INTERNATIONAL CENTRE MANAGEMENT SYSTEM

By
MUHAMMAD IRFAN HAKIMI BIN YAHYA

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THESIS CONFIRMATION AND APPROVAL

This is acknowledged and confirmed that the thesis entitled: **International Centre Management System** by **Muhammad Irfan Hakimi Bin Yahya** Matric No.: **S65610** have been checked and all the suggested corrections have been done. The thesis is submitted to the Faculty of Computer Science and Mathematics, Universiti Malaysia Terengganu in partial fulfilment of the requirements for the award of the degree of Bachelor of Computer Science (Software Engineering) with Honours.

Authorized by:

....   Date:....................

Main Supervisor
Name: Assoc. Prof. Ts. Dr Masita @ Masila Abdul Jalil
Official Stamp:

....   Date:....................

FYP Coordinator
Bachelor of Computer Science (Software Engineering) with Honours
Name: Dr. Rabiei Mamat
Official Stamp:

DECLARATION

I hereby declare that this thesis is the result of my own research except as cited in the references.

Signature   :
Name   :   Muhammad Irfan Hakimi Bin Yahya
Matric No. :   S65610
Date   :

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INTERNATIONAL CENTRE MANAGEMENT SYSTEM

ABSTRACT

Today, many universities are working hard to become more global. At Universiti Malaysia Terengganu (UMT), managing international students and staff is very important, but the current process is still manual and not well organized. Because of that, this project was carried out to create an International Centre Management System (ICMS) to make it easier to manage visa records and travel abroad applications. The purpose of this project is to build a web-based system that helps staff do their work faster, reduces mistakes, and improves communication. The method used to develop the system is the Waterfall model, and the system was created using PHP, CodeIgniter 3, and Oracle Database. This system has two main functions: the visa module, which stores information about international students and staff and sends email reminders one month before the visa expires, and the travel abroad module, which allows staff to apply for travel and get approval updates through email. A dashboard is also provided to show charts and statistics about the number of international students and travel activities. After completing this project, we found that the system helped reduce processing time, improved communication with automatic emails, and made it easier to find and manage data. When compared to other systems like UM Mobility and UiTM Mobility, this system is more suitable for UMT's needs because it is more focused and easier to expand in the future. In conclusion, the International Centre Management System is useful for UMT and helps improve the way international matters are handled. As a recommendation, the system can be improved further by adding multi-language support, mobile access, and connection to immigration systems to make it even better.

SISTEM PENGURUSAN PUSAT ANTARABANGSA

ABSTRAK

Hari ini, banyak universiti sedang berusaha keras untuk menjadi lebih global. Di Universiti Malaysia Terengganu (UMT),pengurusan pelajar dan staf antarabangsa sangat penting,namun proses semasa masih dilakukan secara manual dan tidak teratur.Oleh itu,projek ini dijalankan untuk membangunkan Sistem Pengurusan Pusat Antarabangsa (ICMS) bagi memudahkan pengurusan rekod visa dan permohonan perjalanan ke luar negara. Tujuan projek ini adalah untuk membina sistem berasaskan web yang membantu staf menjalankan tugas dengan lebih pantas,mengurangkan kesilapan, dan meningkatkan komunikasi.Kaedah yang digunakan dalam pembangunan sistem ini adalah model Waterfall,dibangunkan menggunakan PHP, CodeIgniter 3, dan Oracle Database. Sistem ini mempunyai dua fungsi utama: modul visa, yang menyimpan maklumat pelajar dan staf antarabangsa serta menghantar peringatan e-mel sebulan sebelum visa tamat, dan modul perjalanan ke luar negara, yang membolehkan staf memohon perjalanan dan menerima kemas kini kelulusan melalui e-mel. Sebuah papan pemuka juga disediakan untuk memaparkan statistik berkaitan bilangan pelajar antarabangsa. Setelah projek ini disiapkan, didapati sistem ini membantu mengurangkan masa pemprosesan, meningkatkan komunikasi melalui e-mel automatik, dan memudahkan pencarian serta pengurusan data. Apabila dibandingkan dengan sistem lain seperti UM Mobility dan UiTM Mobility, sistem ini lebih sesuai dengan keperluan UMT kerana lebih fokus dan mudah untuk dikembangkan pada masa hadapan. Kesimpulannya, Sistem Pengurusan Pusat Antarabangsa ini sangat berguna untuk UMT dan membantu meningkatkan cara urusan antarabangsa dikendalikan. Sebagai cadangan, sistem ini boleh ditambah baik dengan sokongan pelbagai bahasa, akses mudah alih, dan sambungan ke sistem imigresen bagi menjadikannya lebih mantap.

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LIST OF ABBREVIATIONS

FR   Functional Requirement.
FSKM   Fakulti Sains Komputer dan Matematik.

IC   International Centre.
ICMS   International Centre Management System.

NFR   Non Functional Requirement.

UMT   Universiti Malaysia Terengganu.

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Project Background

This overview provides a brief summary of the project's purpose, highlighting its main functions and the advantages it seeks to deliver, offering a basis for understanding the project's aims and reasoning.

The International Student Management System (ISMS) is an online platform created to simplify and centralize the management of data for international students and staff within the university. Previously, the absence of a unified system for handling crucial information—such as visa records, partnerships, travel applications, and student mobility—led to fragmented processes and potential delays. The ISMS addresses these issues by offering a secure, centralized resource that enables administrative staff to access and manage records in real-time, reducing manual steps and potential errors.

Core features of the ISMS include automatic visa renewal reminders, data visualizations for partnerships, tracking for staff travel applications, and a streamlined approach to managing mobility programs. Designed with ease of use in mind, the ISMS improves accessibility for both staff and students, ensuring information is consistently up-to-date. Ultimately, the system enhances efficiency, data accuracy, and the level of support available for international students and staff at University Malaysia Terengganu.

1.2   Problem Statements

The university faces a significant challenge due to the absence of an integrated system to handle information for international students and staff. This gap makes it difficult to monitor essential data, such as visa statuses, partnership agreements, and travel plans, which can lead to inefficiencies and potential compliance risks.

The current system faces several operational challenges that affect efficiency and accuracy. Without a centralized database, accessing and updating information in real time becomes difficult, which often leads to delays and errors in managing student and staff records. These inefficiencies hinder effective monitoring and decision-making.

In addition, the system lacks an intuitive user interface, which reduces usability for both students and administrative staff, leading to frequent navigation errors and frustration. The absence of automated alerts further compounds the problem, as important deadlines such as visa renewals and mobility application updates can be overlooked. Moreover, the system offers limited tools for tracking mobility programs and travel abroad arrangements, making it difficult for staff to manage and oversee these processes effectively.

1.3 Problem Solution

This section details the proposed solutions to address the key issues identified. It outlines the core features and functionalities designed to improve system efficiency and tackle these challenges effectively.

The proposed system will include a centralized database to streamline data management by storing all essential information regarding international students and staff. This will allow for easy access and real-time updates, ensuring greater efficiency in administrative tasks. Additionally, a user-friendly interface will be designed to replace the current complex layout, making navigation more intuitive and accessible for both students and administrative staff.

To further improve efficiency, the system will feature automated alerts to notify users of important deadlines such as visa renewals, travel updates, and mobility program applications. Moreover, enhanced tools for mobility and travel abroad management will be integrated to handle applications, approvals, and travel logistics, allowing designated staff to monitor and manage these processes more effectively.

1.4 Objectives

This section outlines the specific aims of the project, which serve as benchmarks for the development process and provide clear targets to assess its success.

The project's objectives are as follows:

i. To assess the current challenges in managing international student and staff data within the university, with an emphasis on data handling inefficiencies, as well as issues related to mobility and travel abroad.

ii. To design a cohesive system that effectively addresses the identified requirements for visa, networking, travel, and mobility functions, all while ensuring an intuitive interface.

iii. To develop the International Student Management System, including automated notifications for enhanced compliance and efficiency, as well as robust tools for managing mobility and travel processes, with comprehensive testing and deployment to ensure seamless operation.

1.5   Project Scope

The scope section defines the boundaries of the project by detailing what is included and excluded in the system's design and development. This helps ensure clarity on project deliverables and limits, preventing scope creep.

1.5.1   Scope of the System

The scope of the system provides a detailed description of the functionalities that the system will include. It specifies the core components required to meet project goals while outlining areas beyond the project's scope.

The scope of the International Centre Management System covers the creation of a centralized database to manage records of international students and staff. This database will allow the secure storage and efficient retrieval of data. In addition, the system will include the development of user interfaces tailored for students, administrative personnel, and academic advisors to ensure accessibility and ease of use.

The system will also implement automated alerts to notify users of important deadlines, such as visa expiration reminders. Furthermore, it will support the processing of applications for staff travel and student exchange programs, streamlining the approval workflow and improving administrative efficiency.

Certain aspects fall outside the scope of this project. These include integration or linking with systems beyond the university's administrative domain, as well as any physical upgrades or hardware enhancements that are not directly related to the software's functionalities.

1.6 Thesis Outline

The thesis is organized into seven chapters. Chapter 1, Introduction, presents the background of the project, outlines the problem statement, and introduces the proposed solutions such as the creation of a centralized database, the design of a user-friendly interface, and the enhancement of travel management tools. This chapter also defines the research objectives, describes the scope of the project, and provides an overview of the thesis structure.

Chapter 2, Literature Review, examines related literature, theories, and concepts that form the foundation of the research. It also reviews existing systems, such as the International Islamic University Malaysia's International Student Management System, and compares their functionalities to derive lessons that inform the current project. Chapter 3, Methodology, explains the research methodology adopted for the study, detailing the steps taken in system design and development. This chapter also outlines the project planning schedule and milestones before concluding with a brief summary.

Chapter 4, System Requirements, identifies and describes the requirements of the system, including the techniques used to elicit requirements, the functional and non-functional requirements, and the requirement analysis supported by diagrams such as use case and class diagrams. Chapter 5, System Design, focuses on the architectural and database design, along with package diagrams, interface designs, and the rationale behind design decisions. Chapter 6, System Implementation, describes the development process, including the hierarchical menu, implementation details, and challenges encountered. Finally, Chapter 7, Conclusion, summarizes the research findings, highlights the contributions of the project, discusses constraints, and proposes future work, concluding with a final recap of the thesis.

CHAPTER 2

LITERATURE REVIEW

This chapter presents a comprehensive review of the existing literature relevant to the topic under study. It aims to explore previous research findings, theoretical frameworks, and methodologies that have been applied in similar areas. By examining and analyzing these sources, the chapter highlights the current state of knowledge, identifies research gaps, and establishes the academic context for the present study.

The literature review serves as a foundation for understanding how the current research fits into the broader field. It critically evaluates the strengths and limitations of existing studies, providing justification for the need and direction of this research. This chapter ultimately supports the development of a clear research focus and guides the formulation of objectives and methodologies.

2.1 Introduction

This chapter presents a review of existing literature related to the development and implementation of International Centre Management Systems, with a specific focus on functionalities such as visa management and travel abroad applications for staff. The aim is to explore and analyze previous research, existing systems, and technological solutions adopted by other higher education institutions to manage international operations effectively.

The literature reviewed in this chapter includes systems such as UiTM Mobility, UM Mobility, and IIUM's International Student Management System, which support administrative processes involving international students and staff. These systems commonly address components such as visa and passport tracking, insurance documentation, and automated notification features, as well as travel approval workflows that involve multiple administrative roles.

By critically analyzing these systems, this chapter identifies strengths, limitations, and opportunities for improvement—particularly in areas such as user access control, centralized data handling, integration with institutional login systems, and automated report generation. The findings from this review will inform the design and development of the proposed International Centre Management System at UMT, ensuring that it aligns with institutional needs, enhances operational efficiency, and supports data-driven decision-making.

2.2 Fundamental Theory and Concept

The International Centre Management System is developed based on fundamental concepts in information systems, database management, and workflow automation. These principles support the system's goal of improving the efficiency and accuracy of managing international student and staff data at UMT.

Information System Theory emphasizes the structured collection, processing, and dissemination of data to aid administrative functions. The use of relational databases ensures reliable storage and easy retrieval of important records such as visa details, passport information, and travel history.

Additionally, the concept of workflow automation is applied to streamline processes such as travel abroad applications. This includes features like digital form submission, approval tracking, and automatic email notifications to enhance communication and reduce manual work.

Together, these theories provide a strong foundation for building a practical and effective management system tailored to the needs of UMT's International Centre.

2.3 Related Works

2.3.1 International Islamic University Malaysia's International Student Management

The International Islamic University Malaysia (IIUM) has implemented an International Student Management system to streamline administrative processes for international students. This system includes features such as enrollment, visa compliance tracking, and access to various support services.Noor et al. (2020)noor2020impact

Although IIUM's system has been successful in managing student data, some challenges persist, particularly in user experience and integration with other university services. Students frequently encounter difficulties navigating the interface, which can lead to confusion and delays when accessing essential information.

This project seeks to analyze the strengths and limitations of IIUM's current system to develop a more user-friendly interface with better integration with university services. Additionally, our proposed system will incorporate automated communication tools to improve engagement and provide greater support to international students. Islam et al. (2016)

Figure 2.1: IIUM Student Management system
(Source : https://office.iium.edu.my/international/)

2.3.2 Mobility Programme at Universiti Teknologi MARA

As shown in Figure 2.1 Universiti Teknologi MARA (UiTM) provides a well-rounded Mobility Programme that encompasses both inbound and outbound opportunities. This initiative enables students to take part in exchange programs, summer courses, and study abroad experiences. It offers UiTM students valuable chances to immerse themselves in diverse academic and cultural settings while cultivating their global competencies.

Although the program presents numerous advantages, it can also introduce challenges such as logistical management, funding access, and intricate administrative processes, which may be difficult for students to navigate.

By examining the structure and challenges of the UiTM Mobility Programme, our project aims to develop an improved system that simplifies participation, enhances logistical support, and streamlines communication for students involved in mobility activities. Noor et al. (2020)
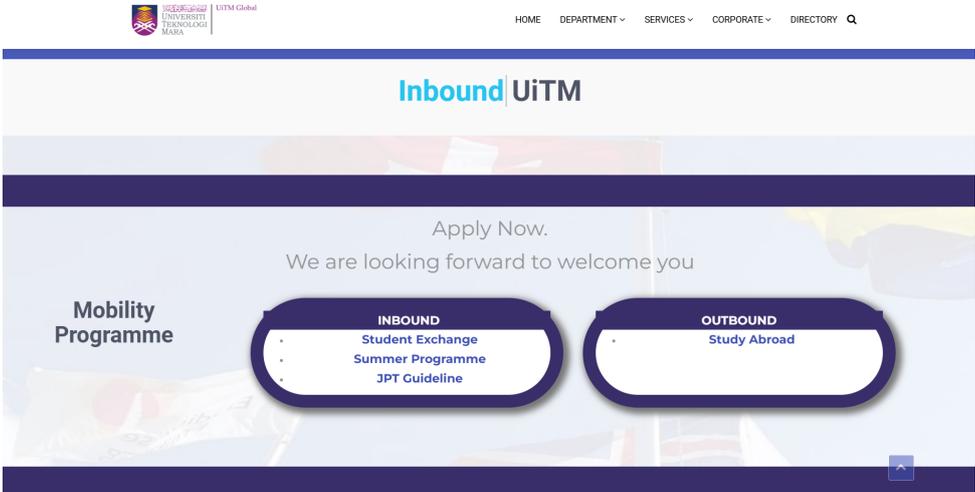
Figure 2.2: Universiti Islam Teknologi Mara Mobility system
(Source : https://uitmglobal.uitm.edu.my/international-affairs/mobility-programme)

2.3.3 Outbound Mobility Program at the University of Malaya

The Outbound Mobility Program at the University of Malaya provides students with the chance to study abroad at partner institutions for one or two semesters, allowing for potential credit transfers. This program places a strong emphasis on cultural awareness and outlines eligibility criteria, such as minimum GPA and language proficiency, while offering thorough guidance on budgeting, accommodation options, and visa application processes.

The program encourages students to explore partner universities through informative factsheets and alumni testimonials, promoting well-informed decision-making. However, it also highlights challenges, including fluctuating costs depending on the destination and complexities associated with visas, which require meticulous planning and support from the university.
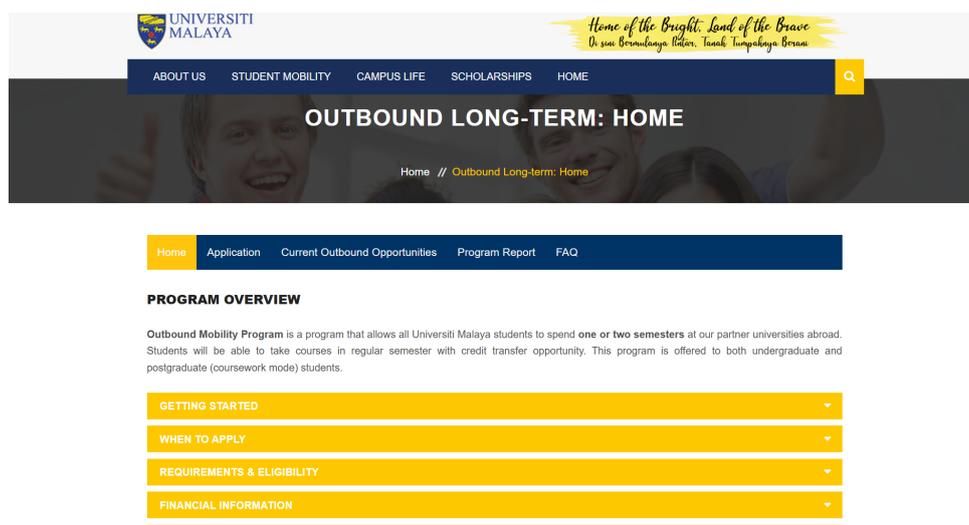
Figure 2.3: University Malaya Mobility system
(Source : https://gem.um.edu.my/outbound-long-term-home)

2.3.4 Comparison Table

Figure 2.4: Comparison Table

Feature	IIUM System	UiTM Mobility Programme	UM Mobility System
Purpose	Manage international student data.	Facilitate student exchange.	Support study abroad opportunities.
Interface Design	Medium	Poor	Excellent
Mobility	Not available	Available	Available
Visa Handling	Excellent	Good	Good
Target Users	International students.	Local and international students.	Outbound students.

This comparison table examines three university mobility systems. IIUM System, UITM Mobility Programme, and UM Mobility System by assessing their purpose, interface design, mobility support, visa handling, and target users. The IIUM System specializes in managing international student data but does not offer mobility features, whereas the UITM Mobility Programme supports student exchanges but has a weaker interface design. On the other hand, the UM Mobility System excels with a user-friendly interface and provides study abroad opportunities, though its visa assistance is only on matches with UITM. Each system serves different audiences, IIUM focuses on international students, UITM accommodates both local and international students, and UM is tailored for outbound students. The table presents a balanced comparison, making it easier to evaluate each system's advantages and limitations.

2.4 Discussion

The International Centre Management System (ICMS) was created to help Universiti Malaysia Terengganu (UMT) manage international students and staff more easily. Before this system, the process was manual and took a lot of time. Mistakes could happen, and it was hard to keep track of everything. With this new web-based system, the process has become faster, more accurate, and better organized.

The visa module helps store important information about international students and staff. It also sends an email reminder one month before the visa expires, so staff can take action early. This helps avoid problems with visa deadlines. The travel abroad module lets staff apply for travel and get updates through email. This makes the process clearer and easier for everyone involved.

The dashboard shows charts and numbers to help staff see the total number of international students and staff, and how many travel applications have been made. When we compare this system to UM Mobility and UiTM Mobility, our system is more suitable for UMT because it is simple, focused, and can grow in the future.

2.5 Summary

In conclusion, the International Centre Management System (ICMS) is very helpful for UMT. It saves time, reduces mistakes, and makes communication easier through email. The system also helps staff find and manage information quickly. The tools and method used, like PHP, CodeIgniter 3, Oracle Database, and the Waterfall model, helped to build a strong system. In the future, the system can be improved by adding language options, making it work better on phones, and connecting it to immigration systems. These changes will make the system even more useful and ready for future needs.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter presents the methodology used in the development of the system. It outlines the approach, processes, and tools applied throughout the project to ensure that the objectives are achieved effectively and systematically. The methodology serves as a structured plan that guides the entire development lifecycle, from requirement gathering to system testing and evaluation.

By clearly defining the methods and techniques used, this chapter ensures that the system development process is transparent, repeatable, and aligned with best practices in software engineering. It also provides justification for the chosen development model and technologies, ensuring the system is built in a logical and efficient manner.

3.2 Project Methodology

In software development, there are many model that help to guide how to make and manage software. Some of the popular one is Waterfall model, Agile model, Spiral model, V-Model and Incremental model. Each of this model have their own pros and cons. For this project, we choose Waterfall model because it is linear and step-by-step, which make it easy to manage and understand the process. This model is good for project that already have clear requirement, so we can focus on one phase at a time and finish it properly before go to the next step.

- **Planning:** In this step, we plan about the project like what we want to do and how to do it. We also make timeline using Gantt chart so we can finish on time.

- **Requirement Gathering:** At this stage, we collect information what the system need. We do interview with stakeholder, survey and check the other system to get idea.

- **System Design:** After finish gather requirement, we design the system. This include how the system look, database, and the architecture to make sure all requirement are meet.

- **Implementation:** In this step, we do the coding part. We use PHP and other tool to build the system.

- **Testing:** Finally, we test the system to check if got any problem. If we find error, we will fix it so the system work properly.

3.3 Project Planning Schedule

3.3.1 Milestone

The following table 3.1 outlines the key milestones for the FYP project. Each milestone represents a significant event or deliverable in the project timeline, serving as critical checkpoints that help ensure the project remains on track. By clearly defining these milestones, we can better manage our time and resources, and keep all stakeholders informed about our progress. Fairbanks and Buchko (2018)

Table 3.1: Milestones for FYP Project

Milestone No.	Description	Start Date	End Date
1	Project Title Approval	7 October 2024	12 October 2024
2	Submission of SPMP	14 October 2024	18 October 2024
3	Submission of SRS	23 October 2024	27 October 2024
4	Submission of SDD	28 October 2024	1 November 2024
5	Project Prototype	4 November 2024	18 November 2024
6	Final Presentation	15 January 2025	18 January 2025
7	Submission of Thesis	8 February 2025	1 February 2025

3.3.2 Gantt Chart

A Gantt chart is a timeline that shows the project schedule and progress. It helps track tasks, manage time, and ensure milestones are achieved on time for the International Student Management System project.

Key details in the Gantt chart include:

- **Scope:** A web-based system to simplify processes for international students and staff.

- **Tasks:** Follow the Waterfall model phases, completing each task on time.

- **Dependencies:** Tasks must be done in order, as each depends on the previous one.

- **Time Management:** Proper time allocation ensures the project stays on schedule.

- **Milestones:** Important checkpoints to track progress and keep the project on track.

WBS NUMBER	TASK TITLE	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
1	Planning				
1.1	Project Background	09/10/24	10/10/24	1	100%
1.1.1	Project Objectives	11/10/24	12/10/24	1	100%
1.2	Research	13/10/24	15/10/24	2	100%
1.3	Project Scope	16/10/24	17/10/24	1	100%
1.4	Problem Statement	18/10/24	19/10/24	1	100%
1.5	Problem Solution	20/10/24	22/10/24	2	100%
1.6	Determine Methodology	23/10/24	24/10/24	1	100%
2	Requirements				
2.1	Reviews On Similar System	20/10/24	21/10/24	1	70%
2.2	Research on Documentation	21/10/24	22/10/24	1	65%
2.3	Gather Requirements	21/10/24	23/10/24	2	60%
2.4	Submit Draft SPMP	24/10/24	25/10/24	1	50%
2.5	Check SPMP with Supervisor	25/10/24	26/10/24	1	30%
2.6	Submit Final SPMP	29/10/24	30/10/24	1	0%
3	Analysis & Design				
3.2	Designing Diagram	30/10/24	01/11/24	3	0%
3.2.1	Finalize Diagram	1/11/24	02/11/24	1	0%
3.2.2	Submission SRS	03/11/24	03/11/24	1	0%
3.3	Design Description	03/11/24	05/11/24	2	0%
3.3.1	Finalize SDD	07/11/24	08/11/24	1	0%
3.4	PITA 1 Preparation	09/11/24	10/11/24	1	0%
3.5	PITA 2 Preparation	11/11/24	12/11/24	1	0%
4	Implementation				
4.1	User Management Module	12/11/24	16/11/24	4	0%
4.2	Student Profile Module	17/11/24	21/11/24	4	0%
4.3	Document Management Module	22/11/24	26/11/24	4	0%
4.4	Reporting Module	27/11/24	01/12/24	4	0%
5	Testing				
5.1	Module Testing	02/12/24	06/12/24	4	0%
5.2	Integration Testing	07/12/24	11/12/24	4	0%
5.3	User Acceptance Testing (UAT)	12/12/24	16/12/24	4	0%
6	Final Review and Submission				
4.1	Prepare Final Report	17/12/24	21/12/24	4	0%
4.2	Review with Supervisor	22/12/24	23/12/24	1	0%
4.3	Final Adjustments	24/12/24	26/12/24	2	0%
4.4	Final Presentation Preparation	27/12/24	30/12/24	3	0%
4.2	Submit Thesis & Code	01/02/25	01/02/25	1	0%
4.3	Final Evaluation	02/02/25	08/02/25	6	0%
4.4	Final Result Announcement	10/02/25	10/02/25	1	0%

Figure 3.1: Gantt chart for the FYP project phases.

Figure 3.1 shows the Gantt chart dividing the FYP project into six phases from October to February. It starts with Planning, where tasks like setting goals, research, and scope are done. Then, in Requirements Gathering, all needed information is collected and checked with the supervisor. Next is Analysis and Design, focusing on diagrams and design details. By November, the project moves to Implementation, where parts like user management are developed. December is for Testing to make sure everything works well. Finally, in February, the project ends with Final Review and Submission, including report writing, supervisor feedback, and presentation prep. This timeline helps keep the project on track.

3.4 Summary

The International Centre Management System (ICMS) was developed to help Universiti Malaysia Terengganu (UMT) manage information related to international students and staff. The system focuses on two main parts: visa management and travel abroad applications. It is a web-based system built using PHP, CodeIgniter 3, and Oracle Database.

The visa module allows staff to store and update personal, visa, and passport information of international students and staff. It also sends an email reminder one month before a visa expires, which helps the university avoid visa problems. The travel abroad module helps staff apply for overseas trips. Their applications can be reviewed, approved, or rejected by the international office, and the system sends updates by email.

The system also includes a dashboard to show useful data and graphs, such as the number of international staff and students at UMT. This makes it easier for the management team to understand the trends and make decisions.

Overall, the system improves work efficiency, reduces mistakes, and supports better communication. It replaces manual processes with a digital system that is faster, safer, and easier to use. This system can be improved in the future with more features such as mobile access and multi-language support.

CHAPTER 4

SYSTEM REQUIREMENTS

4.1 Introduction

This chapter explains the system requirements needed to build and run the International Centre Management System (ICMS). System requirements are important to make sure the system works smoothly and meets the needs of the users. The requirements are divided into two parts: functional requirements and non-functional requirements.

Functional requirements describe what the system must do. For example, storing visa records, sending email reminders, and allowing staff to apply for travel abroad. These functions help the staff manage international students and staff more easily.

Non-functional requirements explain how the system should perform. This includes things like system speed, security, and user friendliness. These requirements make sure the system is not only working, but also easy and safe to use.

This chapter also lists the hardware and software needed to develop and use the system, such as the programming language, framework, and database. All these requirements are important to make sure the system is reliable, efficient, and useful for Universiti Malaysia Terengganu (UMT).

