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"REGATE: ENHANCING INTERACTION AND EDUCATIONAL RESOURCES AT COLEGIO DE MONTALBAN"

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CHAPTER I

THE PROJECT AND ITS BACKGROUND

Introduction

In the contemporary digital era, technology permeates every facet of our lives, offering advanced capabilities akin to personal computers. Its seamless integration into daily activities delivers unmatched convenience, mobility, and entertainment. At educational institutions like Colegio de Montalban, modern technology profoundly impacts students' experiences. From enhancing learning processes to fostering stronger teacher-student connections, technology has become an essential tool for academic engagement and success.

A school portal is vital for fostering seamless communication among students, teachers, and administrators by serving as a centralized hub for updates, academic resources, and notifications. It enhances students' access to essential academic information like grades and schedules while supporting their overall growth with features such as career guidance and scholarship opportunities. For administrators, the portal streamlines operational tasks, ensuring efficiency and effective management. By offering tailored, role-specific access, it provides a user-centric experience that meets the diverse needs of its stakeholders, making it an indispensable tool in modern education (Ghosh A., 2024).

According to Vidyalaya (2024), a school portal functions as a secure web interface that allows its users access to a different range of academic and learning resources. Users must provide login credentials, such as a user ID and password, verified through an authentication process to ensure secure access. This dynamic system fosters an engaging digital learning environment while addressing critical concerns like data security and privacy. The school portal ensures authorized users can access its features. Furthermore, a school management portal is designed not just for

students but also for other stakeholders, including teachers, facilitators, and administrators. It facilitates effective communication among all parties and acts as a centralized hub for updates, such as notices, news, forms, and real-time notifications. By offering distinct logins tailored to each user role, the portal ensures that content and functionality are customized to meet the specific needs of its diverse user base.

Education acts as a cornerstone for personal and community development. In the digital age, portals have become crucial tools for fostering communication and providing access to educational resources. These platforms centralize essential functions such as enrollment, school announcements, and library services, simplifying processes for students, teachers, and administrators. Enhancing interaction and improving educational resources at Colegio de Montalban is essential for cultivating a more efficient and engaging academic environment (Krishna and Sakthivel, 2022)

This project addresses the existing gaps in school portals, particularly the lack of advanced features necessary for seamless operation. Improving these systems can lead to better collaboration, enhanced communication, and educational experiences. By addressing the limitation of the previous system, this project aims to create a portal that not only supports administrative tasks but also enhances learning outcomes.

Research highlights the importance of dynamic and interactive portals that feature tools like real-time notifications and personalized dashboards. Studies have shown that well-developed portals can boost academic performance and user satisfaction, emphasizing the need for a new system that fosters better interaction for all users (Adeyemi & Issa, 2020). The current portal lacks the essential features required for a fully interactive and resource-rich platform. It also falls short of providing adequate collaboration tools and limited access to educational resources. These gaps

impede effective communication and reduce the school portal's usability, creating barriers to meeting its objectives.

The project focuses on addressing the limitations of the current school portal, which falls short of meeting the increasing demands for functionality, user experience, and efficient communication. By recognizing these lacking functionalities, the project aims to create a dynamic web application that facilitates seamless interaction among students, faculty, and administrators. The new school management portal system will provide a comprehensive solution with enhanced access to academic resources, improved collaboration tools, and a user-centered design that promotes engagement. Ultimately, this project seeks to bridge the gap between outdated systems and the evolving needs of educational institutions, fostering a more effective and supportive digital learning environment.

The project developers began by recognizing the growing need for an efficient, reliable, and user-friendly dynamic web application school portal management system. Thus, the project developers developed reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban. This dynamic web application includes various features such as dedicated portals for students, instructors, and administrators, alongside subsystems that provide robust functionality for academic and resource access, all centralized within the platform.

reGate enables administrators to manage tasks efficiently, including overseeing the homepage, news updates, and announcements, as well as handling student document request forms, which helps reduce administrative workload. For students and instructors, their portals include dashboards where they can view their profiles, grades (for students), and schedules. This streamlined system allows students and instructors to access current schedules and room assignments conveniently through a centralized interface.

The system, reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban, is an innovative solution aimed at overcoming the limitations of the current school portal. Traditional school portals often suffer from outdated interfaces, limited interactivity, and a lack of personalized user experiences, making them less effective in meeting the needs of students, instructors, and administrators. Manual administrative processes, including document requests, are time-consuming and prone to errors, leading to inefficiencies and added workload. The project system addresses these challenges by providing a dynamic, user-friendly web application with tailored dashboards, centralized communication tools, and streamlined administrative functions. With reGate, users can access academic resources, view their schedules, and student's grades, and handle document requests efficiently, enhancing overall interaction and productivity within the educational environment.

The renovation of the gateway, therefore, is a strategic step aimed at modernizing the school portal to meet the needs of a digital-first education environment. Thus, the project developers aim to improve the current school portal to transform it into a more convenient, efficient, and interactive platform that enhances the overall user experience. By integrating modern features and streamlined processes, the upgraded portal will provide users—students, instructors, and administrators—with a more engaging and efficient system.

This renovation will focus on features such as improved communication tools, user-friendly interfaces, and centralized access to academic resources, and enhanced functionalities for better interaction. The goal is to create a seamless experience that meets the evolving needs of the school community, making it easier for users to navigate, access essential information, and collaborate effectively. The enhanced portal will ultimately support the academic and administrative needs of Colegio de Montalban, fostering a more connected and responsive educational environment.

The dynamic web application integrates various tools and technologies, including Visual Studio Code, Figma, and MongoDB Atlas, to enhance interaction and educational resources in the development of the school portal management system. These components play a key role in improving the functionality and user experience of the dynamic web application. To build the system, project developers need expertise in school portal management, programming software, and various programming and markup languages such as JavaScript, React.js (for HTML and JavaScript), Tailwind CSS (for styling), Swiper Animation, Next.js (which includes tools like Next Response, Next Request, and Auth), bcrypt.js (for secure password hashing), HTML, CSS, PHP, and APIs such as REST API, Student API, Instructor API, Schedules API, Auth.js API (for authentication), Mongoose API (for database schema), JSON-Server (for running JSON APIs), Rechart.js (for charts), React Icons API, Thunder Client (API Tester), and Payment API (Stripe API) along with hardware integration. Developers must also ensure compliance with applicable laws and regulations, such as the Data Privacy Act of 2012 (Republic Act 10173).

Visual Studio Code was used to develop the school portal management system, while MongoDB Atlas serves as the integrated server and database solution. These components provide a user-friendly interface and real-time updates on the homepage, offering greater convenience compared to the current school portal. The new system effectively addresses issues found in the existing portal, such as outdated updates, insufficient resources, and poor resource management, thereby enhancing the overall user experience. With the growing reliance on technology in education, the school recognizes the importance of having a robust digital platform that can support effective communication, streamline processes, and improve access to academic resources.

The current school portal, while functional, falls short of meeting the evolving needs of students, instructors, and administrators due to its limited features and outdated user interface. This project seeks to address these limitations by proposing the development of a dynamic web

application, "reGate," that aims to enhance user experience, centralize essential functions, and promote greater interactivity and convenience. The renovated portal will integrate modern tools for communication, resource management, and collaboration, supporting Colegio de Montalban's goal of creating an efficient and user-friendly digital learning environment that aligns with its core values and meets the needs of all stakeholders.

Objectives of the Study

The project developers intend to develop reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban, a dynamic web application school portal management system designed for organization, convenience, efficiency, and effectiveness. Specifically, the project developers aims to:

1. create a school portal management system that focuses on simplicity, efficiency, and flexibility, enhancing interaction and resource management compared to the current system.
2. Design a system that displays the school's homepage to streamline announcements, news, updates, and other information, emphasizing a user-friendly, efficient layout to improve the end-user experience.
3. Build a digital platform that enables both instructors and students to access their portals, fostering better time management, resource allocation, and interaction.
4. Construct a student portal where students can view their dashboard, profile, grades, schedules, enrollment status, past grades, e-library, document request forms, and the student handbook.
5. Construct an instructor portal where instructors can access their dashboard, profile, schedules, and request forms.
6. Design and implement pages for enrollment, organization, administration, and the "About Us" section, providing up-to-date resources and information for all users.

7. Create a system that improves communication between deans, program heads, instructors, and students, promoting better interaction and resource sharing at Colegio de Montalban..

Significance of the Study

The development and implementation of the reGate: Enhancing Interaction and Educational Resources system at Colegio de Montalban are poised to bring significant advantages to multiple stakeholders within the educational. By creating a dynamic web application that improves resource management, communication, and access to information, this project aims to modernize the school portal system and contribute to an enriched academic and administrative environment. The proposed system promises to address current inefficiencies and provide a more streamlined, user-friendly interface, benefiting not only the students and faculty but also the broader community and future developers. The following groups will derive notable benefits from the system:

Students. Students will be the primary beneficiaries of the new system. Through the student portal, they will have direct access to their personal dashboards, grades, schedules, enrollment status, and academic resources. This system will enable students to better manage their academic journey by providing a centralized platform for grade tracking performance, accessing schedules, and keeping up-to-date with school announcements. Additionally, the system will facilitate efficient communication with instructors and administrators, thus fostering an improved learning experience.

