Sri Lanka Institute of Information Technology

Tuition Management System
Information Technology Project (IT2080)

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Background

Sysro Institute is a well-established tuition center located in Ruwanwella, Sri Lanka. The institute has been providing quality education to students for over a decade, catering to students from grade 1 up to A-levels. With a team of highly qualified and experienced teachers, Sysro Institute is known for its commitment to delivering excellent academic results and ensuring the overall development of its students.

The institute has a comprehensive range of courses, including Mathematics, Science, English, and Commerce, that are designed to meet the unique learning needs of each student. Sysro Institute has a reputation for offering personalized attention to students and providing them with an engaging and stimulating learning environment. The institute believes in developing critical thinking skills, nurturing creativity, and encouraging students to explore their potential to the fullest.

Sysro Institute has established itself as one of the leading tuition centers in the area, with a proven track record of academic success. The institute's mission is to empower students with knowledge and skills that will help them achieve their academic goals and prepare them for a successful future.

Problem and motivation

Current Process:

- Sysro Institute relies on a manual process to manage student, teacher, and parent information, attendance records, exam results, expenses, and fee data.
- The current process involves maintaining physical records such as attendance registers, fee registers, and exam results sheets. Teachers and staff must spend a considerable amount of time maintaining these records, which can lead to errors and inconsistencies.
- The current process involves tracking student performance manually which could be really challenging.

Problems/ Specific Challenges:

- The traditional method of managing data is time-consuming, prone to errors, and not scalable as the number of students and teachers increases.
- Manual attendance marking for each student in each class takes up a significant amount of time, especially during peak hours.
- The current system lacks an efficient method to track expenses and fee collection, leading to delays and errors in financial management.
- Scheduling classes and events using a manual process creates confusion and miscommunication among students, teachers, and parents.
- The lack of a centralized platform for student, teacher, and parent information results in disorganized data management.
- The lack of automation in the process results in mismanagement of data, making it difficult to track student performance manually.
- The current system lacks the ability to provide notifications to students and teachers, making it difficult to schedule reminders for classes and other events. This hinders communication between students, teachers, and parents, resulting in delays and confusion.

Desired Solution:

- Sysro Institute is interested in implementing a tuition management system to automate the entire process of data management.
- The new system should provide a centralized platform for storing all information related to student, teacher, and parent data management, attendance records, exam results, expenses and fee data, and tracking student performance.

- Additionally, the system should have a schedule management feature for efficient planning of classes and events and provide notifications via email to students and teachers for scheduling reminders.
- The tuition management system should have separate dashboards for admins, parents, students, and teachers, enabling them to access relevant information easily.
- The system should include a report generation feature to generate customized reports on attendance, performance, fee collections, and expenses.

Aim

The aim of this project is to develop a tuition management system that automates the process of managing student, teacher, and parent information, attendance records, exam results, expenses and fee data, and provides notifications to students and teachers.

This system will enable Sysro Institute to streamline its administrative processes and improve communication between students, teachers, and parents.