4.2 Requirement Elicitation Techniques

Requirement elicitation refers to the systematic process of identifying, collecting, and documenting the functionalities to be implemented in the system and the constraints under which it must operate. This process is essential for ensuring that the system meets the stakeholders' expectations and adheres to organizational or regulatory standards. Elicitation involves direct engagement with stakeholders, thorough analysis of existing systems, and comprehensive study of relevant documentation. The goal is to identify business needs, risks, and assumptions, providing a solid foundation for system design and development.

4.2.1 Requirement Sources

This section identifies the primary sources of requirements for the system. Understanding these sources ensures that no critical requirement is overlooked.

Stakeholders

Stakeholders are individuals or groups who directly or indirectly influence the system or are impacted by its implementation. For the **International Student Management System (ISMS)**, the key stakeholders include:

- **Academic Vice Deputy Chancellor UMT:** Approves applications with sponsorships other than UMT or self-sponsored, ensuring compliance with relevant policies.

- **Head of Department UMT:** Provides support for travel applications and ensures adherence to institutional guidelines for staff traveling abroad.

- **International Networking Office:** Plays a crucial role in managing student and staff visa applications, travel requests, and compliance with regulatory requirements.

- **International Students and Staff:** End-users who will directly interact with the system for visa updates, application submissions, and receiving notifications.

Engaging stakeholders in workshops and interviews helped ensure their needs were accurately captured.

Documents

During the elicitation phase, the following document was analyzed to gather insights and validate requirements for the system:

- Travel Abroad Application Document: Provided by the International Centre, this document outlines the process for UMT staff to apply for travel abroad. It includes:

  - Travel Application Form: Contains required details and guidelines for submitting applications to travel abroad.

  - UMT Sponsorship Application: Details the procedure and requirements for staff to apply for sponsorship from UMT for their travel.

  - Guide to Fill the eRisk Form: Offers step-by-step instructions on completing the eRisk form within the Mynemo system, which is a critical component of the travel application process.

  This document was instrumental in defining the functional requirements for travel abroad applications, sponsorship handling, and integration with Mynemo in the system.

Existing Systems

Existing systems were analyzed to understand current practices and identify gaps or opportunities for innovation. The most relevant systems reviewed included:

- **IIUM International Student Management System:** Provided a baseline for essential functionalities like visa tracking and demographic reporting.[Islam et al. (2016)]

- **UiTM Mobility System:** Offered insights into managing student mobility processes, emphasizing user-friendly interfaces and workflow automation.[Noor et al. (2020)]

- **UM Mobility System:** Highlighted best practices in managing travel requests and compliance with institutional policies for international programs.[Azzwan and Azhar (2016)]

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4.2.2   Requirement Techniques

To gather the requirements for the system, we used a combination of methods to ensure the system design would meet the needs of the stakeholders. These methods were selected based on their effectiveness in understanding user expectations and identifying relevant features.

Conversational Techniques

We used conversational techniques to directly communicate with stakeholders. One of the main activities was a meeting with the Head of the International Center at UMT, who is also my Person-in-Charge (PIC). During the meeting, we discussed several important aspects of the system, including:

- **Functional Requirements:** The main features needed for the system, such as handling visa renewals, travel applications, and creating reports.

- **System Design:** How the system should look and work, including its user interface and accessibility.

- **Current Issues:** Problems faced by the International Center when managing international students and staff, and how the system could solve these problems.

- **Suggestions and Feedback:** Ideas and recommendations from the PIC to ensure the system aligns with UMT's goals.

This meeting was very helpful because it gave me a clear idea of what the stakeholders expect from the system.

Observational Techniques

We also used observational techniques to learn from existing systems that handle similar tasks. We looked into the following systems:

- **UM Mobility System:** We observed how this system manages applications and tracks the process for both students and staff.

- **UiTM Mobility System:** We studied how this system handles international travel applications and visa tasks to see what features could be useful.

- **IIUM International Student System:** We focused on how this system manages international students, including visa renewals, reports, and application workflows.

By studying these systems, We was able to identify useful features and also note some weaknesses that We could avoid in my design. This step gave me a better understanding of how such systems work and what users might need.

4.3 System Requirements

4.3.1 Functional Requirement

Functional requirements define the essential features that developers must implement for users to achieve their goals. These requirements describe how the system should behave under specific conditions. The functional requirements should be clear, concise, and unambiguous. Well-written functional requirements typically exhibit the following characteristics:

- **Necessary:** Each requirement must be directly related to a specific business goal or user need.

- **Concise:** Requirements should be simple and easy to understand without unnecessary jargon.

- **Attainable:** All requirements should be realistic within the project's time and budget constraints.

- **Granular:** Each requirement should be precise and focused on a single aspect to ensure better management and implementation.

- **Consistent:** Requirements should not contradict each other and must use consistent terminology.

- **Verifiable:** Each requirement should be measurable and testable at the end of the project.

The following are the functional requirements for the International Student Management System (ISMS), based on the system's target users and their needs:

Table 4.1: Functional Requirements for the International Student Management System (Part 1)

Requirement ID	Functional Requirement	Explanation	Actor
FR1	The system shall allow international students to check the status of their visa renewal applications.	Provides real-time updates on the status of visa renewal applications.	International Students and Staff
FR2	The system shall send email notifications for upcoming visa expiration.	Sends notifications one month prior to expiration.	International Students and Staff
FR3	The system shall allow international students to view a report of their visa status and history.	Displays detailed visa-related information and history.	International Students and Staff
FR4	The system shall allow UMT staff to apply for travel abroad.	Enables submission of required documents and supporting materials (e.g., travel itinerary).	UMT Staff
FR5	The system shall allow UMT staff to check the status of their travel abroad applications.	Provides updates on the progress of travel abroad applications.	UMT Staff
FR6	The system shall send email notifications for travel application status.	Notifies UMT staff of approval or rejection.	UMT Staff
FR7	The system shall allow the Academic Vice Deputy Chancellor UMT to approve or reject applications.	Specifically for sponsorships outside UMT or self-sponsored applications.	Academic Vice Deputy Chancellor UMT
FR8	The system shall generate reports of pending applications for Academic Vice Deputy Chancellor UMT.	Includes sponsorship-based reports.	Academic Vice Deputy Chancellor UMT

Table 4.2: Functional Requirements for the International Student Management System (Part 2)

Requirement ID	Functional Requirement	Explanation	Actor
FR9	The system shall allow Head of Department UMT to review and approve travel applications.	Facilitates the processing of travel requests submitted by staff.	Head of Department UMT
FR10	The system shall allow Head of Department UMT to track application status and generate reports.	Provides updates and relevant reports for travel abroad applications.	Head of Department UMT
FR11	The system shall allow the International Networking Office to update visa information.	Includes family information (e.g., family member names, relationships, etc.).	International Networking Office
FR12	The system shall allow the International Networking Office to generate demographic reports.	Generates reports based on categories such as gender, country, status, faculty, and level of study.	International Networking Office
FR13	The system shall allow the International Networking Office to manage travel applications.	Reviews and approves travel abroad applications submitted by UMT staff.	International Networking Office
FR14	The system shall allow the International Networking Office to send email reminders for visa expiration.	Sends reminders to international students and staff one month prior to expiration.	International Networking Office

4.3.2 Non-functional Requirement

The non-functional requirements (NFRs) define the operational capabilities and constraints of the system, focusing on how well the system will perform under various conditions.

Table 4.3: Non-Functional Requirements for the International Student Management System

Requirement ID	Non-Functional Requirement
NFR1	The system shall handle up to 500 concurrent users without performance degradation.
NFR2	The system shall support the latest versions of web browsers, including Chrome, Firefox, and Safari.
NFR3	The system shall ensure 99.9% uptime for critical services.
NFR4	The system shall employ encryption for sensitive data and secure authentication methods (e.g., OAuth).
NFR5	The system shall support multiple languages, including English and Malay, based on user preferences.
NFR6	The system shall be user-friendly, intuitive, and responsive for both technical and non-technical users.

4.4 Requirement Analysis
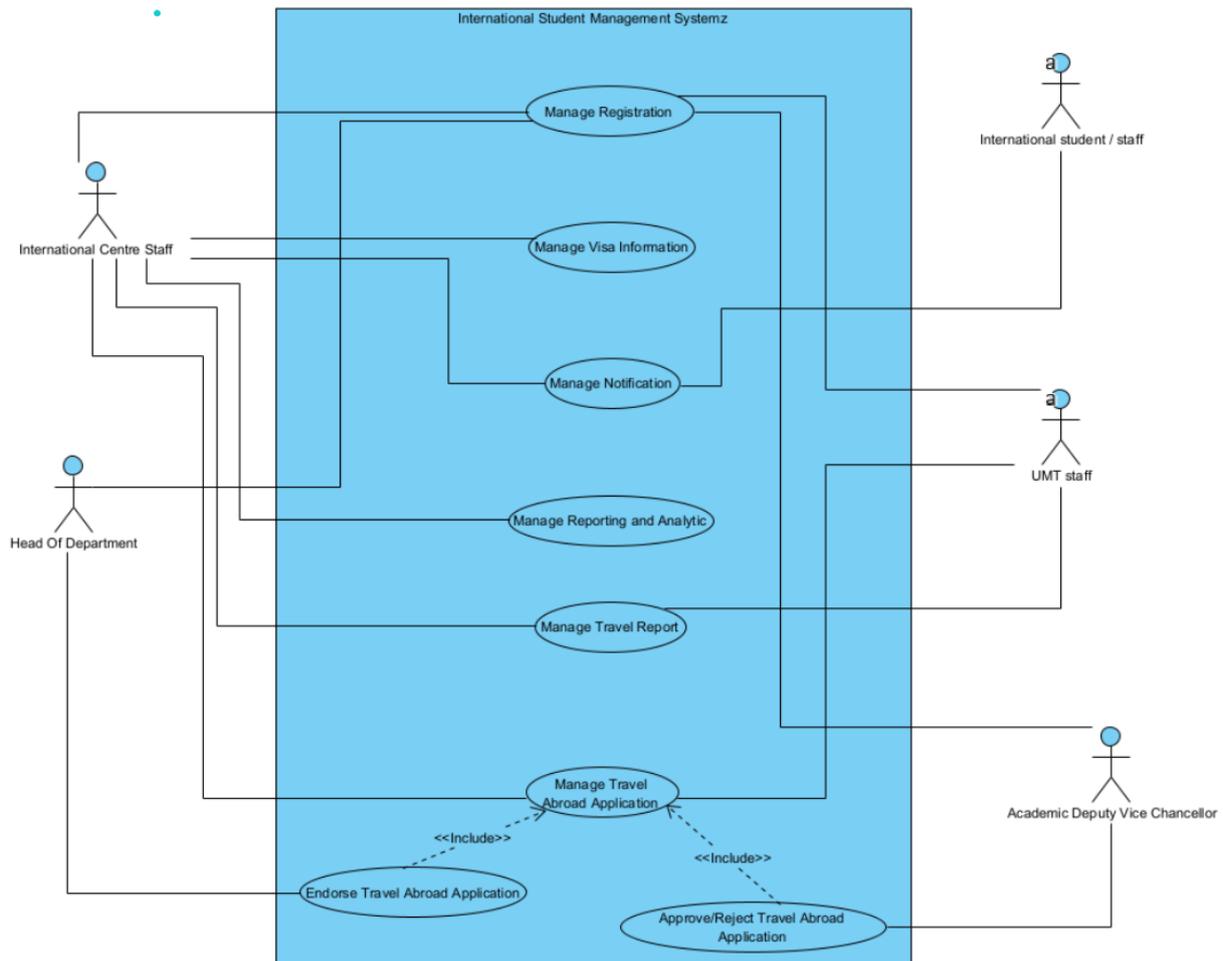
4.4.1 Use Case Diagram

Figure 4.1: Use Case Diagram for the International Student Management System

This use case diagram shows how different people interact with the International Student Management System. The Admin is responsible for managing the registration, visa information, notifications, and reports. International students and staff use the system to register and manage their visa details. UMT staff help by reviewing and endorsing travel abroad applications. These applications are then sent to Head of Department for endorsement. Finally, the Academic Vice Deputy Chancellor decides whether to approve or reject the travel applications. The diagram also shows how endorsing and approving/rejecting travel abroad applications are important steps in managing these requests.[Fauzan et al. (2019)]

4.4.2 Use Case Descriptions

Table 4.4: Use Case 1: Manage Registration

Use Case Name: Manage Registration	**ID:** UC1 **Importance Level:** High
Primary Actor: UMT Staff, Head of Department, Timbalan Naib Canselor, International Office Admin	**Use Case Type:** Primary, Essential

Stakeholder and Interests:
UMT Staff/Head of Department/Timbalan Naib Canselor/International Office Admin - want to manage and view the registration of international students and staff in the system. International students/staff - want to ensure their details are correctly registered and updated.

Brief Description: This use case describes how authorized users (UMT staff, Head of Department, Timbalan Naib Canselor, and International Office Admin) can manage and view the registration details of international students and staff in the system. The registration is based on the user credentials from Mynemo.

Trigger: Authorized user logs into the system using Mynemo credentials.

Type: External

Relationship:

Normal Flow of Events:

1. Authorized user logs into the system using Mynemo credentials.
2. The system verifies the user's credentials.
3. The system displayed the registration management option.
4. Authorized user selects "Manage Registration."
5. Authorized user can view or update the details of international students/staff.
6. The system saves any updates and provides a confirmation mesage.

Sub-Flows:

Alternate/Exceptional Flows:
1a. If the registration data is incomplete, the system will prompt the admin to complete all required fields.

Table 4.5: Use Case 2: Manage Visa Information

Use Case Name: Manage Visa Information	**ID:** UC2	**Importance Level:** High

Primary Actor: Admin   **Use Case Type:** Primary, Essential

Stakeholder and Interests:

Admin - wants to manage visa, family, and student/staff information effectively.

International students/staff - want to update or view their personal, family, and visa details.

International Centre Staff - want to view and manage international students' and staff's visa-related details.

Brief Description: This use case describes how the admin and international centre staff can manage visa information for international students and staff. The system provides three sections: personal information, family information, and visa details, which can be viewed and edited as necessary.

Trigger: Admin or international centre staff needs to update or view visa information for a specific student/s

Type: External

Relationship:

Normal Flow of Events:

1. Admin or international centre staff logs into the system.
2. User selects "Manage Visa Information."
3. User chooses a student/staff member to update or view information.
4. The system displays three sections:
   - Student/Staff Information
   - Family Information
   - Visa Information
5. User views or edits the required details in any of the sections.
6. The system saves the updated information or displays the existing data.

Sub-Flows:

3a. If the user cannot find the specific student/staff member, they can search using filters.

Alternate/Exceptional Flows:

1a. If the user enters incomplete or invalid data while editing, the system prompts them to correct the errors before saving.

Table 4.6: Use Case 3: Manage Notification

Use Case Name: Manage Notification	ID: UC3 Importance Level: Medium

Primary Actor: Admin	Use Case Type: Supporting

Stakeholder and Interests:
Admin - wants to notify international students/staff of important updates or actions.
International students/staff - want to receive notifications about important updates regarding their visa status or travel abroad applications.

Brief Description: This use case describes how the admin can send notifications to international students and staff about important events, such as visa expirations or travel application statuses.

Trigger: Admin needs to notify international students/staff about an important event or deadline.

Type: External

Relationship:

Normal Flow of Events:

1. Admin logs into the system.
2. Admin selects "Manage Notification."
3. Admin chooses the notification type and recipient.
4. Admin drafts the message and sends the notification.
5. The system sends the notification to the selected recipients.

Sub-Flows:

Alternate/Exceptional Flows:
1a. If the notification cannot be sent due to network isues, the system will alert the admin and retry sending.

Table 4.7: Use Case 4: Manage Reporting and Analytics

Use Case Name: Manage Reporting and Analytics	ID: UC4 Importance Level: Medium

Primary Actor: Admin	Use Case Type: Supporting

Stakeholder and Interests:
Admin - wants to generate reports and analytics related to international student and staff population, travel, and visa status.
UMT staff - interested in reports for academic or administrative purposes.

Brief Description: This use case describes how the admin can generate various reports and analytics related to the international student and staff population, visa statuses, and travel applications.

Trigger: Admin needs to generate a report for monitoring or analysis.

Type: External

Relationship:

Normal Flow of Events:

1. Admin logs into the system.
2. Admin selects "Generate Report."
3. Admin selects the type of report and any specific filters.
4. The system generates and displays the report.

Sub-Flows:

Alternate/Exceptional Flows:
1a. If data is missing or the report cannot be generated, the system alerts the admin and requests corrective action.

Table 4.8: Use Case 5: Manage Travel Abroad Application

Use Case Name: Manage Travel Abroad Application	**ID:** UC5	**Importance Level:** High

Primary Actor: Admin, Secretariat, Timbalan Naib Canselor, International Centre (IC)   **Use Case Type:** Primary, Essential

Stakeholder and Interests:
Admin, Secretariat, Timbalan Naib Canselor, IC - want to review, endorse, approve, or reject travel abroad applications from staff members.
Staff members - want to apply for and receive approval for travel abroad.

Brief Description: This use case covers the processe of managing travel abroad applications, including endorsement, approval, and sending approval letters by the relevant authorities.

Trigger: Staff member submits a travel abroad application.

Type: External

Relationship:

Normal Flow of Events:

1. Staff member submits a travel abroad application.
2. Secretariat reviews the application and forwards it to Head of Department for endorsement.
3. Head of Department checks the application and endorses or rejects it.
4. The system checks whether the application is self-sponsored or not.
5. If self-sponsored, the application is forwarded directly to Academic Vice Deputy Chancellor for approval.
6. If not self-sponsored, the application is forwarded to International Centre (IC) for further review and decision.
7. If approved, IC sends the approval letter to the staff member.

Alternate/Exceptional Flows:
1a. If the application is incomplete, the system will request the staff member to resubmit it.
3a. If Head of Department rejects the application, the system notifies the staff member of the rejection.
5a. If Academic Vice Deputy Chancellor rejects the self-sponsored application, the system notifies the staff member of the rejection.

4.4.3 Activity Diagrams

In this section, activity diagrams are used to show the steps involved in different processes within the system. These diagrams help to visualize how tasks are carried out and how users interact with the system. By using activity diagrams, it becomes easier to understand how everything works and how different parts of the system are connected.[Dumas and Ter Hofstede (2001)]
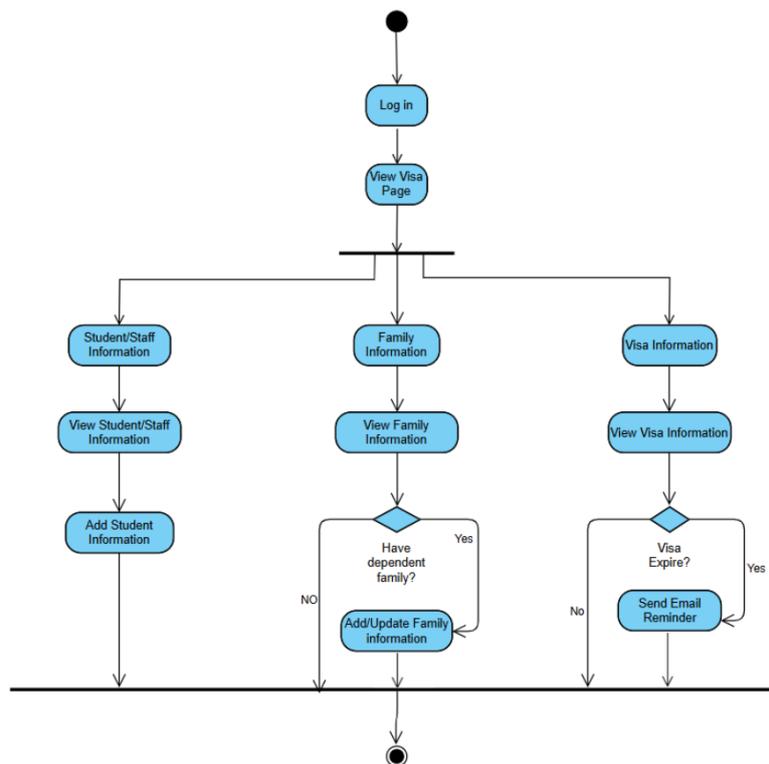

Figure 4.2: Activity Diagram for the Visa Management

This activity diagram illustrates the **Visa Management** process. The process begins when the user logs into the system, which directs them to the **Visa Page**. On this page, the user is given three options: **Student/Staff Information**, **Family Information**, and **Visa Information**. If the user selects **Student/Staff Information**, they can view and update their personal details. If they choose **Family Information**, they can update the details of any family dependents. If **Visa Information** is selected, the user can update their visa details. After updating the necessary information, the system checks if the **Visa Expiry Date** is approaching. If the visa is nearing

expiration, the system sends an **Email Reminder** to notify the user.
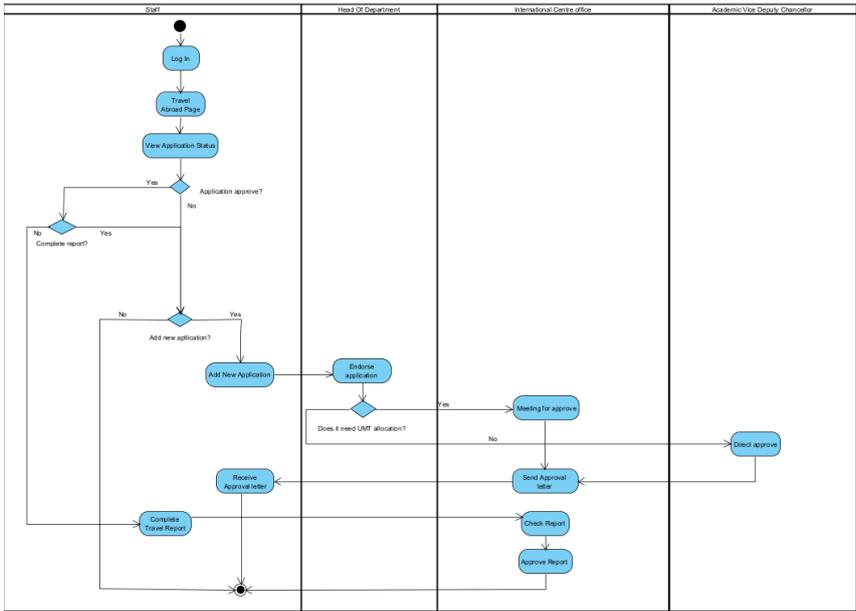
Figure 4.3: Activity Diagram for the Visa Management

This activity diagram illustrates the steps in the **Travel Abroad** process for staff members. The process begins when the staff member logs into the system and checks the status of their travel application. If necessary, they can add a new application and endorse it. Once endorsed, the system checks whether UMT allocation is required. If UMT allocation is needed, the application is forwarded for a meeting at the International Centre office. If no allocation is required, the approval letter is sent directly to the staff member. The Academic Vice Deputy Chancellor can either approve the application directly or attend the meeting for final approval. After approval, the staff member receives the approval letter.

After completing the trip, the staff member is required to submit a Travel Report. The report is reviewed by an International Centre (IC) officer. If the report meets the required standards, the IC officer approves it. The process concludes once the travel report is approved, finalizing the travel abroad procedure for the staff member.

4.4.4 Class Diagram

A class diagram is a static model that shows the classes and the relationships among clases that remain constant in the system over time. The class diagram depicts classes, which include both behaviors and states, with the relationships between the classes.[McGill (2001)]
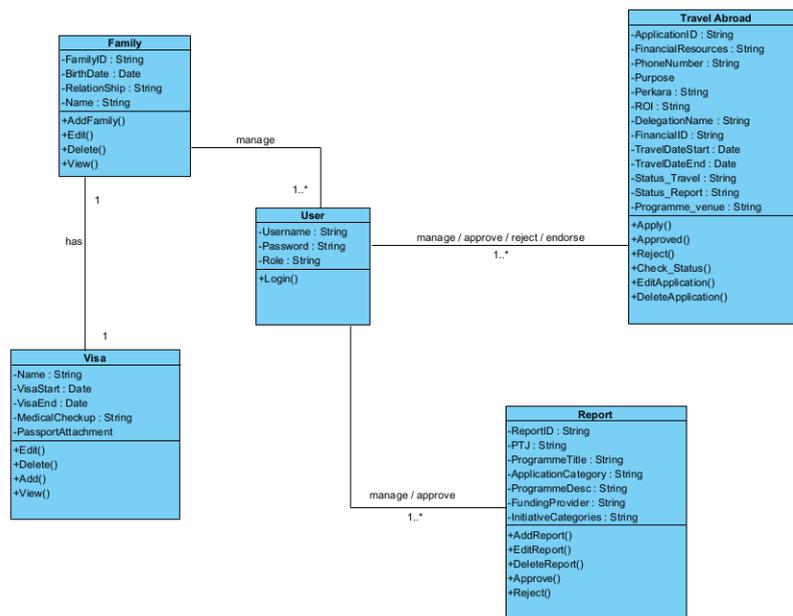

Figure 4.4: Class Diagram for the International Student Management System

This class diagram illustrates the components of our travel abroad application system. We have International Centre staff who oversee visa information and travel applications, staff members who can initiate travel applications and endorse applications submitted by their colleagues, the deputy vice-chancellor who plays a crucial role in approving applications, and responsible centers who are tasked with endorsing applications. The system effectively tracks and manages information related to travel applications and visa details, ensuring a streamlined and efficient process. This visual representation provides a clear understanding of the system's structure and how its different parts interact to facilitate efficient travel abroad application management.

4.4.5 Sequence Diagrams

Sequence diagrams are one of two types of interaction diagrams. They illustrate the objects that participate in a use case and the messages that pass between them over time for one use case. A sequence diagram is a dynamic model that shows the explicit sequence of messages that are passed between objects in a defined interaction.[Al-Fedaghi (2021)]
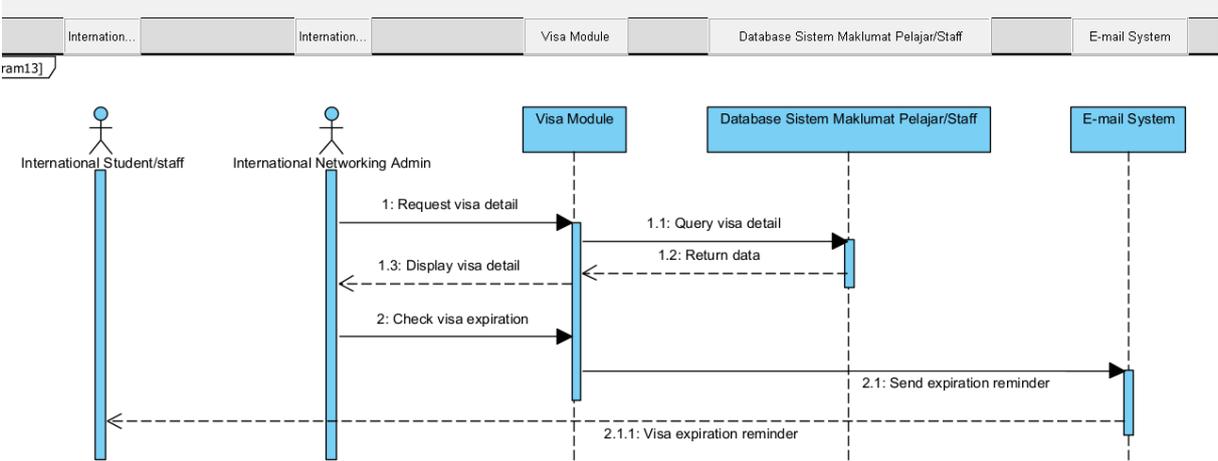

Figure 4.5: Sequence Diagram for visa management

This sequence diagram illustrates the process of retrieving and managing visa details within our system. A student or staff member initiates the process by requesting their visa information. The system then queries the database to fetch the relevant details, which are subsequently displayed to the user. To ensure timely reminders, the system also checks the visa's expiration date. If the expiration date is approaching, an email notification is sent to the user, serving as a proactive measure to prevent any potential visa-related complications. This streamlined process enhances efficiency and provides a valuable service to our international community.