Instructors. Instructors will benefit from the system's ability to simplify administrative tasks and enhance their teaching experience. By accessing their own portal, instructors can manage and request changes to their schedules, communicate with students, and handle course-related requests more efficiently. The system will reduce administrative burdens, allowing instructors to focus more on teaching and less on paperwork.

Administrators. School administrators will have access to a comprehensive suite of tools for managing the daily operations of the institution. From handling student enrollments and generating reports to managing announcements and overseeing academic calendars, the system will streamline a variety of administrative processes. The centralized database will provide administrators with real-time insights into student performance, faculty schedules, and other critical school data, allowing for more informed decision-making and better resource management.

Institution. The institution itself will benefit greatly from the reGate system by achieving a more organized and efficient administrative framework. The system will improve communication between all stakeholders—students, faculty, and administrators—and provide a robust platform for managing academic activities and institutional resources. By integrating various functionalities, the system will help Colegio de Montalban keep pace with technological advancements and better serve the educational needs of its students.

Community. The local community will benefit from enhanced interaction with the school, as the system will improve the transparency and accessibility of school-related information. Parents, alumni, and other community members will have greater access to school events, news updates, and academic achievements, which will strengthen the relationship between the institution and its surrounding community. Additionally, the system can serve as a model for other educational institutions in the region, promoting technological innovation in education.

Future Project Developers. The reGate system will serve as an invaluable resource for future project developers and technology professionals. By analyzing and participating in the design, implementation, and maintenance of the system, developers will gain insights into best practices for creating scalable and efficient web applications in the education sector. Moreover, they will be able to build upon the foundation laid by this project, contributing to the evolution of digital education tools in the future.

Scope and Delimitation

The project, "reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban," is envisioned as a dynamic web application school portal management system designed to address the institution's existing school portal limitations. This project focuses on developing and implementing a modern, user-friendly solution to improve communication, resource accessibility, and administrative efficiency. Conducted within Colegio de Montalban's main campus, the project spans the first semester of Academic Year 2024-2025. During this period, the system will undergo design, development, and rigorous testing to ensure functionality and usability.

The project encompasses various stakeholders, including students, instructors, and administrators. Students will benefit from features such as grade access, document requests, and schedule updates, while instructors will gain access to teaching schedules and other essential tools. Administrators will manage announcements, document requests, and system updates efficiently. These functionalities aim to create a centralized platform to streamline academic and administrative tasks, fostering an improved user experience. The project involves analyzing the current portal’s limitations, gathering user requirements, and evaluating the system's impact through surveys and testing. Key features include dedicated portals for each user group, real-time notifications, a document request subsystem, and centralized access to resources. The project's scope also includes assessing user satisfaction and system efficiency to refine and enhance its functionalities.

Despite its comprehensive capabilities, certain functionalities are excluded due to time and resource constraints. Features such as online tuition payment integration, advanced analytics tools, live chat, and a mobile app version are beyond the current scope. These omissions allow the project to focus on delivering a reliable and user-friendly system within the allocated timeframe. Additionally, external factors such as user behavior, financial systems, and integrations with third-

party applications are not covered in this project. By addressing the institution's needs and adhering to practical constraints, "reGate" represents a balanced approach to modernizing Colegio de Montalban's school portal. It prioritizes usability and efficiency while acknowledging the limitations inherent in any system development process. Future iterations may explore additional features and integrations to further enhance the portal's capabilities.

Operational Framework

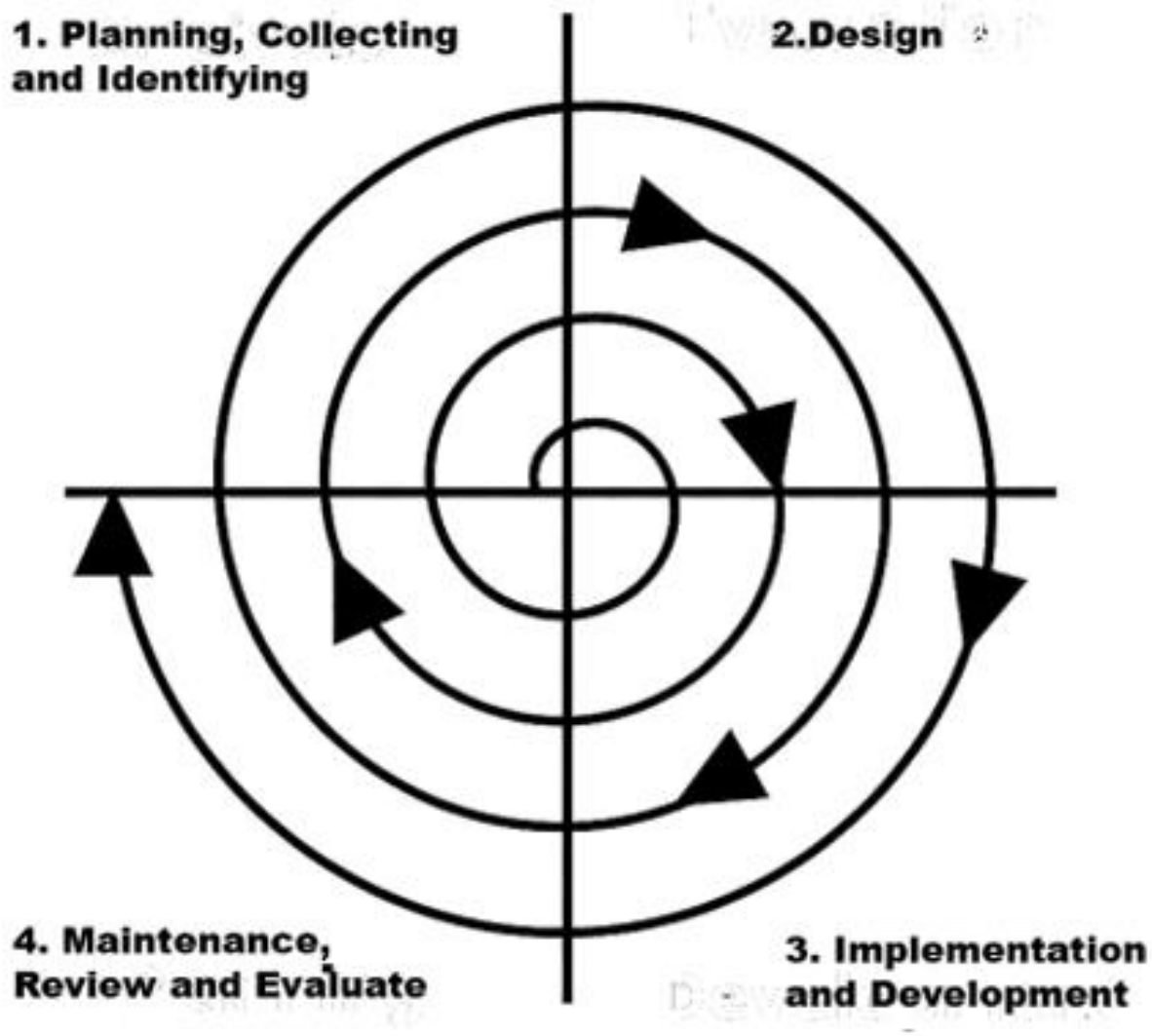

Figure 1.1. & 1.2. An operational framework illustrating the development of reGate: Enhancing Interaction and Education Resources at Colegio de Montalban using Spiral Model

The project developers employed the Spiral Model during the development stages of "reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban." This strategic framework was selected to ensure flexibility, continuous improvement, and alignment with user needs throughout the entire project lifecycle. The development phase, based on the Spiral Model, was divided into several iterative cycles.

In the first cycle, the project developers focused on detailed planning and system design, refining the architecture, creating data flow diagrams, and finalizing user interface prototypes. Consultations with stakeholders ensured the system design aligned with user requirements and institutional goals. During the second cycle, the project developers moved into implementation and initial testing, coding and developing features such as user registration, the homepage, document request forms, and others.

Regular unit, integration, and usability testing were conducted to identify and fix bugs, ensuring that the functionalities met the expected standards. The third cycle emphasized refinement and enhancement based on feedback collected after the second cycle and insights from testing. The project developers utilized Figma as a visual prototyping tool to design the presentation layer of the system. This phase focused on creating interactive mockups and visual representations of the user interface to simulate the user experience and navigation flow.