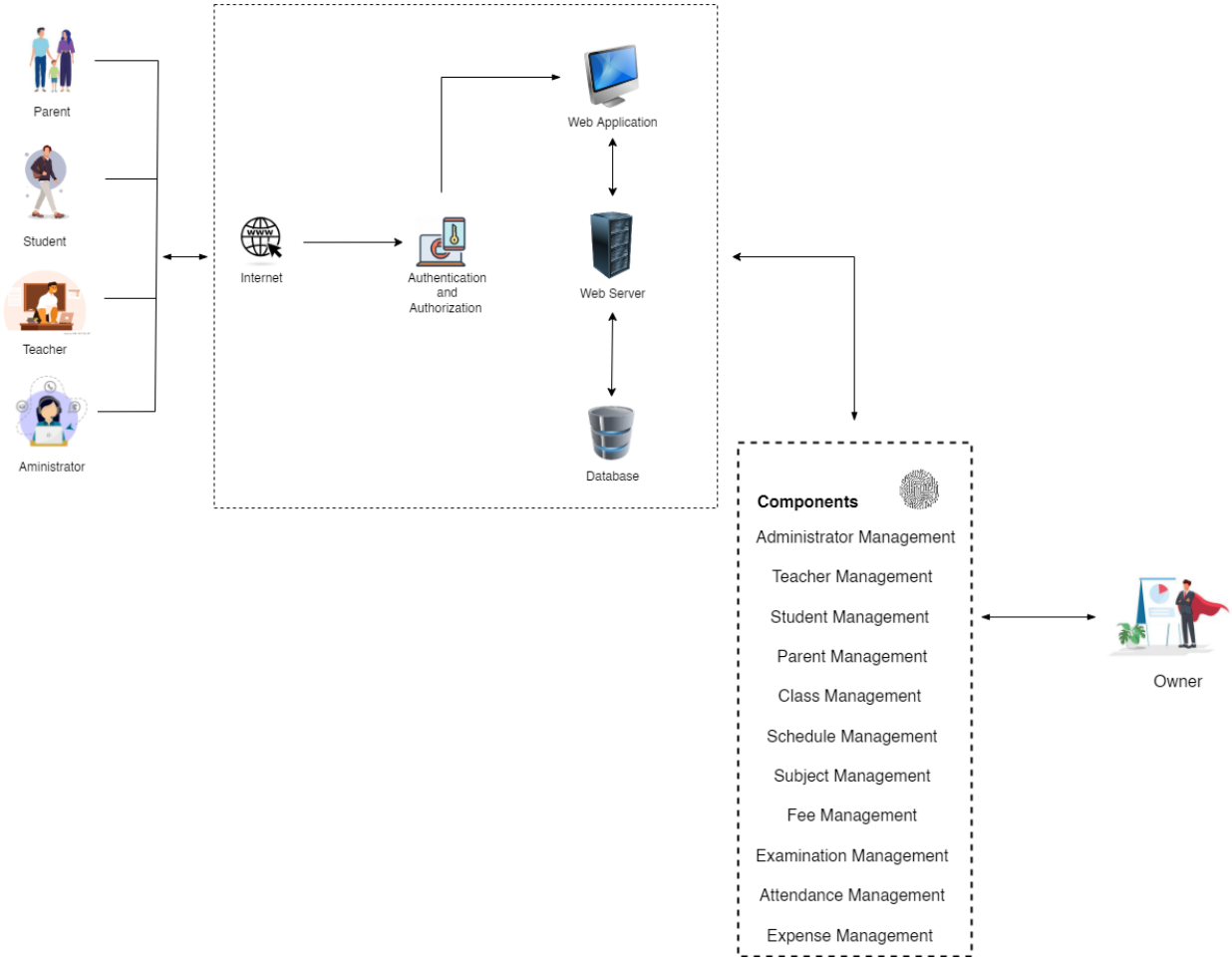
Objectives

- Develop a centralized database to store admin, student, teacher, and parent information.
- Implement a module for tracking student attendance records and exam results.
- Develop a module to manage expenses and fee data.
- Create features to track student performance and provide personalized support.
- Integrate a notification system to schedule reminders and improve communication between students, teachers, and parents.
- Design and develop a user-friendly interface for easy navigation and use by administrative staff, students, teachers, and parents.
- Test and refine the system to ensure it meets the needs of Sysro Institute and is free of bugs and errors.
- Implement the system in a timely manner and ensure a smooth transition from the current manual process to the new tuition management system.

System Overview

Our proposed Tuition Management System is designed to streamline and automate the Sysro Institute's operations by providing a web-based application that is highly sophisticated and user-friendly.

The system offers separate, tailored dashboards for each of the major stakeholders involved in the center, including the administrator, teacher, student and parent, as well as separate portals for managing attendance, exams, and expenses.



System Functions

Student Management

- The student management function in the admin dashboard is designed to provide the administrator with a comprehensive solution for managing student accounts.
- The admin has the ability to create new student accounts, view, search, edit, and delete existing accounts as needed.
- When a new student is added to the system, the system will automatically generate a new secure password and send it to the student via email.
- Additionally, the student will receive a welcome email containing information about their account and instructions on how to log in and access the system.
- The system also provides the admin the ability to monitor student performance.
- Additionally, the admin has the capability to generate reports based on student data.
- Moreover, the Student Dashboard provides students with a centralized platform to view their academic journey. They can easily view their class schedules, helping them stay on top of their daily activities and keep track of their classes.
- Additionally, the student dashboard allows students to track their progress. This enables them to identify areas where they need to improve and work on their weaknesses.

Functional Requirements:

Admin

- Administrators can create new student accounts
- Administrators can view, search, edit, and delete existing student accounts as needed
- Administrators can generate reports based on student data
- Administrators can monitor student performance

Student

- Students can view their assigned classes and class schedules
- Students can track their progress

Non-functional Requirements:

- **Performance**: The system should be able to handle a large number of student accounts and data without any significant impact on the system's speed or performance.
- **Security**: The system must be secure and ensure the confidentiality, integrity, and availability of student data at all times.
- **Usability**: The Student Dashboard should be user-friendly, intuitive, and easy to navigate, making it accessible for students of all technical backgrounds.
- **Reliability**: The system must be reliable and available 24/7, ensuring that students can access their information and perform necessary tasks at any time.
- **Scalability**: The system should be scalable and able to accommodate an increasing number of student accounts and data as the tuition center grows and expands.