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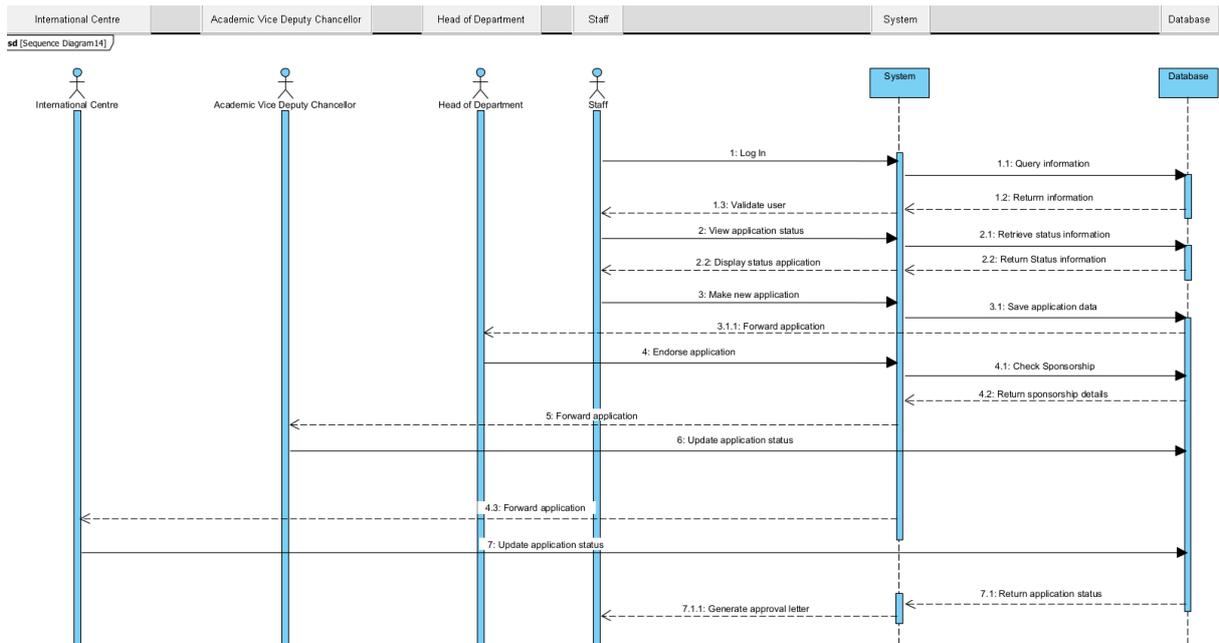
Figure 4.6: Sequence Diagram for visa management

This sequence diagram provides a visual representation of the travel application process within our system. A staff member initiates the process by logging in and checking the status of their current applications. If necessary, they can add a new travel application and endorse it. Once endorsed, the system determines whether UMT allocation is required. If allocation is needed, the application is scheduled for a meeting at the International Centre office. Otherwise, the aproval letter is generated and sent directly to the staff member. The Academic Vice Deputy Chancellor plays a crucial role in the approval process, either by directly approving the application or attending the meeting to provide their approval. Upon final approval, the staff member receives the approval letter, concluding the travel application process. This diagram offers a clear overview of the various stages and interactions involved in the travel application workflow.

4.4.6 CRUD Matrix

One useful technique to identify how the underlying objects in the problem domain work together to collaborate in support of the use cases is CRUD analysis. CRUD analysis uses a CRUD matrix, in which each interaction among objects is labeled with a letter for the type of interaction: C for create, R for read or reference, U for update, and D for delete.

The following table illustrates the CRUD matrix for the Travel Abroad System.

Figure 4.7: CRUD Matrix for International Student Management System

Role/Object	Travel Application	Travel Endorsement	Travel Approval	Travel Report	Travel Report Approval	Visa Management
UMT Staff	CRUD	R	R	CRUD	R	-
International Centre Staff	RU	R	RU	RU	RU	CRUD
Head Of Department	R	RU	-	-	-	-
Academic Vice Deputy Chancellor	R	R	RU	-	-	-

Key:

- **C:** Create (Can add or submit information)

- **R:** Read (Can view information)

- **U:** Update (Can modify or edit information)

- **D:** Delete (Can remove or delete information)

Explanation:

- **Staff** can **create**, **read**, and **update** their travel applications, and can also **read** the approval letters.

- **Head of Department** can **read** travel applications, **create** and **update** endorsements, and **read** the applications and their status.

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- **Academic Vice Deputy Chancellor** can **read** travel applications and endorsements, **create** and **update** approval or rejection decisions, and **read** the approval letters.

- **International Centre** can **read** travel applications and endorsements, **create** and **update** the approval letters for UMT sponsorship, and **update** the application status.

CHAPTER 5

SYSTEM DESIGN

5.1 Introduction

This chapter presents the design of the International Centre Management System, which is developed to assist the International Centre of University Malaysia Terengganu (UMT) in managing visa-related data and travel abroad applications for staff. The system design phase is crucial as it translates the gathered requirements into a blueprint for implementation. A well-structured design ensures that the system meets both functional and non-functional requirements while maintaining scalability, security, and maintainability.

The system is designed using the Model-View-Controller (MVC) architectural pattern supported by the CodeIgniter 3 framework. This architecture separates the system's core logic, user interface, and data handling into distinct layers, promoting modularity and code reusability.

This chapter covers six main components: the system architecture, package diagram, database design, interface design, design discussion, and a chapter summary. Each section provides detailed insights into how the system is structured and how each component interacts with others to ensure smooth functionality. The design decisions made are aligned with the project's goals, institutional requirements, and best practices in software engineering.

5.2 System Architecture

5.2.1 Architectural Design

The International Centre Management System (ISMS) is designed using the Model-View-Controller (MVC) architectural pattern, dividing the application into three interconnected components to ensure scalability, maintainability, and separation of concerns. **?**
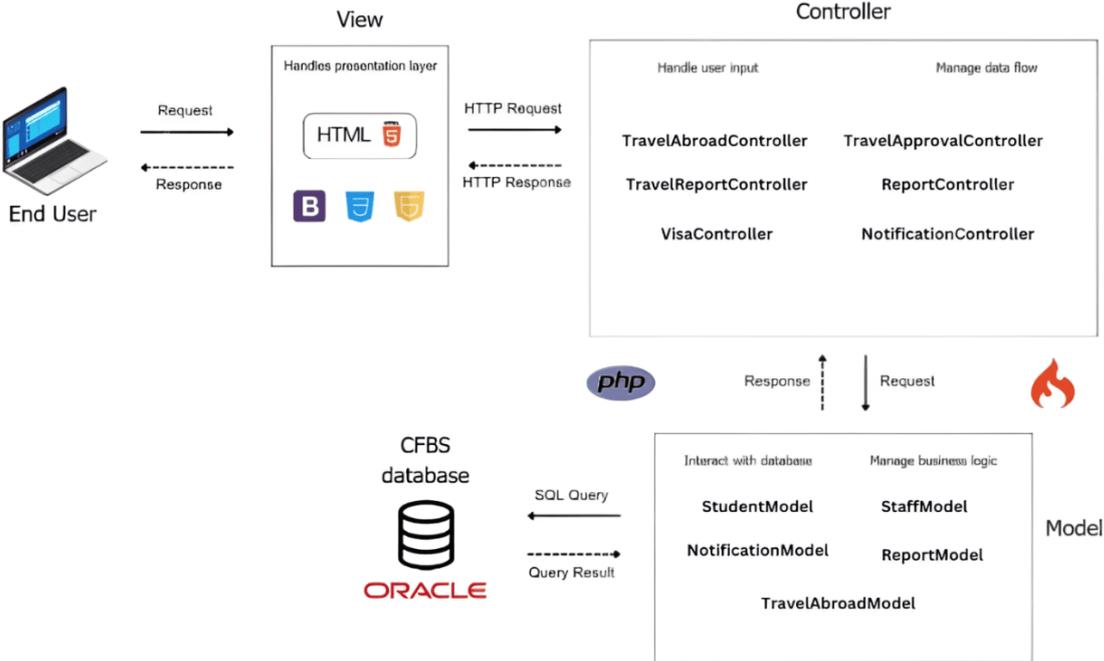
Figure 5.1: User Data Dictionary

The diagram show in 5.1 shows the structure of my project using the MVC (Model-View-Controller) design pattern. The View is the part users interact with, like the website interface built using HTML, CSS, and Bootstrap. When users perform actions, such as submitting a travel application or checking visa details, the View sends their requests to the Controller.

The Controller is responsible for handling these requests. It processes the input, determines what needs to be done, and communicates with the Model to retrieve or update data. For example, the TravelAbroadController processes travel applications, the VisaController handles visa-related information, and other controllers manage tasks like sending notifications, approving applications, or generating reports.

The Model is where the system's data and logic are managed. It connects to the Oracle database to store and retrieve information, such as user profiles, travel records, and notification schedules. After processing the data, the Model sends it back to the Controller, which then passes it to the View. This allows users to see updates, like their application status or visa expiry reminders.

The MVC architecture organizes the system into three clear parts: the View for the user interface, the Controller for processing requests, and the Model for managing data. This makes the system efficient, easy to manage, and user-friendly.

5.2.2 Design Rationale

The MVC architecture was chosen because it allows different parts of the system to be developed and tested independently. This modular approach makes it easier to scale the system, as new features like better reporting or additional user roles can be added without disrupting the entire system. Other options, like Monolithic or Layered Architecture, were considered but didn't offer the same level of flexibility and ease of maintenance. By keeping different func-

tions separate, MVC simplifies debugging, updating, and customizing the system for various user roles. This modular setup is perfect for handling the complexity of ISMS features like visa management, travel applications, notifications, and reports.
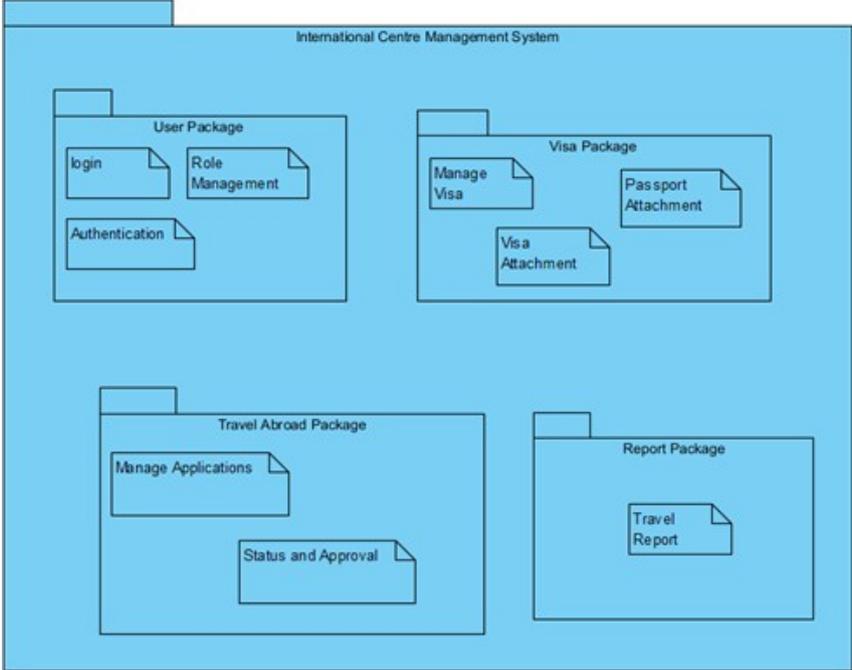
5.3 Package Diagram

Figure 5.2: Package Diagram for the International Student Management System

5.4 Database Design

5.4.1 Normalization

Zero Normal Form: 0NF

0NF

NoMatric	Name	Passport	Email	VisaExpiryDate	DateOfEntry	AgentName	PhoneNumber	Emergency Contact	Family	Visa_detail
S65610	Irfan Hakimi	65866578678	irfan@gmail.com	1/1/2024 - 1/1/2025	1/1/2024	Mesut Ozil	0184090065 , 876453223	Aesya,wife,0192486139	Aesya,wife,0192486139	235512E12, 1/1/2024 - 1/1/2025
S65410	Ahmad Albab	87878870897	Ahmad@gmail.com	2/2/2024 - 2/2/2025	2/2/2024	Luis Figo	00124462311 , 67444235	Ali,Father,0123322454	Ali,Father,0123322454	239912E12, 2/2/2024 - 2/2/2025

MedicalCheckup	PassportAttachment	NotificationID	Receiver	AlertReminder	Notification_type	ReminderDate	Notification_Attachments	ReportID	PTJ
yes	file	N1122	Irfan Hakimi	Visa Expired in One Month	Visa	1 month, 1 day	None	R122	FSKM
no	file	N1124	Ahmad Albab	Programme Exchange Summer	Other	2 month, -	file		

Programme_Title	ApplicationCategory	ProgramDesc	TotalAllocation	FundingProvider	InitiativeCategories	Travel_Date	ProgrammeVenue	NumberParticipants	Impact	ContactName
UMT Seoul Mobility	Research	Mobility to Seoul Korea	RM 20,000	UMT	VOT66922	2/1/2025 - 12/1/2025	University Kimchi , Seoul Korea	15	Research	Son Heung Min

ContactPhoneNo	Email	ApplicationID	ApplicantName	FinancialResources	Purpose	Perkara	ROI	DelegationName	DateProgramme	TravelList
90766778	Son@yahoo.com	512	Irfan Hakimi	Tajaan	student exchange programme	R2311	Rm2000	University Kimchi	5/1/2025	Bromo Indonesia - 2024

FinancialDetails	CostPerUnit	Cost	Cost_Notes	Total	Tentative	UserID	Username	Password
Cost Per Student	RM 5,000	RM 30,000	15 Students	RM 30,000	file	U221	Irfan Hakimi	irf@n1234

Status_Travel	Status_Travel_Comment	Endorsement_Travel	Endorsement_travel_comment	Status_Report	Status_Report_Comment
Approve	Document Lengkap	Sokong	Document Lengkap	Approve	Report Lengkap

Figure 5.3: Unnormalized Form

in this unnormalised form or we just can call it zero normal form, there is a some attribute that has redundant value . we can see at VisaExpiryDate which it has two value for one column "1/1/2024 - 1//1/2025". Another example that can be seen is at PhoneNumber that has two different value. At EmergencyContact there is three different attribute that has different answer.

One Normal Form: 1NF

In the first normal form, an entity contains no repeating groups and all attributes must have a unique name.

NoMatric	Name	Passport	Email	VisaID	VisaStartDate	VisaEndDate	DateOfEntry
S65610	Irfan Hakimi	65866578678	irfan@gmail.com	E26791	1/1/2024	1/1/2025	1/1/2024
S65410	Ahmad Albab	87878870897	Ahmad@gmail.com	E23991	2/2/2024	2/2/2025	2/2/2024

AgentName	PhoneNumber 1	PhoneNumber2	Emergency Contact Name	Emergency Contact Phone Num	Emergency Contact Relationshi	Family Name	Family BirthDate
Mesut Ozil	60184090065	876453223	Aesya	60192486139	wife	Aesya	14/10/2003
Luis Figo	60124462311	67444235	Ali	60123322454	Father	Ali	12/5/1954

Family Relationship	Visa ID	Visa Start	Visa End	MedicalCheckup	PassportAttachment	MedicalCheckup	NotificationID
wife	E2232	1/1/2024	1/1/2025	yes	file	yes	N1122
Father	V7698	2/2/2024	2/2/2025	no	file	no	N1124

Receiver	AlertReminder	Notification_type	Reminder Before Date	Reminder After Date	Notification_Attachments	ReportID	PTJ
Irfan Hakimi	Visa Expired in One Month	Visa	1 month	1 day	none	R122	FSKM
Ahmad Albab	Programme Exchange Summer	Other	2 month	none	file		

Programme_Title	ApplicationCategory	ProgramDesc	TotalAllocation	FundingProvider	InitiativeCategories	Travel Date Start	Travel Date End
UMT Seoul Mobility	Research	Mobility to Seoul Korea	RM 20,000	UMT	VOT66922	2/1/2025	12/1/2025

Programme Venue Institution	ContactName	ContactPhoneNo	Email	ApplicationID	ApplicantName	FinancialResources	Purpose
University Kimchi	Son Heung Min	90766778	Son@yahoo.com	512	Irfan Hakimi	Tajaan	student exchange programme

Perkara	ROI	Programme Venue Country	NumberParticipants	Impact	DelegationName	DateProgramme	TravelList
R2311	Rm2000	Seoul Korea	15 Students	Research	University Kimchi	5/1/2025	Bromo Indonesia - 2024

FinancialDetails	CostPerUnit	Cost	Cost_Notes	Total	Tentative	Status_Travel	Status_Travel_Comment
Cost Per Student	RM 5,000	RM 30,000	15 Students	RM 30,000	file	Approve	Document Lengkap

Endorsement_Travel	Endorsement_Travel_Comment	Status_Report	Status_Report_Comment	UserID	Username	Password	
Approve	Document Lengkap	Approve	Document Lengkap	U221	Irfan Hakimi	Irf@n1234	

Figure 5.4: First Normal Form

In this First Normal Form, we gonna separate the attribute that has redundant and different data value into a new attribute. For example, we can see that VisaExpiryDate has been divide into VisaStartDate and VisaEndDate. we also can see that EmergencyContact has been divide into EmergencyContactName, EmergencyContactPhoneNumber,EmergencyContactRelationship. ReminderDate has been separate into ReminderBeforeDate and ReminderAfterDate. Travel-Date separate into TravelStartDate and TravelEndDate.

Second Normal Form: 2NF

An entity with a primary key consisting of only one attribute is in the second normal form (2NF). **?**

International Student

NoMatric	Name	Passport	Email	VisaID	AgentName
S65610	Irfan Hakimi	65866578678	irfan@gmail.com	E26791	Mesut Ozil
S65410	Ahmad Albab	87878870897	Ahmad@gmail.com	E23991	Luis Figo

PhoneNumber 1	PhoneNumber2	Emergency Contact Name	Emergency Contact Relationship	Emergency Contact Phone Number	DateOfEntry
60184090065	876453223	Aesya	Wife	60192486139	1/1/2024
60124462311	67444235	Ali	Father	60123322454	2/2/2024

FamilyID
F11
F22

Figure 5.5: Table International Student in Second Normal Form

International Staff

StaffID	Name	Passport	Email	VisaID	AgentName
SU221	Amsyar Hadi	878789787	Amsyar@gmail.com	E26240	Segio Busquet

PhoneNumber 1	PhoneNumber2	Emergency Contact Name	Emergency Contact Relationship	Emergency Contact Phone Number	DateOfEntry
60913466754	243736635	Osama Bin Laden	father	60173425565	1/1/2025

FamilyID
F33

Figure 5.6: Table International Staff in Second Normal Form

Family

FamilyID	Family Name	Family Relationship	Family Birthdate	VisaID
F11	Aesya	Wife	14/10/2003	E26735
F22	Ali	Father	12/5/1954	E26735
F33	Osama Bin Laden	father	9/11/1946	E10993

Figure 5.7: Table Family in Second Normal Form

Notification

NotificationID	Receiver	AlertReminder	Notification_type	Reminder Before Date	Reminder After Date
N1122	Irfan Hakimi	Visa Expired in One Month	Visa	1 month	1 day
N1124	Ahmad Albab	Programme Exchange Summer	Other	2 month	none

Notification_Attachments	VisaID
none	E26791
file	E23991

Figure 5.8: Table Notifications in Second Normal Form

Travel Application

ApplicationID	ApplicantName	FinancialResources	Purpose	Perkara	ROI
512	Irfan Hakimi	Tajaan	student exchange programme	R2311	R2311

Travel Date Start	Travel Date End	Programme Venue Institution	Programme Venue Country	NumberParticipants	Impact
2/1/2025	12/1/2025	University Kimchi	Seoul Korea	15 Students	Research

DelegationName	DateProgramme	FinancialID	Status_Travel	Status_Travel_Comment	Endorsement_Travel
University Kimchi	5/1/2025	F01	Approve	Document Lengkap	Sokong

Endorsement_travel_comment	Status_Report	Status_Report_Comment	ContactName	ContactPhoneNo	Email
Document Lengkap	Approve	Report Lengkap	Son Heung Min	90766778	Son@yahoo.com

Figure 5.9: Table Travel Application in Second Normal Form

Financial

FinancialID	FinancialDetails	CostPerUnit	Cost	Cost_Notes	Total
F01	Cost Per Student	RM 5,000	RM 30,000	15 Students	RM 30,000

ApplicationID
512

Figure 5.10: Table Financial in Second Normal Form

49

Visa

VisaID	VisaStart	VisaEnd	MedicalCheckup	PassportAttachment
E26791	1/1/2024	1/1/2025	yes	file
E23991	2/2/2024	2/2/2025	no	file
E26240	1/1/2024	1/1/2025	yes	file
E26735	3/3/2024	3/3/2025	yes	file
E26735	4/4/2024	4/4/2025	yes	file
E10993	5/5/2024	5/5/2025	yes	file

Figure 5.11: Table Visa in Second Normal Form

Report

ReportID	PTJ	Programme_Title	ApplicationCategory	ProgramDesc	TotalAllocation
R122	FSKM	UMT Seoul Mobility	Research	Mobility to Seoul Korea	RM 20,000

FundingProvider	InitiativeCategories	Impact			
UMT	VOT66922	Research			

Figure 5.12: Table Report in Second Normal Form

User

UserID	Username	Password
U221	Irfan Hakimi	Irf@n1234

Figure 5.13: Table User in Second Normal Form

This is Second Normal Form (2NF). In this structure, all tables are already organized to avoid repeating groups, ensuring each piece of data is stored in the correct table. Each non-primary attribute depends entirely on the primary key, eliminating partial dependencies. For example, in the International Student table, attributes like `Name` and `Passport` are fully linked to the `NoMatric` key. Similarly, in the Travel Application table, all fields depend on the `ApplicationID`. By separating data into tables such as `Family`, `Notification`, and `Visa`, the system reduces redundancy and makes data management more efficient.

Third Normal Form: 3NF

The third normal form means that no attribute within an entity is dependent on a non-prime attribute that, in turn, depends on the primary key.

International Student

NoMatric	Name	Passport	Email	VisaID	AgentName
S65610	Irfan Hakimi	65866578678	irfan@gmail.com	E26791	Mesut Ozil
S65410	Ahmad Albab	87878870897	Ahmad@gmail.com	E23991	Luis Figo

PhoneNumber 1	PhoneNumber2	Emergency Contact Name	Emergency Contact Relationship	Emergency Contact Phone Number	DateOfEntry
60184090065	876453223	Aesya	Wife	60192486139	1/1/2024
60124462311	67444235	Ali	Father	60123322454	2/2/2024

FamilyID
F11
F22

Figure 5.14: Table International Student in Third Normal Form

International Staff

StaffID	Name	Passport	Email	VisaID	AgentName
SU221	Amsyar Hadi	878789787	Amsyar@gmail.com	E26240	Segio Busquet

PhoneNumber 1	PhoneNumber2	Emergency Contact Name	Emergency Contact Relationship	Emergency Contact Phone Number	DateOfEntry
60913466754	243736635	Osama Bin Laden	father	60173425565	1/1/2025

FamilyID
F33

Figure 5.15: Table International Staff in Third Normal Form

Family

FamilyID	Family Name	Family Relationship	Family Birthdate	VisaID
F11	Aesya	Wife	14/10/2003	E26735
F22	Ali	Father	12/5/1954	E26735
F33	Osama Bin Laden	father	9/11/1946	E10993

Figure 5.16: Table Family in Third Normal Form

Notification

NotificationID	Receiver	AlertReminder	Notification_type	Reminder Before Date	Reminder After Date
N1122	Irfan Hakimi	Visa Expired in One Month	Visa	1 month	1 day
N1124	Ahmad Albab	Programme Exchange Summer	Other	2 month	none

Notification_Attachments	VisaID
none	E26791
file	E23991

Figure 5.17: Table Notification in Third Normal Form

Travel Application

ApplicationID	ApplicantName	FinancialResources	Purpose	Perkara	ROI
512	Irfan Hakimi	Tajaan	student exchange programme	R2311	R2311

Travel Date Start	Travel Date End	FinancialID	ProgrammeID	Status_Travel	Status_Travel_Comment
2/1/2025	12/1/2025	F01	P01	Approve	Document Lengkap

Endorsement_Travel	Endorsement_travel_comment	Status_Report	Status_Report_Comment	UserID
Sokong	Document Lengkap	Approve	Report Lengkap	U221

Figure 5.18: Table Travel Abroad in Third Normal Form

Programme

ProgrammeID	Programme Venue Institution	Programme Venue Country	NumberParticipants	DateProgramme	DelegationName
P01	University Kimchi	Seoul Korea	15 Students	5/1/2025	University Kimchi

ContactName	ContactPhoneNo	Email
Son Heung Min	90766778	Son@yahoo.com

Figure 5.19: Table Programme in Third Normal Form

Financial

FinancialID	FinancialDetails	CostPerUnit	Cost	Cost_Notes	Total
F01	Cost Per Student	RM 5,000	RM 30,000	15 Students	RM 30,000

ApplicationID					
512					

Figure 5.20: Table Financial in Third Normal Form

Visa

VisaID	VisaStart	VisaEnd	MedicalCheckup	PassportAttachment
E26791	1/1/2024	1/1/2025	yes	file
E23991	2/2/2024	2/2/2025	no	file
E26240	1/1/2024	1/1/2025	yes	file
E26735	3/3/2024	3/3/2025	yes	file
E26735	4/4/2024	4/4/2025	yes	file
E10993	5/5/2024	5/5/2025	yes	file

Figure 5.21: Table Visa in Third Normal Form

Report

ReportID	PTJ	Programme_Title	ApplicationCategory	ProgramDesc	TotalAllocation
R122	FSKM	UMT Seoul Mobility	Research	Mobility to Seoul Korea	RM 20,000

FundingProvider	InitiativeCategories	Impact	UserID		
UMT	VOT66922	Research	U221		

Figure 5.22: Table Report in Third Normal Form

User

UserID	Username	Password
U221	Irfan Hakimi	Irf@n1234

Figure 5.23: Table User in Third Normal Form

This is Third Normal Form (3NF), which ensures that every non-primary key attribute depends only on the primary key and not on other non-key attributes. For instance, in the **International Student** table, fields like `Name`, `Passport`, and `VisaID` are linked directly to the primary key `NoMatric`. Emergency contact details are placed separately to avoid repeating data. In the **Family** table, `FamilyID` identifies each family member, and `VisaID` connects the family to their visa information. The **Notification** table uses `NotificationID` as the primary key, ensuring that details like `Receiver` and `AlertReminder` depend on it. Similarly, the **Visa** table keeps all visa-related details tied to `VisaID` without duplicating other data.

