WEB-BASED THESIS ROUTING SYSTEM FOR SAINT MICHAEL COLLEGE OF CARAGA

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INTRODUCTION

Project Context

The Thesis Routing System (TRS) is a systematic procedure for managing an academic thesis submission, evaluation, and endorsement. A TRS is pertinent as education becomes increasingly research-oriented and time-constrained for degree completion. It eases the panel's workload by minimizing their workload on handling the thesis and enhancing openness through manual checks. The Research Office at Saint Michael College of Caraga faces a significant challenge in routing research papers, as the process is time-consuming and requires printing multiple copies of each document. This results in delays and inefficiencies, as staff must manually distribute and manage numerous physical copies for review and approval, creating unnecessary workload and contributing to excessive paper usage.

F. L. R. Geanne et al., state that managing thesis processes can be complex. Students, advisers, and panels must be wisely coordinated for document and requirement submissions, defense scheduling, and other associated activities involving the needs of identifiable entities in the thesis process [1]. From this problem, E – thesis Management System (ETMS) is designed to solve difficulties using an online search to al [2]. The coordinator can handle the thesis data and update its availability [2].

According to Q. B. Joseph, several hurdles surfaced in online thesis supervision during emergency remote teaching, including challenges in transitioning from offline to online thesis supervision, ineffective communication between advisors and students, limited time for

consistent online access, hindered field data collection, decreased thesis completion rates among students, difficulties in communicating with group mates, and overall thesis writing [3].

Submitting a thesis at Saint Michael College of Caraga (SMCC) is costly and time-consuming, as multiple copies must be printed. Conventional methods are expensive and inefficient, primarily due to the time spent on document processing and handling. This results in high costs and delays, while also limiting the overall efficiency of the submission and review process.

To address the problem, the proposed TRS would enable online review of these documents so that their quality can be maintained during the reviewing process while following up on thesis progress live. This will ensure transparency and accountability throughout, where students and panel can keep track of submission statuses. Additionally, TRS will securely store all drafted thesis submissions and comments for easier management and retrieval purposes when needed.

The Thesis Routing System (TRS) at Saint Michael College of Caraga (SMCC) is designed to streamline the thesis submission and review process. By eliminating the need for printed copies, the system reduces costs and promotes sustainability, aligning with the institution's eco-friendly initiatives. Through the TRS, thesis reviewers and faculty members can provide feedback and comments electronically, enabling real-time tracking and ensuring secure storage of all documents. This modernized system enhances transparency, efficiency, and accountability, while meeting the research office’s requirements for a seamless and contemporary approach to thesis management.

Project Objectives

The researchers' study aims to design, develop, and implement a digital Thesis Routing System (TRS) for Saint Michael College of Caraga.

Specifically, it aims to:

1. Digitizing the thesis submission and review process enhance efficiency, reduces paperwork, and improves organization and accessibility.
2. Provide real-time tracking of thesis submission statuses to enhance transparency and enable efficient monitoring of progress and feedback.
3. Facilitate secure storage of all thesis-related documents, including drafts, comments, approvals, and generate certificates of endorsement.

Scope and Limitation

The online-based Thesis Routing System (TRS) for Saint Michael College of Caraga (SMCC) aims to improve the whole thesis submission and evaluation process in the Research office with four user roles — students, panel members, advisers, and the administrator. Students can submit thesis documents by the department, and the administrators can route them to the appropriate panel for review. Panel members and advisers evaluate submissions, provide feedback, and approve or request revisions, ensuring an organized and accessible evaluation process.

The web-based system was explicitly meant for SMCC and may only be easily adjusted for other institutions with drastic changes. Furthermore, although it allows digital submission and tracking, manual assessment is still required, making it time-consuming since faculty members and supervisors must look into and offer suggestions.

Definition of Terms

The terms defined below explain the basic concepts and factors discussed during the conceptualization and development of TRS and contextual information on how the researchers apply these concepts in their study.

Access control—The TRS system has access control mechanisms that allow only authorized personnel access to certain functionalities and data. Various hierarchies of access are granted to students, faculty, and superusers to safeguard delicate information and preserve the system's integrity.

Administrator—An Administrator has the highest level of control over the TRS. He or she has the overall operation of the system, manages user accounts and their permissions, maintains data integrity, and changes or updates the system according to the institution's needs. Administrators would act as the main enforcers of access control and cybersecurity to keep sensitive information safe and ensure reliability within the system.

Attack Vectors—in this case, are the methods or paths that promote unauthorized access to TRS by malicious actors. They refer to the ways or routes bad people can use to enter the TRS system unauthorizedly. Knowing attack vectors is about identifying potential threats like phishing scams involving fake websites, malware for sending spam messages, and some SQL injections, among other cybercrimes. Therefore, the TRS should have strong cybersecurity measures because all these intruders depend on the same known techniques.

Database-Oriented Management System—It is used to save and modify databases. It may also be used to create TRS since the data-keeping process is user-friendly software built to suit specific

needs in various scenarios. End-users, including the Research office, may readily access the database without considering the underlying schema.

End-user – refers to individuals involved in the research process who utilize the TRS within SMCC. This includes students, panels, advisers, and administrators overseeing the entire process. Each user has specific rights and responsibilities to ensure secure and appropriate access to the system.

Thesis Routing System (TRS) - is a platform where students can submit their title proposals and final documents for routing through predefined stages (Route 1, Route 2, Route 3), ensuring a systematic review and approval process.

User Interface (UI)- The component of the TRS through which users interact with the system. A good UI is able to present ease of use, clarity, and, most of all, accessibility to all roles, from student to administrator.

Version control—managing and recording making changes in documents and data within the TRS. it enables users to revise, restore a previous version, and keep a history of updates.

Chapter II

REVIEW OF RELATED LITERATURE

This literature review discusses types of web-based thesis routing systems. These systems facilitate the submission and reviewing action together with the approval of various academic papers. Such systems promote the online submission of these documents, thereby eliminating the printing costs, among other expenses. This also helps monitor the process of reviewing in a way that increases accountability and transparency. In other words, the systems of a very varied nature allow the panelists to circulate the documents within themselves for comments and to mark them for different levels of review. This review looks at existing literature on the effectiveness of technologies on academic processes, such as the review of thesis, to find the challenges with the current practices and make recommendations on how to enhance the management of academic papers through web-based systems.

Web-based Thesis Management System

According to M. Bagoes et al., the primary aim of the web-based thesis management system is to enable the sharing of information regardless of the distance of time between the panel and students using an internet connection [5]. One of the most significant stages of college is the thesis stage, which is the last major project a student must undertake before they can graduate [4], [6], [30]. In academia, the essential role of thesis writing can be challenging. It is so important that it is a prerequisite for students to graduate [3]. Moreover, the problem with conducting research-based work offline or manually, such as evaluating the papers, providing feedback, and other remarks, is that it takes a lot of hassle, which might cause a lack of

productivity and waste of time [14], [20]. A web-based thesis management system can help mitigate the problems posed by the conventional, manual thesis processes by promoting effective communication and sharing of information among students, advisers, and panels. It helps manage the evaluation of the works, the provision of feedback, and coordination in general, which eliminates the bottlenecks associated with works of research in an offline mode. Ultimately, this system helps enhance workability and ensures that thesis writing is done within the deadlines, assisting students to graduate on time.

Managing and coordinating thesis processes could take a lot of work. The Student, adviser, and panel must be appropriately coordinated for document and requirement submissions and related activities concerning the needs of identified entities in the thesis process [1]. Web-based online thesis guidance application facilitates the processing of student thesis data and enhance thesis guidance for better completion of the final thesis task [31]. This system offers a portal that will make it simpler to follow and finish the thesis cycle [7]. According to P. Putra, the thesis Monitoring Information System is expected to be used in circumstances that allow thesis guidance to be carried out indirectly on campus or in situations where the Supervising Lecturer needs to re-examine the thesis of the Student, then this thesis Monitoring Information System can be utilized because it allows students to upload thesis which is to be examined by lecturers [32], [33]. This project will contribute to better thesis management in the future [2]. A thesis supervision management program that operates on the web can address the problems associated with the management and coordination of the thesis processes. This is done by simplifying document exchanges and related activities between students, advisers, and panels. This system provides web-based monitoring systems to track progress and complete the thesis

cycle, eliminating distance barriers in the guidance and evaluation process. In essence, this system is designed to improve the overall management of a learner's thesis and fast-track the thesis submission process.

Documents Submission Management System

According to A. M. Samuel, Document Management System (DMS) is described as the use of a computer system or software to store, manage, and track electronic documents [15], [21]. Nowadays, human life has shifted to the life of persuasive computing, which makes information technology a part of human life anytime and anywhere [22]. Moreover, document management systems support the life cycle management of document-based information [9], [17]. A Document Management System (DMS) is software for capturing, managing, and tracking electronic documents. This indicates the advancement of persuasive computing that embeds information technology in people's lives, thereby improving the management of document-laden information.

Document submission management systems have become an essential topic regarding digital transformation in organizations because they enable paperless businesses, speed up processes, lower business costs, and support organizational sustainability activities [10], [23]. Online submissions and approvals of official documents are ways in which computerized networks have made document management and submission simple through quick transformation and exchange between several entities [8], [35]. The design elements include ease of use, accessibility, and the ability to produce downloadable and printable [34]. The use of document submission management systems is essential to the digital transformation of any

organization as they assist in creating a paperless work environment, speeding up processes, cutting down expenses, and availing eco-friendliness in a given organization; they enhance document management via submission and approval of documents online with emphasis being placed on ease of use, accessibility and ability of the documents to be printed as well as downloaded.

Effectiveness of Providing Feedback for Students

According to W. Yong, research has shown that engaging students in peer feedback can help them revise documents and improve their writing skills [11]. Peer review, especially online peer review, has several advantages over teacher feedback regarding timeliness, convenience, volume, and learner autonomy [12]. Moreover, promptly delivering input and ensuring students can use it to improve learning is fundamental to its success [26]. More importantly, giving feedback during the writing process is essential to enhance students' writing skills [18]. Peer review contributes to developing enhanced writing competence, with online evaluations possessing several benefits over instructor feedback in terms of time, ease, quantity, and independence. Giving prompt input during the writing process is vital, positively affecting learning.

Findings of B. A. Mamoon, Feedback is difficult in this area. However, it is essential in improving the students' learning process [13], [19]. Self-efficacy is also believed to mediate between a teacher's feedback and a student's academic performance [24]. Therefore, teachers must provide students with good feedback to assist them in accessing and implementing knowledge through practices [25], [27]. At the same time, feedback is one of the things that

students most want [28]. As a result, students who receive feedback gain experience in problem detection, may become more aware of writing problems and may discover different revision strategies [29]. Feedback is an essential factor in increasing the learning of students, and it is self-efficacy in its relationships between the teacher's feedback and academic performance; purposeful feedback facilitates students' knowledge, is very important, and helps students detect and correct problems.

Role-Based Access Control

According to C. Arnab, Access control defines and constrains what a user can do in a system. In other words, it authorizes the user for certain activities that the user wishes to perform [36]. Today, security is recognized as an absolute need in application development [37]. Access control refers to an organization's policy for an authorizing process for access, the mechanisms that provide and enforce the policy, and the model on which the policy and process are based [38]. As defined by C. Arnab, access control determines and enforces what users can do within a system based on organizational policies, reflecting the critical role of security in modern application development.

Today's rapidly developing communication technologies and dynamic, collaborative business models have made data security and resources more crucial than ever, especially in multi-domain environments like Cloud and Cyber-Physical Systems (CPS) [39]. Activating appropriate roles for a session in the role-based access control (RBAC) model has become challenging because of the so-called role explosion [40]. Access control, a critical feature of any secure system, encompasses subject-to-object segregation based on a security policy and

involves three phases: identification, authentication, and authorization [41]. The rapid advancement of communication technologies and dynamic business models has heightened the importance of data security, particularly in multi-domain environments like Cloud and Cyber-Physical Systems, where challenges such as role explosion complicate the activation of roles in role-based access control (RBAC).

Chapter III

SOFTWARE REQUIREMENTS AND DESIGN SPECIFICATION

This chapter analyzes the technical aspects of the proposed system's construction, including the software and hardware requirements. In addition, it provides an extensive description of the Thesis Routing System (TRS) and its merits, including its construction, design requirements, and other components requisite for its deployment and maintenance.

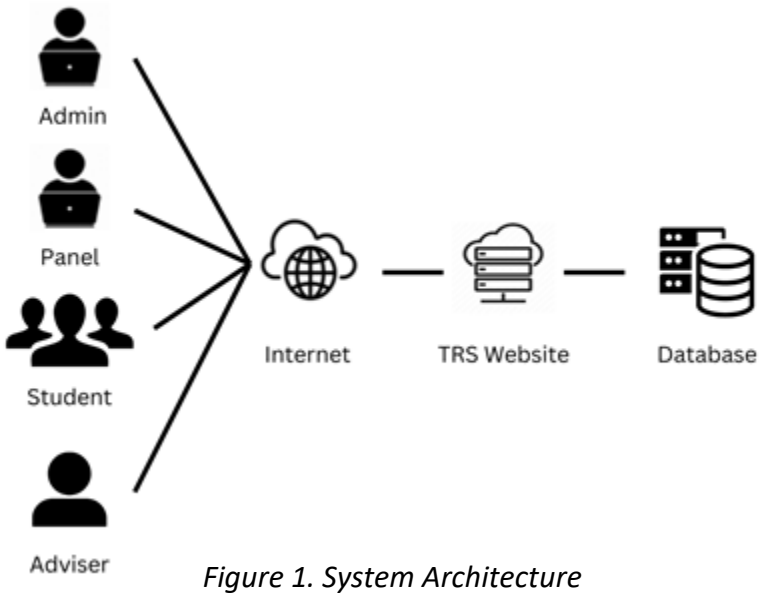


Figure 1. System Architecture

Figure 1 This diagram represents the structure of the Thesis Routing System where various users, namely, Admin, Panel, Student, and Adviser, are interconnected to the TRS system through the Internet. Each user utilizes the TRS according to their assigned roles. For instance, the Admin has complete authority over the system and manages the users, the Panel critiques and assesses the documents submitted, and Students upload their thesis documents correspondingly. At the same time, advisers assist in ensuring the Student gets the paper cleared.

The TRS website serves as the primary communication channel. It facilitates user access to the system and a database containing vital information, including the user list, thesis documents, and reviews. In such a manner, routing, controlling, and retaining all the information concerning thesis processes is much more effective and orderly.

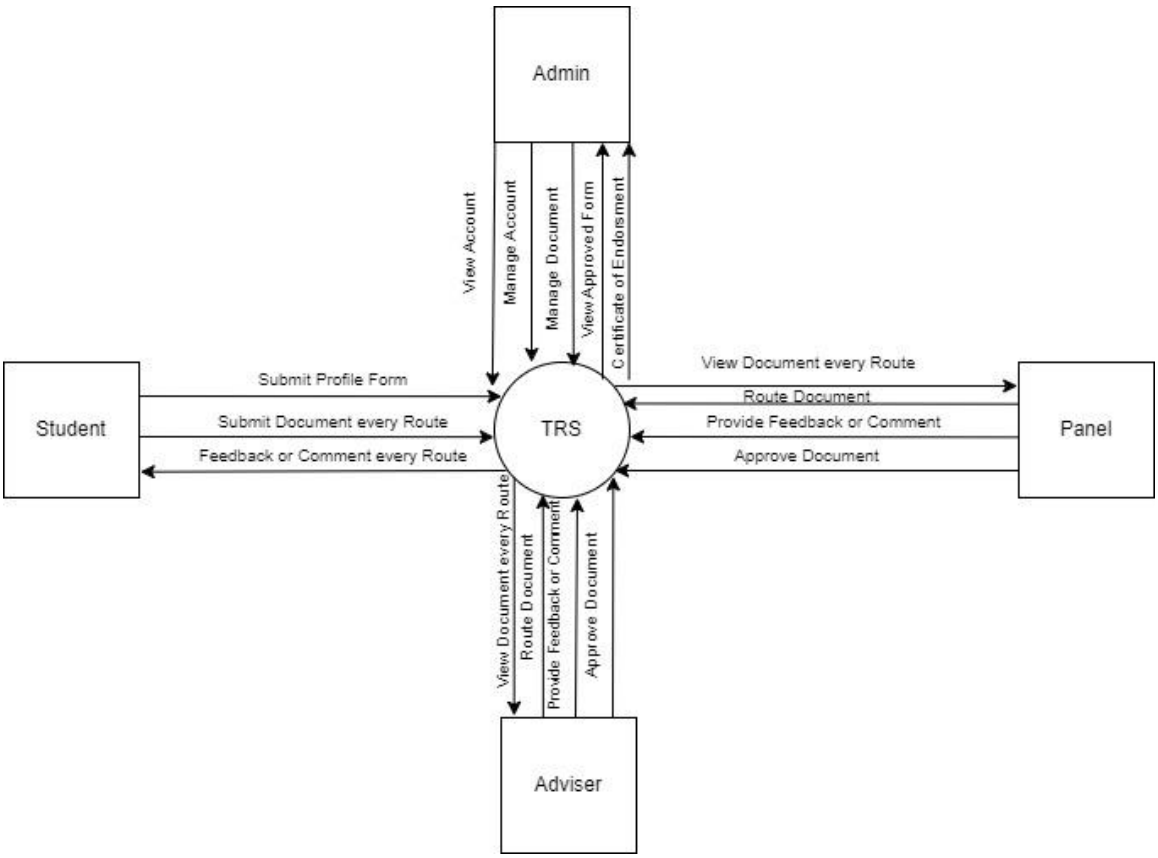


Figure 2. Conceptual Diagram

Figure 2 This diagram describes how all the user roles interact in the TRS: Student, Admin, Panel, and Adviser. This depicts how students submit profile forms and thesis documents based on the feedback at each routing stage. Admin handles the account handling of the users and gives follow-up on the document handling. The members of the panel check and route the documents, provide feedback, and approve the submissions. While advising students, offers comments and

approvals. Overall, this diagram represents a collaborative workflow intent to make processes for submitting, reviewing, and approving theses more easily undertaken.

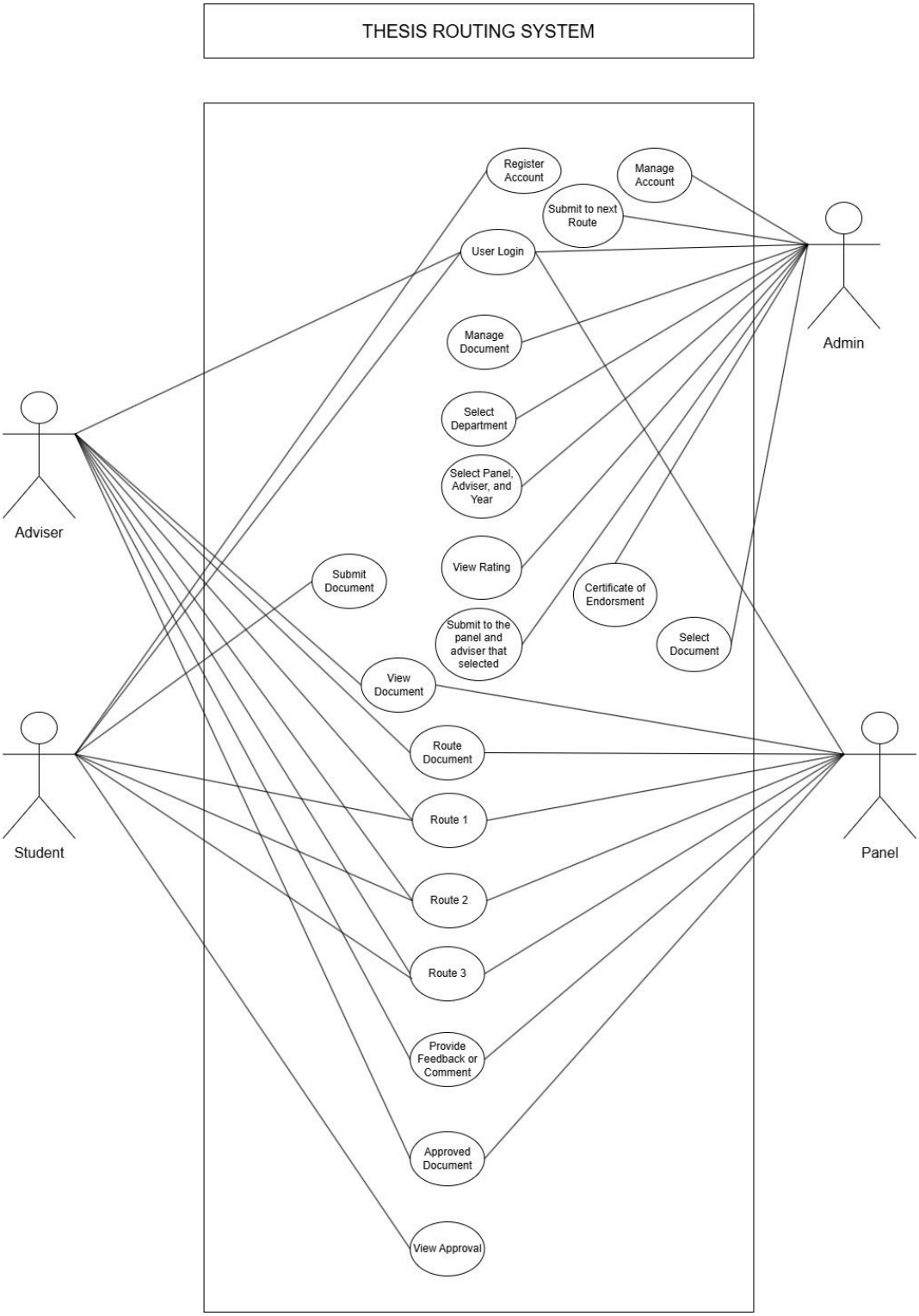


Figure 3. Use Case Diagram

Figure 3 This illustration explains the stages of the processes involved in the Thesis Routing System and mentions the interactions and processes with the students, panel, adviser, and Admin. It starts with user registration and login, providing full access to the other system functionalities. After logging in, the student will submit the thesis document using the given paths. After the submission, the corresponding panel and adviser will view and evaluate the document and will also provide comments and feedback as the document is being routed. If the document does not pass the assessments, it is returned to the Student for appropriate amendment within set periods. Along the Route chosen, the routing process continues until a final decision is made and the document, coming up for 'approval,' is fully approved by all. This systematic diagram shows the thesis submission, feedback, and approval processes collaboratively involving all concerned parties at each stage.

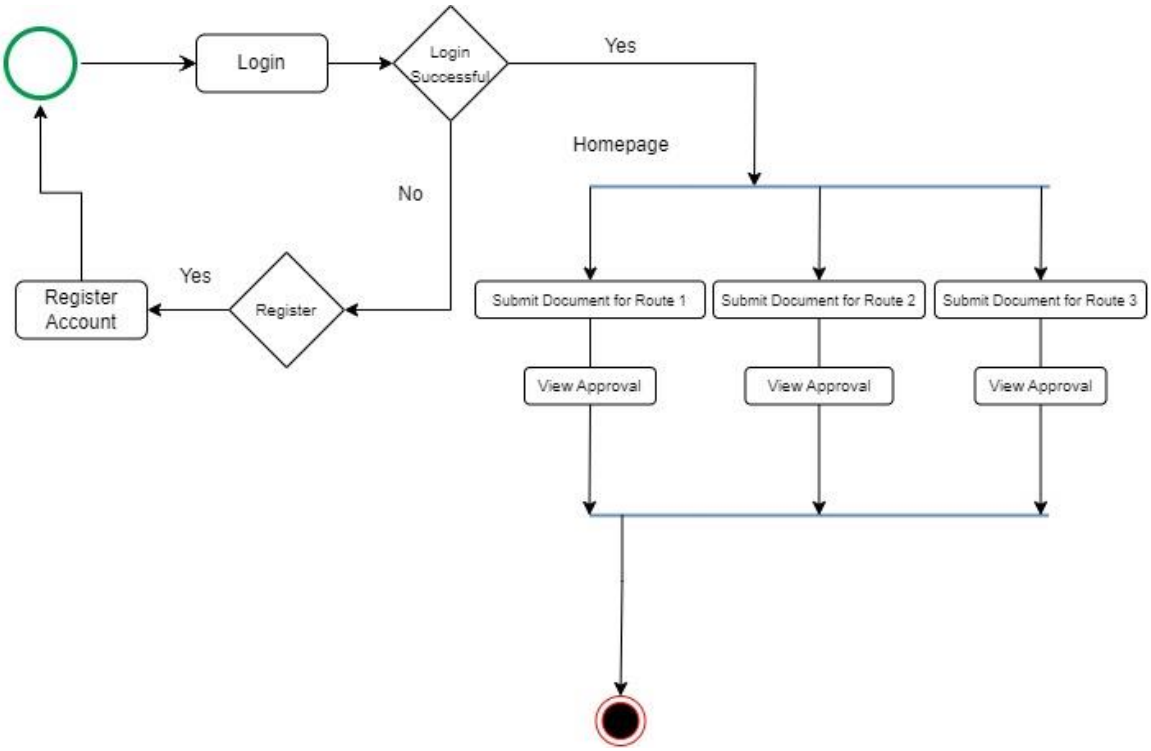


Figure 4. Activity Diagram – Students

Figure 4 The presented flowchart, illustrates the processes of registration, logging in, and uploading documents. To a user, the option to log in or register is presented. If the user has not registered, the registration procedure will be undertaken. After the user registers or follows a successful login, he is taken to the homepage. He can submit thesis documents on Route 1, Route 2, and Route 3. The process ends when the documents get filed. If the user fails to log in, the user is brought back to the beginning with the expectation that the user will be able to try again.