Teacher Management:

- The Admin Dashboard's Teacher Management function provides administrators with the tools to efficiently manage teacher accounts.
- Administrators can create new teacher accounts, view, search, edit, and delete existing teacher accounts as needed. This ensures that teacher information is up-to-date and accurate.
- When a new teacher is added to the system, the system will automatically generate a new secure password and send it to the teacher via email.
- Additionally, the teacher will receive a welcome email containing information about their account and instructions on how to log in and access the system.
- Also, the Teacher Management function provides administrators with the ability to generate reports based on the data.
- Moreover, the Teacher Dashboard gives teachers a comprehensive overview of their students and classes. They can view the number of students and classes assigned to them, gender and grade distribution of their students, attendance data, and exam results statistics.
- The teacher dashboard also includes a feature to track students' progress over time.
- Furthermore, the teacher dashboard includes a feature for teachers to submit notices if they are unable to attend their classes. When a notice is submitted, students in the assigned classes will be notified via email.

Functional Requirements:

Admin

- Administrators can create new teacher accounts

Teacher

- Teachers can view the number of students and classes assigned to them

- Administrators can view, search, edit, and delete existing teacher accounts as needed
- Administrators can generate reports based on student data
- Teachers can view gender and grade distribution of their students
- Teachers can view attendance data
- Teachers can view exam results statistics
- Teachers can track students' progress over time
- Teachers can submit notices if they are unable to attend their classes

Non-functional Requirements:

- **Security**: The system must ensure that the passwords generated for teacher accounts are secure and not easily hackable. It should also have measures in place to prevent unauthorized access to teacher information.
- **Reliability**: The system should be available and functional at all times, with minimum downtime and disruptions to the teacher management process.
- **Scalability**: The system should be able to handle a large number of teacher accounts and data, with the ability to scale up or down as needed.
- **Performance**: The system should be fast and responsive, with quick loading times and minimal lag. Teachers should be able to access and manage their accounts quickly and efficiently.

Parent Management:

- The Admin Dashboard's Parent Management function provides administrators with the tools to efficiently manage parent accounts.
- Administrators can create new parent accounts, view, search, edit, and delete existing parent accounts as needed. This ensures that parent information is up-to-date and accurate.
- When a new parent is added to the system, the system will automatically generate a new secure password and send it to the parent via email.
- Additionally, the parent will receive a welcome email containing information about their account and instructions on how to log in and access the system.
- In addition, the Parent Management function provides administrators with the ability to generate reports based on the data.
- Moreover, the Parent Dashboard provides parents with a comprehensive view of their child's academic performance and attendance within the tuition center. This user-friendly dashboard

allows parents to track their child's progress in real-time and stay informed about their education.

Functional Requirements:

Admin

- Administrators can create new parent accounts
- Administrators can view, search, edit, and delete existing parent accounts as needed
- When a new parent is added to the system, the system will automatically generate a new secure password and send it to the parent via email
- Administrators can generate reports based on parent data

Parent

- Parents can track their child's academic performance
- Parents can view their students' attendance records

Non-functional Requirements:

- **Security**: The system must ensure that all parent data is securely stored and transmitted. The system should also provide a secure login process for parents to access their child's information.
- **Usability**: The Parent Dashboard should be user-friendly and easy to navigate, even for parents who may not be tech-savvy.
- **Reliability**: The system should be reliable and available at all times, with minimal downtime or system errors.
- **Performance**: The system should be able to handle a large number of parent accounts and data, and provide quick access to information.
- **Scalability**: The system should be able to scale up as the number of parent accounts and data increases over time.

Admin Management:

- The Admin Management function in the admin dashboard allows the administrator to create new admin accounts, view, search, edit, and delete existing accounts as needed, ensuring that only authorized individuals have access to the information contained within the admin dashboard.

- When a new admin is added to the system, the system will automatically generate a new secure password and send it to the admin via email.
- Additionally, the admin will receive a welcome email containing information about their account and instructions on how to log in and access the system.
- In addition, the system provides the capability to generate reports based on the admin data.
- Moreover, the Admin Dashboard provides the administrator with complete control over the management of the tuition center, enabling them to manage and access information about students, teachers, parents, subjects, classes, exams, schedules, attendance and financial aspects (fees and expenses).