Figma allowed the developers to craft detailed prototypes that showcased the system's layout, design elements, and user journeys without the need for actual coding. These prototypes were instrumental in gathering user feedback early in the development

process, ensuring that the design met user expectations and requirements. By leveraging Figma, the project developers streamlined the process of visualizing the system's interface, making it easier to iterate on designs and address usability concerns before full-scale development. The iterative nature of the Spiral Model was well-suited for this stage, as it allowed the developers to engage in continuous cycles of planning, design, implementation, and evaluation. This model ensured that the system could be updated and improved in each cycle based on real user feedback and evolving project needs, essential for meeting the requirements of a dynamic web application school portal.

The project developers focused on performance and usability improvements, enhancing features such as the student dashboard and improving navigation for a better user experience. This cycle also included additional user feedback sessions to further optimize the system. The final cycle was dedicated to rigorous system testing, evaluation, and preparation for deployment, where extensive performance and security checks were conducted. Feedback from this phase, gathered through surveys and user testing, was essential for confirming the system’s readiness and reliability.

The iterative approach of the Spiral Model allowed continuous feedback loops at the end of each cycle, facilitating necessary adjustments and improvements. These cycles also incorporated risk management strategies; at the start of each cycle, potential challenges such as usability issues, technical limitations, or security vulnerabilities were assessed. By addressing these risks in each cycle, the project developers proactively managed issues and enhanced the system’s robustness.

By integrating the Spiral Model, the development of reGate effectively incorporated user feedback early on and continually refined the system throughout development. This operational framework helped ensure that the final product met stakeholder needs, remained user-friendly, and addressed any identified risks. The end result was a comprehensive, user-centered school portal that provided an improved experience for students, instructors, and administrators at Colegio de Montalban, balancing ambitious goals with practical constraints to deliver a functional and reliable system.

Conceptual Framework

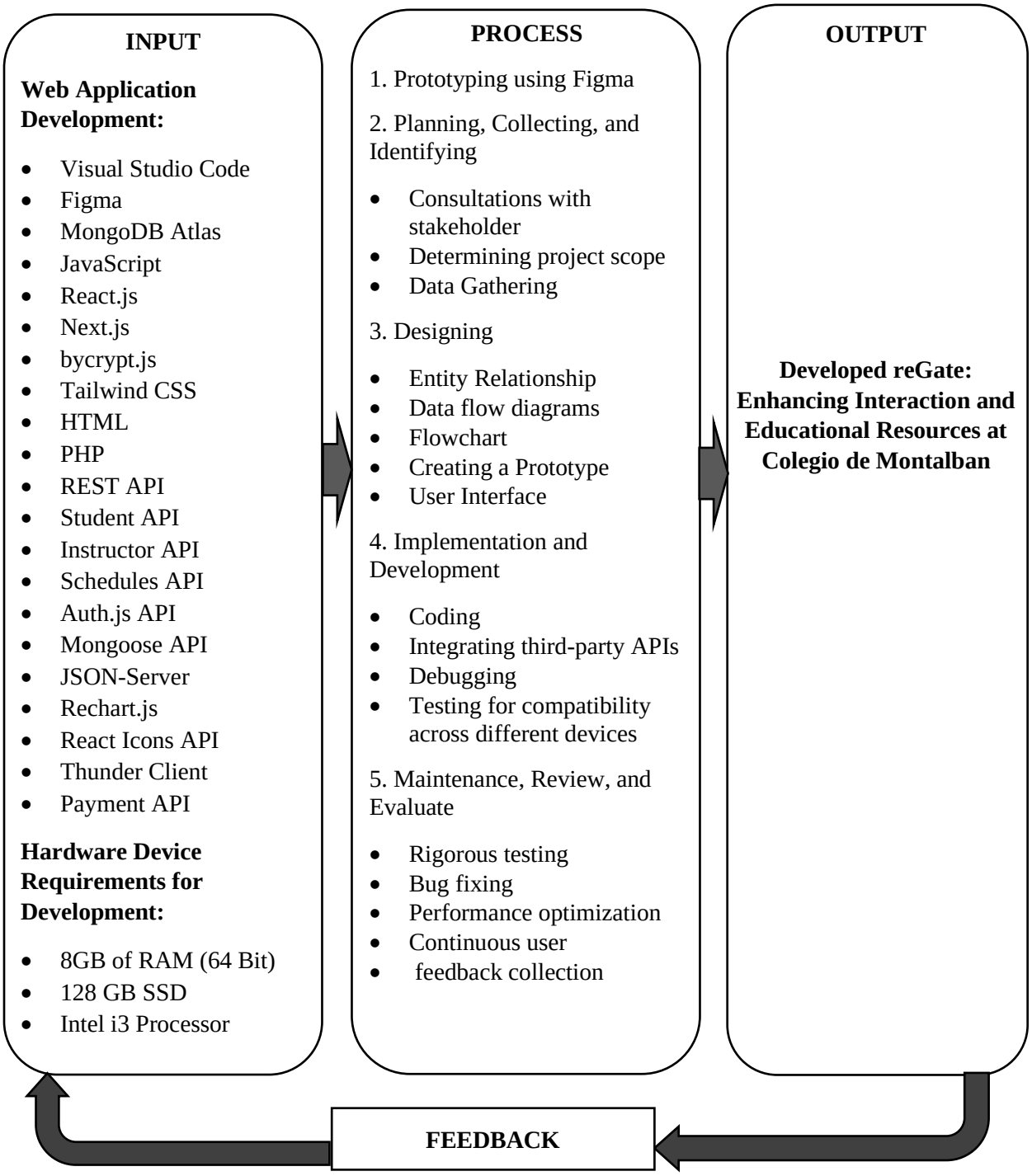

Figure 1.3. A Conceptual Framework Showing the Development of reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban

The conceptual framework for reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban, is structured around four key components: Input, Process, Output, and Feedback. This framework provides a clear and systematic approach to developing and refining the dynamic web application school portal management system. The Input phase focuses on collecting all necessary data required for the system. It includes user requirements and resource availability. The input phase ensures that the project developers have a comprehensive understanding of the system requirements before moving forward.

The process phase consists of a systematic series of steps to transform inputs into the final output. Initially, prototyping using Figma was conducted to visualize the user interface and overall system design. The Process phase involves several critical stages. Initial planning and requirement identification involve consultations with stakeholders to understand their needs and determine the scope of the project. This stage also includes brainstorming and data gathering of project developers to outline the project's foundation. During the design phase, the project developers created prototypes and blueprints for the dynamic web application. This involves creating data flow diagrams, entity-relationship diagrams, flowcharts, creating a prototype, and user interface designs, ensuring that the system will be user-friendly and will meet functional requirements.

The development stage involves the actual coding and building of the school portal management system, using various development tools such as Visual Studio Code, Figma, and MongoDB Atlas. The process includes coding, integrating third-party APIs, debugging, and testing for compatibility across different devices. After development, the system undergoes rigorous testing to identify and fix bugs, optimize performance, and ensure security. Continuous evaluation and user feedback collection are integral to maintaining and improving the system. Finally, the maintenance, review, and evaluation phase ensured the system's robustness through rigorous

testing, bug fixes, performance optimizations, and continuous feedback collection to refine the application.

The output of this process is the fully functional reGate: school portal management system, a dynamic web application that enhances interaction and resource management at Colegio de Montalban. The system provides a user-friendly interface for announcements, news and updates, viewing pages, managing educational resources, and streamlining administrative processes. It also includes features like real-time updates and detailed analytics, offering an improved educational experience for all stakeholders. Feedback is continuously collected and analyzed to identify areas for enhancement and address any issues, ensuring that the system remains effective and aligned with users' needs over time.

CHAPTER II

REVIEW OF RELATED LITERATURES, STUDIES, AND SYSTEMS

In this chapter, various local and foreign literature, studies, and systems were reviewed by the project developers to gain understanding of existing research and other academic works relevant to the area of the project, and thus, present a broader knowledge to the academic community and at the same time, help the project developers intensify their knowledge in the field.

The Need for a Unified School Portal System

In today's educational landscape, the integration of digital tools has become essential for improving communication, resource access, and overall academic engagement. One of the most vital digital tools in modern education is the student portal, which provides a centralized platform for students, teachers, and administrators to interact and manage academic and administrative tasks. Research on the development and implementation of such portals highlights the importance of user-centered design, seamless navigation, and the integration of various functionalities such as real-time updates, personalized user experiences, and school management system. This body of research underscores the critical role of school portals in enhancing the efficiency of academic processes and improving the overall user experience.

Student portals, which provide students with centralized access to resources, communication tools, and academic updates, were examined in research by Krishna and Sakthivel (2022) as crucial platforms for academic engagement. The study emphasized the value of user-centered design by emphasizing functionalities like real-time information

updates and easy navigation. The integration of learning management systems (LMS) to enable blended and conventional learning models was also highlighted, as this improves academic results and user experience.

