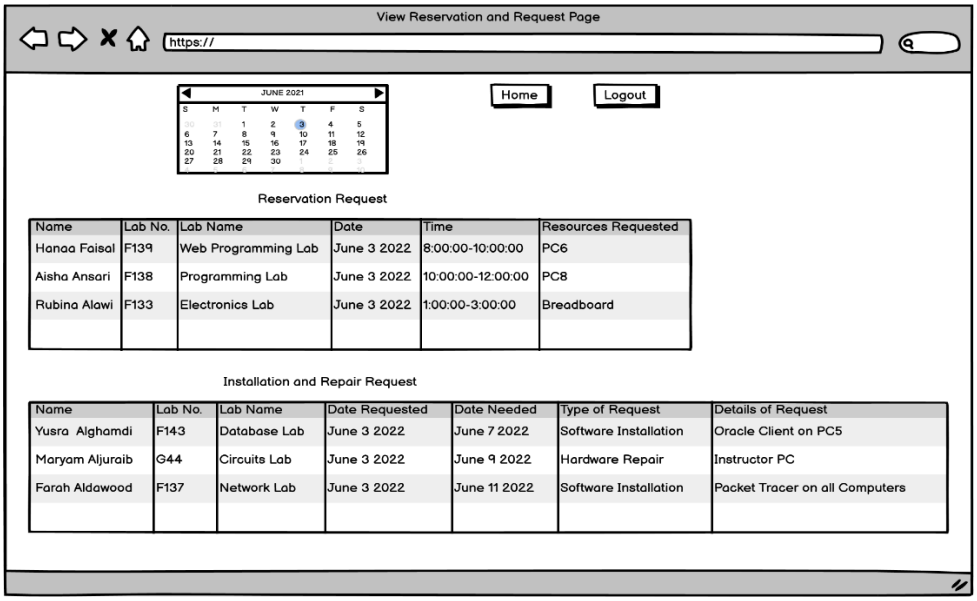

Figure 11: View Reservation and Request for Lab Technician

This page is exclusive for the lab technician. Here the lab technician can generate a report for the inventory.

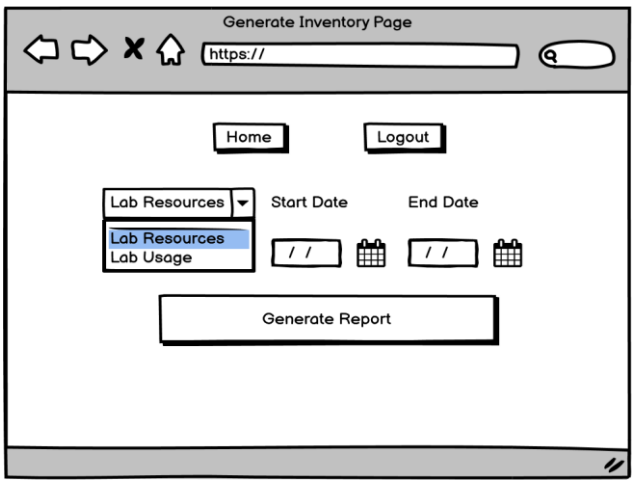

Figure 12: Inventory Report for Lab Technician

This page is exclusive for the lab technician. Here, the lab technician can perform the file maintenance.