5.4.2 Entity Relational Diagram

An Entity Relationship Diagram (ERD) is a type of diagram that lets you see how different entities (e.g., people, customers, or other objects) relate to each other in an application or a
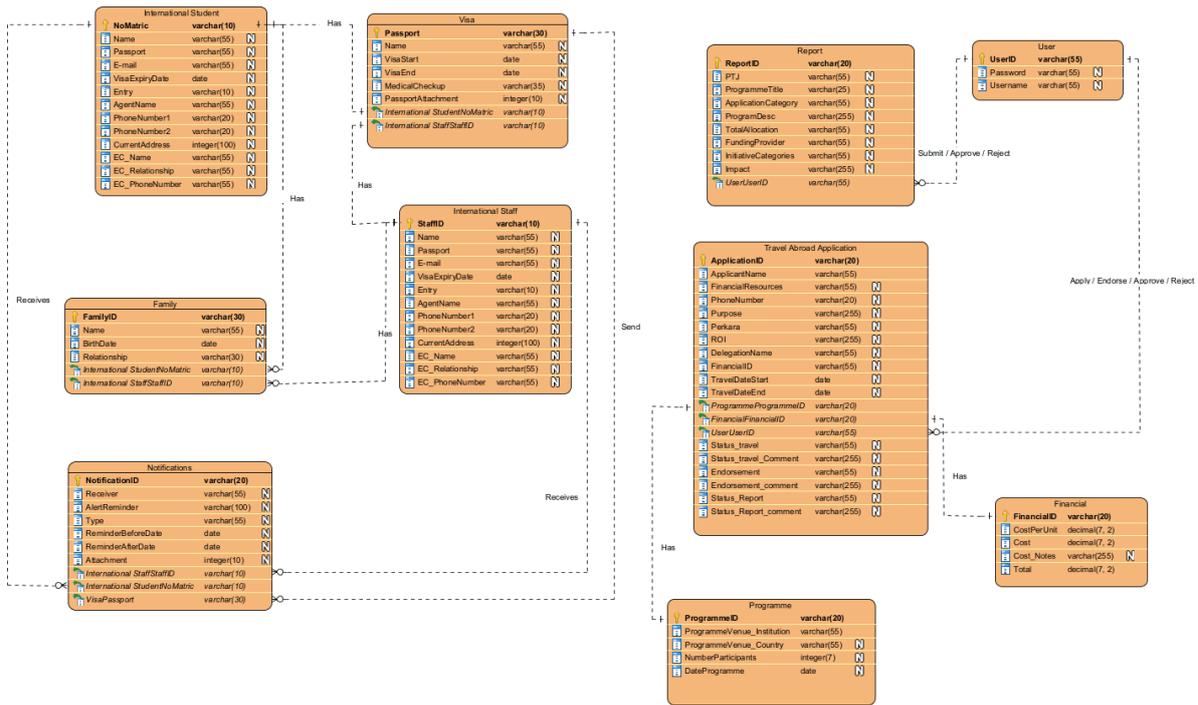
Figure 5.24: Entity Relationship Diagram

database.

This figure 5.24 Entity-Relationship Diagram (ERD) is a visual representation of a database's structure, showing how different entities are connected through relationships. In the case of the International Student Management System, the ERD includes entities like International Student, International Staff, Visa, Family, Travel Application, Programme, Financial, Notification, Report, and User. Each entity has specific attributes, such as NoMatric, Name, and Passport for International Students, and StaffID, Name, and Email for International Staff. Relationships between entities are established using primary and foreign keys. For example, the Visa entity is linked to both the International Student and Family entities, while the Travel Application connects to Programme, Financial, and User entities. This ERD helps to clarify how data flows within the system, ensuring data integrity and minimizing redundancy.

5.4.3 Data Dictionary

Alphabetically list the system entities or major data along with their types and descriptions.

INTERNATIONAL STUDENT

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
NoMatric	Student Matric Number	VARCHAR	100	NO	PK	
Name	Full Name of the Student	VARCHAR	20	NO		
Passport	Passport Number	VARCHAR	100	NO		
Email	Student Email Address	VARCHAR		NO		
VisaID	Visa Record ID	VARCHAR	20	NO	FK	Visa
VisaStartDate	Visa Start Date	DATE		NO		
VisaEndDate	Visa End Date	DATE		YES		
DateOfEntry	Date of Entry to the Country	DATE		YES		
AgentName	Name of the Agent	VARCHAR	100	YES		
PhoneNumber1	Primary Phone Number	VARCHAR	20	YES		
PhoneNumber2	Secondary Phone Number	VARCHAR	20	YES		
EmergencyContactName	Emergency Contact Name	VARCHAR	100	YES		
EmergencyContactRelationship	Relationship to Emergency Contact	VARCHAR	50	YES		
EmergencyContactPhoneNumber	Emergency Contact Phone Number	VARCHAR	20	YES		
FamilyID	Family Record ID	INT		NO	FK	Family

Figure 5.25: International Student Data Dictionary

INTERNATIONAL STAFF

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
StaffID	Staff ID	VARCHAR	20	NO	PK	
Name	Full Name of the Student	VARCHAR	20	NO		
Passport	Passport Number	VARCHAR	100	NO		
Email	Student Email Address	VARCHAR		NO		
VisaID	Visa Record ID	VARCHAR	20	NO	FK	Visa
VisaStartDate	Visa Start Date	DATE		NO		
VisaEndDate	Visa End Date	DATE		YES		
DateOfEntry	Date of Entry to the Country	DATE		YES		
AgentName	Name of the Agent	VARCHAR	100	YES		
PhoneNumber1	Primary Phone Number	VARCHAR	20	YES		
PhoneNumber2	Secondary Phone Number	VARCHAR	20	YES		
EmergencyContactName	Emergency Contact Name	VARCHAR	100	YES		
EmergencyContactRelationship	Relationship to Emergency Contact	VARCHAR	50	YES		
EmergencyContactPhoneNumber	Emergency Contact Phone Number	VARCHAR	20	YES		
FamilyID	Family Record ID	INT		NO	FK	Family

Figure 5.26: International Staff Data Dictionary

FAMILY

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
FamilyID	Family Record ID	INT		NO	PK	
FamilyName	Name of Family Member	VARCHAR	100	NO		
FamilyBirthDate	Birth Date of Family Member	DATE		NO		
FamilyRelationship	Relationship to the Student	VARCHAR	50	NO		
VisaID	Visa Record ID	VARCHAR	20	NO	FK	Visa

Figure 5.27: Family Data Dictionary

VISA

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
VisaID	Visa Record ID	VARCHAR	20	NO	PK	
VisaStart	Visa Start Date	DATE		YES		
VisaEnd	Visa End Date	DATE		YES		
MedicalCheckup	Medical Checkup Status	VARCHAR	50	YES		
PassportAttachment	Attachment of Passport	VARCHAR		YES		

Figure 5.28: Visa Data Dictionary

NOTIFICATIONS

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
NotificationID	Notification Record ID	INT		No	PK	
Receiver	Receiver of the Notification	VARCHAR	100	No		
NotificationType	Type of Notification (Reminder/Alert)	VARCHAR	50	No		
AlertReminder	Reminder Alert Description	VARCHAR	255	Yes		
ReminderBeforeDate	Date Before Which to Remind	DATE		Yes		
ReminderAfterDate	Date After Which to Remind	DATE		Yes		
NotificationAttachments	Attachments for the Notification	VARCHAR	255	Yes		
VisaID	Associated Visa Record	INT		No	FK	Visa

Figure 5.29: Notifications Data Dictionary

TRAVEL APPLICATION

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
ApplicationID	Application ID	INT		No	PK	
ApplicantName	Name of the Applicant	VARCHAR	100	No		
FinancialResources	Financial Resources Available	DECIMAL		Yes		
Purpose	Purpose of the Travel	VARCHAR	255	No		
Perkara	Perkara	VARCHAR	255	YES		
ROI	Return Of Investment	Decimal	7,2	YES		
TravelDateStart	Start Date of Travel	DATE		No		
TravelDateEnd	End Date of Travel	DATE		No		
FinancialDetailID	Financial Detail ID	INT		No	FK	Financial
ProgrammeID	Programme ID	INT		No	FK	Programme
DelegationName	Name of the Delegation	VARCHAR	100	Yes		
Status_Travel	Status Approval for Travel Application	VARCHAR	55	YES		
Status_Travel_Comment	Comment on Status Approval for Travel Application	VARCHAR	255	YES		
Erdorsement_Travel	Endorsement From PTJ	VARCHAR	55	YES		
Erdorsement_Travel_Comment	Comment On Endorsement From PTJ	VARCHAR	255	YES		
Status_Report	Report Travel Status Approval	VARCHAR	55	YES		
Status_Report_Comment	Comment On Report Travel Status Approval	VARCHAR	255	YES		
UserID	User ID	INT		No	FK	User

Figure 5.30: Travel Applications Data Dictionary

PROGRAMME

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
ProgrammeID	Programme ID	INT		No	PK	
ProgrammeVenueInstitution	Venue Institution	VARCHAR	100	No		
ProgrammeVenueCountry	Venue Country	VARCHAR	50	No		
NumberParticipants	Number of Participants	INT		Yes		
NumberParticipants	Number Of Participants	INT	5	Yes		
DateProgramme	Date of Programme	DATE		Yes		
DelegationName	Name of Delegation	VARCHAR	55	Yes		
ContactName	Contact Name	VARCHAR	55	Yes		
ContactPhone	Contact Number Phone	VARCHAR	55	Yes		
Email	Email	VARCHAR	55	Yes		

Figure 5.31: Programme Data Dictionary

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FINANCIAL

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
FinancialID	Financial Detail ID	INT		No	PK	
FinancialDetails	Details For Financial	VARCHAR	255	YEs		
CostPerUnit	Cost Per Unit	DECIMAL		Yes		
Cost	Total Cost	DECIMAL		Yes		
CostNotes	Notes on Cost	TEXT		Yes		
TotalCost	Total Cost of the Application	DECIMAL		Yes		

Figure 5.32: Financial Data Dictionary

REPORT

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
ReportID	Report Record ID	INT		No	PK	
PTJ	Unit/Department Name	VARCHAR	100	No		
ProgrammeTitle	Title of the Programme	VARCHAR	100	No		
ApplicationCategory	Category of the Application	VARCHAR	50	No		
ProgramDesc	Description of the Program	TEXT		Yes		
TotalAllocation	Total Allocation for the Programme	DECIMAL		No		

Figure 5.33: Report Data Dictionary

USER

Attribute	Description	Data Type	Size	Null	PK/FK	FK References Table
UserID	User ID	INT		No	PK	
Username	Username for login	VARCHAR	100	No		
Password	Password for login	VARCHAR	100	No		

Figure 5.34: User Data Dictionary

5.5 Interface Design

5.5.1 Overview of User Interface

The International Student Management System (ISMS) has a simple and easy-to-use interface for different users: UMT Staff, International Office Admin, Pusat Tanggungjawab, and Timbalan Naib Canselor. Each user type has different features that help them with their tasks.

UMT Staff Interface UMT staff can log in to the system to manage their travel applications and check the status of their requests. They cannot update visa details or receive notifications about updates. They also cannot view reports related to international students or staff. Their main task is to manage and track their travel applications.

International Office Admin Interface The International Office Admin can manage visa and travel applications. They can approve or reject applications and send notifications to users about the status of their applications. Admins can also create reports to track international students and staff. These reports help in managing and monitoring the process.

Pusat Tanggungjawab Interface Pusat Tanggungjawab users can review and endorse travel applications. They do not approve the applications, but they make sure all required documents are submitted before the application moves forward. Their role is important for checking that everything is in order.

Timbalan Naib Canselor Interface The Timbalan Naib Canselor can review and approve travel applications. They ensure that all the required conditions are met before approving an application. Their role helps to make sure that the approval process follows the university's rules and guidelines.

5.5.2 Screen Images
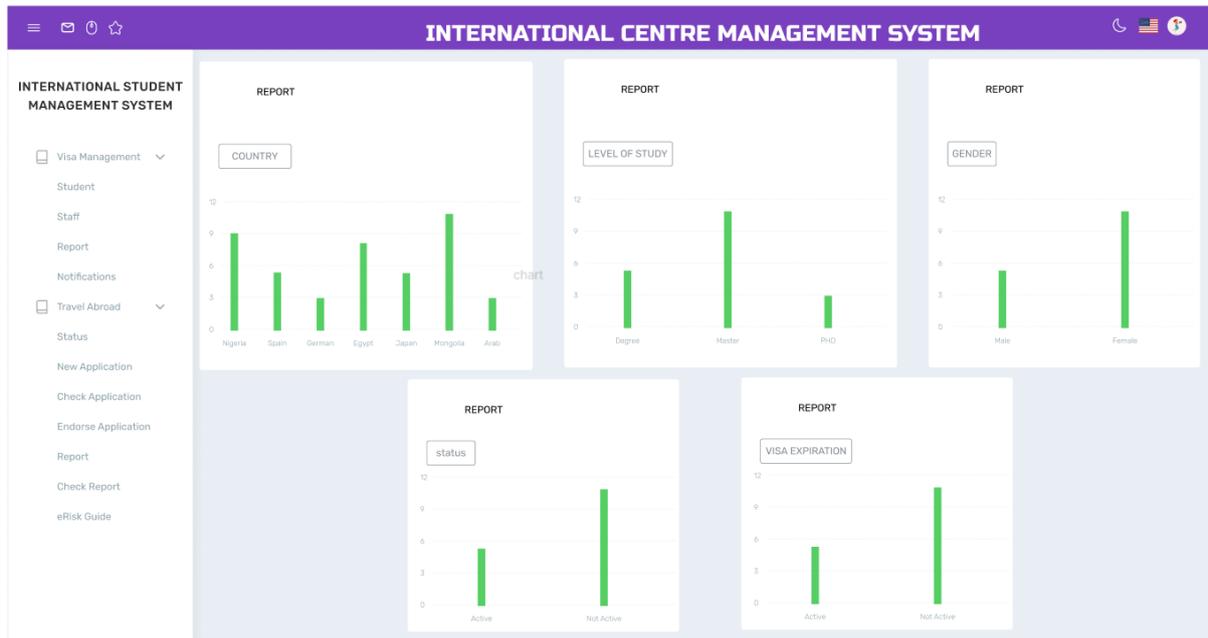
Figure 5.35: Dashboard Page for International Centre Management System
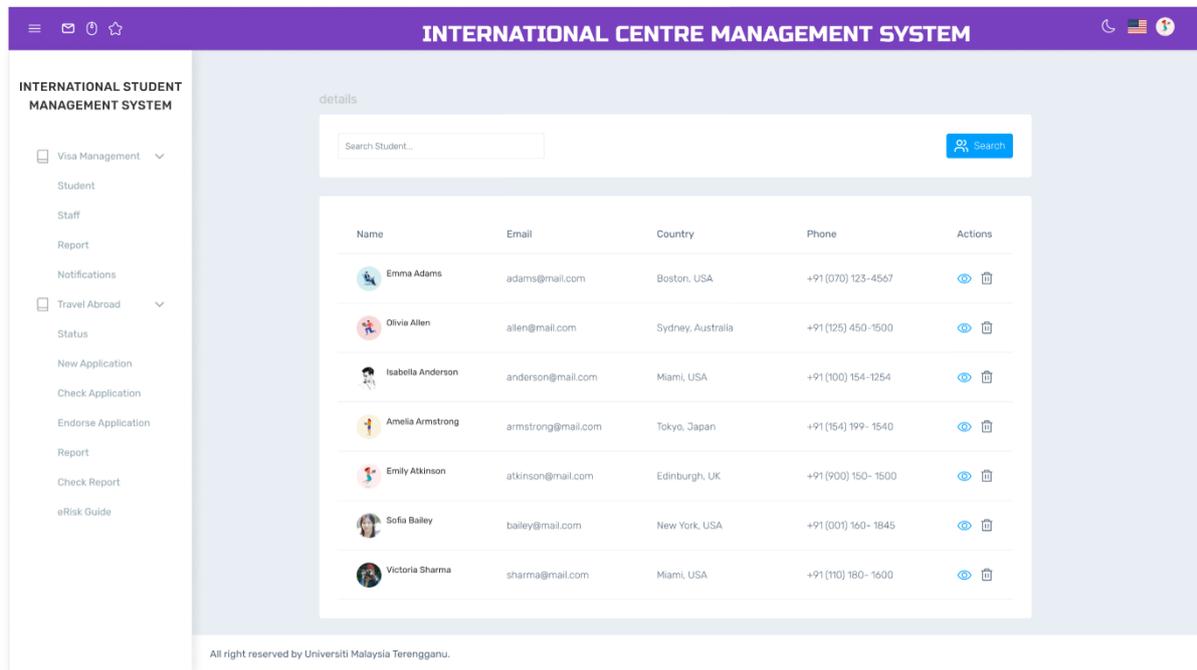
Figure 5.36: Student List Page

Figure 5.37: Student Dashboard management Page
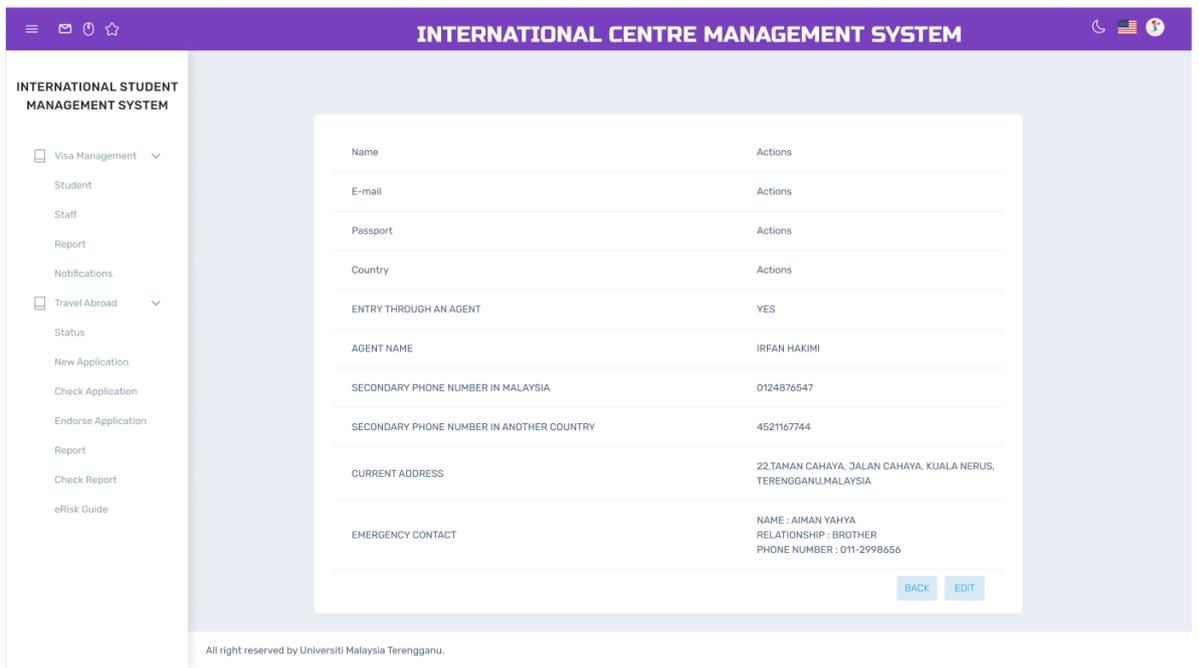
Figure 5.38: Detail Student Information Page
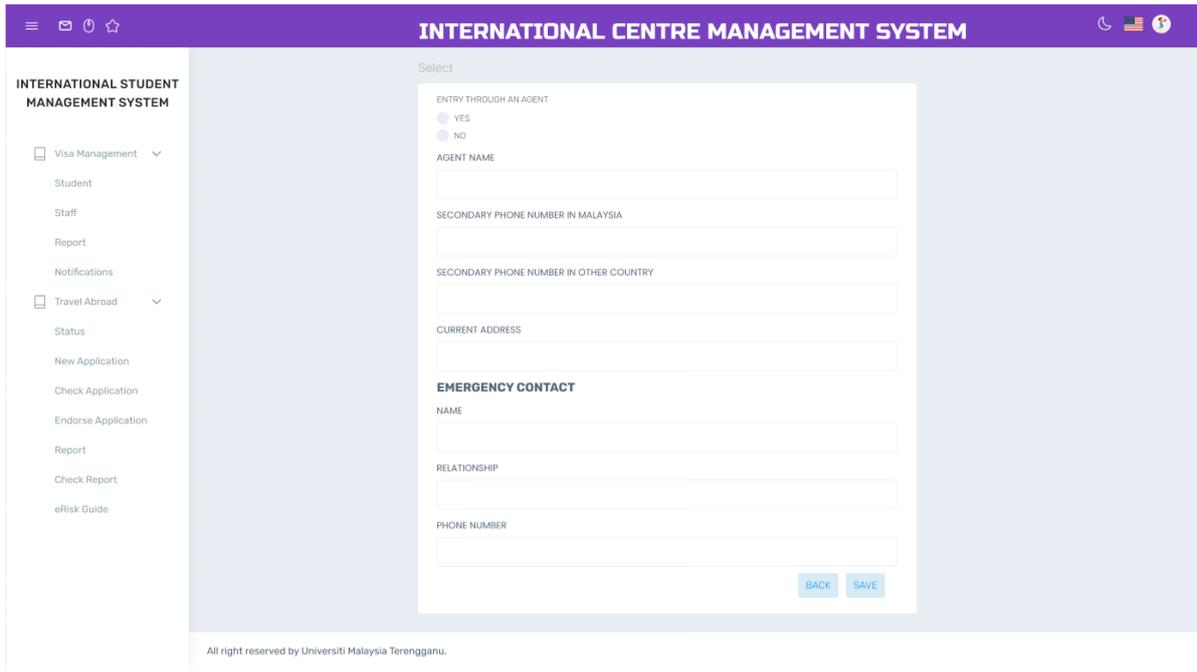
Figure 5.39: Student Edit Page
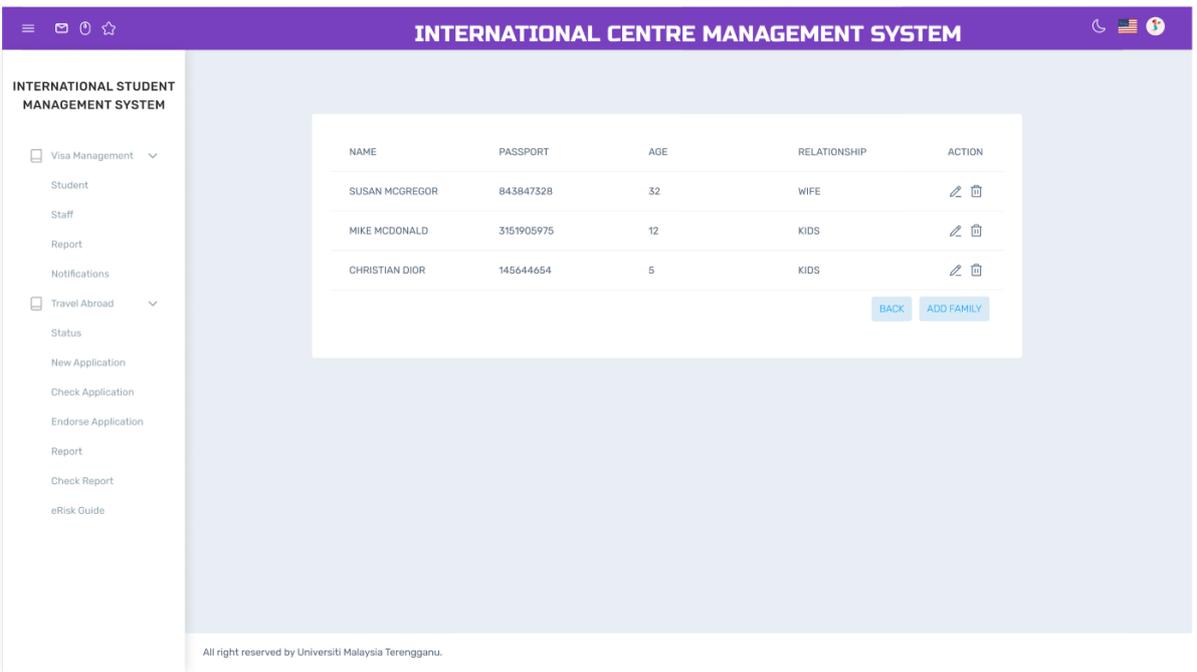
Figure 5.40: Student's Family Information List Page
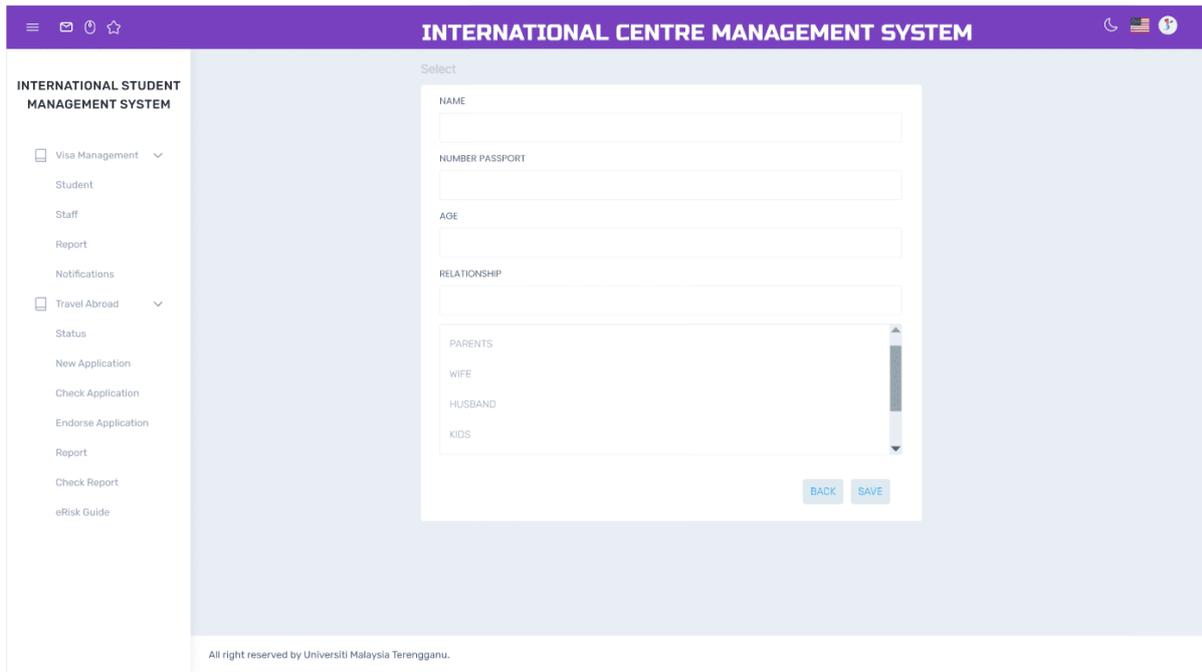
Figure 5.41: Student's Family Information Edit Page
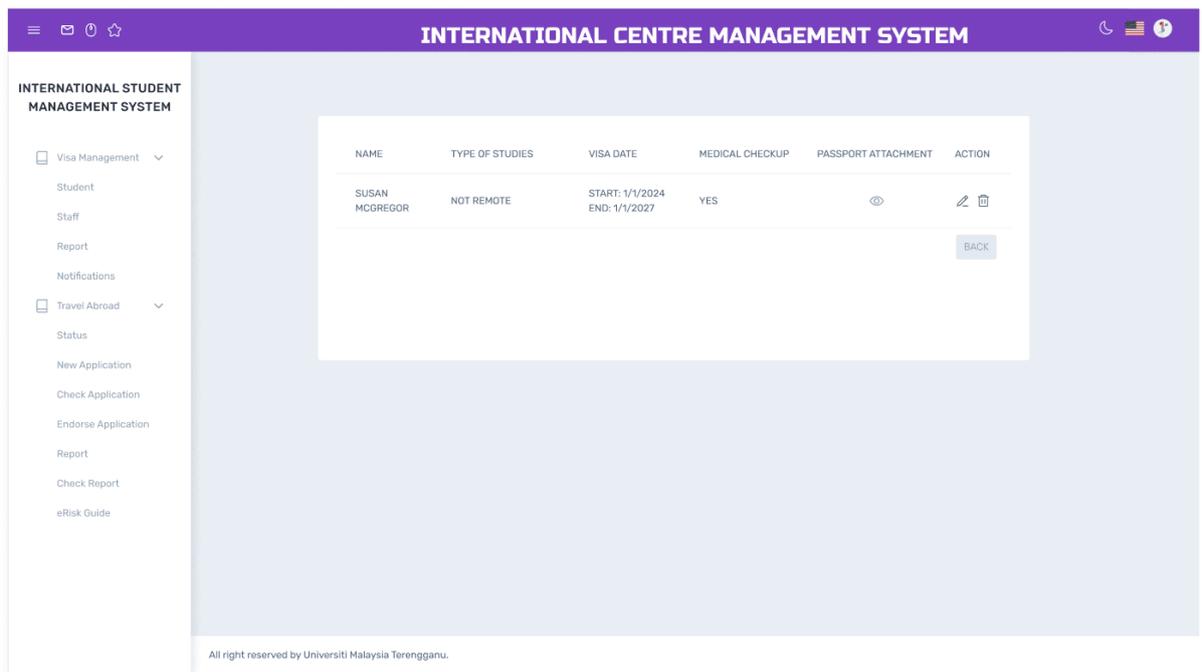
Figure 5.42: Medical Information List Page
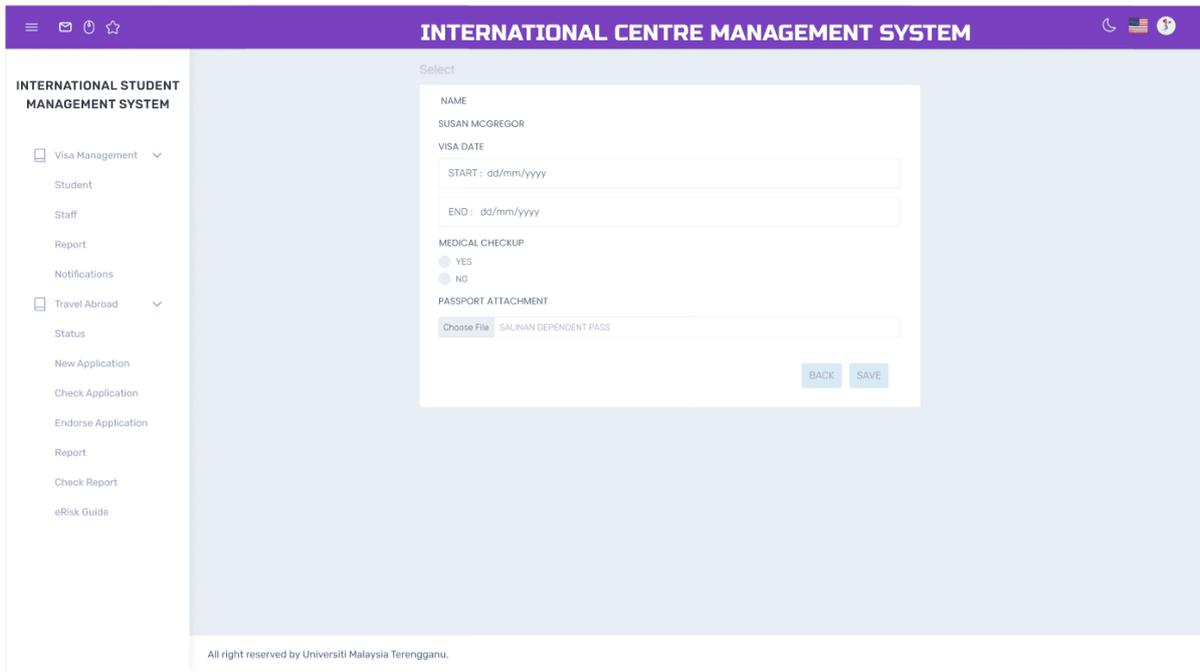
Figure 5.43: Medical Information Edit Page
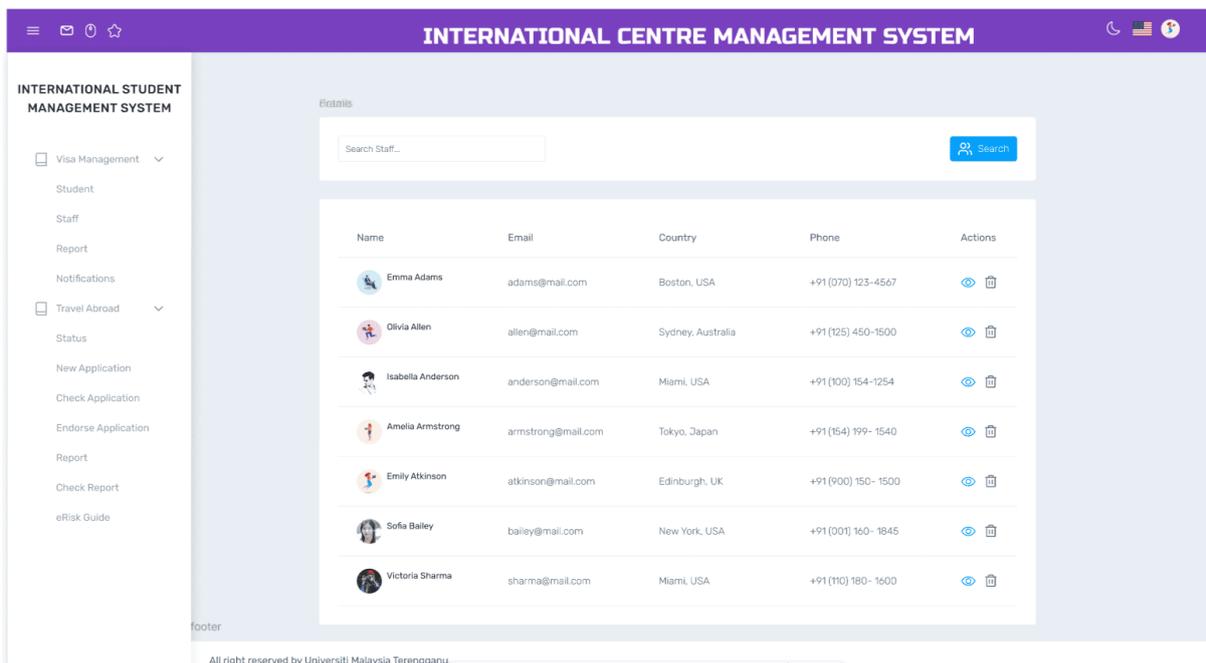
Figure 5.44: Staff List Page
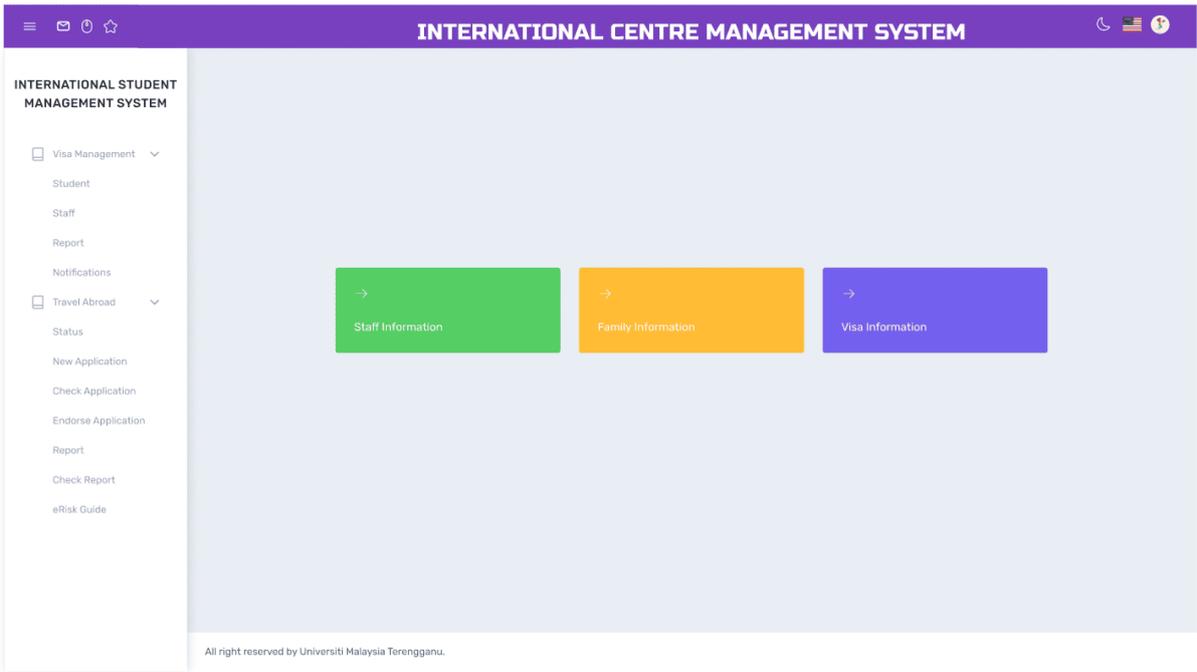
Figure 5.45: Staff Dashboard Management Page