Functional Requirements:

Admin

- Administrators can create new admin accounts
- Administrators can view, search, edit, and delete existing admin accounts as needed
- Administrators can generate reports based on the admin data
- Administrators can manage and access information about students, teachers, parents, subjects, classes, exams, schedules, attendance and financial aspects such as fees and expenses
- Administrators can generate and view reports in real-time, allowing for quick and informed decision-making

Non-functional Requirements:

- **Security**: The system must ensure that all admin accounts and information are secure and only accessible by authorized individuals through secure login and password management protocols.
- **Performance**: The system must be able to handle large amounts of data and user traffic without compromising performance or functionality.
- **Reliability**: The system must be available and reliable at all times to ensure that administrators can access information and perform necessary tasks without interruptions or delays.
- **Usability**: The system must have a user-friendly interface that is easy to navigate and understand for administrators with varying levels of technical expertise.
- **Scalability**: The system must be scalable to accommodate future growth and changes in the tuition center's management needs.

Class Management:

- The Admin Dashboard's Class Management function streamlines class organization and management for the tuition center.
- It offers administrators the ability to create, view, search, edit, and delete classes as needed.
- The function also enables enrollment and unenrollment of students, as well as report generation.
- Also, when a teacher is assigned to a class by the administrator, they will be notified via email.
- Similarly, when a student is enrolled or unenrolled from a class, both the student and their parent will receive notification via email.
- If there are changes made to the information about a class, such as the class teacher, date, time, or venue, the teacher and all enrolled students will also be notified via email. This ensures that all relevant parties are kept informed and up-to-date on the latest class information.

Functional Requirements:

Admin

- Administrators can create, view, search, edit, and delete classes as needed
- Administrators can keep track of all classes offered by the center
- Administrators can enrollment and unenroll students as needed
- Administrators can generate reports based on class data

Non-functional Requirements:

- **Performance**: The system should be designed to handle a large number of classes without experiencing any lag or delay in response time.
- **Usability**: The system should have an intuitive and user-friendly interface, making it easy for administrators to navigate and manage classes.
- **Security**: The system should have robust security measures in place to protect the sensitive data of students and teachers at the tuition center.
- **Availability**: The system should be available 24/7, with minimal downtime for maintenance and upgrades.

- **Reliability**: The system should be reliable and accurate in managing class information and notifications, ensuring that all parties receive timely and accurate information.
- **Scalability**: The system should be scalable, able to handle an increasing number of classes and students as the tuition center grows.

Schedule Management:

- The Admin Dashboard's Schedule Management function provides administrators with the ability to view class schedules for all existing classes in the tuition center. This function presents class schedules in a user-friendly calendar format, making it easy to view and understand the class schedule at a glance.
- The calendar view displays class dates, times, and venues, providing administrators with a comprehensive overview of the center's class schedules. In addition, administrators have the option to download the class schedules in PDF format, allowing them to easily share or print the schedules as needed.

Functional Requirements:

Admin

- With a user-friendly calendar view, administrators can easily view and understand the schedules for all existing classes in the center.
- Administrators can also download the class schedules in PDF format.

Non-functional Requirements:

- **Performance**: The Schedule Management system should be able to handle a large volume of data without any lag or delay. It should be able to load and display schedules quickly and efficiently.
- **Availability**: The system should be available 24/7 to ensure that administrators have access to class schedules whenever they need them.
- **Security**: The system should have proper authentication and authorization mechanisms to ensure that only authorized users have access to class schedules.
- **Scalability**: The system should be scalable to accommodate the addition of new classes and the expansion of the tuition center. It should be able to handle an increasing number of schedules and users without any performance degradation.

Subject Management:

- The Admin Dashboard's Subject Management function provides a centralized platform for administrators to manage the subjects offered by the tuition center. This includes creating new subjects, viewing, searching, editing, and deleting existing subjects as necessary, making it easy to keep the subject offerings up-to-date and relevant.
- Additionally, the subject management function includes the ability to generate reports that include subject details, allowing administrators to easily track the subjects offered and their related information.

Functional Requirements:

Admin

- Administrators can create, view, search, edit, and delete subjects as needed
- Administrators can generate reports based on subject data

Non-functional Requirements:

- **Performance**: The system must be able to handle a large number of subjects and their associated data without any significant decrease in performance..
- **Security**: The subject management system must be secure and protect confidential data from unauthorized access.
- **Usability**: The subject management system must be user-friendly and easy to navigate.
- **Reliability**: The system must be reliable and available at all times.
- **Scalability**: The system must be scalable and able to handle future growth. As the number of subjects offered by the tuition center increases, the system should be able to accommodate this growth without any major changes to the underlying infrastructure.

Exam Management:

- The Exam Management Portal provides teachers with the necessary tools to efficiently manage exams for the tuition center.
- Teachers can create new exams, view, search, edit, and delete existing exams related to their assigned classes.

