CAMARINES SUR
POLYTECHNIC COLLEGES
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CAMARINES SUR POLYTECHNIC COLLEGES
COLLEGE of
COMPUTER STUDIES

Chapter 1

INTRODUCTION

The chapter includes project context, purpose of the project, objectives, significance of the study, scope and limitation, and project dictionary. Each will be discussed separately.

Project Context

Education is a crucial component of human growth and has a big impact on how people's futures turn out. To create capable and useful members of society, a high-quality necessary. Educational institutions play a crucial role in ensuring that young people have the information and skills they need to succeed in their chosen careers and make a positive contribution to their communities.

Technology plays a vital role in society today, specifically in education, it enables people to have a better access to resources, information, and anything online. Knowing that technologies have been shape the educational advancement the way human act today. The institution of Masoli High School of Bato, Camarines Sur has been around for more than 50 years in academic learning services. Despite of the tecnological advancement in education, however, there are still institutions like Masoli High School that use manual processes in their day-to-day transactions and provide reports manually.

The school's manual and paper-based methods for keeping track students' data, class schedules, enrollment, and grading systems are among its major issues. The existing procedure takes too long and is prone to mistakes, which delays the release of crucial documents, results in incorrect grading, and causes schedule management issues. Not just Masoli High School but also in the other schools in the area and around the nation struggle with this issue.

In addition, schools have embraced hybrid and online learning models in response to current world concerns. This change has made it clear that a digital platform is needed to improve

and streamline school operations. To meet the needs of the school now and adjust to changing pedagogical approaches in the future, a web-based student-faculty portal is required.

The goal of this project is to develop a Web-based Student-Faculty portal that will be offer a productive and well-organize system for handling student records, class schedules, grading systems, and document requests. The technology will automate the manual procedures that are currently used, get rid of mistakes, and enhance interaction between administrators, teachers, and students. Masoli High School can now offer a more effective and efficient educational system that can cater to the requirements of its students and change with the times by implementing this system.

The project background describes the difficulties of Masoli High School currently facing and the requirement for a Web-based Student-Faculty Portal System interface to resolve these difficulties. The goal of the project is to develop a system that can automate manual procedures of the school, enhance communication, and adjust to the new norms in education. The project's setting emphasizes how crucial it is for educational institutions to have a productive and well-organize system may affect the learning outcomes of the students.

Purpose and Description of the Project

The goal of this project is to solve the issue of the ineffective and disjointed management of student records, class schedules, and grading systems now present at Masoli High School. This project intends to create a web-based student-faculty interface to manage student data in a more thorough and effective manner, saving teachers and administrators time and effort and enhancing the accuracy and trustworthiness of the data.

The web-based student-faculty portal intends to give students, instructors, and administrators a forum for productive collaboration. Students will be able to access instructional

resources through this platform, such as study guides, announcements, and crucial dates, which will improve their educational experience. Also, it will give teachers a better system for grading their pupils and keeping track of their progress, which will enhance their teaching experience.

What makes this project distinctive and innovative is its potential to create a digital platform that can integrate numerous school management operations in one system. It is also exceptional in that it may give students, teachers, and administrators access to a productive communication system. Masoli High School will lead the digital revolution of the Philippine education industry by creating a web-based student-faculty interface, giving its pupils access to a more effective and efficient educational system.

Objectives of the Project

The main objectives of this study is to develop a Web-based Student-Faculty Portal for Masoli High School. Particularly, this study aims to achieve the following:

1. To identify the present issues and constraints of the current manually procedure of Masoli High School in terms of;

    1.1 Enrollment

    1.2 Class Scheduling

    1.3 Grading System

    1.4 Request for documents

2. To create a Web-based Student-Faculty Portal that automate the process of gathering data and analyzing school forms.

3. To test the development system using black box testing in terms of:

    3.1 User Acceptance Testing

    3.2 Stress Testing

    3.3 Security Testing

Significance of the Study

The proposed system for Masoli high school, is to speed up and increase the operation of the school. So this study will be of great help to the following:

Masoli High School. This system improved the process of their transactions and distribution of documents, registration and grading system. This research helped them update to deliver response to students' transactions through SMS notification. In addition, this research helps the organization and reduces the time of transactions.

School Administrators. This project will give school administrators a thorough and integrated system for handling many areas of school administration, such as student records, class scheduling, promotion, and enrollment. As a result, their decision-making will be more informed, their productivity will increase, and the school's total services and educational offerings will be of higher quality.

Teachers. This study will give teachers a productive method for handling their class schedules, homework, and grading, allowing them to concentrate more on instructing and mentoring their students. They will be able to monitor their students' development and performance, which will help them in providing timely feedback and support that is appropriate for their pupils.

Students. Students will be able to quickly access their academic records, grades, schedules, and other crucial information thanks to this study, which can support their ability to stay informed and motivated in their academic endeavors. Also, it will offer a more streamlined procedure for promotions, enrollment, and other related chores, which can cut down on the time and effort needed to finish administrative operations.

Researchers. They would be able to take advantage of the system and become ready for enhance their abilities and demonstrate the knowledge they have acquired; how they will advance their career; could manage events in the real world with creativity and come up with reasonable solutions to challenges.

Future Researchers. Future researchers and developers working in the same sector can improve results by using this system as a valuable reference and manual. They can improve their own work and substantially advance the field if they take advantage of the knowledge and lessons learned via this method.

Scope and Limitations of the Project

This research includes the creation of an elaborate web-based student portal specifically designed for Masoli High School. The main goal of the portal is to improve and organize the institution's different academic and administrative procedures. The Enrollment, Class Scheduling, Grading System, and Request for Documents modules will make up the core of the Student Portal. It will act as a user-friendly and effective platform for students, teachers, and administrators to manage crucial activities connected to academic advancement and organizational tasks.The application of testing procedures, such as User Acceptance Testing (UAT) to make sure the system meets end-user expectations, Stress Testing to evaluate system performance under various loads, and Security Testing to protect the portal against potential vulnerabilities, is also a crucial component of this project. The system will also have a provision for sending SMS notifications when there are updates, ensuring prompt and efficient communication between the school and its stakeholders.

The web-based Student Portal has a lot of potential, but there are some drawbacks that must be understood. First, dependable internet access and appropriate infrastructure are crucial for the system's effectiveness. Users may experience issues accessing and utilizing the portal in situations of bad connectivity. Second, to ensure smooth navigation and maximize system efficacy, all users must get adequate training and orientation. The complete scope of development and implementation may be constrained by financial restraints. Although there will be security testing, it's crucial to understand that no system can be completely protected from cybersecurity threats,

necessitating continual measures to maintain system security. The study's focus will be on the mentioned modules, maybe neglecting other opportunities for the administrative procedures at the institution to be improved. Last but not least, despite being a useful tool for communication, SMS notifications may not be able to reach people who do not have smartphones or who live in places with poor cellular reception.

Project Dictionary

The following are the technical terms that is use and give meaning in this study. To provide a better understanding, operationally and conceptually definition are provided.

Black Box Testing. It is a method of software testing that looks at a program's functionality. System without being aware of its fundamental dynamics or organization [1]. These are referred to in this study as the methods for assessing the project's functionality.

Security Testing. Security testing is a sort of software testing that identifies vulnerabilities, hazards, and dangers in a software program and protects it from malicious intruder attacks. The goal of Security Tests is to detect all potential flaws and weaknesses in the software system that could result in a loss of information, revenue, or repute at the hands of the Organization's workers or outsiders [2].In this study, Security testing is refer as a process to examine the system to test how the system secured in any malicious things and vulnerabilities.

SMS API. SMS APIs enable to send or receive SMS messages quickly and easily through any website or application [3].In this study, API SMS is a tool that is being use to deliver responses to the clients transactions.

Stress Testing. Stress testing focuses on resilience, availability, and error handling under high load rather than what is correct behavior in normal circumstances [4].In this study, Stress testing is a one way test process to determine the availability and reliability of the system.

Student Information Management System. A management information system for managing student data in educational institutions [5].System for managing student information, activities involving student information, administrative procedures, and management skills.

User Acceptance Testing. User acceptance testing is a stage of software development in which the software is tested in the real world by its intended audience [6].In this study, User acceptance testing is a procedure in which target users participate in testing the system to validate it against the requirements.

Web-Based. Refers to the only usage of web browsers and internet technology for functionality and access, without the need for extra software installations. The study's objective of improving administrative and educational procedures by offering a user-friendly, broadly accessible system is consistent with the emphasis on web accessibility.

Notes

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Chapter 2

REVIEW OF RELATED LITERATURE AND SYSTEMS

This chapter includes a discussion of the synthesis of the state of the art along with a thorough analysis of both domestic and foreign literature and systems. Discussion is also had over the study's contribution to closing the noted research gap.

Related Literature and Systems

In this study, the researchers collected relevant literature, studies, and systems from various websites and journals. These sources served as the foundation for the project and were essential to completing it.

Grading Process Monitoring

There are several procedures involved in computing, recording, and monitoring grades in educational institutions. First off, teachers use homework, tests, and other evaluations to gauge their pupils' progress. They then input the grades into a computer program or online platform, depending on the type of system [11].In blended learning, students have some control over all of the content, tempo, location, and duration of their education. [9]. The study of Javer Borngo Online Grading System For Mindanao State University Maigo School of Arts and Trades [2020] is an online grading system to collect, process, and return grades produced by faculty members. It goes over the design requirements, features, and implementation of the online grading system, as well as faculty and student reactions. This system is shown to have several advantages over analog grading methods, including scalability, real-time feedback on the status of grading, the reduced potential for human error in compiling grades after submission, the ability to return both provisional and final grades to course faculty and students in a timely manner, and the ability to archive and export grading data for future use. [1, 5] Contrarily, the curriculum used in traditional face-to-face instruction is not transferable to blindfolded learning since the grades obtained will differ from

those obtained in traditional instruction. [10]. Also, technology is enabling every work, and the educational system is the one that benefits from the development of technology.

The grades are kept in a centralized database, which enables the school or establishment to keep track of each student's development and overall academic achievement. Teachers, administrators, and occasionally even parents can access this database via a secure login [4].In summarizing the collected data made from the respondents of the study is also an important necessity to consider. These are considered to be the body of the research evidences that can use by the researcher to evaluate its importance and to come up with his conclusions and recommendations. Gathering of the data analysis may always take several days to be collected. But most importantly, all of the statements and the data gathering principles should be followed by the researcher.

Grade System Performance

The current system of computing, recording, and monitoring grades has considerably automated and digitalized the educational system. This technique has made it simpler for educators to assess and document pupils' academic growth and track their performance over time. This system's capacity to rapidly and properly record grades, minimizing the possibility of mistakes and discrepancies that could happen with human grading, is one of its main advantages. As a result, teachers can give students feedback more promptly, which can enhance their learning outcomes.

According to Christopher M. Lee of Technological University of the Philippines, The E-Class Record from DepEd was used by me while working as a SHS Faculty in Diliman College - Quezon City for computing both the "Written Works" and the "Performance Tasks" grades of the ABM Students last Second Semester 2018-2019 in the subject Fundamentals of Accountancy, Business, and Management. According to the article the Information Software helped me in utilizing my class record reports effectively and accurately, and to generate an organized output-

based teaching class record that is mandatory for both the School and DepEd reporting requirements [4].

Barreno, Arevalo, Abundo, and Laput, a group of students who also studied the computerized grading system, creating a computerized grading system would make the process of recording and computing for grades much easier for teachers, as it would lessen the workload and stress for advisers and subject teachers and it would also be a convenience for students [2].Additionally, the centralized database produced by this technology makes it simple to track student performance, allowing instructors and administrators to find areas for improvement and offer tailored interventions to help kids who may be having trouble. Secondary advantages for the school's instructors and pupils include the ability to take a break from routine duties when the system does the work, an enormous productivity boost, and a cascade of positive effects on the students when calculation accuracy and teacher proficiency improve [2].

Also, a lot of schools and universities, like La Consolacion College Manila, University of the East, San Sebastian College, Far Eastern University, and San Beda College, employ the computerized grading system to compute grades and distribute grades to their students [7]. The universities and schools nearby Nazarence Catholic School use more contemporary methods for computing and publishing grade slips, demonstrating the dependability and effectiveness of an entirely electronic grade slip system [7]. Also, an excellent example of a public institution that computes and distributes its students' grades using a computerized grading system is the Pamantasang Lungsod ng Maynila.

Learning competencies are the "Knowledge, Comprehension, Skills, and Attitudes that Students Must Show in Any Lesson or Activity" compared to the previous curriculum, where MELC was reduced by 60%, leaving the student to concentrate on the most important subjects. [15].

Web Based Portal

A web-based portal is a website or web application that gives consumers access to numerous types of data and services through a single interface. Normally, a web-based portal is made to specifically address the requirements of a certain community or group, such as a company's employees, a school's students, or a professional organization's members. A web-based portal's functionality and content can be tailored to the unique requirements of the user group it caters to. A corporate portal might have features like personnel directories, payroll and benefit information, and project management tools whereas an educational portal might have elements like online course materials, student records, and discussion forums.

Web-based portals are easy and flexible ways to access information and services since they can be accessed from anywhere with an internet connection. They may also be made to be mobile-responsive so that they may be accessed from tablets and smartphones. The benefit of using web-based grading portal is that it will be useful for both student and teachers. A web-based grading technique should, in theory, wouldn't be any more complex or time-consuming than conventional pen-and-paper grading methods. Researchers believe that they developed a working model for such a device. However, there still a lot of progress to be made before this program can lead a successful [17]. Web based applications promote learning in many ways since are close to pupils' needs and interests. Web based applications are easy to access from everywhere, are easy to use and gives the opportunity to pupils to learn in an authentic way through real life-inspired activities[8].

An evaluation is then carried out to test the effectiveness of this information web portal for users in general. The contribution from this research is propose a web information portal with conceptual model that can be used for public community to increase the social awareness from society about RPTRA also can increase the engagement between community and public for social learning [16].

Class Management System

A class management system, usually referred to as a classroom management system, is a piece of software made to assist teachers in running their courses more effectively. The system often has a number of features that enable teachers to carry out a number of duties, including monitoring grades, communicating with students and parents, and exchanging instructional materials.From primary schools to colleges, class management systems are employed in a range of educational contexts. By automating repetitive operations like grading, they can save teachers time while also giving them useful information about the behavior and performance of their students. Depending on the requirements of the teacher and the educational institution, the characteristics of a class management system can change. While some systems may place a more emphasis on tracking attendance and behavior, others may offer features like gradebooks, discussion boards, and online assignments.

The ability to let teachers tailor the educational experience for each student is one of the major advantages of a class management system. Teachers can spot areas where students may be having difficulty and offer individualized guidance and feedback by keeping track of students' performance and behavior.It only takes a little time to create a comprehensive, quality solution for assigning a major improvement over manual labor. One of the effective features of CSS is its simplicity and Scalability, all of which are critical in the future growth of the system. Future work and correlations are needed for the Class Schedule System. The design and development of a smartphone application are also on the to-do list. Smartphone apps allow users to access the application at any time and from any place, even if they do not have access to desktop applications [12].

Classroom management (CM) is an important skill and a key competency that every teacher should learn and possess. It is one of the most important characteristics of teaching quality (Girardet, 2018; Mägdefrau, 2010) and a necessity to maximize the social and academic

achievement of students (Hudson, Voytecki, Owens, & Zhang, 2019). High CM competencies establish a positive climate, allowing teachers to implement effective in-class learning by monitoring and managing pupils' behaviours (Jackson, Simoncini, & Davidson, 2013) [21].

Scheduling System

A scheduling system is a piece of software created to assist people or organizations in using their time more effectively. Typically, the system has functions that let users make schedules, keep track of appointments and events, and set reminders. Depending on the requirements of the user or business, the characteristics of a scheduling system can change. While some systems may place a greater emphasis on project management and team scheduling, others may offer capabilities like calendar management, appointment scheduling, and automated reminders.

A scheduling system's ability to assist users in avoiding conflicts and making the most use of their time is one of its main advantages. Users can spot potential conflicts and adapt their schedule by keeping track of appointments and events. This can facilitate better work-life balance and stress reduction. All students could be tested at the same time and with the same number of test administrations within a school year. Alternatively, the decision for the number and frequency of such tests could be made by teachers based on their observations and personal judgments about students [19].

Today, computer technology is highly developed. It is very economical to use software technology to design a course scheduling system and let the computer complete this demanding and rigorous work. Common course scheduling systems mainly include hill climbing al-gorithms, tabu search algorithms, ant colony algorithms, and simulated an-nealing algorithms. These algorithms have certain shortcomings. In this re-search, we investigated the mutation genetic algorithm and applied the algorithm to the student's scheduling system. Finally, we tested the running speed and accuracy of the system. We found that the algorithm worked well in the course

scheduling system and provided strong support for solving the tedious scheduling work of the educational administration staff [3].

Web-Based Enrolment

According to design and implement an enrolment system through web based application intended for higher education institution in Zamboanga Peninsula amidst covid-19 pandemic. The functionalities of the system are guided using Use Cases identified during requirement phase. The existing system encountered several constraints on the process of the enrolment, especially in detecting conflict of course schedules and the availability of slots of the courses offered, handling large number of data, and in cases where modifications or errors in the program that need to be fixed[13].

The reliability and success of any organization such as academic institution rely on its ability to provide secure, accurate and timely data about its operations. Erstwhile managing student information in academic institution was done through paper-based information system, where academic records are documented in several files that are kept in shelves. Several problems are associated with paper-based information system. Managing information through the manual approach require physical exertion to retrieve, alter, and re-file the paper records. These are nonvalue added services results in data inconsistency and redundancy, currently institutions have migrated to web-based student information management system without considering the security architecture of the web portal [14].

The Student Academic Information System manages all types of data, including student grades and personal information. The performance of Kalinga State University Rizal's Student Information System is more effective and efficient in terms of delivering enrollment operations and maintaining student information records. Student Academic Information System (SAIS) is a student lifecycle data management system that covers everything from admissions to graduation

and alumni tracking, as well as curriculum, advisement, payment, and integration with the general ledger in the Financial Management Information System and employee records in the Human Resources Information System [22].

Student Information Management System

According to C K Gomathy., [2022],"Student Information Management System (SIMS), is a management information system for education establishments to manage student data. In the current system all the activities are done manually. It is very time consuming and costly. Our Student Management system deals with the various activities related to the students [Gomathy. 2022].

In order to provide this service we designed simple follow of the Students Information role Management System enter project which has various of modules which is helpful for the student administration to the of efficiently faculty manages them student's details. Keywords: - Student information management system, Student information activity, Administration process, Manging capability [20].

The International Journal of Computing Sciences Research, 3(1), 163-188..., this information e-learning module system is a web-based application designed to support the academic needs of both faculty and students, in particular to track learning progress [18].

According to Jiasi Huang, states that student information management as an effective countermeasure to ensure the quality and safety of the educational environment, the management of higher vocational colleges, combining information technology to construct a student information management system, student information management system, is an important subject of practical innovation research, which directly determines the internal management level of higher vocational colleges and the integration of students Quality. Generally speaking, the management of college students involves education, basic management, rewards and subsidies, employment and

accommodation, etc. As the overall work is more complex, it is difficult to implement informatization construction. [6].

Synthesis of the State-of-the-Art

The review of relevant literature and systems plays a crucial part in the synthesis of the state-of-the-art. Understanding the project scope, objectives, and possible contributions requires completion of this fundamental phase. The discussion that follows draws important conclusions from the systems and literature that have been evaluated, illuminating numerous facets of this dynamic topic.

Grading procedures have changed as a result of the widespread use of technology in educational institutions, particularly online platforms and computer programs. Teachers now have a potent tool for effectively tracking and monitoring student development in the form of automated grading systems. The benefits of this strategy are well-illustrated by notable examples like the Javer Borngo Online Grading System, including scalability, real-time feedback, error reduction, and seamless communication of grades to both educators and students. In the context of the educational landscape, the contrast between conventional face-to-face instruction and blended learning emerges as a crucial point of consideration. In order to adapt to changing pedagogical approaches and student preferences, blended learning, which gives students discretion over learning pace and material, makes use of technological improvements.

Administrators, instructors, and parents now have more control over keeping track of kids' academic progress thanks to the consolidation of grades into safe, centralized systems. This accessibility has been made possible by web-based portals with secure logins for authorized users. The gradual adoption of computerized grading systems by educational institutions has improved data management and accessibility. Digital grading systems also bring about a number of advantages, such as quick and accurate record-keeping, prompt feedback distribution, decreased

teacher workload, and increased student engagement. This tendency is demonstrated by tools like the E-Class Record, which compute grades, produce well-organized reports, and satisfy reporting requirements.

The use of technology to improve grading practices, expedite administrative tasks, support various learning models, and improve educational results holistically is highlighted, especially in the context of research reviews and system analyses. Efficiency, accuracy, and accessibility are fostered in the educational sector by the incorporation of digital tools and systems. This synthesis captures how integrating technology has led to an ongoing shift of educational practices.

Gap Bridged by the Study

This section presents the difference between the proposed system from the local and foreign studies and systems cited. The various related literature and studies cited reinforce the sense that the researchers found that the current study is unique in terms of the functionalities, features, and scope for it is dedicated to the automation of Enrollments, Grading, Scheduling and a web-based platform that collects information from different sources into a single user interface and presents users with the most relevant information for their context. This comprehensive system offers modules for Enrollment, Class Scheduling, Grading System, and Request for Documents and offers a consolidated platform for students, teachers, and administrators. Administrative tasks are streamlined, access to vital information is improved, effective communication is facilitated through SMS notifications, data management is improved, and system security is guaranteed through stringent testing procedures. The total efficiency and efficacy of school operations will be considerably increased by this initiative, which will eventually produce a more conducive environment for all parties concerned.