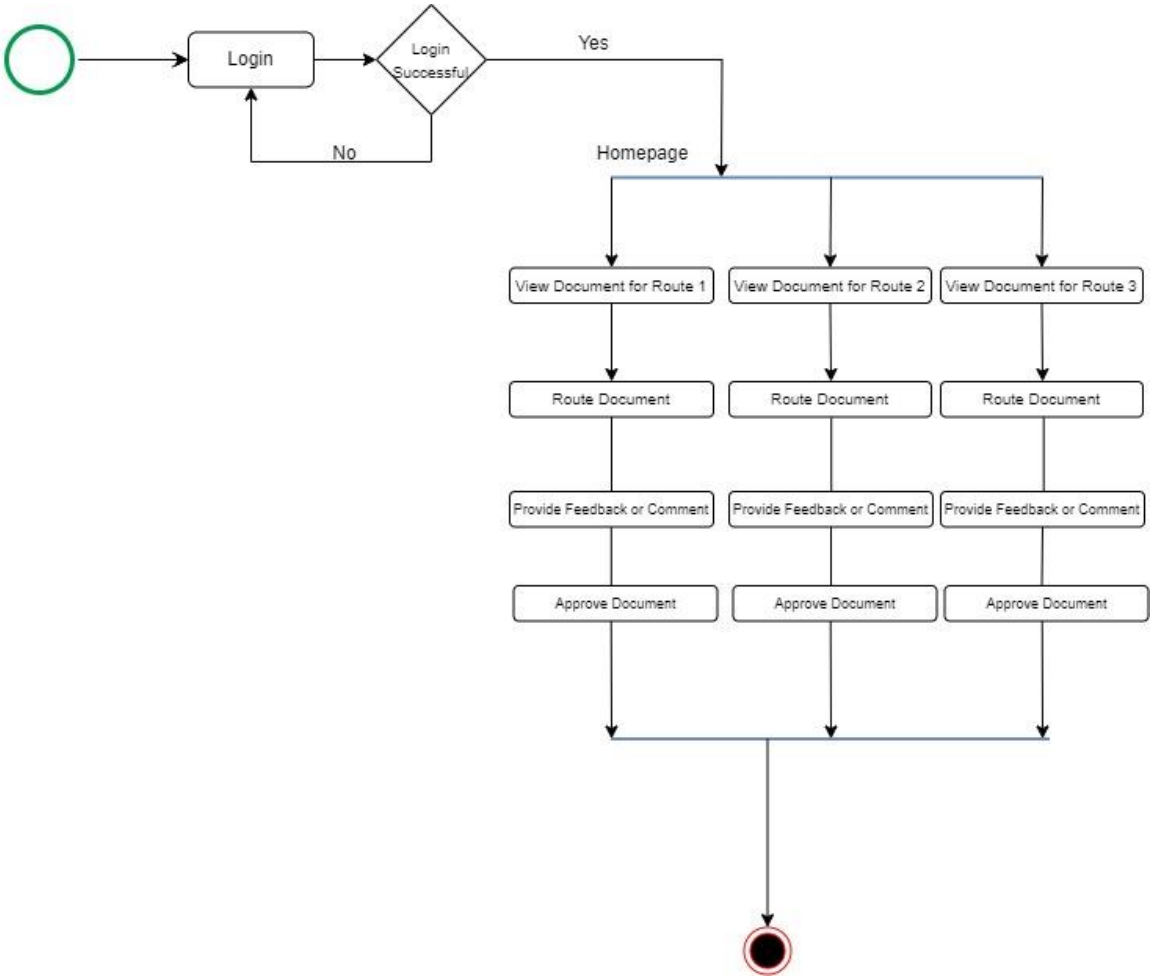


Figure 5. Activity Diagram - Panel

Figure 5 The process flow chart presented here, applies to the panel. It shows the panel's mechanism for auditing and ratifying documents for different routes. After signing in, the panelists can access the documents of Route 1, Route 2, or Route 3. Each document is then sent for evaluation to the panel, who reviews it and gives their comments before approving the documents.

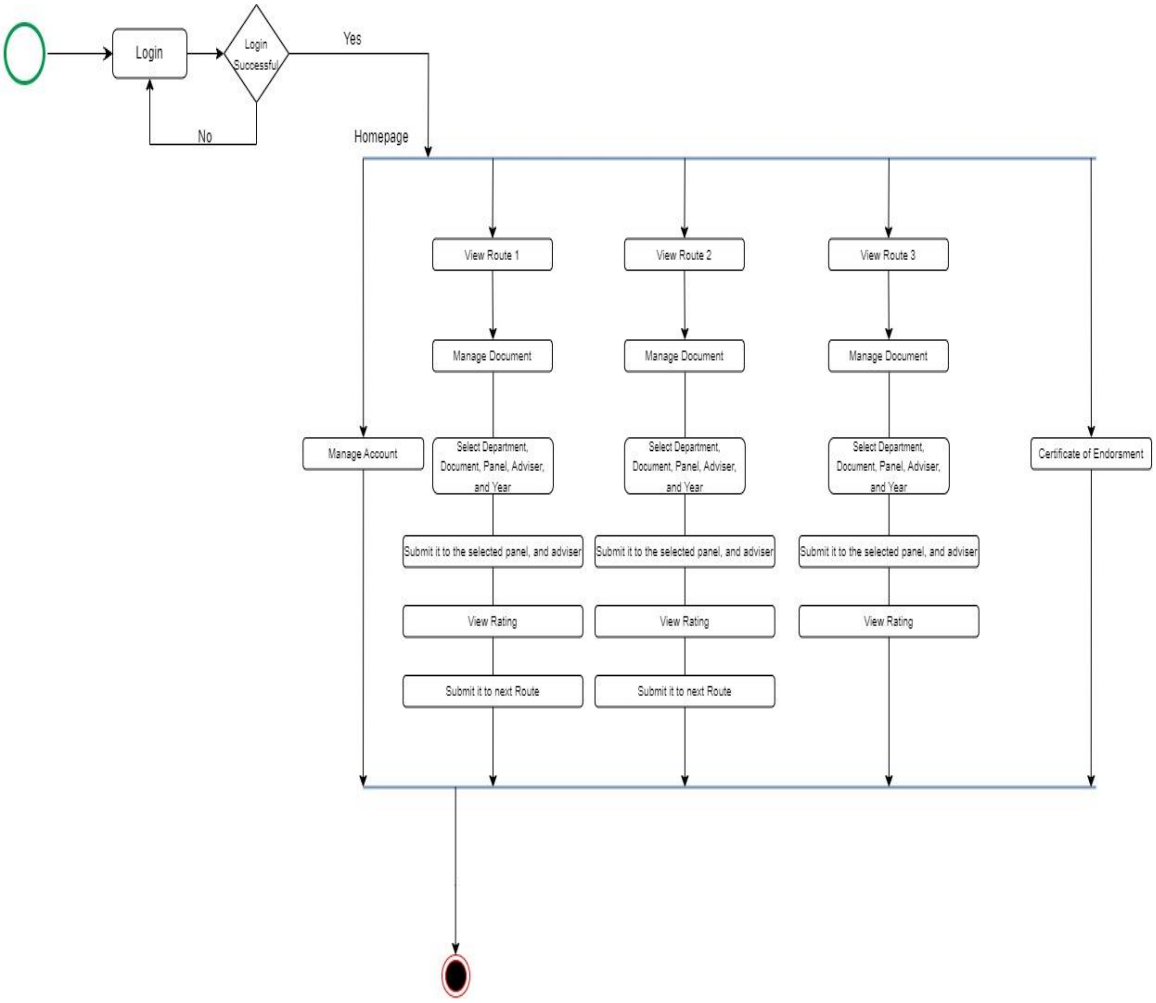


Figure 6. Activity Diagram – Admin

Figure 6 This flowchart is designed so the admin can manage routes and documents. She logs in, gets to her homepage, and views documents of every Route (Route 1, Route 2, or Route 3). She will manage documents for every Route by filling out all the relevant details, such as department, document, panel, adviser, and year. Then, this document is sent to the selected panel and adviser, and the approval of the panel will show if they are done routing so they can processed to the following routing. The Admin can also manage the account.

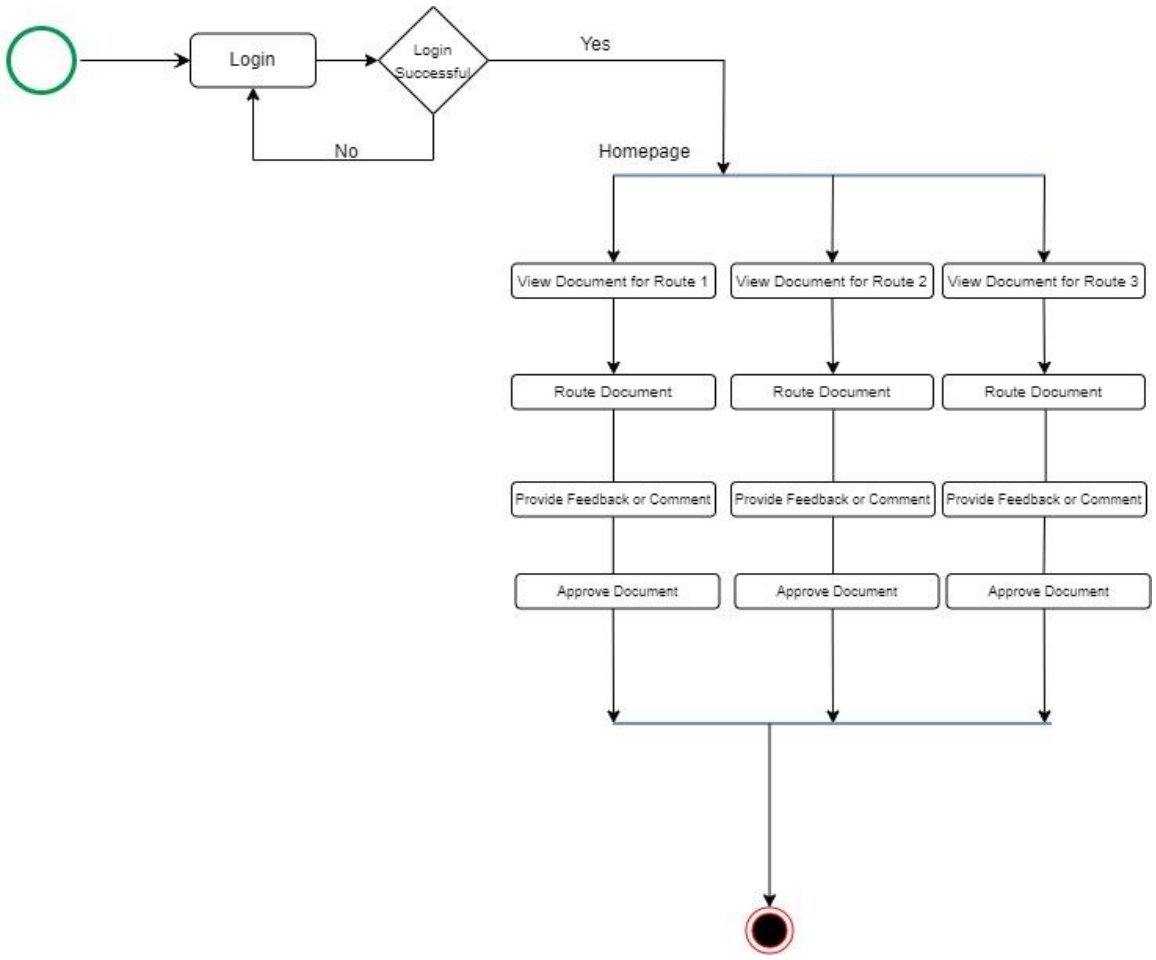


Figure 7. Activity Diagram – Adviser

Figure 7 This flow chart applies to the adviser. After the adviser logs in, it will direct him to the homepage, where he can view Route 1, Route 2, and Route 3. Every time the adviser routes a document, he can provide feedback or comments and approve the document so it can proceed to the next Route.

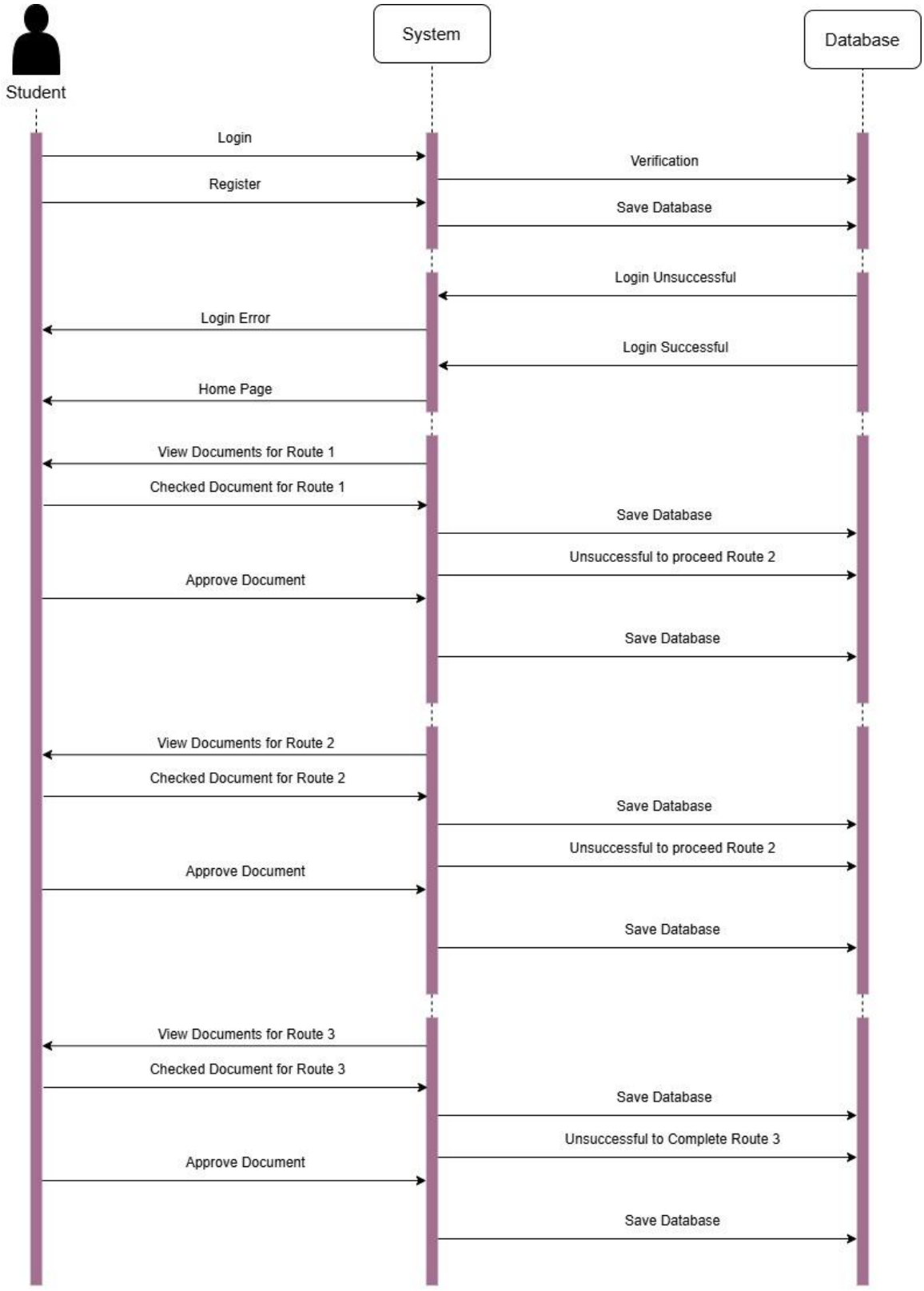


Figure 8. Sequence Diagram – Student

Figure 8 illustrates the interaction of a student system coupled with the database for a multiple-step procedure for document submission. It shows the login process, registration, and verification of the login credentials by the system, including saving the data in the database. An error is returned if the login is unsuccessful; otherwise, it is redirected to the home page. Next, the Student will complete the profile form and add relevant documents for routes 1, 2, and 3. Each submission attempts to save a record in the database, making it impossible to check the system and ensure that the documents are well submitted. The system may allow the Student to proceed to the next Route after determining the satisfactory verification results or display a failure message indicating it was impossible to complete the current Route. This is repeated for every Route afterward. The system will make changes to the database after every step.

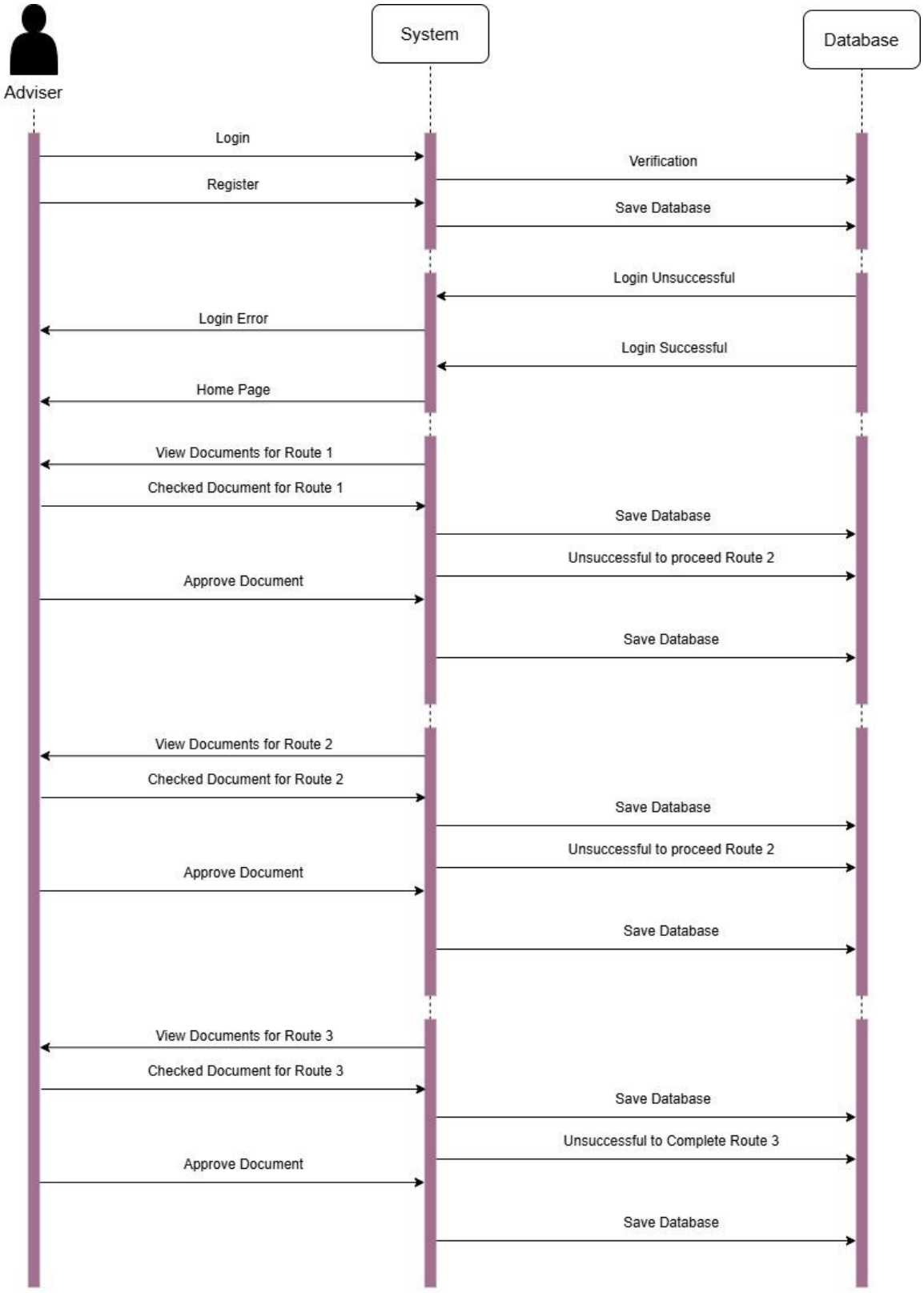


Figure 9. Sequence Diagram – Panel

Figure 9 illustrates how a panel reviews and approves all documents through three routes. The panel logs in or registers checks user credentials and modifies the database. When the login is unsuccessful, an error appears; to the contrary, the panel is taken to the main page. Similarly, per Route, the panel can see the documents forwarded for consideration, and the system allows checking them while modifying the database. When the documents are acceptable, the panel approves them; otherwise, a message is sent that it is impossible to proceed with the process. This also applies to the three routes, thus allowing each stage to be thoroughly reviewed and updated on the system.

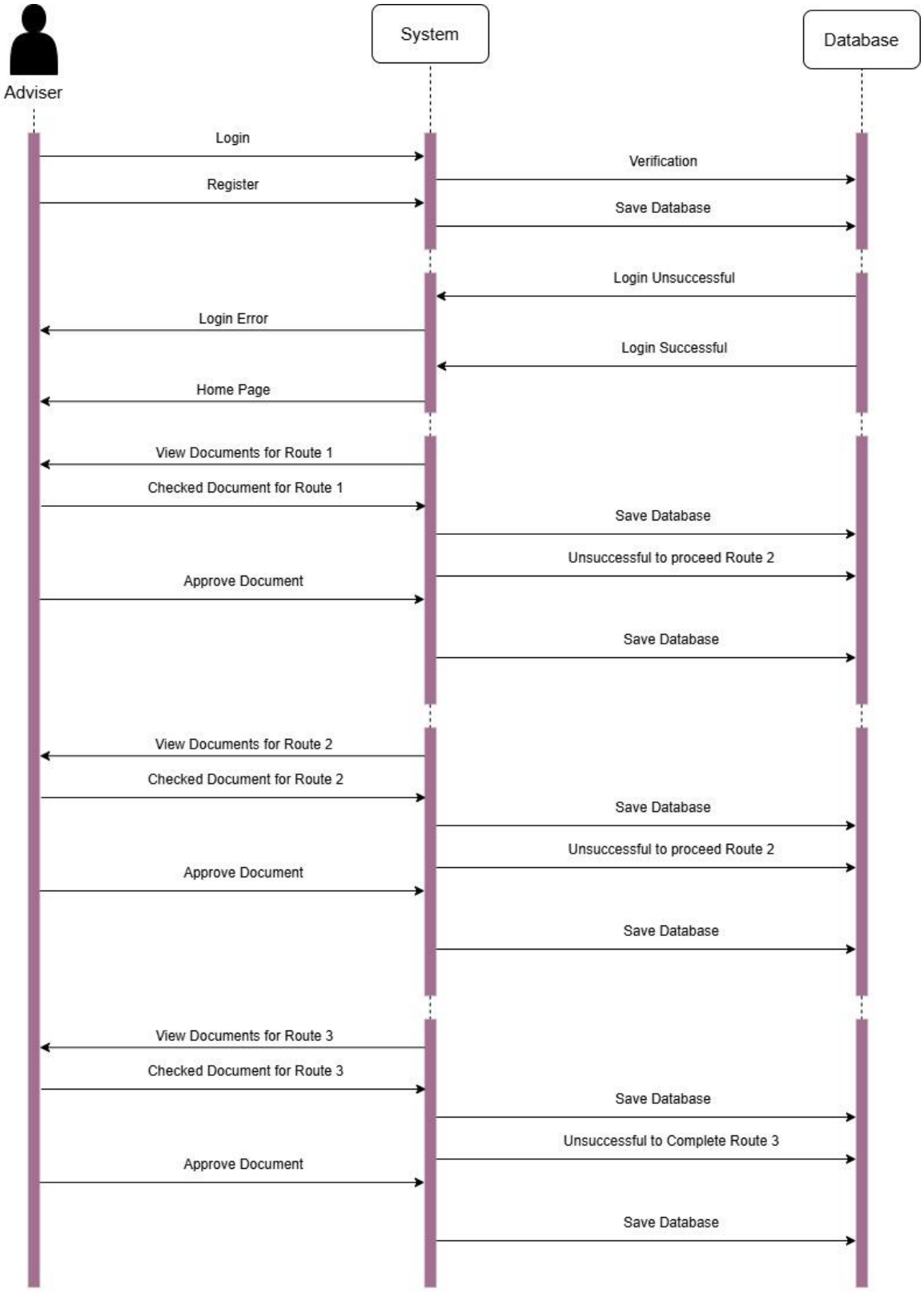


Figure 10. Sequence Diagram – Adviser

Figure 10 illustrates an adviser checking and approving documents via three paths. The adviser is either signing in or signing up, and the system checks the user and modifies the user database. In the case of unsuccessful login attempts, an error is displayed. Otherwise, the adviser is forwarded to the home page. In each way, the adviser is shown the documents already presented, and the system scans through them and updates the system. If the papers are according to the requirements, the adviser accepts the documents; if not, a message that describes the inability to go further is sent. The same steps are taken as described in routes 1, 2, and 3 above so that everything is well-checked and the system is updated at every stage.

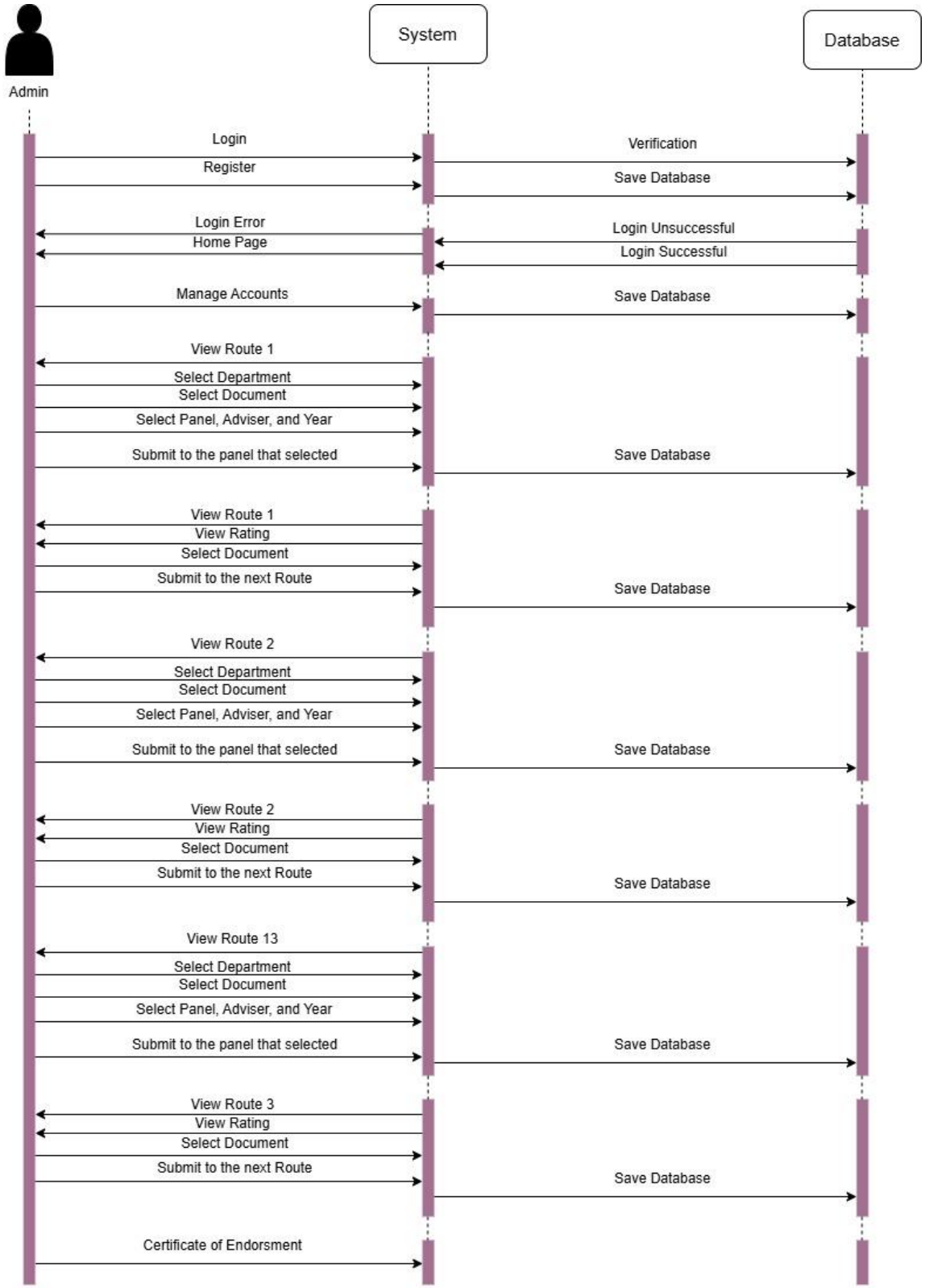


Figure 11. Sequence Diagram – Admin

Figure 11 illustrates how the Admin interacts with the system. The administrator is taken to the homepage after successfully logging in to the system. The Admin can view and control the documents from all the routing pages. If a student uploads a document, this document is, however, not sent to the adviser and panel. The file is first assessed, and the concerned department found the panels – panel1, panel2, panel3, and panel4 - assigned by the Admin. After this is completed, the file is forwarded according to the hierarchy. Once the Student completes all the routing steps that are supposed to be completed, they are given a Certificate of Endorsement.

