FACULTY OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY
UNIVERSITI MALAYA

PROGRAM ACADEMIC ACCREDITATION SYSTEM

ACADEMIC PROJECT 1 REPORT
WIA3002 ACADEMIC PROJECT 1
SEMESTER 1 2023/2024

DARRELL BECKLEY ANAK JOHNSON
17075190/2

SUPERVISOR: PROF. TS. DR. RAFIDAH BINTI MD NOOR

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Firstly, I would like to express my appreciation to my parents and my siblings for the support that they have given me throughout the way. During hard times, the encouragement and the moral support from my family has helped me to continue. Especially to my sister, Vallirie Easter, for her help and advice on web development of the project.

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Once again I would like to express a heartfelt gratitude to everyone.

ABSTRACT

As the world becomes more advanced, education will also need to keep up with technological advancement. As such, more and more people are aiming to attend universities or higher education institutes. In response, universities and higher education institutes are taking more action to ensure that the education provided is of high-quality in order to attract more people to attend their programs. The action taken is the accreditation process which helps to verify their high-quality education. A university can have multiple programs, and as time goes on, more and more programs are created for various fields of studies. In Universiti Malaya, the body that has been given the authority to carry out this process is the Quality Management and Enhancement Centre (QMEC). This project aims to develop a program academic accreditation system which will help QMEC to organise their data. To ensure that problems such as unorganised data, missed communication and zero data visualisation, the system developed will be aiming to develop a system that will help organise the data, alert the users (faculty user and admins) as well as create a data visualisation to help the admin perform their task more efficiently.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

In the last two decades, the improvement that has been experienced is so great which then saw the increase in the number of students applying for higher education. These in turn increased their likelihood for a better career in the future (Atia et al., 2020). With that in mind, the higher education system in Malaysia has also developed rapidly since the country's independence back in 1957 (Crosling, 2017). In order to ensure that the students get high quality education in line with Malaysia's aim to become an international and regional educational hub, it is necessary for Malaysia's Higher Education Institute's academic programs to be accredited by going through an accreditation process.

Accreditation is a process that is voluntary where an institution or a program goes through with the objective of improving its academic standard and therefore ensures that the students will receive quality education and training (Acevedo-De-Los-Ríos & Rondinel-Oviedo, 2021). Due to the globalisation of higher education, the universities all around the world including Malaysia are taking more action in ensuring that their programmes are achieving high level qualification which will improve their standings in the international standings (Acevedo-De-Los-Ríos & Rondinel-Oviedo, 2021). In Malaysia, the body that is responsible for verifying the accreditation process is the Malaysia Qualifications Agency (MQA). The MQA are responsible to ensure that the higher education institutes are up to the standard which will then reflect in the international ranking and hence promote Malaysian qualification and gain international recognition (Suvin, 2023). The accreditation process in Malaysia involves a strict evaluation where the institution and programs will be judged based on established standards such as quality of teaching, learning, research and others in accordance with the Malaysian Qualifications Framework (MQF).

In order for Universiti Malaya to achieve the qualification, the Quality Management and Enhancement Centre (QMEC), Universiti Malaya, is entrusted with the task of managing quality assurance and enhancement activities relating to the University's core processes (qmec@um.edu.my, 2022). All of the accreditation process also follows the requirements of the Malaysian Qualifications Framework (MQF) based on the Quality Management System (QMS).

1.2 Aim and Objectives

The aim of this project is to develop a program academic accreditation system for QMEC. The system will help the users to view the data in a more systematic way. This is to ensure that the users are able to handle the accreditation data smoothly.

The objective of this project are as follow:

1. To develop a Programme Academic Accreditation management system for easy use instead of using excel sheets.
2. To analyse which academic program is due for accreditation.
3. To provide notification to the faculties to prepare a report for accreditation.
4. To evaluate the data and then create a chart to visualise the data.

1.3 Problem Statements

The problem statements will be described in this section.

1.3.1 Unorganised data

Currently, the QMEC admins are using an excel sheet file to keep track of the list of programs that needs to be accredited. As there are numerous faculty and programs that are offered by Universiti Malaya, there will be a need to keep track of all these programs as well as their own deadline in which they need to send a report in order to be accredited. By using an excel sheet, it is hard on the eyes to view the list of the programs and the information of those programs one by one.

1.3.2 Faculty users are unaware of deadline for submissions

As previously stated, the current method of keeping the data is by using the excel sheet. This excel sheet is only accessible by the admins in QMEC. Therefore the admin in QMEC needs to inform the faculty users manually one by one in regards to the deadline of report submission. As there are a lot of programs, sometimes some faculty users are missed out due to human error and do not receive a notice from QMEC regarding the deadline. This will result in the program not being able to be accredited properly as the documents needed are missing.

1.3.3 There are no way to visualise the data

Due to the current data being kept in an excel sheet file. There is no way for the admin to view the data in a more easier way such as using a chart to visualise the data.

Without a way to visualise the data, it will make it harder for the admin in QMEC to identify the data that they need to view urgently. Using the excel sheet, they would have to look at the data line by line and row by row which is a tedious and inefficient way of looking for the information needed especially if the data is needed urgently. This will be time consuming for the admin to look through the data one by one.

CHAPTER 2: LITERATURE REVIEW

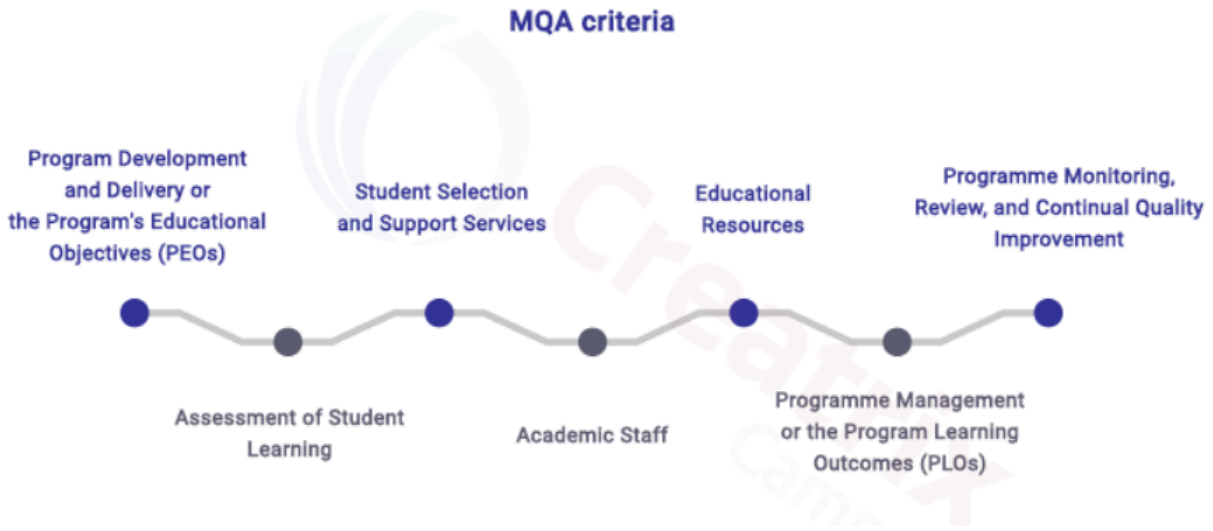
2.1 Introduction

This chapter will focus on the MQA Accreditation process as well as the existing systems that are being used to manage the data for the accreditation process. Through that we will be able to look at the pros and cons of each system and look at how we can address the problem at hand.