The Student Portal significantly improves how Masoli High School conducts its administrative and academic operations by addressing these crucial areas. As a result, the

educational institution becomes more effective and responsive. It also improves data management,

eliminates manual labor, and improves communication.

Notes

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Chapter 3

TECHNICAL BACKGROUND

This chapter includes the software development methodology to be use for the study by the researchers. Furthermore, it also include the research design, research methods including the instrument, respondents, locale or environment, the data gathering procedure, also, the statistical treatment. The generalization of the methodology will be also be going to be discuss in this chapter.

Software Development Methodology

The proponents provides an explanation of the connections between the chapters's various sections. Each chapter's section explains the fundamental research procedures and techniques for collecting data by updating the created web-based. Based on its effectiveness, the approach the researchers will employ in this study will determine the performance statistics of the created web-based system. In this study, the researchers will be using Scrum Methodology.

https://www.workamajig.com/b
log/scrum-methodology-guide
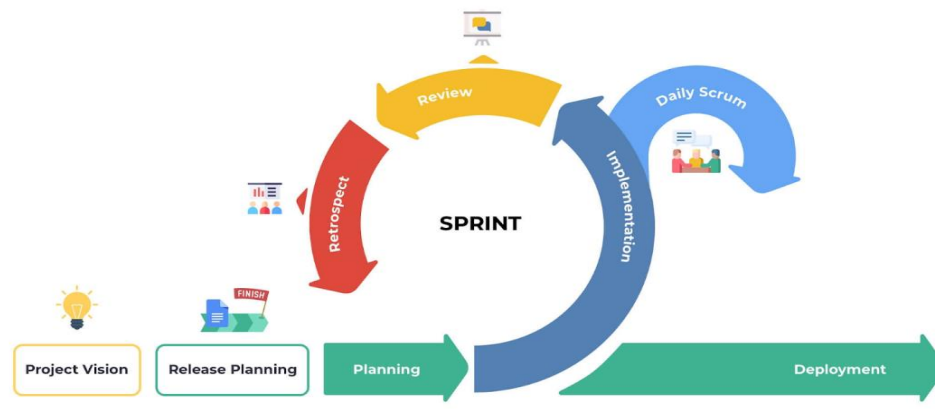
Figure 1: **Scrum Methodology**

Planning. Planning in detail is done during this stage. A thorough plan is created by project managers and teams, outlining the tasks, deadlines, resource allocation, and projected costs. It's

crucial for establishing expectations, outlining duties, and making sure the project continues on course.It's crucial to achieve predictability in software projects, lower the risks associated, and establish a baseline expectation for all stakeholders. In contrast to estimation, which is a technique for forecasting project-related variables like effort, scope, timeline, etc., planning places a lot of emphasis on preparation and forecasting [3].

Implementation. The project's actual work is completed during this phase. As tasks are completed and resources are allocated, the project moves closer to its objectives. It's the most active stage and needs close supervision to make sure everything is going as planned.The project plan must be put into effect during the implementation phase. In order to accomplish the goals of the project plan, the project manager will organize and lead project resources at this point. The project manager's role is to oversee and direct each action as it is carried out throughout the project [4].

Review and Retrospective. After the implementation phase, comes this stage. The project's performance, results, and progress are all reviewed. In groups, people evaluate what went well and what may be better. Learning from the project experience and making improvements for future projects are the main goals of the retrospective phase.Held after the conclusion of an iteration, such as a Scrum sprint or an OKR cycle, to make sure the team still recalls the most crucial occurrences and to enable learnings to be incorporated right away in the following iteration [5].

Deployment. Software development projects frequently have a distinct release phase. Preparing the software for deployment to end users or clients is involved. The software is prepared for use through quality assurance, testing, and final adjustments. The software is made available to its intended audience once everything is in order. The project's final deliverables must be prepared and given to the appropriate stakeholders during the Release phase, the last of the Scrum methodology's processes. Here, the group must make sure that their labor of love is repaid with a job well done [6].

Material and Statistical Tools

This section will be discussing the research design and research method in specific related to the objective of the study.

Research Design

The study design that will be used for this project is mixed methodologies that incorporates of quantitative and qualitative research approach. Mixed methods research can provide a more comprehensive picture than a single quantitative and qualitative study since it combines the advantages of both disciplines. [7] The researchers use mixed-methods research in this study. They gathered data through interviewing the respondents of Masoli High School Bato, Camarines Sur. It involves collecting of data and information. This study address the issue in manual processing specifically, in Enrollment, Class scheduling, grading system, and requesting documents. Which mostly can be lost when there are disasters happening. Based on that issues the researchers have the ideas what the purpose of their system performance have to be develop. It is the way to determine and analyze the system to create a better and functional system. A Web-based portal that can help to generate data and information processes with efficiency, reliability, and usability through using the black box testing.

Research Method

This section will be discussing the hardware and software tools, the instrument to be use, the data gathering procedure, the sampling technique, respondents and statistical test. The respondents of this study would be the Masoli High School the school head, teachers, the students and the parents.

Hardware and Software Tools

The list of the following are the hardware and software tools can help to the researchers to develop and utilizing the system using the hardware and software tools to fully accomplish the

functional requirement in developing the Web-Based Student-Faculty Portal for Masoli High School.

Table 1 presented the list of hardware tools and its specifications.

Table 1

HARDWARE TOOLS

Hardware Tools	Specifications
Processor	Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz 2.50 GHz
Motherboard	Intel Pentium® Dual Core or Higher
Wi-Fi 5	2.4GHz
Hard Drive	1GB or Higher
USB Mouse and Keyboard	Standard USB keyboard and Mouse
Mobile Phone	Android
Printer	Standard Printer

Table 1 shows the hardware tools that will be using by the researchers in developing and utilizing the system. The first tool is the processor. A Processor has a specification of Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz 2.50 GHz which provide instruction and processing power in controlling all the components in the system. Second is the Motherboard with its specification of Intel Pentium® with Dual Core or higher, followed by the Hard Drive with 1GB or Higher, Wi-fi5 with a specification about 2.4GHz is use for connecting every device needed in developing. USB Mouse and Keyboard with the specification of a standard are both importance in writing codes and commands in developing the system. Researchers will also be using a Mobile phone with its specification of android in accessing the system specifically for enrollment, viewing their grades and requesting documents. And lastly a printer with its standard specification for printing credentials and other documents.

The Table 2 presents list of the software tools and their specifications that will help to the researchers during the developing of the Web-Based Student-Faculty Portal for Masoli High School.

Table 2

SOFTWARE TOOLS

Software Tools	Specifications
Front-end Tools	HTML, CSS, JAVASCRIPT
Back-end Tools	Laravel Framework, PHP, MYSQL, XAMPP
Code-Editor	VISUAL STUDIO
SMS API	SEMAPHORE

Table 2 shows the list of the software tools that will be using the researchers in executing and developing the system. For Front-end tools the researchers will be using HTML, CSS, and Javascript for designing. For logical design for Back-end Tools the researchers will using a Laravel framework, PHP, XAMPP for executing programs and codes. And Mysql for database administration. This served as the storage location for all vital data required in the proposed system.

Code Editor. Researchers will be using Visual Studio IDE for a flexible starting point which can edit, debug, and write code. Visual Studio includes compilers, code completion tools, graphical designers, and a plethora of additional features to aid in software development in addition to the standard editor and debugger included in most IDEs.

Instrument

To collect all of the information needed for the study. The instrument would be used to gather data, and the researchers would conduct an interview, black box checklist and questionnaire.

Interview Guide. It serves as a manual for researchers conducting interviews. Direct communication between the teacher and student throughout the interview is helpful. A script is necessary for an interviewer to have as a reference. It is a strategy to assist the interviewer in knowing what questions to ask in stages, how to frame them, and when to ask follow-up inquiries. This would aid researchers in figuring out the issue with Masoli High School Bato, Camarines Sur's manual process.

Black Box via questionnaire. The researchers would use a Black Box checklist to evaluate the system's functionality in objectives number 3 in the study, used Black Box Testing Percentage scale serves as the guide for interpreting the response of the respondents regarding the functionality of the system based on black box testing in terms of use case and user acceptance testing. Table 3 show the black box testing scale wherein it has the range of the respondents being computed using percentage.

Table 3 show the black box testing scaling, which here could measure the level of functionality of use case testing and user acceptance testing.

Table 3

BLACK BOX TESTING

Range	Level of Functionality	Description
0.76 - 1.00	Highly Functional	The system was able to pass 76%-100% of the required functionality.
0.51 - 0.75	Moderately Functional	The system was able to pass 51%-75% of the required functionality.
0.26 – 0.50	Slightly Functional	The system was able to pass 26%-50% of the required functionality.
0.00 - 0.25	Not Functional	The system was able to pass 1%-25% of the required functionality.

This will make it easier to identify what needs to be done in the system. And could be determined here if the system passes the criteria given by the black box testing range. Testing would help a lot to find out if the system has errors and because of this, system errors can be prevented immediately.

In table 4 User acceptance testing is shown, which here could measure how to test the system through the test cases in the table. With its expected results, the results may vary from 0-1 which stated pass or fail. 0 as pass and 1 as fail. Each test case must have a expected results in which the results is only between this two pass (0) and fail (1). the results of the corresponding

test case will be the factor to determine if the system is up to the standard of the black box testing, user acceptance testing.

Table 4

USER ACCEPTANCE TESTING

Test Scenario	Test Description	Pass(0)	Fail(1)	Score
Part. 1 Admin				
Admin Log In	1.Enter username and password	• The admin is redirected to the admin dashboard	• The admin is not able to log in and an error message is displayed	
Create Teacher User	1.Create a new teacher user in the system	• The teacher user is successfully created and can log in to the system	• The teacher user creation fails or cannot log in with the created credentials	
Create Grade Level	1. Create a new grade level within the system	• The grade level is successfully created and appears in the system	• The grade level creation fails or does not appear in the system	
Create Section	1. Create a new section in a specific grade level	• The section is created and associated with the chosen grade level	• The section creation fails or is not associated with the chosen grade level	
Create Subject	1. Create a new subject in the system	• The subject is successfully created and visible in the system	• The subject creation fails or is not visible in the system	

Create Class list	1. Create a class list for a specific section	• The class list is created and contains the specified students	• The class list creation fails or the students are	
			not added to the list	
Manage Profile	1. Manage the admin's profile information	• The admin's profile information is successfully updated	• The profile update fails or the changes are not saved	
Create Scheduling	1. Set up a schedule for a particular event or task	• The scheduling plan is successfully created and implemented	• The scheduling plan creation fails or is not implemented in the system	
Accept and Process	1. Go to the "Accept and Process" section	• The requests or submissions are successfully accepted and processed	• The acceptance or processing of requests or submissions fails	
Add and Delete	1. Adding and deleting items or records should be handled correctly by the system	• The new record or item is successfully added, and the existing record or item is deleted	• The addition or deletion of records or items fails, or the changes are not reflected in the system	
Part. 2 Teacher				
Log In	1. Verify that the teacher can successfully log in to the system using valid credentials	• The teacher is redirected to the teacher dashboard	• The teacher is not able to log in, and an error message is displayed	

View Class List	1. View the list of classes assigned to the teacher	• The teacher can view the class list for their assigned classes	• The class list cannot be accessed or displayed properly	
Input Grades	1. Verify the functionality to input grades for students	• The grades are successfully inputted and saved for the	• The grade input fails, or the entered grades are	

		selected student(s)	not saved properly	
View Profile	1. View the teacher's profile information	• The teacher's profile information is displayed correctly	• The profile information is not accessible or displayed incorrectly	
Manage Profile	1. Verify the ability to manage the teacher's profile information	• The teacher's profile information is successfully updated	• The profile update fails or the changes are not saved	
View Scheduling	1. View the scheduling information for classes	• The teacher can view the scheduling information for their assigned classes	• The scheduling information cannot be accessed or displayed properly	
Input Attendance	1. Verify the functionality to input attendance for students	• The attendance is successfully inputted and saved for the selected student(s)	• The attendance input fails, or the entered attendance is not saved properly	
Part. 3 Student				

Log in	1. Verify that the student can successfully log in to the system using valid credentials.	• The student is redirected to the student dashboard.	• The student is not able to log in, and an error message is displayed.	
View Grades	1. Test the ability to view the grades for the student's classes.	• The student can view the grades for their classes.	• The grades cannot be accessed or displayed properly.	
View Attendance	1. Verify the functionality to view the attendance records for the student.	• The student can view their attendance records.	• The attendance records cannot be accessed or displayed properly.	
Manage Account	1. Verify the ability to manage the student's account settings.	• The student's account information is successfully updated.	• The account update fails or the changes are not saved.	
View Ranking	1. Test the functionality to view the student's ranking or position.	• The student can view their ranking or position in the class or school.	• The ranking information cannot be accessed or displayed properly.	
View Scheduling	1. Test the ability to view the class schedule for the student.	• The student can view their class schedule.	• The class schedule cannot be accessed or displayed properly.	
Request Report	1. Verify the functionality to request a report or document.	• The request for the report or document is successfully submitted.	• The request submission fails or is not processed properly.	

Table 4 shows the test cases may the system encounter. The table shows the test scenarios and test cases that is needed to be testing. the expected results, and status of the expected results are 0 and 1 that is interpreted as pass (1) and fail (0). and the fourth row is the score or the result of the test case that is to be testing.

In table 5 Stress testing is shown which here could measure the corresponding tasks that can perform its workload even it is simultaneously used by different number of users. In the table shows the different scenarios represents on the system that is to need to be testing.

The table include the requirements, test case, expected result, and the results that vary between the pass (1), and fail (0).

Table 5

STRESS TESTING

REQUIREMENTS	TEST CASE	EXPECTED RESULT	PASSED (1)	FAILED (0)
Login	Simulate a high number of users for logging in.	The system should handle a number of users logging in their accounts and provide an appropriate response.		
Enrollment	Simulate a high number of student enrollees.	The system should handle a number of enrollees and ensure that all enrollees are accepted.		
Class Schedule	Simulate a high number of classes, sections and grade level for scheduling.	The system should be able to schedule a numbers of grade level, sections, and classes as scheduled.		
Input Grades	Simulate a high number of students need to input of grades.	The system should be able to input grades correctly of students and manage the records.		
Request Documents	Simulate a high number of documents as requested.	The system should be able to handle a number of documents as requested of the students and a number of students whom request.		

Log out	Simulate a high number of users log out	The system should be able to handle a number of users perform log out.		

The Table 6 shows the level of the Security testing, if the system passed or failed the presented following requirements will be determined. On this table determine the requirements, test cases, and expected results.

The table above defines the requirements of the system, including the test cases where define the number of users on on how the system response to the a high numbers of users presented requirements for the system .

Table 6

SECURITY TESTING

Range	Level of Security testing	Description
2.40 - 3.00	High	the system was able to pass the three planted risk/threats namely (SQL injection, URL Manipulation, Privileged Elevation
1.70 – 2.30	Moderate	the system was able to pass the two out three planted risk/threats namely (SQL injection, URL Manipulation, Privileged Elevation
1.00 – 1.6	Low	the system was only able to pass the one out three planted risk/threats namely (SQL injection, URL Manipulation, Privilege Elevation

Security testing ensures the system is protected from hostile assaults, finds weaknesses, and assures regulatory compliance. It helps maintain system security by preventing illegal access and data tampering. Security testing is essential in protecting the privacy and integrity of sensitive information and preventing financial and reputational harm to a business. Security testing also detects and stops harmful software, ensuring that systems meet industry standards and are secured. In today's digital world, where cyber threats are growing more complex and common, it helps firms uncover flaws and strengthen their security posture. Regular security testing is crucial to

maintaining a safe system, staying ahead of emerging risks, and defending the system and its users from online threats.

Data Gathering Procedure

In order to gather the data that is being needed, the researchers will come up in conducting an interview to the respondents at Masoli High School to collect information about their issues in manual processing of the school. What others they need and what they want to improve in their manual processes and the performance of the system, it came up to what possible solutions can be needed to offer to solve the issues. Together with the administrators of the said school, the researchers organized the information and analyze the data they collected to determine what visible solution to the issues. These information and data collected serve as the bases in founding and improving new system to be develop.

Interview. It is a way to gather the necessary information in solving the problem. This where data gathering occurs by asking questions for much-needed information from the respondents verbally and directly. The respondents will be ask in an open-ended questions manner regarding the paper based method they use during transactions in the school. The opinion of the respondents will be vital to the researchers as they will give a whole new level of overview to the study as well as its output. This is the process of gathering information by having a direct conversation with the respondents of Masoli High School.

Sampling Technique

The sampling technique will be use is random sampling. Every person in this situation is chosen entirely at random, and each person in the population has an equal probability of being chosen. Assigning a number to each member of the population and selecting the members of the sample from a table of random numbers is one way to create a random sample. [7].

Respondents

The target respondents of this study will include the students and teachers of Masoli High School who were the main source of information of this study who were give an information to the researchers that is needed to develop the system.

The table 7 show the distribution of respondents from the locale by calculating the percentage using convenience sampling.

Table 7
DISTRIBUTION OF RESPONDENT

RESPONDENTS	POPULATION SIZE	SAMPLE SIZE
Student	580	236
Teacher	27	27
TOTAL	607	261

The respondent are the Student and Teacher of Masoli High School, Bato, Camarines Sur. It represents the selected respondents from the total population of the locale which has a total of 607 and the total of sample size is 261.

Statistical Test

The following statistical measures are used by the researchers to examine the study's overall findings.

Sampling Techniques. This formula was used by the researcher to calculate the sample size (n) for simple random sampling can be calculated using:

$$\boldsymbol{n = 1 + \frac{N}{1 + N(\frac{e^2}{N^2})}}$$

Where: n = represent the Sample Size

N = is the Population Size

e = is the desired margin of error

Arithmetic Mean. Arithmetic mean is often known simply as the mean. It is a measure of central tendency, and like all measures of central tendency, it simply involves taking the sum of a group of numbers. The sum of a collection of numbers is divided by the count of numbers in the collection. The arithmetic mean identifies the numerical average of all values in a data set.

$$A = \frac{1}{n}\sum_{i=1}^{n} a_i$$

Where:

A = Arithmetic Mean, n = number or values, = data set values

Notes

[1]   Figure.Scrum in Project Management: The Complete Guide. October 18, 2023.

https://www.workamajig.com/blog/scrum-methodology-guide

[2]   Scrum in Project Management: The Complete Guide. October 18, 2023.

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[3]   Agile Planning and Estimation - GeeksforGeeks. October 18, 2023.

https://www.geeksforgeeks.org/agile-planning-and-estimation/

[4]   17. Project Implementation Overview – Project Management – 2nd . October 18,

2023.   https://opentextbc.ca/projectmanagement/chapter/chapter-17-project-

implementation-overview-project-management/

[5]   Review vs. Retrospective, or both? Differences and similarities of . October 18,

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[7]   Simple Random Sampling | Definition, Steps & Examples. (n.d.). Retrieved

March 8, 2023, from https://www.scribbr.com/methodology/simple-random-

sampling/

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Chapter 4

RESULTS AND DISCUSSION

In this chapter, the analysis and interpretation of data gathered which were included in the discussion of the system process methodologies use contains the planning, implementation, development, testing, and deployment. This chapter focused on the system processes and models that represent the system process.

Identified Problems

The researchers identified the problem during the first stage of the system development, by conducting an interview to the clients. Based on the information gathered Masoli High School specifically the teachers on that institution suggest to automate the currently manual process of the transactions. With the problems that is being identified, the researchers can determine how to solve it in order to help the clients to automate the manual transactions.

In table 1 shown the problems that is being identified by the researchers through an interview to the clients. By determining the identified problems, the researchers can now propose a solution.

Table 8

PROBLEMS IDENTIFIED

Identified Problems	Description
1. Manual process of enrollment of the students	The teachers use written and manual recording to enrolled students.
2. Manually inputting the grades	The teacher's uses excel to input and record student's grades.
3. Manual process of requesting documents and other transaction	The students use over-the-office registry in requesting documents.
4. Scheduling of the class	The school head/administrators use written and manual scheduling class for teachers.

In table 8 shows the problems identified by the researchers are being listed, also the description that depicts what the identified problems were. Based on the data and information gathered by the researchers, the problems of the clients and of the school that is currently experiencing is the manual processes and transactions of enrollment, inputting grades, scheduling of the class, and the requesting of the documents and other transaction.

Proposed Solutions

To solve these problems of the clients of Masoli High School, the researchers develop a "Web-based Students-Faculty Portal for Masoli High School" that would help to the clients to automate the processes in the school, also to reduce problems and task that is currently encountered by the teachers and students of the school. With the proposed solutions, the identified problems by the researchers may help to the clients to solve the problems they encounter.

In table 9 shown the proposed solution by the researchers to the identified problems that the clients currently facing. With the identified problems, the researchers were able to start planning a solution on what is the best thing to do to make the proposed solutions reality in order to help the clients.

Table 9

PROPOSED SOLUTIONS

Identified Problems	Proposed Solutions
1. Manual process of enrollment of the students	The researchers develop a system that will automate the process of enrollment.
2. Manually inputting the grades	The researchers develop a system that will automatically inputting the grades.
3. Manual process of requesting documents and other transaction	The researchers develop a system that will automate the process of requesting documents and other transaction.
4. Scheduling of the class	The researchers develop a system that will automatically schedule the class for the teachers.