Figure 12. Entity Relationship Diagram – Database Design

Figure 12 shows a database schema for a document routing and endorsement system involving multiple entities like students, admins, advisers, and panel members. The student stores personal information and submits documents at different route stages. The Admin manages all the documents submitted by the Student and can manage the account for the panel and adviser. The panel can route the document, give feedback for every document he receives, and approve the document if there's no problem, the same as the adviser. The panel has different

expertise, so there are panel1, panel2, panel3, panel4. If the Student completes all the routes, they will receive a certificate of endorsement; then the Admin will create a schedule for their final proposal.

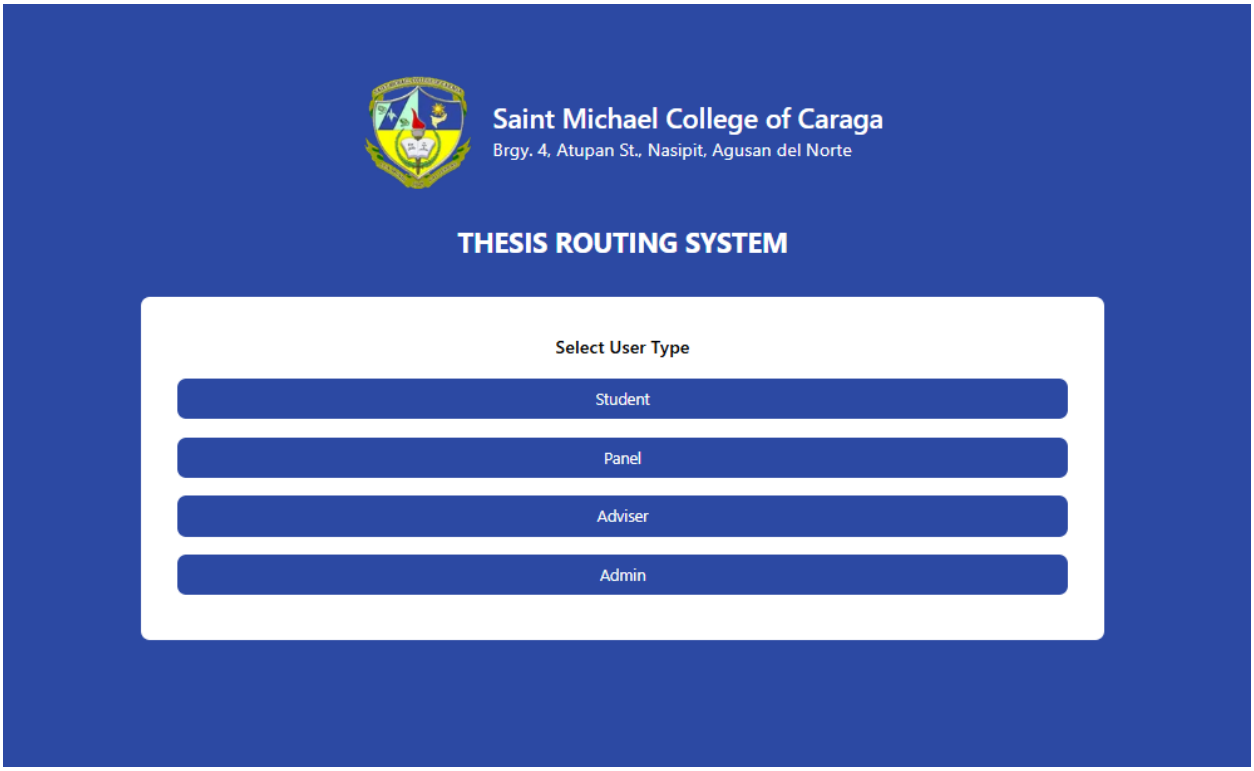


Figure 13. All users – Landing Page (User Interface Design)

Figure 13. display landing page when the user searches the website. The user can choose what kind of user they are.

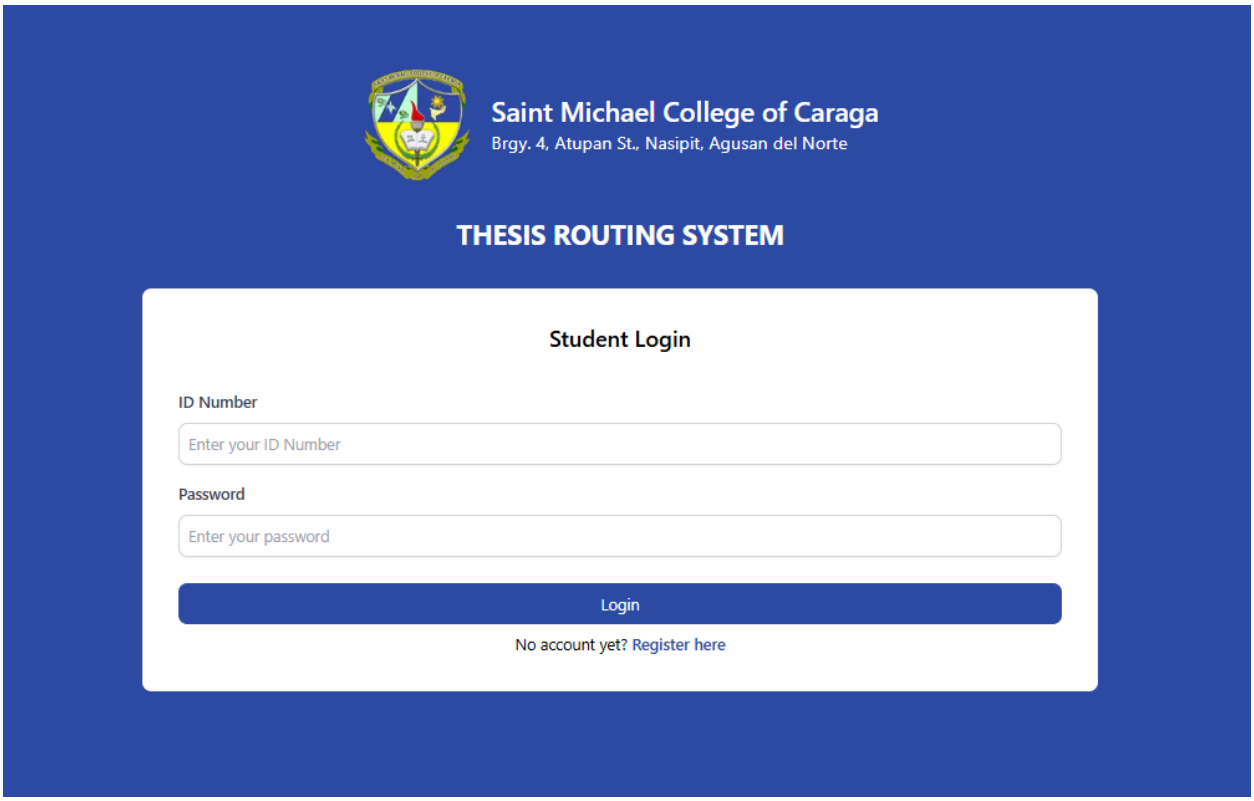


Figure 14. All users – login page for Student (User Interface Design)

Figure 14 displays the login page for students. If the Student has no account, the group leader only needs to create an account. If he has an account, then he can log in directly. The Student needs to enter his ID number and password to log in.

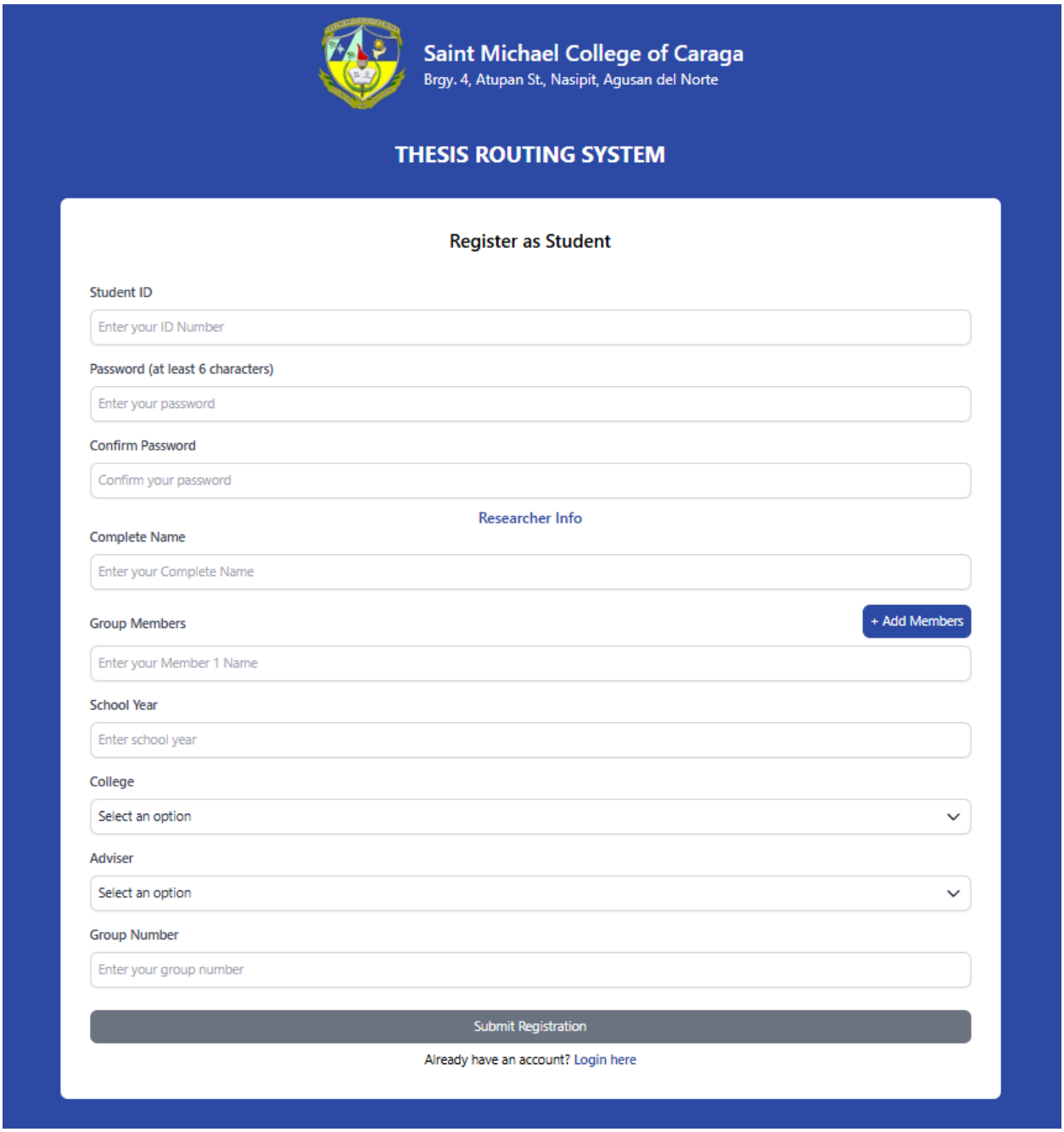


Figure 15. All users – Student Register Page (User Interface Design)

Figure 15 displays the registration page. The Student needs to enter his school ID and password to register. The Student or researcher must enter his full name, school year, department, course, and group number to register.

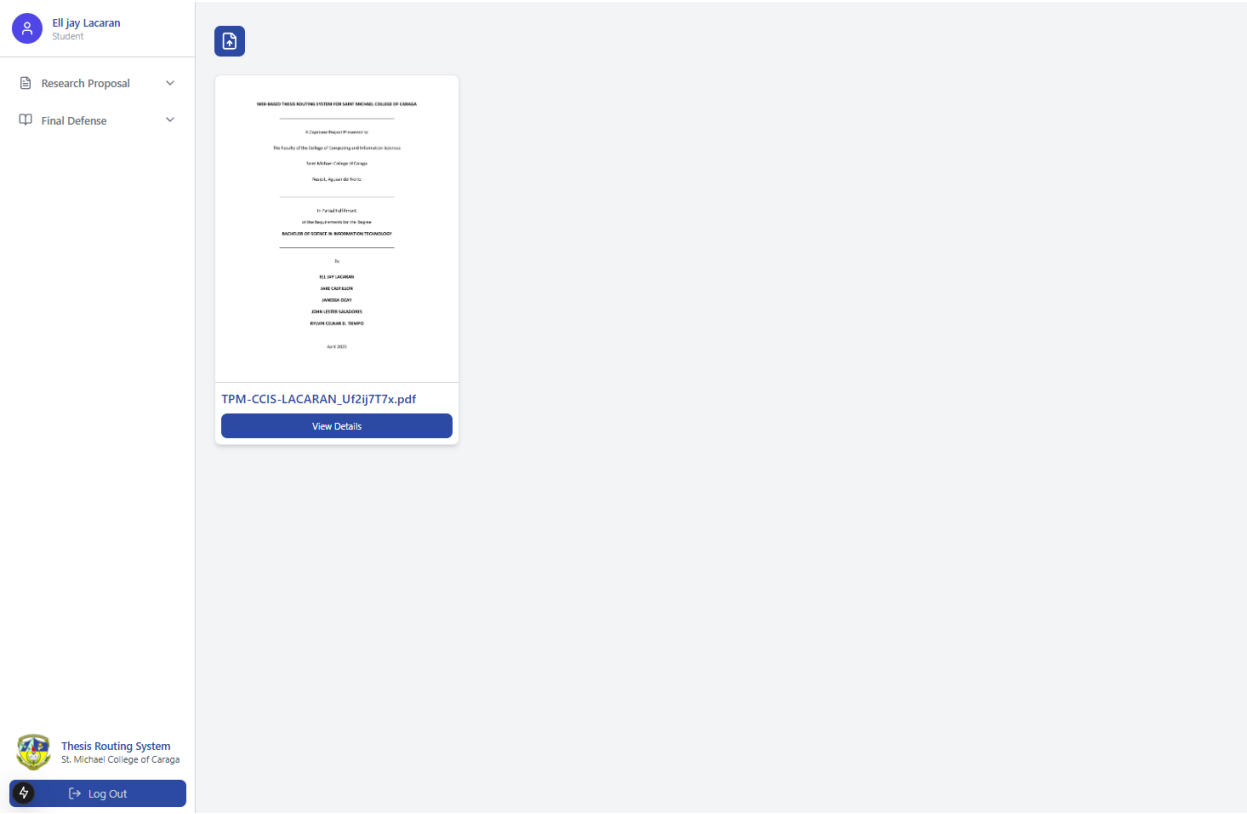


Figure 16. Student Side – Home Page (User Interface Design)

Figure 16 shows the student home page, featuring Documents submitted on the main screen. The sidebar includes the 'Research Proposal' section that has Routes 1, 2, and 3 as well as 'Final Defense' and also display the student's name.

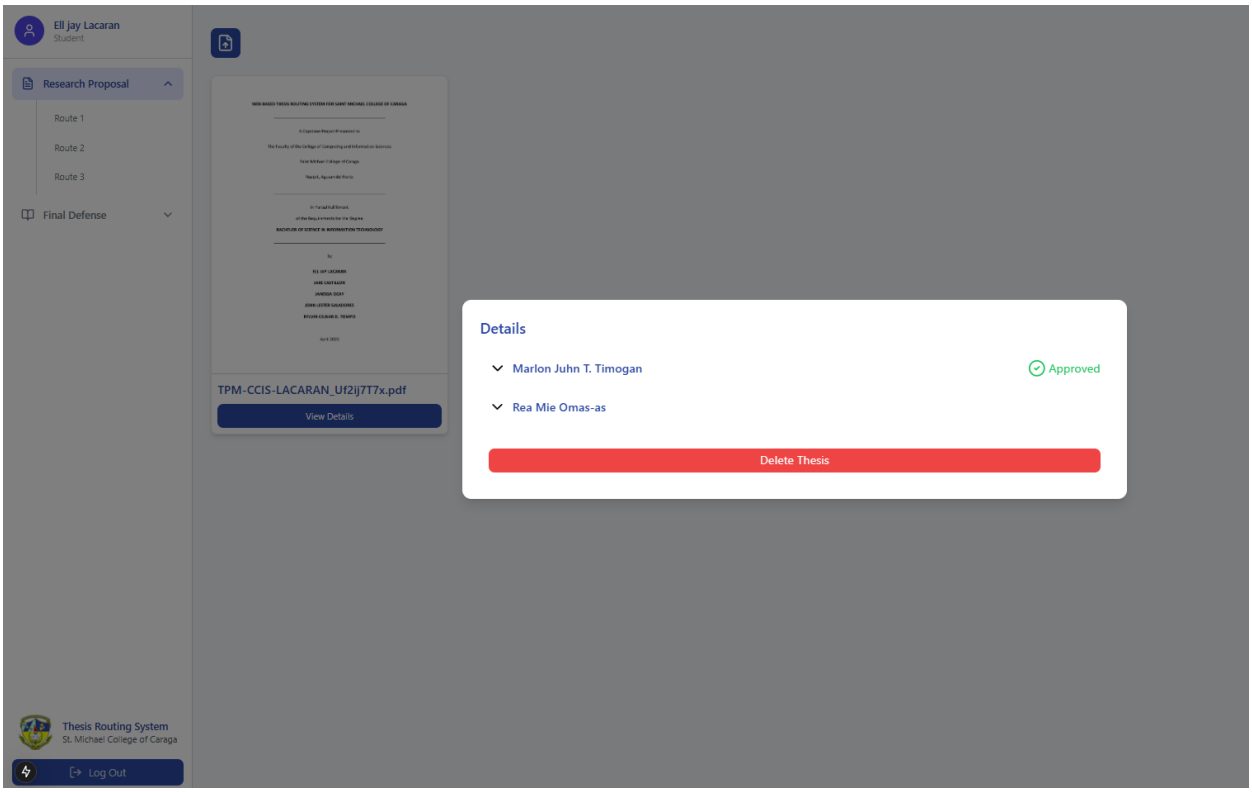


Figure 17. Student Side – Route 1 Page (User Interface Design)

Figure 17 illustrates the Route 1 document approval process. The student submits a PDF file, which is then displayed in the route 1. The panel and adviser can route the file and provide feedback. If the document has issues, it will not be marked as approved.

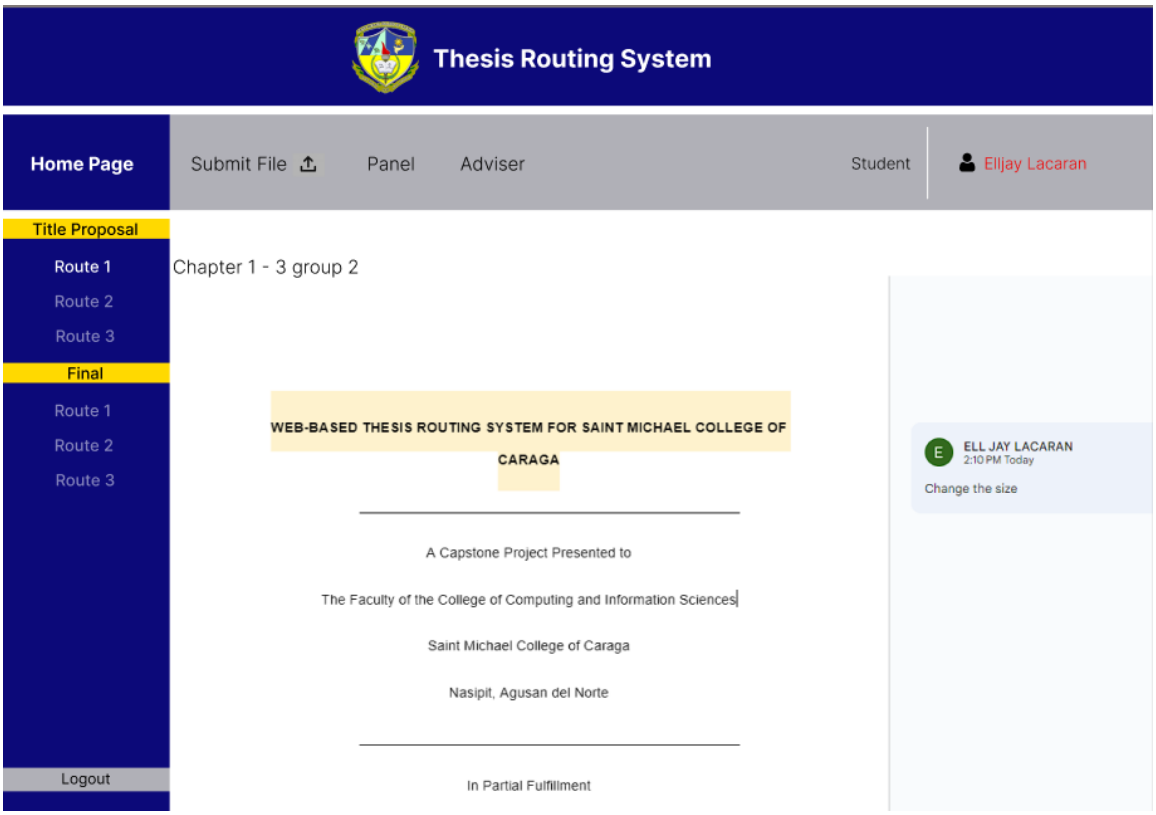


Figure 18. Student Side – View Document Page (User Interface Design)

Figure 18 displays when the Student will view this document with feedback from the panel and adviser.

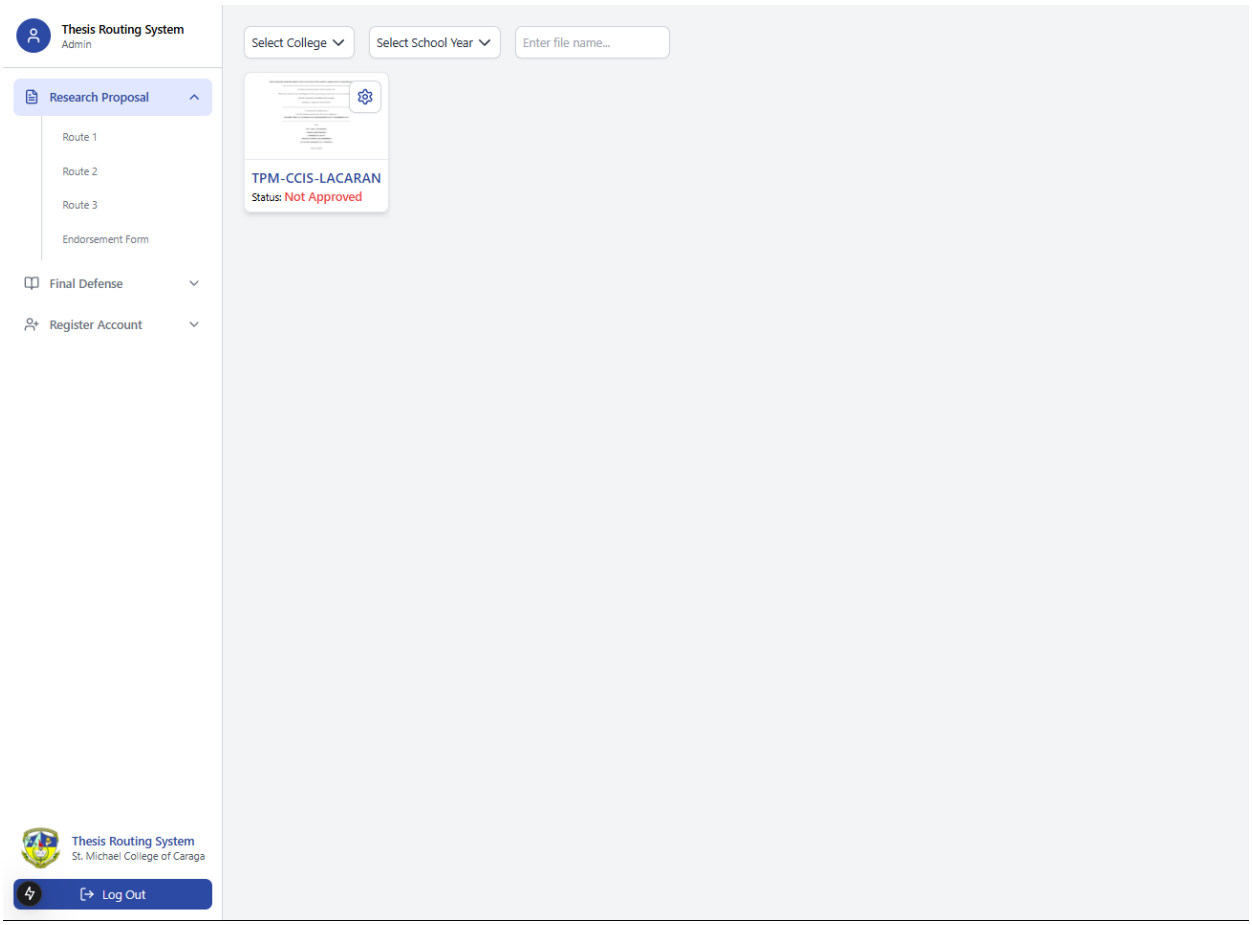


Figure 19. Admin Side – Route 1 Page (User Interface Design)

Figure 19 displays all documents submitted by students. The Admin is responsible for managing the students' submitted documents. The admin can select and search which department and school year to display documents for. Then, they select the file and assign panels and advisers to review and provide feedback on the document. Once the file completes checking for the current Route, the Admin submits it to the next Route, so the Student doesn't need to submit a file again for the next Route in Route 2.