Figure 5.46: Report and Graph Page
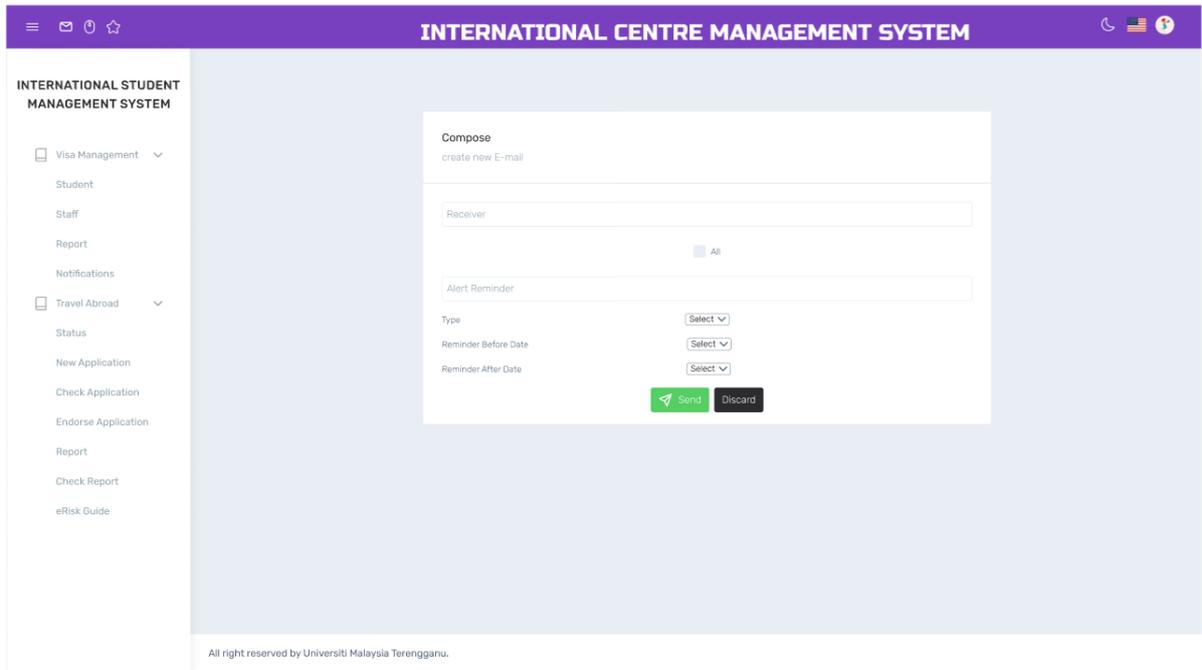
Figure 5.47: Visa Notification Submission Page
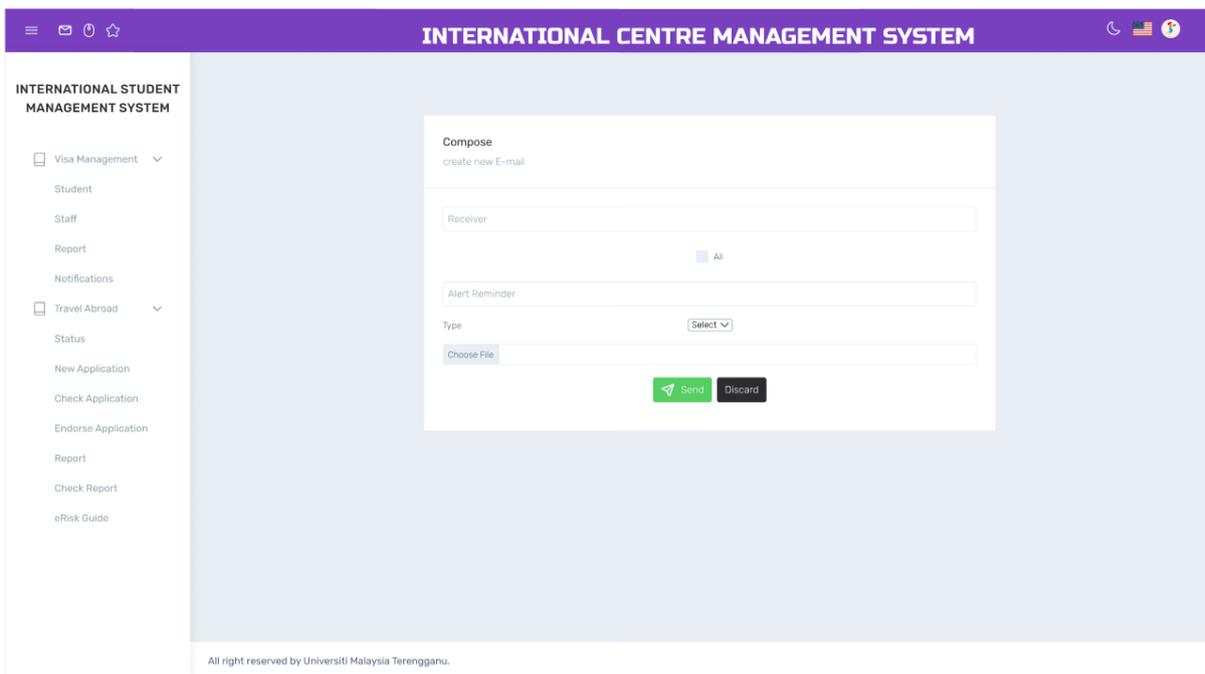
Figure 5.48: Event Notification Submission Page
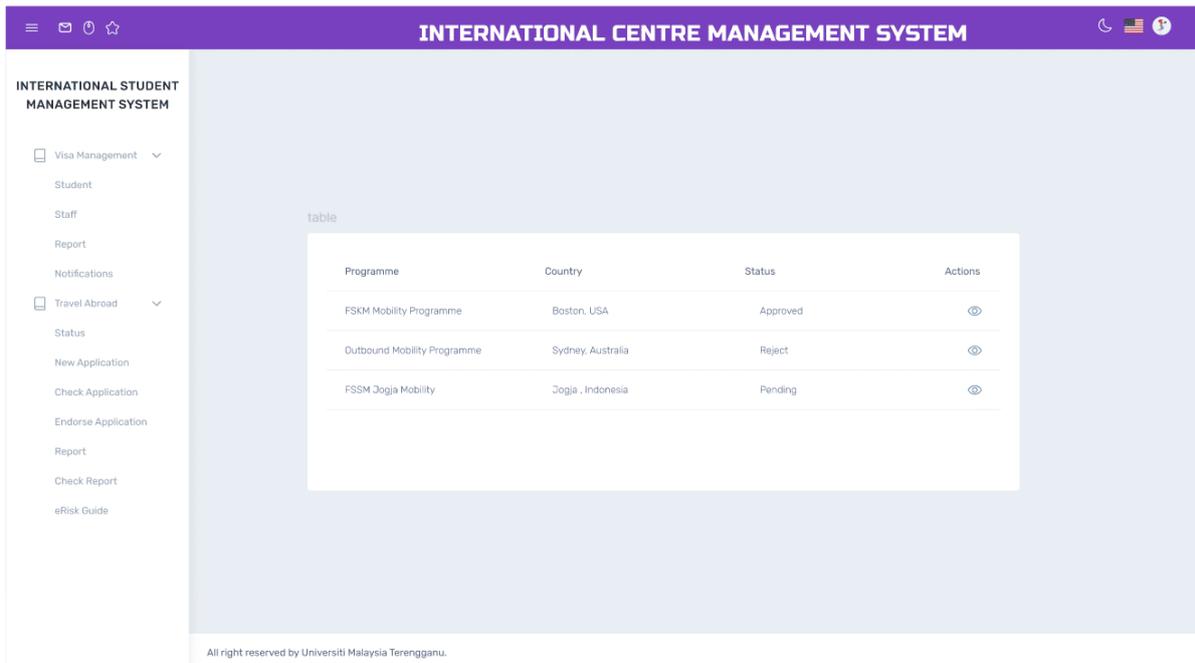
Figure 5.49: Travel Abroad Application List
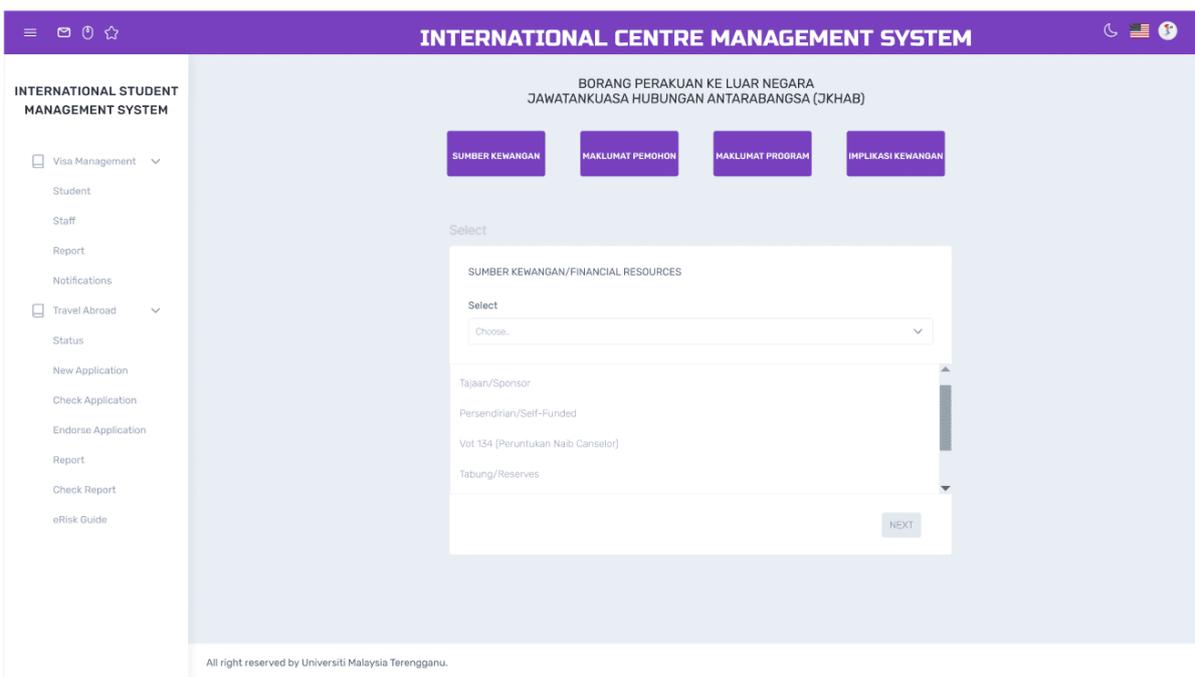
Figure 5.50: Section 1 Travel Application Page

Figure 5.51: Section 2 Travel Application Page

Figure 5.52: Section 3 Travel Application Page

Figure 5.53: Section 4 Travel Application Page

Figure 5.54: Travel Abroad Application List
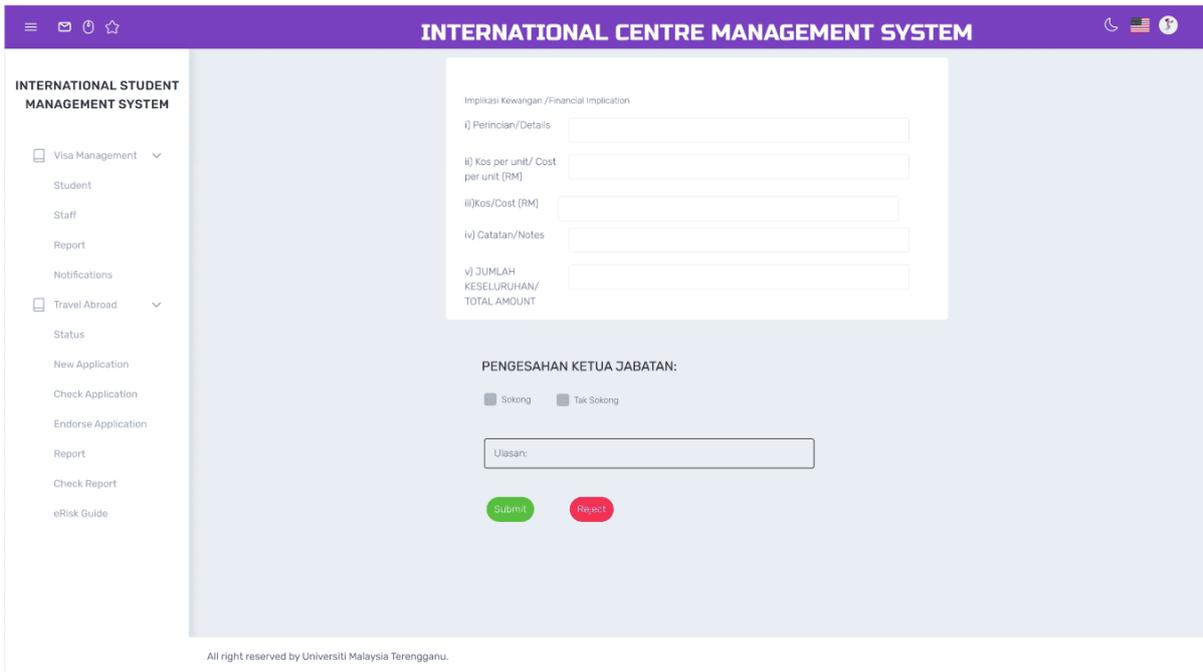
Figure 5.55: Travel Application Endorsement Page