Table 9 shows the proposed solutions that the researchers came up with. Based on the identified problems. The researchers develop a system that will automate the process of enrollment, to automatically inputting the grades, automate the process of requesting documents and other transaction, and to automatically scheduling the subjects for the teachers.

Operational Feasibility

How well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirement analysis phase of system development. [1] Were used to determine operational feasibility. To interpret the operational feasibility the researchers developed a functional

Decomposing diagram. [2]

Operational feasibility means the ability to fulfill the objectives of a project by utilizing the allocated resources appropriately. It helps to identify possible project problems and how to fix them. [3] This assessment involves undertaking study to analyze and determine whether -and how well-the organization's needs can be met by completing the project. [4] The proposed system was design to make it easier and reality for services, and transactions and other they needed that has scope of the system. The researchers develop a fishbone to further illustrate how to solve the identified problems. With the fishbone, the researchers can identify the effect or the issue at hand, where it can be solved efficiently.

Fishbone Diagram

Fishbone diagram is a visual aid classifying a problem's possible origins. This technique is used to determine the underlying causes of issues. A fishbone diagram combines the technique of brainstorming with a form of mind map template, and is frequently used for root cause analysis. The name comes from "Kaoru Ishikawa" the diagram likewise called "Ishikawa diagram" that is known as fishbone diagram, which much look like a skeleton of a fish. Fishbone diagrams are

typically worked right to left, with each large "bone" of the fish branching out to smaller bones, each containing more detail.[5] The "fish head" of a fundamental fishbone diagram frequently represents the hassle that needs to be resolved, and the reasons for the impact are indexed alongside the bone.
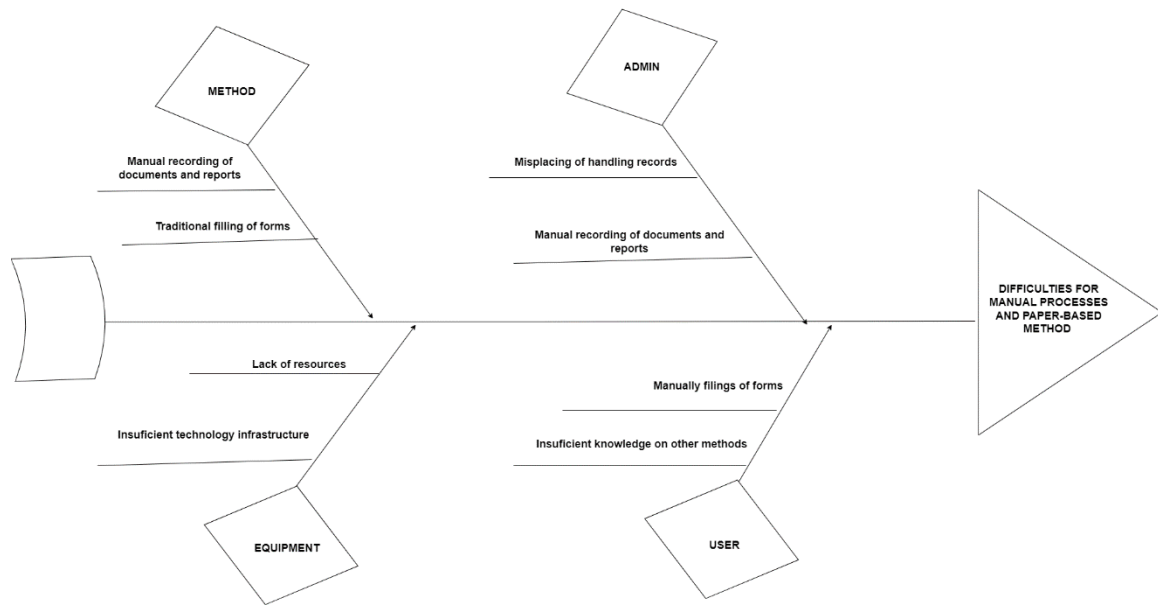
Figure 2: **Fishbone Diagram**

Figure 2 showed the Fishbone Diagram, the problem, human, method, environment, and equipment. Each of this has a problem and issues that needed to seek an attention to resolve these kinds of issues.

The researchers use fishbone diagram to determine the roots and causes of the problems and issues given on each component, which help to the researchers in developing the "Web-based Student-Faculty Portal for Masoli High School". By that, the researchers can point down the problems needed to resolve for the system they need to develop.

Functional Decomposition Diagram

The system's functionalities is included in the functional decomposition diagram. An FDD is a graphical representation of the system hierarchy and the relationship between components. [6] It also showed how to use the system's functions. It featured a thorough explanation of the "Web-based Student-Faculty Portal for Masoli High School".

The functional decomposition diagram served as the systems blueprint, focusing on the overall functions of each entity once the program was implemented. Functional decomposition relates to the multiple functional linkages based on how the initial complicated business function was established. It primarily focuses on how the overall functionality was constructed and how different components interacted in one another. The diagram illustrates on how to present the structure of an organization in a single page where it considers when designing.
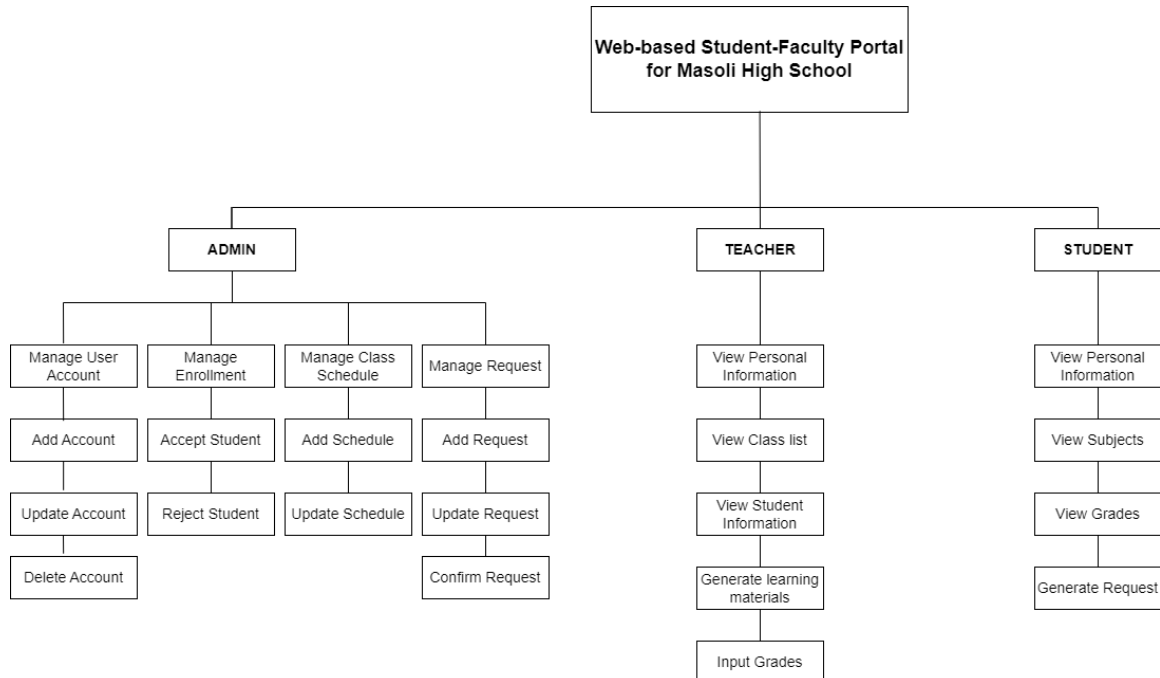
Figure 3: **Functional Decomposition Diagram**

Figure 3 depicts the functional decomposition diagram, which aids in explaining the systems scope and conclusion. As a result, the user has prior knowledge of how the system operates and what user has access in the system. The purpose was to demonstrate the organizational capability on a single page that is necessary to consider while creating the architectural framework. It is simple to build a model of what an organization accomplishes quickly by looking to its capabilities from a functional standpoint.

Technical Feasibility

Technical feasibility involves evaluating in detail the technical requirements, constraints, and capabilities of the proposed solution/process to develop, implement, and maintain it within the given constraints and available resources [7]. Incorporating technical challenges and unknowns associated with the design and operation of a technology, the technology's reliability, the ease of conducting extra corrective activities, and the capacity to monitor the system's efficacy.

Compatibility Checking (hardware/software and other technologies)

The hardware tools that was used by the researchers in developing and utilizing the system. The first tool is the processor. A Processor has a specification of Intel(R) Core (TM) i5-6300U CPU @ 2.40GHz 2.50 GHz which provide instruction and processing power in controlling all the components in the system. Second is the Motherboard with its specification of Intel Pentium® with Dual Core or higher, followed by the Hard Drive with 1GB or Higher, Wi-fi5 with a specification about 2.4GHz is use for connecting every device needed in developing. USB Mouse and Keyboard with the specification of a standard are both importance in writing codes and commands in developing the system. Researchers will also be using a Mobile phone with its specification of android in accessing the system specifically for enrollment, viewing their grades and requesting documents. And lastly a printer with its standard specification for printing credentials and other documents.

Also, it includes software tools that was used by the researchers in executing and developing the system. For Front-end tools the researchers will be using HTML, CSS, and JavaScript for designing. For logical design for Back-end Tools the researchers will using a Laravel framework, PHP, XAMPP for executing programs and codes. And MySQL for database administration. This served as the storage location for all vital data required in the proposed system. For Code Editor. Researchers will be using Visual Studio IDE for a flexible starting point which can edit, debug, and write code. Visual Studio includes compilers, code completion tools, graphical designers, and a plethora of additional features to aid in software development in addition to the standard editor and debugger included in most IDEs.

Table 10 depicts the hardware and software tools that the researchers was used during the development of the system.

Table 10

HARDWARE AND SOFTWARE TOOLS

Hardware Tools	Specifications
Processor	Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz 2.50 GHz
Motherboard	Intel Pentium® Dual Core or Higher
Wi-Fi 5	2.4GHz
Hard Drive	1GB or Higher
USB Mouse and Keyboard	Standard USB keyboard and Mouse
Mobile Phone	Android
Printer	Standard Printer
Software Tools	
Front-end Tools	HTML, CSS, JAVASCRIPT
Back-end Tools	Laravel Framework, PHP, MYSQL, XAMPP
Code Editor	VISUAL STUDIO

Table 10 shows the list of the hardware and software tools with each specification for the compatibility of every tools that was used by the researchers in developing the "Web-based Student-Faculty Portal for Masoli High School". it includes Processor, Motherboard, Wi-Fi 5, Hard Drive, USB Mouse and Keyboard, Mobile Phone, and printer. For software tools, Front-end Tools, Back-end Tools, and Code-Editor.

Relevance of the Technologies

The relevance of the following technologies hardware and software tools to the system were the researchers used during the development of the system has an important role in developing the "Web-based Student-Faculty Portal for Masoli High School" it has a significant role to make this system reality. Each of the hardware and software tools are used to develop features of the system. Hardware tools include processor, motherboard, wi-fi 5, hardrive, USB, mouse and keyboard, mobile phone, and printer were researchers used to start the development of the system while software tools include front-end, back-end, and code editor were used for coding or programming and designing interface of all feature and function of to the system.

Schedule Feasibility

One of the most used frequently for listing task is the schedule feasibility, it use for listing task to do during planning, developing, and implementing the proposed system. Were applied in "Web-based Student-Faculty Portal for Masoli High School".

Schedule feasibility, is a likelihood wherein the project will be completed by the planned due date, with the effort of the researchers to conduct a questionnaire to their respondents to gather more additional information or data to be added of the information needed also for monitoring the system daily to improve it.

The researchers used the schedule feasibility to list the task to do, to plan it and also to determine how long it would take for developing the system. Some tasks have a specified initialization

deadline. Setting time and date objectives for the development of the system was essential. It was crucially created by the system's development before meet the deadline.

Gantt Chart

A project management tool assisting in the planning and scheduling projects of all sizes; Gantt chart defined as a graphical representation of every task against time [8]. The project manager use gantt chart to track schedule for the whole duration of the project to monitor the progress.

Figure 4 shows the time setting of every task by which the system was completed. The Gantt chart monitor the completion time of the whole system with the document according to its expected or target date of accomplishment. The Gantt chart will organize the level of progress based on the goal and tasks completed. With the Gantt chart, project managers are able to monitor the progress.

TASK	August				September				October				November				December				January			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Planning																								
Identified Problems	GC	GC	G																					
Proposed Solution			GC	GC	C																			
Schedule Feasibility					GC	G																		
Operational Feasibility						G	G										GC	GC						
Technical Feasibility							GC	G																
Requirements Modeling									GC	G														
Data & Process Modelling									GC	GC	G													
Object Modeling									G	G														
Risk Assessment Analysis										GC	GC													
Data Design										GC	GC							GC	GC					
Coding										GC	GC										GC	GC	C	
Implementation and Development																								
Output and User Interface Design					GC	GC	GC	GC	GC	GC	GC	GC	GC											
Hardware Specification					GC	GC	GC	GC	GC	GC	GC	GC	GC											
Program Specification					GC	GC	GC	GC	GC	GC	GC	GC	GC											
Testing																								
User Acceptance Testing													GC	GC	GC	GC								
Stress Testing													GC	GC	GC	GC			G	G				
Security Testing													GC	GC	GC	GC			C	C	GC	GC	GC	GC
Deployment																								
Deployment Diagram																					C	GC	GC	GC
Legend		**Goal**			**Completed**																			

Figure 4**: Gantt Chart**

Figure 4 shown the schedule's step process of the research through the Gantt chart. The researchers started developing a strategy for doing the research. Gathered information through mock interview, and a survey questionnaire to establish the proposed system. After developing a plan, the researchers proceed with identified problem, proposed solution, operational feasibility, technical, requirements modeling, data and process modeling, object modeling and risks assessment analysis. During the implementation and development stage, the researchers started to do the output and user interface, data design, software, hardware and program specification. In testing stage researchers started to test the system using black box testing, namely user acceptance testing, stress testing, and

security testing to make sure that no errors or bugs in the system as well as to secure the information inputted of the users.

Requirements Modeling

The supervision of the system's components from input, process, output, performance*,* and control was parted in the requirements modeling. For further understanding the process of the developed system, this is also includes object modeling to show the actions conducted after the system creation. Teams await for making use of, caring for, or consequences from the solution.

Input. To log in, user must enter a username and password in order to send and received service request. If there is encountered some error, the administrator can modify the input data.

Process. Users need to input the registered account on the log in page of the website to access it. After the successful log in input data, Users request was fulfilled using the system. Moreover, it processed data request and manage user account.

Output. It has the ability to arrange user input data and display some user specific information. The expected outcomes from the user are the Web-based Student-Faculty Portal for Masoli High School notification and confirmation logs. Users are taken to the home page of the website after logging in.

Performance. The system can quicken the process, it makes the services much easier, and make the responders' difficulties less severe. It was also capable of archiving information from the completed transaction.

Control. The system prevents unwanted access to the system and guarantee the confidentiality of the systems database, the system provides login security. This ensures that all information is gathered in a single secure location where only authorized users may access it. With control, user confidentiality is protected.

Data and Process Modeling

The system analyst are used tools and technique for data and process modeling to make it easily understand the representation of data flow and process that were set throughout the development of the system. This executed as the guide to easily determine which processes and flows were crucial to the project, resulting in a design of how the system should be built.

Context Diagram

Context diagram depicts the relationships of the various internal entities and the system. The system describes its circumferences and anything that interacts with it. The context diagram defines the boundary between the systems and its environment, illustrating how entities interacts. A context diagram shows the process and flow of the whole system.

Figure 5 illustrate the context diagram, which shows the overall functions of the admin, teachers, and the student.
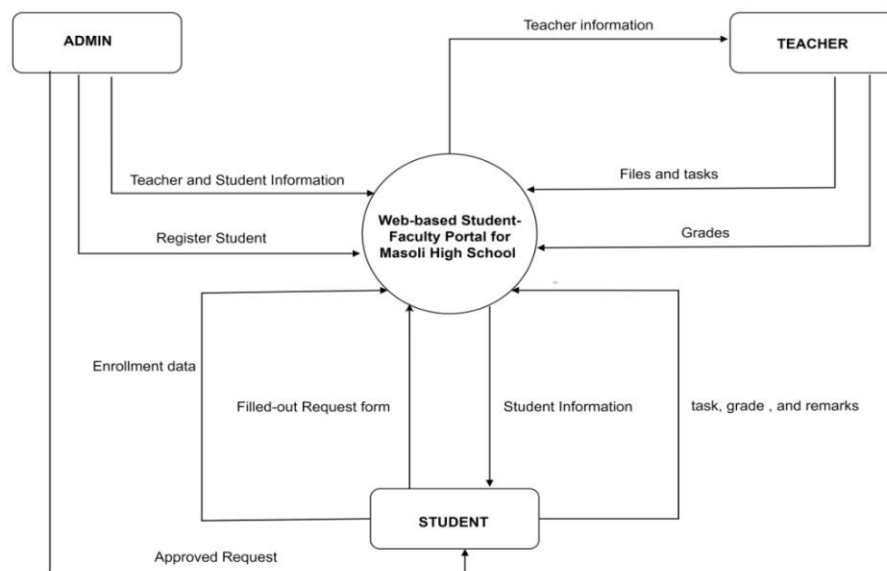
Figure 5: **Context Diagram**

Figure 5 shows the Context Diagram of the Web-based Student-Faculty Portal of Masoli High School. The context diagram has three components, external entities, data flows, and system processes. In the diagram the admin can input teacher and student information on the system, can

register student, and approved request of the student. The teacher can view his or her information on the system, upload files and tasks for their students and can input grades of the student on the system. The student can update his or her enrollment data and filled out request form on the system, also they can view their personal information and view their tasks, grades and remarks.

Data Flow Diagram

The process or system's information flow depicted in a data flow diagram. It contains the numerous sub process the data flows through, data inputs and outputs, and data stores. Standardized symbols and terminology are used to connect DFDs in order to define diverse. This is used how to visually show how information moves through a system or process.

Data flow diagram as seen in Figure 5. Shows the graphic representation. It includes the numerous data, outputs, and stores that the data flow through. login, manage users, manage enrollment, manage class schedule, manage grades, manage request, and manage SMS text or send notification are the six modules that make up data flow diagram level 0.

The researchers present and illustrate data flow diagram level 0 in order to understand the readers about the whole flow of the system Web-based Student-Faculty Portal of Masoli High School. In the diagram include admin, teacher, and student. Wherein, the admin can access and manage users, enrollment, manage class schedule, manage request, and manage SMS text or send notification, as well as the teacher can manage grades of the student. The student can view grades, and request transaction.
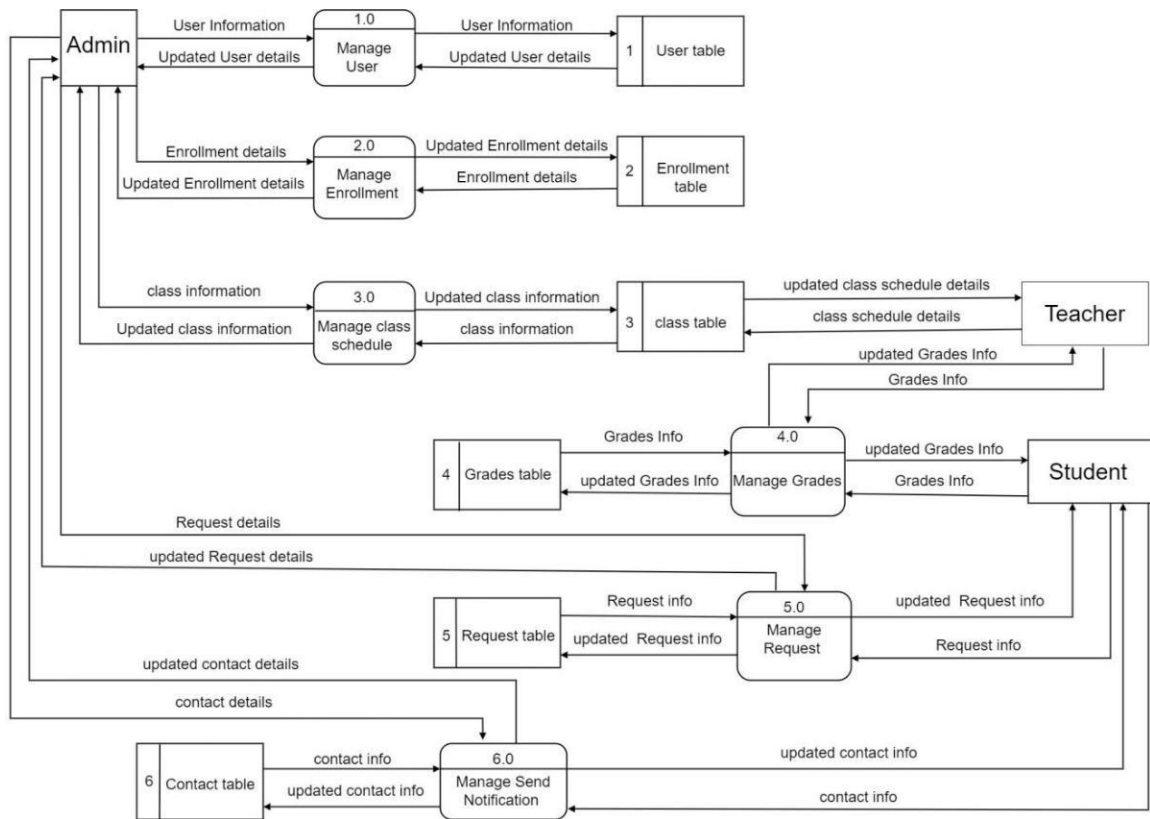
Figure 6: **Data Flow Diagram Level 0**

Figure 6 shows the Data Flow Diagram Level 0 of the Web-based Student-Faculty Portal of Masoli High School. It shows the overall data flow processes of the system and the relation of each modules with the other. It shows the flow of every users, the admin, teachers, and the students. Also showed in the diagram the level 0 of data flow at which the admin handles accounts as well as the types of users- teachers and students who are able to access the register, login and out that include in managing the users in module 1.0, module 2.0 the managing of enrollment, module 3.0 the process in managing class schedule, module 4.0 the process in managing the grades, in module 5.0 the process in managing the request, lastly module 6 the process in managing in sending notification and subsequently, it displayed each level's saving in the database of the system.