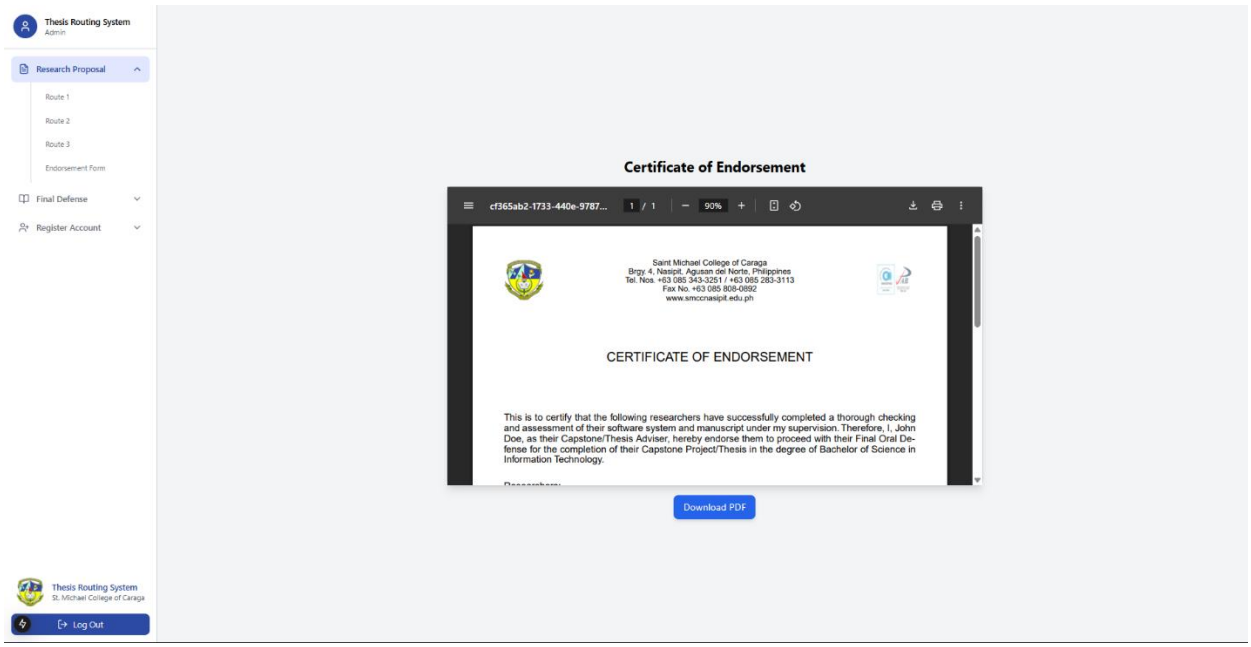


Figure 20. Admin Side – Endorsement Form Page (User Interface Design)

Figure 20 shows the certificate of endorsement. The endorsement certificate will be used if the Student completes all the routing.

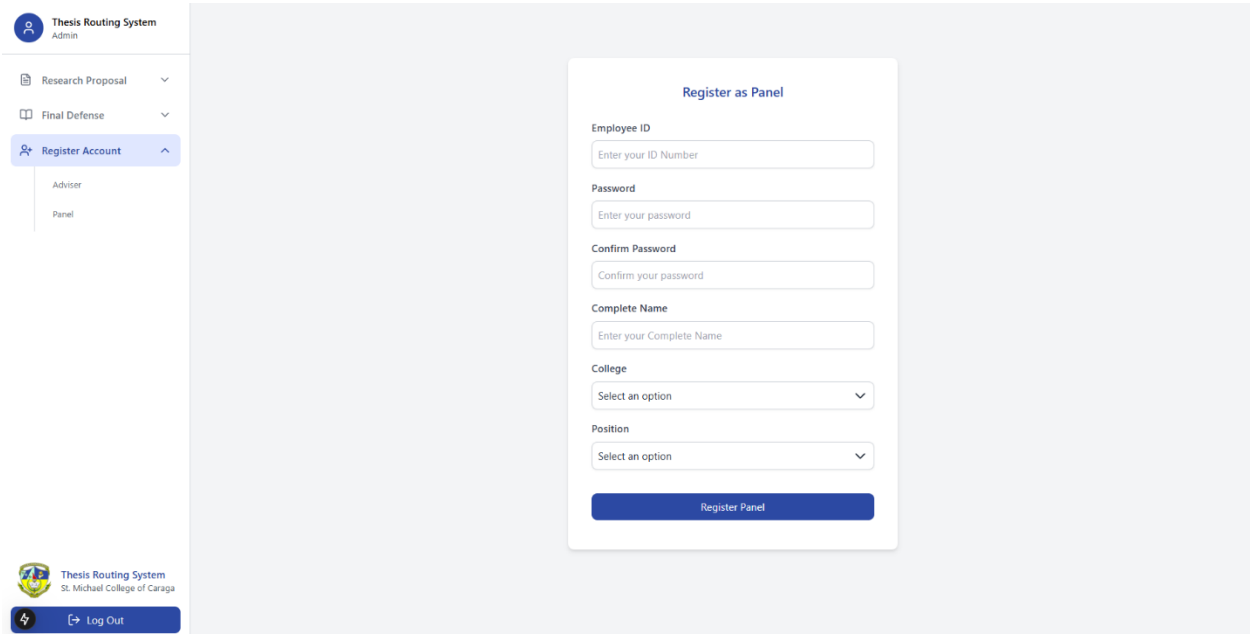


Figure 21. Admin Side – Panelist Registration Page (User Interface Design)

Figure 21 displays the Panelist Registration. The Admin manages the panel account. The Admin enters the username, password, complete name of the panel, department and position, then clicks the register button.

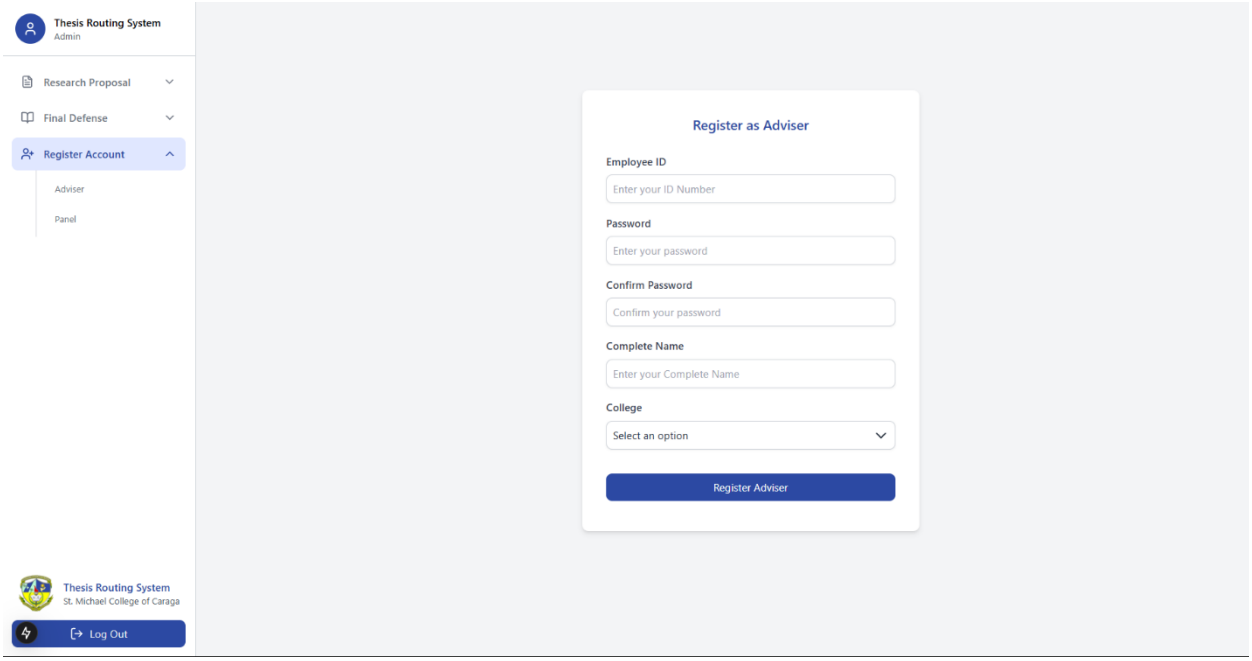


Figure 22. Admin Side – Adviser Registration Page (User Interface Design)

Figure 22 displays the Adviser Registration. The Admin manages the adviser account. The Admin enters the complete name of the adviser, department, username, and password, then clicks the register button.

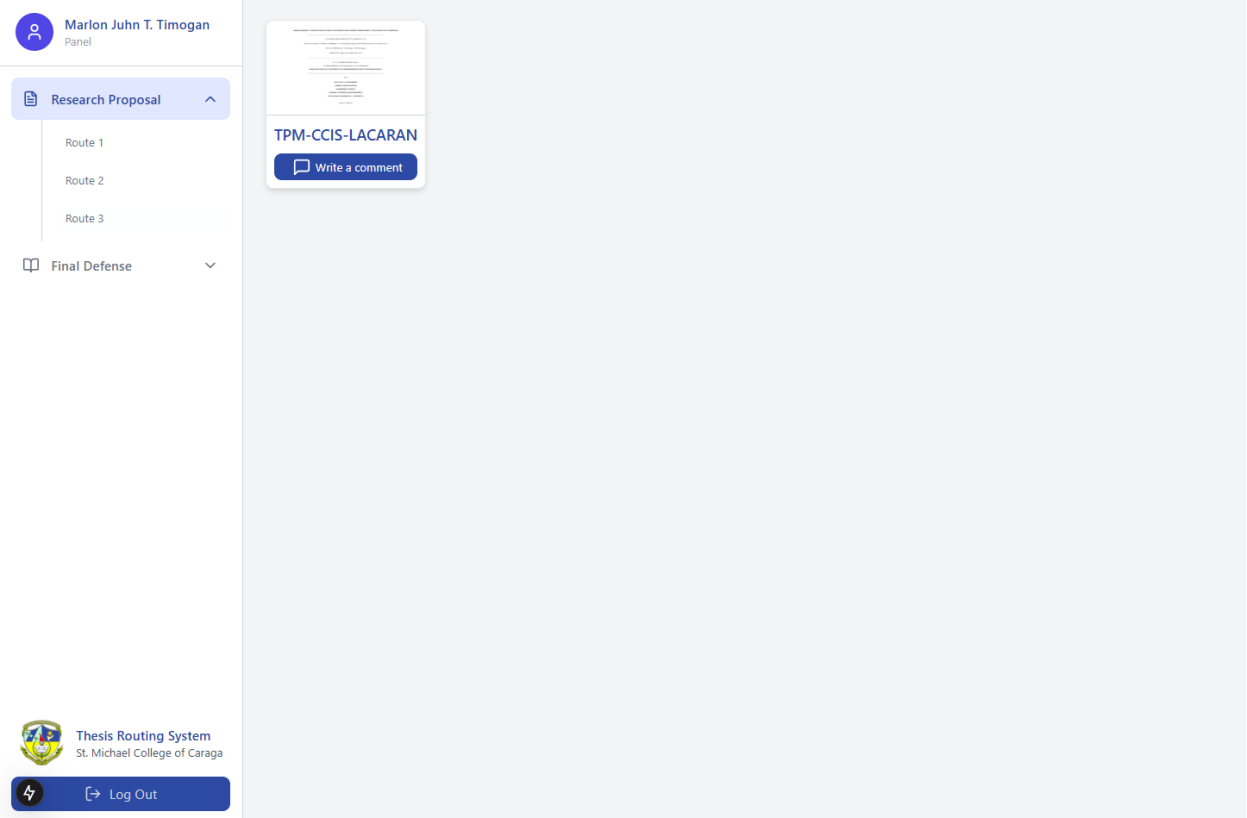


Figure 23. Panel Side – Route 1 Page (User Interface Design)

Figure 23 displays the route 1, route 2, route 3. The panel can view the document submitted by the Student.

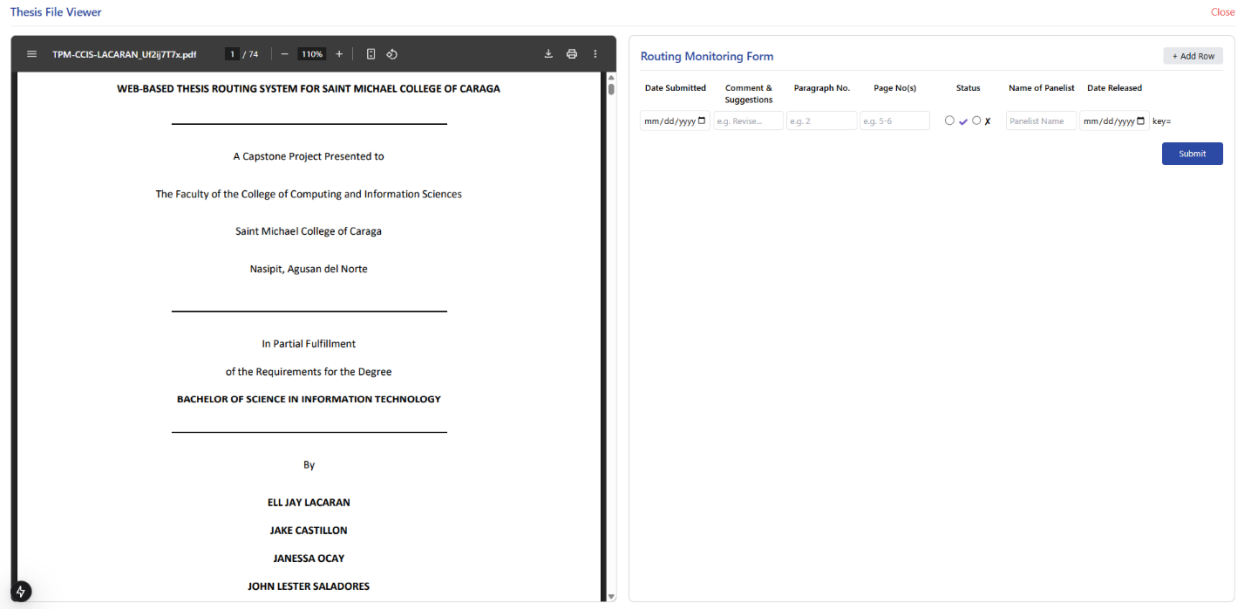


Figure 24. Panel Side – Route 1 View Document Page (User Interface Design)

Figure 24 displays the PDF file that are viewed by the panel. The panel has expertise. If the panel is assigned to Chapter 2, he can only access Chapter 2. The panel can approve the document. If there's no problem in his file, then if there's a problem. He can highlight the sentence where he wants, and the comment icon will show on the sentence where he highlighted it. The comment will show the panel's name on the right side.

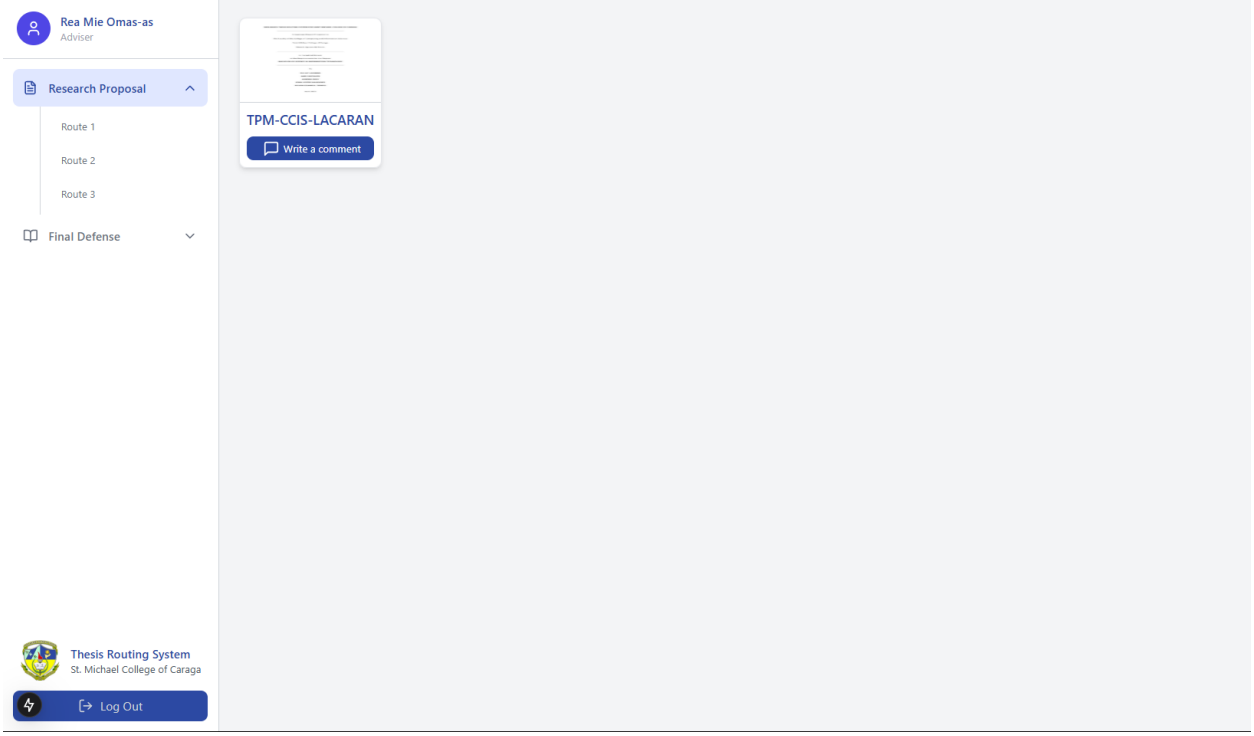


Figure 25. Adviser Side – Route 1 Page (User Interface Design)

Figure 25 displays the route 1, route 2, route 3. The adviser can view the document submitted by the Student.

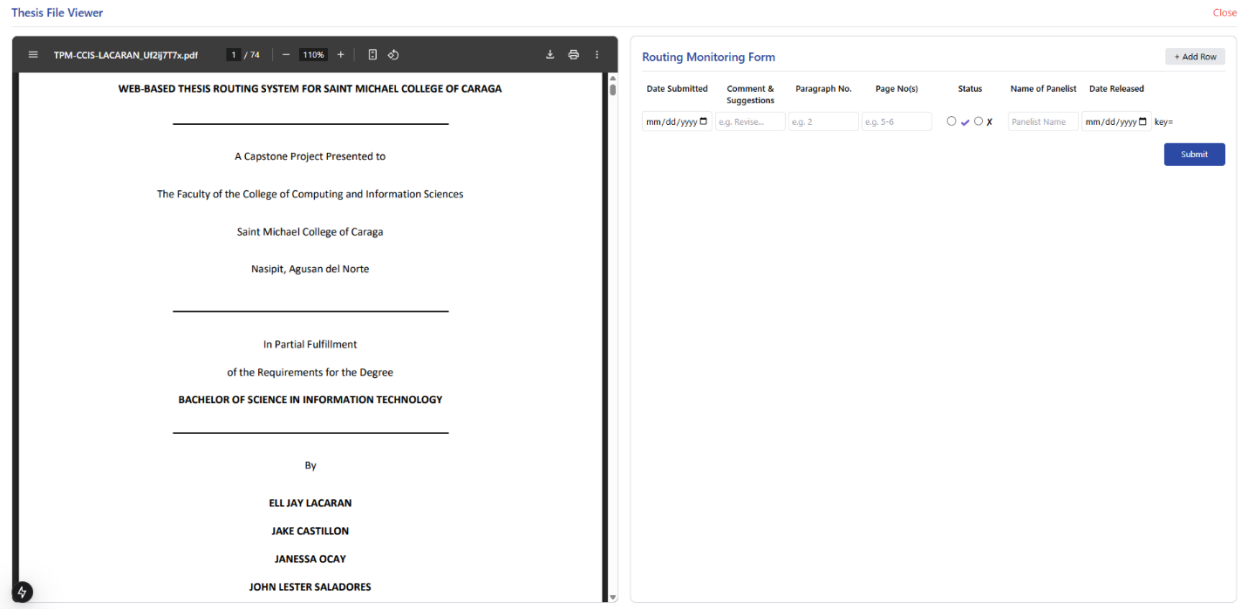


Figure 26. Adviser Side – Route 1 View Document Page (User Interface Design)

Figure 26 displays the PDF file viewed by the adviser. The adviser can approve the document if there's no problem in his file. If there's a problem, he can write a comment on the right side. The comment will show on the right side with the details and the adviser's name.

Table 1

Software Requirements

Components	Specification	Usage
Internet Browser	Any	Internet browsers make accessing and rendering web pages easier, allowing users to surf the World Wide Web. This loads the web server, which connects the users to the TRS and allows access to its features upon successful login.
Front-end	HTML	HTML serves as the structural foundation of web pages. It allows you to define the arrangement and structure of content components, including text, graphics, and forms.
	React.js	React.js is a JavaScript library for constructing interactive user interfaces, allowing developers to create reusable UI components and update the view efficiently as data changes, thereby improving the performance and user experience of web applications.
	Tailwind CSS	Tailwind CSS is a utility-first front-end framework that provides low-level CSS classes, allowing developers to rapidly design custom user interfaces directly in the markup without writing custom stylesheets.

	JavaScript	JavaScript enhances web pages with flexible functionality and interactive elements, enabling developers to add features such as animations and rapid modifications that react to user input.
Back-end	Next.js	Next.js is a React-based framework that allows server-side rendering, static site generation, and hybrid rendering. It improves performance of the web application, boosts SEO, facilitates routing, and provides functionalities such as automatic code splitting and API routes.
	Node.js	Node.js is a JavaScript runtime for developing scalable, high-performance network applications. It implements an event-driven, non-blocking I/O model, which is well-suited for real-time web applications, APIs, and other types of applications that have multiple, concurrent connections.
	(Database)	
	Firebase	Firebase is an application development platform for mobile and web applications. It offers backend services such as real-time databases, authentication, hosting, and cloud functions, making app development easier with scalability and real-time capabilities.

Server	Netlify	A web hosting and automation platform that simplifies the deployment of front-end projects by providing continuous integration, automatic builds from Git repositories, and features like serverless functions and custom domains.

Table 2

Hardware Requirements

Components	**Specification**	**Usage**
Device	Ram	Electronic devices such as computers, laptops, smartphones, and tablets utilize RAM. It allows rapid access to your system's stored information is enabled via Random Access Memory (RAM), which acts as temporary storage.
	Processor	The Central Processing Unit, also known as the processor, is the brain of a computing device. It handles data processing and carries out computations and instructions. It has various cores that work on different tasks simultaneously.
	HDD	

	SDD Flash Storage	HDD and SSD are primarily used for computer and laptop storage, while mobile devices such as smartphones and tablets use flash storage. These are used to store data such as applications, multimedia, programs, and the operating system.
Printer	Any Ink Jet Printer Units	An inkjet printer is a device that prints text, images, and graphics on paper using ink. It is more widely used and typically less expensive. This reliable option is ideal for daily printing tasks because it can produce high-quality prints for various documents and images

ETHICAL STANDARD

In conducting this study, ethical considerations are crucial to maintaining the integrity, transparency, and credibility of the research process. This study adheres to ethical principles by prioritizing the confidentiality of sensitive student and academic data within the Web-based Thesis Routing System (TRS), ensuring that access is restricted solely to authorized personnel. The digitalized nature of the TRS necessitates stringent data protection measures to prevent unauthorized access and misuse. Furthermore, the system is designed to align with ethical principles of fairness, accountability, and respect for all users, ensuring compliance with institutional policies and legal standards while fostering trust among stakeholders.

A. Protection of Intellectual Property Rights (IPR)

The "Web-based Thesis Routing System for Saint Michael College of Caraga" is a software solution developed specifically for managing thesis submission and evaluation at Saint Michael College of Caraga. The system's source code, design, and interface will be copyrighted to protect intellectual property rights. Additionally, all uploaded theses remain the intellectual property of the submitting students and faculty, ensuring that the system upholds copyright laws and does not infringe on intellectual ownership. Since no unique branding or logo beyond the institution's existing identity will be created, trademark registration is unnecessary.

B. Informed Consent

All users of the TRS will be fully informed about the system's purpose, functionality, and potential benefits through a user agreement. Before registering, students, advisers, panel

members, and administrators before they agree or decline to join, ensuring they understand the scope of their involvement. No living organisms, including animals, are involved in this system, as it is strictly a digital tool for academic purposes.

C. Data Privacy and Confidentiality

The TRS prioritizes data privacy by securely storing all user data and uploaded documents in a Firestore database with encryption. Access to sensitive information will be restricted to authorized personnel, such as administrators and panel members, based on user roles. All data will be anonymized when necessary to protect user identities, and no third-party access will be allowed without explicit consent.

D. Voluntary Participation and Freedom to Withdraw

Participation in the TRS is entirely voluntary, with students, faculty, and panel members free to engage with the system or request account deactivation without facing any penalties. Clear documentation will ensure users are aware of their rights to opt out of the system at any time, respecting their autonomy and decision-making. This study exclusively involves human participants and does not include animals in any capacity. Comprehensive documentation will be provided to ensure clarity and transparency regarding these policies.

E. Minimization of Harm and Risk Management

The TRS minimizes potential harm by ensuring ease of access, secure data handling, and reliable functionality. Services such as a helpdesk, training sessions, and an FAQ section support users when needed. Social risks are mitigated through equitable access and confidentiality, while encryption protects data from breaches. Regular monitoring and user

feedback mechanisms address concerns promptly, keeping physical, social, and psychological risks to an absolute minimum.