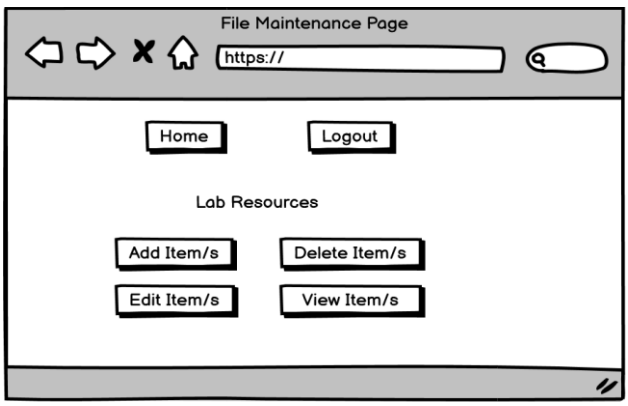

Figure 13: File Maintenance for Lab Technician

2. Implemented Interface Design

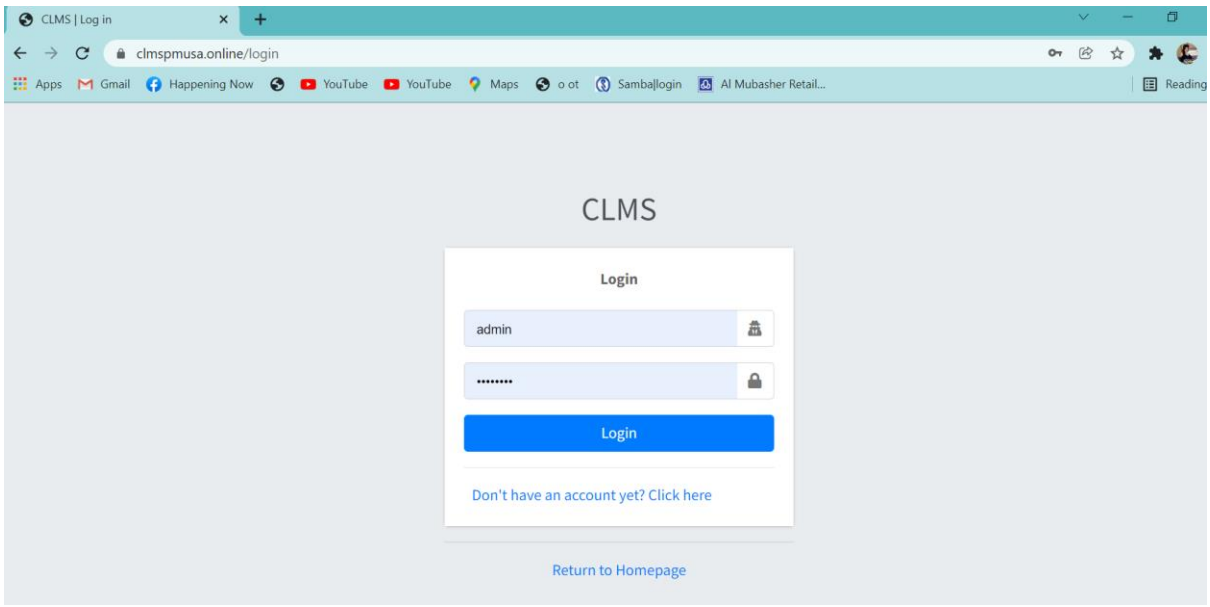

Figure 14 Login Screen Page

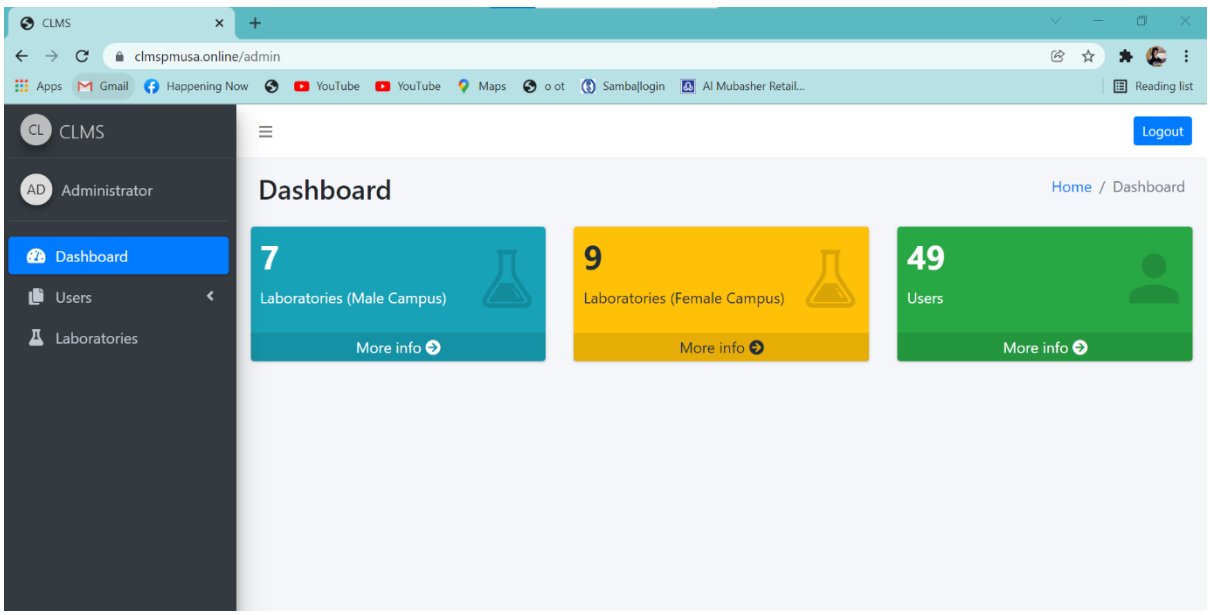

Figure 15: Administrator Page