- The teacher can also mark attendance for students who sat for the exam and add marks for each student.
- They can edit added marks if necessary, and release the unofficial student grades for approval by the admin.
- When the unofficial marks are released, the students will be notified via email. Moreover, teachers can also view statistics about exams, such as attendance and grade distribution, and generate reports based on the data.
- In addition, students are able to log into the Exam Management Portal to view their marks.
- The Admin Dashboard's Exam Management function empowers administrators to oversee exams at the tuition center. They can approve and release official grades, which are automatically sent via email to teachers, students, and parents. Additionally, administrators can generate reports based on exam data.

Functional Requirements:

Admin

- Administrators can approve and release official grades, which are automatically sent via email to teachers, students, and parents
- Administrators can generate reports based on exam data

Student

- Students can log into the Exam Management Portal to view their marks

Teacher

- Teachers can create new exams
- Teachers can view, search, edit, and delete existing exams related to their assigned classes
- Teachers can mark attendance for students who sat for the exam
- Teachers can add marks for each student
- They can edit these marks if necessary, and release the unofficial student grades for approval by the admin
- Teachers can also view statistics about exams, such as attendance and grade distribution
- Teachers can generate reports based on the data

Non-functional Requirements:

- **Security**: The exam management portal must ensure the confidentiality and integrity of student data, such as exam scores and attendance records. The system must have strong authentication and access controls to prevent unauthorized access.
- **Performance**: The exam management portal must be able to handle a large number of concurrent users during peak exam periods, without slowing down or crashing. It should also have fast response times when generating reports or updating student records.
- **Usability**: The exam management portal must be user-friendly and intuitive for both teachers and students. It should have clear navigation and well-designed interfaces, with appropriate feedback provided to users during actions such as adding or editing grades.
- **Reliability**: The exam management portal should be highly available and reliable, with minimal downtime or disruption.
- **Scalability**: The exam management portal should be able to scale up or down as needed to accommodate changes in the number of students, classes, or exams. The system should be designed to handle future growth and expansion of the tuition center.

Fee Management:

- The Admin Dashboard's Fee Management function provides a centralized approach to fee collection and tracking.
- The administrator has complete visibility into the payment status of each student and can easily see which students have paid and which students are yet to pay.
- Admin can add, view, edit, search and delete payment records.
- Additionally, the system provides detailed reports on fees collected, enabling the administrator to make informed decisions about the financial health of the tuition center.
- Moreover, the system sends automated reminders to parents who have not yet paid their fees, reducing the burden on administrators to follow up with each individual parent.

Functional Requirements:

Admin

- Admin can view the payment status of each student
- Admin can add, view, edit, search and delete payment records
- Admin can generate reports on fees collected and outstanding balances

Non-functional Requirements:

- **Security**: The fee management system must ensure the confidentiality and integrity of all financial information.
- **Performance**: The system should be fast and responsive, with minimal latency in processing payment transactions. It should be able to handle a large number of payment transactions simultaneously without affecting system performance.
- **Scalability**: The system should be able to scale up or down based on the changing needs of the tuition center. It should be able to handle a growing number of students and payment transactions without compromising on performance or security.
- **Reliability**: The fee management system must be reliable and available at all times. It should have a high uptime and provide automatic failover and redundancy options in case of system failure or outage.
- **User-friendliness**: The system should be easy to use and navigate.

Expense Management:

- The Expense Management Portal allows administrators to easily view, add, edit, search and delete expenses related to the tuition center. This includes expenses such as rent, utilities, staff salaries, and supplies, among others.
- By categorizing expenses into different categories, administrators can keep track of their expenses and stay within budget.
- In addition, administrators can also view expense reports, which provide them with valuable insights into the center's financial status and spending patterns.

Functional Requirements:

Admin

- Administrators can view, add, edit, search and delete expenses, including rent, utilities, staff salaries, and supplies, among others
- Administrators can categorize expenses into different categories
- Administrators can keep track of their expenses and stay within budget
- Administrators can generate detailed expense reports
- Administrators can ensure that they never miss a payment or deadline with features such as automated reminders and notifications

Non-functional Requirements:

- **Usability**: The Expense Management Portal should have a user-friendly interface that is easy for administrators to navigate and use.
- **Performance**: The system should be able to handle a large amount of data and users simultaneously without experiencing any significant lag or downtime.
- **Security**: The system should have robust security features to protect sensitive financial data, including user authentication, access control, and encryption of data in transit and at rest.
- **Scalability**: The system should be able to accommodate future growth of the tuition center and handle an increasing number of expenses, categories, and users without requiring significant modifications or upgrades.
- **Availability**: The system should be available 24/7.