F. Beneficence and Contribution to Knowledge

The TRS contributes positively to both the academic community and society by enhancing the efficiency and transparency of the thesis submission and evaluation process. By reducing the environmental impact of printing and streamlining communication between stakeholders, the system aligns with sustainable and eco-friendly practices. The system also ensures that students and faculty benefit directly from improved management and accessibility of thesis documents. Research findings will be made available upon request through institutional channels, such as reports, presentations, or academic publications. Additionally, findings will be shared with participants and stakeholders via accessible formats like summary reports, workshops, or online platforms to ensure transparency and inclusivity.

G. Justice and Fair Participant Selection

The TRS is designed to support all students and faculty equitably, regardless of gender, socioeconomic status, or department. No user will face discrimination, and access to the system will be granted transparently based on their roles in the thesis process. This ensures fairness and inclusivity in the system's implementation and usage. No animals are involved in this project.

H. Data Integrity and Accuracy

All data entered into the TRS will undergo rigorous validation to ensure accuracy and consistency. While the system's automated features, such as document tracking and status

updates, are designed to maintain data integrity, there may still be potential biases or errors in data processing. Limitations such as system updates or user input inaccuracies could affect functionality. Continuous monitoring and regular updates will address these issues, and feedback mechanisms will help identify and correct any discrepancies to enhance reliability.

I. Transparency in Reporting and Honesty

The system will generate accurate and transparent reports on thesis submissions and evaluations, ensuring all activities are documented without manipulation. Administrators will disclose any conflicts of interest and provide proper citations for secondary data sources or external tools used during development.

J. Use of Patented or Copyrighted Materials

The development of the TRS adheres to copyright laws by ensuring that all third-party libraries, tools, or resources used are properly licensed and cited. User-uploaded materials, including theses, remain under the ownership of their respective authors, and no unauthorized use of copyrighted content will occur.

K. Ethical Considerations for Animal and Human Trials

The TRS is a software-based system available exclusively to students at Saint Michael College of Caraga (SMCC). It does not involve any animal or human trials in the traditional sense of experimentation. While students use the system for thesis submission and evaluation, they will not be exposed to physical, emotional, or psychological risks. The system ensures user safety through secure data handling, privacy measures, and a focus on a positive user experience.

L. Responsible Use of AI and Other Related Technologies

AI tools, including automated validation features, have been responsibly integrated into the TRS to enhance its functionality. AI is used to automatically end the routing for each adviser and panel member if they exceed the allotted time. Grammarly was used during the documentation phase to ensure clarity and professionalism, while ChatGPT assisted in refining written materials and addressing technical queries.

M. Ethical Clearance and Institutional Approval

Ethical approval for the development and implementation of the TRS will be secured from the Saint Michael College of Caraga Institutional Review Board. This ensures compliance with institutional and research ethics guidelines, including participant safety, data security, and intellectual property protection

CHAPTER IV

SOFTWARE DEVELOPMENT AND TESTING

This chapter offers a comprehensive description of all major activities involved in the design and testing of the Thesis Routing System (TRS). It comprises a discussion of strategies employed in the system development process, the precise steps taken in the construction process, and activities undertaken for the system's maintenance throughout its entire life.

DEVELOPMENT PROCESS

The systematic software development process of the Online Request of Credentials System (ORCS) is illustrated through the input-process-output diagram shown in Figure #.

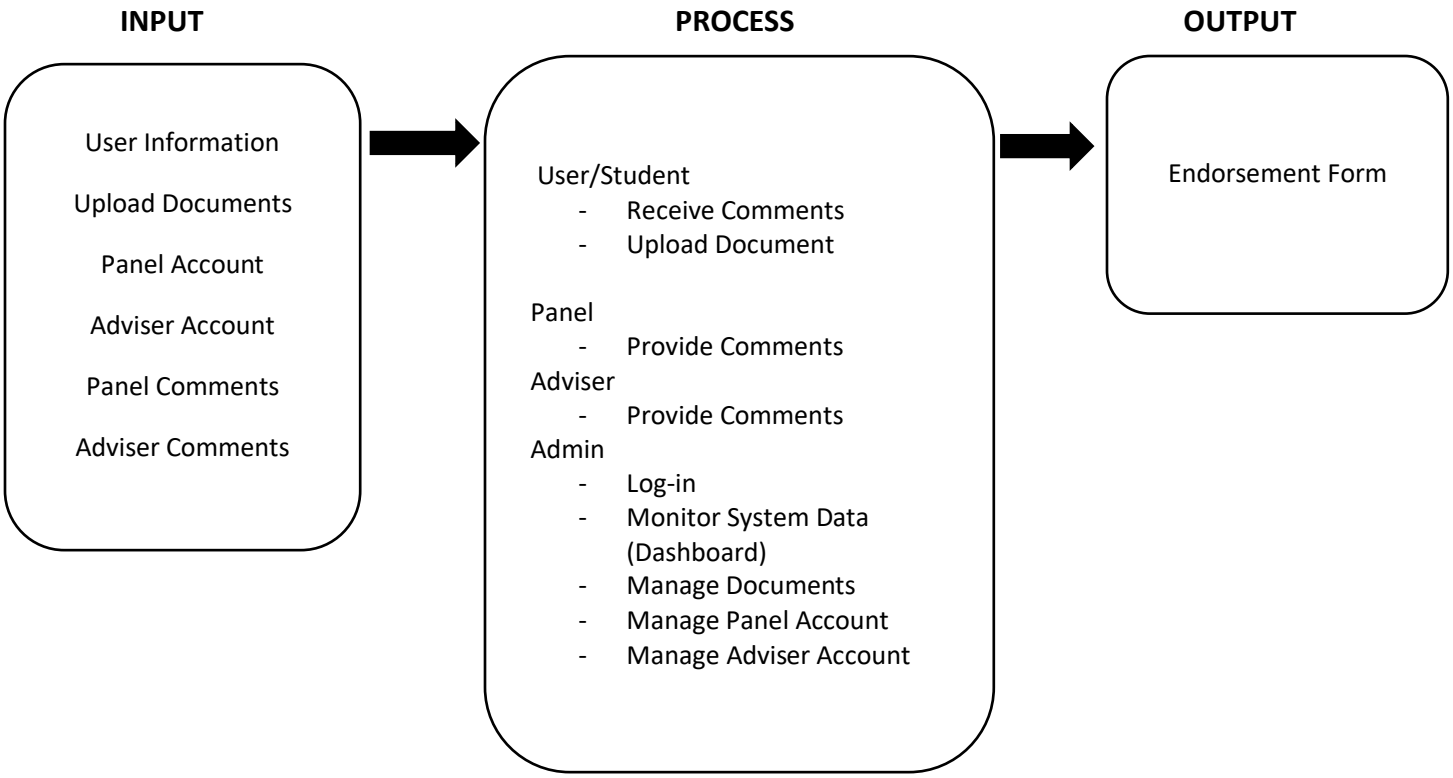


Figure #. Input-Process-Output Diagram

Input

The input "User Information," "Upload Documents," "Panel Account," "Adviser Account," "Panel Comments," and "Adviser Comments" represent essential data elements processed within the system. User Information contains details about individuals accessing the system, ensuring proper identification and role assignment. Upload Documents allows users to submit their documents so the panel and adviser can critique them. The Panel Account is assigned to panel members who review submissions and provide expert feedback, while the Adviser Account is designated for advisers guiding users through the process. Panel Comments and Adviser Comments serve as communication tools, enabling panel members and advisers to provide critiques, suggestions, and necessary revisions. These inputs collectively support document management, user authentication, and feedback integration within the system.

Process

The system follows a structured process that provides for various user roles. Users/Students who can upload documents for review and obtain feedback from both panel members and advisers. Panel members are responsible for reviewing all submissions and issuing comments, whereas advisers evaluate the documents and give advice. The admin checks the overall management of the entire process by logging in and monitoring system data through the

dashboard, managing documents, and managing both panel and adviser accounts. This whole workflow guarantees the efficient submission of documents, structured feedback on them, and effective management of the system.

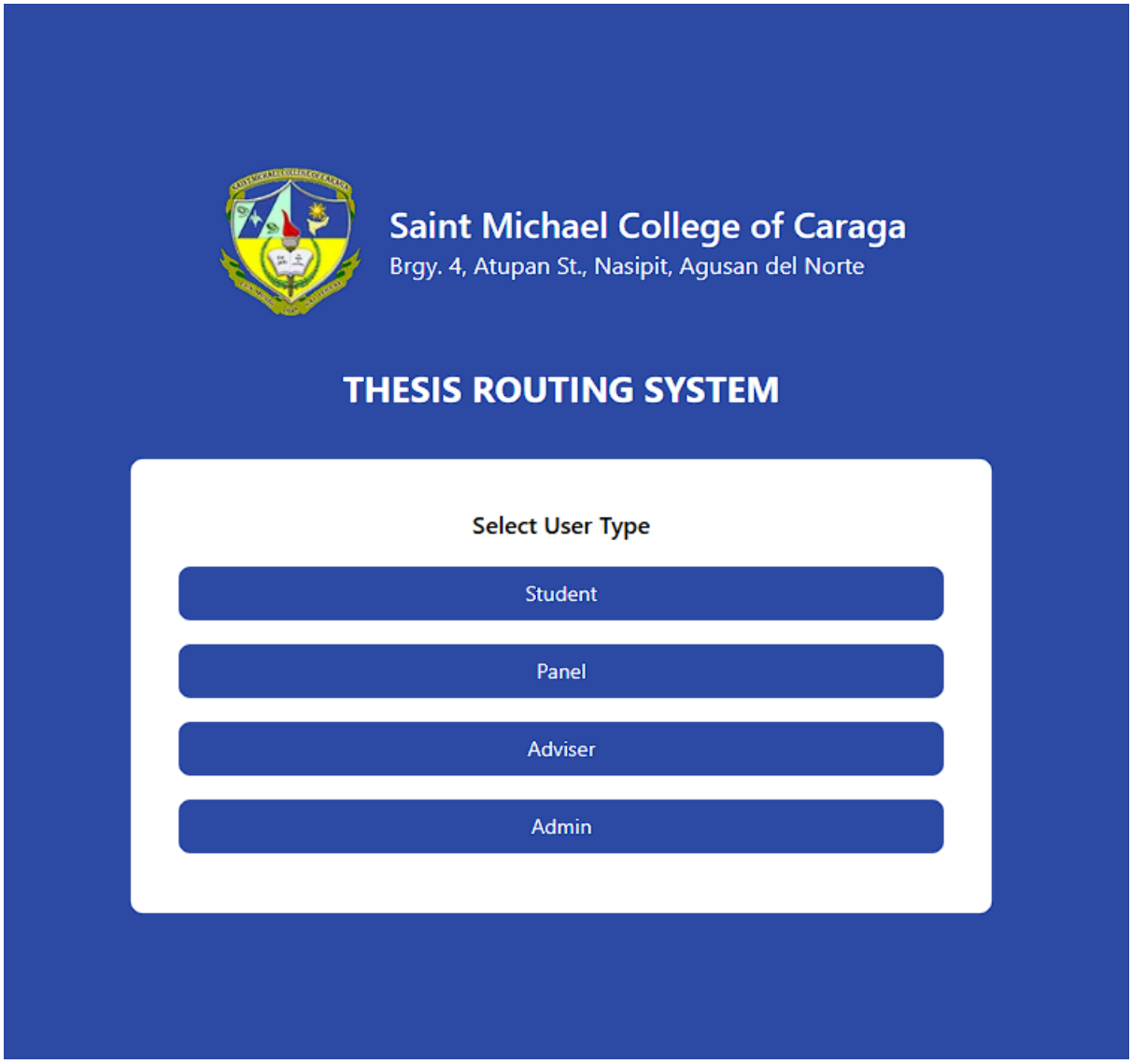


Figure #. Landing Page

Figure # shows the first thing the Users will see when they access the system. The user will choose student, panel, adviser, and admin.

```
const buttonData = [
    {
        label: 'Student',
        onClick: () => {
            router.push('/auth/student');
        },
    },
    {
        label: 'Panel',
        onClick: () => {
            router.push('/auth/panel');
        },
    },
    {
        label: 'Adviser',
        onClick: () => {
            router.push('/auth/adviser');
        },
    },
    {
        label: 'Admin',
        onClick: () => {
            router.push('/auth/admin');
        },
    },
];
```

Figure #. Code Snippet for Landing Page

Figure # This JavaScript code, written for a React (Next.js) environment, is designed to allow users to select their role before logging in.

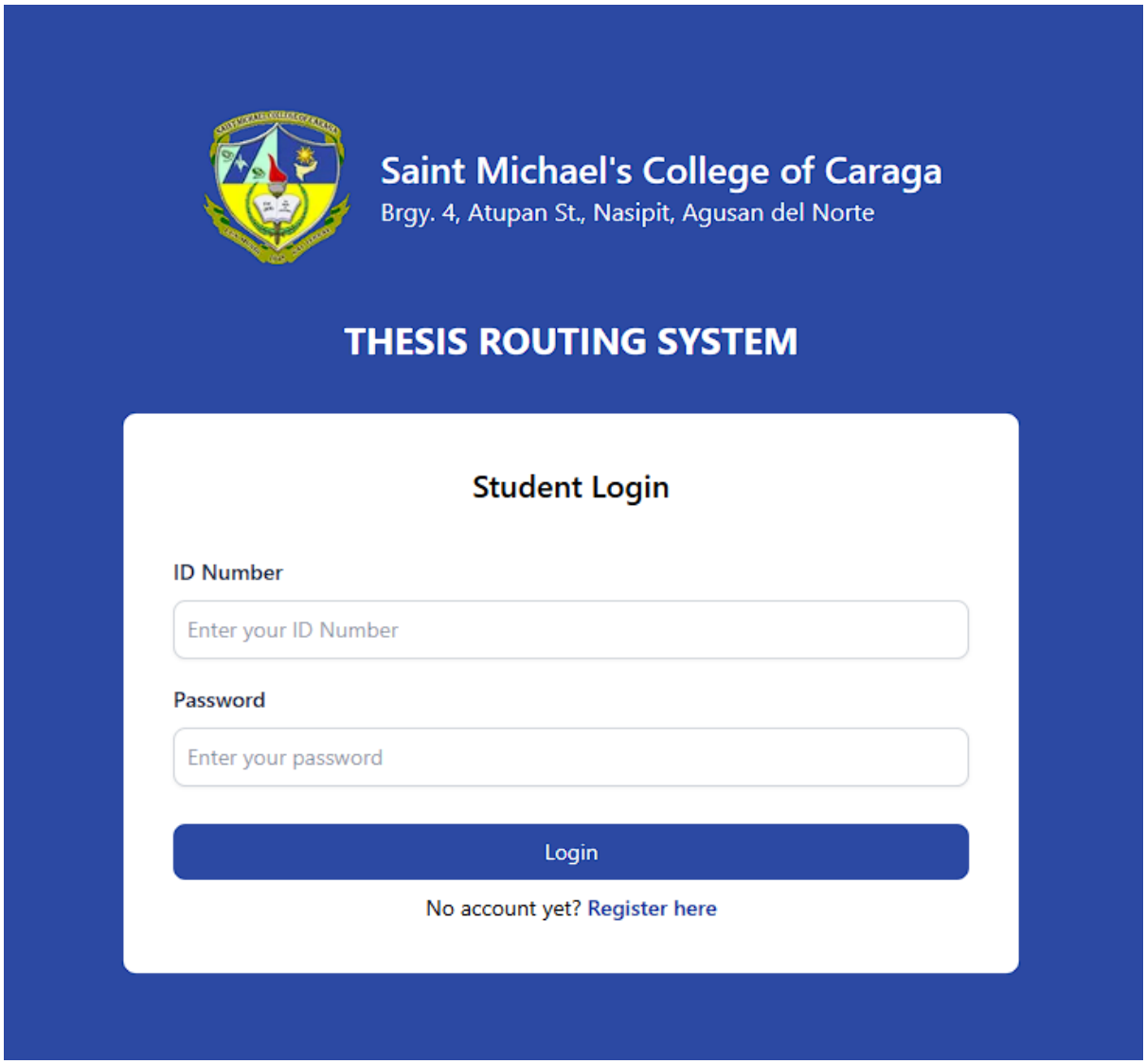


Figure #. Login Page - Student

Figure # This UI is for Student Login Input ID Number, And Password if the student doesn't have an account he/she can register.

```
<div className="flex flex-col justify-center bg-white w-[90%] md:w-[60%] lg:w-[40%] rounded-lg mx-auto p-8">
    <h1 className="text-center font-semibold text-xl mb-8">
        Student Login
    </h1>
    <TRSInput
        label={'ID Number'}
        placeholder={'Enter your ID Number'}
        value={idnumber}
        onChange={(e) => setIdnumber(e.target.value)}
    />
    <TRSInput
        label={'Password'}
        placeholder={'Enter your password'}
        value={password}
        onChange={(e) => setPassword(e.target.value)}
        type="password"
    />

    <TRSButton
        label={`${loginLoading ? 'Logging in...' : 'Login'}`}
        onClick={handleLogin}
    />
    <p className="text-center text-sm">
        No account yet?{' '}
        <span>
            <Link
                href="/auth/student/register"
                className="font-semibold text-smccprimary"
            >
                Register here
            </Link>
        </span>
    </p>
</div>
```

Figure #. Code Snippet for Login Page - Student

Figure # This React (Next.js) component creates a Student Login interface with a responsive, centered design using Tailwind CSS. It includes input fields for ID Number and Password, a login button that updates dynamically, and a registration link for new users.

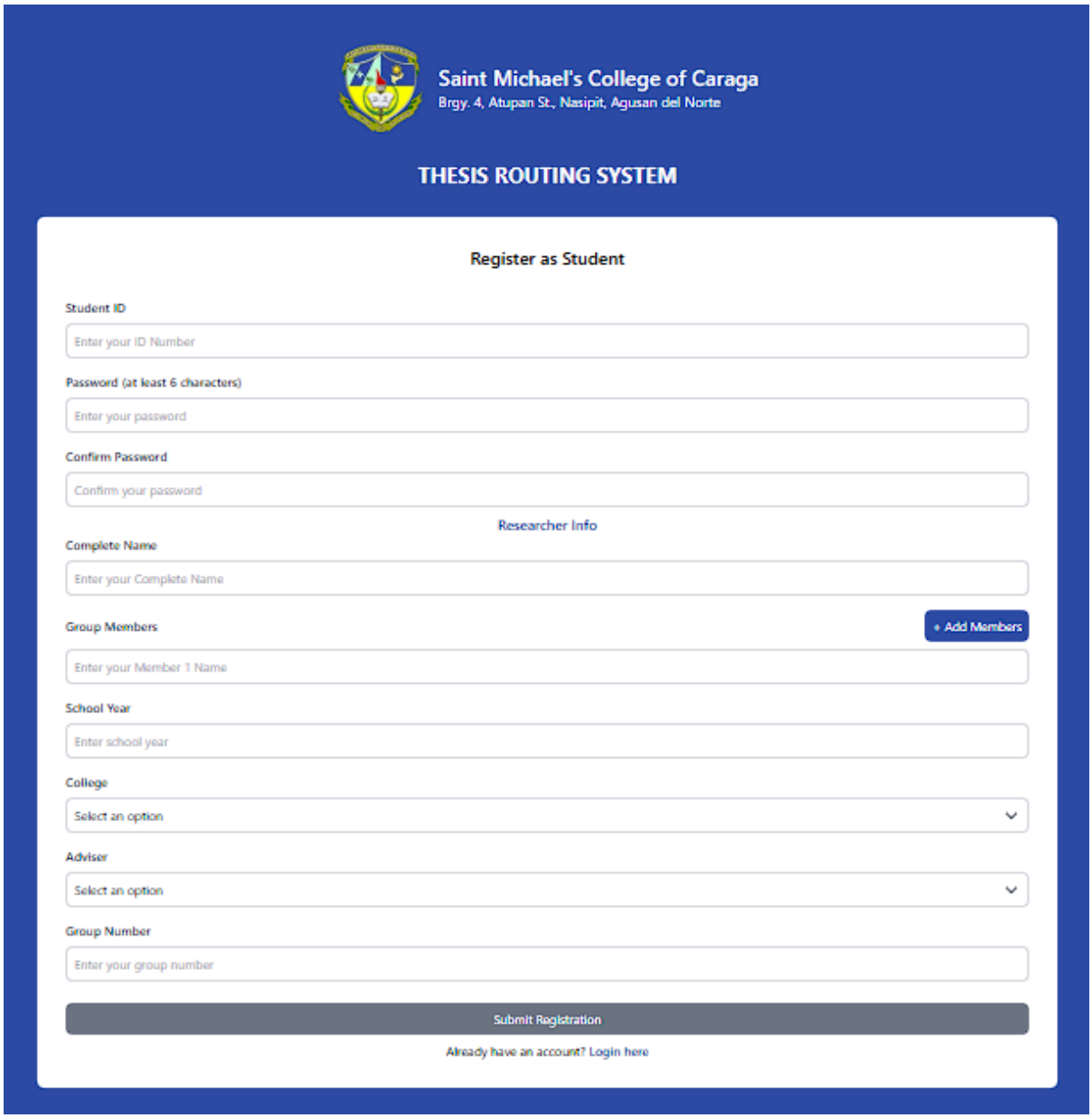


Figure #. Registration Page

Figure # In this UI the Student needs to input their information Student ID, Password, Complete Name of the Leader, Complete Name of Member, School Year, College or Course, Adviser, and Group Number.

```jsx
<div className="flex flex-col justify-center bg-white w-[90%] md:w-[60%] lg:w-[40%] rounded-lg mx-auto p-8">
    <h1 className="text-center font-semibold text-xl mb-8">
        Register as Student
    </h1>
    <TRSInput
        label={'Student ID'}
        placeholder={'Enter your ID Number'}
        value={idnumber}
        onChange={(e) => setIdnumber(e.target.value)}
    />
    <TRSInput
        label={'Password (at least 6 characters)'}
        placeholder={'Enter your password'}
        value={password}
        onChange={(e) => setPassword(e.target.value)}
        type="password"
    />
    <TRSInput
        label={'Confirm Password'}
        placeholder={'Confirm your password'}
        value={confirmPassword}
        onChange={(e) => setConfirmPassword(e.target.value)}
        type="password"
    />

    <p className="-mt-2 text-red-500 text-xs">
        {!passwordMatched & (confirmPassword != '')
            ? 'Passwords do not match.'
            : ''}
    </p>

    <p className="text-center font-semibold text-smccprimary">
        Researcher Info
    </p>
```

```jsx
<TRSInput
    label={'Complete Name'}
    placeholder={'Enter your Complete Name'}
    value={name}
    onChange={(e) => setName(e.target.value)}
/>

<div className="flex justify-between items-center mb-2">
    <div>
        <label className="mb-2 text-sm font-medium text-gray-700">
            Group Members
        </label>
    </div>
    <div>
        <button
            className="text-sm bg-smccprimary text-white px-2 py-2 rounded-lg hover:bg-blue-600"
            onClick={() => setMemberCount(memberCount + 1)}
        >
            + Add Members
        </button>
    </div>
</div>

{Array.from({ length: memberCount }).map((_, index) => {
    return (
        <TRSInput
            key={index}
            placeholder={`Enter your Member ${index + 1} Name`}
            value={membersList[index] || ''}
            onChange={(e) => {
                const updatedMembersList = [...membersList];
                updatedMembersList[index] = e.target.value;
                setMembersList(updatedMembersList);
            }}
        />
    );
})}
```

Figure #. Code Snippet (Query) for Registration Page

Figure # this next.js code is for input information for Student.

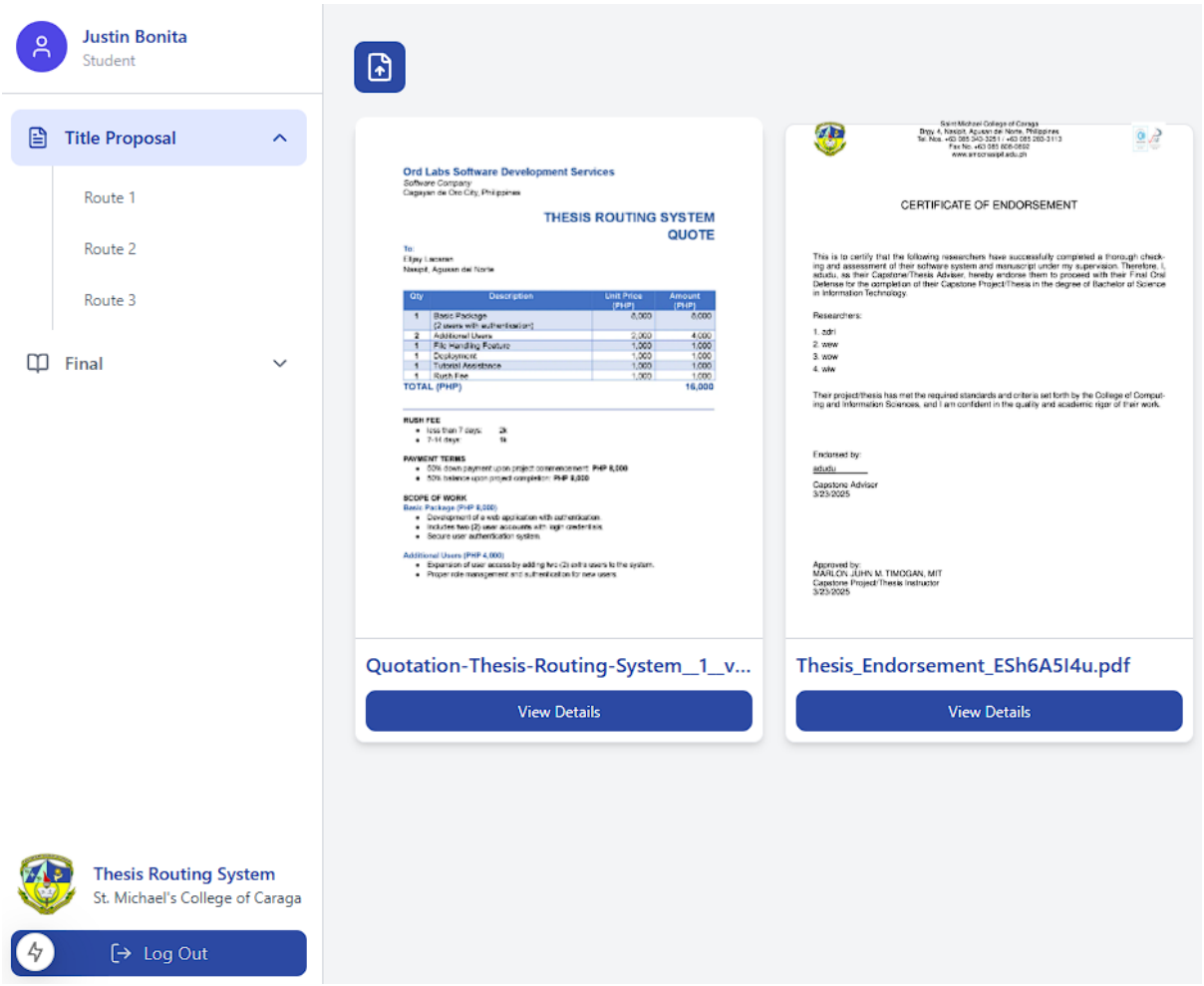


Figure #. Route 1 - Student

Figure # This UI shows the documents that were submitted for the student, and the sidebar has route1, route2, and route3 for the proposal same for the Final.

```jsx
<div className="flex flex-col justify-center md:items-start">
    <div className=" md:ml-0 mb-4 ml-12 ">
        <SubmitFile />
    </div>
    {loading ? (
        <div className="flex justify-center w-full items-center h-40">
            <div className="w-10 h-10 border-4 border-gray-300 border-t-blue-500 rounded-full animate-spin"></div>
        </div>
    ) : (
        <div className="w-full flex flex-wrap gap-4 justify-center md:justify-start">
            {theses.length > 0 ? (
                theses.map((thesis) => (
                    <StudentFileCard
                        key={thesis.id}
                        onDelete={handlePaperDeleted}
                        paperId={thesis.id}
                        pdfUrl={thesis.fileUrl}
                    />
                ))
            ) : (
                <p className="text-gray-500 text-center">No thesis papers found.</p>
            )}
        </div>
    )}
</div>
```

Figure #. Code Snippet for Documents - Student

Figure # This next.js code grabs all the files submitted by the student.

```jsx
<nav className="flex-1 p-3 overflow-y-auto scrollbar-thin scrollbar-thumb-gray-600 scrollbar-track-gray-800">
    <SidebarSection
        icon={FileText}
        title="Title Proposal"
        active={activeSection}
        setActiveSection={setActiveSection}
        links={[
            { name: 'Route 1', href: '/student/proposal/route-1' },
            { name: 'Route 2', href: '/student/proposal/route-2' },
            { name: 'Route 3', href: '/student/proposal/route-3' },
        ]}
        onLinkClick={() => setIsOpen(false)}
    />

    <SidebarSection
        icon={BookOpen}
        title="Final"
        active={activeSection}
        setActiveSection={setActiveSection}
        links={[
            { name: 'Route 1', href: '/student/final/route-1' },
            { name: 'Route 2', href: '/student/final/route-2' },
            { name: 'Route 3', href: '/student/final/route-3' },
        ]}
        onLinkClick={() => setIsOpen(false)}
    />
</nav>
```

Figure #. Code Snippet (Query) for Sidebar

Figure # This next.js code is for the sidebar that shows in the students UI.