Figure 7 illustrate the Data Flow Diagram Level 1- Manage Users of the system Web-based Student-Faculty Portal for Masoli High School. It also include in the process the user table adding

users, update and delete users wherein the admin have access this data flow. It shows in the diagram the processes of user information details and updated user information details.
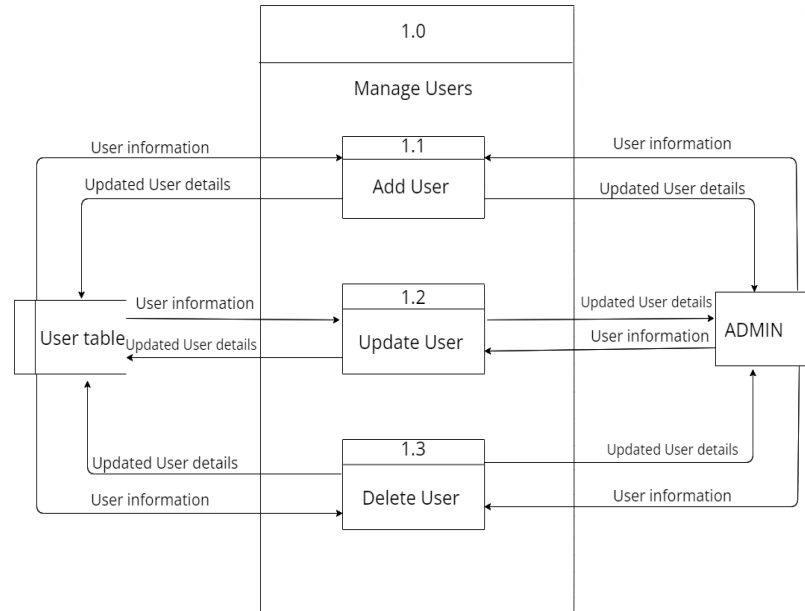
Figure 7: **Data Flow Diagram Level 1- Manage Users**

Figure 7 shows the level 1 data flow diagram of the system Manage Users wherein the admin can add users, update, and delete users and how they manage their corresponding roles. The diagram would further help the users comprehend how the process in the systems works. In the diagram showed the admin can add user information and updated user information from user table, as well as delete user information.

Figure 8. Shows the level 1 data flow diagram for the Enrollment of the students and also the procedure, process, and functions of the systems inside the data modules. In this diagram depicts the system's operation, including how data information processed.
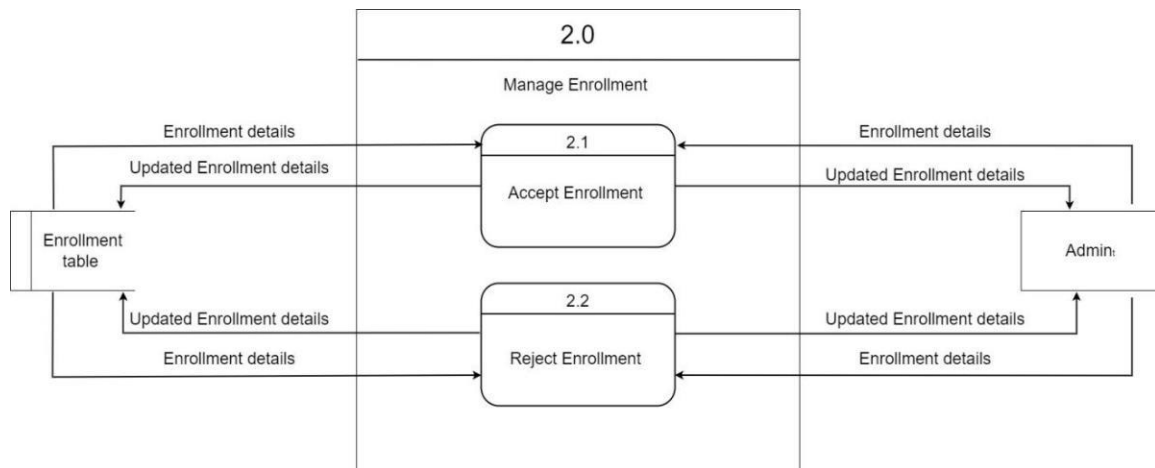
Figure 8: **<u>Data Flow Diagram Level 1- Manage Enrollment</u>**

Figure 7 present the Level 1 Data Flow Diagram of the system for managing the enrollment process wherein; the user may enroll. The process would be managing enrollment details on the system and once the admin viewed the enrollment details of the student they can now accept or reject the student for enrolling, aforementioned for the enrollment admin can promote of the old and new student.

Figure 9 shows the data flow diagram level 1- class scheduling section. Wherein the admin only has access on this part of this module. Admin can manage assigned class schedule, the admin can assign teacher on that particular subjects, grade-level and class sections. Also this module include class table, add schedule, and update schedule.
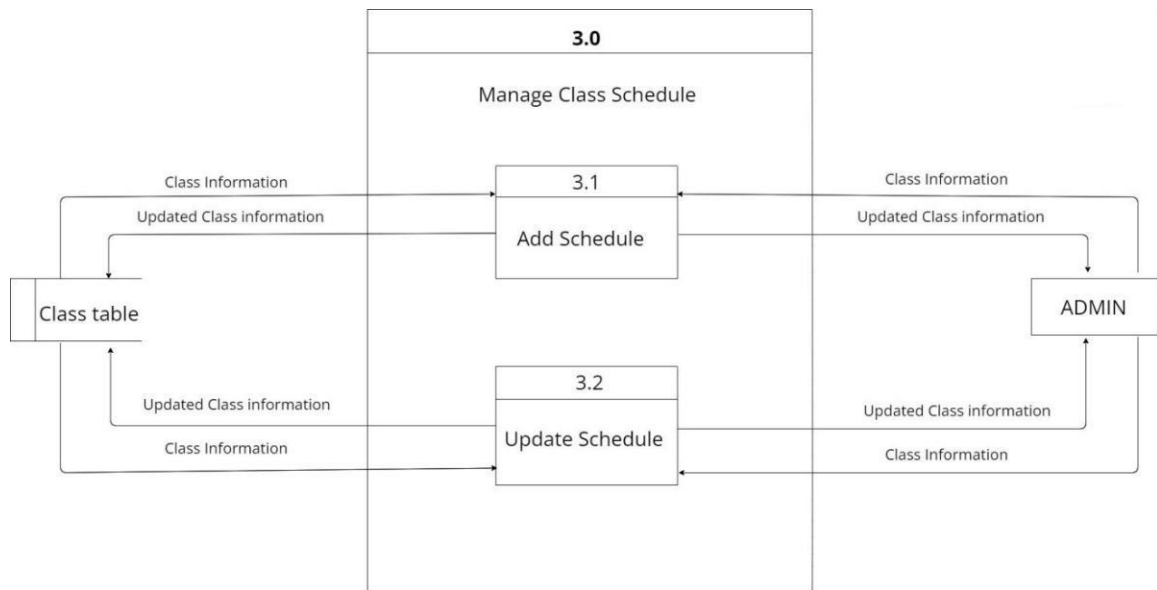
Figure 9: **Data Flow Diagram Level 1-Scheduling**

Figure 9 shows the Data Flow Diagram Level 1- Manage Class Schedule. In this section depicts the process how the admin manages class schedule wherein, it assigned teacher on that particular class, grade-level and subjects. In the diagram above shows class table where it can add class information on add schedule or in the system were it access by the admin wherein, admin can update schedule class information.

Figure 10 shows the data flow diagram level 1- manage grades. In this section depicts on how the system process and manage student's grades. The diagram below include teacher, students, grades table, view grades, update grades, and delete grades. The diagram helps to comprehend the processes in managing student's grades.
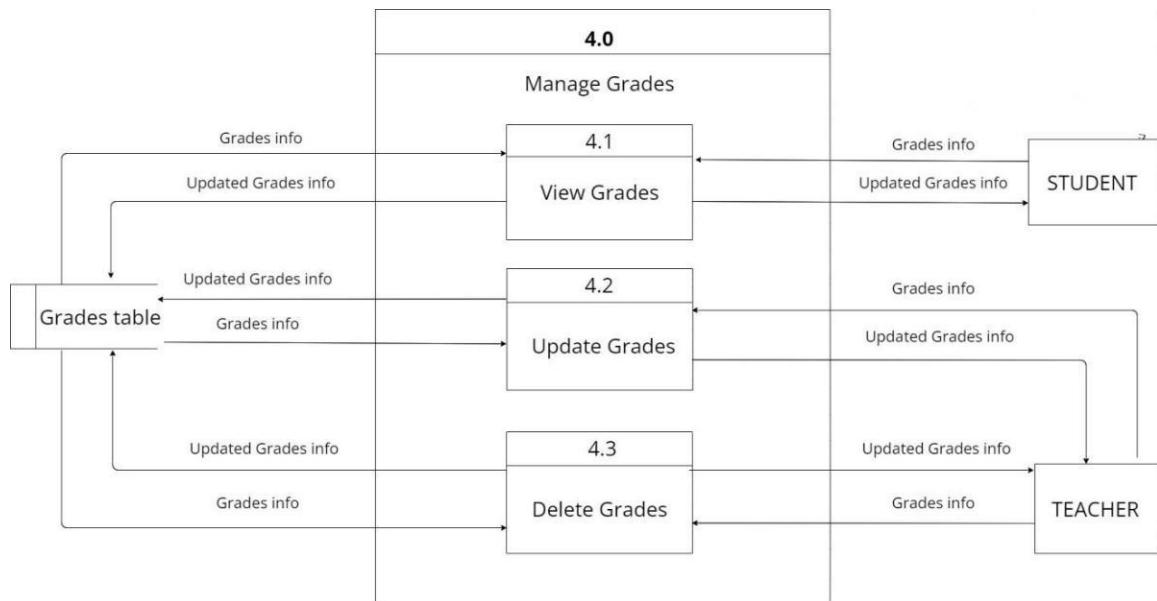
Figure 10: **Data Flow Diagram Level 1- Manage Grades**

Figure 10 shows the Data Flow Diagram Level 1- Manage Grades. In this section depicts the process of managing grades of the students.

In the diagram above presented the process of the student's grade. It includes the grades table, view grades, update and delete grades, student and teacher. Also, the process includes grades information, updated grades information which can be store on database were teacher input the grades othe two individuals which are the teacher, and student. All the information of teacher and student would be stored and monitor by the admin and also monitor the transactions.

Use case Diagram

Use case diagram is merely outlines and illustrates the relationship or interaction between clients or customers and the systems or an application's service providers. It describes various operations a system carries out in correct with one or more users of the system to accomplish a goal.

Figure 11 shows the use case diagram of the Web-based Student-Faculty Portal for Masoli High School wherein, the figure depicts the sequence of actions of each actor or users of the system.
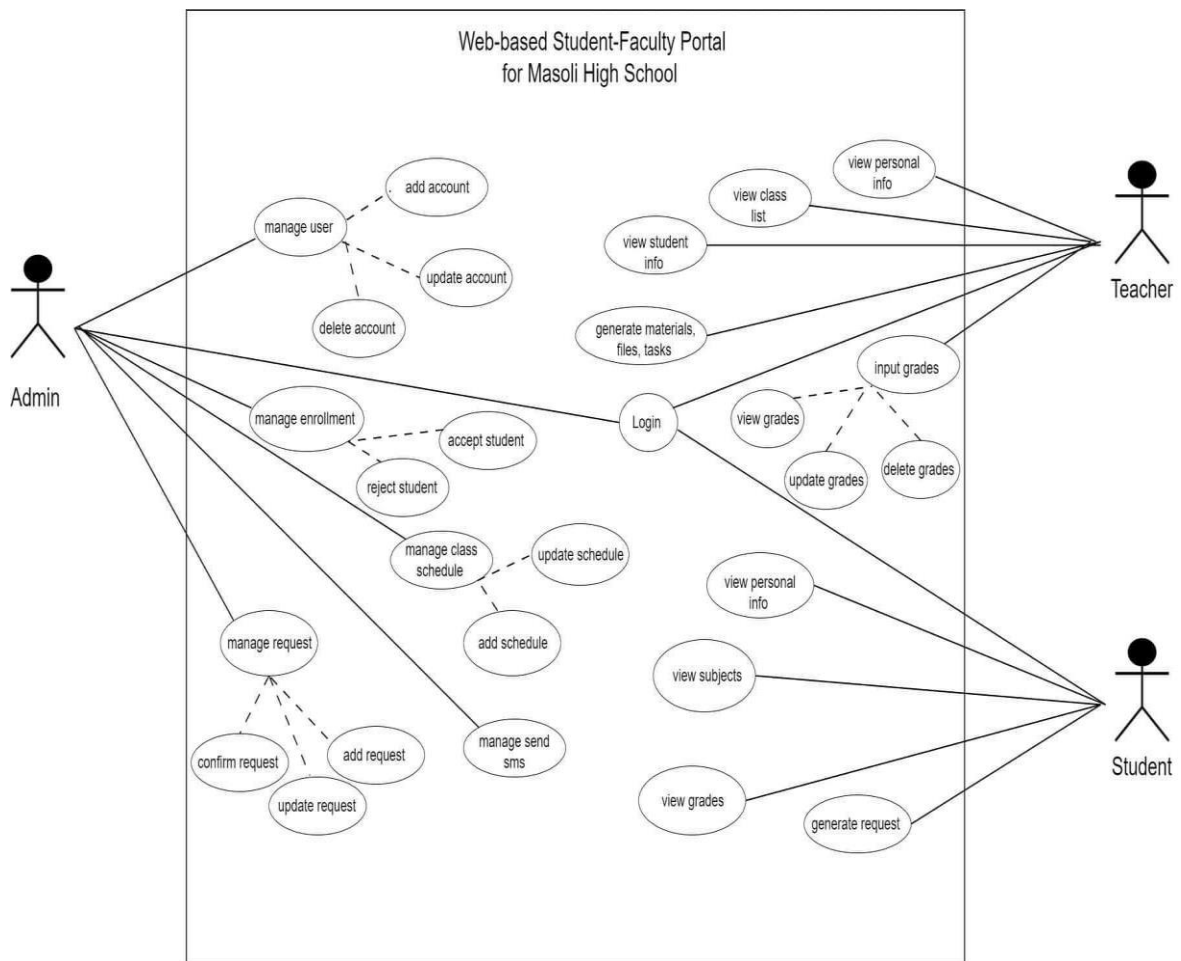
Figure 11: **Use Case Diagram**

Figure 11 shows the use case diagram of the system "Web-based Student-Faculty Portal for Masoli High School", wherein, the systems main actors were users such as the admin, teacher, and student. Where all of actors can access the same login page. Only the admin can manage user including add, update, and delete account. In managing enrollment also, admin can accept and reject student. manage class schedule, admin can add and update schedule, manage request including add, update, and confirm request. Teacher can only input grades for their students, view their profile, generate learning materials, and view class list. The student can view personal info, view subjects, view grades, and generate request.

Figure 12 illustrate the Sequence Diagram of the Admin, with the illustration, it is expected that the reader will be able to understand the process for admin.

By showing the sequence diagram reader can easily identify and understand the process on the system for admin. It shows the flow wherein the admin knows the first thing to do to access the system.

The admin allows to process the gain access of information of the two individuals which are the teacher and student. Admin has its own process to be manage on the system which include updating account, managing enrollment, class schedule, transactions, and SMS notification.
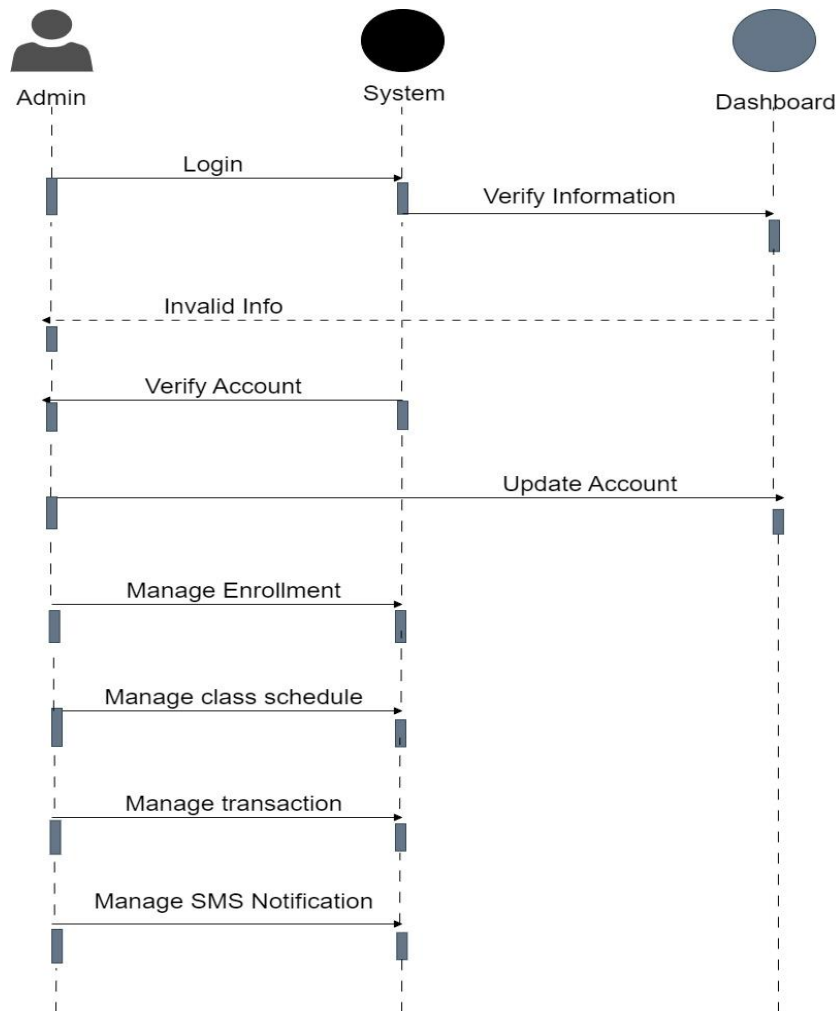
Figure 12: **Sequence Diagram-Admin**

Figure 11 shows the Sequence Diagram of the admin. This diagram shows the process of admin can do with the system. Admin needs to login on the system and he or she allowed to update accounts, manage enrollment, manage class schedule, manage transaction and manage the SMS notification .

Figure 13 illustrate the Sequence Diagram of the teacher, with the illustration, it is expected that the reader will be able to understand the process.
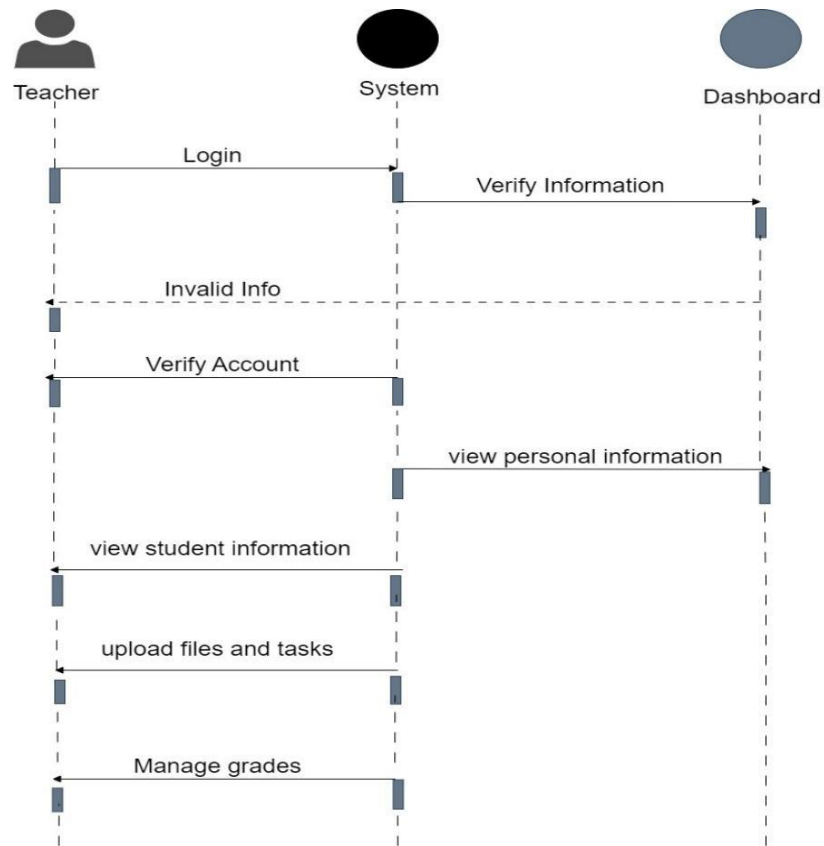
Figure 13: **Sequence Diagram-Teacher**

Figure 12 shows the Sequence Diagram of the teacher. This diagram shows the process of teacher can do with the system. Teacher needs to login on the system and he or she allowed to view their personal accounts or information, view student information, generate or upload learning materials like files, and tasks, and input student grades by modify and delete grades.