2.2 MQA Accreditation Process

The accreditation process used by the MQA is done in such a way so that institutions provide and maintain a high-quality education to the students while also complying with the needs of the community when the students graduate from that said institute. As mentioned in the previous chapter, an accreditation process is completely voluntary but due to globalisation, institutes are seeing this process as a necessary step in ensuring that they remain competitive in the higher education market while also increasing their reputation (Suvin, 2023). To carry out this process, MQA has set certain standards and criteria which will be used to assess the quality and standard of higher education. These criteria are based on the MQF which covers different aspects of their education system, namely curriculum, teaching and learning, assessment, student report services, research and development, and facilities and resources. The figure below shows the criteria which are being used by the MQA for the accreditation process.

Figure 1: MQA Criteria



Note. Suvin, M. C. (2023, March 20). MQA Criteria. Creatrix Campus. https://www.creatrixcampus.com/blog/guide-mqa-accreditation-process-higher-educational-institutions

As Suvin (2023) explained in her article:

The MQA's quality assurance framework is based on the following seven criteria:

1. Program Development and Delivery or the Program Educational Objectives (PEOs): This criterion assesses the extent to which the program's educational objectives are aligned with the needs of the industry and society.
2. Assessment of Student Learning: This criterion evaluates the methods used to assess student learning and how well they align with the program's learning outcomes.
3. Student Selection and Support Services: This criterion evaluates the methods used to select and support students in the program.
4. Academic Staff: This criterion evaluates the academic staff's qualifications, experience, and competence in delivering the program.
5. Educational Resources: This criterion evaluates the facilities, infrastructure, and resources available to support the program, including libraries, laboratories, and other support services.
6. Programme Management or the Program Learning Outcomes (PLOs): This criterion evaluates the program's learning outcomes and how they align with the program's educational objectives. Programme Monitoring, Review, and Continual Quality Improvement.

Moving on, the MQA will have to follow a process in which they will evaluate the institution or program. Figure 2 below shows the process used by the MQA.

Figure 2: MQA Process

Note. Suvin, M. C. (2023, March 20). MQA Process. Creatrix Campus. https://www.creatrixcampus.com/blog/guide-mqa-accreditation-process-higher-educational-institutions

Firstly, institutes that wish to be evaluated have to undergo an eligibility assessment to ensure that they meet the minimum criteria for accreditation. Second, the institute now has to prepare a detailed report on their institute or program based on the MQA criteria and standard mentioned before. With that in mind, the institute has to make sure that the report details how their institute or programs meets the criteria and standard of MQA. Next, once the report has been submitted, a representative of the MQA will be doing a site visit in order to evaluate the report. Once the visit is finished, a review report will then be done where the MQA will then decide whether the institute or programs meets the criteria and standards. Once the decision is done, if the criteria and standards are accepted, the institute or program will receive an accreditation certificate. Institutes that are accredited will have to follow the periodic follow-up to ensure that they continue to meet the criteria and standards of MQA (Suvin, 2023).

2.3 Existing System

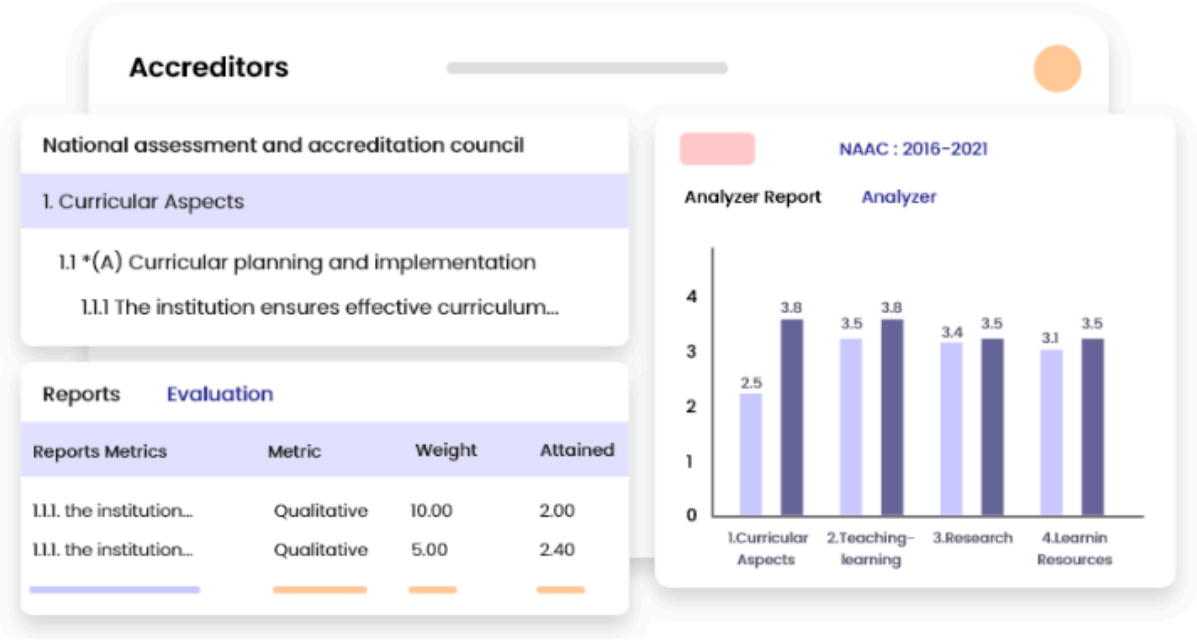
Listed here are some of the existing systems that are relevant to the proposed project.

2.3.1 Accreditation Management Software by Creatrix Campus

The first system that we will be looking at is the Accreditation Management Software by Creatrix Campus. The system allows the users to submit their report and have the system analyse the content of the report and the possible attained weightage based on

the report. The dashboard also allows the user to look over their data for the accreditation process.