Attendance Management:

- The Attendance Management Portal streamlines the process of marking student attendance by utilizing a QR code.
- With this system, students simply scan the QR code to access an attendance form. Once the form is completed, the attendance record is automatically recorded and securely stored in the system and can be easily retrieved for future reference.
- This efficient process saves time and reduces the risk of errors or omissions in the attendance record.
- With this system, administrators can also easily retrieve attendance records for future reference and analysis.
- Moreover, the Attendance Management Portal helps parents to track their child's attendance in real-time, ensuring that they stay informed and involved in their child's education. For example, if a student is absent three times, the system will automatically send an email notification to their parent, alerting them of their child's repeated absence.

Functional Requirements:

Student

- Students can access the attendance form by scannig a QR code

Admin

- Administrators can easily retrieve attendance records for future reference and analysis.

Parent

- Parents can track their child's attendance in real-time.

Non-functional Requirements:

- **Performance**: The system should be able to handle a large number of attendance records and user requests without any significant delays or interruptions.
- **Security**: The attendance data must be stored securely and protected from unauthorized access or manipulation. The system should use encryption and authentication mechanisms to ensure data privacy and integrity.
- **Reliability**: The system should be highly reliable and available, with minimal downtime or service disruptions. It should also have backup and recovery mechanisms to ensure the integrity and availability of the attendance data.
- **Usability**: The system should be easy to use and navigate, with clear instructions for students and teachers on how to access and use the attendance portal. The system should also have an intuitive interface that allows users to quickly and easily view attendance data and generate reports.
- **Accuracy**: The system should be able to accurately record attendance data and prevent errors or omissions in the attendance record. The QR code scanning and form submission process should be reliable and error-free.

Technical requirements:

Hardware	Minimum	Recommended	Browsers	OS
• Processor	• Intel i3 2nd gen • AMD Ryzen 3 1st gen	• Intel i3 7th gen or high • AMD Ryzen 3 3rd gen or high	• Google Chrome • Mozilla Firefox • Microsoft Edge • Safari • Opera	• Windows 7 or high • Mac OS X 10.6
• RAM	• 4GB	• 6GB or high		
• Storage	• 5GB	• 5GB or high (better use SSD)		

Literature review

Tuition management systems have become increasingly popular in recent years due to several factors. One of the main reasons is the increasing use of technology in education and the need for more efficient and streamlined processes. With the growing number of students and tuition centers, manual management of tuition fees, student accounts, attendance, and exam results can be time-consuming and error-prone. Tuition management systems provide an automated solution to manage these processes, reducing administrative workload and allowing for more accurate and timely reporting. In this literature review, we will compare the tuition management system described in this project with previously done projects to identify its unique features and advantages.

Compared to previous systems, the tuition management system described in this project stands out due to several unique features. Firstly, our system provides administrators with the ability to efficiently manage not only student accounts but also teacher, parent and admin accounts. This allows for more effective communication and collaboration between all parties involved in the tuition process. Administrators can create new user accounts, view, search, edit, and delete existing user accounts as needed. Additionally, when a new user is added to the system, the system will automatically generate a new secure password and send it to the user via email. Futhermore, the user will receive a welcome email containing information about their account and instructions on how to log in and access the system.

Another unique feature of our system is the exam portal. Teachers can create, edit, and manage exams for their assigned classes, add and edit marks, and view exam statistics and reports. Administrators can generate reports containing exam data, approve and release official marks, which are automatically sent to teachers, students, and parents via email. This feature is a significant improvement compared to previous systems that may not have such comprehensive exam management features.

The schedule management feature of the Tuition Management System also stands out as a unique feature. Administrators can view and download class schedules for all existing classes in a user-friendly calendar format. This feature enables students, teachers, and parents to access and manage their schedules efficiently.

Performance tracking is another unique feature of the Tuition Management System. Administrators, teachers, students and parents can all monitor and track student performance, identifying areas that require improvement. This feature can help to enhance the learning experience and improve academic performance.

When compared to previously done projects, our tuition management system offers a significant advantage over other systems. For example, Wenzhong and Fengyun et al. (2015) developed a web-based tuition management system aimed at reducing the workload of the finance department of colleges and universities. Although their system was efficient, it lacked a comprehensive fee management module that administrators could use to monitor the payment status of students. Our system provides two separate features for managing finances - fee management function and expense management portal. The fee management function in the admin dashboard gives administrators complete visibility into the payment status of each student, allowing them to easily see which students have paid and which are yet to pay. Furthermore, the system can automatically generate payment reminders, thus reducing the need for manual reminders. In addition, the expense management portal allows administrators to view, add, edit, search, and delete expenses, categorize them, and generate reports that provide valuable insights into the center's financial status and spending patterns.

Yang and Rosmayati et al. (2023) developed a tuition management system that provides a platform for students to find tuition centers that meet their specific needs. Their system also allows private tutors to market their tutoring careers. However, our tuition management system is not only for students and teachers. Parents can also log in as stakeholders and access their dashboards. The Parent Dashboard in our system provides parents with a comprehensive view of their child's academic performance and attendance within the tuition center. This user-friendly dashboard allows parents to track their child's progress in real-time and stay informed about their education.