Figure 14 illustrate the Sequence diagram of the student. The diagram shows the process or flow of the system.
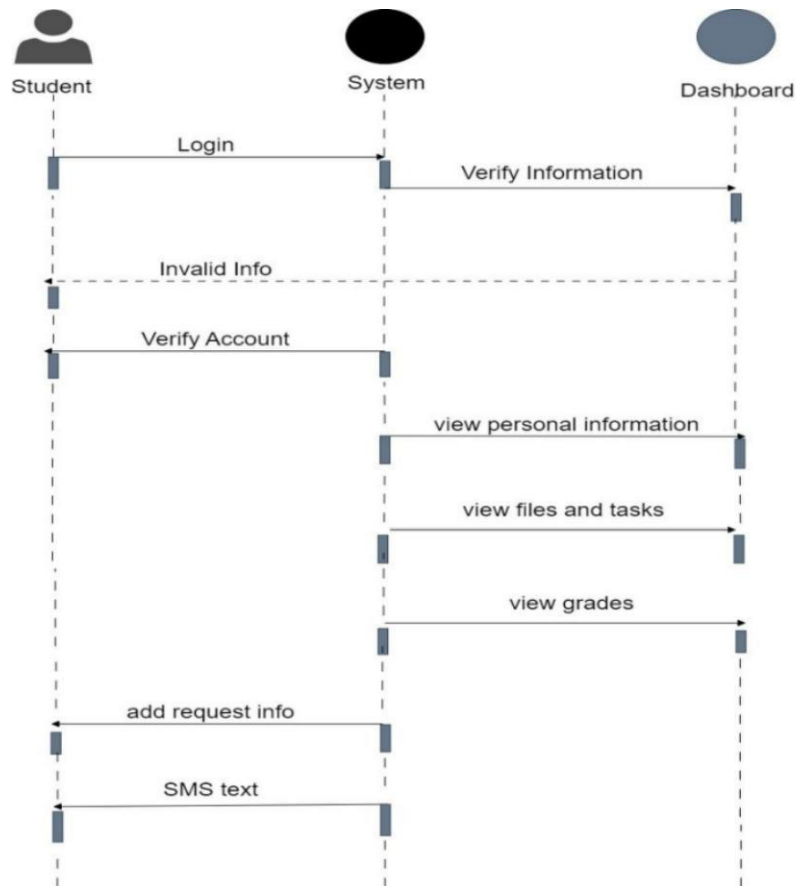
Figure 14: **Sequence Diagram-Student**

Figure 13 shows the Sequence Diagram of the student. This diagram shows the process of student can do with the system. Student login their accounts, allowed to view their accounts or personal information, view the uploaded learning materials, grades, and generate request, and received SMS text for the update of their transactions.

Risk Assessment Analysis

The proposed system contained a risk analysis technique; statistics were utilized to calculate the risk. The proposed system's likelihood and probable future states in order to reduce any undesirable outcomes unforeseeable complications in the future. If there is an excess of data or a system fault occurs, System performance and response time may degrade. To address all potential threats, the Risk assessment or analysis should be considered by researchers. Power

interruptions are unexpected event that cannot be avoided to an unanticipated power loss, the supply will be a good source of current. As a result, some data may be lost. The system's user would be able to save the currently displayed data. Modified state. The application should provide a system backup for system response as well as a restoration option.

Implementation

The implementation stage is related to the execution of the tasks and activities to create a project's product. These activities include creating the various deliverable s, conducting Daily Stand up Meetings, and grooming (i.e., reviewing, fine-tuning, and regularly updating) the Product Backlog at regular intervals [12]. This stage is where the development team discussed and implement a design that brings out logic and structure to the system and allows to avoid of unnecessary complexities and redundancies.

In this stage, the researchers started to implement a design the user interface and made a prototype of the system. Figuring out possible solutions to spikes, and identified the essential tools, programming language, syntax libraries, and basic frameworks.

Output and User-Interface Design

This section detailed the development of the system were was easily comprehend and navigated through its systems various aspects. The design is very simple and it has a framework for web-based student-faculty portal for Masoli high school.

Forms. Form is a window or screen that contains numerous fields, or spaces to enter data. It is referred to a graphical user interfaces (GUIs) that allow users to engage with the system. It allows users to enter, change and view the data in a database table.

Each form requires different information by reading the detailed explanations for each type. These documents are necessary for the system because this includes information to regulate user's

registrations. These documents can also be used to instruct users on how to utilize the system. System explanations and images with minor details.

Figure 15 shows the Login page where admin, teachers, and students may login their account registered on database to proceed on the next page. By logging in, each of the users may access their specified areas.
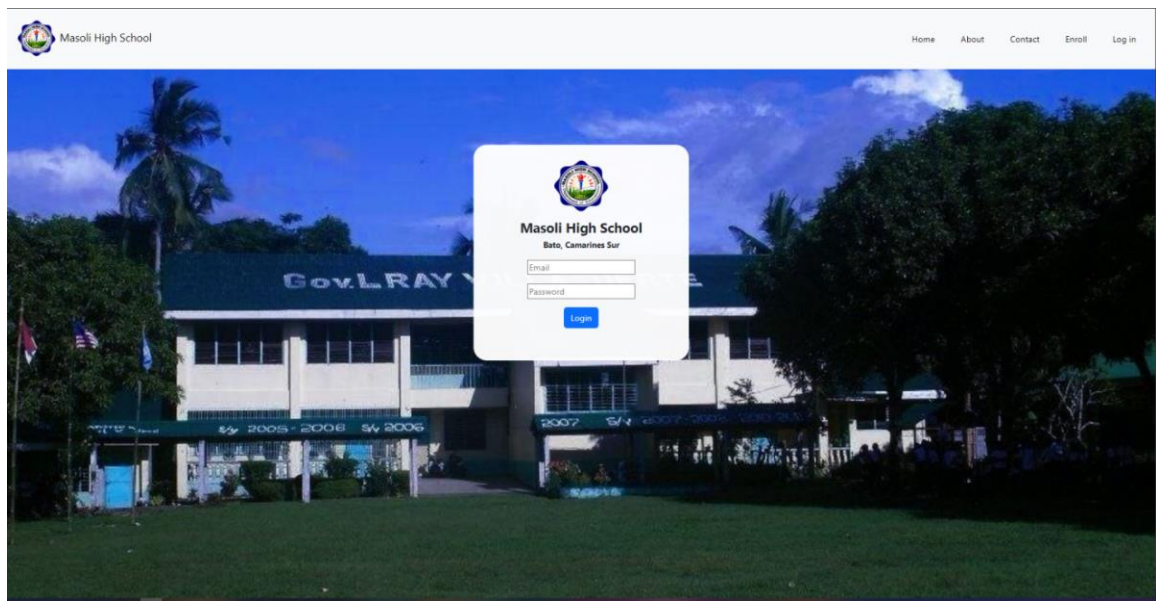
Figure 15: **Login Page**

In the login page, users are needed to input their details the email and their password to access and open the next part of the process by clicking the login button below. If the details inputted in the login page were correct, this would directly go to the specified page. In contrast, if the authentication failed, the user remains on the login page and the screen show an error message saying invalid details were input. This login page is for the users and admin, when you login your admin account you will directly go to admin dashboard, while other users like teachers and students can also allowed to view dashboard but with a limited functions based on their roles in the portal.

This Login page is a multi-login were different users of this system the admin, teacher, and student share a one login page to enter the website.

Figure 16 shows the homepage of Masoli High School Web-based Student-Faculty Portal. The user interface includes an image of the school, a synopsis of the institution, contact information, and enrolling for new students.
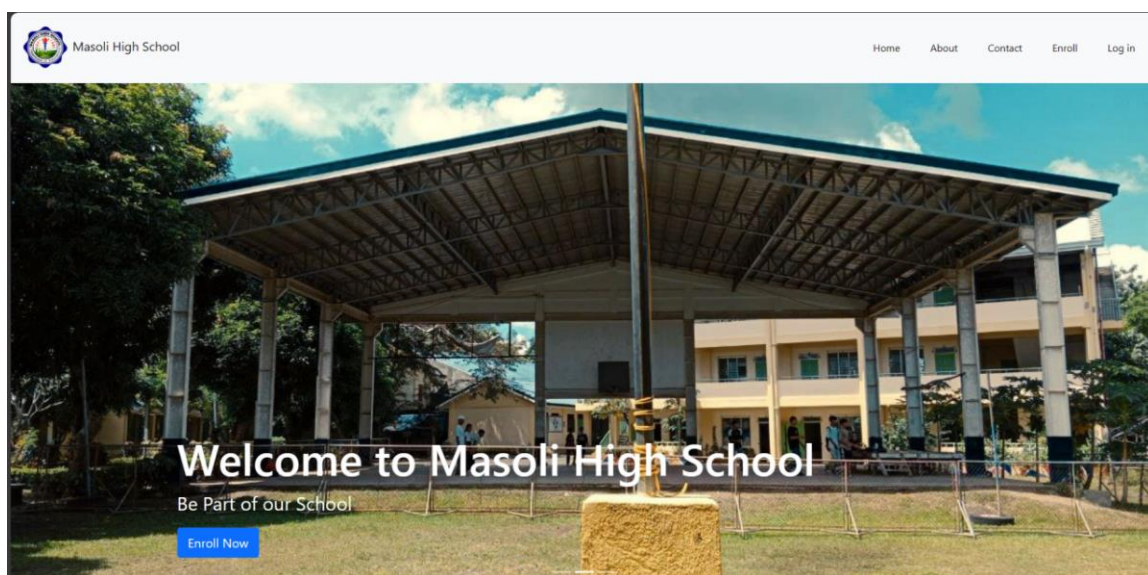
Figure 16: **Homepage**

In the figure above show the homepage of Masoli High School Web-based Student-Faculty Portal. This is typically the landing page or main page that a user finds when they access the website through search engine. It is easy to navigate different pages on the website when buttons are used to link a certain page.

Anyone can access and view this page, regardless of whether they are a student in the designated barangay. And is able to freely browse the page sections. This responsive webpage looks good on a variety of devices including tablets, desktops, and android phones. These details information about the school is shown on the main page.

Figure 17 shows the admin dashboard provides a complete overview of important academic timetables, such as the grading deadline and critical milestones throughout the school year. Users can simply access and specify specific dates for the first, second, third, and fourth grade periods, facilitating educational activity planning and organizing. This function guarantees that the academic calendar is managed efficiently, providing a structured and unified learning environment.
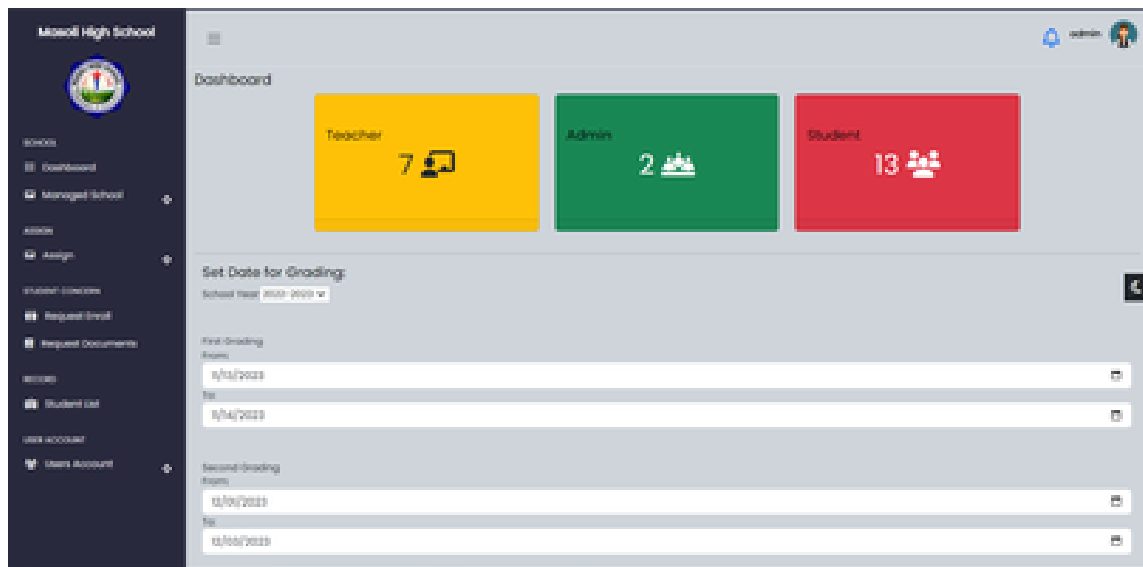
Figure 17: **Admin Dashboard**

Figure 16 shows the admin dashboard; currently, the school administrator can access the dashboard's functionalities. This is what will appear on the screen following login. The overall number of instructors, administrators, and students is displayed on the dashboard. This menu allows you to navigate between displays and access functions according to the user's role—admin, instructor, or student. It is also possible to observe the population of educators, administrators, and even students in general.

Figure 18 shows the enrollment form for Masoli High School where student can fill-up the given information for them to enrolled their selves.
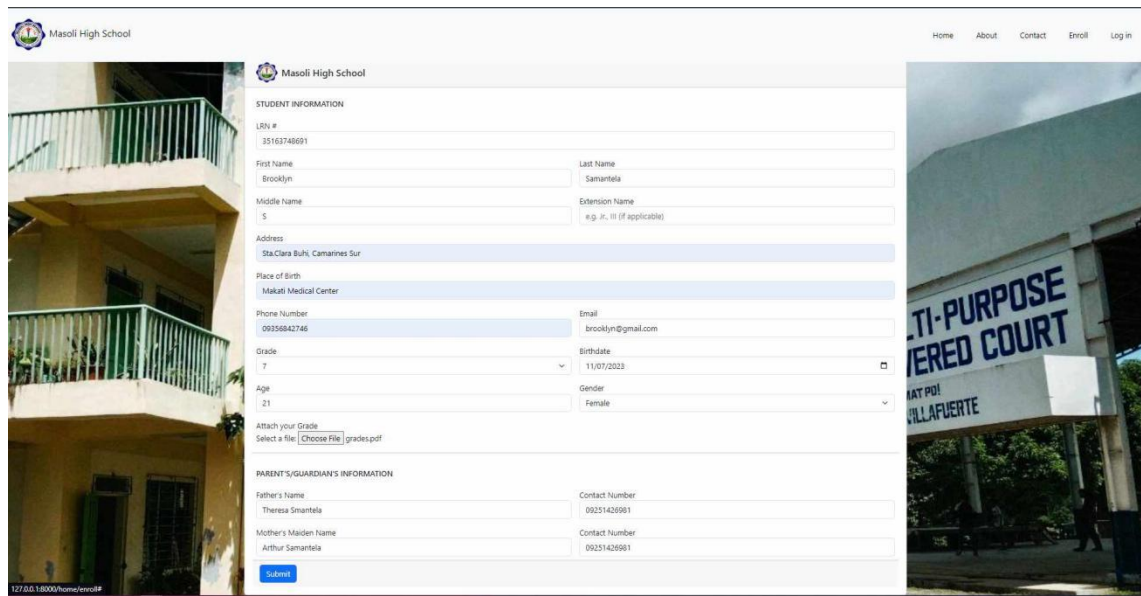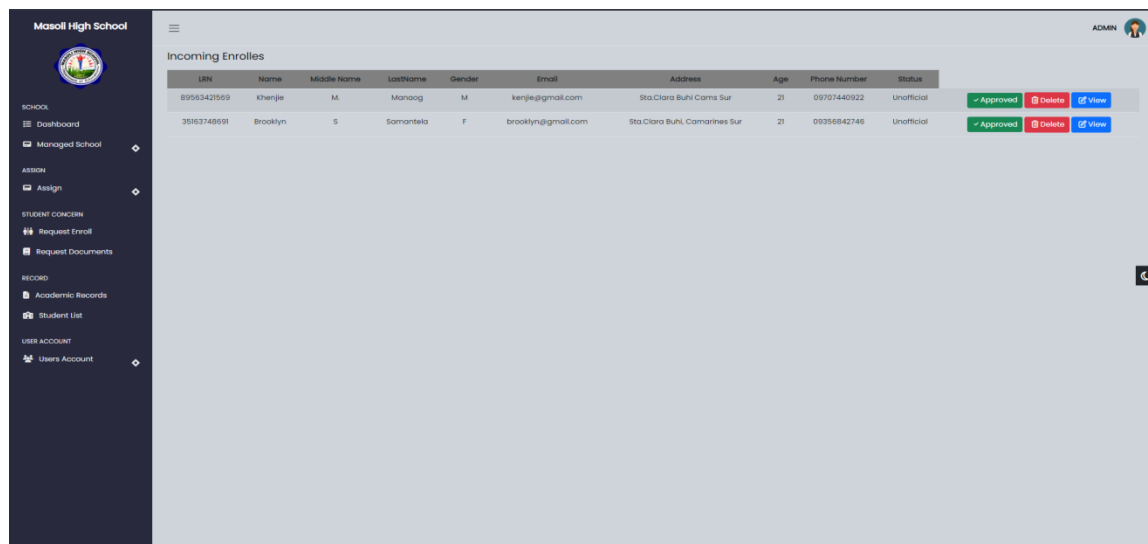
Figure 18: **Enrollment form**

In the enrollment form, students are needed to fill-up this form in order to proceed to the enrollment by inputting the LRN number, name, last name, middle name, gender, address, place of birth, phone number, email, grade, type, age, and birth-date.

In this process admin has the ability to manage this process for enrollment, after the student submitted the filled-up form, the admin has the ability to enroll the student by accepting the student. Through SMS notification admin notified student that they successfully enrolled, whereas rejecting student cannot be able to enroll for some reason that the student has a bad record.

Figure 19 shows the image of the system for incoming enrollees, wherein the admin can see the list of the incoming enrollees of the specific school year in Masoli High School. In this portion of modules where admin can see the primary information of the student.

Figure 19: **Incoming Enrollees**

Figure 18 is the Incoming Enrollees, wherein admin has only access on this module and has the ability to manage this process for incoming enrollees. Admin can also see the primary information of enrollees like, learning reference number or LRN, name, middle name, last name, gender, email, address, age, and phone number. It also includes in the form given the status where unofficial or ready to accept is inputted on the status of enrollment of student.

The incoming Enrollees is where the admin can approve the enrollment of student. When on the status input unofficial means, the student didn't ready to accept their enrollment.

Figure 20 shows the image of the system for reviewing enrollees Information. Wherein the admin can review other information of enrollees. By checking other information inputted on the form.

Figure 20: **Review of Enrollees Information**

Figure 19 above shows the review of enrollees' information. Here the admin can see the other information about enrollees it also includes here the files or requirements who has submitted of the enrollees. Include in the fill out form of the student information the learning reference number or the LRN, name, last name, middle name, email, address, age, gender, phone number, grade level, file of the submitted requirements, also include the information of the parents or guardian include the name of mother, name of father, contact number, and school year.

After checking the information filled out, admin can also assign the year, grade level, and section of the student. And after that the admin can click the update button wherein it can see on the next page of this module the status that it is ready to accept.

Figure 21 shows the image of the system in viewing Student Requirements, wherein, the admin can view submitted files or requirements of the student.
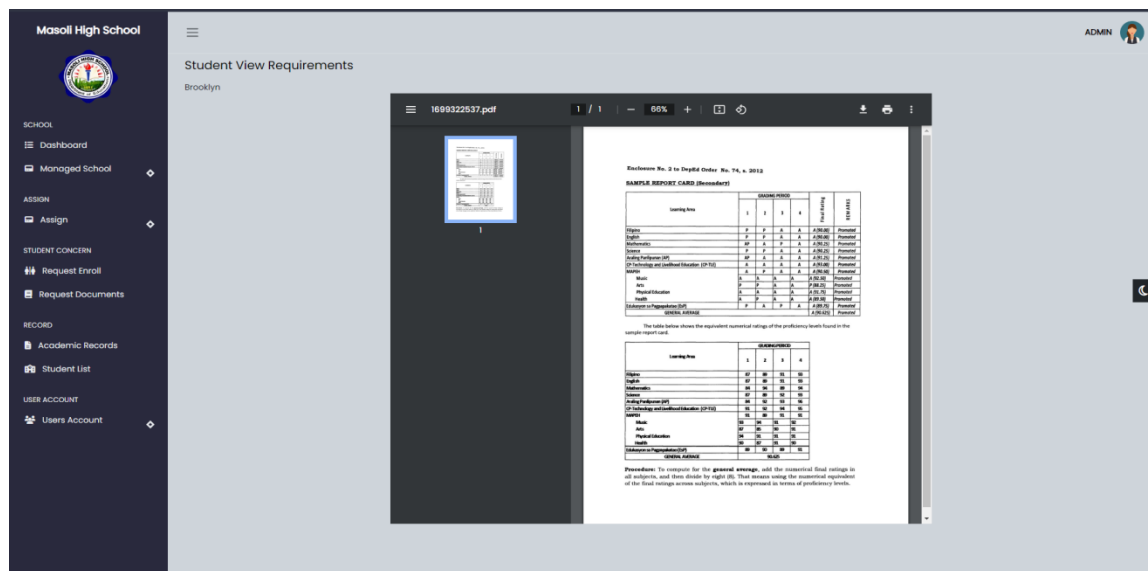
Figure 21: **Student Requirements**

Figure 20 shows the student requirements where admin can view the submitted requirements of the student. On the image above shows the card or the form 138 of the student. If the admin wants to see the other requirements like birth certificate or PSA, Good moral certificates, student information sheets, form 137 or TOR, id pictures and others there's has a button for you to click to view the said other requirements.