A School Portal, as defined by School Software Pro (2021), is a secure, web-based application that allows schools to manage staff, students, and operations efficiently. The portal serves as an interactive platform where students, parents, and teachers can access and manage essential school-related information. This system helps streamline administrative tasks and improve communication, making it an invaluable tool for modern education.

According to Rahmah (2019), the design of a school portal is critical for ensuring that users, such as parents, teachers, administrators, and students, can easily access important information from any location or device. Key features of an effective school portal include personalized user information, role-based login permissions, and seamless integration with existing school systems like the main website and learning management system. Rahmah also emphasizes the importance of user-friendly design, mobile optimization, and relevance in the information presented to ensure the portal's success.

Kamal Sharma R, R.M. Gomathi, and Yahya Ibrahim Imtiaz (2022) discuss the issues that students experience in accessing and managing academic and extracurricular activities in the digital age. The increasing number of programs for different functions, including as attendance tracking, fee collection, and exam scheduling, has resulted in a fragmented user experience. Additionally, students frequently face login troubles, difficulty tracking attendance, and a lack of visibility into club activities and events. To

solve these challenges, the authors propose a centralized web site that would consolidate diverse services, streamline processes, and serve as a uniform platform for students to obtain information and interact with the university. A portal that combines information and simplifies interactions can significantly improve student happiness and the entire academic experience.

Abdelhakim et al. (2022) conducted an in-depth study to assess the quality of university web portals from the perspective of students. The research highlights key factors influencing portal quality, including usability, accessibility, and the relevance of content. By focusing on the student experience, the study underscores the importance of user-friendly design and the role of portals in supporting academic and administrative tasks. The authors argue that continuous evaluation of such systems is essential to meet evolving student needs and maintain institutional competitiveness. This work provides a foundational understanding of web portal evaluation by emphasizing the end-user's viewpoint.

The development of web-based portals has become an essential part of educational institutions, libraries, and other organizations aiming to improve access to information and streamline user experiences. Mallo-Eustaquio (2019) explored the design and implementation of the EMRC web-based portal to enhance library services at MSEUF University. The research highlighted the significance of ICT in meeting the evolving demands of library patrons who increasingly rely on web-based search engines for accessing information. This shift has prompted libraries to innovate and provide platforms that are user-friendly and efficient.

The study used Rapid Application Development (RAD), an approach that emphasizes team collaboration and speed in software development. This methodology was chosen for its ability to create functioning information systems rapidly, aligning with the need for efficient service delivery. The portal was built using a combination of HTML, CSS, JavaScript, PHP for the front end, and MySQL for the database. By employing the Unified Modeling Language (UML) for system design, including use-case and activity diagrams, the research demonstrated systematic development practices that support the creation of effective portals.

Evaluation of the EMRC portal was conducted using the ISO 25010:2011 software quality standard, focusing on areas such as functional suitability, usability, maintainability, reliability, performance efficiency, and security. Results from the evaluation showed that the portal met high standards in most quality characteristics, particularly in security and functional suitability. The study underscored that while the portal was generally effective, areas like system compatibility could be improved. The findings suggest that systematic and quality-oriented approaches can lead to the development of web-based portals that are both functional and adaptable, fulfilling the users' needs and promoting efficient data handling.

Mallo-Eustaquio’s research supports the notion that developing web portals with a clear focus on user experience and quality standards can significantly improve access to library services. The study’s emphasis on iterative development and stakeholder feedback highlights best practices that are applicable in broader educational web application projects, such as the dynamic school portal management system being developed for

Colegio de Montalban. This comparison provides insight into the value of incorporating structured methodologies and ISO standards to ensure the quality and usability of digital platforms in educational environments.

Deepa and Ganguly (2014) provided insights into the development of knowledge-sharing platforms, particularly through the KxSD portal at TERI. Their research underlined the importance of creating systems that cater to specific user communities and provide access to relevant resources. The features of the KxSD portal—focusing on policy, technology, and community partnerships—can inspire the development of a school portal that not only serves academic needs but also promotes collaboration and community engagement. These studies collectively demonstrate the importance of user-centric, well-structured web portals in educational and organizational settings. They highlight the significance of usability, accessibility, and adaptability in creating effective portals that meet the needs of diverse users and improve interaction, information management, and overall user satisfaction.

The development and implementation of web-based systems for educational institutions and administrative purposes has been a focus of research aimed at enhancing efficiency and streamlining processes. The study by Argayoso et al. (2015) examined the creation of an online transaction processing system for recognized student organizations and councils at the Student Affairs Office of Letran Calamba. This system was designed to facilitate the submission of various forms, such as proposals, accomplishments, liquidations, and evaluations, streamlining communication and submission processes between student organizations and the administration.

The research underscored the importance of integrating features that promote interaction and administrative efficiency, including the ability to post and view announcements and manage activity scheduling through a calendar function. Evaluations of the system highlighted its effectiveness in meeting the expectations of users, with positive feedback indicating its impact on user satisfaction and operational efficiency. This study aligns with broader trends in educational technology where digital solutions are developed to reduce administrative burden, foster transparency, and improve service accessibility for stakeholders.

The findings from Argayoso et al.'s work support the adoption of similar web-based solutions in other educational institutions to enhance interaction between student organizations and administrative offices. Such systems not only aid in organizing documentation and activity management but also contribute to more efficient use of resources and better satisfaction among users. This research offers valuable insights for developing user-centric educational portals that prioritize seamless data processing and communication features.

Basher, Gacus, Mingo, and Ambe (2014) emphasized the growing importance of website usability for universities as internet usage increases. Their study outlined a comprehensive five-phased usability testing methodology aimed at assessing a university website's effectiveness. The research gathered both qualitative and quantitative data, which were analyzed to identify usability issues. The findings highlighted the significance of usability testing in identifying problems and enhancing user experience. The study concluded that continuous usability efforts are crucial for user-centered universities,

recommending that improving website usability should be an ongoing process to meet user expectations.

The development of user-friendly and effective school portals is pivotal for enhancing the academic experience of students, teachers, and administrators alike. The studies discussed emphasize the importance of well-designed, secure, and accessible platforms that streamline communication, information management, and administrative processes. By focusing on user needs, incorporating continuous feedback, and utilizing structured development methodologies, educational institutions can create portals that not only address current challenges but also adapt to future demands. Ultimately, a well-developed school portal can significantly contribute to the overall success and satisfaction of its users, making it a crucial component of modern educational environments.

The Impact of User-Centered Design in School Portal Development

The development of school portal management systems has become increasingly significant as educational institutions strive for improved efficiency, accessibility, and user experience. A dynamic web application school portal serves as an essential tool for facilitating communication and interaction among students, instructors, and administrators. These portals streamline processes such as schedule management, grade tracking, course enrollment, and information dissemination, contributing to better academic performance and operational effectiveness. With the rapid advancements in web technologies, leveraging frameworks like Next.js, which support high performance and scalability, can be crucial for creating an efficient and user-friendly platform.

Research on school portal systems has highlighted the benefits of integrating real-time data management and interactive features to enhance user engagement and accessibility. Prior studies underscore the importance of user-centric design, reliable performance, and robust security measures as key elements in developing such systems. The literature points out that implementing industry-standard software quality models, such as ISO 25010:2011, is necessary to meet user expectations and ensure the system's functionality, maintainability, and security. This section reviews existing literature and case studies on web-based school portal management systems to provide a comprehensive understanding of the key elements, methodologies, and outcomes associated with their development and use. Through these insights, this research aims to draw parallels and inform the creation of a dynamic web application tailored for Colegio de Montalban, ensuring that it meets educational standards and user needs.

According to Ghosh, A. (2024), a student portal is a secure, web-based platform that allows students to access a wide range of academic and administrative services, including course registration, grades, class schedules, study materials, and financial aid information. These portals centralize communication between students, faculty, and the institution, enhancing the overall student experience by providing easy access to necessary resources and promoting student engagement. As technology evolves, student portals are expected to become increasingly sophisticated, offering more personalized learning solutions and transforming the educational process.

A school portal is a secure web-based platform that authenticates users and grants access to academic and learning details. According to Vidyald aya (2024), these portals require login credentials to ensure data security and privacy. In addition to serving students, school portals are designed to support various stakeholders, including parents, teachers, and administrators. By

providing role-specific access, the portal enhances communication, offers real-time notifications, and centralizes important updates and forms (Vidyalaya, 2024).

In the world of information technology, student portals have developed as useful tools for improving communication and information dissemination within educational institutions. Krishna and Sakthivel (2022) define a student portal as a web-based platform that provides multiple features to students, faculty members, and administrators. These functionalities include viewing exam results, adding or changing student information, and controlling timetables. Overall, student portals have the potential to reduce administrative duties and increase information availability for all stakeholders in an educational institution.