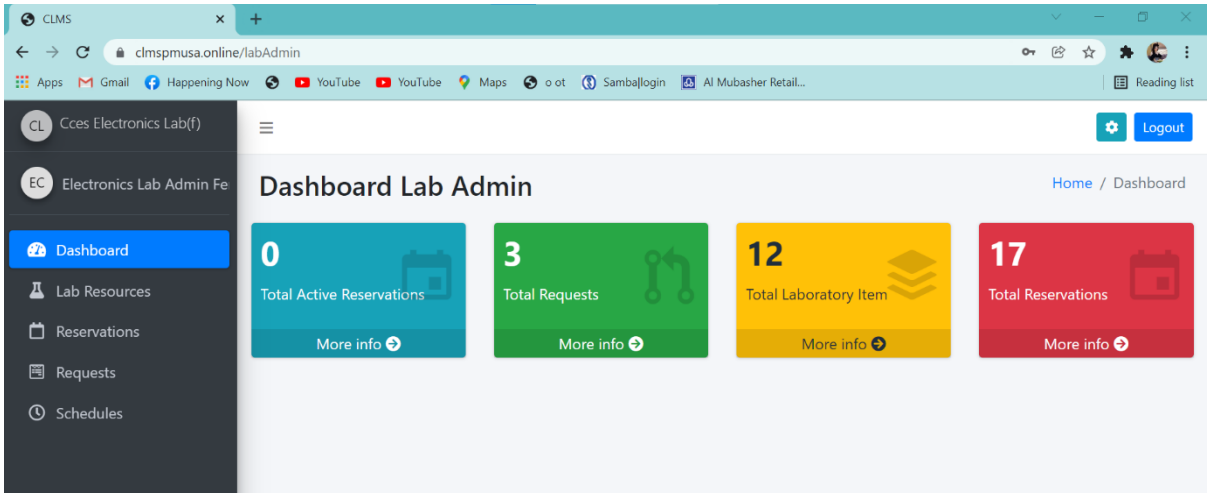

Figure 16: Lab Admin / Lab Technician Page

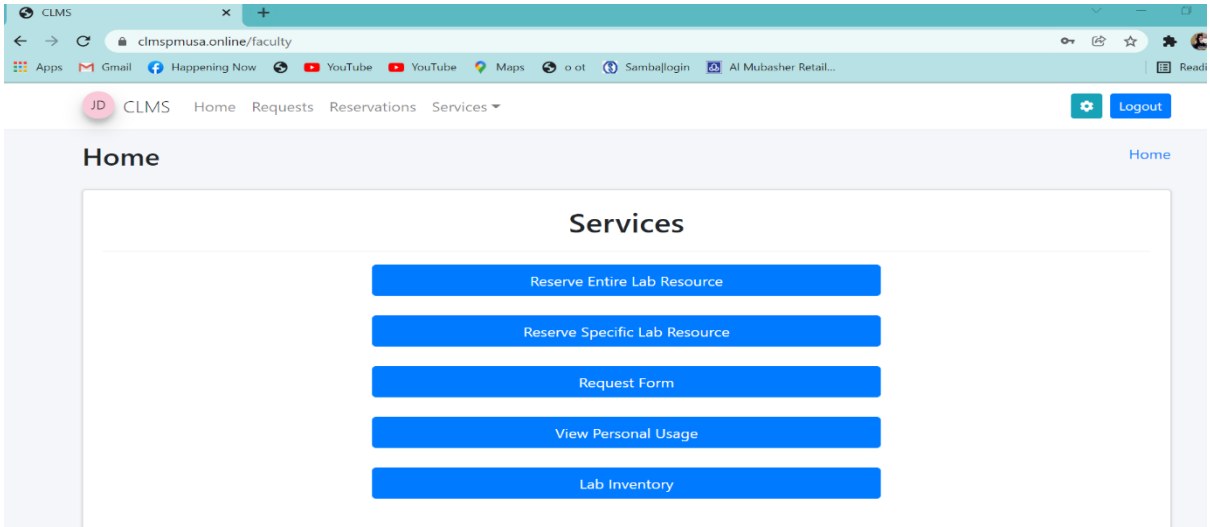

Figure 17: Faculty Page

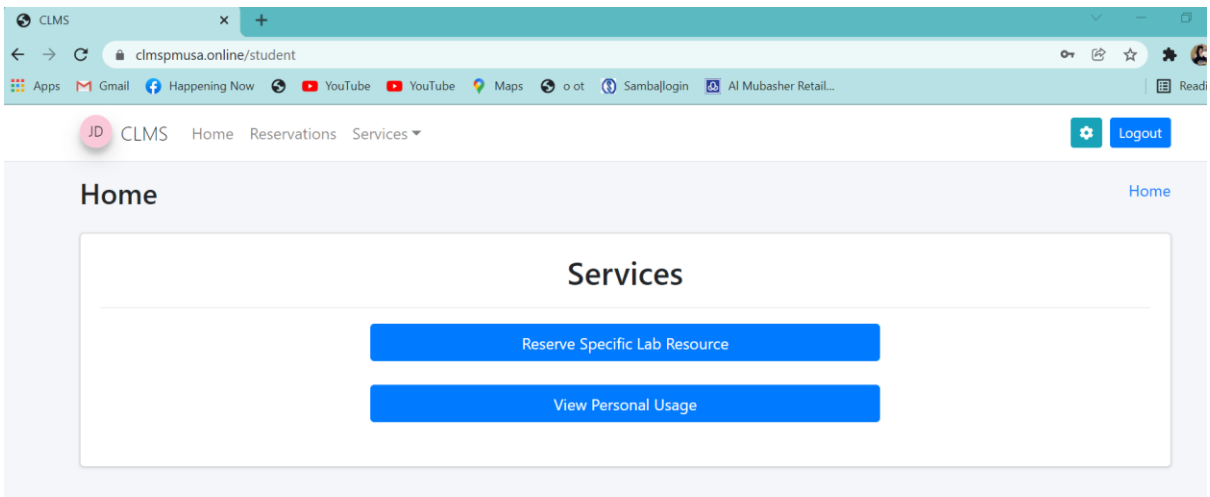

Figure 18: Student Page

3. Procedural Design

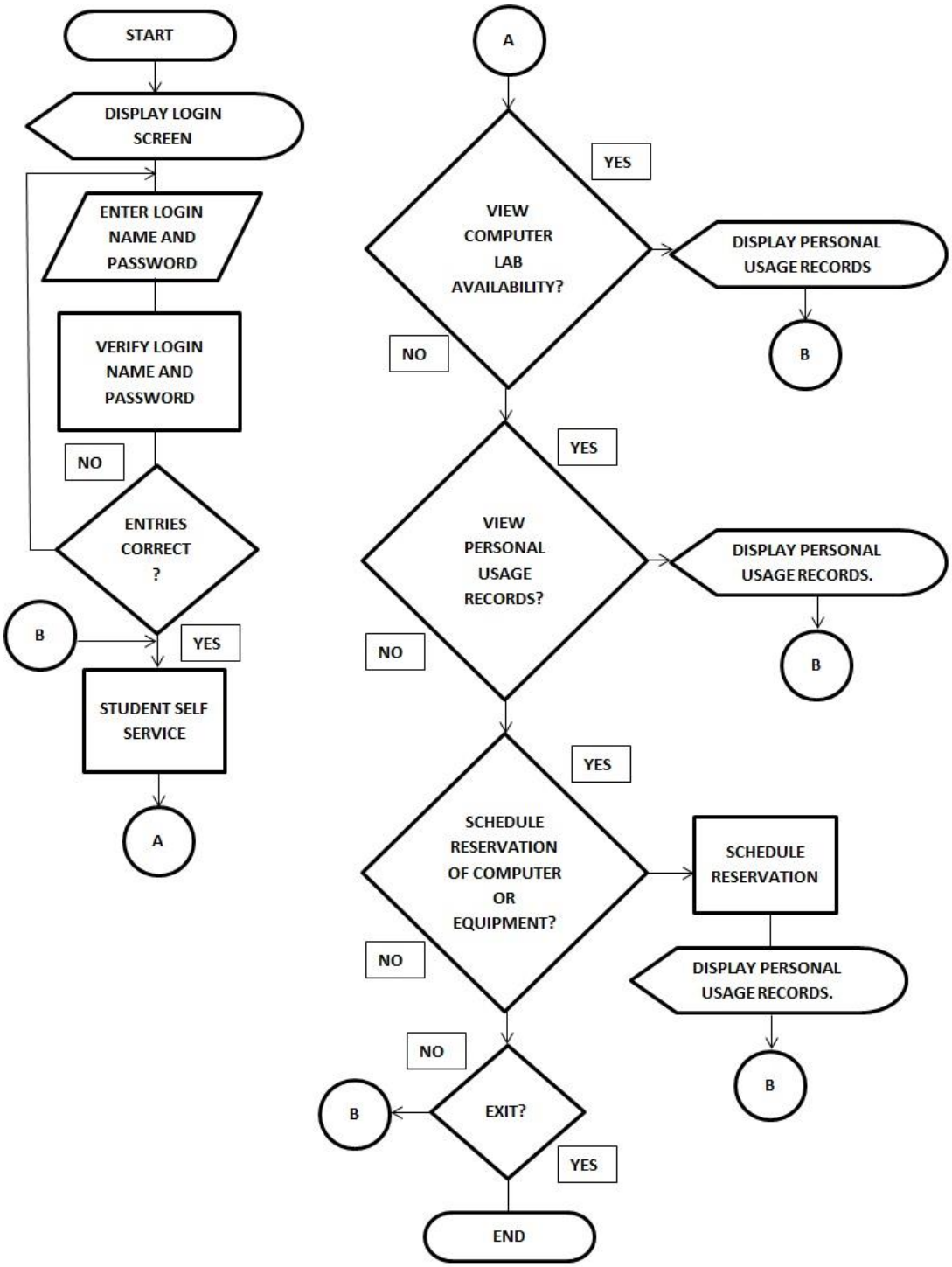