Figure 5.56: Travel Application List Page

70
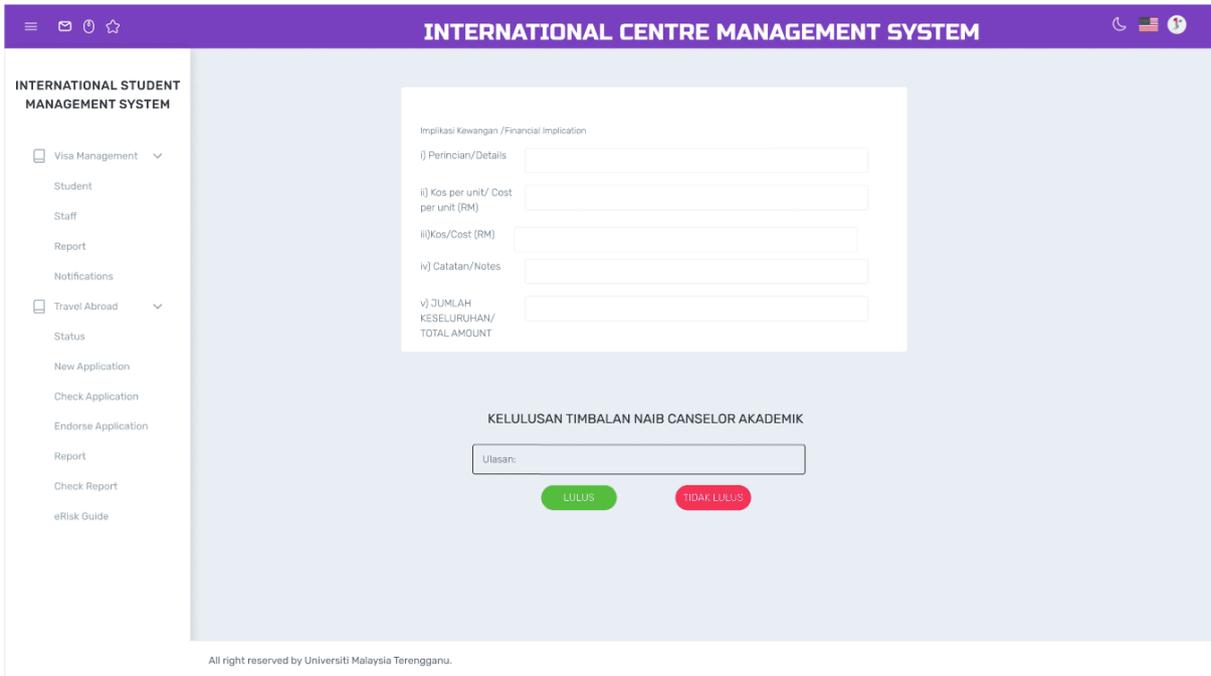
Figure 5.57: Travel Application TNCA Approval Page
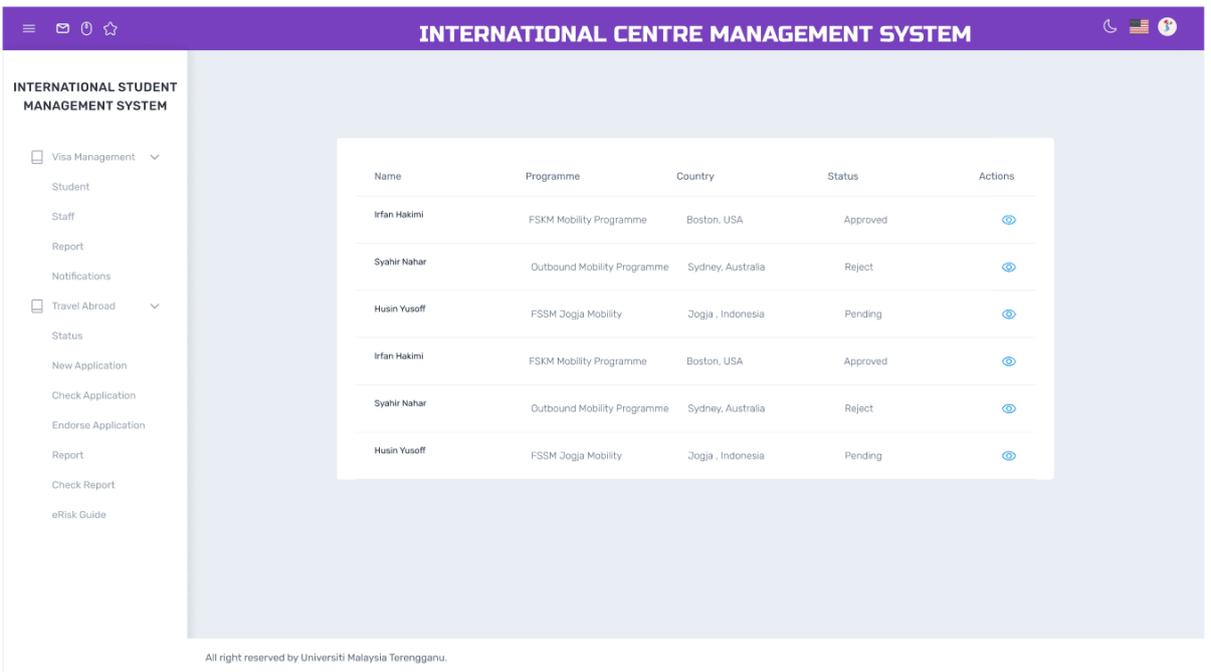
Figure 5.58: Travel Application List Page
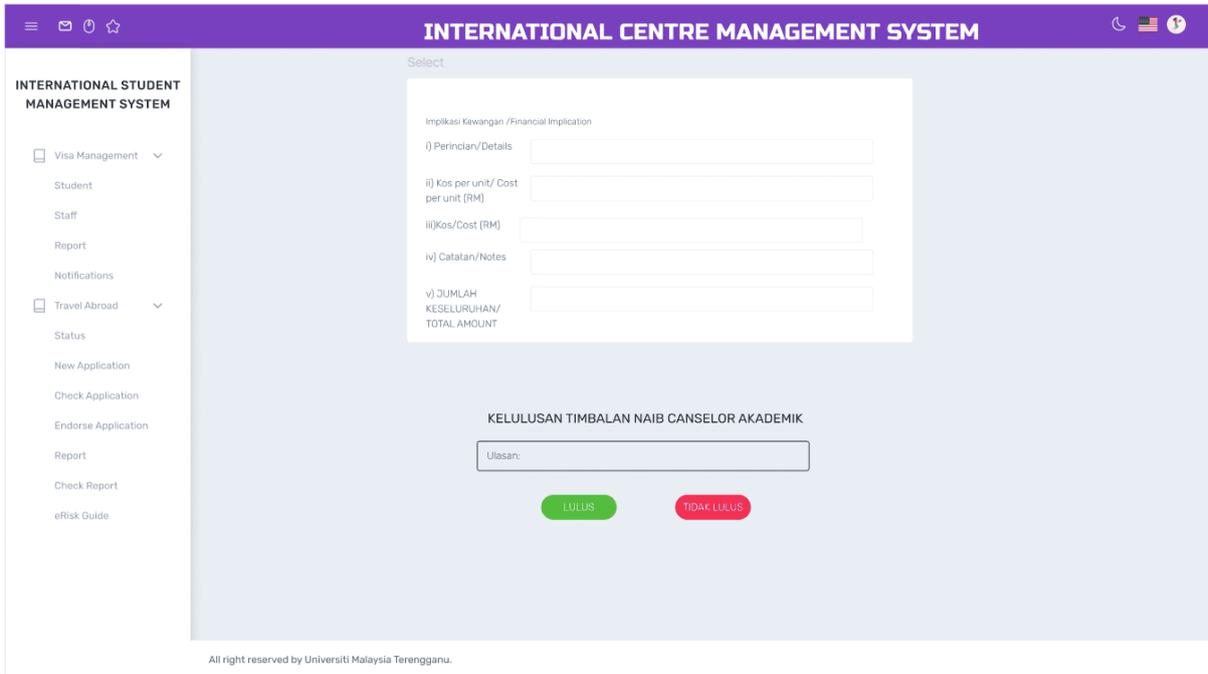
Figure 5.59: Travel Application International Centre Approval Page
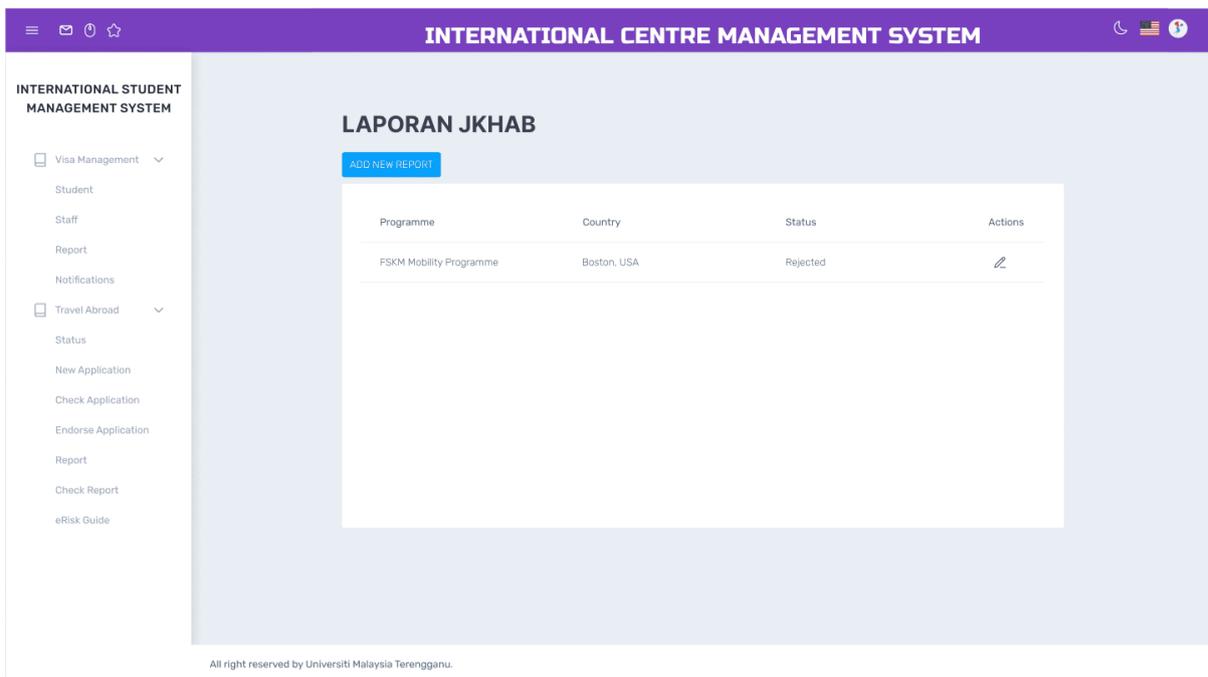
Figure 5.60: JKHAB Report List Page

Figure 5.61: JKHAB Report Form Page

Figure 5.62: JKHAB Report Form Page
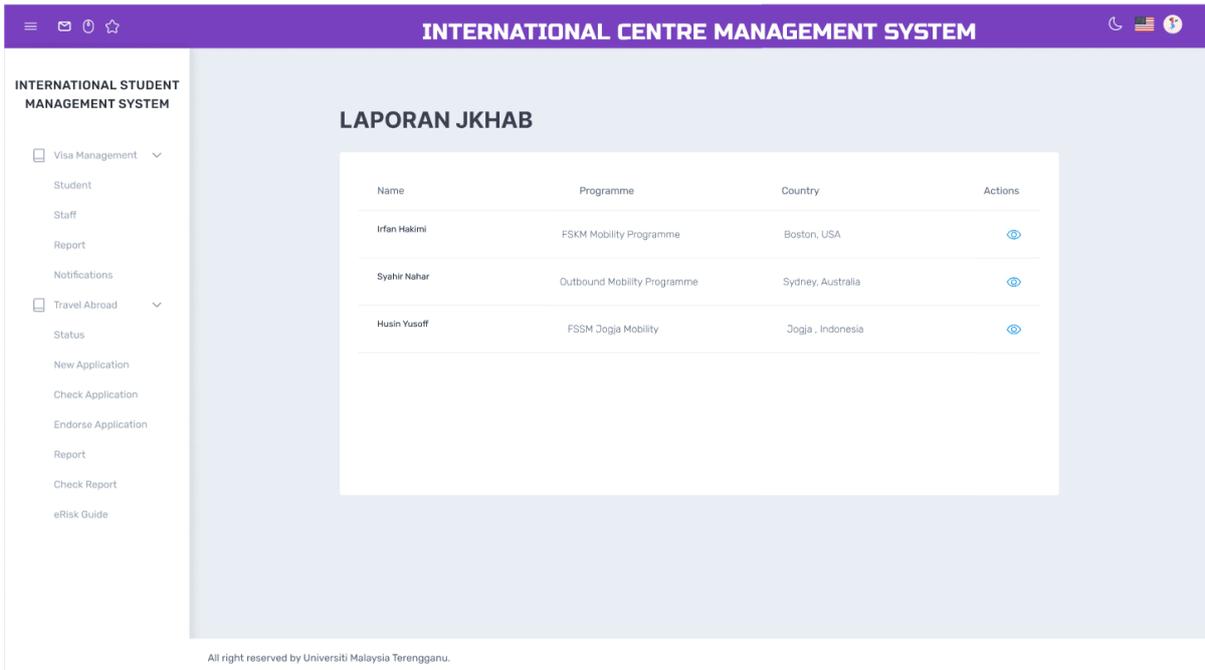
Figure 5.63: JKHAB Report List Page
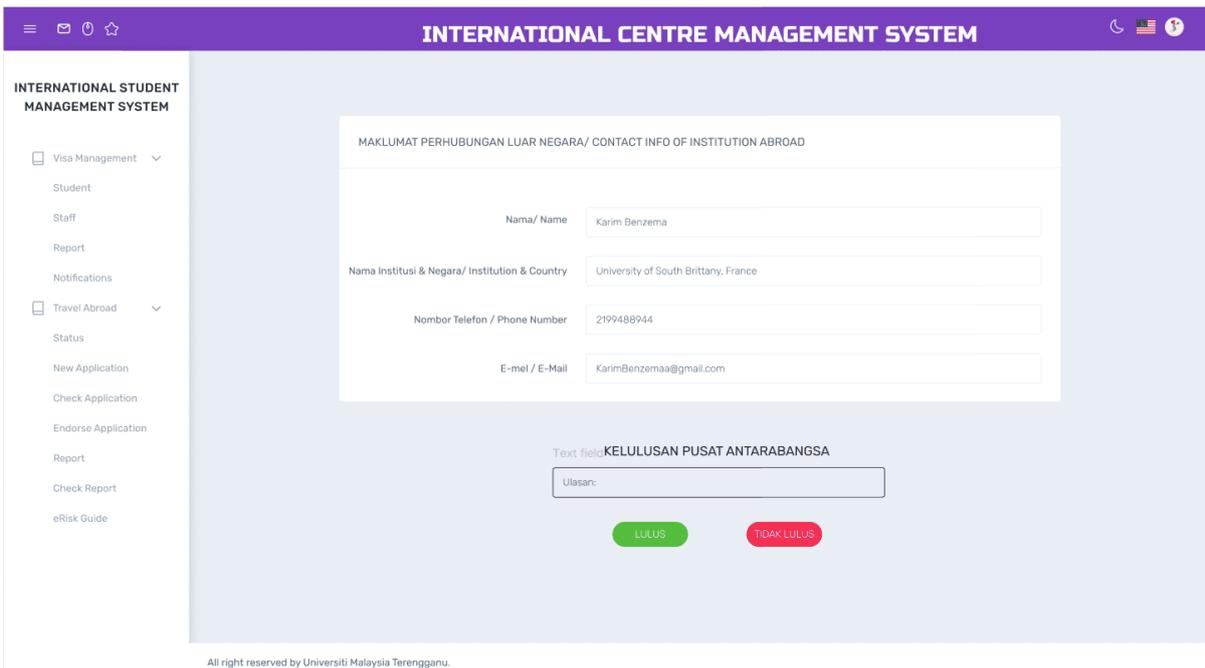
Figure 5.64: JKHAB Report Approval Page

Figure 5.65: E-Risk Guide Page

5.5.3 Screen Objects and Actions

1. Homepage (figure 5.35)

- Object : Graph for population International students and international staffs at Universiti Malaysia Terengganu based on country, level of study, gender, status study and visa expiration

2. Student Dashboard (figure 6.28)

- Object : Three button for Student Information, Family Information and Visa Information.
- Action : Click Student Information to go List of Student Information. Click Family Information to go to List Family Information and click Visa Information to go to the List Visa Information.

3. List International Student (figure 5.36)

- Object : Search Bar, list of student, button edit and button delete
- Action : Search student name or matric number o search bar and click search to get the student information. click edit to edit the student information and click delete to delete the student information.

4. List International Student (figure 5.38)

- Object : button edit and button back
- Action : click the back button to go to previous page. Click the edit button to go to the edit page

5. Edit International Student Page (figure 5.39)

- Object : input field for agent name, secondary phone number, current address, name, relationship, phone number. radio button for entry through agent
- Action : enter the input for agent name, secondary phone number, current address, name, relationship, phone number. choose between yes or no for entry through agent and click save to

save the edit.

6. List Family (figure 5.40)

- Object : list of family, button edit and button delete

- Action : click edit button to edit family information and click delete to delete family information.

7. Edit family page (figure 5.41)

- Object : input field for name, passport, age. Dropdown for input relationship

- Action : Enter input for name, passport, age. Choose relationship with students/staffs. Click Save to save the edit and click back to return to previous page.

8. Visa Information page (figure 5.42)

- Object : List of Visa and medical information. Review Passport attachment button . Edit button and Delete button.

- Action : Click Review Passport attachment button to see the passport attchmenr. Click edit to edit visa information and click delete to delete the visa information.

9. Visa Information page (figure 5.43)

- Object : Input field for name, visa date, visa end. Radio button for medical checkup. Attacment field for passport.

- Action : Enter input for name, visa date, visa end. Click and choose the option for medical checkup. And submit file to passport attachment. Click back to return to previous page and click save to save the changes.

10. Graph Report page (figure 5.46)

- Object : Graph and multiple selection button.

- Action : Click multiple variable between level of study, status of study, country, gender and visa expiration to create the graph of international student/staff population in UMT. Click view detail to see the full report.

11. Notification page (figure 5.47)

- Object : Input field for receiver, alert reminder. Box button "all". Dropdown for type, re-

minder before and after date.

- Action : Enter the input for receiver, alert reminder. Click box button 'all" to choose all student/staff. choose the option from dropdown type, reminder before and after date. Click button send to send notifications and discard button to cancel the changes.

12. Travel Application List page (figure 5.49)

- Object : List of Travel application. Edit button. Delete button. Add Application Button.

- Action : Click Edit button to edit travel application. Click Delete button to delete travel application. Click Add Application to make a new application.

13. Travel Form Application page (figure 5.50)

- Object : Sumber Kewangan Button, Maklumat Pemohon button, Maklumat Program button, Implikasi Kewangan button. Dropdown option for Financial Resources.

- Action : Choose the option for Implikasi Kewangan. Click Next button to move to next section form. Click Maklumat Pemohon button or Implikasi Kewangan button to move to that page.

14. Endorsement Travel Application page (figure 5.55)

- Object : Travel form application. Check Box button "Sokong" and "Tak Sokong". Input field for "ulasan". Submit button. Cancel button.

- Action : Click button "Sokong" or "Tak Sokong". Enter the input for "Ulasan". Click Submit button to submit. Click Cancel to cancel.

15. Approval Travel Application page (figure 5.57) - Object : Travel form application. Input field for "ulasan". Approve button. Reject button.

- Action : Enter the input for "Ulasan". Click Approve to approve the application. Click Reject to reject the application.

16. JKHAB Report page (figure 5.60)

- Object : List of JKHAB report. Add New button. Edit button. Delete button

- Action : Click the Add New button to make a new JKHAB report. Click Edit button to edit the report . Click Delete button to delete the report.

17. JKHAB Report Form page (figure 5.61)

- Object : Input field for PIC name, PTJ, Phone number and Programme title. Radio button for Application Category.

- Action : Enter the input for PIC name, PTJ, Phone number and Programme title, Choose and

click option for Application Category.

18. JKHAB Report List page (figure 5.63)

- Object : List of JKHAB report. Edit button

- Action : Click the Edit button to edit the report.

19. JKHAB Report Approval page (figure 5.64)

- Object : List of JKHAB report. Input field for "Ulasan". Approve button. Reject button

- Action : Enter the input for "Ulasan". Click Approve to approve the JKHAB report. Click the Reject to reject the JKHAB report.

20. E-Risk Guide page (figure 5.65)

- Object : Display for Guide E-Risk.

- Action : Scroll down for E-Risk Guide

5.6 Discussion

The International Centre Management System is created to help manage visa and travel abroad applications for international staff and students at Universiti Malaysia Terengganu. This system includes a user-friendly interface and a well-structured database. The interface is designed based on the actual needs of each user, such as the international office admin, secretariat, and top-level approver. Features like email reminders for visa expiry, application tracking, and role-based access were built to match the real process at the university. The database stores important information such as passport details, visa status, and travel documents in a safe and organized manner. The system design aims to reduce manual work, improve transparency, and make daily tasks more efficient.

5.7 Summary

This chapter explains the system design based on the needs of the users. It covers both the interface, which shows how users interact with the system, and the database, which stores important data. The system helps users manage visa records and travel applications in a simple and smooth way. Every part of the design supports the real work process at the International Centre. With this design, the system is expected to give a better user experience, improve the workflow, and help make sure important tasks are completed on time.

CHAPTER 6

SYSTEM IMPLEMENTATION

6.1   Introduction

This chapter describes how the International Centre Management System (ICMS) was built and deployed, covering the translation of design artifacts into working modules. It details the hierarchical menu structure, the step-by-step development of each functional component, and reflections on technical challenges and resolutions. Finally, it summarizes how the implementation aligns with the requirements specified in Chapter 4 and the design outlined in Chapter 5

6.2   System Hierarchical Menu

This is the hierarchical menu for the International Centre Management System, which is designed to help manage visa and travel abroad processes more easily. It has two main sections: Visa Management, which includes things like student and staff info, family details, visa information, graphs, and reminders, and Travel Abroad Management, which covers applications, status updates, reports, approvals, and endorsements. This layout makes it clearer and more organized so everything can be accessed and handled more smoothly.
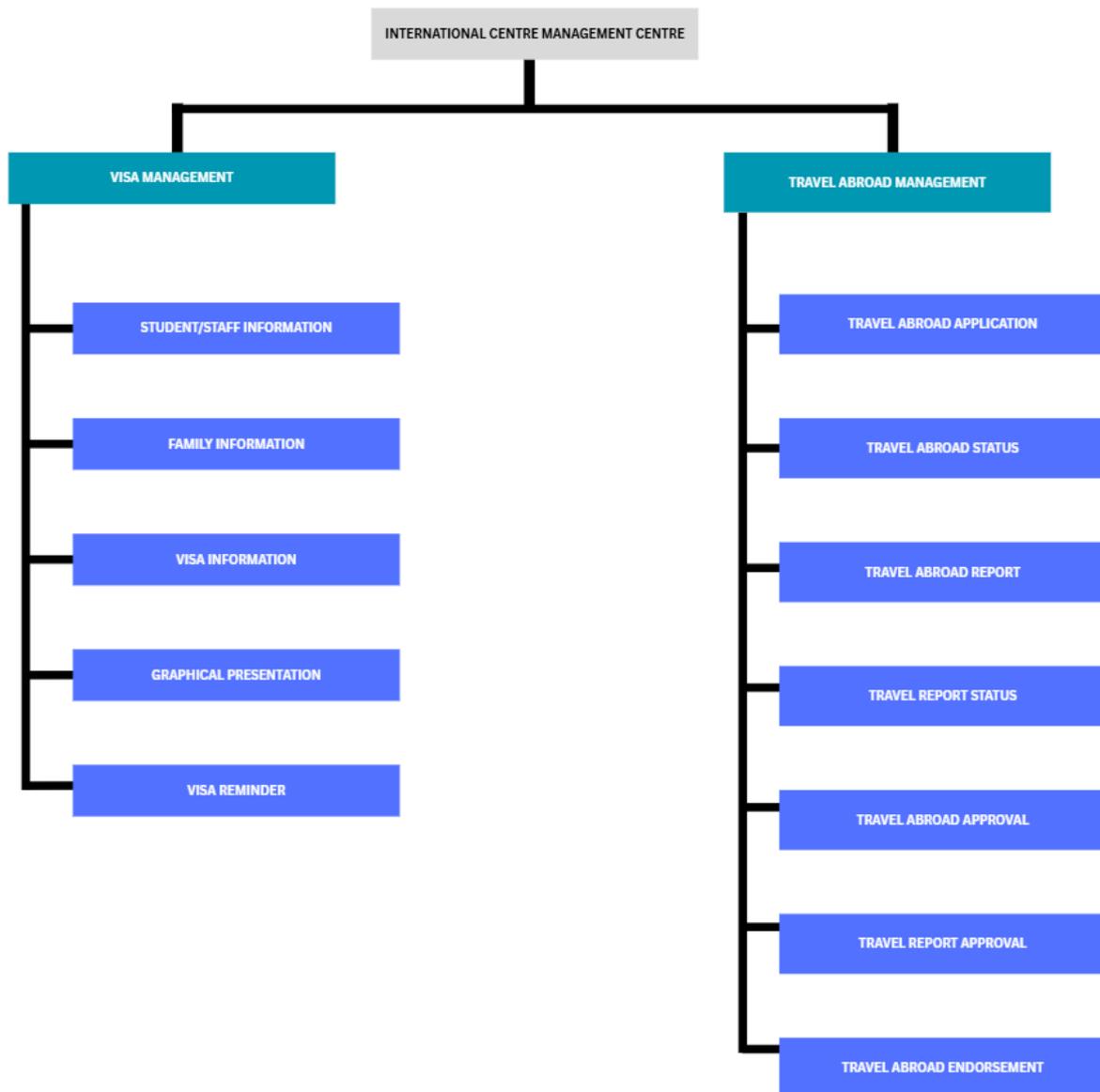
Figure 6.1: Student Dashboard management Page

this figure show that International Centre Management System has two big module which is Visa Management and also Travel Abroad Application. For Visa Management it include the international student and international staff data management for example personal information like their detail information, family information like the data about student/staff family members that came to Malaysia and lastly is the visa information like the data about their visa detail for example visa expiry date and visa attachment.It also include graphical data to show the population for international student and staff by graph and separate it by multiple variable such

as country, gender, status and etc. it also has visa reminder to alert the international student and staff about their visa expiration. For Travel Abroad module, it cover the travel abroad application status, report status, report approval and travel abroad application approval, finally travel abroad endorsement.