The Tuition Centre Management System via Mobile Application implemented by Putera and Mohd et al. 2022 is expected to fulfill the basic needs for tuition centre to handle students and their parents. Problem that led to the development of this system is that there is no exact way to know the understanding of a student in a subject they are currently enrolling. Parents are also unable to know about their children at and performance without meeting the teachers. In contrast to this system, our system also focuses on teachers as a main user. Teachers can also log in to our system and get a comprehensive overview of their students and classes. They can view the number of students and classes assigned to them, gender and grade distribution of their students, attendance data, and exam results statistics. The dashboard also includes a feature to track students' progress over time. In addition to this our system’s teacher dashboard includes a feature for teachers to submit notices if they are unable to attend their classes. When a notice is submitted, students in the assigned classes will be notified via email.

Aida and Azizul et al. (2022) developed a web-based student management system to facilitate student registration at the Damya Deena Tuition Center. Although their system allowed

administrators to update student data faster and systematically, it lacked an attendance portal. Our system includes an attendance portal that allows for easy marking of attendance for students. With this system, students can simply scan a QR code to access the attendance form. Once the form is filled their attendance will be marked and securely stored in the system. This saves time and reduces the risk of errors or omissions in the attendance record.

The Tuition Management System developed by Aqilah and Ruhaya et al. (2022) for Pro Eduelite Tuition Centre has manager, administrators, tutors, and parents as users. The system accepts registration of students, tutors, and staff, update of payment, update of class scheduling, report management, and others. Although their system included a exam management feature, it lacked a notification feature. However, our system can send notifications to students, teachers, and parents via email. This feature helps to keep everyone informed about critical events, such as exams, fee payments, and class cancellations.

In conclusion, tuition management systems have become a valuable tool in educational institutions, and the system described in this project offers several unique features and advantages over previously done projects. Our system provides a user-friendly and comprehensive dashboard for administrators, students, teachers and parents, enabling them to manage their respective tasks easily and efficiently. Additionally, the system's fee and expense management modules offer detailed reporting and insights into the institution's financial status and spending patterns, which can be used to optimize financial planning and budgeting. The Attendance Portal allows easy marking of attendance and retrieval of attendance records. Additionally, the Exam Portal allows administrators to manage exams and track student performance over time. Furthermore, the notification feature ensures that all stakeholders are kept informed about important events, leading to better communication and collaboration.

Overall, our tuition management system offers a complete solution for educational institutions, providing them with a powerful tool to streamline their administrative processes and enhance their financial management. We believe that our system can make a significant contribution to the education industry, and we are confident that it will be well-received by institutions looking to improve their efficiency and effectiveness.

Methodology

Our project will follow an agile development methodology to ensure that we deliver a high-quality product on time and within budget.

We will use the following methods, tools, and technologies for different stages of the project.

Requirements Engineering Methods:

- **User Interviews**: We will conduct interviews with key stakeholders such as the tuition center's administrators, teachers, and students to gather their requirements and expectations for the tuition management system.

- **Surveys**: We will also use surveys to gather feedback and opinions from a larger sample of users.

- **Use Case Diagrams**: We will use use case diagrams to model the system's requirements, capturing the interactions between users and the system.

Design Methods:

- **Unified Modeling Language (UML)**: We will use UML diagrams such as activity diagrams, sequence diagrams, and class diagrams to model the system's design.

- **Wireframes and Mockups**: We will create wireframes and mockups to visualize the system's user interface and obtain feedback from stakeholders.

Development Tools and Technologies:

- **MERN Stack**: We will use the MERN stack (MongoDB, Express.js, React, Node.js) to develop the web application.

- **Git**: We will use Git as our version control system to enable collaboration and track changes.

- **Visual Studio Code**: We will use Visual Studio Code as our integrated development environment (IDE) to develop the system.

Project Management Tools:

- **Jira** was used to manage project tasks, track progress, and keep team members informed of project updates.

- **GitHub** was used to store the project's source code and track changes made to the code over time. This allowed team members to collaborate on the codebase and maintain a history of changes made to the project.