Student portals, which provide students with centralized access to resources, communication tools, and academic updates, were examined in research by Krishna and Sakthivel (2022) as crucial platforms for academic engagement. The study emphasized the value of user-centered design by emphasizing functionalities like real-time information updates and easy navigation. The integration of learning management systems (LMS) to enable blended and conventional learning models was also highlighted, as this improves academic results and user experience.

A School Portal, as defined by School Software Pro (2021), is a secure, web-based application that allows schools to manage staff, students, and operations efficiently. The portal serves as an interactive platform where students, parents, and teachers can access and manage essential school-related information. This system helps streamline administrative tasks and improve communication, making it an invaluable tool for modern education.

According to Kolosky (2023), student portals have become essential tools in education, providing centralized access to academic resources, services, and information. These platforms,

used across K-12 schools and higher education institutions, offer students personalized access to a variety of features. Kolosky also explores the decision-making process faced by schools and teachers in choosing between building a custom student portal or purchasing ready-made software solutions.

According to Rauv (2024), school portals must be designed with the user experience in mind, ensuring accessibility, ease of use, and a clean interface. A well-designed portal can improve communication among administrators, teachers, parents, and students, while reflecting positively on the school's reputation. Rauv emphasizes that intuitive navigation and a streamlined design are critical to enhancing usability and ensuring that information is easily accessible to users.

According to Rahmah (2019), the design of a school portal is critical for ensuring that users, such as parents, teachers, administrators, and students, can easily access important information from any location or device. Key features of an effective school portal include personalized user information, role-based login permissions, and seamless integration with existing school systems like the main website and learning management system. Rahmah also emphasizes the importance of user-friendly design, mobile optimization, and relevance in the information presented to ensure the portal's success.

Raut et al. (2019) developed a PCE Staff/Student Portal to improve the management of student and faculty data in academic institutions. This portal provides an easy way to access and update student records such as academics, alumni data, course information, and placement records. The portal also offers a secure online platform where students may access course resources such as articles, lectures, and videos. It also acts as a great resource for students seeking information about the college, upcoming activities, and educational resources. The PCE Staff/Student Portal aims to

improve productivity and the overall student experience by centralizing information and making it easier to access.

Alatawi et al. (2021) investigated factors influencing student portal usage in Saudi Arabian universities. They argue that effective student portals are crucial for universities to deliver high-quality education through ICT resources. The study employed a quantitative approach to develop a model that identifies student expectations for university portals. The model highlights eight significant factors that positively impact student portal usage. These factors can be used by universities to improve their portals and increase student engagement.

Kamal Sharma R, R.M. Gomathi, and Yahya Ibrahim Imtiaz (2022) discuss the issues that students experience in accessing and managing academic and extracurricular activities in the digital age. The increasing number of programs for different functions, including as attendance tracking, fee collection, and exam scheduling, has resulted in a fragmented user experience. Additionally, students frequently face login troubles, difficulty tracking attendance, and a lack of visibility into club activities and events. To solve these challenges, the authors propose a centralized web site that would consolidate diverse services, streamline processes, and serve as a uniform platform for students to obtain information and interact with the university. A portal that combines information and simplifies interactions can significantly improve student happiness and the entire academic experience.

Xiong et al. (2021) investigated methods to improve university portal websites through usability evaluation. They argue that many university portals prioritize technical features over user experience. To address this, the study proposes a framework for website improvement based on five key usability factors: accessibility, content, design, navigation, and organization. They conducted usability testing and user satisfaction surveys to identify areas for improvement. Based

on the user feedback and data analysis, the study proposes website redesign suggestions. This research provides valuable insights for universities seeking to optimize their portals for a more user-friendly experience.

Roy et al. (2014) examined how users perceive the usability of academic websites. They argue that usability is a crucial factor for user satisfaction, but traditional methods lack robust measurement techniques. To address this, they conducted a quantitative study to evaluate usability on three popular academic websites. The study employed a two-pronged approach: questionnaires and performance-based tasks. Questionnaires assessed user satisfaction and feedback, while performance-based tasks measured task completion times and success rates. The study also investigated the relationship between task completion time and user satisfaction. The results showed consistency between the questionnaire and performance-based measures, suggesting that user perception aligns with objective measures of usability. Additionally, the study assessed website accessibility based on WCAG 2.0 guidelines. This research provides valuable insights into user-centered evaluation methods for academic websites.

Karani et al. (2021) investigated the relationship between university website usability and student satisfaction using a structural equation modeling approach. They focused on the perspectives of students from management, computer applications, and engineering programs. The study identified that students were generally satisfied with the usability of the university website across various dimensions, including content organization and readability, navigation, user interface design, and performance. Content organization and readability emerged as the most significant factor influencing student satisfaction, followed by user interface design, performance, and navigation. The authors argue that the importance of clear, well-organized content aligns with the university's need to effectively communicate with students. This research emphasizes the importance of website usability for universities, highlighting the specific website features that

contribute most to student satisfaction. However, it is important to note that the study only examined student perceptions from one university, so the generalizability of the findings may be limited.

Hussain et al. (2018) examined the usability of a student portal at the University Utara Malaysia. While acknowledging the value of usability heuristics, they argue that user testing provides valuable insights. A questionnaire assessed user satisfaction with the portal's efficiency, effectiveness, performance, and accuracy. Over 70% of users reported satisfaction, but some identified capacity issues during peak registration periods. The study highlights the importance of user feedback and recommends incorporating it into the development process to improve the overall usability of the student portal.

Several studies explore the connection between usability and user satisfaction. Roy et al. (2014) demonstrate consistency between user perception and objective usability measures, suggesting a positive impact on satisfaction. Hussain et al. (2018) and Adeyemi & Issa (2020) also found user satisfaction with the evaluated portals, although some limitations were identified. Adeyemi and Issa (2020) highlight the importance of information quality, system quality, and service quality in determining student satisfaction with university web portals. The study reveals that the accuracy, relevance, and timeliness of information given on the portal have a direct impact on user impressions of its usefulness. Furthermore, the technical characteristics of the site, such as simplicity of use, reaction time, and dependability, as well as user support and assistance, all contribute to overall satisfaction. Institutions may dramatically improve student engagement and happiness by ensuring that their portal is well-designed, efficient, and user-friendly.

Abdelhakim et al. (2022) conducted an in-depth study to assess the quality of university web portals from the perspective of students. The research highlights key factors influencing portal

quality, including usability, accessibility, and the relevance of content. By focusing on the student experience, the study underscores the importance of user-friendly design and the role of portals in supporting academic and administrative tasks. The authors argue that continuous evaluation of such systems is essential to meet evolving student needs and maintain institutional competitiveness. This work provides a foundational understanding of web portal evaluation by emphasizing the end-user's viewpoint.

The integration of technology into educational institutions has greatly improved the management and accessibility of academic information. Inoco and Hernandez (2017) conducted a study on the Electronic Student Information Portal (eSIP) implemented at Davao Oriental State College of Science and Technology. The eSIP system provided students with real-time access to essential academic information, including grades, profiles, academic records, class schedules, and subject offerings. This portal was directly connected to the institution’s database through its independent Electronic School Management System (eSMS), ensuring seamless data retrieval and management. The findings from the study revealed that the eSIP system was effective in terms of information management and accessibility.

It met the minimum quality standards for system functionality, resulting in high levels of student satisfaction. This indicates that well-designed information systems can significantly enhance the academic experience by streamlining data storage, retrieval, and real-time transactions. The results of this study underscore the importance of aligning system features with user needs and ensuring ease of access for end-users. This research serves as a benchmark for developing and implementing information systems in other educational institutions, emphasizing the practical benefits of technology in facilitating efficient information dissemination and management.

The study conducted by Ballard (2023) examined user perceptions of an E-Clearance Portal and highlighted key insights into its functionality and user experience. The findings indicated that while the portal was generally well-received, its visual appeal was perceived neutrally, suggesting room for improvement in design aesthetics. Users praised the portal for its clarity, organization, and efficiency, noting that it was easy to navigate and provided secure access to their information. These attributes contributed to its functionality and user-friendliness, affirming its effectiveness as a tool for streamlining clearance processes. However, the lack of excitement or engagement associated with the portal's visual design suggests a potential area for enhancement to improve user satisfaction further. This research underscores the importance of balancing functionality and aesthetics in web portal development. While operational efficiency and security are critical, enhancing visual appeal can elevate user engagement, ensuring a more holistic and satisfying user experience. The study provides valuable insights for future improvements in designing academic and administrative web portals.