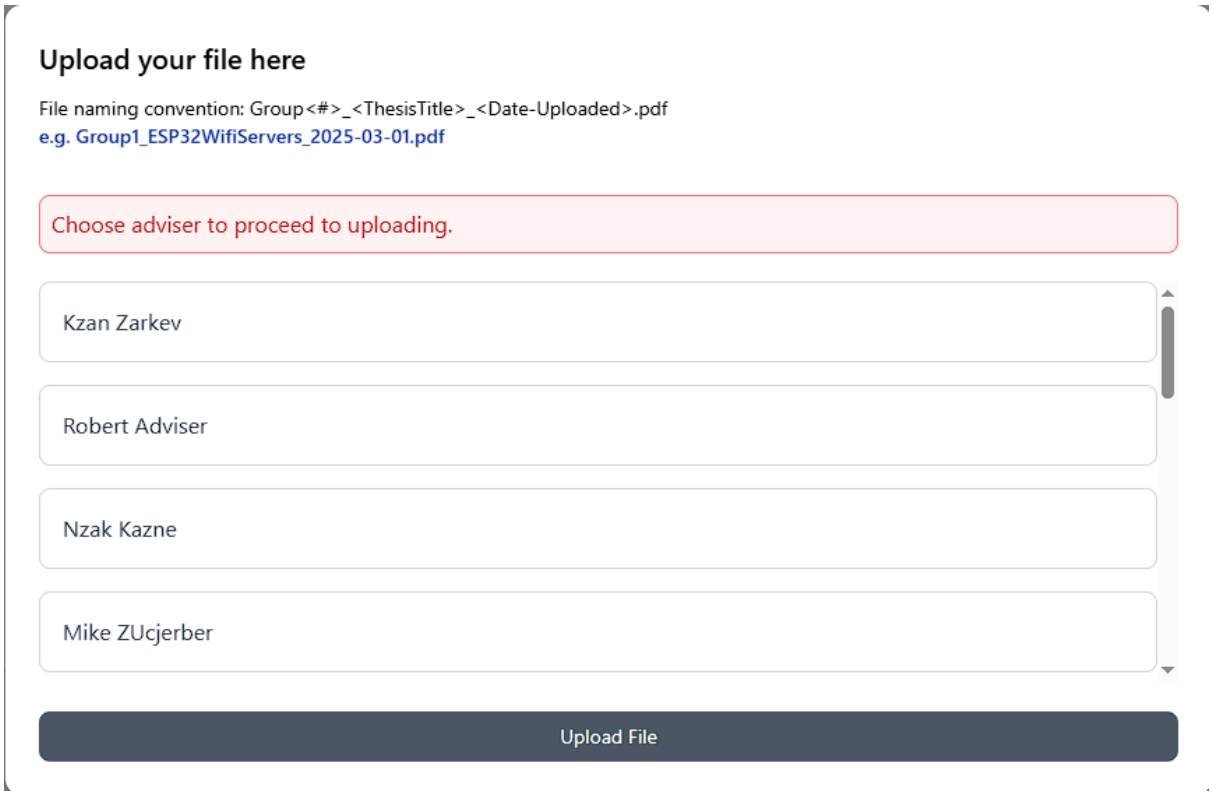


Figure #. Submit Document

Figure # shows the names of advisers and the upload file button.

```
<div className="flex flex-col gap-4 my-5 max-h-72 overflow-y-auto">
    {advisers.map((adviser) => (
        <div
            className={`${
                chosenAdviser.id === adviser.id
                    ? 'bg-smccprimary text-white'
                    : 'bg-white border border-gray-300 text-gray-700'
            } cursor-pointer w-full p-4 rounded-lg hover:bg-gray-200`}
            onClick={() => {
                setChosenAdviser(adviser);
                setIsadviserChosen(true);
            }}
            key={adviser.id}
        >
            {adviser.name}
        </div>
    ))}
</div>
```

Figure #. Code Snippet (Query) for Names of Advisers

Figure # This next.js code is for the list of the names of Advisers.

```
<button
    onClick={() => ikUploadRef.current.click()}
    className={`text-sm ${
        isAdviserChosen
            ? 'bg-smccprimary cursor-pointer'
            : ' bg-gray-600 pointer-events-none '
    }  w-full rounded-lg py-2 text-white`}
    type="button"
    disabled={uploading || !isAdviserChosen}
>
    {uploading ? 'Uploading...' : 'Upload File'}
</button>
```

Figure #. Code Snippet (Query) for Submit Button

Figure # This next.js code is the upload button.

```
<Modal isOpen={isMenuOpen} onClose={() => setIsMenuOpen(false)}>
    <h2 className="text-xl font-semibold text-smccprimary mb-4">Details</h2>
    <div className="flex flex-col gap-7 p-3 bg-white rounded-lg">
        {comments.length > 0 ? (
            comments.map((comment, index) => (
                <div key={index} className="flex flex-col gap-3">
                    <div className="flex justify-between">
                        <div className="flex gap-2">
                            <ChevronDown
                                className="cursor-pointer"
                                onClick={() => toggleComment(index)}
                            />
                            <p className="font-semibold text-smccprimary">
                                {comment.name}
                            </p>
                        </div>
                        {comment.position ? (
                            comment.approved ? (
                                <span className="text-green-500 flex items-center">
                                    <CircleCheck className="mr-1" /> Approved
                                </span>
                            ) : (
                                <span className="text-red-500 flex items-center">
                                    <CircleXIcon className="mr-1" /> Not Approved
                                </span>
                            )
                        ) : null}
                    </div>
                    <Accordion isCommentOpen={openCommentIndex === index}>
                        <div className="pl-3 border border-gray-300 rounded-lg text-black bg-white space-y-2 py-2">
                            {comment.comment}
                        </div>
                    </Accordion>
                </div>
            ))
        ) : (
            <p>No comments found.</p>
        )}
```

```
<button
    className="w-full p-2 mt-5 text-white bg-red-600 hover:bg-red-700 rounded-lg"
    onClick={handleDelete}
>
    Delete
</button>
```

Figure #. Code Snippet for Comments for Panel and Advisers

Figure # This next.js code is for the panel comment and adviser comment. The panel and adviser comments will show there and identify who comments on the file. The button is for deleting if the student uploads a document so he/she can delete it.

```php
// Check if there is an existing pending request for the user
$checkRequestQuery = "SELECT * FROM requests WHERE user_id = ? AND status = 'Pending'";

$stmtCheck = $connection->prepare($checkRequestQuery);
$stmtCheck->bind_param("i", $session_id);
$stmtCheck->execute();
$resultCheck = $stmtCheck->get_result();

if ($resultCheck->num_rows > 0) {
    // If there is an existing pending request, throw an exception
    throw new Exception('You have an existing pending request.');
}

// Insert the new request into the requests table
$insertQuery = "INSERT INTO requests (`user_id`, `course`, `date_requested`) VALUES(?, ?, ?)";
$stmtInsert = $connection->prepare($insertQuery);
$stmtInsert->bind_param("iss", $session_id, $course, $date_requested);
$stmtInsert->execute();

$lastInsertedId = $connection->insert_id;  // Get the last inserted request_id

// Insert into clearance table
$insertQuery = "INSERT INTO clearance (`request_id`) VALUES(?)";
$stmtInsert = $connection->prepare($insertQuery);
$stmtInsert->bind_param("i", $lastInsertedId);
$stmtInsert->execute();

// Insert selected documents into the requested_documents table
if (!empty($selectedDocs)) {
    $insertDocQuery = "INSERT INTO requested_documents (`request_id`, `document_id`) VALUES (?, ?)";
    $stmtDocInsert = $connection->prepare($insertDocQuery);

    // Loop through the selectedDocs array and insert each document_id
    foreach ($selectedDocs as $document_id) {
        $stmtDocInsert->bind_param("ii", $lastInsertedId, $document_id);  // request_id and document_id
        $stmtDocInsert->execute();  // Execute the insert query for each document
    }
}

// Commit the transaction
$connection->commit();
```

Figure #. Code Snippet (Query) for Application Form

Figure # this PHP code shows saving on multiple tables, It will first save the request then after it will create a clearance record using the id generated from request table and after all that it will insert all requested documents.

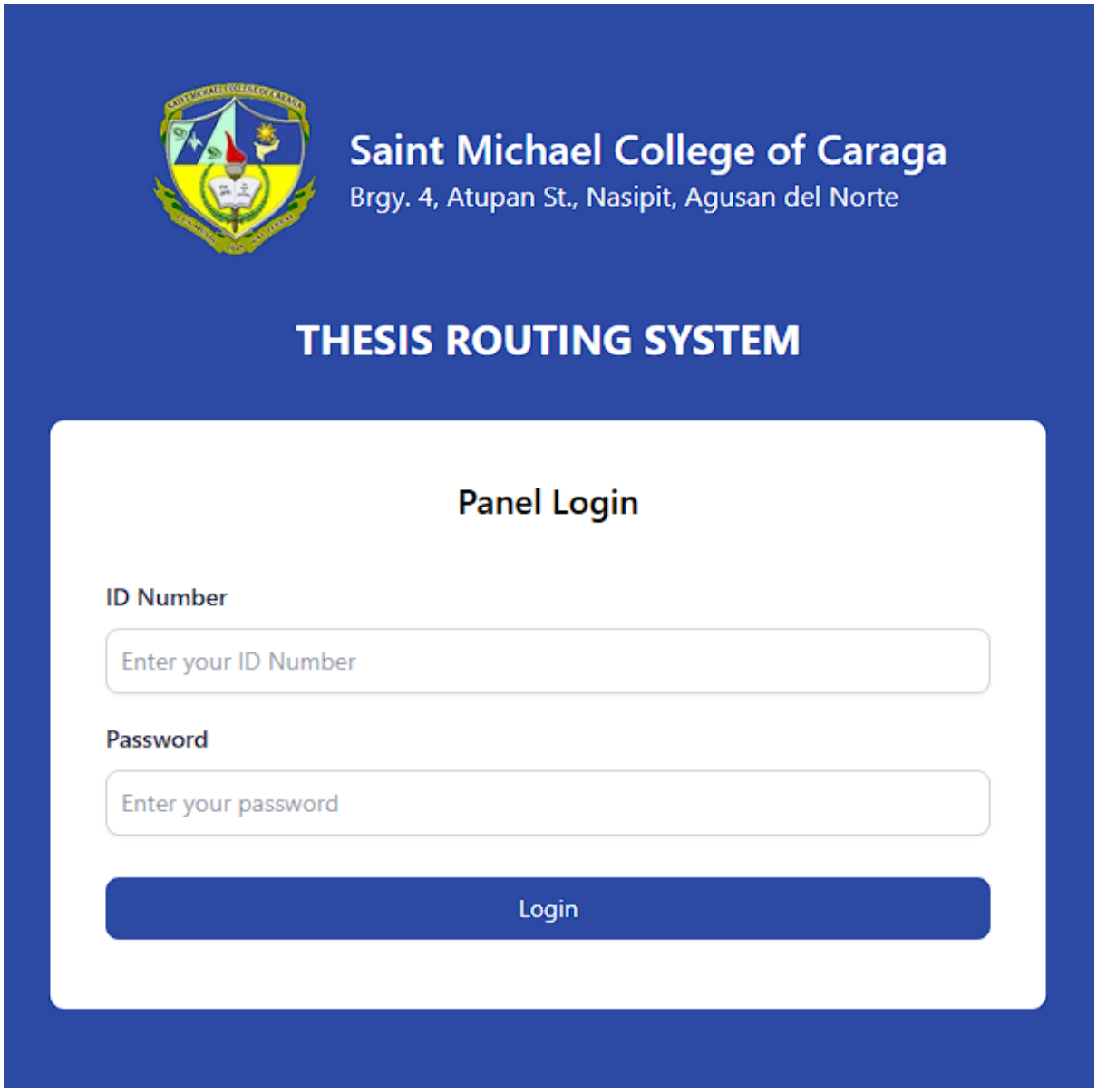


Figure #. Login Page - Student

Figure # This UI is for Panel Login Input ID Number, And Password.

```jsx
<div className="flex flex-col justify-center bg-white w-[90%] md:w-[60%] lg:w-[40%] rounded-lg mx-auto p-8">
    <h1 className="text-center font-semibold text-xl mb-8">Panel Login</h1>
    <TRSInput
        label={'ID Number'}
        placeholder={'Enter your ID Number'}
        value={idnumber}
        onChange={(e) => setIdnumber(e.target.value)}
    />
    <TRSInput
        label={'Password'}
        placeholder={'Enter your password'}
        value={password}
        onChange={(e) => setPassword(e.target.value)}
        type="password"
    />
    <TRSButton
        label={`${loginLoading ? 'Logging in...' : 'Login'}`}
        onClick={handleLogin}
    />
</div>
```

Figure #. Code Snippet for User

This React (Next.js) component creates a Student Login interface with a responsive, centered design using Tailwind CSS. It includes input fields for ID Number and Password, and a login button that updates dynamically.

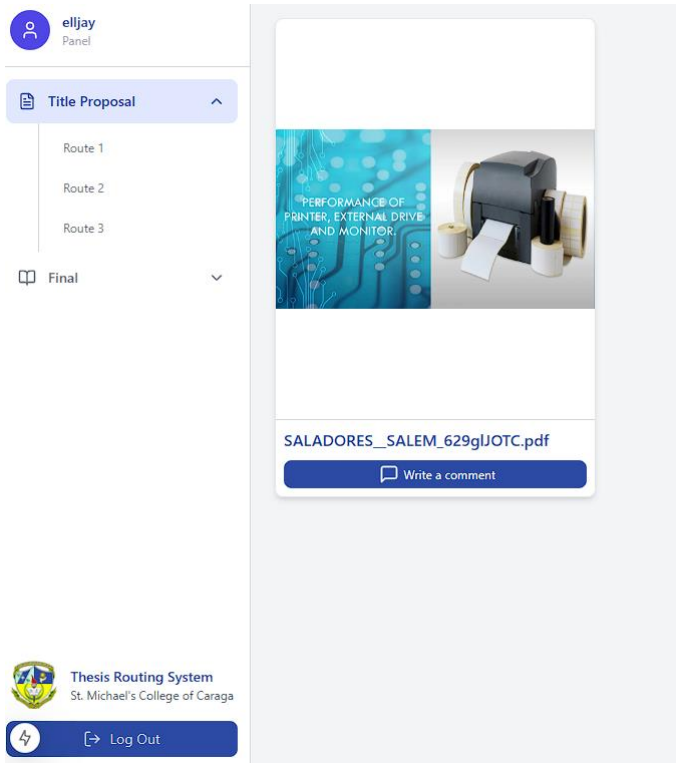


Figure #. Code Snippet (Query) for Documents

Figure # This UI is for the document that is submitted by the student and assigned to the panel.

```
<div className="  flex flex-col justify-center md:items-start">
    {loading ? (
        <div className="flex justify-center w-full items-center h-40">
            <div className="w-10 h-10 border-4 border-gray-300 border-t-blue-500 rounded-full animate-spin"></div>
        </div>
    ) : (
        <div className="w-full flex flex-wrap gap-4 justify-center md:justify-start">
            {theses.length > 0 ? (
                theses.map((thesis) => (
                    <PanelAdFileCard
                        key={thesis.id}
                        role={'panel'}
                        paperId={thesis.id}
                        pdfUrl={thesis.fileUrl}
                    />
                ))
            ) : (
                <p className="text-gray-500 text-center">No thesis papers found.</p>
            )}
        </div>
    )}
</div>
```

Figure #. Code Snippet (Query) for Documents

Figure # This next.js code grabs all the files submitted by the student.

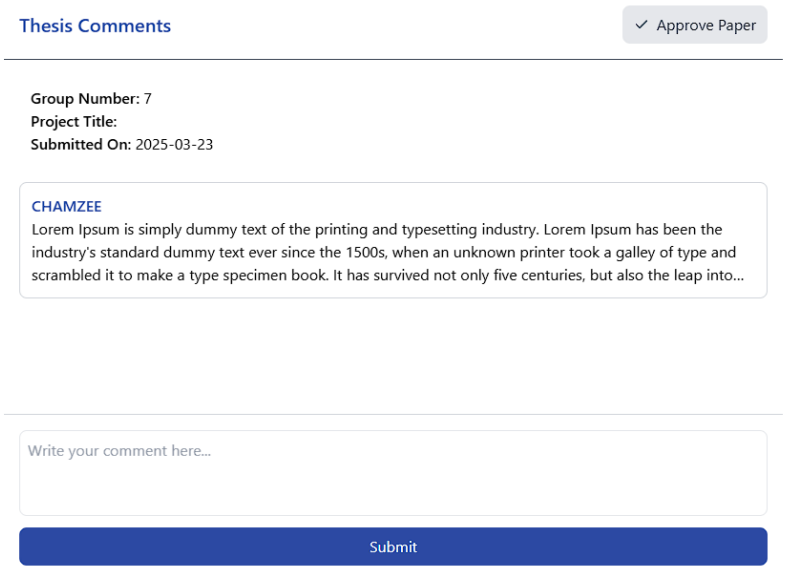


Figure # Comment for Panel

Figure # This UI is for the comments for the Panel and then the submit button if his done. The approve button is if the panel is done commenting then he can approve the file.

```
<div className="p-4 border-t border-gray-300 flex-shrink-0 bg-white ">
    <form
        onSubmit={handleCommentSubmit}
        className="flex flex-col gap-3"
    >
        <textarea
            value={comment}
            onChange={(e) => setComment(e.target.value)}
            placeholder="Write your comment here..."
            className="p-2 border rounded-lg bg-white text-black resize-none max-h-32"
            rows={3}
            required
        />
        <button
            type="submit"
            disabled={isSubmitting}
            className="w-full p-2 bg-smccprimary hover:bg-blue-700 text-white rounded-lg flex items-center justify-center
        >
            {isSubmitting ? 'Submitting...' : 'Submit'}
        </button>
    </form>
</div>
```

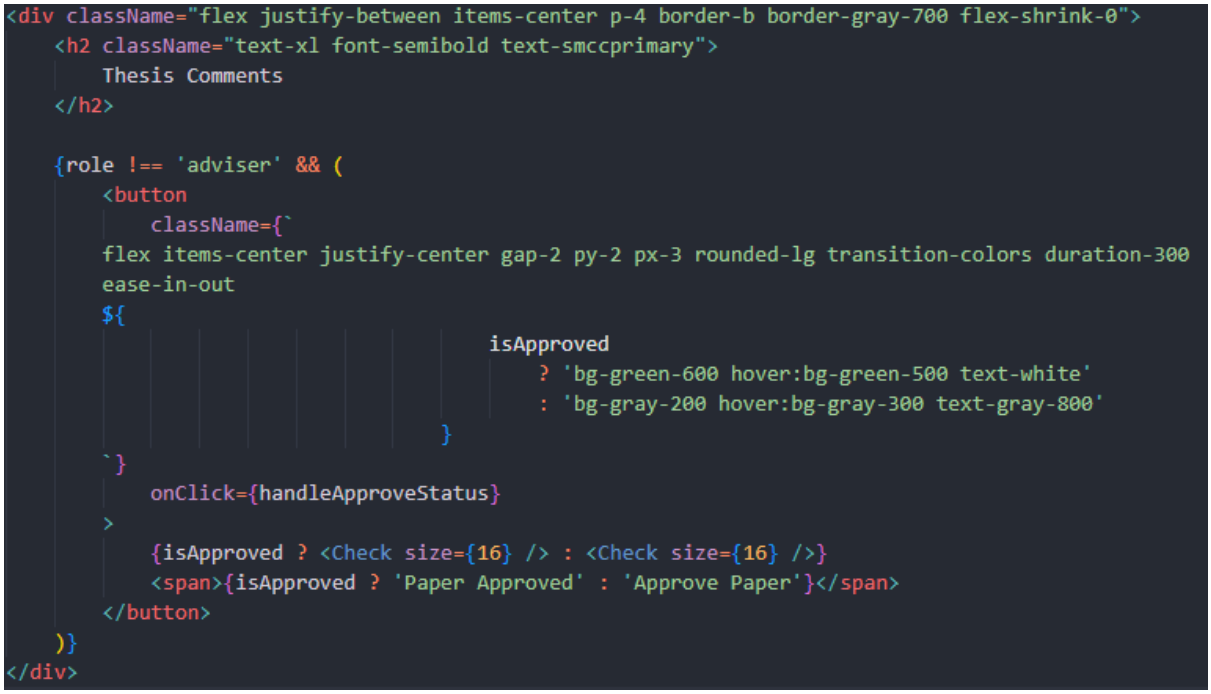
Figure # Code Snippet (Query) for Comment of Panel

Figure # This React component creates a comment form with a styled text area and a dynamic submit button.

```
<Modal
    isOpen={!!selectedComment}
    onClose={() => setSelectedComment(null)}
    className="w-full sm:w-[90%] md:w-[80%] lg:w-[70%] xl:w-[60%] max-w-4xl mx-auto"
>
    <div className="flex flex-col h-[70vh] max-h-[70vh]">
        <h3 className="text-lg font-bold mb-4 py-2 border-b border-gray-700">
            <span className="font-semibold">
                {selectedComment.position?.label ||
                    selectedComment.name}
            </span>
        </h3>
        <div className="flex-grow overflow-y-auto px-2 py-4">
            <p className="whitespace-pre-wrap break-words text-base leading-relaxed">
                {selectedComment.comment}
            </p>
        </div>
        <div className="mt-4 pt-2 border-t border-gray-700">
            <button
                onClick={() => setSelectedComment(null)}
                className="w-full p-3 bg-blue-500 hover:bg-blue-600 text-white rounded-lg
                transition-colors duration-300 ease-in-out"
            >
                Close
            </button>
        </div>
    </div>
</Modal>
```

Figure # Comment

Figure # This code is for maximizing the comments of the panel and adviser.



```
<div className="flex justify-between items-center p-4 border-b border-gray-700 flex-shrink-0">
    <h2 className="text-xl font-semibold text-smccprimary">
        Thesis Comments
    </h2>

    {role !== 'adviser' && (
        <button
            className={`
        flex items-center justify-center gap-2 py-2 px-3 rounded-lg transition-colors duration-300
        ease-in-out
        ${
                                    isApproved
                                        ? 'bg-green-600 hover:bg-green-500 text-white'
                                        : 'bg-gray-200 hover:bg-gray-300 text-gray-800'
                                }
        `}
            onClick={handleApproveStatus}
        >
            {isApproved ? <Check size={16} /> : <Check size={16} />}
            <span>{isApproved ? 'Paper Approved' : 'Approve Paper'}</span>
        </button>
    )}
</div>
```

Figure # Comment

Figure # This code is for approving the file if the panel is done commenting.