Figure 19: Student Request Self Service

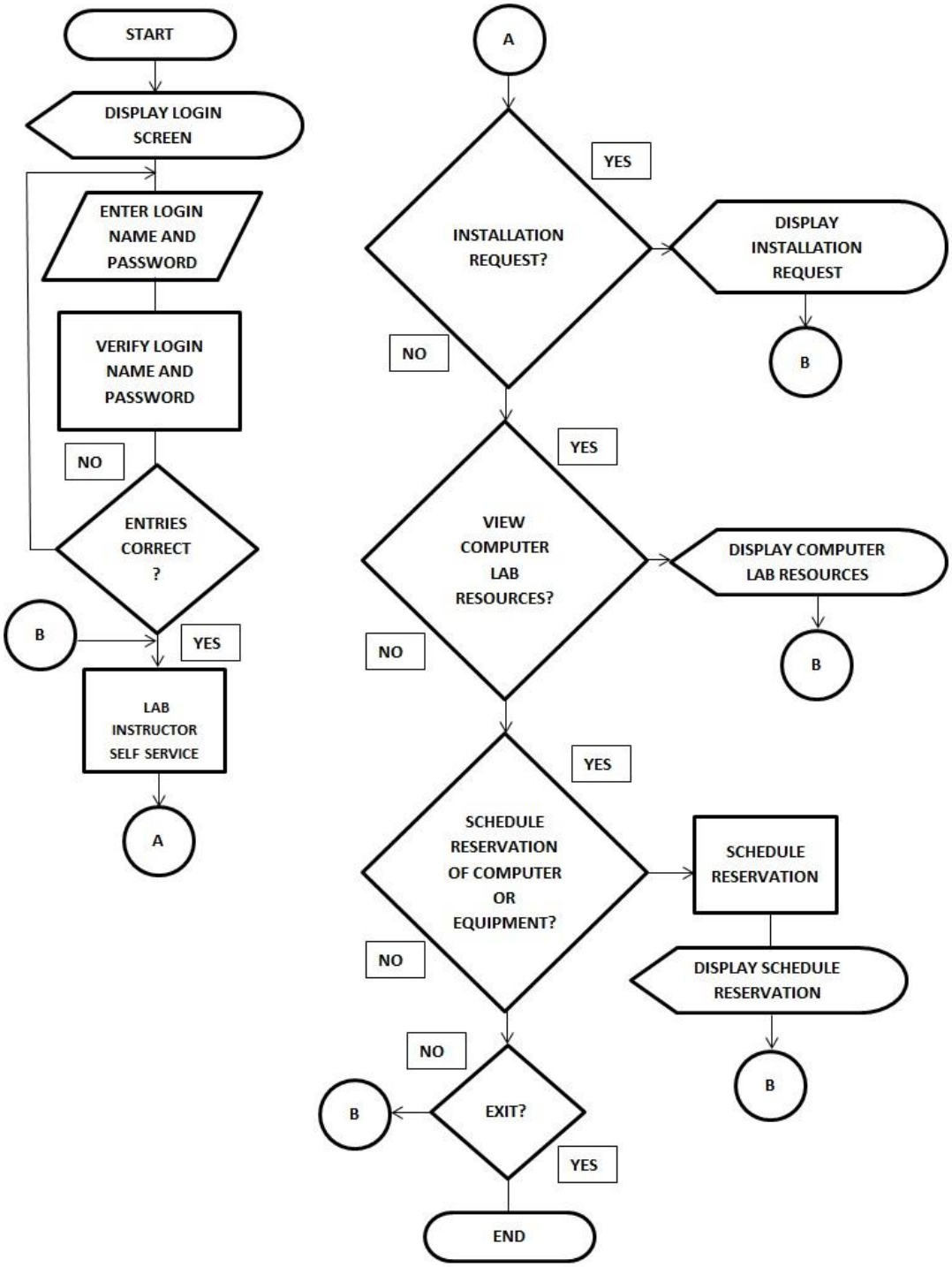

Figure 20: Lab Instructor Request Self Service

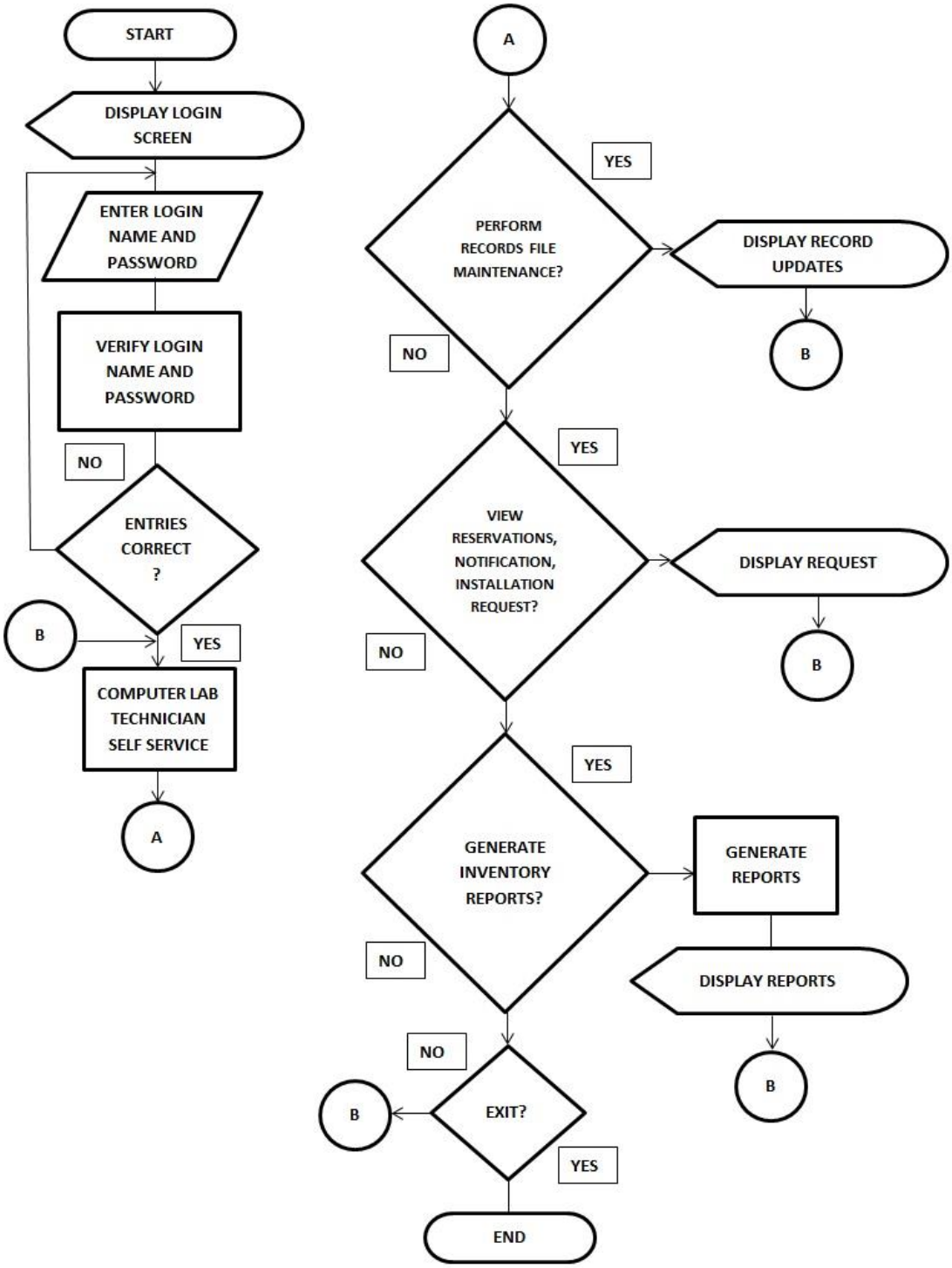

Figure 21: Computer Lab Technician (Inventory Maintenance) Self Service

4. Architectural Design

The system is composed of a Web and Database Server as a repository. It will be connected through the Internet for clients/users to access. The user can access the web pages for Student, Faculty, and Lab Technician Self services like reservations, request, view lab resources, usage, and inventory.