There is also a button on the top the download button, and the print button. If the user wants to download the file, by clicking the download icon it can already downloading the file, while if the user wants to print directly the file without downloading, by clicking the print icon the file is ready for printing.

Figure 22 show the image of the system for accepting the enrollee. This module is where the admin can accept the enrollment of the student.

Figure 22: **Accept Enrollees**

Figure 21 shows the module for accepting the incoming enrollees. Wherein on this module the status of the enrollment of student is ready to accept means that the admin can now enroll the student. On the image is the list of enrollees where on the list included the learning reference number of the student or the LRN, name, middle name, last name, gender, email, address, age, phone number, and the status.

The status is where admin bases whether the student is unofficial or ready to accept, however, on the image the two-student status the one is still unofficial while the other one is ready to accept for enrollment.

On the left side next to the status is approved, delete, and view button where, the admin can approve student enrollment by clicking the approved button, in the delete button is where admin can reject or delete the student on the list of enrollees, while on the view button is where admin can view or check the information of the enrollees.

Figure 23 shows the image of the system for SMS notification. Wherein on this module the admin can notify student.
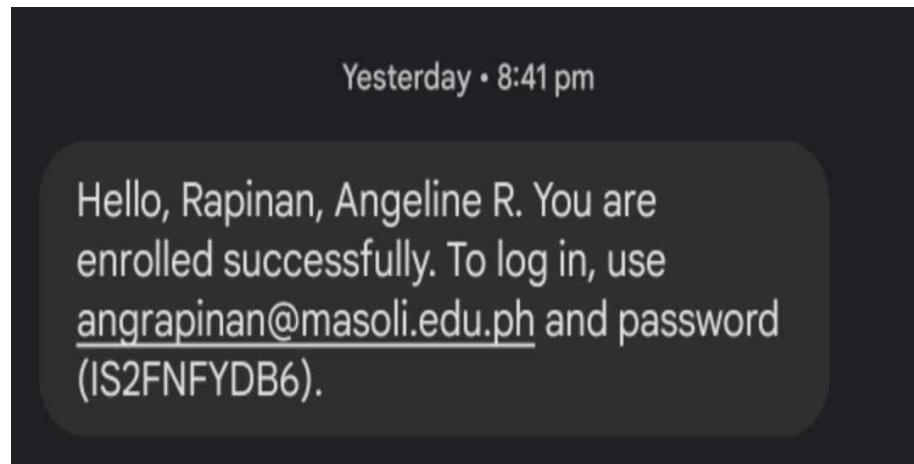
Figure 23:**SMS Notification**

Figure 22 shows the SMS notification where admin on this part of module manage for notifying student who been successfully enrolled in Masoli High School. On the first part of message, it notifies student that has been successfully submitted their enrollment form on the system. With further update about the status for enrollment. While, on the second part of the message it notifies student that he/she's been successfully enrolled.

Furthermore, admin can already update student Gmail account together with their password to log in on the system.

The SMS Notification is where admin can notify student. On the previous modules student input their phone number on the enrollment form for them to receive a message from the admin about to their status.

Figure 24 shows the image of the system for the subject handled by the teacher. Where in this module show the subject, they handled in class.
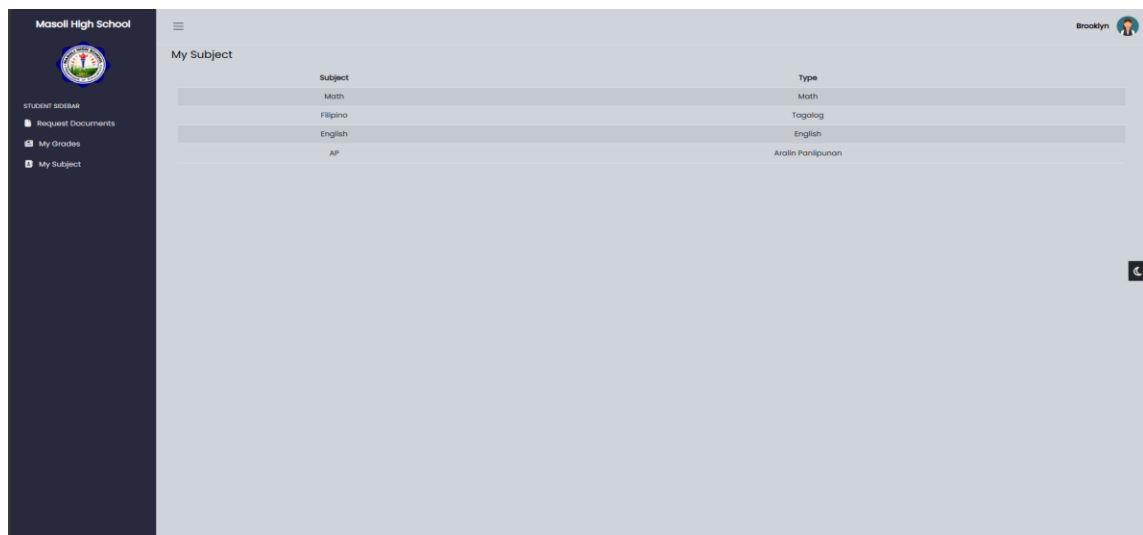
Figure 24: **Teacher-Subject Handled**

Figure 23 shows the teacher-side subject they handled in class. Wherein this module the teacher views the list of the subject they handled in class specific in class name and class section. Include in the list of the subjects are the subject name and subject type.

On top of the list of subjects in left side where the account of the teacher can find, on this module the teacher needs to log in their email account and password for them to access their other information. One of the parts of this module for teacher is to view their subject they handled in specific grade level and sections. To determined what subjects, they have. The list was including class name, class section, subject name, and subject type.

Figure 25 shows the image of the system for the handled class-section. Where on this module, the teacher views the list of the student they handled for a specific class section. On this part where we can see the list of the students in class.

Figure 25: **Teacher-Class Handled**

Figure 24 shows the teacher-side list of the students in class section they handled. Wherein this module the teacher has the ability to view and access this module. The image above, include in the form the learning reference number or LRN, name, grade and section, emails, and records. However, on the records teachers can view the record of his/her student.

The list of student record is where the teacher able to determined and manage information of every student in class they handle.

At the top of the list of students handle in left side where the account of the teacher can find, on this module the teacher needs to log in their email account and password for them to access their other information. One of the parts of this module for teacher is to view their students they handled in specific grade level and sections. To determine the how many students they have in class. The list was including LRN, name, grade, section, email, and records.

Figure 26 shows the selected subject to grades. Where on this module the student were able to input grades on the selected subjects.
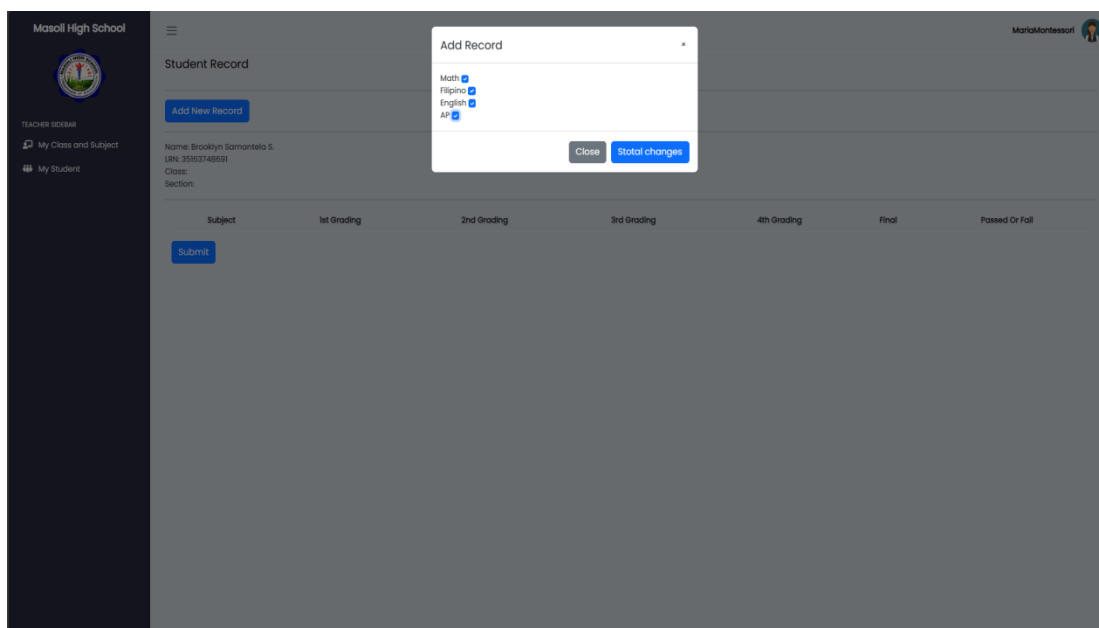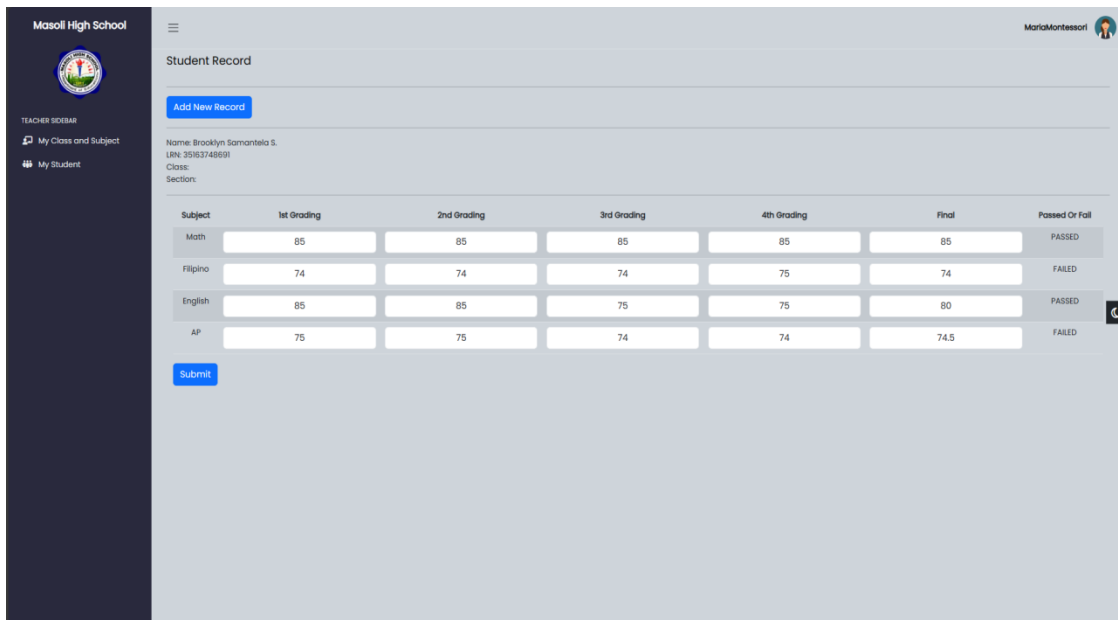
Figure 26: **Selected-Subjects to Grades**

Figure 25 shows the selected-subjects to grades. In this module wherein the teacher has the ability to selects subjects to input grades on the student record in specific class section they handled. On the image shows the add record where teacher select subject to add on student record for the specific semester of the school year.

In this part of the module, teacher can view the list of the student record and select student they need to input a grade in specific subjects for the semester. By clicking the name of student, they can view their record and select subject to add on the records that is needed to input grades. After selecting the subjects, click the button stotal changes to view the changes made on the record and continue the next process that will be discussing on the next figure.

Figure 27 shows grading sheet, a grading sheet is an all-inclusive record of a student's academic achievement. like ease of identification, fields like the student's complete name, class, section, and Learner Reference Number (LRN) are usually included.
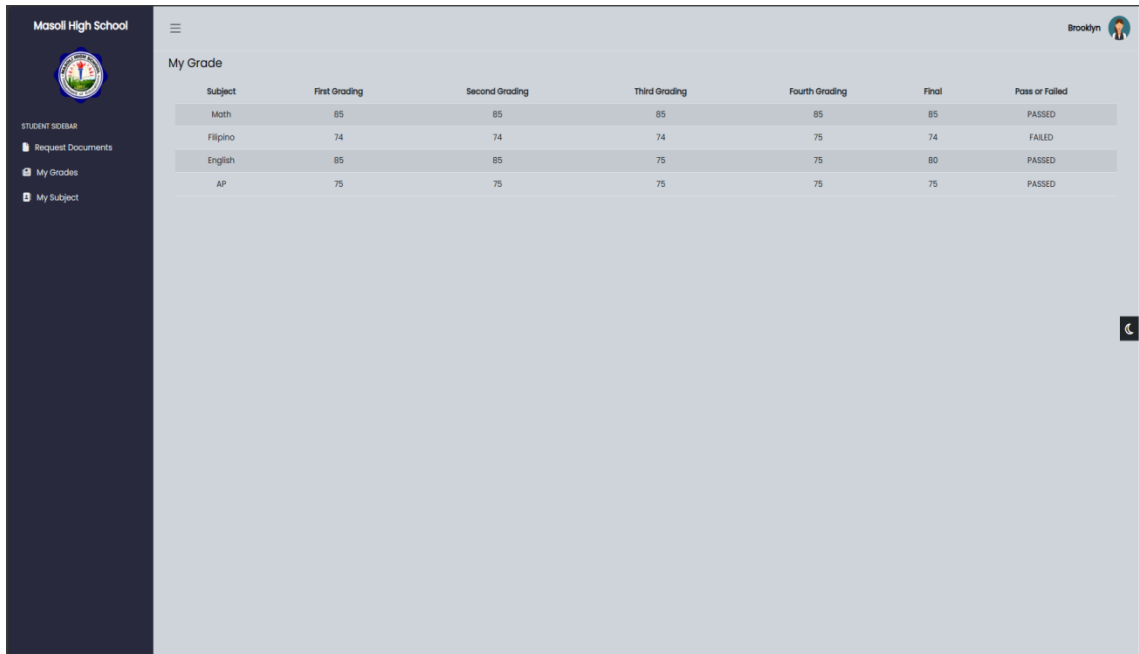
Figure 27: **Grading Sheet**

The grading sheet allows teachers to offer grades for each period, but its primary focus is on the particular subjects. There are distinct columns for each of the four quarters. A final grade column is also included, which computes the overall performance for all four quarters. When evaluating whether or not the student has passed, the cumulative grade is crucial. In order to evaluate performance and make well-informed judgments about promotion or more support, parents, students, and educators can all benefit from having an orderly and comprehensive summary of a student's academic progress provided by the grading sheet.

Figure 28 shows the image of the system in viewing the grades. Where student able to access and view their grades on the system. On this part of the module each student can view their grades if there he/she is enrolled of this semester in specific school year

Figure 28: **View Grades**

Figure 28 shows viewing the grades on their account. Wherein on this module the student is needed to log in their account and password to access the system to open and view their grades for the semester. The records include the subject, first grading, second grading, third grading, and final it also includes in the record the equivalence of the grades which interpreted as passed or failed.

The records show the grades from first to final semester. This record helps students to view and analyze whether they need to continue the progression they made or they need to learn more to be able to improve their failing grades.

Figure 29 shows the image of the system in viewing their subjects. This module show the subjects list of student.
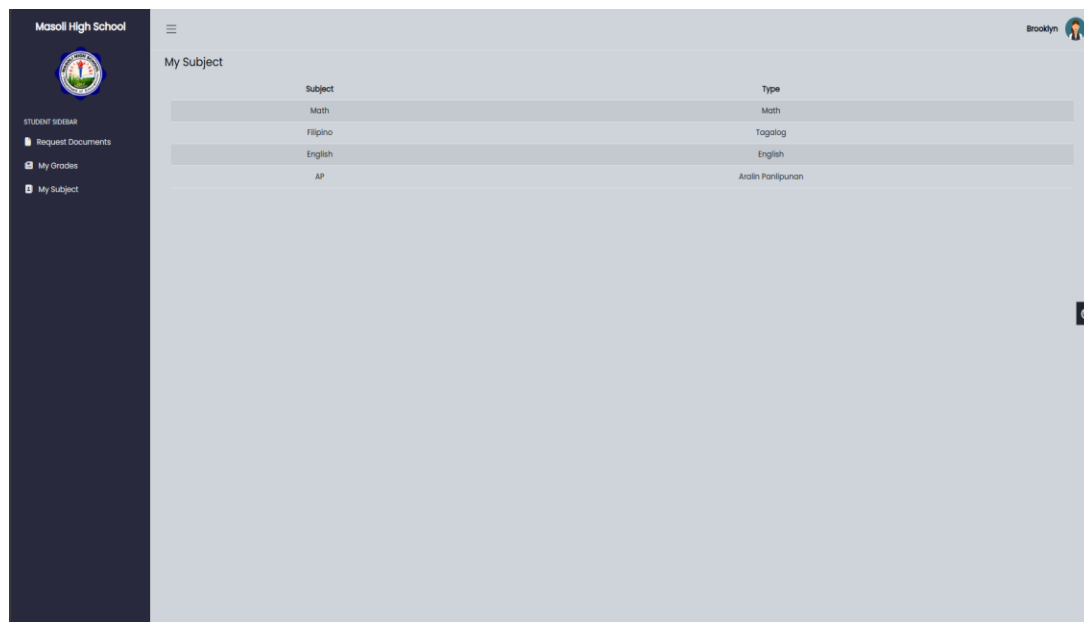
Figure 29: **View Subjects**

Figure 29 shows the subjects list of the particular student. Where in this module after logging in the account and password to access and open the account and records to view the subjects. The records include the subjects and types.

This module shows the subjects for the specific semester. The admin has the ability to manage and distribute subjects for each grade and class sections. The subjects that is on the list was available to view to those student whose bonified enrolled for the school year in Masoli High School.

Figure 30 shows the image of the system for student account. Where on this module student has the ability to manage and view their accounts registered on the system. The students has the ability to update their information.
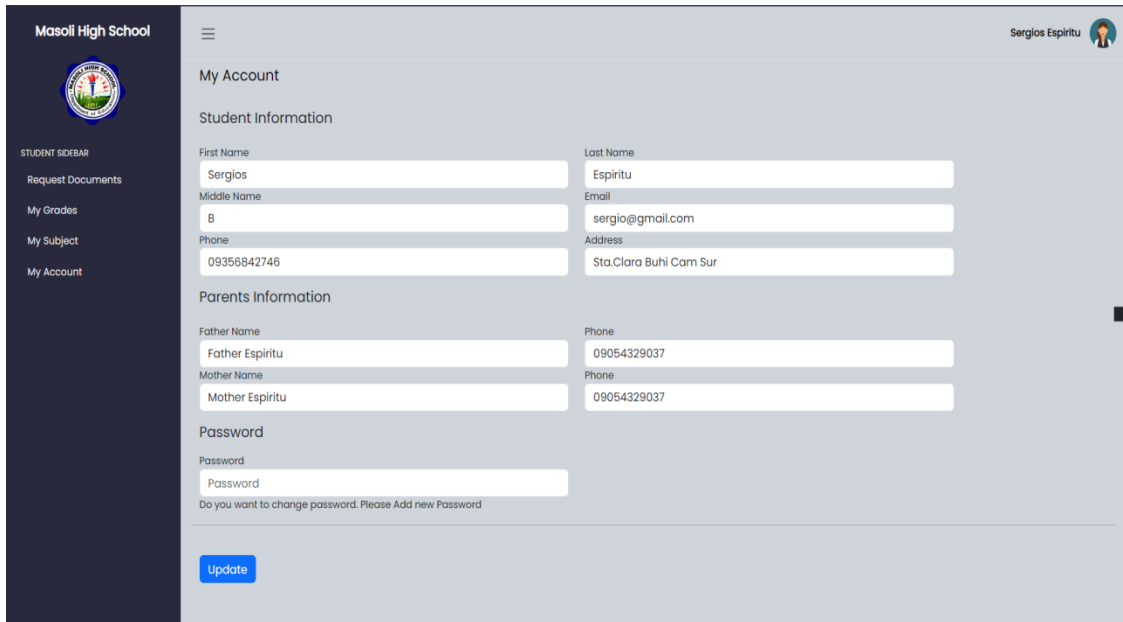
Figure 30: **Student Account**

Figure 30 shows the student account, wherein on this module student has access to view and update their information. From the student information form it include the first name, last name, middle name, email, phone number, address, also include parent's information the father name, mother name, phone number, and password. In the field of password, it is free to change the current password if the user wants to change the password.

This overview will show the details of the user. User can update their own information by clicking the update button.

Figure 31 show Request form, a request form is a written document used to organize and record requests made inside an organization. It usually has fields for the name of the person making the request, indicating who started it, the kind of form or request, and the day it was sent in. It might also include details regarding the request's present state, such as whether it has been denied, is in process, or is awaiting additional action.

Figure 31: **Request Form**

The form gives the administrator the ability to examine and decide on the request, giving them the choice to either approve or cancel it. This request form improves the effectiveness and transparency of the request process inside a school by providing an organized method of recording requests and communicating with them.