Figure 3: A platform to plan, assess, analyze



Note. Accreditation Management Software. (n.d.). A platform to plan, assess, analyze. Creatrix Campus. https://www.creatrixcampus.com/accreditation-management-software

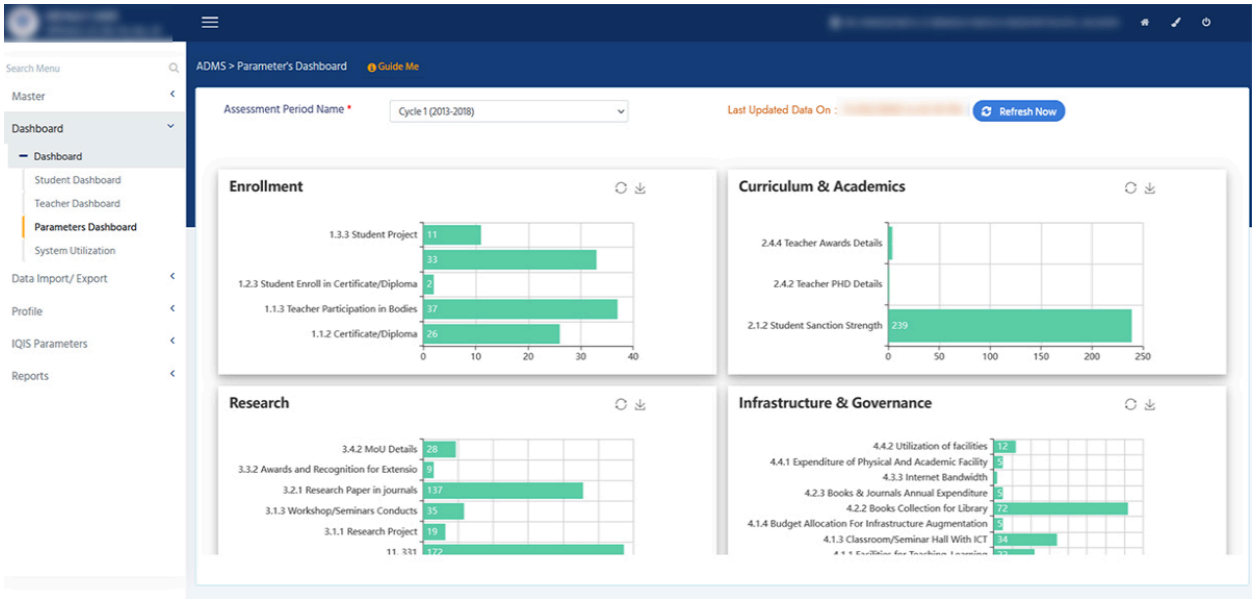
Figure 4: Better process visibility

Note. Accreditation Management Software. (n.d.). Better process visibility. Creatrix Campus. https://www.creatrixcampus.com/accreditation-management-software

2.3.2 Accreditation Data Management System by MasterSoft

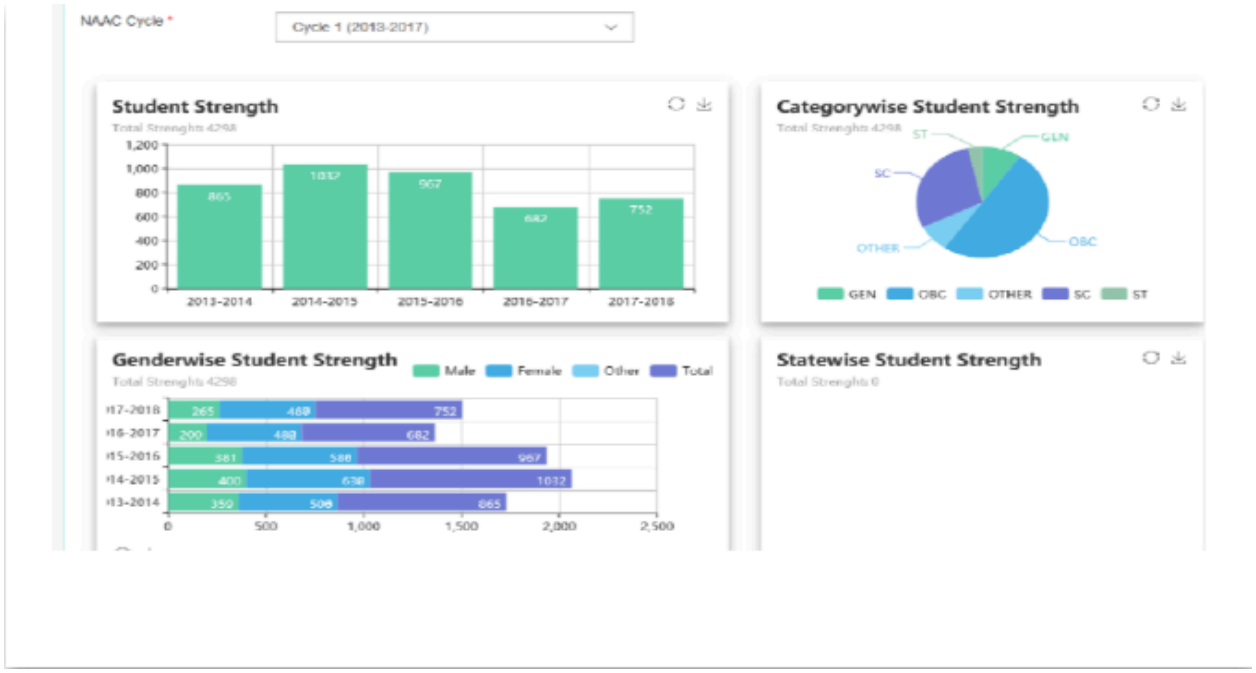
The second system is the Accreditation Data Management System by MasterSoft. The system, unlike the previous one, allows multiple users to submit data to the same programs which allows for more efficient work as multiple people can handle different aspects of the data. It also allows the user to visualise the data using charts and bars. The system also allows the user to generate a report based on the data acquired and based on the accreditation format needed.