6.3   System Development

6.3.1   User Module

Figure 6.2: Mynemo Website Page
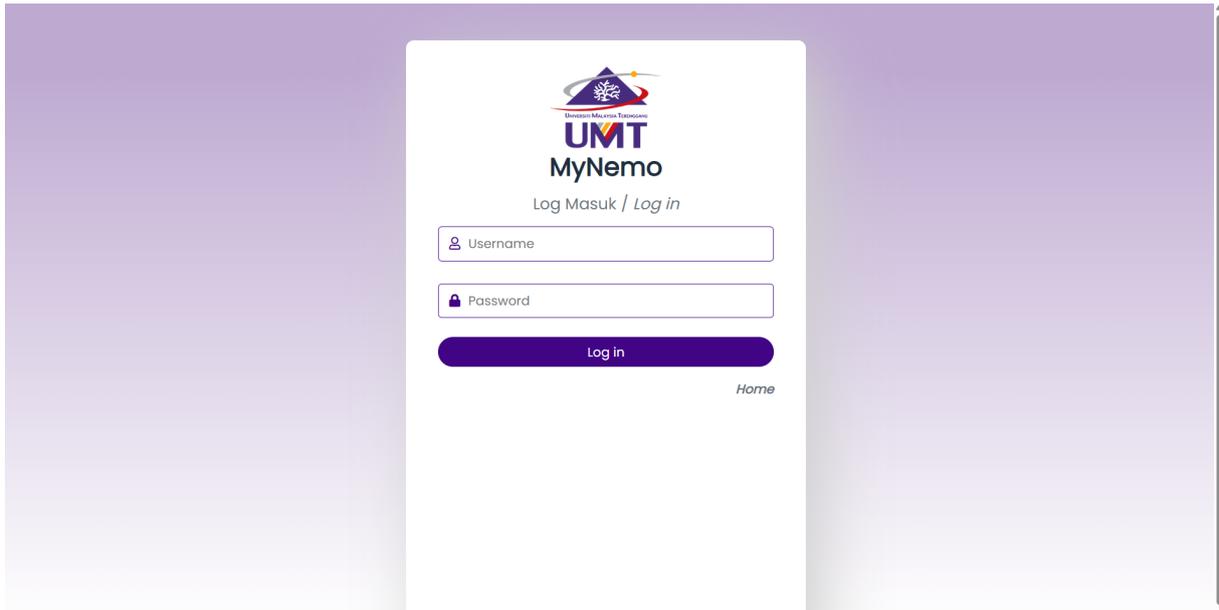
Figure 6.3: Mynemo Login Page
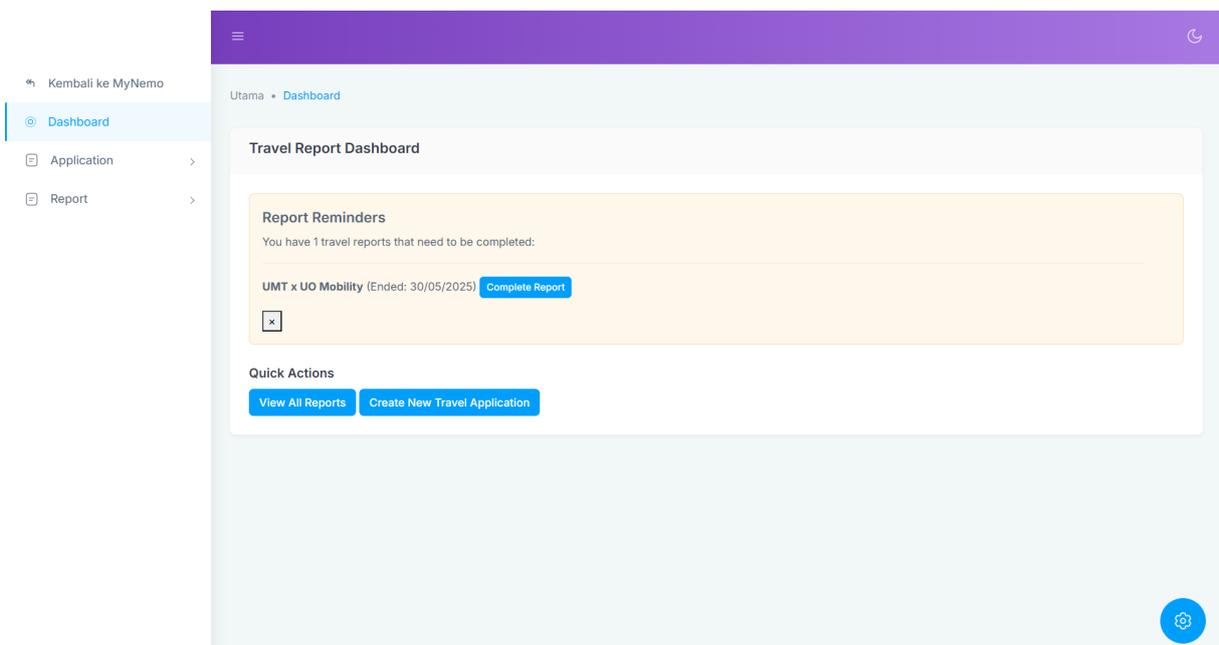
Figure 6.4: Student Dashboard Page
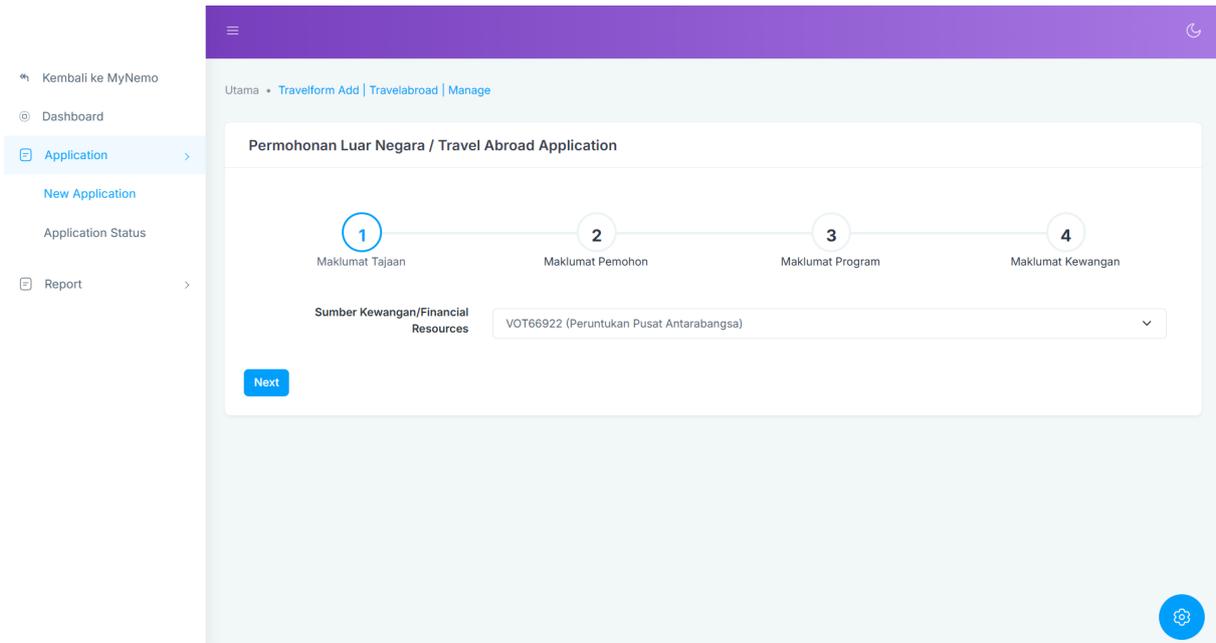
Figure 6.5: Travel Abroad Application Page
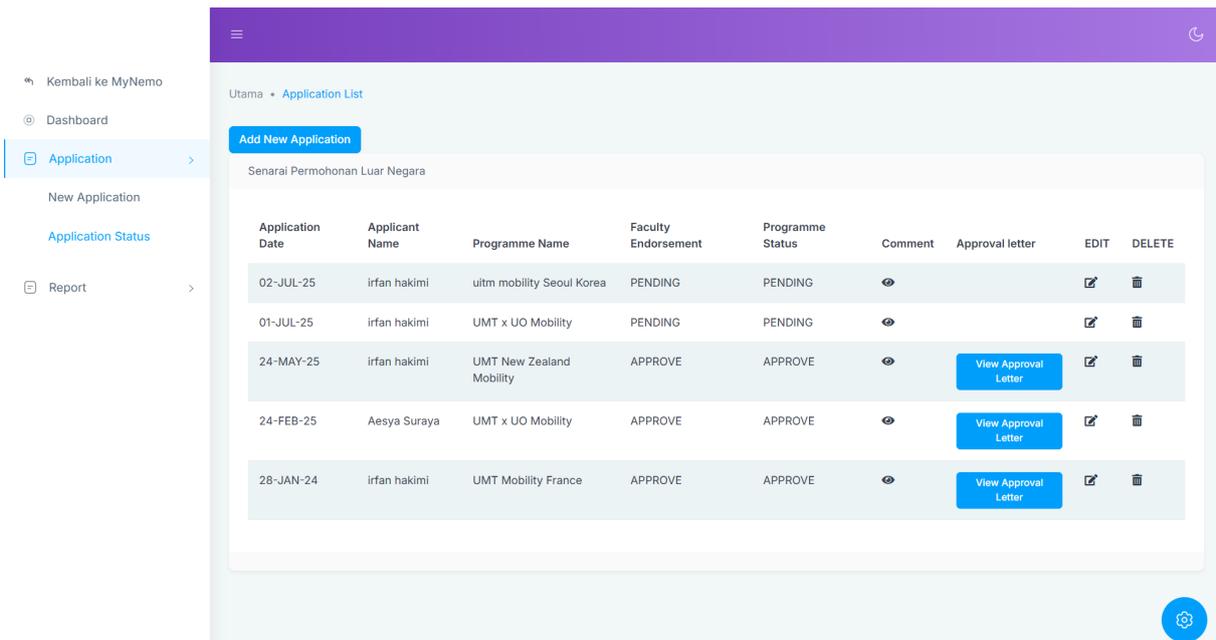
Figure 6.6: Travel Abroad Application Status Page
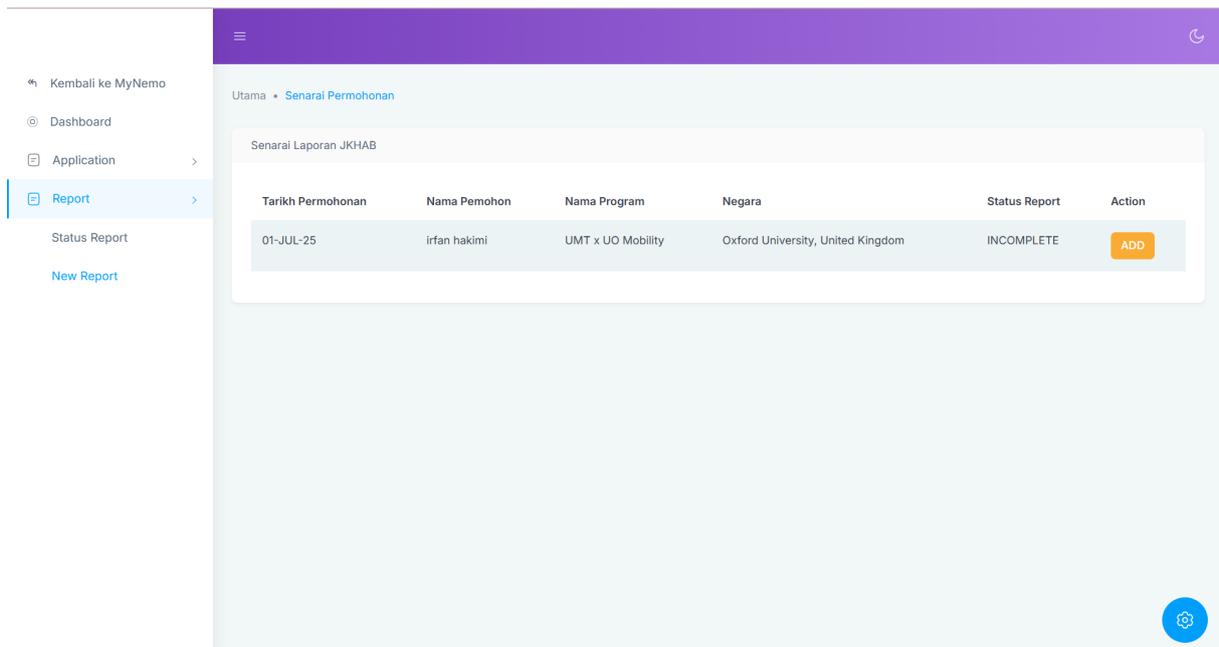
Figure 6.7: New Report Page
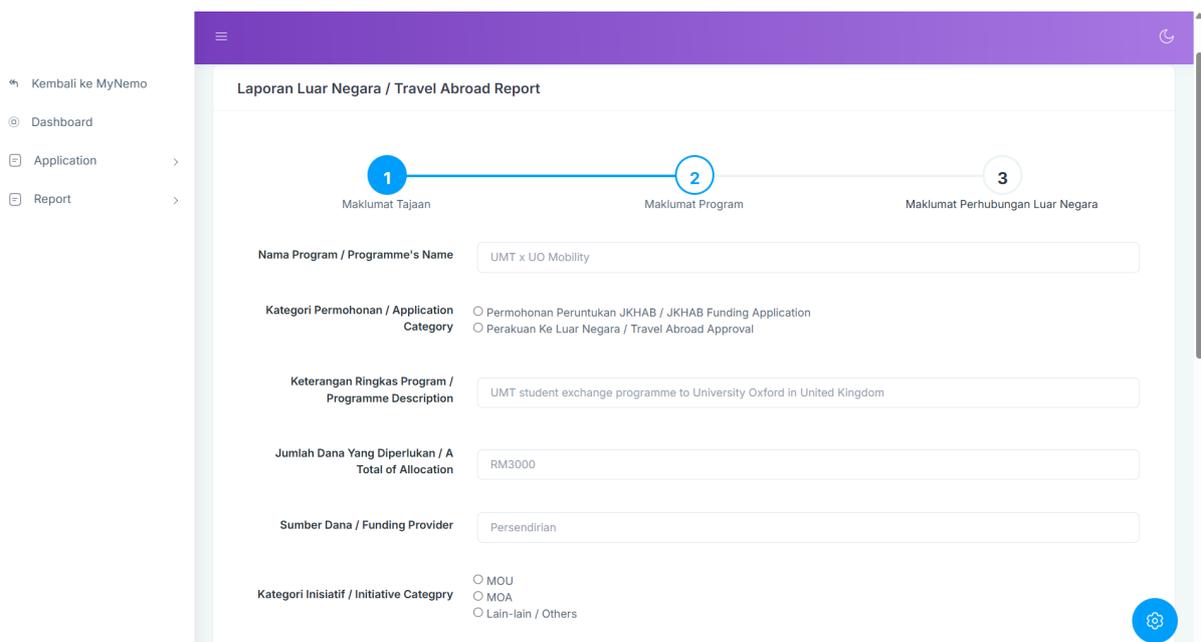
Figure 6.8: Report Form Page
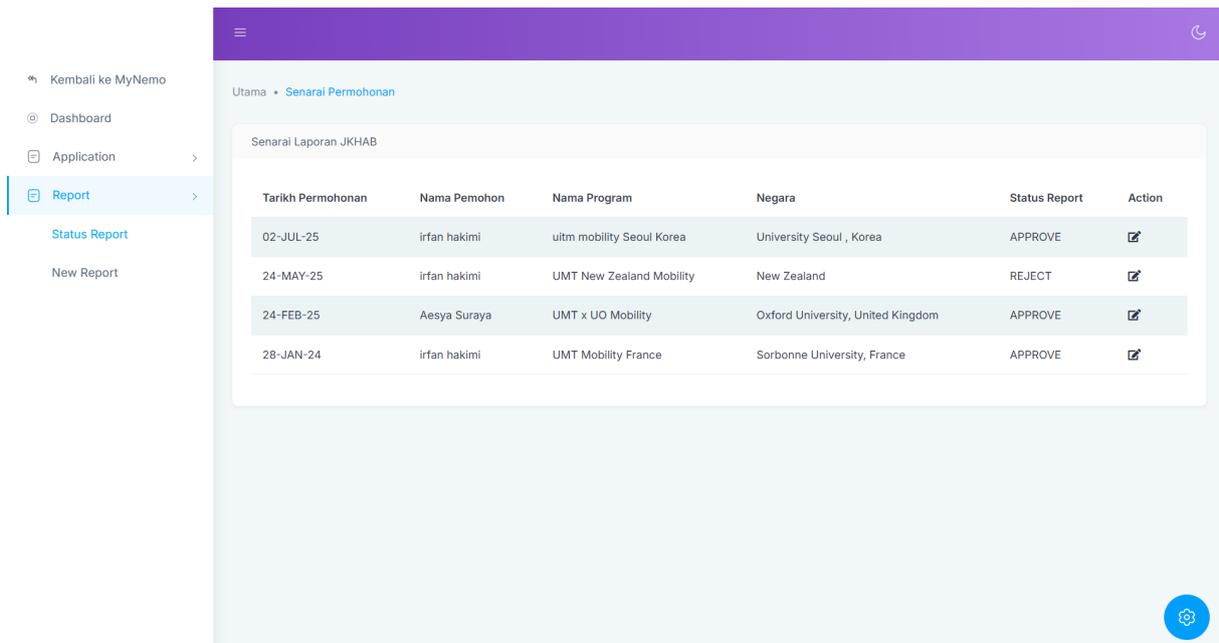
Figure 6.9: Report Status Page

6.3.2 Admin Module
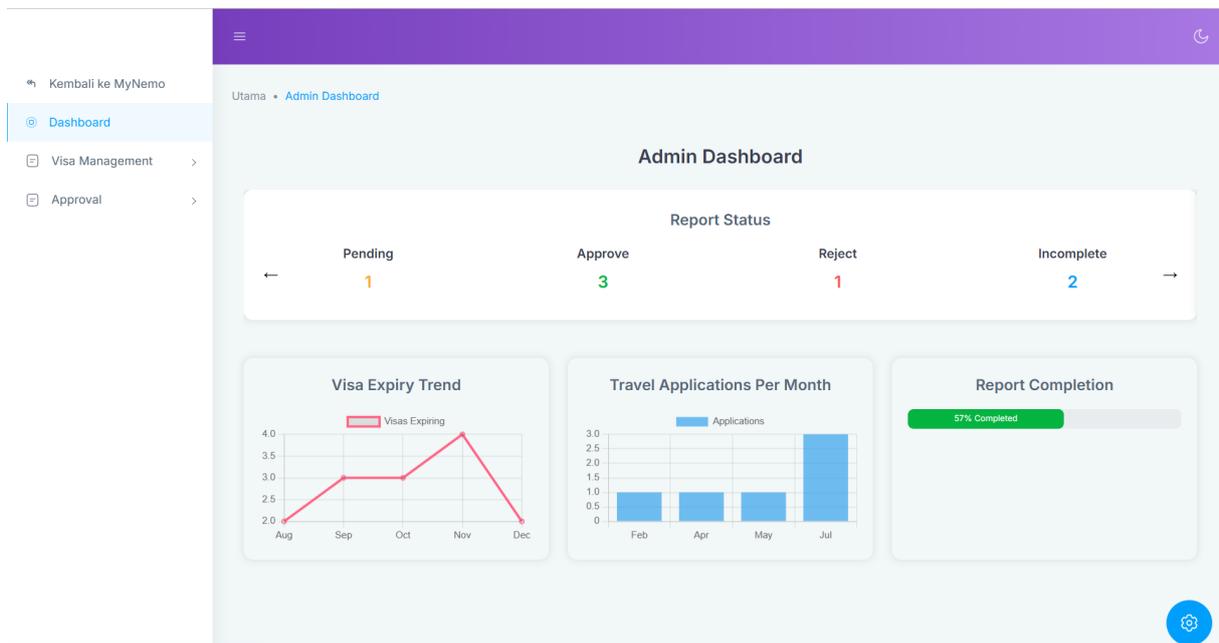
Figure 6.10: Admin Dashboard Page

Figure 6.11: Student List Page

Figure 6.12: Student Page
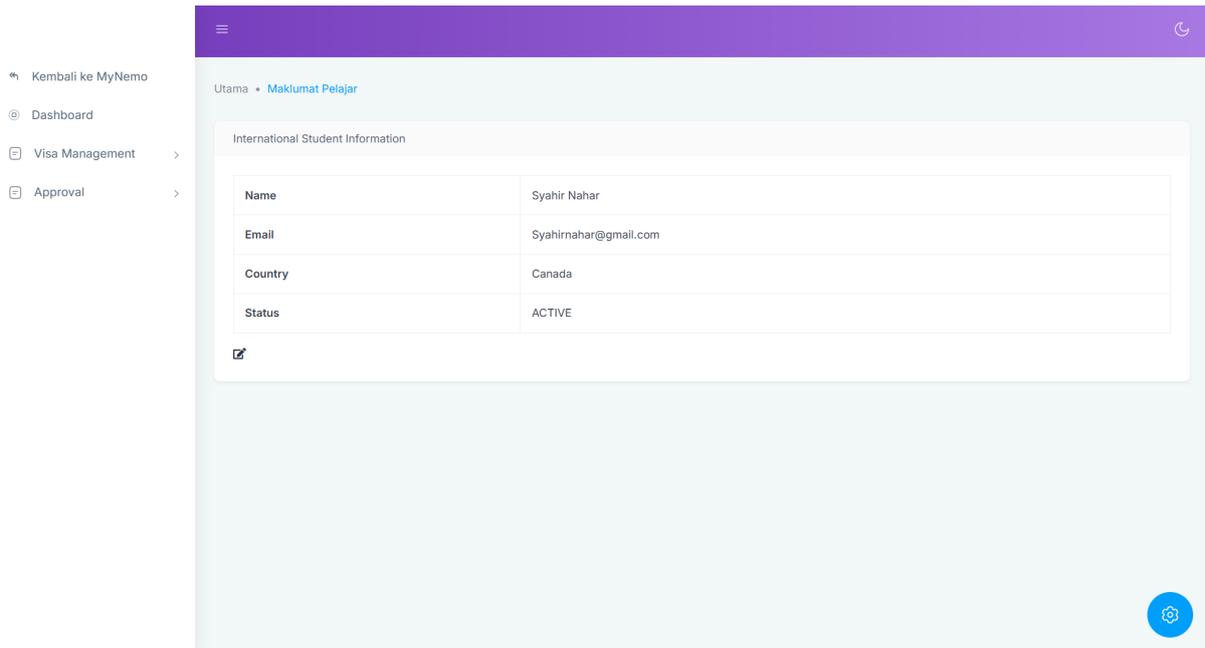
Figure 6.13: Student Information Page
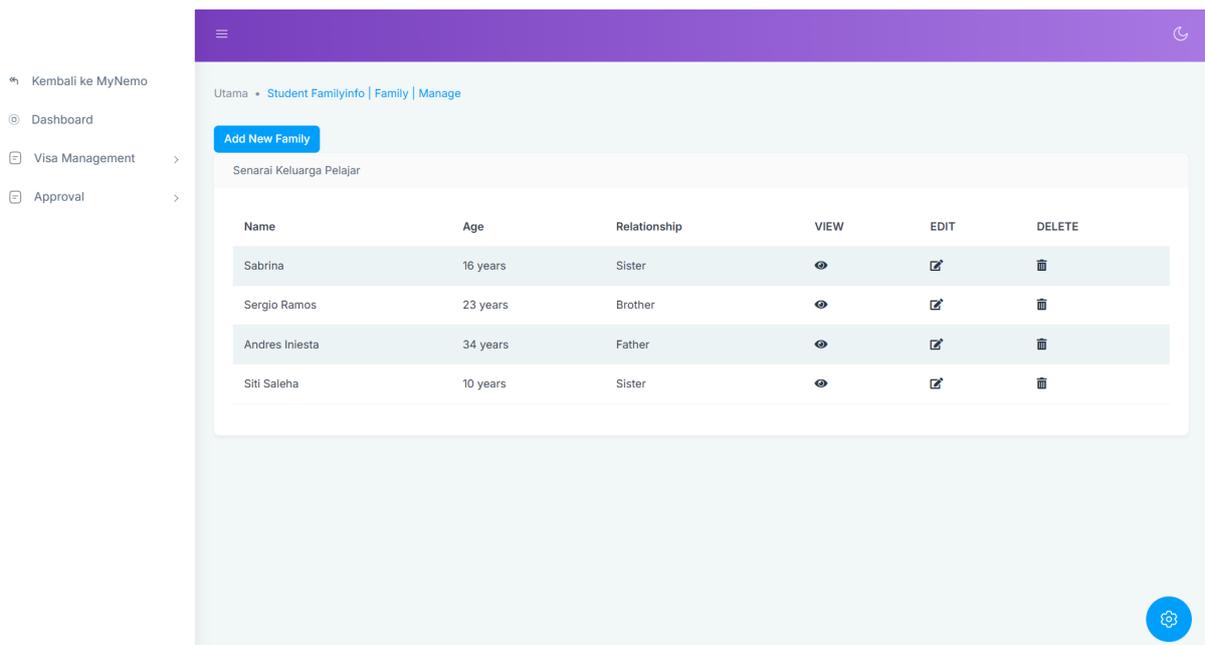
Figure 6.14: Family Information Page
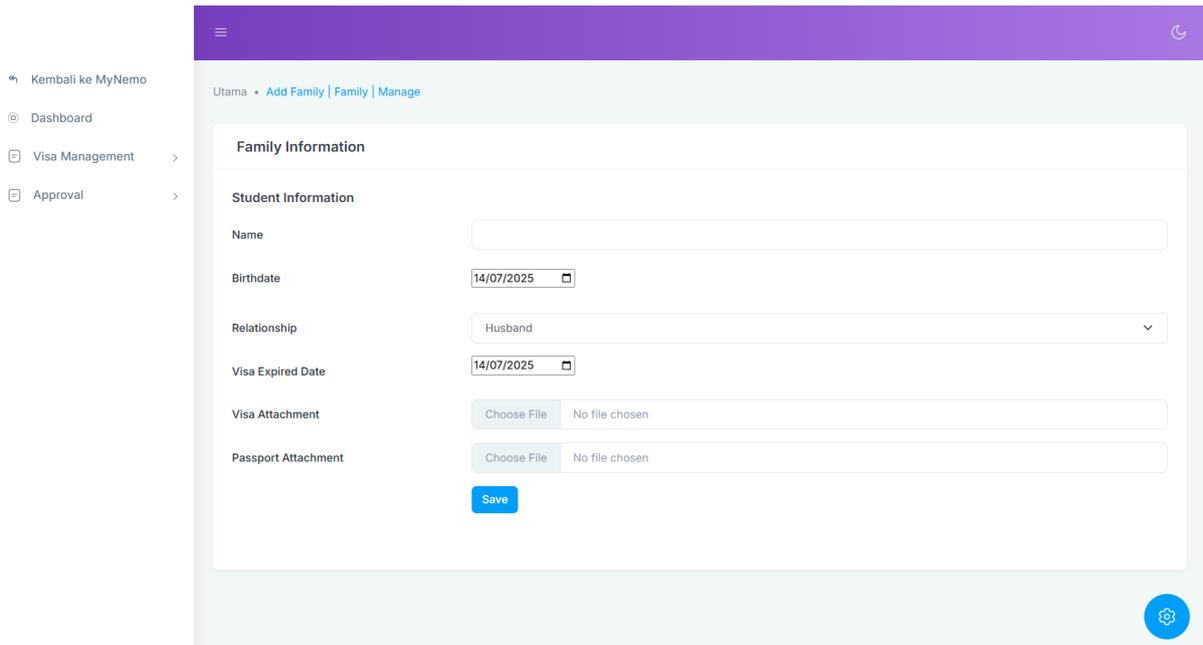
Figure 6.15: Family Add Page
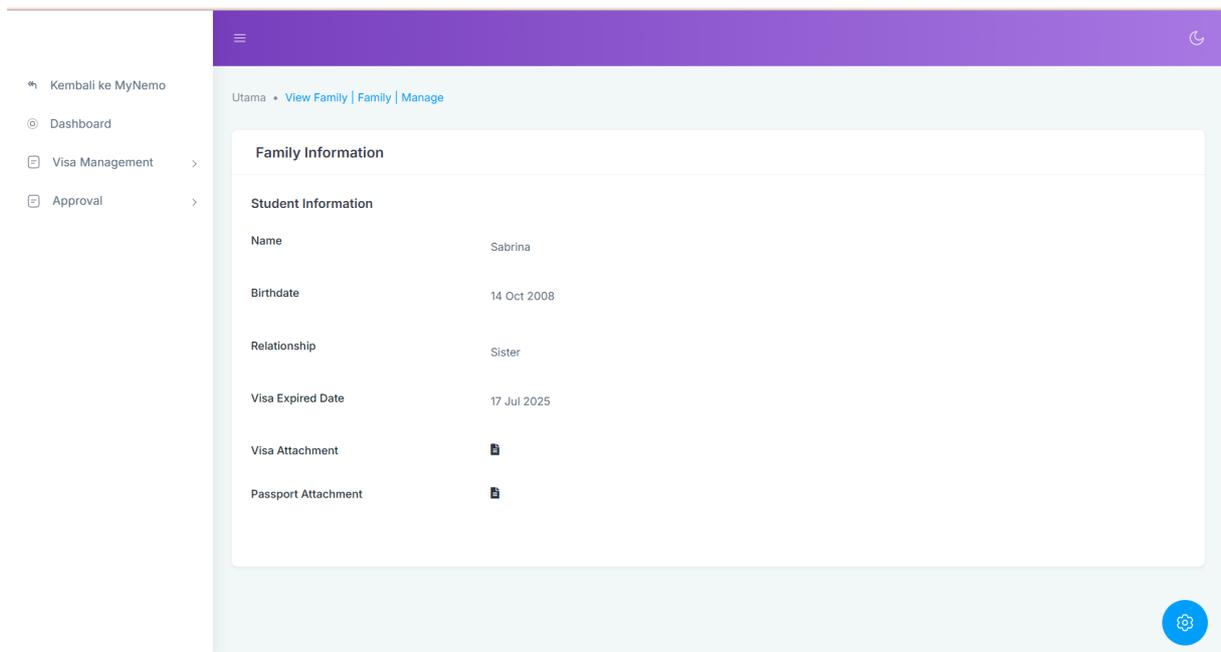
Figure 6.16: Family View Page
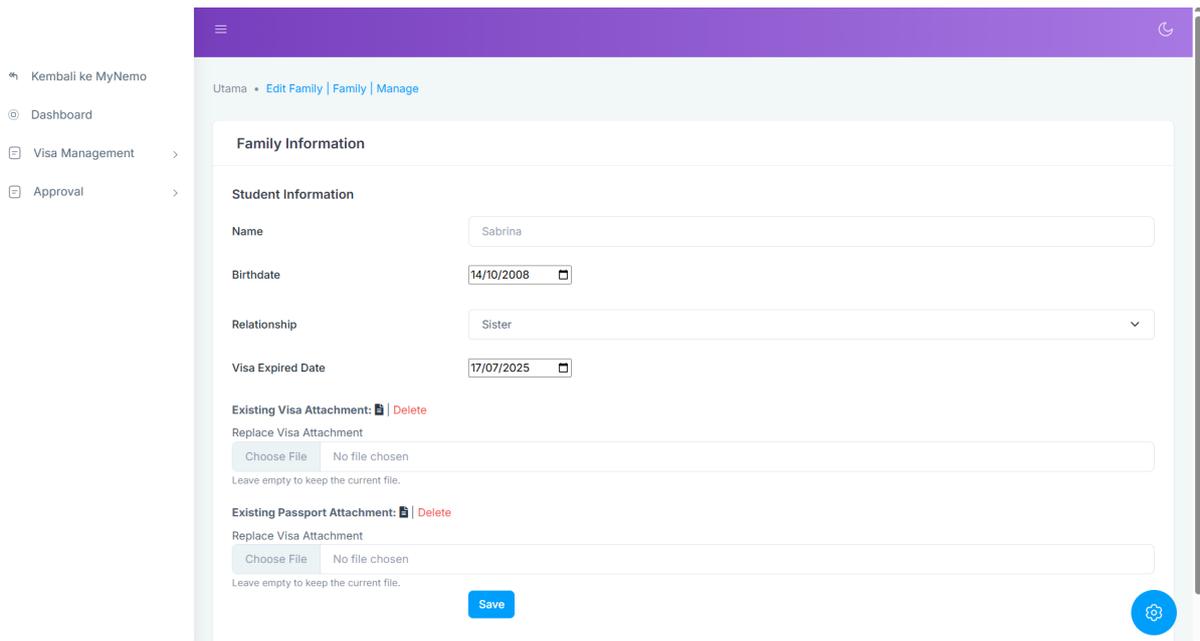
Figure 6.17: Family Edit Page
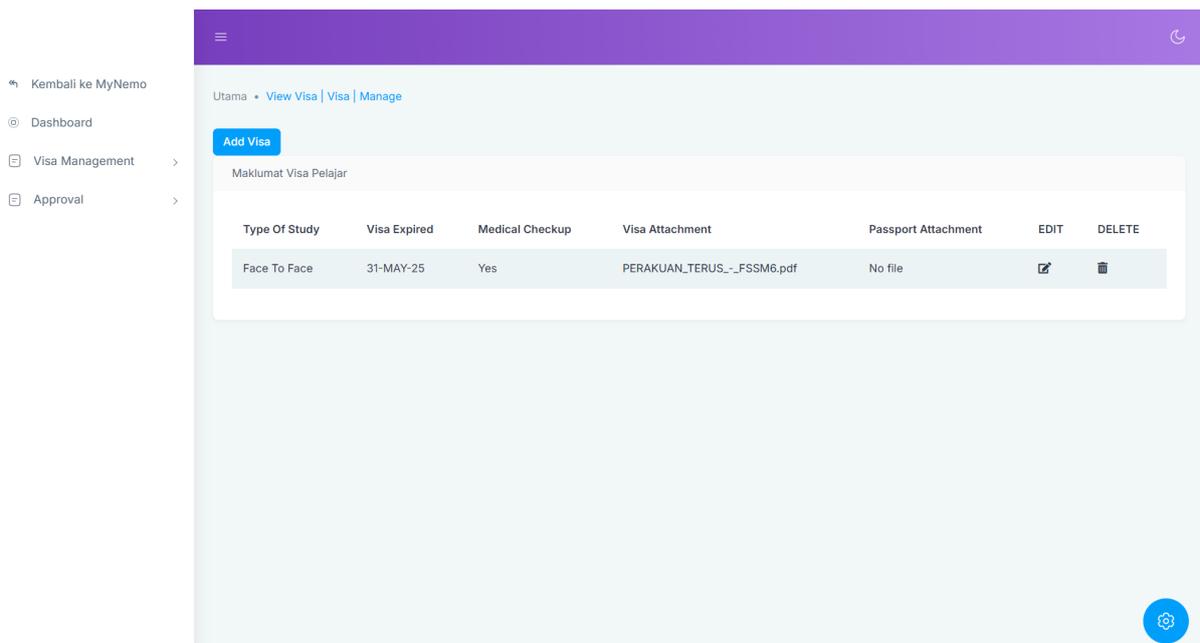
Figure 6.18: Visa Information Page
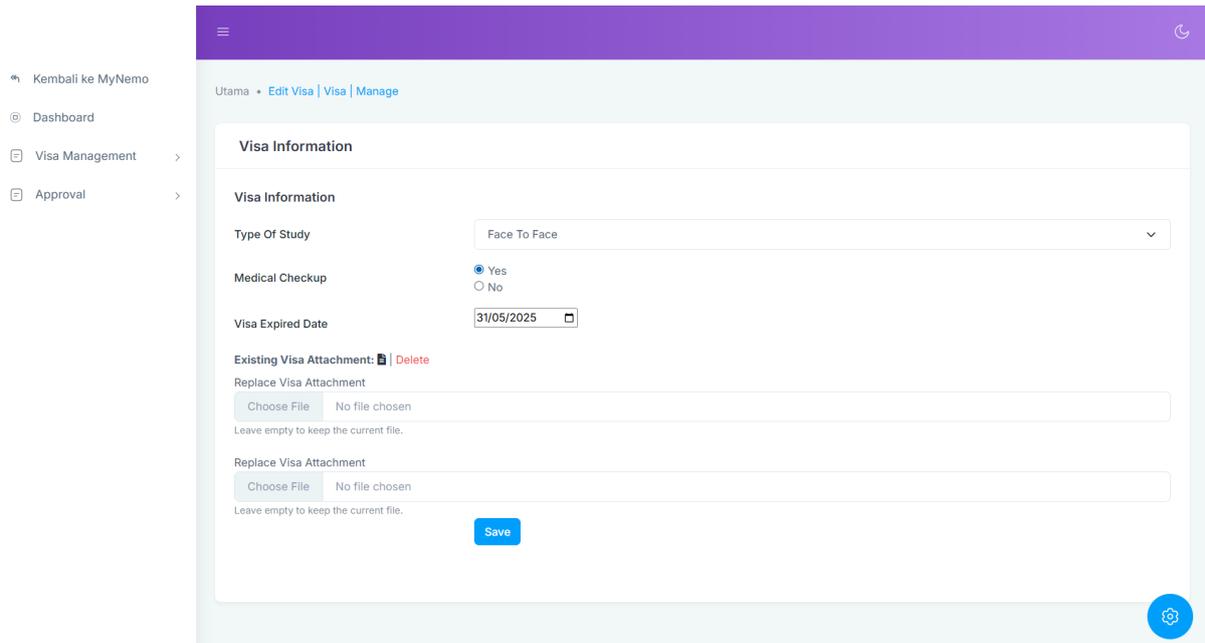
Figure 6.19: Visa Edit Page
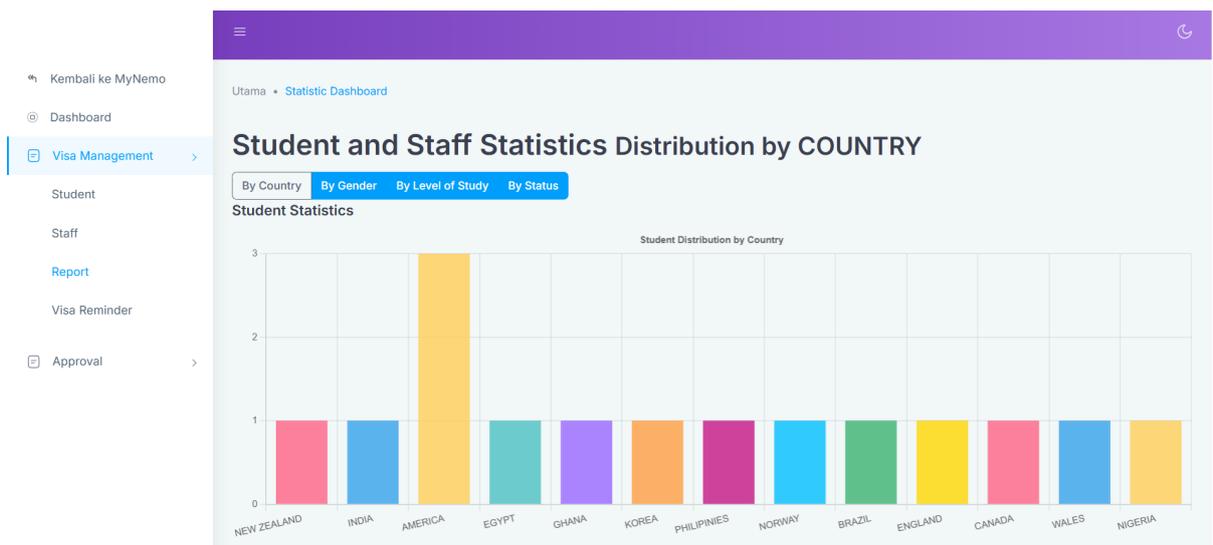
Figure 6.20: Graph Report Page