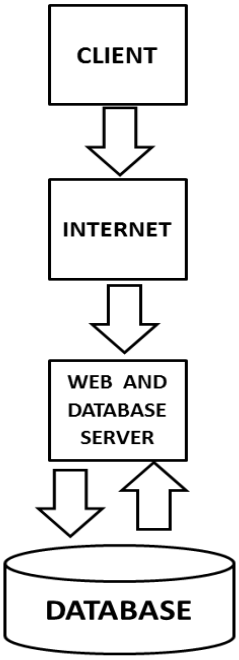

Figure 22: Database, Client and Server Connection

2. Data Design

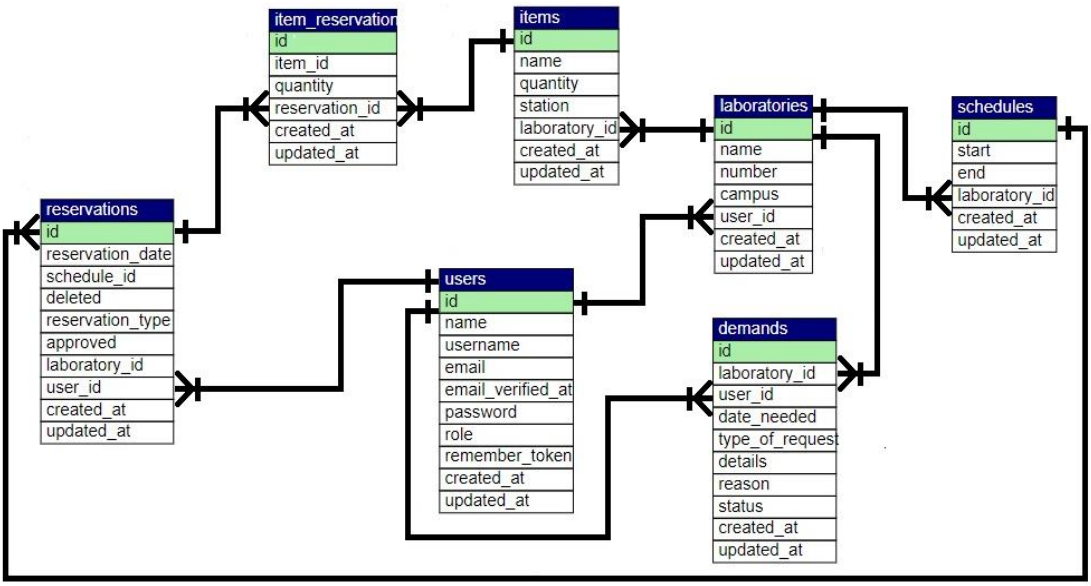

Figure 23: Entity Relationship Diagram (ERD) - Data Design

E. Implementation

The system development life cycle and the waterfall model were used to ensure the system will be correct, complete, and effective. The system needs to undergo the phases of development. Moreover, these methods have been proven effective in system Software development.

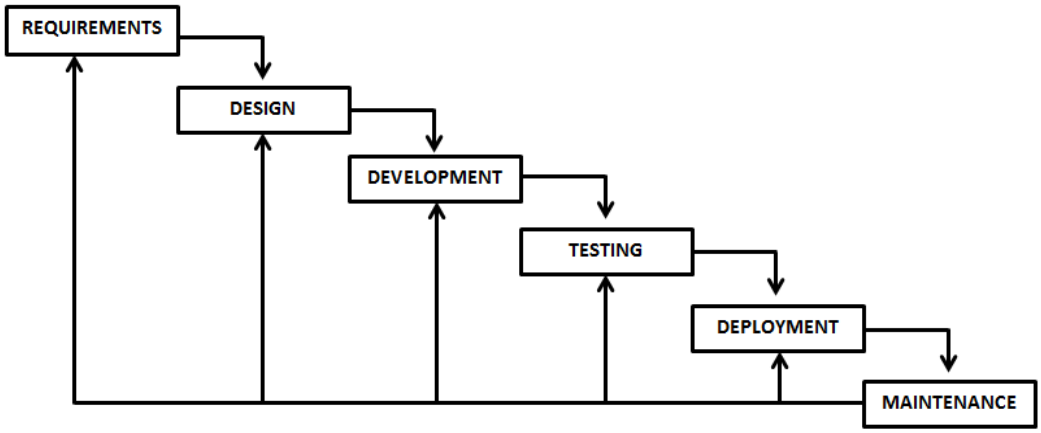

Figure 24: Process Model - Waterfall Mode

The project was assessed by testing the performance, user(s) surveys, and interviews. The finished system was tested and tried accordingly by the users (Students, Lab Instructors and Lab Technicians). The users after finishing the trials, answered the survey and were interviewed, and gave remarks and feedbacks.

Chapter IV

PROJECT ASSESSMENT

A. User Testing

With the help of users (Faculty, Laboratory Technicians, and Students) the proponents were able to test the system. The users evaluated the user interfaces of the web service when it comes to accessibility, appearance, and functionality. Each user has as they login can view designated pages depending on their level. They suggested what is needed in the user interface as well how the operations, features, and functions.

The Total number of students who participated in the survey was 40. The Faculty were 21 and the Lab Admin / Lab Technicians were 13. The total of all Respondents was 74.

The Explorative Method was used where the user evaluates the system in a dry run. Using Likert Scale, the users are given a survey where they can answer the following questions based on the system. The proponent conducted a system demonstration to the students using the I3 touch big screen in the classroom. The

students also explore the system using their devices. While Lab Technicians and Instructors were given link access to explore the system. The proponent prepared two forms for the survey, an online form (Google Forms) and a printed survey form.

Some usual errors or bugs were encountered in the system are connected with the database. Other errors encountered were regarding the retrieval of data from the database and output to the user. The errors were encountered while developing the system and with the help of the users who evaluated the system.

B. Testing Results

The result of the evaluation before the performance of the system is measured according to the surveys.

Student Survey Questions

Q1	The color and background of Web application is normal and visually appealing.
Q2	The login interface is appropriate.
Q3	User interface in the Web application easy to navigate.
Q4	The pages are well designed.
Q5	The Terminology in Web application is clear.
Q6	The contents in the Web application are precise.
Q7	The information in the web application is clear.
Q8	The information in the Web Application is organized.
Q9	The Web application able to complete the task in the least amount of time.
Q10	The Web application is consistent and user friendly.