Figure 5: Parameter's Dashboard



Note. MasterSoft. (n.d.). Best Accreditation Software - Accreditation Management System. https://www.iitms.co.in/products/accreditation-data-management-system/

Figure 6: Student Dashboard

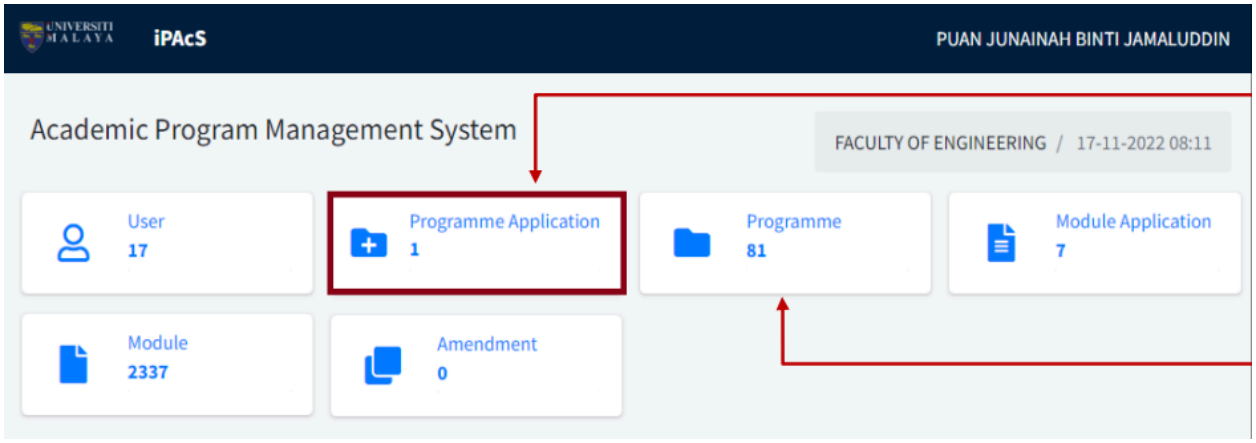


Note. MasterSoft. (n.d.). Best Accreditation Software - Accreditation Management System. https://www.iitms.co.in/products/accreditation-data-management-system/

2.3.3 Academic Programme Management System (iPAcS)

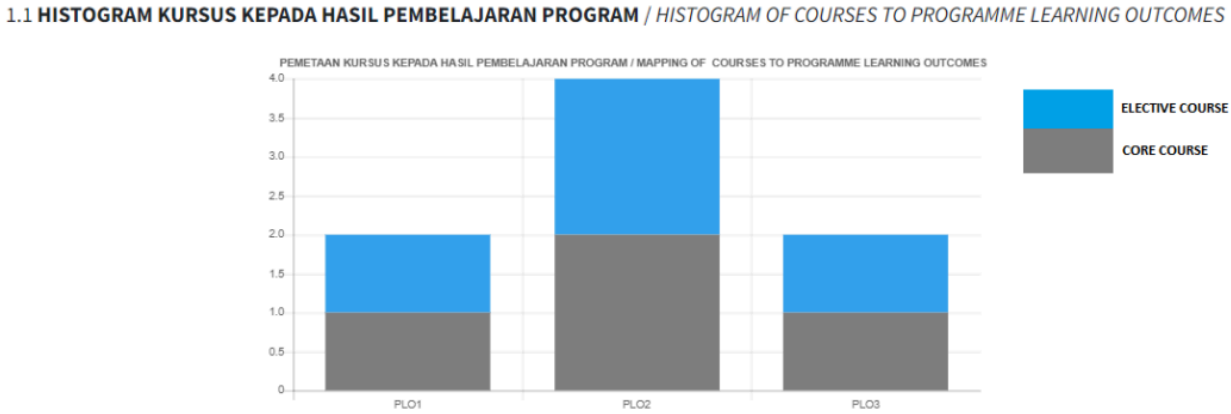
The next system is the Academic Programme Management System (iPAcS) by Universiti Malaya. The system helps the users to input their modules and courses inside the system to ensure that the data is being kept systematically. The system's primary function is to register the course or modules for a program and as such does not have the ability to be used as an accreditation system. The data collected are merely the specification of the course and not data that are used for the evaluation based on the MQA criteria and standard. There are also no alert functions and the data visualisation is only limited to the amount of course or the type of course.

Figure 7: Dashboard



Note. Universiti Malaya. (n.d.). ACADEMIC PROGRAMME MANAGEMENT SYSTEM (iPAcS) [Slide show]. https://portal.um.edu.my/doc/akademik/ASP%20CENTRE/Unit%20Analitik%20Pembelajaran/2022/Slide%20Demo%20IPACS%20(Siri%202)_28.02.2023v2.pdf

Figure 8: Histogram of courses



Note. Universiti Malaya. (n.d.). ACADEMIC PROGRAMME MANAGEMENT SYSTEM (iPAcS) [Slide show].

https://portal.um.edu.my/doc/akademik/ASP%20CENTRE/Unit%20Analitik%20Pembelajaran/2022/Slide%20Demo%20IPACS%20(Siri%202)_28.02.2023v2.pdf

2.4 Existing System Comparison

The table below shows the comparative analysis between the existing system.

System Name	Dashboard	Message Alert	Data Visualisation	Availability
Accreditation Management Software by Creatix Campus	A simple dashboard where users can navigate to different pages	Exist	Great data visualisation	Paid to use
Accreditation Data Management System by MasterSoft	Multiple dashboard for different purposes	None	Great data visualisation	Paid to use
Academic Programme Management System (iPAcS) by Universiti Malaya	A simple dashboard where users can navigate to different pages	None	Limited visualisation	Free to use