Quiloña and Afable (2019) conducted a study focused on developing a website for Eastern Samar State University-Can-avid Campus to improve its digital presence. The website aimed to showcase essential information, including the university's profile, mission, vision, policies, achievements, and capabilities. Using a descriptive-developmental research method, the researchers employed PHP and WordPress as the primary tools for website creation. The quality of the website was assessed following the ISO/IEC 9126 software quality standards, which evaluate functionality, reliability, usability, efficiency, maintainability, and portability. Results from the evaluation revealed that the website met all specified requirements and exhibited high usability. The researchers concluded that the website would enhance the university's information dissemination and online visibility, potentially increasing its appeal to prospective students and

clients. This study highlights the importance of user-centric design and adherence to software quality standards in developing effective web platforms for educational institutions.

The development and implementation of web-based information systems in educational institutions have been explored in numerous studies, emphasizing their role in enhancing communication, accessibility, and functionality. Caratiquit (2021) conducted a developmental study on the Web-based School Information and Publication System aimed at promoting school visibility, delivering timely and relevant information to students, employees, and parents, and offering easy access to educational materials. This system also included online updates of school activities, creating an interactive platform for the school community.

The study utilized the iterative waterfall methodology, a structured approach that allowed for continuous refinement of the system in response to user feedback. The evaluation of the system was conducted based on the ISO 25010:2011 software quality standards, which include functional suitability, maintainability, usability, security, reliability, performance efficiency, compatibility, and portability. Results from the evaluation showed that the system met the expected standards, with overall assessments rating the quality and functionality as "Excellent." This suggests that the system was highly effective in addressing the needs of its users, enhancing the school's ability to disseminate information and engage with its community.

In comparison with similar research efforts, Caratiquit's (2021) study aligns with findings that highlight the importance of web-based platforms in educational settings for fostering better communication and accessibility. The emphasis on evaluating the system against established software quality frameworks like ISO 25010:2011 underlines a commitment to ensuring that educational tools not only meet functional requirements but are also reliable and user-friendly. This

aligns with broader trends in educational technology development that prioritize user-centric designs and robust performance to support teaching and administrative activities.

The development of web-based portals has become an essential part of educational institutions, libraries, and other organizations aiming to improve access to information and streamline user experiences. Mallo-Eustaquio (2019) explored the design and implementation of the EMRC web-based portal to enhance library services at MSEUF University. The research highlighted the significance of ICT in meeting the evolving demands of library patrons who increasingly rely on web-based search engines for accessing information. This shift has prompted libraries to innovate and provide platforms that are user-friendly and efficient.

The study used Rapid Application Development (RAD), an approach that emphasizes team collaboration and speed in software development. This methodology was chosen for its ability to create functioning information systems rapidly, aligning with the need for efficient service delivery. The portal was built using a combination of HTML, CSS, JavaScript, PHP for the front end, and MySQL for the database. By employing the Unified Modeling Language (UML) for system design, including use-case and activity diagrams, the research demonstrated systematic development practices that support the creation of effective portals.

Evaluation of the EMRC portal was conducted using the ISO 25010:2011 software quality standard, focusing on areas such as functional suitability, usability, maintainability, reliability, performance efficiency, and security. Results from the evaluation showed that the portal met high standards in most quality characteristics, particularly in security and functional suitability. The study underscored that while the portal was generally effective, areas like system compatibility could be improved. The findings suggest that systematic and quality-oriented approaches can lead

to the development of web-based portals that are both functional and adaptable, fulfilling the users' needs and promoting efficient data handling.

Mallo-Eustaquio's research supports the notion that developing web portals with a clear focus on user experience and quality standards can significantly improve access to library services. The study's emphasis on iterative development and stakeholder feedback highlights best practices that are applicable in broader educational web application projects, such as the dynamic school portal management system being developed for Colegio de Montalban. This comparison provides insight into the value of incorporating structured methodologies and ISO standards to ensure the quality and usability of digital platforms in educational environments.

Putungan et al. (2022) developed a web-based employment portal for the Public Employment Service Office (PESO) of the City of Cabuyao, aimed at providing a collaborative, dynamic, and cost-effective solution for job-seekers. Using the Iterative Waterfall Model, the system facilitated phases of requirements gathering, design, coding, testing, and implementation. The study employed a descriptive research design, gathering feedback from 16 respondents, including job seekers and PESO employees. The findings indicated that the system met its objectives, demonstrating an efficient method for prioritizing job applicants and supporting online job matching. The implementation of this portal improved the technological capabilities of PESO, providing up-to-date services that enhanced the applicant prioritization process.

Deepa and Ganguly (2014) provided insights into the development of knowledge-sharing platforms, particularly through the KxSD portal at TERI. Their research underlined the importance of creating systems that cater to specific user communities and provide access to relevant resources. The features of the KxSD portal—focusing on policy, technology, and community partnerships—can inspire the development of a school portal that not only serves academic needs but also

promotes collaboration and community engagement. These studies collectively demonstrate the importance of user-centric, well-structured web portals in educational and organizational settings. They highlight the significance of usability, accessibility, and adaptability in creating effective portals that meet the needs of diverse users and improve interaction, information management, and overall user satisfaction.

Acala and Talirongan (2023) conducted a quantitative study assessing the usability and user satisfaction of the Online Portal Empowered Netizens (OPEN) at Mindanao State University Lanao del Norte Agricultural College using the Computer System Usability Questionnaire (CSUQ). The research included 185 college students and evaluated four key areas: Usefulness (SYSUSE), Information Quality (INFOQUAL), Interface Quality (INTERQUAL), and Overall Usability (OVERALL). Results indicated that the portal performed well in all categories, enhancing students' academic experience. However, the study acknowledged limitations in generalizability to other institutions. The authors recommended ongoing updates, user feedback collection, and continuous monitoring to maintain the portal's user-friendliness and effectiveness. This study highlights the importance of user-centric design and periodic evaluation to improve educational portals.

The development and implementation of web-based systems for educational institutions and administrative purposes has been a focus of research aimed at enhancing efficiency and streamlining processes. The study by Argayoso et al. (2015) examined the creation of an online transaction processing system for recognized student organizations and councils at the Student Affairs Office of Letran Calamba. This system was designed to facilitate the submission of various forms, such as proposals, accomplishments, liquidations, and evaluations, streamlining communication and submission processes between student organizations and the administration.

The research underscored the importance of integrating features that promote interaction and administrative efficiency, including the ability to post and view announcements and manage activity scheduling through a calendar function. Evaluations of the system highlighted its effectiveness in meeting the expectations of users, with positive feedback indicating its impact on user satisfaction and operational efficiency. This study aligns with broader trends in educational technology where digital solutions are developed to reduce administrative burden, foster transparency, and improve service accessibility for stakeholders.

The findings from Argayoso et al.'s work support the adoption of similar web-based solutions in other educational institutions to enhance interaction between student organizations and administrative offices. Such systems not only aid in organizing documentation and activity management but also contribute to more efficient use of resources and better satisfaction among users. This research offers valuable insights for developing user-centric educational portals that prioritize seamless data processing and communication features.

The development and evaluation of web-based applications for educational institutions have been pivotal in enhancing communication, efficiency, and usability for faculty, staff, and students. Tupas (2015) conducted a study on the design and development of the LPU-B High School website, focusing on how faculty members, staff, and students perceive the site in terms of content, efficiency, functionality, and usability. This research highlights the importance of user-centric design and the need for educational institutions to incorporate interactive and accessible web solutions. The study utilized a robust technical framework involving several web development components: database integration, programming, and graphical user interface (GUI) design. The user interface was built using HTML and CSS, ensuring compatibility across various web browsers. Server-side processing was handled using PHP and a content management system, with data managed through relational databases in MySQL. This combination of technologies allowed the

site to process user requests efficiently and display information sourced from the database, providing an interactive and engaging user experience.

Evaluating the effectiveness of such systems often involves assessing their functionality and how well they meet user needs. Tupas (2015) found that the LPU-B High School website, designed with user needs in mind, provided a strong foundation for managing school-related content and interactions. The findings underscored the importance of continuous assessment to identify potential areas for improvement, promoting a cycle of ongoing enhancement to meet evolving user expectations. This research aligns with other studies that emphasize the role of well-developed school websites in fostering better communication and resource management within educational institutions. Similar frameworks can be used for other schools and institutions to develop or refine web-based platforms, ensuring they align with the expectations and needs of faculty, staff, and students. Moreover, the integration of effective databases and server-side processing technologies has become a standard for creating responsive and scalable web applications.

The integration of technology into educational institutions has become essential for improving administrative processes, enhancing data management, and streamlining service delivery. Grepon et al. (2021) conducted a comprehensive study on the development and implementation of a School Management Information System (SMIS) for a community college in Northern Mindanao. This research underscores the significant impact that a well-designed system can have on managing educational operations and procedures.

Colleges and universities often face challenges related to the handling of student records and academic processes. Manual and paper-based systems can be cumbersome, inefficient, and prone to errors, creating operational difficulties. The need for a robust system that automates these

processes is evident, and the SMIS developed in this study addresses these challenges effectively. The system was built using the Agile Model, which is known for its iterative development and continuous feedback loop, ensuring that the system meets user needs throughout its development phase.