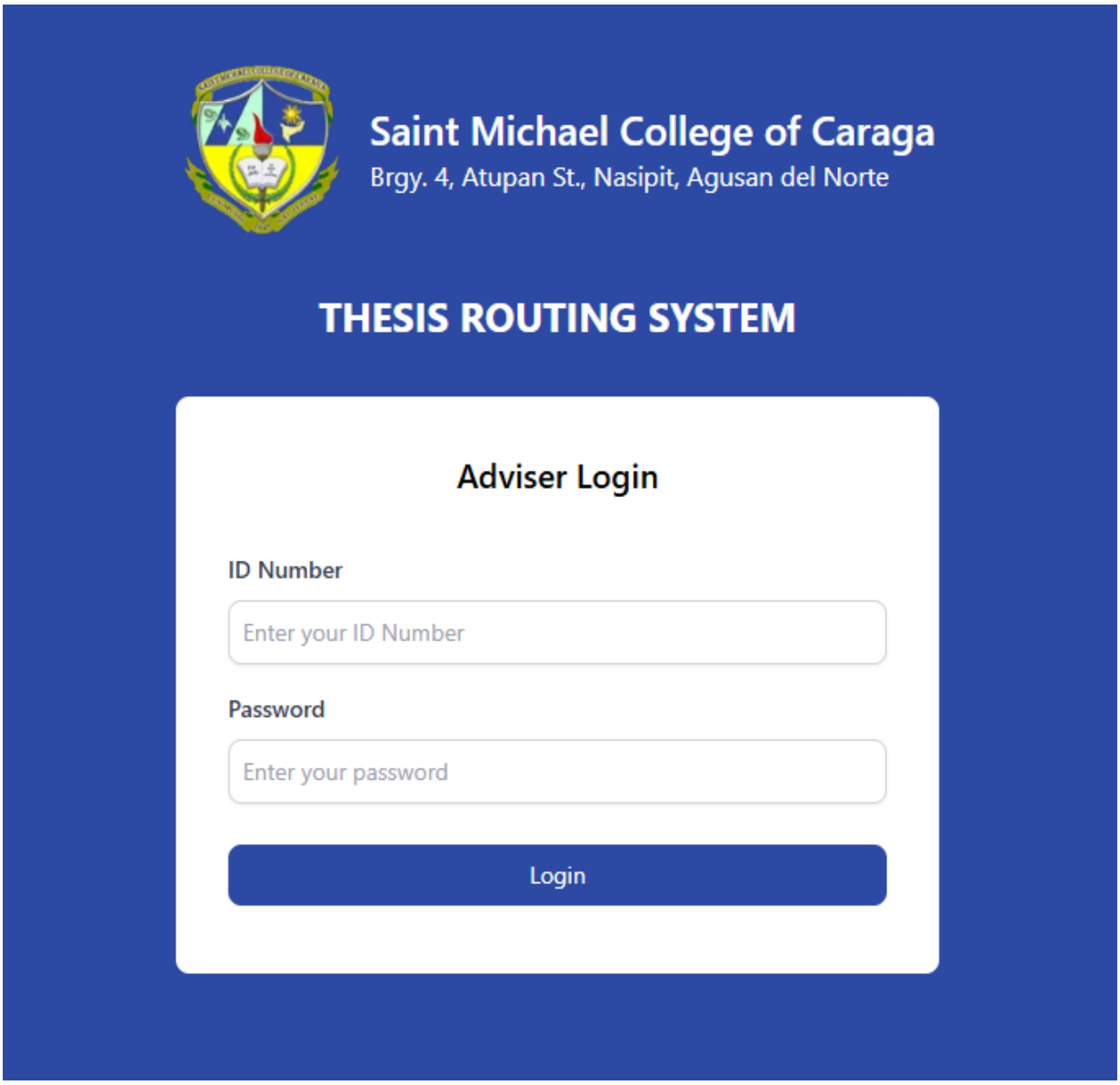


Figure #. Login Page - Adviser

Figure # This UI is for Adviser Login Input ID Number, And Password

```
    <div className="flex flex-col justify-center bg-white w-[90%] md:w-[60%] lg:w-[40%] rounded-lg mx-auto p-8">
        <h1 className="text-center font-semibold text-xl mb-8">
            Adviser Login
        </h1>
        <TRSInput
            label={'ID Number'}
            placeholder={'Enter your ID Number'}
            value={idnumber}
            onChange={(e) => setIdnumber(e.target.value)}
        />
        <TRSInput
            label={'Password'}
            placeholder={'Enter your password'}
            value={password}
            onChange={(e) => setPassword(e.target.value)}
            type="password"
        />
        <TRSButton
            label={`${loginLoading ? 'Logging in...' : 'Login'}`}
            onClick={handleLogin}
        />
    </div>
</div>
```

Figure #. Code Snippet for Adviser

Figure # The code is a React-based login form for advisers, featuring a styled container, a heading, input fields for ID number and password, and a login button. It includes state management for user input and a dynamic button label that change's based on the login process.

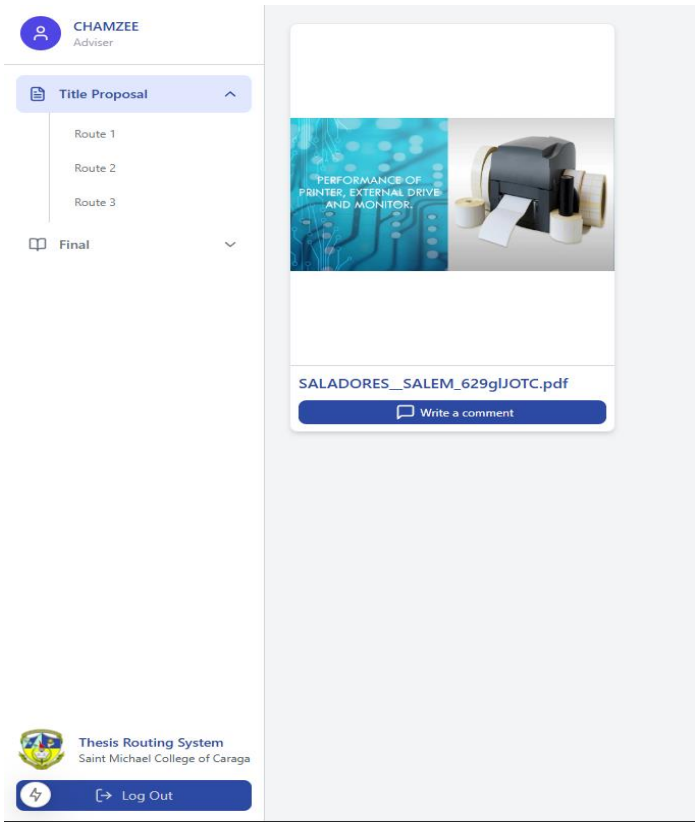


Figure #. Document Submitted

Figure # The adviser receives the students' submitted documents, reviews them, writes comments, and the students and panels can view the feedback on their side.

```
<div className="  flex flex-col justify-center md:items-start">
    {loading ? (
        <div className="flex justify-center w-full items-center h-40">
            <div className="w-10 h-10 border-4 border-gray-300 border-t-blue-500 rounded-full animate-spin"></div>
        </div>
    ) : (
        <div className="w-full flex flex-wrap gap-4 justify-center md:justify-start">
            {theses.length > 0 ? (
                theses.map((thesis) => (
                    <PanelAdFileCard
                        key={thesis.id}
                        role={'adviser'}
                        paperId={thesis.id}
                        pdfUrl={thesis.fileUrl}
                    />
                ))
            ) : (
                <p className="text-gray-500 text-center">No thesis papers found.</p>
            )}
        </div>
    )}
</div>
```

Figure #. Code Snippet for Managing and Displaying Thesis Papers

Figure # This code is managing and displaying a list of thesis papers for an adviser, showing a loading spinner while fetching data, rendering thesis files if available, and displaying a message if no papers are found.

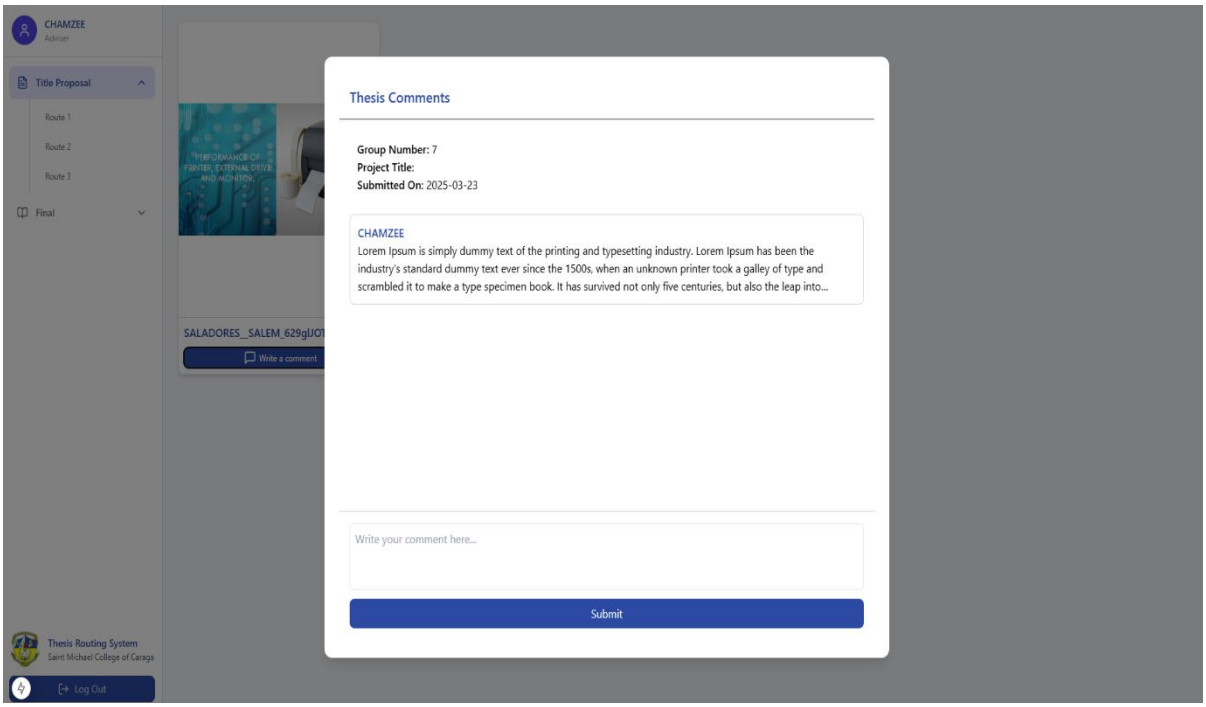


Figure #. for Adviser Comment

Figure # The adviser reviews and provides feedback on a submitted thesis. It includes thesis details (Group Number, Project Title, and Submission Date), adviser comments, and a text box for adding new comments with a submit button.

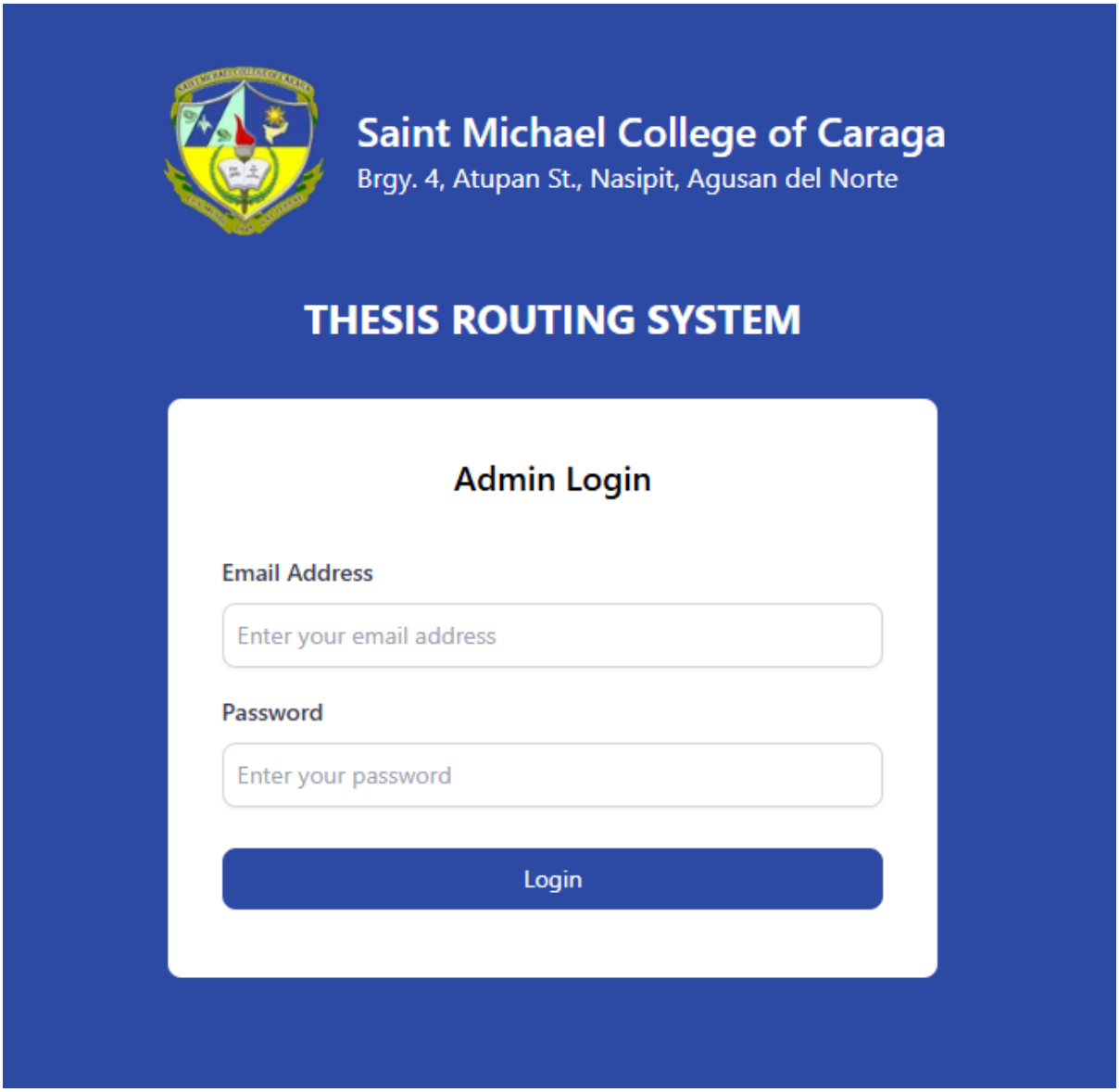


Figure #. Login Page - Admin

Figure # This UI is for Admin Login Input Email Address, And Password

```
    <div className="flex flex-col justify-center bg-white w-[90%] md:w-[60%] lg:w-[40%] rounded-lg mx-auto p-8">
        <h1 className="text-center font-semibold text-xl mb-8">Admin Login</h1>
        <TRSInput
            label={'Email Address'}
            placeholder={'Enter your email address'}
            value={email}
            onChange={(e) => setEmail(e.target.value)}
        />
        <TRSInput
            label={'Password'}
            placeholder={'Enter your password'}
            value={password}
            onChange={(e) => setPassword(e.target.value)}
            type="password"
        />
        <TRSButton
            label={`${loginLoading ? 'Logging in...' : 'Login'}`}
            onClick={handleLogin}
        />
    </div>
</div>
```

Figure #. Code Snippet for Admin

Figure # This code defines a login form for an Admin, including a heading, input fields for email and password, and a button.

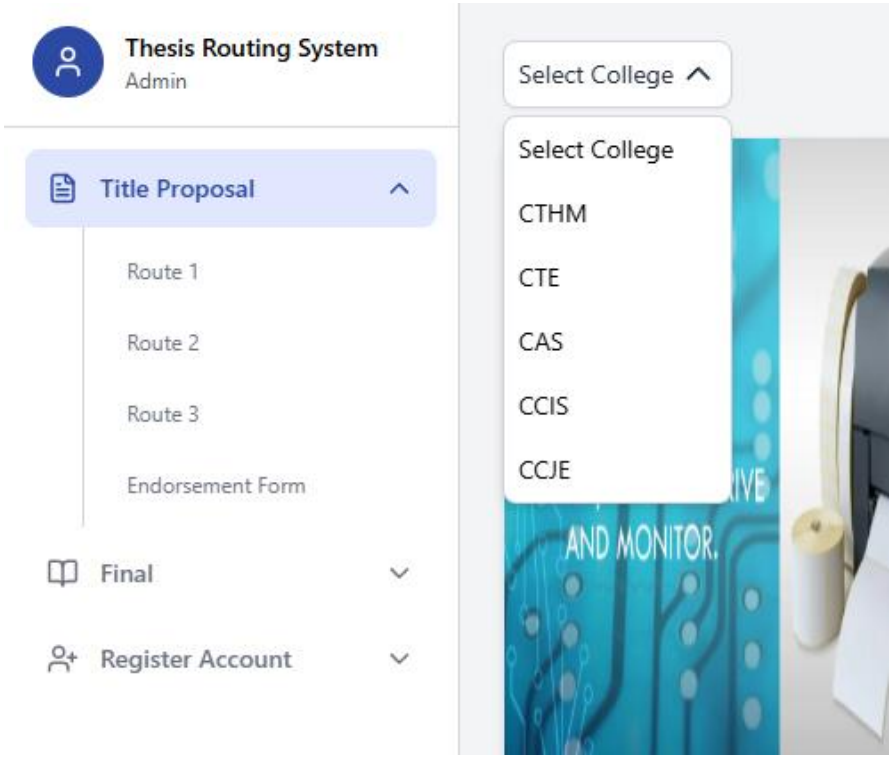


Figure #. Course Selection

Figure # The admin can select different colleges from a dropdown menu to view students' submitted documents.

```
const Page = () => {
    const { theses, loading, getAllThesis, filterPapers } = useThesisStore((state) => state);
    const [selectedCollege, setSelectedCollege] = useState('');

    const getThesisPapers = useCallback(async () => {
        selectedCollege.label === 'Select College' || selectedCollege === '' ?
          await getAllThesis()
          :
          await filterPapers(selectedCollege.label);
      }, [getAllThesis, filterPapers, selectedCollege]);

    const colleges = [
        { value: 'Select College', label: 'Select College' },
        { value: 'CTHM', label: 'CTHM' },
        { value: 'CTE', label: 'CTE' },
        { value: 'CAS', label: 'CAS' },
        { value: 'CCIS', label: 'CCIS' },
        { value: 'CCJE', label: 'CCJE' },
    ];


    useEffect(() => {
        getThesisPapers();
    }, [getThesisPapers, selectedCollege]);

    return (
        <div className="flex flex-col justify-center md:items-start">
            <TRSDropdown
                options={colleges}
                onSelect={setSelectedCollege}
                innerLabel={'Select College'}
            />
```

Figure #. Code Snippet for Course Selection

Figure # This Code allows an Admin to select a college from a dropdown menu. It retrieves thesis papers based on the selected college. If no specific college is selected, it fetches all thesis papers; otherwise, it filters them according to the chosen college. The dropdown displays a list of college options and updates the selection when the Admin makes a choice.

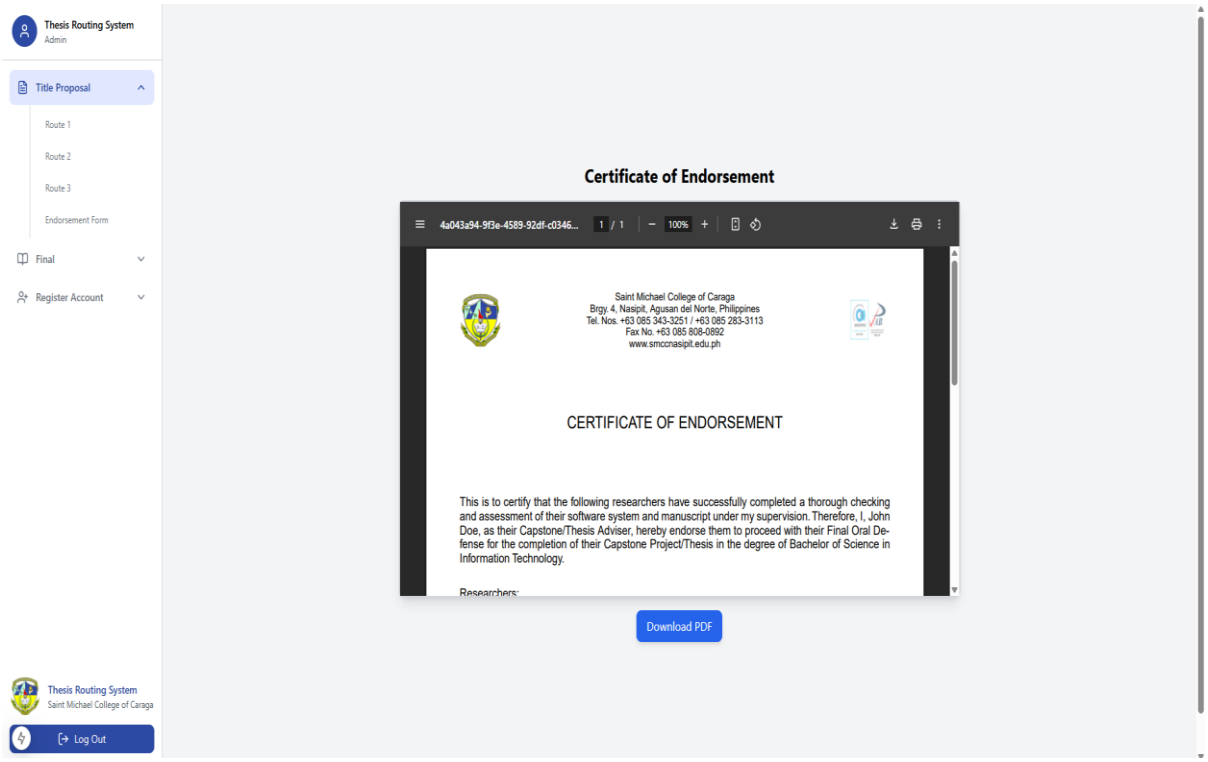


Figure #. Endorsement Form

Figure # This is a Certificate of Endorsement, which students receive after successfully completing all the required routes in the system. The admin has the ability to download the certificate as a PDF file once the process is completed.

```jsx
const CertificateOfEndorsement = ({ date = '', adviserName = 'Unknown Adviser', studentNames = [] }) => {

  return (
    <Document>
      <Page size="A4" style={styles.page}>
        {/* Header with Left and Right Logos */}
        <View style={styles.header}>
          <Image src={leftLogo} style={styles.logo} />

          <View style={styles.headerTextContainer}>
            <Text style={styles.headerText}>Saint Michael College of Caraga</Text>
            <Text style={styles.headerText}>Brgy. 4, Nasipit, Agusan del Norte, Philippines</Text>
            <Text style={styles.headerText}>Tel. Nos. +63 085 343-3251 / +63 085 283-3113</Text>
            <Text style={styles.headerText}>Fax No. +63 085 808-0892</Text>
            <Text style={styles.headerText}>www.smccnasipit.edu.ph</Text>
          </View>

          <Image src={rightLogo} style={styles.logo} />
        </View>

        <Text style={styles.title}>CERTIFICATE OF ENDORSEMENT</Text>

        <View style={styles.section}>
          <Text>
            This is to certify that the following researchers have successfully
            completed a thorough checking and assessment of their software system
            and manuscript under my supervision. Therefore, I, {adviserName}, as their
            Capstone/Thesis Adviser, hereby endorse them to proceed with their
            Final Oral Defense for the completion of their Capstone Project/Thesis
            in the degree of Bachelor of Science in Information Technology.
          </Text>
        </View>
        <View style={[styles.section, { flexDirection: "column", alignItems: "flex-start" }]}>
          <Text>Researchers:</Text>
          <View style={{ marginTop: 10 }}>
            {studentNames.length > 0 ? (
              studentNames.map((name, index) => (
                <Text key={index} style={{ marginBottom: 5 }}>
                  {index + 1}. {name}
                </Text>
              ))
            ) : (
              <Text>No researchers found.</Text>
            )}
          </View>
        </View>
```

```
        <View style={styles.section}>
          <Text>
            Their project/thesis has met the required standards and criteria set
            forth by the College of Computing and Information Sciences, and I am
            confident in the quality and academic rigor of their work.
          </Text>
        </View>

        <View style={styles.signatureSection}>
          <View style={{ marginBottom: 10 }}>
            <Text>Endorsed by:</Text>
            <Text
              style={{
                borderBottomWidth: 1,
                borderBottomColor: "black",
                textAlign: "center",
                marginTop: 7,
                width: "auto", // Allow dynamic width
                minWidth: 80, // Set a minimum width to avoid very short underlines
                alignSelf: "flex-start", // Align dynamically
              }}
            >
              {adviserName}
            </Text>
          </View>


          <Text>Capstone Adviser</Text>
          <Text>{date}</Text>
        </View>

        <View style={styles.signature}>
          <Text>Approved by:</Text>
          <Text>MARLON JUHN M. TIMOGAN, MIT</Text>
          <Text>Capstone Project/Thesis Instructor</Text>
          <Text>{date}</Text>
        </View>
      </Page>
    </Document>
  );
};

export default CertificateOfEndorsement;
```

Figure #. Code Snippet for Endorsement Form

Figure # The code generates a Certificate of Endorsement for students who complete the thesis process. It includes the college name, contact details, student names, adviser's endorsement, and approval by the Capstone Instructor. The document follows an A4 format

with a header, sections for verification, and signatures. It dynamically displays student names and ensures proper authorization.

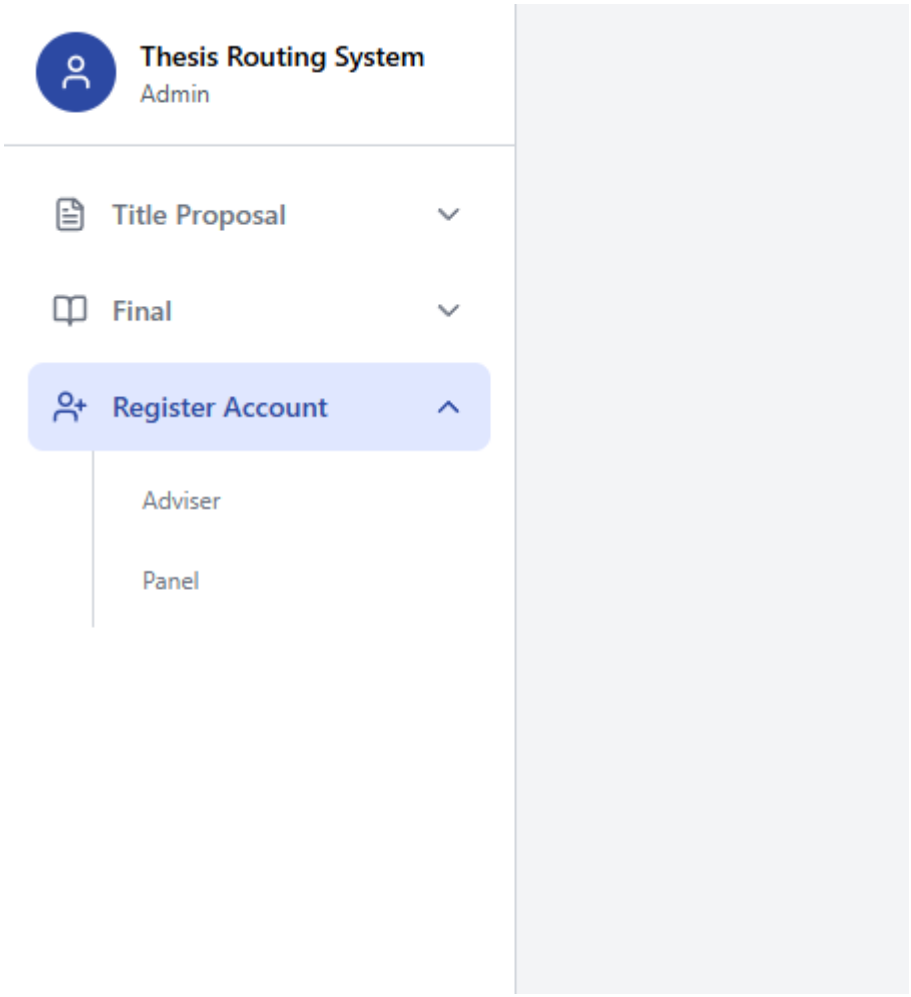


Figure #. Register Accounts

Figure # The Register Account section allows the admin to create accounts for advisers and panel members.