Data Design

The data design describes the sorts of data that will be stored and used in the system. The first design activity is data design, which results in a program structure that is simpler, more modular, and more effective. The data structures necessary for software implementation are derived from the information domain model produced during the analysis stage. The data dictionaries' content and the data objects, attributes, and relationships depicted in entity relationship diagrams serve as the foundation for data design operations.

Entity Relationship Diagram

An information system's entities and the relationships between those entities are graphically depicted using the data modeling technique known as an entity relationship diagram (ERD). A

project's interests are represented by entity relationships, which are connections between entities. The entity framework architecture is represented by an ERD's conceptual and representational model of data [13].

Figure 32 Illustrate the connections of all data of each table, the connections represent the relationship functions of each data.
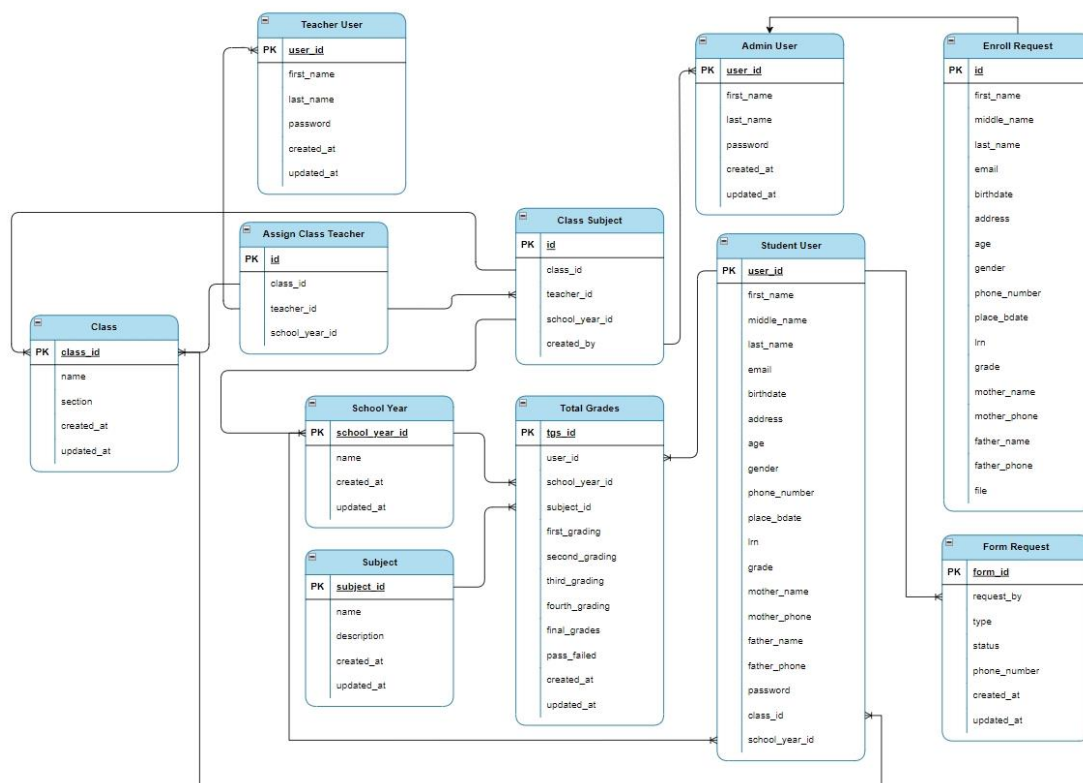

Figure 32: **Entity and Relationship Diagram**

Figure 32 shows the Entity Relationship Diagram (ERD), it is a graphical representation of the connections of each entity connected to each other. ERD diagram visualizes data as basic objects and connections between each other. The diagram shows consist of 11 tables that corresponds between each other's that can help to function the system well. The table corresponds

to the database table where the data are being sent and kept, it encrypts confidential information of the users where even the admin cannot view the confidential information of the users.

System Architecture

The "Web-based Student-Faculty Portal of Masoli High School" has been implemented in PHP and Laravel framework. The part visible to the users is the system views and HTML, CSS, and JavaScript is used for the interface. The system interacts with the XAMPP MySQL database using models. The controller is the bridge between the model and the views.

The system architecture, outlines the proposed system's structure, behavior, and additional points of view. The way the system utilizes and interacts are all reflected in its design. It specifies how the component of the system connects to the others and how data is transferred between them. A system's architecture reveals how it is conceptualized in terms of its structure, operations, and connections.

Network Model

The networking model describes the architecture, components, and design used to establish communication between the source and destination systems [14]. With the use of computers or desktop, mobile phones, and internet connections. The Network model is a database model that shows the relationships among the objects.

Figure 33 illustrate the Network Model of the "Web-based Student-Faculty Portal of Masoli High School". Through the network model, the researchers can simply illustrate the process of the communication between the sources and the destination.
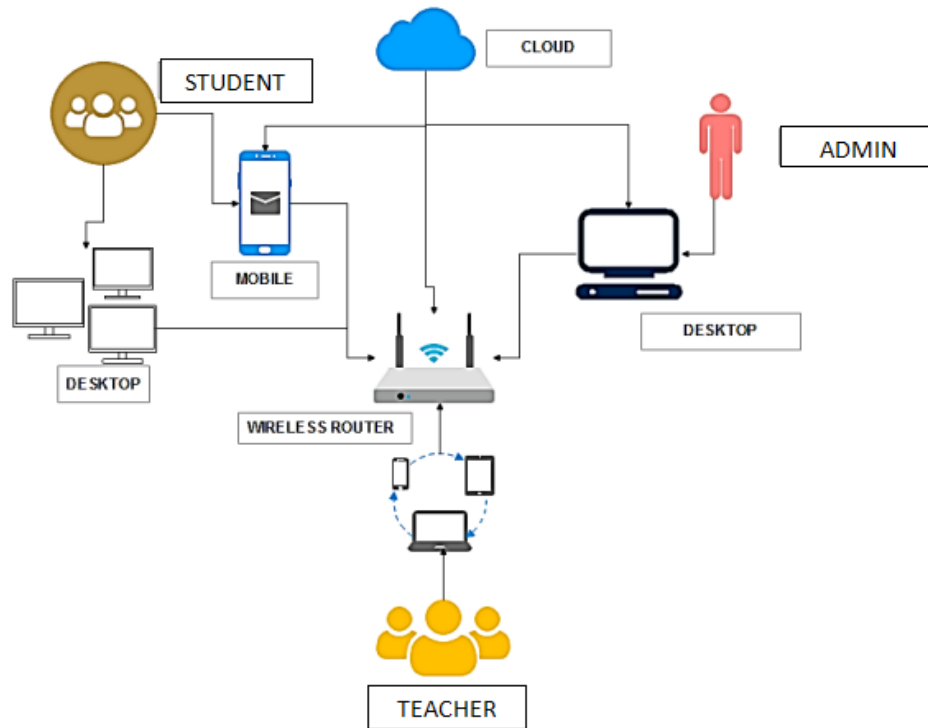
Figure 33: **Network Model**

Figure 33 shows the process of the communication between the sources and destination the network model. The model is used to represents the features of the system. Through the used of hardware and software tools it helps to access the systems website.

Network Topology

The physical and logical arrangement of nodes and connections in a network. Describe the arrangement of networks and the relative location of traffic flows. The researchers use network topology diagrams to determine the best placements for each node and the optimal path for traffic flow [15].

Figure 34 illustrate the Network Topology of the "Web-based Student-Faculty Portal of Masoli High School". The model is used to represent the placement of nodes.
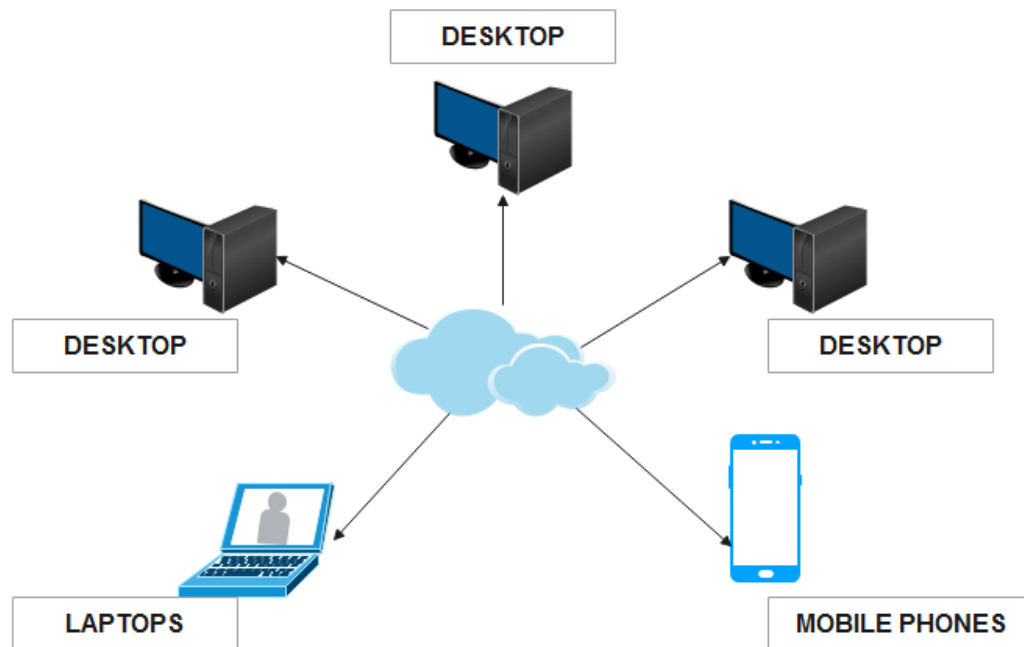
Figure 34: **Network Topology**

Figure 33 shows the placement of nodes network topology of "Web-based Student-Faculty Portal of Masoli High School". In the diagram shows the network topology with one internet on the center that served as the wide area network (WAN) were five gadgets connect which are the Desktop, Laptop, and Mobile phone that is used to access the website. it shows the arrangement of communication between the other gadgets over the internet. The users access the website through connecting the internet by using any of the gadgets available.

Security

A hardware tool that guards and indicators unauthorized access right into a system. System protection refers to the measures that an enterprise takes to defend its networks and assets from disruption, interference, and malicious intrusion [16]. The researchers made a certain ways to secured the data and information inputted by the users.

Development

In the development phase, the team works on implementing the features in the Sprint backlog. They also perform unit testing and code reviews to ensure that the code is of high quality.

Software Specification

The software specification that the system needs are the following, these are needed for building the system, Visual Studio Code for code editor, PHP, HTML, CSS, JavaScript for front-end, for back-end of the system Laravel Framework, PHP, MySQL , XAMPP, are needed and Semaphore for SMS API.

Hardware Specification

The hardware specification that is used in developing the system are the standard USB, keyboard, and mouse. Intel core i5-6300U CPU @2.40GHz-2.50GHz for the processor, Intel Pentium Dual core or higher for motherboard, Wi-Fi5 with 2.4GHz, Hard drive with 1GB or higher, Android for mobile phone, and a standard for printer.

Program Specification

The system's program specification allows user participation in registration of credentials, enrollment, scheduling, grading and requesting documents as well as for the admin side to manage accounts and update, add user accounts, and view users' activity logs, generate reports and confirmation and approval.

Programming Environment

The developer can create programs using a combination of hardware and software called a programming environment. Integrated development environments, or IDEs, where developers frequently work. These provide users with access to all the functionality required to write and test

their code. Front-end and back-end components utilized during system development are included in the programming environment.

Front End

The researchers used JavaScript for website to build the front-end platform. Also used CSS to create graphical user interface of the system.

The front-end developer uses web languages like HTML, CSS, and JavaScript to develop a website where people can access and utilize. The researchers used HTML, and JavaScript languages to build the front-end platform of the Web-based Student-Faculty Portal of Masoli High School. And for the system's graphical user interface, the researchers used CSS. The front end is what the users can see either the admin the teacher or the student.

JavaScript. JavaScript is the programming language of the web that is one of the core technologies of the World Wide Web, alongside HTML and CSS, complementing CSS in formatting HTML elements while providing user interaction, a capability that CSS alone lacks. JavaScript framework has features that aim to simplify the development and debugging process of the system, the Web-based Student-Faculty Portal for Masoli High School JavaScript was used to provide dynamic content and run the system. Its visuals and multimedia. JavaScript was employed since it allows the website to be interactive. Elements that interact with a user.

HTML. HTML *(Hypertext Markup Language)* is a popular markup language used to construct web pages. Web pages and web apps provide the foundation of websites. is then improved and kept up. Other technologies, like as JavaScript and HTML, have modified it. CSS. HTML was utilized to create the system's structure and contents. The HTML code Researchers were able to code the tables, as well as forms such as login and register, among other things.HTML functioned as the system's bones, the system's foundation.

CSS. CSS (*Cascading Style Sheets*) is a style sheet language that is used to describe the display of a document authored in a markup language like HTML or XML. CSS, like HTML and JavaScript, is a foundational technology of the World Wide Web [17]. CSS was used to designed and organized the system, and to make the system more pleasant to users' eyes and to include more design and organized the entire system. CSS gave the web pages more life and attractiveness to users and were simple to navigate because the website layouts are more organized.

Back End

The researchers used Laravel Framework, PHP, MySQL and XAMPP to develop a database of the website. The XAMPP were use on the back-end. MySQL database was utilized to store all the data inputted on the system. The XAMPP is for creating a local web server and MySQL is for connecting the system and XAMPP.

MySQL. MySQL is the world's most popular open-source database [18]. SQL is the most prevalent standardized language used to access databases, and the "SQL" component of "MySQL" stands for "Structured Query Language". It was originally designed to handle huge datasets fast and has long been utilized in highly production environments. Despite the fact that MySQL is always evolving, it provides a comprehensive and useful set of functions. MySQL's connection, performance, and security make it ideal for connecting to databases via the internet. The researchers used MySQL to administer the database or data that the user provided. Input, as well as to test each database to ensure that all written functions in the source code work.

XAMPP. XAMPP is a free and open-source cross-platform web server solution stack package built by Apache Friends that includes the Apache HTTP Server, the MariaDB database, and interpreters for PHP and Perl scripts that allows you to establish a WordPress website locally on your PC using a local web server. XAMPP is an important tool for academics since it allows MySQL and PHP to

run and use the local web server. The researchers utilize XAMPP to test the system they are designing on a local web server.

Deployment Diagram

Deployment diagrams depict the relationship between the system's software and hardware components, as well as the physical distribution of processing. It's showing the physical organization of the nodes in a distributed system, the artifacts that are stored on each node, and the components and other aspects that the artifacts implement, often during the implementation phase of development.

The researchers present deployment diagram to illustrates the physical distribution process of each data from hardware components to system's software.

Figure 35 illustrate the deployment diagram in order to understand the process distribution of data in the system.
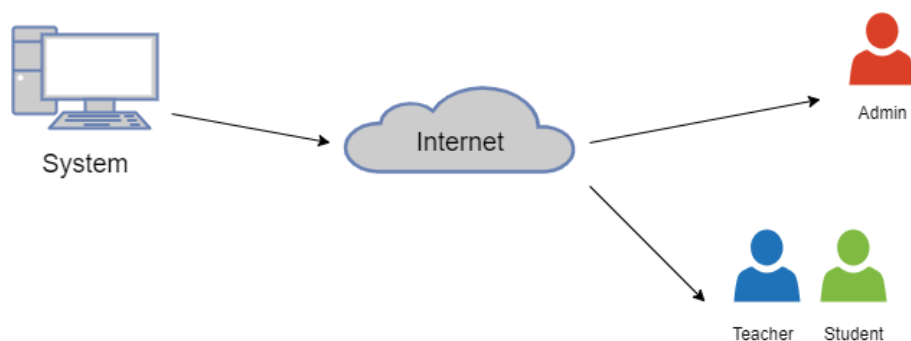

Figure 35: **Deployment Diagram**

The figure 35 shows the deployment diagram of the system Web -based Student-Faculty Portal for Masoli High School, the diagram consists of the system. Once the system was already uploaded on the web the system can now accessible for any type of users. The login system has two panel were it access by the user and the admin. On the admin panel were initialize add or delete user, accept or reject student, manage class schedule, manage transaction. The student can now

view they're grades, tasks and ranking and can make a request for documents. The teacher panel can now upload tasks and other learning materials, and grades of the students.

Test Plan

Test Plan is a detailed document that lists the test methodologies, objectives, timeline, estimates, deadlines, and resources needed to execute a project. Consider it a blueprint for executing the tests required to guarantee the software is working properly, with test managers in charge [19]. In software testing, test planning is the foundation of the entire project. QAs are certain to become confused with unclear, undefined goals and deadlines if they do not have a sufficiently detailed and well-crafted plan. This obstructs quick and accurate testing, slowing results and prolonging release cycles.

In this diagram illustrate the plan on how the system to be tested by the clients and IT experts.

https://codilime.com/static/03d20e664e119583c8d3f27883bbf6e3/a878e/what-is-a-test-plan.png
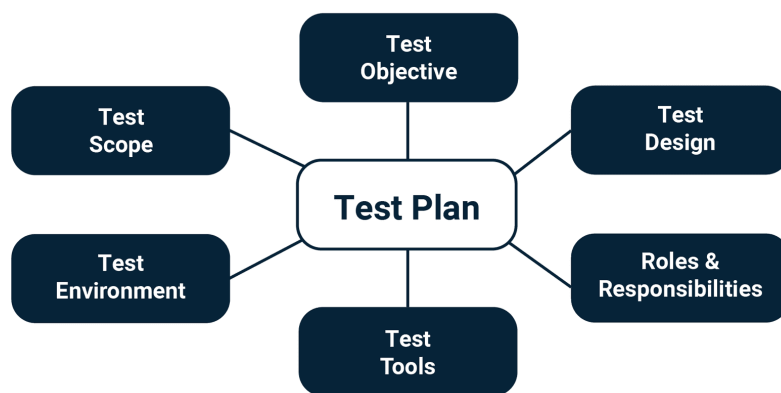
Figure 36: **Test Plan Diagram**

The figure above shows the test plan diagram on how the system Web-based Student-Faculty Portal for Masoli High School will be tested. In the illustrations, Test plan diagram consists of six stages are test scope, test objectives, test design, roles and responsibilities, test tools and test environment. In which those stages of test plan is important during the testing of the system. During testing of the system clients and IT experts should be considered the six stages that is listed on the

test plan. upon testing the system experts should also know the objectives why the researchers developed the system, the design, the roles and responsibilities, the tools that the researchers used to developed the system , the environment and the scope of the system. The researchers evaluate the functionality of their developed system through user acceptance testing, stress testing, and security testing.

Testing

Testing is the review and retrospective phase it is an essential part of the agile scrum process and should be done after every sprint ends. It's an opportunity to evaluate what was successful, what could be improved, and how to move forward by gathering client's feedback and team insights [20].

To confirm that the system functions properly, the researchers conduct a series of tests with the admin, teacher, and student. The researchers perform integration testing and user acceptance testing to ensure that the software meets all the requirements. As a result of the researchers' testing, bugs were also corrected.

User Acceptance Testing

User Acceptance Testing is included under the black box testing methodology where the clients/end users involved in testing the product to validate the product against their requirements. User Acceptance Testing (UAT) is used to uncover defects in software, systems, and networks that may cause issues for users. UAT verifies that software can execute real-world tasks while meeting development criteria. Prior to the software's official release, users are given the opportunity to engage with it to discover if any features were overlooked or if any flaws exist [21].

Table 11 shows the test scenario and test cases done on the system using the black box testing tools User acceptance testing. The researchers used user acceptance testing for testing each

module of the system to see if the system need to be fixed. In this table, user acceptance testing the

results will vary between these two options, the pass and fail results of each scenario of the system.

Table 11

USER ACCEPTANCE TESTING

Test Scenario	Test Cases	Pass (1)	Fail (0)	Admin (1/0)	Level of Functionality
Admin					
Admin Log In	1.Enter username and password	• The admin is redirected to the admin dashboard	• The admin is not able to log in and an error message is displayed	1	Completely Functional
Create Teacher User	1.Create a new teacher user in the system	• The teacher user is successfully created and can log in to the system	• The teacher user creation fails or cannot log in with the created credentials	1	Completely Functional
Create Grade Level	1. Create a new grade level within the system	• The grade level is successfully created and appears in the system	• The grade level creation fails or does not appear in the system	1	Completely Functional
Create Section	1. Create a new section in a specific grade level	• The section is created and associated with the chosen grade level	• The section creation fails or is not associated with the chosen grade level	1	Completely Functional
Create Subject	1. Create a new subject	• The subject is successfull	• The subject creation fails or is		

	in the system	• y created and visible in the system	• not visible in the system	1	Completely Functional
Create Class list	1. Create a class list for a specific section	• The class list is created and contains the specified students	• The class list creation fails or the students are not added to the list	1	Completely Functional
Manage Profile	1. Manage the admin's profile information	• The admin's profile information is successfully updated	• The profile update fails or the changes are not saved	1	Completely Functional
Create Scheduling	1. Assign schedule for a particular grade level and section.	• The scheduling plan is successfully created and implemented	• The scheduling plan creation fails or is not implemented in the system	1	Completely Functional
Results:				1	Completely Functional
Teacher					
View Class List	1. View the list of classes assigned to the teacher	• The teacher can view the class list for their assigned classes	• The class list cannot be accessed or displayed properly	1	Completely Functional
Input Grades	1. Verify the functionality to input grades for students	• The grades are successfully inputted and saved for the selected student(s)	• The grade input fails, or the entered grades are not saved properly	1	Completely Functional
View Profile	1. View the teacher's profile information	• The teacher's profile information	• The profile information is not accessible or	1	

		is displayed correctly	displayed incorrectly		Completely Functional
Manage Profile	1. Verify the ability to manage the teacher's profile information	• The teacher's profile information is successfully updated	• The profile update fails or the changes are not saved	1	Completely Functional
View Scheduling	1. View the scheduling information for classes	• The teacher can view the scheduling information for their assigned classes	• The scheduling information cannot be accessed or displayed properly	1	Completely Functional
Result				1	Completely Functional
Student					
Log in	1. Verify that the student can successfully log in to the system using valid credentials.	• The student is redirected to the student dashboard.	• The student is not able to log in, and an error message is displayed.	1	Completely Functional
View Grades	1. Test the ability to view the grades for the student's classes.	• The student can view the grades for their classes.	• The grades cannot be accessed or displayed properly.	1	Completely Functional
Manage Account	1. Verify the ability to manage the student's account settings.	• The student's account information is successfully updated.	• The account update fails or the changes are not saved.	1	Completely Functional
View Ranking	1. Test the functionalit	• The student can view	• The ranking		

	y to view the student's ranking or position.	their ranking or position in the class or school.	information cannot be accessed or displayed properly.	0	Not Functional
View Scheduling	1. Test the ability to view the class schedule for the student.	• The student can view their class schedule.	• The class schedule cannot be accessed or displayed properly.	1	Completely Functional
Request Report	1. Verify the functionality to request a report or document.	• The request for the report or document is successfully submitted.	• The request submission fails or is not processed properly.	1	Completely Functional
Result				0.83	Completely Functional
Overall Results				**0.94**	**Completely Functional**

The overall results of user acceptance testing as shown in table 4 below is completely functional with a total of (0.94) with the following results of 1, 1, 1, 1, 1, 1, 1, 1, 1. 1, 1, 1, 1, 1, 1, 1. 1, 1, 1, 0, 1, 1, 0.83. Further, the table indicates the overall standard of the system as completely functional.