The study evaluated the system's performance based on the ISO 25010 quality model, which measures various attributes of software quality such as functionality, usability, and reliability. The results showed that the system scored above 4.04 on a Likert scale for each criterion, indicating very good performance. The findings demonstrated that the developed e-school system was functional, usable, and reliable, contributing to improved efficiency in school operations. Grepon et al. (2021) also suggested future enhancements, such as integrating smartphone and tablet-based attendance monitoring and placing kiosks for grade and schedule viewing within the campus. These additions would further optimize the system's accessibility and convenience for users.

Similar research has highlighted the importance of integrating technology into educational institutions to improve data processing, record-keeping, and service delivery. Systems that provide centralized storage, retrieval, and management of data not only streamline administrative tasks but also help reduce the workload on personnel, allowing them to focus on more critical tasks. The use of quality evaluation models like ISO 25010 helps ensure that such systems meet the expected standards and continue to provide value over time. This study by Grepon et al. aligns with the growing body of literature that supports the adoption of information systems in schools to enhance operational efficiency and service quality. The implementation of such systems can serve as a model for other educational institutions seeking to modernize their administrative practices and improve the overall student and staff experience.

Bringula (2016) conducted a study to identify factors affecting the usability of web portal information services (WPIS) using canonical correlation analysis. The research highlighted that WPIS usability is influenced by a combination of design-related factors, including content quality, speed, aesthetics, ease of use, and effectiveness, as well as student-driven elements such as self-initiative and commitment. It found that design factors were more impactful than student characteristics in driving user satisfaction and portal usage. The study also suggested that effectiveness should be considered a design goal rather than a usability dimension. Additionally, it emphasized that intrinsic motivation, rather than external pressure, plays a crucial role in user engagement. Bringula's work underscores the importance of user-centered design and motivation in developing educational web portals. Future research could expand on these findings by investigating adaptive interfaces and personalized content to further enhance user experience and usability.

Magno-Tan et al. (2014) developed and assessed a cloud-based college management information system aimed at enhancing document and record management for university colleges. The system supports efficient management of data related to curriculum, faculty, facilities, research, and extension activities, crucial for funding and accreditation purposes. Designed using an object-oriented method and incremental development, the system was tested at the College of Computer and Information Science (CCIS) of the Polytechnic University of the Philippines. The system was evaluated based on functionality, usability, user-friendliness, security, performance, and robustness. Results showed strong satisfaction in most areas, with the system being rated "very satisfactory" for most criteria, and "good" for robustness. The study suggested that other colleges could benefit from adopting this cloud-based system for improved information management and decision-making.

Balcita and Palaoag (2020) developed an integrated School Management System with a centralized database to enhance the efficiency of services within educational institutions. Recognizing the challenges of scattered offices and information transfer, the study aimed to build a system incorporating features such as enrollment, assessment, report generation, and decision support. Utilizing a standardized framework based on existing systems and the Agile AWE model, the system was implemented in a school that previously relied on manual processes. The study assessed the system's acceptability among administrators, staff, teachers, students, and guardians through continuous feedback. Results indicated that the system, being fully functional and customizable, provided significant benefits by improving service quality and meeting institutional needs.

Basher, Gacus, Mingo, and Ambe (2014) emphasized the growing importance of website usability for universities as internet usage increases. Their study outlined a comprehensive five-phased usability testing methodology aimed at assessing a university website's effectiveness. The research gathered both qualitative and quantitative data, which were analyzed to identify usability issues. The findings highlighted the significance of usability testing in identifying problems and enhancing user experience. The study concluded that continuous usability efforts are crucial for user-centered universities, recommending that improving website usability should be an ongoing process to meet user expectations.

In conclusion, the development of an efficient and user-friendly school portal system plays a pivotal role in improving communication, operational efficiency, and academic engagement within educational institutions. Through the integration of key features such as real-time data management, seamless navigation, and personalized user experiences, school portals can enhance the overall educational experience for students, faculty, and administrators. Research highlights the importance of adopting best practices, including user-centric design and security measures, to

ensure the system meets the needs of all stakeholders. By drawing on these insights, educational institutions can create portals that foster greater student engagement, improve access to academic resources, and support the evolving demands of modern education.

Strategic Optimization of School Portals for Enhanced Education

The integration of web-based platforms into educational institutions has transformed how academic and administrative tasks are managed, enhancing communication and access to essential resources. School portals, in particular, serve as secure digital environments that provide authenticated access to various stakeholders, including students, teachers, parents, and administrators. These portals not only centralize academic information but also improve data security, usability, and communication within the school community. Numerous studies have explored the development, usability, and impact of such platforms, highlighting their importance in improving the educational experience, administrative efficiency, and student engagement. This paper examines various research efforts and case studies that showcase the role of school portals in enhancing the functionality and accessibility of educational services.

A school portal is a secure web-based platform that authenticates users and grants access to academic and learning details. According to Vidyald aya (2024), these portals require login credentials to ensure data security and privacy. In addition to serving students, school portals are designed to support various stakeholders, including parents, teachers, and administrators. By providing role-specific access, the portal enhances communication, offers real-time notifications, and centralizes important updates and forms (Vidyalaya, 2024).

Raut et al. (2019) developed a PCE Staff/Student Portal to improve the management of student and faculty data in academic institutions. This portal provides an easy way to access and update student records such as academics, alumni data, course information, and placement records. The portal also offers a secure online platform where students may access course resources such as articles, lectures, and videos. It also acts as a great resource for students seeking information about the college, upcoming activities, and educational resources. The PCE Staff/Student Portal aims to improve productivity and the overall student experience by centralizing information and making it easier to access.

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included online updates of school activities, creating an interactive platform for the school community.

In comparison with similar research efforts, Caratiquit's (2021) study aligns with findings that highlight the importance of web-based platforms in educational settings for fostering better communication and accessibility. The emphasis on evaluating the system against established software quality frameworks like ISO 25010:2011 underlines a commitment to ensuring that educational tools not only meet functional requirements but are also reliable and user-friendly. This aligns with broader trends in educational technology development that prioritize user-centric designs and robust performance to support teaching and administrative activities.

Putungan et al. (2022) developed a web-based employment portal for the Public Employment Service Office (PESO) of the City of Cabuyao, aimed at providing a collaborative, dynamic, and cost-effective solution for job-seekers. Using the Iterative Waterfall Model, the system facilitated phases of requirements gathering, design, coding, testing, and implementation. The study employed a descriptive research design, gathering feedback from 16 respondents, including job seekers and PESO employees. The findings indicated that the system met its objectives, demonstrating an efficient method for prioritizing job applicants and supporting online job matching. The implementation of this portal improved the technological capabilities of PESO, providing up-to-date services that enhanced the applicant prioritization process.

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In conclusion, web-based school portals play a pivotal role in modernizing educational institutions by enhancing communication, improving data management, and providing centralized access to academic resources. The research reviewed demonstrates the diverse applications of such systems, from improving administrative efficiency to creating user-friendly platforms for students and staff. As educational institutions continue to embrace digital technologies, the continuous improvement and evaluation of these portals remain crucial for ensuring they meet the evolving needs of their users. By focusing on usability, functionality, and user-centered design, these portals can significantly enhance the overall educational experience and contribute to the effectiveness of teaching and learning.

Synthesis of the review

The development of reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban seeks to address the inefficiencies and challenges faced by educational institutions in managing interactions and educational resources. A comprehensive review of relevant literature and studies underscores the importance of integrating technology into educational portals to improve administrative workflows, student engagement, and access to resources. While the adoption of digital platforms varies across institutions, the benefits of implementing a robust web application like reGate are clear. These benefits include streamlined administrative processes, enhanced user experience, and improved accessibility for students, instructors, and administrators. Research has consistently highlighted the importance of transitioning from manual systems to digital solutions that streamline operations, foster interaction, and ensure data security.

Several studies emphasize the effectiveness of digital systems in educational settings. For instance, Argayoso et al. (2015) demonstrated how an online transaction processing system enhanced the communication and submission processes between student organizations and the administration, underscoring the benefits of integrating features such as real-time status updates and interactive calendars. These findings suggest that modern systems can significantly improve administrative efficiency and user satisfaction. Research on educational portals and management systems emphasizes their potential to simplify administrative tasks, improve communication, and facilitate access to vital academic information. Studies have shown that user-friendly interfaces and real-time updates significantly contribute to student satisfaction and engagement. These findings align with reGate's goal of providing a centralized, interactive platform that supports academic and administrative functions, thus promoting a more efficient educational environment.