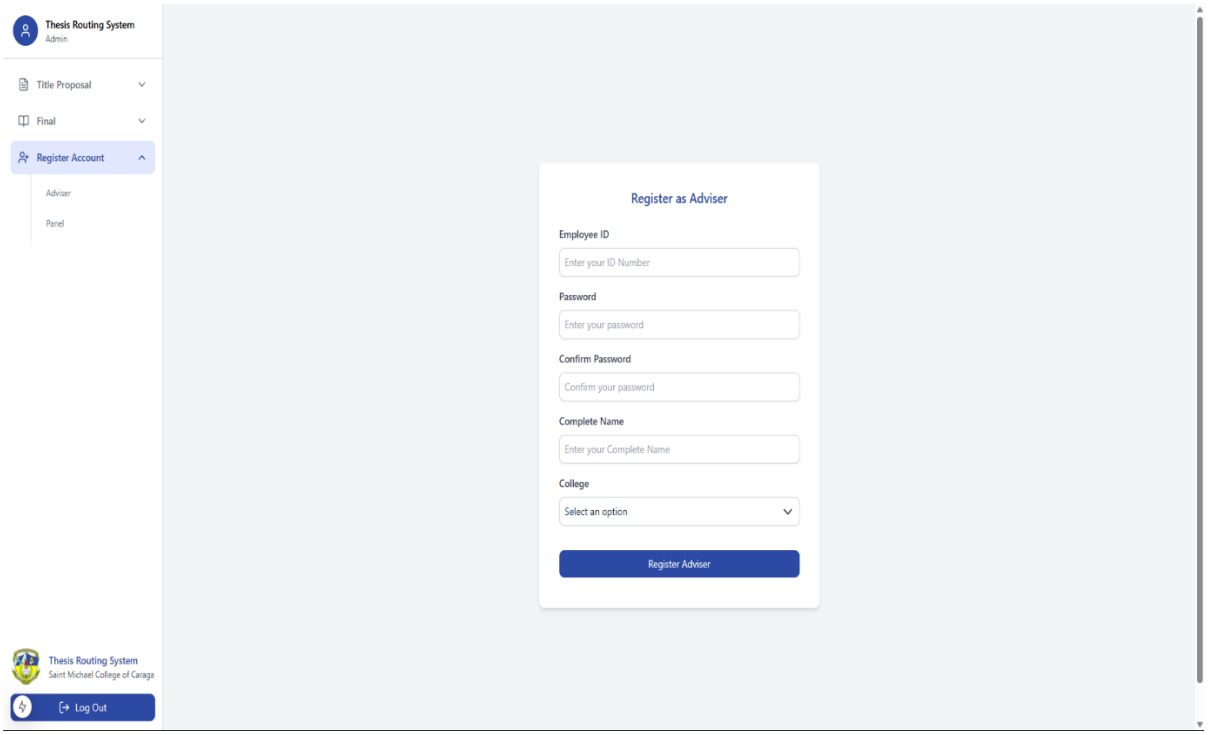


Figure #. Adviser Registration

Figure # The Adviser Registration page allows the admin to create an adviser account by entering details such as Employee ID, Password, Confirm Password, Full Name, and the College they are affiliated with, which oversees their assigned courses.

```jsx
<div className="flex items-center justify-center min-h-screen p-4">
    <div className="bg-white shadow-md rounded-lg w-full max-w-md p-8">
        <h1 className="text-lg font-semibold text-center text-smccprimary mb-6">
            Register as Adviser
        </h1>

        <div className="space-y-4">
            <TRSInput
                label="Employee ID"
                placeholder="Enter your ID Number"
                value={idnumber}
                onChange={(e) => setIdnumber(e.target.value)}
            />
            <TRSInput
                label="Password"
                placeholder="Enter your password"
                value={password}
                onChange={(e) => setPassword(e.target.value)}
                type="password"
            />
            <TRSInput
                label="Confirm Password"
                placeholder="Confirm your password"
                value={confirmPassword}
                onChange={(e) => setConfirmPassword(e.target.value)}
                type="password"
            />
            <TRSInput
                label="Complete Name"
                placeholder="Enter your Complete Name"
                value={name}
                onChange={(e) => setName(e.target.value)}
            />
            <TRSDropdown
                label="College"
                options={departmentOptions}
                onSelect={setDepartment}
                value={department} // Ensure the value is controlled
            />
        </div>

        <div className="mt-6 text-center">
            <TRSButton
                label={`${registerLoading ? 'Loading...' : 'Register Adviser'}`}
                onClick={handleRegister}
                className="w-full bg-smccprimary text-white py-2 rounded-lg hover:bg-blue-700 transition hover:shadow-lg"
            />
        </div>
    </div>
```

Figure #. Code Snippet for Adviser Registration

Figure # The code represents a form for Registering.an adviser. It includes input fields for Employee ID, Password, Confirm Password, Full Name, and a dropdown for selecting the

College. The form uses state management to handle input changes and includes a submit button that dynamically updates based on the registration process.

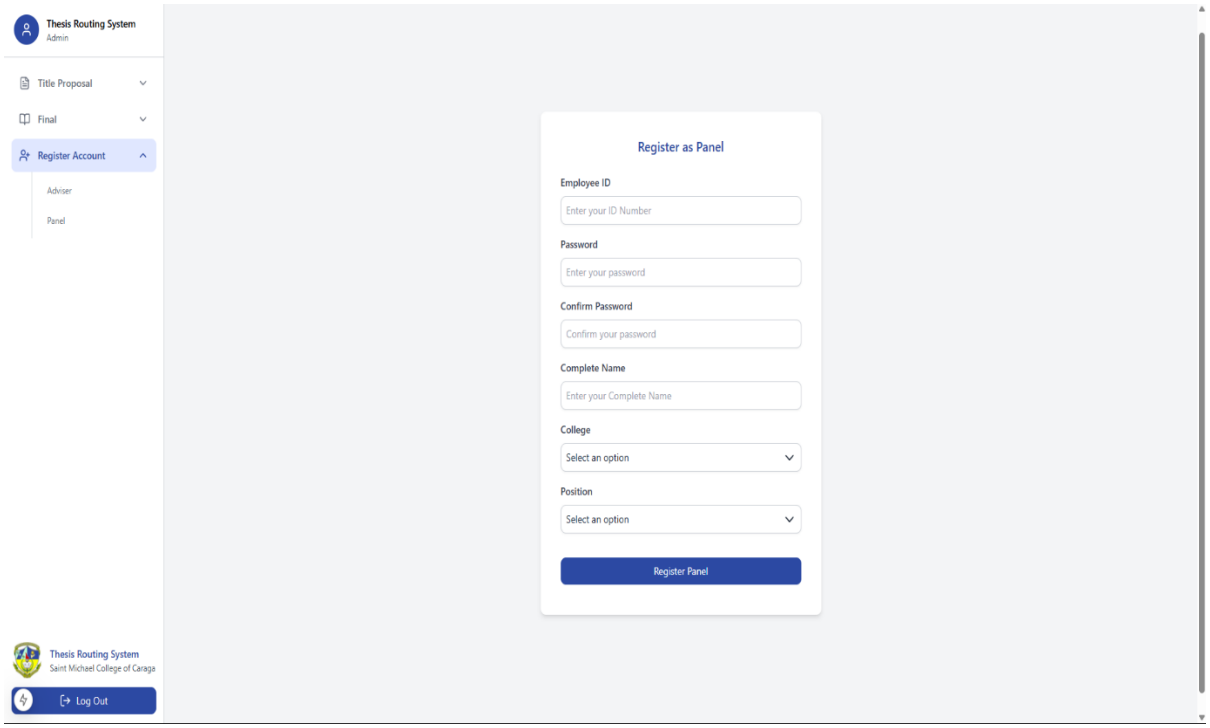


Figure #. Panel Registration

Figure # The admin can register a panel member by providing the Employee ID, Password, Confirm Password, Complete Name, and selecting the College and position from dropdown menus. The registration is completed by clicking the Register Panel button.

```jsx
<div className="flex items-center justify-center min-h-screen p-4">
    <div className="bg-white shadow-md rounded-lg w-full max-w-md p-8">
        <h1 className="text-lg font-semibold text-center text-smccprimary mb-6">
            Register as Panel
        </h1>
        <TRSInput
            label="Employee ID"
            placeholder="Enter your ID Number"
            value={idnumber}
            onChange={(e) => setIdnumber(e.target.value)}
        />
        <TRSInput
            label="Password"
            placeholder="Enter your password"
            value={password}
            onChange={(e) => setPassword(e.target.value)}
            type="password"
        />
        <TRSInput
            label="Confirm Password"
            placeholder="Confirm your password"
            value={confirmPassword}
            onChange={(e) => setConfirmPassword(e.target.value)}
            type="password"
        />
        <TRSInput
            label="Complete Name"
            placeholder="Enter your Complete Name"
            value={name}
            onChange={(e) => setName(e.target.value)}
        />
        <TRSDropdown
            label="College"
            options={departmentOptions}
            onSelect={setDepartment}
            value={department}
        />{' '}
        {/* Ensure the value is controlled */}
        <TRSDropdown
            label="Position"
            options={positionOptions}
            onSelect={setPosition}
            value={position}
        />{' '}
        {/* Ensure the value is controlled */}
        <div className="mt-6 text-center">
            <TRSButton
                label={`${registerLoading ? 'Loading...' : 'Register Panel'}`}
                onClick={handleRegister}
```

Figure #. Code Snippet for Panel Registration

Figure # This code is a Panel Registration Form. It includes input fields for Employee ID, Password, Confirm Password, Complete Name, College, and Position. The form dynamically

updates the state when values are entered. A register button is provided to handle the panel registration process, with a loading state to indicate progress.

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATION

SUMMARY OF FINDINGS

Based on the testing process conducted, the Thesis Routing System for Saint Michael College of Caraga was evaluated for its accuracy, functionality, and overall performance using a survey instrument adapted from the ISO 25010 Software Product Quality Standards. The evaluation focused on three major aspects: functional suitability, performance efficiency, and usability.

The results of the evaluation affirm that the system is "Very Functional" with a mean score of 3.25. This suggests that it effectively satisfies the specific tasks and objectives required for its implementation. It also scored well in functional completeness, correctness and appropriateness to ensure that users are given precise results and a smooth operation of the system.

In terms of performance efficiency, the system was rated as "Very Efficient" with a mean score of 3.25. It performed well regarding time behavior and resource use, showing its ability to respond quickly to requests while using system resources effectively. Capacity management could be improved to maintain optimal performance levels during periods of heavy usage.

Overall, the system was rated "Strongly Acceptable" with a grand mean of 3.50. which means that it is highly acceptable to users and performs well in meeting their needs in terms of functionality, performance efficiency, and usability. The system shows strong performance in major areas like functional completeness, time behavior, resource usage, and ease of use, and also offers a user-friendly experience.

CONCLUSION

In conclusion, the system has excellent functional suitability with its attributes accomplishing the assigned tasks and user goals. The system gives proper results, accomplishes all needed functions, and supports task realization efficiently. But there is a scope to extend its functional completeness and suitability in order to more closely align itself with user needs.

RECOMMENDATION

To further enhance the system's effectiveness and overall user experience, the following recommendations are suggested:

1. **Improve Missing Functionalities:** Implementing a list format for viewing documents and adding features like page numbers and comment location will support better navigation and ease of use, making the system more efficient for users when reviewing documents.

2. **Enhance Panel Connection:** Allowing direct connections on the paper/file instead of relying solely on the "commenting" feature will support clearer interaction between the panel and the paper, improving user understanding and reducing confusion.

3. **Enhance Department Separation:** Separating the CTHM and CBM departments and adding announcements will support better organization, ensuring users can easily navigate the system and access relevant information for each department, enhancing overall usability.

By implementing these recommendations, the system can maximize its efficiency, usability, and overall user experience, making the operations smoother, interactions clearer, and organization improved. This will enhance the sustainability and long-term effectiveness of the system, allowing it to be more reliable and user-friendly to all stakeholders.

REFERENCES

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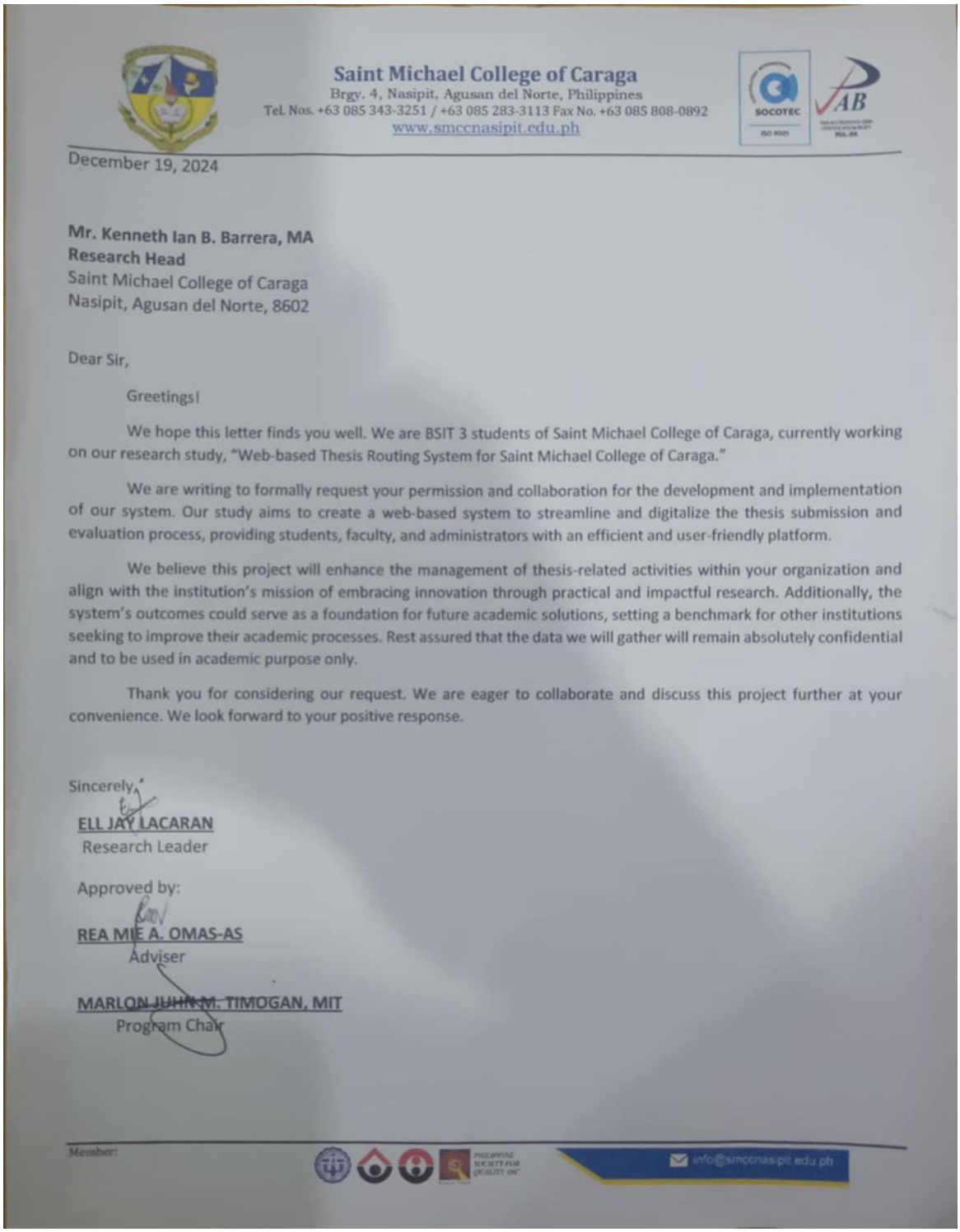
APPENDICES

A. System Source Code

B. User's Manual

C. Letter of Permission



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December 19, 2024

Mr. Kenneth Ian B. Barrera, MA
Research Head
Saint Michael College of Caraga
Nasipit, Agusan del Norte, 8602

Dear Sir,

Greetings!

We hope this letter finds you well. We are BSIT 3 students of Saint Michael College of Caraga, currently working on our research study, "Web-based Thesis Routing System for Saint Michael College of Caraga."

We are writing to formally request your permission and collaboration for the development and implementation of our system. Our study aims to create a web-based system to streamline and digitalize the thesis submission and evaluation process, providing students, faculty, and administrators with an efficient and user-friendly platform.

We believe this project will enhance the management of thesis-related activities within your organization and align with the institution's mission of embracing innovation through practical and impactful research. Additionally, the system's outcomes could serve as a foundation for future academic solutions, setting a benchmark for other institutions seeking to improve their academic processes. Rest assured that the data we will gather will remain absolutely confidential and to be used in academic purpose only.

Thank you for considering our request. We are eager to collaborate and discuss this project further at your convenience. We look forward to your positive response.

Sincerely,

ELL JAY LACARAN
Research Leader

Approved by:

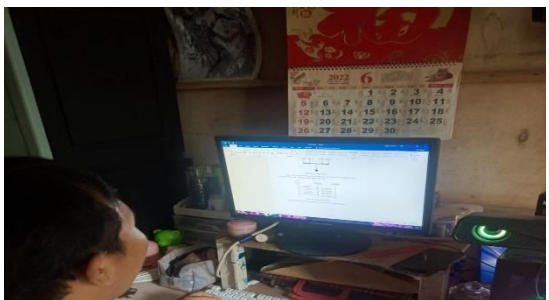
REA MIE A. OMAS-AS
Adviser

MARLON JUHN M. TIMOGAN, MIT
Program Chair

Member:

info@smccnasipit.edu.ph

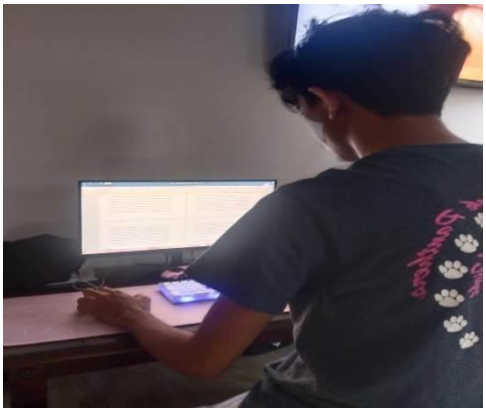
D. Documented Undertaking



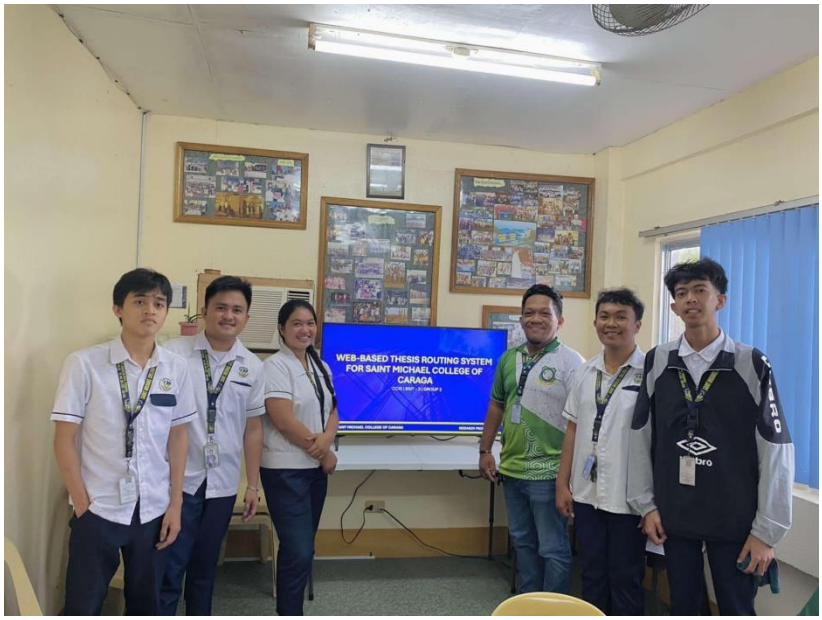
Creating a detailed document that encompasses

Chapters 1 through 3. Creating a comprehensive Gantt chart

During Title Hearing



Creating Document for Chapter 1 - 3

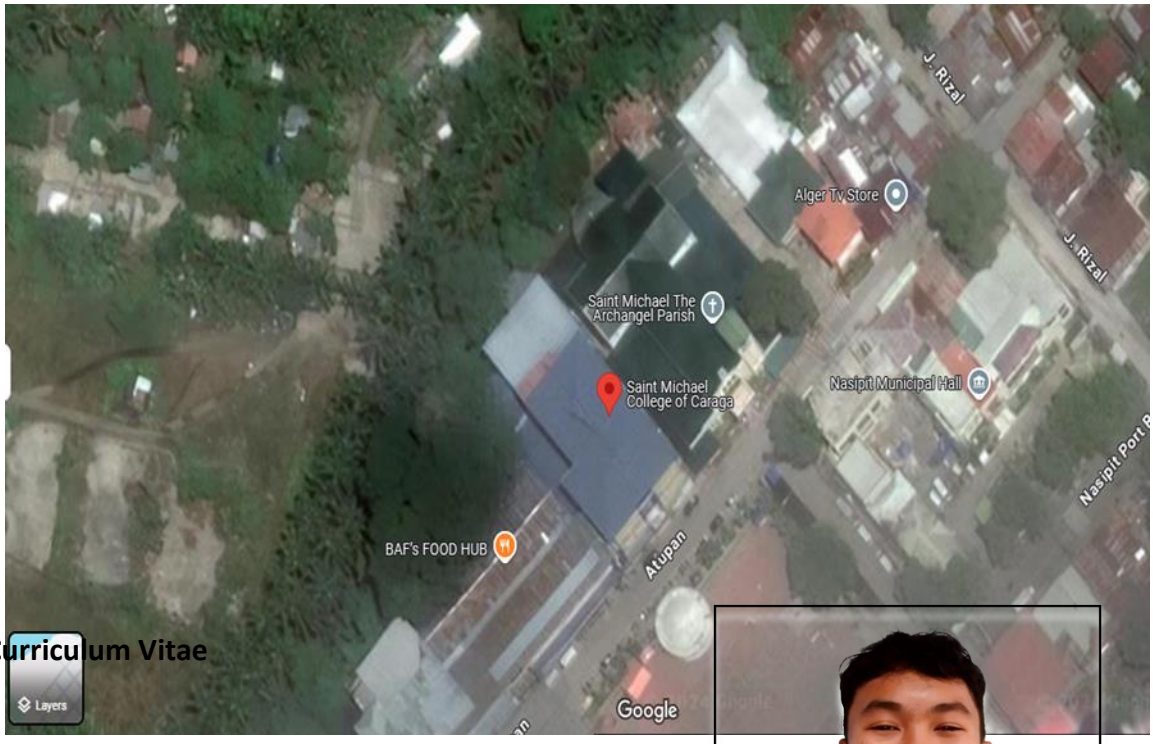


This moment marks the significant occasion when we presented our title proposal

E. Certificate of Implementation

F. Research Locale

SAINT MICHAEL COLLEGE OF CARAGA



G. Curriculum Vitae

Name : Ell jay Lacaran

Address : D-3 Camagong Nasipit, ADN

Contact No. : 09453391491

Email : Elljay_lacaran@smccnasipit.edu.ph

Personal Details

Date of Birth : July 21, 2003

Gender : Male

Civil Status : Single

Age : 21

Citizenship : Filipino

Educational Background

Elementary : Camagong Elementary School

Junior High School : Saint Michael College of Caraga

Junior High School : Saint Michael College of Caraga

Skills

- Video Editing
- Photo Editing
- Programming

Membership School Organization

- N/A

G. Curriculum Vitae

Name : Jake Castillon

Address : Address Poblacion 4, Nasipit, ADN

Contact No. : 09275334409

Email : jake_castillon@smccnasipit.edu.ph

Personal Details

Date of Birth : February 4, 2002

Gender : Male

Civil Status : Single

Age : 22

Citizenship : Filipino

Educational Background

Elementary : Siquijor Elementary School

Junior High School : Siquijor National High School

Junior High School : Toledo National High School

Skills

- Graphic Design

Membership School Organization

- N/A

G. Curriculum Vitae

Name : Jenessa Suazo Ocay

Address : Gumabon Magsaysay Misamis Oriental

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Personal Details

Date of Birth : September 30,2002

Gender : Female

Civil Status : Single

Age : 22

Citizenship : Filipino

Educational Background

Elementary : Gumabon Elementary school

Junior High School : Consuelo National Highschool

Junior High School : Consuelo National Highschool

Skills

- Basic web Development

Membership School Organization

- N/A

G. Curriculum Vitae

Name : John Lester Saladores

Address : District 6 Punta Nasipit ADN

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Personal Details

Date of Birth : September 14 2003

Gender : Male

Civil Status : Single

Age : 21

Citizenship : Filipino

Educational Background

Elementary : Punta Elementary School

Junior High School : Saint Michael College of Caraga

Junior High School : Saint Michael College of Caraga

Skills

- Digital Art

Membership School Organization

- N/A

G. Curriculum Vitae

Name : Rylvin Celnar D. Tiempo

Address : Culit, Nasipit Agusan Del Norte

Contact No. : 09758026676

Email : rylvincelnar_tiempo@smccnasipit.edu.ph

Personal Details

Date of Birth : December 07, 2002

Gender : Male

Civil Status : Single

Age : 22

Citizenship : Filipino

Educational Background

Elementary : Culit elementary school

Junior High School : Culit National High school

Junior High School : Culit National high school

Skills

- Microsoft Office Suite

Membership School Organization

- N/A