Figure 6.21: Visa Reminder Page

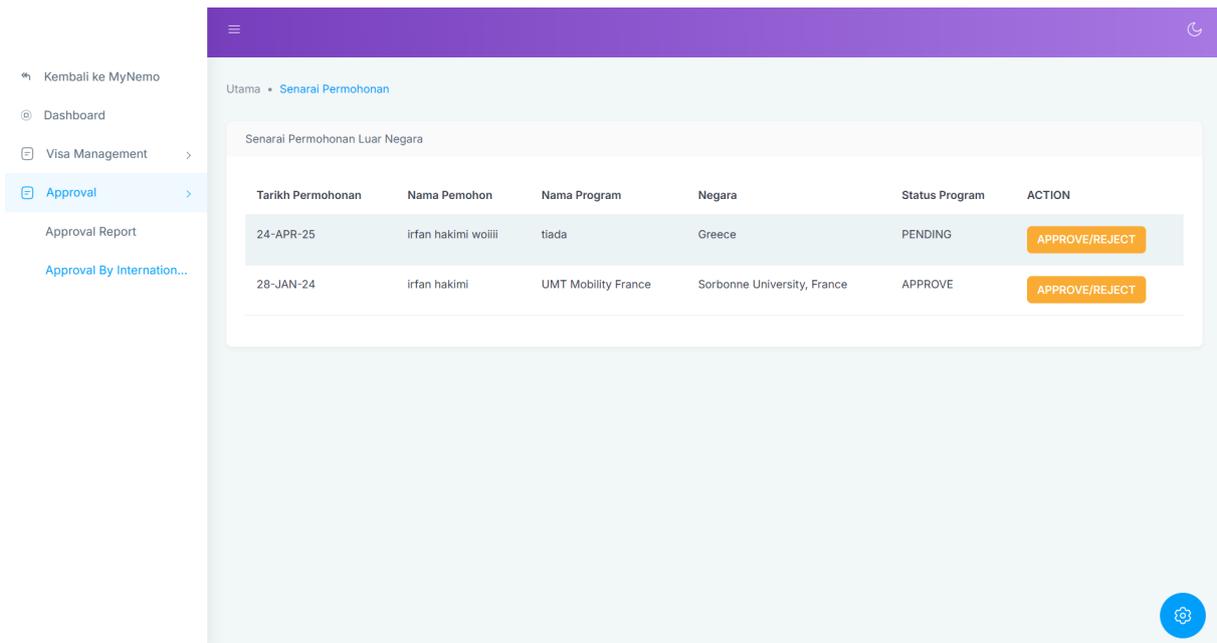Figure 6.22: Report List Page

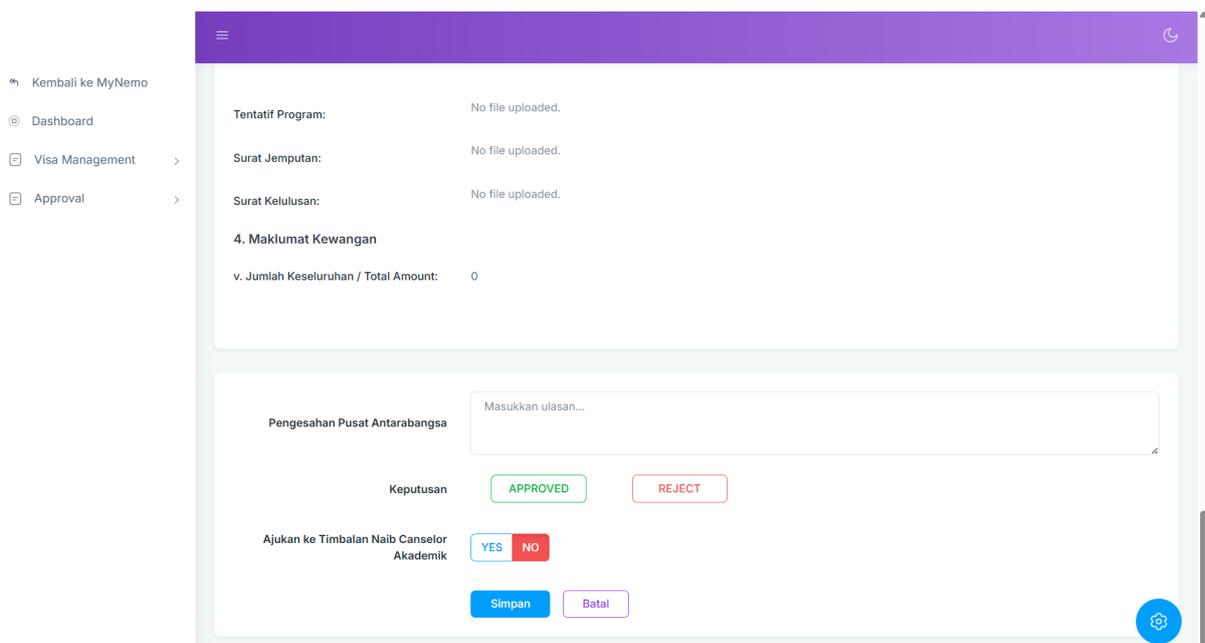Figure 6.23: Travel Abroad Application List Page

Figure 6.24: Travel Abroad Application Approval Page

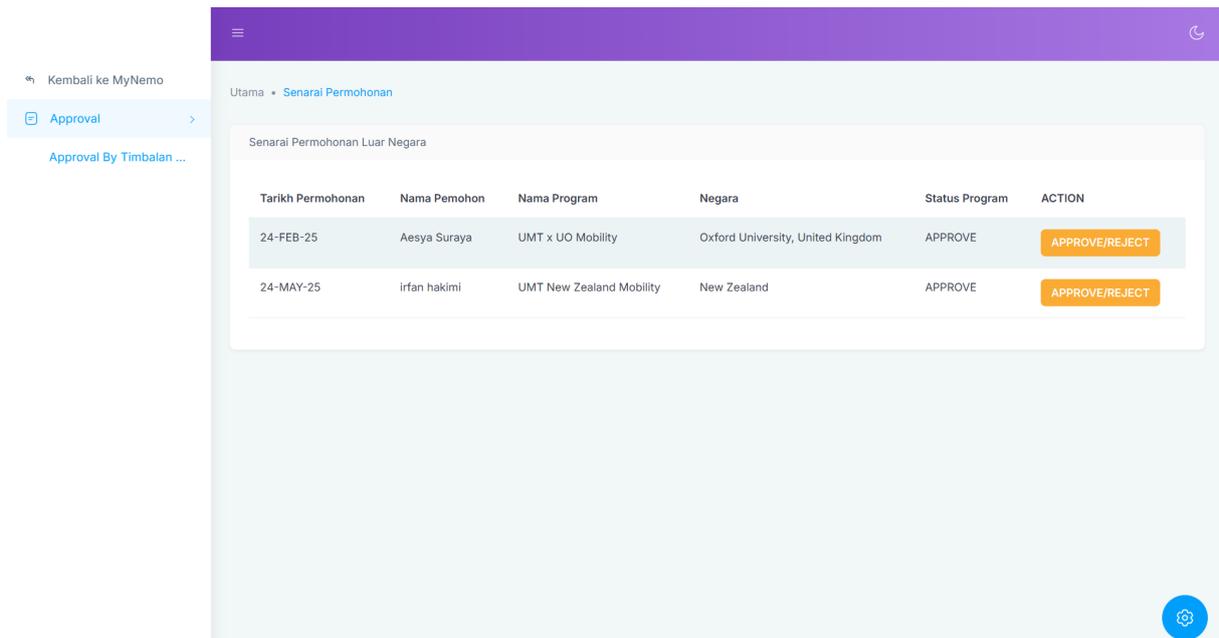### 6.3.3   Timbalan Naib Canselor Akademik Module

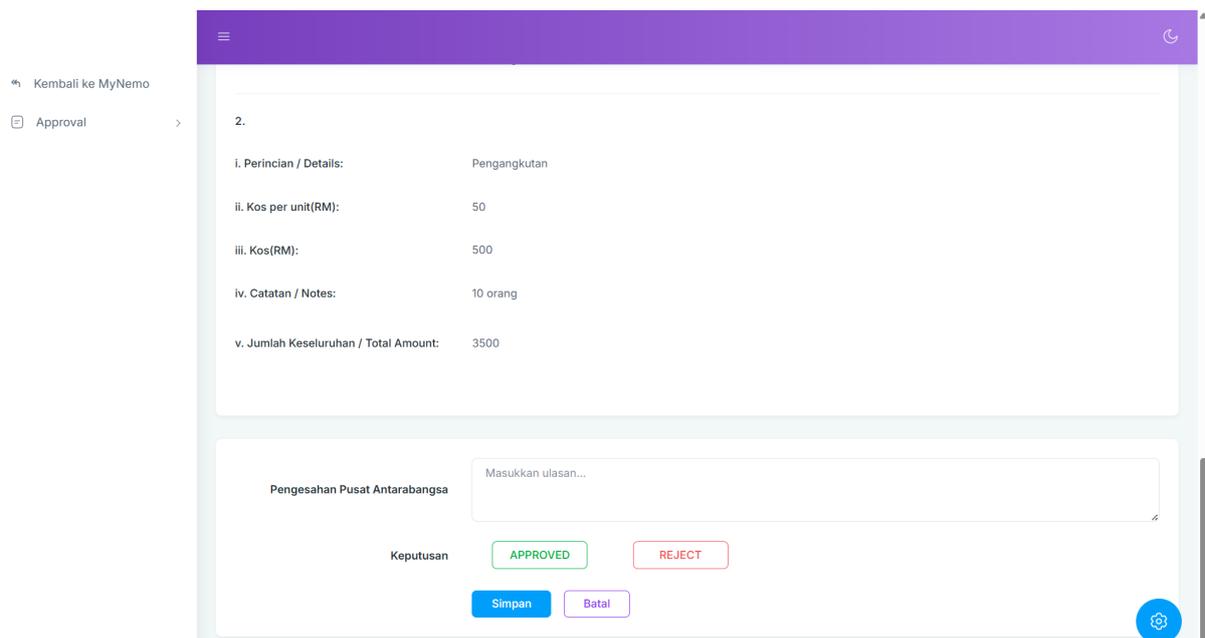Figure 6.25: Travel Abroad Application List Page

Figure 6.26: Travel Abroad Application Approval Page

6.3.4 Ketua Jabatan Module

Figure 6.27: Travel Abroad Application List Page

Figure 6.28: Travel Abroad Application Endorsement Page

6.4 Discussion

In this system, we focused on making sure the Visa Management and Travel Abroad Management modules work well and are easy to use. For Visa Management, we added features like student and staff information, family details, visa info, reminders, and graphs so admins can keep track of everything better. For Travel Abroad Management, we included steps for applying, checking status, approvals, and endorsements to make the process clearer and more organized. we also made sure only authorized users can access certain parts of the system using role-based access, and tried to keep the system fast and responsive even when handling reports and data.

6.5 Summary

This chapter explains how we built the International Centre Management System to help manage visa and travel abroad processes in one place. The hierarchical menu makes it easier to see and navigate all the functions for both modules. Overall, the system meets its goals by giving users the right tools to manage information, send reminders, track applications, and handle approvals smoothly while keeping everything secure and user-friendly.

CHAPTER 7

CONCLUSION

7.1 Introduction

This final chapter reflects on the design, development, and delivery of the International Centre Management System (ICMS), summarizing its main contributions, acknowledging project constraints, and suggesting directions for future improvement. It also revisits how ICMS addresses the project's core objectives and offers a base for future expansion aligned with the university's international operations.

7.2 Project Contributions

ICMS was developed to support and enhance the efficiency of visa and travel abroad management processes at the International Centre of UMT. The system introduces two core modules: the Visa Management module allows admin to record and view essential data such as personal, family, passport, visa, and insurance details, while also offering automated reminders and graphical reports for better tracking and planning. The Travel Abroad module streamlines the staff application process by supporting submission, status updates, approval workflows, and endorsement tracking. With role-based access control, each user—from admin to high-level officers—interacts only with relevant features, improving both usability and data security. The system was developed using CodeIgniter 3 with a clear hierarchical menu structure and follows the Waterfall methodology, making it easier to manage and trace each implementation step back

to its original requirements.

7.3 Project Constraints

While ICMS meets most of its functional goals, several constraints were encountered during development. The system was built and tested on a personal laptop with limited memory (8GB RAM), which impacted performance during data-heavy operations. Integration with existing UMT systems such as the student portal or email services was simulated due to limited access, which restricted real-time data syncing and live testing. Additionally, the system is currently optimized for desktop access only, with no mobile responsiveness or offline support, which may limit usability in certain environments. These constraints were mainly due to time, technical access, and scope restrictions set during the academic project timeline.

7.4 Future Work

Future upgrades to ICMS could focus on improving accessibility, integration, and automation. Adding multi-language support would make the system more user-friendly for international users. Full integration with university databases and Single Sign-On (SSO) would allow for real-time data synchronization and smoother login experiences. Introducing mobile responsiveness or developing a mobile app could further increase usability and accessibility. Features like dashboards with real-time notifications, advanced analytics, or automated email alerts for visa expiry and application status would enhance system intelligence and user engagement. Finally, adding admin controls for user account management would give more flexibility in handling user access and roles.

7.5 Summary

In conclusion, the International Centre Management System successfully delivers a centralized, role-aware platform for managing international student and staff information, as well as handling travel abroad applications. Despite a few limitations due to scope and resource

constraints, the system meets its key objectives and provides a strong starting point for future improvements. With the current architecture and clear separation of modules, ICMS is well-positioned for future enhancements that can align with the growing needs of UMT's international engagement and digital transformation.

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APPENDICES

Appendix A: Turn-It-In Summary Report

Thesis_BI_SKKP__S65610_ .pdf

ORIGINALITY REPORT

12%	8%	2%	9%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to KYUNG HEE UNIVERSITY Student Paper	2%
2	Submitted to Universiti Malaysia Terengganu UMT Student Paper	1%
3	Submitted to Rose-Hulman Institute of Technology Student Paper	1%
4	Submitted to Universiti Tunku Abdul Rahman Student Paper	1%
5	eprints.utar.edu.my Internet Source	1%
6	www.sweetstudy.com Internet Source	1%
7	www.coursehero.com Internet Source	1%
8	Submitted to Multimedia University Student Paper	<1%
9	Submitted to Universiti Teknologi Malaysia Student Paper	<1%

Appendix B: Travel Abroad Application (1)

UMT

BORANG PERAKUAN KE LUAR NEGARA
JAWATANKUASA HUBUNGAN ANTARABANGSA (JKHAB)

Sila tandakan (/) pada petak yang berkaitan dan nyatakan jumlah yang dimohon/ diluluskan

Please mark (/) on the related square below, and state the amount that is requested/approved

	Tajaan/*Sponsor*	Geran Penyelidikan:	
	Tabung/Reserves		i) Sumber luar negara/ *International funding*
	Persendirian/*Self-Funded*		ii) Sumber dalaman UMT/ *UMT Internal funding*
	Vot 134		iii) Sumber kerajaan/ *Government funding*

Nama Pemohon/*Applicant's Name*: _____ PTJ: _____

No. Handset/ *Mobile No.*: _____

BIL	MAKLUMAT PROGRAM/*PROGRAM INFORMATION*			
1.	Nama Program / *Program Name*			
2.	Deskripsi Program /*Program Description* (ringkasan berkenaan program)			
3.	Tujuan /*Purpose*			
4.	Kategori Program/ Program Category	Pengajaran & Pembelajaran/ *Teaching and Learning*		
		Penyelidikan/ *Research*		
		Pemindahan Ilmu/*Knowledge Transfer*		
		USR		
		Lain-lain/ *Others (Please specify)* _____		
5.	Impak Program /*Impact of Program* *Penjelasan dalam bentuk Pulangan Pelaburan (Return of Investment – ROI)	Bil	Perkara	ROI (Jumlah geran/ bil. Pelajar/ bil. kolaborasi
6.	Nama Delegasi /*Delegation Name*			
7.	Tarikh Program /*Date of Program*			

Appendix C: Travel Abroad Application (2)

8.	Tempat Program / *Program Venue*			
9.	Kekerapan ke luar Negara (tahun semasa) *nyatakan tarikh dan tempat dilawati terdahulu* *Frequency abroad (current year)* *specify the date and place of previous visit*			
10.	Implikasi Kewangan / *Financial Implication*			

Perincian/ *Details*	Kos per unit/ *Cost per unit (RM)*	Kos/ *Cost* (RM)	Catatan/ *Notes*
Peruntukan tajaan luar (sekiranya ada)/ Sponsorship (if any)			
Peruntukan UMT yang terlibat			
JUMLAH KESELURUHAN/ *TOTAL AMOUNT*			

PENGESAHAN KETUA JABATAN:

☐ Sokong   ☐ Tidak disokong

Ulasan:

Tandatangan:

(Cop Rasmi)

Nota:

Sila lampirkan dokumen sebagaimana berikut:

- Surat jemputan
- Tentatif program secara terperinci
- Surat kelulusan pemegang amanah (sekiranya menggunakan peruntukan tabung amanah)
- Surat tajaan peruntukan (sekiranya tugas rasmi ke luar Negara ditaja oleh organisasi luar)

Appendix C: Approval Letter

UNIVERSITI MALAYSIA TERENGGANU
21030 Kuala Nerus, Terengganu, Malaysia
☎: +609-6684810
: +609-6685199
📠: +609-6684148
🖥: www.umt.edu.my
📧: ic@umt.edu.my

PUSAT ANTARABANGSA
INTERNATIONAL CENTRE

Rujukan Kami : UMT/PA/100-10/153 JLD 8 (88)
Tarikh : 18 Disember 2024

Prof. Madya Dr. Seah Ying Giat
Pensyarah, Fakulti Perikanan dan Sains Makanan

Prof. Madya Dr. Lee Jen Nie
Pensyarah, Fakulti Sains dan Sekitaran Marin

Prof. Madya Dr.,

PERAKUAN KE LUAR NEGARA BAGI INVITATION TO THE SIGNING CEREMONY AND SPECIMEN SURVEY FOR FIELD GUIDE AT THE NATIONAL MUSEUM OF NATURE AND SCIENCE

Dengan segala hormatnya perkara diatas adalah dirujuk.

2. Sukacita dimaklumkan, Pengerusi Jawatankuasa Hubungan Antarabangsa (JKHAB) telah bersetuju memperakukan permohonan ke luar negara bagi **Invitation to The Signing Ceremony and Specimen Survey for Field Guide at The National Museum of Nature and Science pada 11 – 21 Mac 2025 bertempat National Museum of Nature and Science dan The Kagoshima University Museum, Jepun dengan dengan tajaan dari National Museum of Nature and Science berjumlah RM14,000.00 (perincian seperti lampiran).** Bagi kelulusan perakuan ini, sebarang tuntutan perbelanjaan di luar negara menggunakan sumber kewangan universiti adalah tidak dibenarkan dan kos perjalanan domestik adalah menggunakan peruntukan mengurus **Pusat Tanggungjawab PTj.** Walaubagaimanapun, **Kelulusan akhir bergantung kepada Kelulusan Naib Canselor, UMT.** Bersama-sama ini dilampirkan Langkah-langkah Keselamatan bagi Perjalanan Luar Negara untuk rujukan Prof. Madya Dr. selanjutnya.

3. Untuk makluman Prof. Madya Dr., mesyuarat juga bersetuju terhadap penetapan ROI sebagaimana berikut dan kegagalan dalam mencapai ROI yang telah ditetapkan akan memberi implikasi terhadap permohonan kelulusan ke luar negara untuk masa akan datang.

a) 1 MoU dan MoA
b) 1 Kolaborasi penyelidikan

4. Sehubungan dengan itu, Prof. Madya Dr. dimohon untuk hadir ke Pusat Antarabangsa sebelum tarikh perjalanan bagi mendapatkan bahan promosi dan juga perlu untuk menghantar laporan beserta gambar menggunakan google form yang dicapai melalui QR Code sepertimana yang dilampirkan. Semoga perkara ini berada dalam makluman dan perhatian pihak Prof. Madya Dr. selanjutnya.

Sekian, terima kasih.

"Kebersamaan UMT"
"MALAYSIA MADANI"
"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

PROF. TS. DR. LAM SU SHIUNG
Pengarah, Pusat Antarabangsa
Universiti Malaysia Terengganu
☎ 09-668 5198
📧 lam@umt.edu.my

s.k : Dekan, FPSM
: Dekan, FSSM
: Urusetia perjalanan ke luar negara, Canselori
: Fail Edaran

OfficialUMT

Terokaan Seluas Lautan, Demi Kelestarian Sejagat | Ocean of Discoveries for Global Sustainability

BIODATA OF THE AUTHOR

Muhammad Irfan Hakimi bin Yahya is a final-year student pursuing a Bachelor of Science in Computer Science (Software Engineering) with Honours at Universiti Malaysia Terengganu. Throughout his studies, he has developed a strong interest in software engineering, system development, and project management. For his final year project, he developed the International Student Management System using PHP and the CodeIgniter 3 framework, following the Waterfall development methodology. The system focuses on visa tracking and travel abroad applications for university staff and international students, integrating features such as email reminders, application approvals, and data reporting. This project allowed him to strengthen his skills in web development, system architecture, and user-focused design.