Student Feedback Results

Q1					
Score	1	2	3	4	5
No. of Respondent			5	20	15
Total Per Score	0	0	15	80	75
Total Respondent	40				
Highest Score	5				
Total Score	170				
Total Perfect Score	200				
Percentage	85				

Q2					
Score	1	2	3	4	5
No. of Respondent				8	32
Total Per Score	0	0	0	32	160
Total Respondent	40				
Highest Score	5				
Total Score	192				
Total Perfect Score	200				
Percentage	96				

Q3					
Score	1	2	3	4	5
No. of Respondent				29	11
Total Per Score	0	0	0	116	55
Total Respondent	40				
Highest Score	5				
Total Score	171				
Total Perfect Score	200				
Percentage	86				

Q4					
Score	1	2	3	4	5
No. of Respondent			5	24	11
Total Per Score	0	0	15	96	55
Total Respondent	40				
Highest Score	5				
Total Score	166				
Total Perfect Score	200				
Percentage	83				

Q5					
Score	1	2	3	4	5
No. of Respondent			6	19	15
Total Per Score	0	0	18	76	75
Total Respondent	40				
Highest Score	5				
Total Score	169				
Total Perfect Score	200				
Percentage	85				

Q6					
Score	1	2	3	4	5
No. of Respondent			3	14	23
Total Per Score	0	0	9	56	115
Total Respondent	40				
Highest Score	5				
Total Score	180				
Total Perfect Score	200				
Percentage	90				

Q7					
Score	1	2	3	4	5
No. of Respondent			6	8	26
Total Per Score	0	0	18	32	130
Total Respondent	40				
Highest Score	5				
Total Score	180				
Total Perfect Score	200				
Percentage	90				

Q8					
Score	1	2	3	4	5
No. of Respondent			4	7	29
Total Per Score	0	0	12	28	145
Total Respondent	40				
Highest Score	5				
Total Score	185				
Total Perfect Score	200				
Percentage	93				

Q9					
Score	1	2	3	4	5
No. of Respondent				9	31
Total Per Score	0	0	0	36	155
Total Respondent	40				
Highest Score	5				
Total Score	191				
Total Perfect Score	200				
Percentage	96				

Q10					
Score	1	2	3	4	5
No. of Respondent			6	9	25
Total Per Score`	0	0	18	36	125
Total Respondent	40				
Highest Score	5				
Total Score	179				
Total Perfect Score	200				
Percentage	90				

Faculty Survey Questions

Q1	The login interface is easy and appropriate.
Q2	The interface is normal and appealing.
Q3	The screen layout design is appropriate.
Q4	The application is easy to navigate.
Q5	The application is easy to learn.

Q6	The functions of the application are well integrated.
Q7	The application is user friendly.
Q8	The application give error messages that are clear.
Q9	The information in the application is clear and organized.
Q10	The application helped to complete the task in the least amount of time.

Faculty Feedback Results

Q1					
Score	1	2	3	4	5
No. of Respondent				9	12
Total Per Score	0	0	0	36	60
Total Respondent	21				
Highest Score	5				
Total Score	96				
Total Perfect Score	105				
Percentage	91				

Q2					
Score	1	2	3	4	5
No. of Respondent				10	11
Total Per Score	0	0	0	40	55
Total Respondent	21				
Highest Score	5				
Total Score	95				
Total Perfect Score	105				
Percentage	90				

Q3					
Score	1	2	3	4	5
No. of Respondent				8	13
Total Per Score	0	0	0	32	65
Total Respondent	21				
Highest Score	5				
Total Score	97				
Total Perfect Score	105				
Percentage	92				

Q4					
Score	1	2	3	4	5
No. of Respondent				12	9
Total Per Score	0	0	0	48	45
Total Respondent	21				
Highest Score	5				
Total Score	93				
Total Perfect Score	105				
Percentage	89				

Q5					
Score	1	2	3	4	5
No. of Respondent				9	12
Total Per Score	0	0	0	36	60
Total Respondent	21				
Highest Score	5				
Total Score	96				
Total Perfect Score	105				
Percentage	91				

Q6					
Score	1	2	3	4	5
No. of Respondent				8	13
Total Per Score	0	0	0	32	65
Total Respondent	21				
Highest Score	5				
Total Score	97				
Total Perfect Score	105				
Percentage	92				

Q7					
Score	1	2	3	4	5
No. of Respondent				12	9
Total Per Score	0	0	0	48	45
Total Respondent	21				
Highest Score	5				
Total Score	93				
Total Perfect Score	105				
Percentage	89				

Q8					
Score	1	2	3	4	5
No. of Respondent			3	10	8
Total Per Score	0	0	9	40	40
Total Respondent	21				
Highest Score	5				
Total Score	89				
Total Perfect Score	105				
Percentage	85				

Q9					
Score	1	2	3	4	5
No. of Respondent				11	10
Total Per Score	0	0	0	44	50
Total Respondent	21				
Highest Score	5				
Total Score	94				
Total Perfect Score	105				
Percentage	90				

Q10					
Score	1	2	3	4	5
No. of Respondent			2	5	14
Total Per Score	0	0	6	20	70
Total Respondent	21				
Highest Score	5				
Total Score	96				
Total Perfect Score	105				
Percentage	91				

Lab Admin Users

Q1	User Interface is normal and appealing.
Q2	User login interface is easy and appropriate.
Q3	User interfaces is easy to navigate and user friendly.
Q4	User functions are well integrated.
Q5	The response time of the application is fast.
Q6	The user interface gives clear error messages.
Q7	The information is organized and clear.
Q8	The application is consistent.
Q9	The application is efficient.
Q10	The application is able to complete a task in the least amount of time.

Lab Admin Users Feedback Results

Q1					
Score	1	2	3	4	5
No. of Respondent				7	6
Total Per Score	0	0	0	28	30
Total Respondent	13				
Highest Score	5				
Total Score	58				
Total Perfect Score	65				
Percentage	89				

Q2					
Score	1	2	3	4	5
No. of Respondent				5	8
Total Per Score	0	0	0	20	40
Total Respondent	13				
Highest Score	5				
Total Score	60				
Total Perfect Score	65				
Percentage	92				

Q3					
Score	1	2	3	4	5
No. of Respondent				4	9
Total Per Score	0	0	0	16	45
Total Respondent	13				
Highest Score	5				
Total Score	61				
Total Perfect Score	65				
Percentage	94				

Q4					
Score	1	2	3	4	5
No. of Respondent				5	8
Total Per Score	0	0	0	20	40
Total Respondent	13				
Highest Score	5				
Total Score	60				
Total Perfect Score	65				
Percentage	92				