Table 1: System Comparison

CHAPTER 3: METHODOLOGY

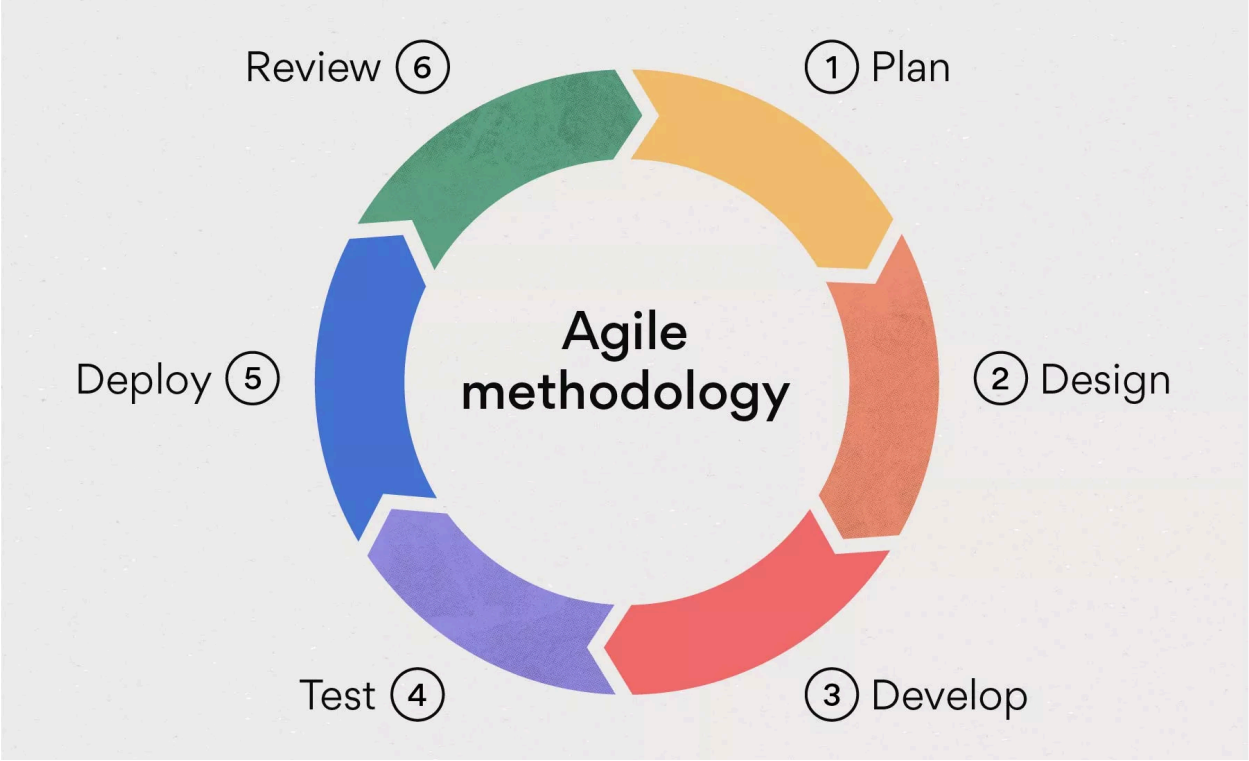
3.1 Introduction

This chapter situates the study of Accreditation and Accreditation System with the help of previous research, scholarly and articles pertaining to the subject so that an analysis on the subject can be done and thus help to resolve the problems mentioned in earlier chapter.

To answer the purpose of the study, a qualitative research methodology is used. It mainly focuses on literature and reports drawn from secondary sources such as books, e-books, official websites, articles and other scholarly research on accreditation.

3.2 Methodology: Agile

Figure 9: Agile methodology



Note. Laoyan, S. (2022, October 15). Agile methodology. Asana. https://asana.com/id/resources/agile-methodology

Based on the figure above, the agile methodology is used to develop the system. There are six phases in the agile methodology which are, plan phase, design phase, develop phase, test phase, deploy phase and lastly, the review phase.

On the first phase, which is the plan phase, interviews and discussion with the stakeholders in order to define the project requirements. Aside from that, literature review on the subject of accreditation and accreditation system is being carried out in order to analyse how the proposed system can help fulfil the requirements for the stakeholders. The second phase which is the design phase, a proposed solution will be designed based on all the information that has been gathered during the first phase. UML diagrams such as the flow chart and the use case diagram are designed to better visualise the flow of the system to the stakeholders. Moving on to the third phase which is the develop phase, a simple prototype will be made in the early stages of the phase and will then be presented to the stakeholders on how the proposed system will roughly look like. Once approved, the project will focus on building the system based on the base or the prototype of the project. Next, the project will move on to the next phase which is the test phase, where the performance of the system will be tested. Any bugs or errors faced during this phase will then be solved until a satisfactory and stable system is reached. After that, the project will move on to the deploy phase where the system will be deployed into the user's work environment with the help of the project stakeholders. Lastly, during the review phase, feedback and reviews from stakeholders and users will be taken into account to further improve the system if any.

CHAPTER 4: ANALYSIS AND DESIGN

4.1 Introduction

This chapter will cover stakeholders for the project and the proposed system architecture and system design for the project. Diagrams are used to illustrate the system's requirements and process.

4.2 Stakeholders Collaboration Initiative

The program academic accreditation system is a project that is being done in collaboration with the Quality Management and Enhancement Centre (QMEC), Universiti Malaya. The product of this project will then be deployed and used by QMEC. On the 9th October 2023, a virtual meeting with Professor Ts. Dr. Rafidah Md Noor was held to discuss the project requirements for the system.

Figure 10: Virtual Meeting with Professor Ts. Dr. Rafidah Md Noor

4.3 Requirements

In order to achieve the objectives for the project, several requirements need to be fulfilled in order for the system behaviour to be in line with stakeholder's requirements.

4.3.1 Functional Requirements

ID	Module	Requirements
FR-01	Dashboard	The system shall allow the faculty user to view the list program that they manage
FR-02		The system shall allow the faculty user to view the status of program that they manage
FR-03		The system shall allow the admin to view all the program available
FR-04		The system shall allow the admin to view the list of program that needs full accreditation
FR-05		The system shall allow the admin to view the list of program that needs reaccreditation
FR-06	Login	The system shall authenticate faculty users and admins during login
FR-07	Registration	The system shall allow admin to register new faculty users
FR-08	Upload	The system shall allow faculty users to upload documents to the system
FR-09	Download	The system shall allow the admin to download the documents uploaded by the faculty users.
FR-10	Alert	The system shall alert and send email to faculty users and admin regarding submission deadline

Table 2: Functional Requirements

4.3.2 Non-Functional Requirements

ID	Requirements	Priority
NFR-01	The system shall provide an easy-to-use interface	Usability
NFR-02	The system shall operate on Google Chrome, Mircosoft Edge, Firefox, and Safari	Portability
NFR-03	The system shall allow only authorized user to login the system	Security

Table 3: Non-Functional Requirements

4.4 Flowchart

The figure below will show the flowchart of the system for the faculty user as well as for the admin:

Figure 11: Faculty User Flowchart

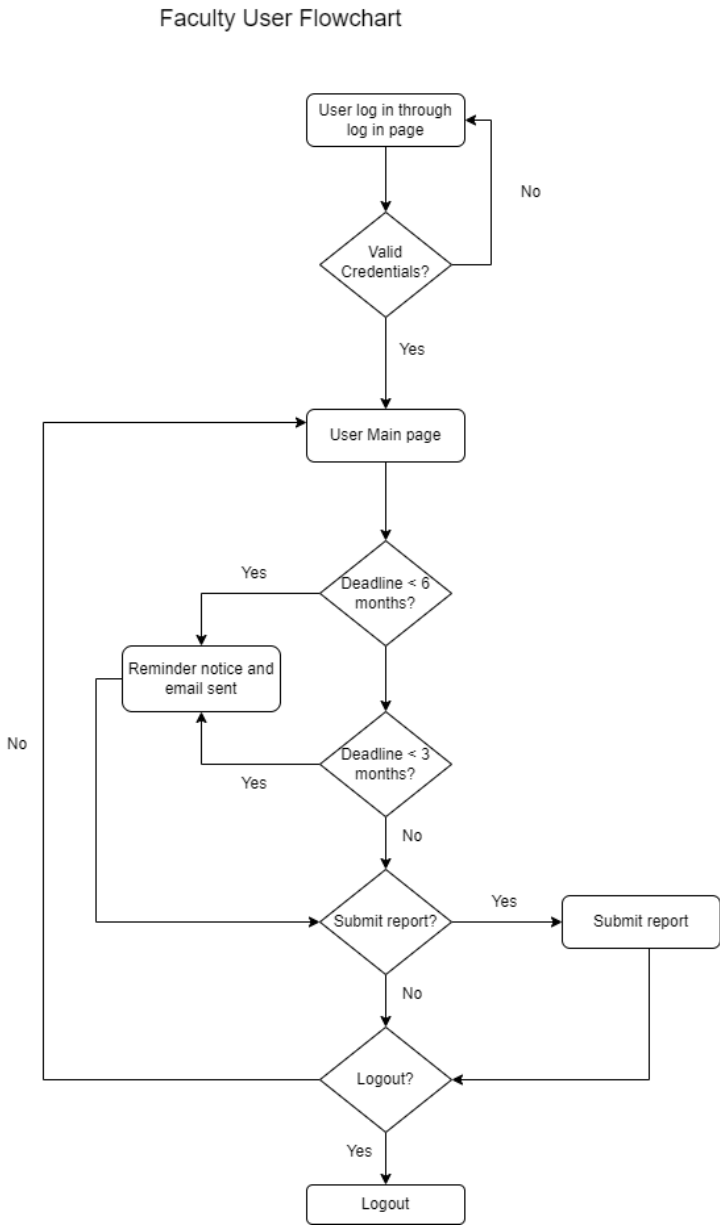
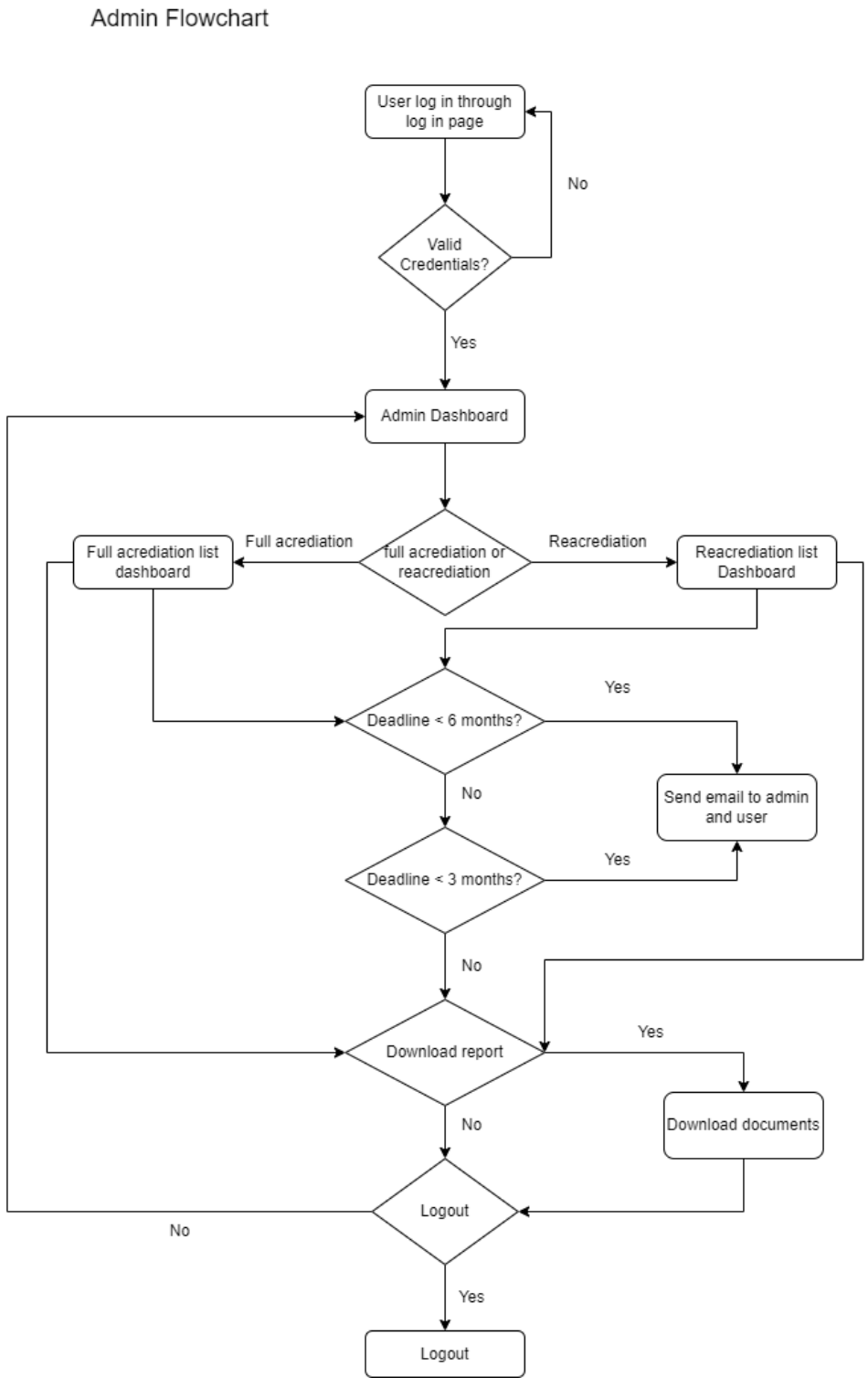