The results show the overall functionality of the system Web-based Student-Faculty Portal for Masoli High School for the end-user in terms of the test scenarios, test cases, results, and level of functionality. The data that are only being command on the system are being accepted wherein, the system gave a completely functional based on the results. This indicates that the system developed is performing well in terms of user acceptance testing in terms of test scenario, test cases, results, and level of functionality. Furthermore, this shows the high acceptability result of the Web-based Student-Faculty Portal for Masoli High School meet the requirements specified by the end-user standard functions of black box testing in terms of user acceptance testing. Therefore, the

researchers developed a system that will provide a better solution to the current constraints and issues in manual processes of documents and paper-based method of the Masoli High School.

The researchers ensured the system developed could meet the requirements and conditions specified under the black box testing during the development. Thus, above shows the achieving results. Indeed, the Web-based Student-Faculty Portal for Masoli High School gained a completely functional.

Nevertheless, only the admin participated in the survey, the study can be also conducted with a larger number of sample size and of respondents. This study will allow to be replicated and validated which help to gain a thorough response.

Therefore, the Web-based Student-Faculty Portal for Masoli High School meets end-user requirements and is completely functional in terms of user acceptance testing where functionality of the testing has been already further enhanced.

Also, in the table 12 IT experts or analyst acted as the teacher, student, and the admin of the system to test if the system is completely functional or not. Also, the table would show the result of the testing if the system is convenient to use for the teacher, student, and admin. The table also shows if the one IT analyst who tested the system would want to use the developed system Web-based Student-Faculty Portal for Masoli High School in processing documents after the system deployed.

Table 12
USER ACCEPTANCE TESTING

Test Scenario	Test Cases	Pass (1)	Fail (0)	IT Analyst (1/0)	Level of Functionality
Admin					
Admin Log In	1.Enter username and password	• The admin is redirected to the admin dashboard	• The admin is not able to log in and an error	1.0	Completely Functional

			message is displayed		
Create Teacher User	1.Create a new teacher user in the system	• The teacher user is successfully created and can log in to the system	• The teacher user creation fails or cannot log in with the created credentials	1.0	Completely Functional
Create Grade Level	1. Create a new grade level within the system	• The grade level is successfully created and appears in the system	• The grade level creation fails or does not appear in the system	1.0	Completely Functional
Create Section	1. Create a new section in a specific grade level	• The section is created and associated with the chosen grade level	• The section creation fails or is not associated with the chosen grade level	1.0	Completely Functional
Create Subject	1. Create a new subject in the system	• The subject is successfully created and visible in the system	• The subject creation fails or is not visible in the system	1.0	Completely Functional
Create Class list	1. Create a class list for a specific section	• The class list is created and contains the specified students	• The class list creation fails or the students are not added to the list	1.0	Completely Functional
Manage Profile	1. Manage the admin's profile information	• The admin's profile information is successfully updated	• The profile update fails or the changes are not saved	1.0	Completely Functional

Create Scheduling	2. Assign schedule for a particular grade level and section.	• The scheduling plan is successfully created and implemented	• The scheduling plan creation fails or is not implemented in the system	1.0	Completely Functional
Results:				**1.0**	**Completely Functional**

Teacher					
View Class List	1. View the list of classes assigned to the teacher	• The teacher can view the class list for their assigned classes	• The class list cannot be accessed or displayed properly	1.0	Completely Functional
Input Grades	1. Verify the functionality to input grades for students	• The grades are successfully inputted and saved for the selected student(s)	• The grade input fails, or the entered grades are not saved properly	1.0	Completely Functional
View Profile	1. View the teacher's profile information	• The teacher's profile information is displayed correctly	• The profile information is not accessible or displayed incorrectly	1.0	Completely Functional
Manage Profile	1. Verify the ability to manage the teacher's profile information	• The teacher's profile information is successfully updated	• The profile update fails or the changes are not saved	1.0	Completely Functional

View Scheduling	1. View the scheduling information for classes	• The teacher can view the scheduling information for their assigned classes	• The scheduling information cannot be accessed or displayed properly	1.0	Completely Functional
Result				1.0	Completely Functional

Student

Log in	1. Verify that the student can successfully log in to the system using valid credentials.	• The student is redirected to the student dashboard.	• The student is not able to log in, and an error message is displayed.	1.0	Completely Functional
View Grades	1. Test the ability to view the grades for the student's classes.	• The student can view the grades for their classes.	• The grades cannot be accessed or displayed properly.	1.0	Completely Functional
Manage Account	1. Verify the ability to manage the student's account settings.	• The student's account information is successfully updated.	• The account update fails or the changes are not saved.	1.0	Completely Functional
View Ranking	1. Test the functionality to view the student's ranking or position.	• The student can view their ranking or position in the class or school.	• The ranking information cannot be accessed or displayed properly.	0	Not Functional
View Scheduling	1. Test the ability to view the	• The student can view	• The class schedule cannot be	1.0	

	class schedule for the student.	their class schedule.	accessed or displayed properly.		Completely Functional
Request Report	1. Verify the functionality to request a report or document.	• The request for the report or document is successfully submitted.	• The request submission fails or is not processed properly.	1.0	Completely Functional
Result				0.83	Completely Functional
Overall Results				**0.94**	**Completely Functional**

The overall results of user acceptability testing as shown in table 5 is completely functional (0.94) with the following results of 1, 1, 1, 1, 1, 1, 1, 1, 1. 1, 1, 1, 1, 1, 1. 1, 1, 1, 0, 1, 1, 0.83. Further, table 5 indicates the overall standard as completely functional.

The results show the overall functionality of the system for the end-user in terms of the test scenarios, test cases, results, and level of functionality. The data that are only being command on the system are being accepted wherein, the system gave a completely functional based on the results. This indicates that the system developed is performing well in terms of user acceptance testing in terms of test scenario, test cases, results, and level of functionality. Furthermore, this shows the high acceptability result of the Web-based Student-Faculty Portal for Masoli High School meet the requirements specified by the end-user standard functions of black box testing in terms of user acceptance testing. Therefore, the researchers developed a system that will provide a better solution to the current constraints and issues in manual processes of documents and paper-based method of the Masoli High School.

The researchers ensured the system developed could meet the requirements and conditions specified under the black box testing during the development. Thus, above shows the achieving

results. Indeed, the Web-based Student-Faculty Portal for Masoli High School gained a completely functional.

Nevertheless, only one IT expertise or analyst participated in the survey, the study can be also conducted with a larger number of sample size and of respondents. This study will allow to be replicated and validated which help to gain a thorough response.

Therefore, the Web-based Student-Faculty Portal for Masoli High School meets end-user requirements and is completely functional in terms of user acceptance testing where functionality of the testing has been already further enhanced.

Stress Testing

Stress testing a Non-Functional testing technique that is performed as part of performance testing. During stress testing, the system is monitored after subjecting the system to overload to ensure that the system can sustain the stress. It enables the testing team to track system performance amid failures and determine whether or not the system saved the data before crashing. Also to see if the system emits meaningful error messages when it crashes or just some random exceptions and ensure that unexpected failures do not compromise security [22].

Stress testing is a software testing approach that examines the robustness of software by stressing it beyond its regular operating limitations. It is essential for critical software, but it is used for all sorts of software. Stress testing focuses on resilience, availability, and error handling under high load rather than what is correct behavior in normal circumstances. It is a sort of software testing that checks the system's stability and reliability. This test focuses on the system's robustness and error handling under extremely high load situations. It even goes beyond the standard operating point to examine how the system performs under extreme settings. And it is done to ensure that the system will not crash during a crunch. [23].

Table 13 display the requirements, test case and the expected results. This table also, shows the results varied between passed (1) or failed (0) gathered during the stress testing of the system in terms of handling a command from a number of user's and how the system processed input correctly.

Table 13

STRESS TESTING

REQUIREMENTS	TEST CASE	EXPECTED RESULT	PASSED (1)	FAILED (0)
Login	Simulate a high number of users for logging in.	The system should handle a number of users logging in their accounts and provide an appropriate response.	1	
Enrollment	Simulate a high number of student enrollees.	The system should handle a number of enrollees and ensure that all enrollees are accepted.	1	
Class Schedule	Simulate a high number of classes, sections and grade level for scheduling.	The system should be able to schedule a numbers of grade level, sections, and classes as scheduled.	1	
Input Grades	Simulate a high number of students need to input of grades.	The system should be able to input grades correctly of students and manage the records.	1	
Request Documents	Simulate a high number of documents as requested.	The system should be able to handle a number of documents as requested of the students and a number of students whom request.	1	
Log out	Simulate a high number of users log out	The system should be able to handle a number of users perform log out.	1	
Result:			**1**	

In table 13 shows whether the corresponding task can perform and simulate a number of users of the system. The results of stress testing as shown in the table 13 is completely functional (1) with the results of 1, 1, 1, 1, 1. Further, table 13 indicates the overall as completely functional.

The results of the testing show the overall functionality of the system Web-based Student-Faculty Portal for Masoli High School for the end-user in terms of the requirements, test cases, and for the expected results of the system. The researchers ensured that the data and requirements that are only being asked are being accepted and meet the conditions defined of the black box testing that is used to test the system. In which it gives good feedback were system completely functional.

The results were gained of the researchers through carefully examined the following requirements, test cases, and the expected results were performed of testing. The results defined under the defined condition of the black box testing. Indeed, the results for stress testing of system Web-based Student-Faculty Portal for Masoli High School were a completely functional.

Nevertheless, only a handful groups of individuals from Masoli High School participated in the survey. Also, the study can be replicated and validated where it will help gained a thorough feedbacks.

Therefore, the Web-based Student-Faculty Portal for Masoli High School meets the end-user requirements and it is completely functional in terms of stress testing, where the functionality of the testing is already been further enhanced.

Security Testing

Security testing is a technique used to verify whether an information system secures data and functions as intended.

A sort of software testing that identifies system vulnerabilities and ensures that the system's data and resources are secure from potential invaders. It assures that the software system and application are free of hazards or risks that could result in a loss. Security testing of any system is focused on identifying all potential flaws and weaknesses in the system that could result in the loss of information or the organization's reputation. Security testing is a sort of software testing that focuses on evaluating a system's or application's security. The purpose of security testing is to detect

vulnerabilities and potential dangers, as well as to verify that the system is secure from unauthorized access, data breaches, and other attacks [24].

Table 14 would show the security testing items to be evaluated and the expected result vary between the two passed or failed. This shows the results gathered during the security testing of the system in terms of handling an information and how the information input secured on the system.

Table 14

SECURITY TESTING

Items to be Evaluated	Passed (1)	Failed (0)
SQL Injection Attack Objective: Test the systems resilience against SQL injection attacks.		
1. Attempt to input SQL injection queries into user input fields.	1	
2. Observe if the system processes and sanitizes inputs correctly.	1	
3. Verify that the system rejects malicious SQL Injection attempt.	1	
Result:	1	
File Upload Vulnerability Objective: assess the system's security regarding file uploads.		
1. Attempt to upload files with malicious content or executable scripts.	1	
2. Check if the system properly validates file types and content.	1	
3. Ensure that the uploaded files do not compromise the integrity of the system.	1	
Result:	1	
Denial of Service (DoS) Attack Objective: evaluate the system's resilience against DoS attacks.		
1. Simulate a large number of requests or traffic to over whelm the system.	1	
	1	

2. Verify that the system has mechanisms in place to detect and mitigate DoS attack.		
3. Assess the system's ability to maintain availability during a simulated attack.	1	
Result:	1	

Brute Force Attack
Observe: Test the system's resistance to brute force attacks on login credentials.

1. Attempt multiple logins attempts with incorrect credentials.	1	
2. Observe if the system enforces account lockouts or delays after a certain number of failed attempts.	1	
3. Verify that the system logs and alerts administrators about repeated login failures.	1	
Result:	1	
Average	**1**	

The overall results of security testing as shown in table 14 is completely functional (1) with the following results 1, 1, 1, 1. Further, table 14 indicates the overall standard of the system as completely functional.

The results of the testing show the overall functionality of the system Web-based Student-Faculty Portal for Masoli High School for the end-user in terms of the following items that evaluated included the SQL injection attack, file upload vulnerability, denial of service (DoS) attack, and brute force attack. The results varied passed (1) or failed (0). The researchers ensured the security access of the system to avoid threats, attacks, and vulnerability of the information, and credentials inputted on the system.

The aforementioned results were gained through carefully examined and testing the items to be evaluated on the system through the following security measures. The results of testing were under the specific condition of defined black box testing. Indeed, the Web-based Student-Faculty Portal for Masoli High School were completely functional.

Nevertheless, only one security experts from the faculty of College of Computer Studies participated in the survey testing, however, the study can also be conducted with a larger sample size of security experts for testing the security of the developed system. This will allow the study to be replicated and validated to gained a thorough feedbacks.

Therefore, the Web-based Student-Faculty Portal for Masoli High School ensured the security of the system and is completely functional in terms of security testing.

Table 15 will show the summary of the overall results of the three black box testing namely, user acceptance testing, stress testing, and security testing which was used to test system "Web-based Student-Faculty Portal for Masoli High School".

Table 15

SYSTEM'S LEVEL OF FUNCTIONALITY RESULT

Black box Testing	Result	Level of Functionality
User Acceptance Testing (Admin)	0.94	Completely Functional
User Acceptance Testing (IT Analyst)	0.94	Completely Functional
Stress Testing	1	Completely functional
Security Testing	1	Completely functional
Overall Result	**0.97**	**Completely functional**

In overall, the overall results of acceptability testing as shown in table 15 is completely functional (0.97) with the following results of 0.94, 0.94, 1, 1. Further, table 15 indicates the overall standard of the system as completely functional.

The above results show the overall, the system is completely functional for the end-user in terms of the test cases and expected results. Researchers developed system ensured that only being asked are being accepted. Which gave the system a completely functional.

The aforementioned results were gained through carefully examined and testing test cases, test scenarios, and expected results. The results of testing were under the specific condition of defined black box testing. Indeed, the Web-based Student-Faculty Portal for Masoli High School has a level of functionalities of completely functional.

The researchers ensured that the system developed could meet the requirements and condition defined of black box testing during the development of the system. The results above thus achieved; the researcher's system resulted as completely functional for level of functionality. This indicates that the developed system is sufficiently meet the requirements of the end-user. To achieved a fully functional rates from the end-user, it is critical to always consider the end-user requirements.

Therefore, in conclusion, the Web-based Student-Faculty Portal for Masoli High School is completely acceptable for end-user and is completely functional in terms of level of functionality, where the functionality of the testing has already been further enhanced in terms of enrollment, class scheduling, grading system, and requesting documents.

Notes

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Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter, presented and discussed the summary of findings, conclusions, and recommendations of the capstone project "Web-based Student-Faculty Portal of Masoli High School". The presented data and information on this chapter was based on the gathered data during the gathering data and the development process of the system. This chapter aimed to present the summarized findings, conclusions, and the recommendations recommended for further understanding the research.

Summary

The study of the "Web-based Student-Faculty Portal of Masoli High School", depicts a web-based system where it helps to make the school manual processes and transactions make it easy like for enrollment of the students, class scheduling, grading, and requesting of documents. With the use of any of this gadget like mobile phones, laptops, computers or desktop, and also tablets can used in accessing this system website. Aforementioned the school administrator or admin was the primary user of the system. The systems allow admin to manage user account including add, update and delete user account, manage enrollment accept and reject student, manage class schedule add and update schedule, manage request add, update, and confirm request. The system allows teacher to generate a reports like announcement, uploading files, tasks, and other materials, input a grade of the student by subject they handled. Also, systems allow student to view their accounts specially their subjects, class remarks, grades per-subject, generate a request, and view the transaction. The goal of this system is to assess the system performance by using the black box testing, that include the user acceptance testing, stress testing, and security testing.

Scrum methodology was used by the researchers to go through the process of this method to develop a better product to help to resolve the current manual processes of Masoli high school. In

this method it includes phases that the researchers to go through which step by step process to followed to make a better system.

The first phase in scrum methodology is planning, in this stage the researchers were identified the problem issues of Masoli High School which is the manual processing of documents and transactions that was based on the information gathered on the respondents. In the implementation phase, researchers started to construct a design to be develop in intended to the features and functionalities of the system that was the respondent's issues addressed. In the development phase the system on this phase was started to coded and tested to make sure that the user received the expected output and the researchers met their goal. Upon creating the study, the researchers conducted a mock interview to their respondent's trough interview guide and questionnaire their provided. The researchers was used a questionnaire as a data collection tool and interview guide to know what the clients' needs, issues, and difficulties. Arithmetic mean was used to statistically analyze the data collection they gathered.

The researchers expected a better result to their study and become it successful based on the survey results they was gathered. The researchers believed that it may be useful to the faculties of Masoli High School.

Findings

Upon the several trials and creative thinking that researchers done during the analysis. Through interviewing the respondents, the researchers find out this following finding. Through this the researchers decided to develop a system that automate the manual processes of Masoli High School.

1. The researchers found out the present issues and constraints of the current manually procedure of Masoli High School in terms of Enrollment , Class Scheduling, Grading System, and Request for documents. To automate the manual processes the researchers proposed a solution by developing a Web-based Student-Faculty Portal for Masoli High School.

2. The researchers developed an online website system to help automate the current manual processes of Masoli high school. During the development of the system, the researchers applied all the information and data they gathered to come up to a better solution. Instead of manually and paper-based method the develop system web-based student-faculty portal for Masoli high school is the better way solution to this issues.

3. The researchers was used interview guide and questionnaire in gathering data and information needed, and they evaluate all the data to determine whether the system developed is passed using the black box testing criteria for user acceptance testing, stress testing, and security testing through the help of the client and an IT experts. The results came up after testing the developed system using black box testing.

3.1 The User Acceptance Testing result of the Web-based Student-Faculty Portal for Masoli High School determined that it is completely functional with the arithmetic mean of 0.94 based on the survey. It is determined that the system is completely functional. Admin, teachers, students, and IT experts did not find any defects and errors in the system which resulted in a high result.

3.2 The Stress Testing result of the Web-based Student-Faculty Portal for Masoli High School has a total weighted mean of 1 and it is determined that it is completely functional based on the survey.

3.3 The Security Testing result of the Web-based Student-Faculty Portal for Masoli High School has a total weighted mean of 1 in which determined that the level of functionality of the system is completely functional as intended that was determined based from the survey.

Conclusions

The researchers reached the following conclusions based on their findings:

1. The system Web-based Student-Faculty Portal for Masoli High School is a web-based that helps to solve the constraints and issues encountered in current manual processing for enrollment of the students, class scheduling, grading system, and of requesting documents in the school.

2. The developed system Web-based Student-Faculty Portal for Masoli High School is responsive and can be accessed by any devices with a web browser.

3. According to the overall result of 0.97 and statistical metric, the Web-based Student-Faculty Portal for Masoli High School is entirely functional in terms of testing, employing user acceptance testing, stress testing, and security testing. The layout of the system makes it easy for the user to understand how everything works. After implementing the functionality of the intended project, the functionality of the system provides the best description of the system's behavior. As a consequence, the project's user decided that the "Web-based Student-Faculty Portal for Masoli High School" is suitable in terms of black box testing.

Recommendations

The following are the researchers' recommendations based on the specific objectives of the Web-based Student-Faculty Portal for Masoli High School:

1. Future researchers of the system Web-based Student-Faculty Portal for Masoli High School can develop an application were can provide automation process of Masoli High School.

2. Future researchers of the system Web-based Student-Faculty Portal for Masoli High School can add a new feature of the system that can generate the payment records for the school fees.

3. Future researchers of the system Web-based Student-Faculty Portal for Masoli High School can develop an application that generate clearance of the student.