Q5					
Score	1	2	3	4	5
No. of Respondent				6	7
Total Per Score	0	0	0	24	35
Total Respondent	13				
Highest Score	5				
Total Score	59				
Total Perfect Score	65				
Percentage	91				

Q6					
Score	1	2	3	4	5
No. of Respondent				7	6
Total Per Score	0	0	0	28	30
Total Respondent	13				
Highest Score	5				
Total Score	58				
Total Perfect Score	65				
Percentage	89				

Q7					
Score	1	2	3	4	5
No. of Respondent				3	10
Total Per Score	0	0	0	12	50
Total Respondent	13				
Highest Score	5				
Total Score	62				
Total Perfect Score	65				
Percentage	95				

Q8					
Score	1	2	3	4	5
No. of Respondent				3	10
Total Per Score	0	0	0	12	50
Total Respondent	13				
Highest Score	5				
Total Score	62				
Total Perfect Score	65				
Percentage	95				

Q9					
Score	1	2	3	4	5
No. of Respondent				4	9
Total Per Score	0	0	0	16	45
Total Respondent	13				
Highest Score	5				
Total Score	61				
Total Perfect Score	65				
Percentage	94				

Q10					
Score	1	2	3	4	5
No. of Respondent				6	7
Total Per Score	0	0	0	24	35
Total Respondent	13				
Highest Score	5				
Total Score	59				
Total Perfect Score	65				
Percentage	91				

Chapter V

DISCUSSIONS

Building an application for the Web is not an easy task. It has been an endeavor to start the application from the design and the functionalities that is required to make the system work most efficiently. The proponent was able to learn how to plan the system, choosing the right hardware, selecting a framework for the software to design the appropriate user interface for different users, and create a data repository in the form of a database where the users can perform their task. All of these are combination of hardware and software and the operation to make the application as a system to work efficiently. The challenge is how to plan and design an application that will provide a way or a tool to make the task of the users easier.

Maintenance Plan

The initial system as a web application in a form of a website is not yet complex. It still needs improvement when comes to features. These features will help the user to efficiently use the application in the future.

To maintain the system, the following are needed:

Routine Website and Server Maintenance

This includes security updates and installation of up-to-date software and optimizations for enhancement of speed and performance.

Continuous Improvements

As time goes by the website also needs to improve to catch up with the trends. Features need updates for the users. This can be achieved by means of feedback from the users.

Security and Contingencies for Emergencies

Usually, problems will arise and something may go wrong. This problem could internal or external (this could be the server slowing down or an intruder or a hacker penetrating your website). The website will need a Team that will make sure that the system will be up and running, defend and secure the website for any malicious activities. The Team must be ready for any emergency.

Improving Website Coding

Coding is needed and part of the enhancement procedure for the website's features. This can be done by tools that will the programmer or designer to improve the responsiveness of the system.

Monitoring and Reporting the Performance

Investing time and money on websites is common. Gathering data is important to make sure your website is on the right track. Again, this can be done by feedback and suggestion by means of surveying. This will ensure the future of the website when it comes to enhancing and optimizing the performance.

Chapter VI

CONCLUSION

As stated in the problem domain. The study aims to improve the current inventory of records logs files related to students that access computer laboratories. Again, these are managed through the spreadsheets like Excel. It is focused to fix the drawbacks:

1. Ineffectiveness pertaining to data entry errors.
2. Tediousness operations while creating presentable reports.
3. Lack of authorization and security (i.e. possibility of tampering of records).
4. Non-availability of information pertaining to records alteration/update time-stamps and user identification.

This is significant since it will benefit the Laboratory Technicians, Instructors, and Students. It will enhance the operation of the service request and management of the computer lab inventory and resources. Reducing the time needed to make a request and perform management and task through the inventory.

By providing the web service, the students and laboratory instructors will be to perform their service requests online. The management of inventories can be done online. A faster, secure, and efficient way of monitoring, retrieving data, information and generating reports will be done in the least amount of time.

Chapter VII

FUTURE WORK

As for now, the system (web service) is not yet a part of the official website of PRINCE MOHAMMED BIN FAHD UNIVERSITY. In the future, after the approval of the PMU management and seeing the potential of the web service, they may incorporate the system as part of their website. The research can also become a basis or step for other future research that is relevant. Future proponents can include this study to be a part of their literature.

The following features will be integrated into the system in the future:

- A user validation for Faculty and Students will be provided for Security and Authentication when they create a new users account. When the user registers a new account, a validation code will be given via their PMU official email account.
- For the Lab Admin / Lab Technician account, it will be allowed to assign multiple Computer laboratories to manage.

Moreover, hopefully in the future, the web service will be further improved by future developers and designers.

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APPENDICES

[1] Source Code: https://gitlab.com/charmainecruz.up.ph/is295bproject

[2] User Acceptance Test: See Appendix A

Appendix A. User Acceptance Certificate

جامعة الأمير محمد بن فهد
PRINCE MOHAMMAD BIN FAHD UNIVERSITY

CERTIFICATE OF ACCEPTANCE

Is hereby granted to

Miss Charmaine Bioca Cruz

Has completed the project **"Computer Laboratory Management System for Prince Mohammed Bin Fahd University Website"** which was evaluated last Tuesday, December 21, 2021.

This is to further certify that the required output have been verified and fully accepted by the Dean and Chairs of College of Computer Engineering and Science.

Issued on December 23, 2021 in Prince Mohammed Bin Fahd University, Alkhobar, Kingdom of Saudi Arabia

Dr. Ghassen Ben Brahim
Dean, CCES

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المملكة العربية السعودية
تلفون : ٤٥٦٩ ٨٤٩ ١٣ ٩٦٦+
فاكس : ٤٥٦٨ ٨٩٦ ١٣ ٩٦٦+