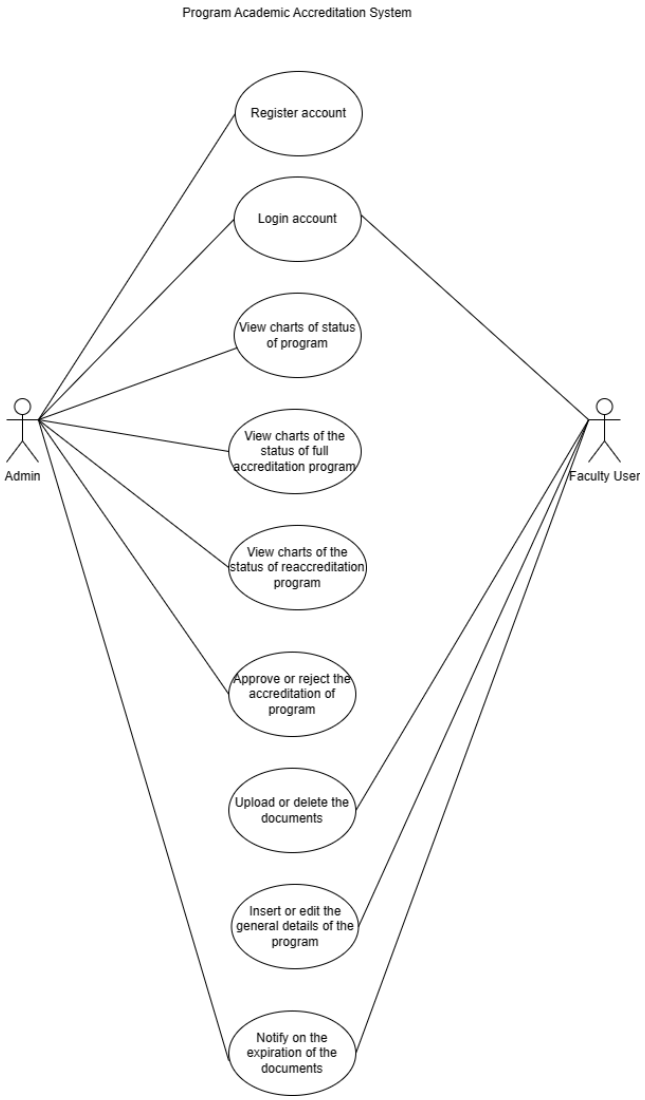
Figure 12: Admin Flowchart



4.5 Use Case Diagram

The system's use case diagram for the users are shown below. The use case describes the behaviour of the program academic accreditation system. The use case consists of 2 actors which are the faculty user and the admin.

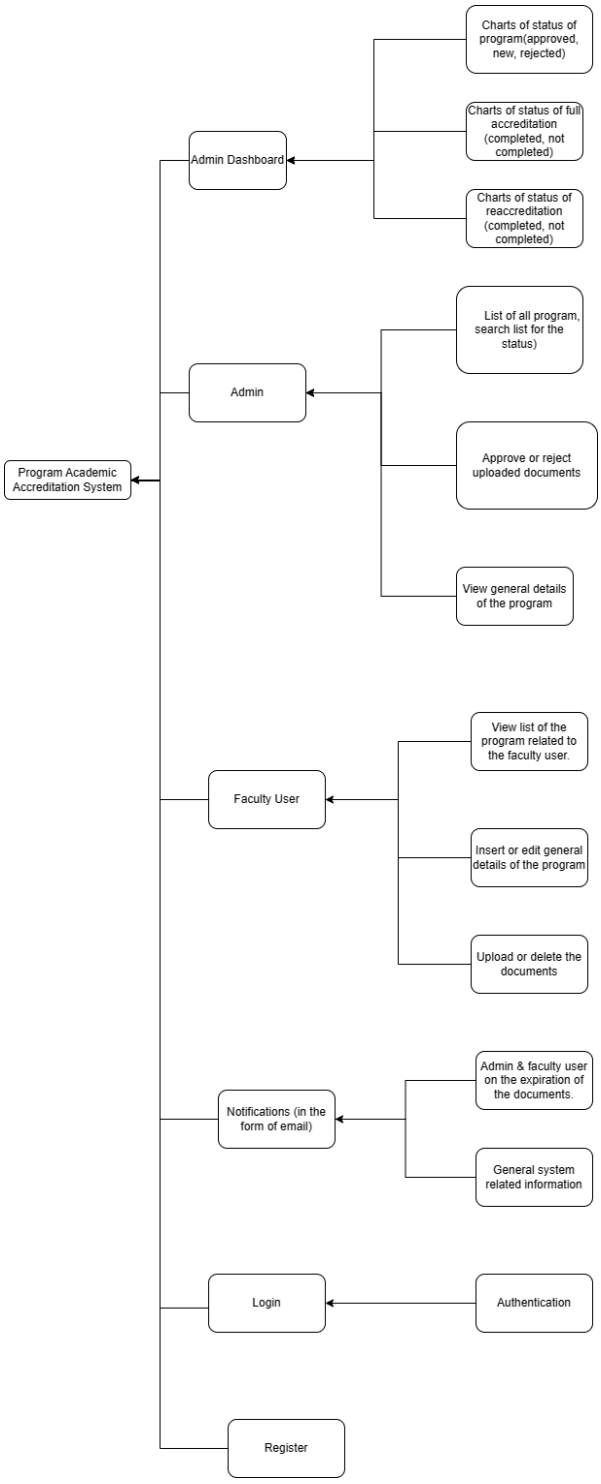
Figure 13: Use case diagram



4.6 Module Diagram

The module diagram will further describe the modules that were mentioned previously. A more detailed view on the module will be shown in the module diagram.

Figure 14: Module diagram



CHAPTER 5: SYSTEM DEVELOPMENT

5.1 Introduction

This chapter details the technical implementation for the project as well as the demonstration of the mock user interface.

5.2 Technical Implementation

The tools used for the implementation of the program academic accreditation system will be described here.

5.2.1 Web Server Framework

The framework that is used for the web server is the ASP.NET Core. ASP.NET Core is an open-source Microsoft framework that is robust and easy to understand. ASP.NET Core has a variety of compatible packages and extensions which helps developing the web server become more structured and easier. Despite being a framework, ASP.NET Core can also use different types of programming languages to help with system development such as C#, HTML, CSS, and JavaScript..

ASP.NET Core offers packages such as DevExpress which makes the development for dashboard and report easier. Besides that, ASP.NET Core also uses a Model-View-Controller (MVC) architecture. For example, a model represents data that is stored in the database, while the view is an interface where the user can interact and view the data. The controller would be the conduit in the middle between the model and view which handles the request for the data and then processes it before returning the view to the user. ASP.NET Core also has a built-in object-relational mapper (ORM) which allows easy interaction with databases.

Figure 15: ASP.NET Core Logo

5.2.2 C#

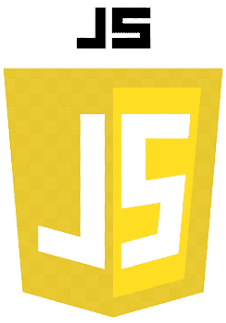
The back-end programming language of the accreditation system will be using C#. C# is the programming language that can be used along with the ASP.NET Core framework. C# is an object-oriented programming language which makes the process of developing the website easier. Besides, it is one of the most popular programming languages for website development.

Figure 16: C# Logo

5.2.3 JavaScript

For the front-end of the accreditation system, JavaScript will be used for the pop-up message or other error messages to alert the user. JavaScript makes the accreditation system become more interactive with the users.

Figure 17: JavaScript Logo



5.2.4 HTML

Hypertext Markup Language (HTML) will be used for the front-end of the accreditation system. It is used to build the structure and content of the website such as how the form will be displayed.