Similarly, Tupas (2015) explored the design and functionality of the LPU-B High School website, emphasizing the importance of user-centric design in creating accessible and interactive educational portals. The study highlighted that well-developed systems equipped with robust server-side processing and user-friendly interfaces can meet the needs of students, faculty, and staff, aligning with trends that prioritize user experience in educational technology. The success of these systems also points to the value of continuous assessment and iterative development to adapt to evolving user requirements. Grepon et al. (2021) extended these insights by showcasing the benefits of a School Management Information System (SMIS) developed for a community college, which was rated highly for functionality, usability, and reliability based on the ISO 25010 quality model.

Their research emphasized the importance of integrating technology for efficient data management and service delivery, which can be further improved with mobile accessibility features. Studies by Bringula (2016) and Magno-Tan et al. (2014) stressed the importance of factors such as content quality, ease of use, and effective security in web portal systems. These studies also showed that the design and user experience were more impactful than user-driven factors, aligning with the idea that intrinsic motivation and an engaging interface drive usage and satisfaction. Furthermore, Balcita and Palaoag (2020) and Basher et al. (2014) underlined the need for comprehensive, centralized platforms that improve efficiency by integrating various administrative functions, including enrollment, reporting, and communication. Continuous usability testing and user feedback are critical for sustaining the effectiveness of such systems, as they ensure the platform remains aligned with user expectations and needs.

In conclusion, the development of dynamic web application school portal management systems has proven to be a transformative approach for enhancing educational efficiency, communication, and user experience. The studies reviewed underscore the importance of adopting

digital platforms that prioritize user-centric design, real-time tracking, and secure data management. With proven benefits from existing systems that integrate administrative functions and foster interaction, reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban is well-positioned to leverage these strategies. By focusing on a dynamic, user-friendly interface and seamless integration, reGate can address common challenges faced by educational institutions and enhance the overall service delivery for students, faculty, and administrative staff. This system's design, which emphasizes accessibility, automation, and reliable performance, can contribute significantly to modernizing educational management and promoting a more efficient and interactive learning environment. reGate is well-positioned to address the challenges faced by educational institutions in managing educational resources and facilitating user interaction. Drawing from the successes of similar systems and the lessons learned from relevant studies, reGate promises to enhance accessibility, streamline administrative workflows, and foster better communication within Colegio de Montalban.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

This chapter presents research design, research locale, sample/respondents, data collection and data analysis

Research Design

The project developers adopted a quantitative-qualitative descriptive research design to evaluate “reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban”. This research approach was selected to collect data from respondents in a systematic manner, providing a comprehensive understanding of the project's current implementation and potential areas for improvement. By choosing this non-experimental design, the developers aimed to gather data without manipulating variables, ensuring that the information accurately reflects users' experiences and perceptions.

The quantitative aspect focuses on the structured collection of data through survey questionnaires and metrics, enabling the developers to obtain measurable insights into the system's effectiveness. Complementing this, the qualitative aspect facilitates in-depth exploration through interviews or open-ended questions, capturing detailed feedback, opinions, and suggestions from respondents. This dual approach supports a holistic analysis, allowing the developers to draw connections between numerical data and user narratives.

The use of this combined research method is ideal for obtaining valuable feedback from a substantial number of users, such as students, instructors, and administrative staff, who interact with the system. The insights gained are instrumental in identifying strengths and weaknesses, as well as developing interventions that enhance user experience and address feedback. This approach

not only ensures that data is representative and reliable but also allows for the identification of areas requiring adjustments to meet the needs and expectations of Colegio de Montalban's educational community, ensuring that the findings align with the objectives of creating a system that is adaptable and well-suited for the development of a dynamic web application school portal management system.

Research Locale

The study was conducted at Colegio de Montalban (CdM) a public educational institution located in Montalban, Rodriguez in the province of Rizal, Philippines (Latitude: 14. 750561", Longitude 121. 141668"). Founded in September 25, 2003. The campus is surrounded by several types of residential neighborhoods, business buildings, and an increasing number of organizations, and it is conveniently accessible by public transportation.

Brief History

Colegio de Montalban (CDM; formerly as the Pamantasan ng Montalban) is a government-funded university in Kasiglahan Village, Rodriguez, Rizal, Philippines. It was established on September 25, 2003 by virtue of Municipal Ordinance No. 03-24, and approved by the Sangguniang Bayan ng Rodriguez to provide vocational-technical and higher education to help alleviate poverty. From July 2004 to July 2010, CDM was under the administration of Mayor Pedro S. Cuerpo, who was subsequently succeeded by Mayor Cecilio C. Hernandez since July 2010. On July 7, 2014, by virtue of Sangguniang Bayan ng Rodriguez Ordinance No. 14-15, Pamantasan ng Montalban was renamed Colegio de Montalban. CdM offers free tuition and other school fees under the Universal Access to Quality Tertiary Education Act of 2017 or RA10931.

The establishment of the project “reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban” is a forward-thinking initiative designed to advance the functionality of the school’s portal management system. This dynamic web application aims to enhance the efficiency of administrative processes, improve student and faculty interactions, and provide better access to educational resources. The development of reGate reflects the institution’s ongoing dedication to modernizing its services and delivering an upgraded experience for its academic community.

Sample & Respondents

The proponents of reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban have randomly selected participants who consist exclusively of faculty members, administrative staff, and 100 students enrolled in the Bachelor of Science in Information Technology course at Colegio de Montalban for the first semester of the school year 2024-2025.

Data Collection Method

The data collection method for this research will involve a structured survey designed to gather data from students, faculty, and administrative staff at Colegio de Montalban (CDM). This mixed-methods approach, combining quantitative and qualitative data collection, aligns with the project's quantitative-qualitative descriptive research design. The survey aims to understand the current challenges and perceptions related to the existing school portal system and to evaluate the potential reception and impact of reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban.

The survey will focus on key areas such as demographics, current challenges, system features, and anticipated benefits of the reGate system. Respondents will rate their experiences and

opinions on aspects such as user-friendliness, efficiency, accessibility, and the importance of features like real-time updates, seamless navigation, and comprehensive resource management. Open-ended questions will also be included to capture more detailed feedback and suggestions from participants.

Questions will primarily use a Likert scale format to quantify user perceptions, while qualitative questions will allow for deeper exploration of user opinions. The survey will be administered online via a platform such as Google Forms to ensure accessibility and convenience. A pilot test will be conducted to ensure clarity, reliability, and validity of the questionnaire. The collected data will be analyzed using descriptive statistics for the quantitative portion and thematic analysis for qualitative responses. This approach will provide a comprehensive understanding of the current system's inefficiencies, limitations, and reGate's potential to enhance user interaction and streamline educational processes at CDM.

Data Analysis

The proponents prepared the data thoroughly before conducting the data analysis. The data analysis process for evaluating reGate: Enhancing Interaction and Educational Resources at Colegio de Montalban integrates both quantitative and qualitative data to provide a comprehensive assessment of the school portal management system’s effectiveness in meeting its objectives. The proponents will ensure that data are thoroughly prepared and verified for accuracy and completeness, including consistency and reliability checks. The proponents meticulously checked the values, and the data were analyzed using the statistical software associated with Google Forms. A t-test will also be used to analyze the data, enabling the identification of significant differences in user experiences and satisfaction levels.

Quantitative data will be collected through structured surveys, system logs, and performance metrics. Surveys will measure user satisfaction with key portal features such as ease of access, resource availability, interaction functionalities, and real-time updates, using Likert scales to capture numerical data on user experiences and satisfaction levels. The data will then be analyzed using statistical software linked to Google Forms to generate descriptive statistics, such as averages, percentages, and standard deviations, and identify trends in user experiences and overall satisfaction.

The t-test will help assess the significance of differences in quantitative data, providing insights into user satisfaction and engagement before and after the implementation of reGate. System performance metrics, including user activity levels, frequency of interactions, and response times, will be evaluated to assess system efficiency and functionality. Comparative analysis will be conducted to measure operational improvements and user engagement before and after the implementation of reGate, facilitating an objective evaluation of its impact on school portal operations.

Qualitative data will be collected from open-ended survey responses, feedback submitted through a “Feedback” section, and interviews with administrative staff and faculty. This approach will provide deeper insights into user experiences and potential issues not captured by quantitative data. Thematic analysis will be used to identify recurring themes such as usability challenges, system responsiveness, and overall user satisfaction. Reviewing feedback submissions and user comments will highlight common issues and areas for improvement. Interviews with administrators and faculty will provide valuable insights into the system’s impact on administrative processes and day-to-day operations. This qualitative analysis will complement the quantitative findings, offering context, explaining user experiences, and identifying specific needs and limitations.

By integrating quantitative and qualitative data, the analysis will deliver a holistic assessment of reGate's performance. Quantitative analysis will provide measurable insights into system performance, user engagement, and satisfaction, while qualitative findings will add depth, explaining user experiences and uncovering challenges such as usability and technical issues. This combined approach will ensure a nuanced understanding of the system's strengths and weaknesses, guiding recommendations to refine reGate and enhance the educational experience at Colegio de Montalban.

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