Figure 18: HTML Logo

5.2.5 CSS

Cascading Style Sheets (CSS) will be used along HTML for the structure of the website. It is used for styling the website such as modifying the size, position, and the spacing of the content.

Figure 19: CSS Logo

5.2.6 Database

The Accreditation System will use Microsoft SQL Server (MSSQL) as the database for the project. MSSQL is a relational database management system that uses SQL (Structured Query Language).

Figure 20: MSSQL Logo

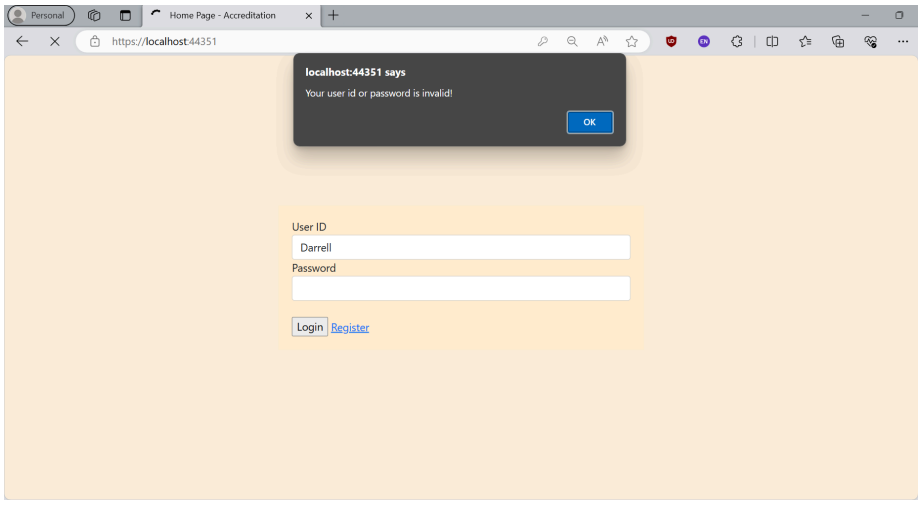
5.3 User Interface

In this section, the user interface for the program academic accreditation system is displayed. Disclaimer, this is not a fully functional prototype yet and is still being developed at the moment.

5.3.1 Login Page

The figure below shows the login page where users will login to the system by using valid login credentials. In this page, only existing users with correct user name and password will be allowed to login.

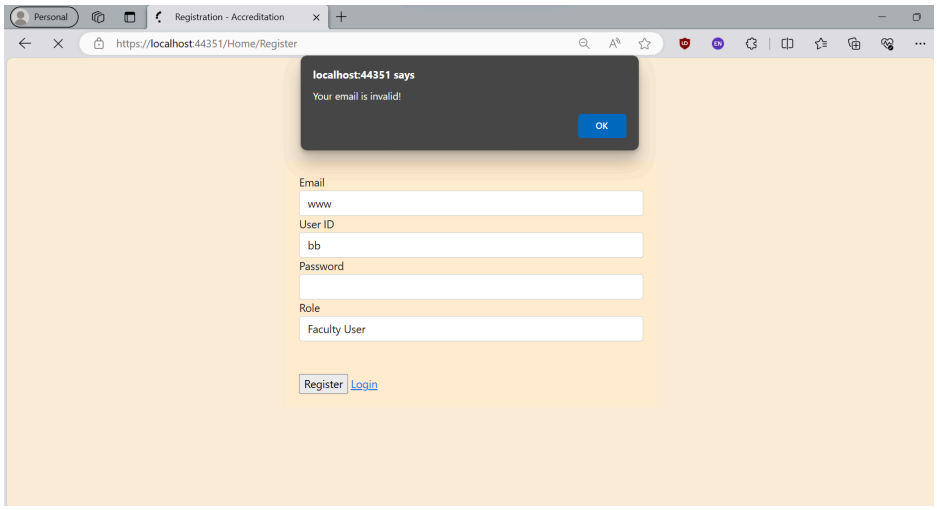
Figure 21: Login Page



5.3.2 Register

In the register page, users can register the account if they do not have any account yet. The validation of the email and existing username, password, and the email are available in the register page.

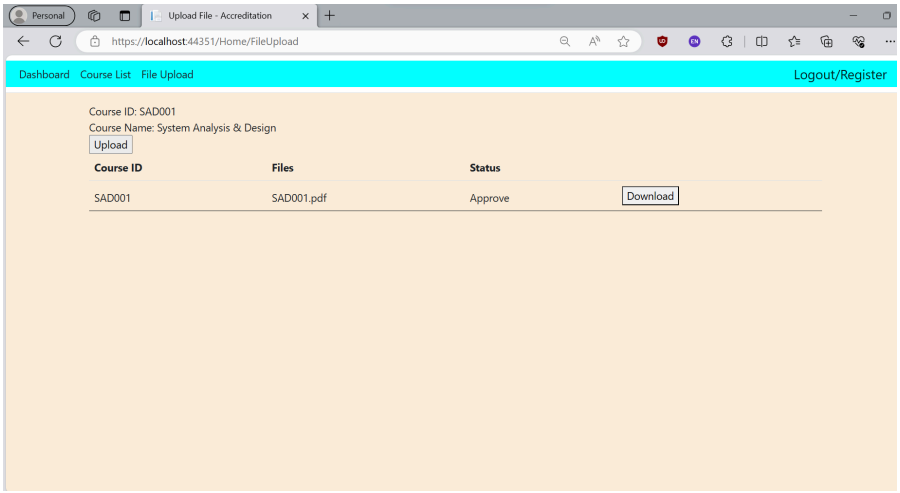
Figure 22: Register Page



5.3.3 File Upload page

In this section, the faculty user can upload and download the documents for the accreditation of the program.

Figure 23: File Upload Page



CHAPTER 6: CONTRIBUTION

It is believed that the Program Academic Accreditation System would be able to help QMEC Universiti Malaya to organise their data in a better view. The implementation of the alert system will also help with better timely submission of important documents for the accreditation process and ensure no programs are left out during the accreditation process. The chart will help QMEC admin to better view the data to find out important statistics of programs that need to be accredited.

CHAPTER 7: CONCLUSION

In conclusion, the Program Academic Accreditation System is developed to help in organising the data for QMEC admins. Once the system is functional, this will help the admin to organise their data better. With the proposed development of the alert system, the system will be able to hopefully solve the problem of the faculty users being oblivious to the documents submission deadline.

The gap found in the first part of the project is the lack of knowledge in the accreditation process and also an average level of mastery on the tools used for the technical implementation. In order to address this issue, a more frequent update shall be done with the stakeholders and supervisor and also continuing in developing the system throughout the duration of the semester break.

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