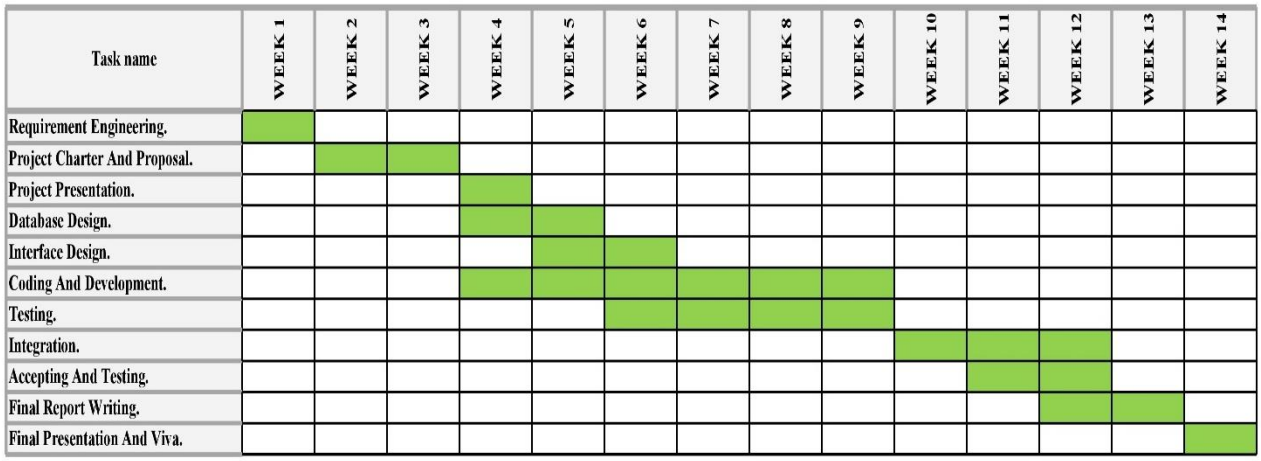
Alternatives and Justifications:

- Alternative design tools like Sketch or Figma were considered but not selected because they were not as suitable for the specific requirements of the project as UML. While Sketch or Figma may have been more visually appealing, UML offered more detailed documentation and better support for software engineering concepts. Additionally, our development team had expertise with UML, making it the more efficient and effective choice.

- Agile was chosen as the methodology for requirements engineering and development due to its flexibility and ability to accommodate changing requirements throughout the project. Alternatives like the Waterfall methodology were considered but were not as suitable for the project due to their more rigid, sequential approach. Since the tuition management system is a complex project, with a high likelihood of changes in requirements over time as we receive feedback from users, the Agile methodology allows for more flexibility and adaptability to change, which is important for our project's success.

Project Plan

Grant Chart



Work breakdown structure

No	Task	Sub Task	Duration	Members
01	Requirement Gathering &Analysis	○ Interview with clients ○ Gather requirements details ○ map out project timeline - Identify exactly which team members will be involved inour project ○ Create a charter document ○ Create an agile document and project ○ Understanding project risks	8	Vidura Shehan Sahan Vinnath Lahiranga Sadupa Yashodini Venura

02	Develop UI	Login • Student Login • Parent Login • Admin Login • Exam Management Login • Teacher Login Admin UI • Admin Dashboard • Administrators • Teachers • Instructors • Students • Parents • Classes • Subjects • Exam Management • Fee Management • Attendance Management • Expense Management Student UI • Student Dashboard Teacher UI • Teacher Dashboard • My Students • My Classes • Exam Management Parent UI • Parent Dashboard • My Children		Vidura Shehan Sahan Vinnath Lahiranga Sadupa Yashodini Venura

Testing methods

Testing is a critical aspect of software development, and it ensures that the product delivered to the end-users is of high quality and meets their requirements. In our project, we plan to use both frontend and backend testing techniques to ensure the quality of the software.

Backend Testing:

We will be using Postman to perform integration testing of our backend APIs. Postman provides a simple and efficient way to test RESTful APIs, and it helps us to identify any issues in the API design or functionality.

Evaluation Method

The system will be evaluated through several methods to ensure its effectiveness, reliability, and efficiency.

- **User Testing**: The system will undergo user testing with a sample group of teachers, administrators, students, and parents to gauge their satisfaction with the system's usability, functionality, and overall performance.

- **Performance Testing**: The system's performance will be evaluated under various conditions to determine its responsiveness, stability, and scalability. Performance testing will be conducted using simulated loads, peak loads, and stress loads.

- **Security Testing**: The system will undergo security testing to ensure that it is protected against potential security breaches and cyber attacks. This includes testing the system's authentication, authorization, and encryption capabilities.

- **Usability Testing**: The system's usability will be evaluated to ensure that it meets the needs of its users. This will include testing the system's navigation, layout, and ease of use.

- **Functionality Testing**: The system's functionality will be evaluated to ensure that it meets the requirements outlined in the system's specifications. This includes testing the system's features, such as fee management, expense management, class management, exam management, and schedule management.

- **Compatibility Testing**: The system will be evaluated to ensure that it is compatible with a variety of browsers, operating systems, and devices. This will include testing the system's functionality and usability across different platforms.

- **Acceptance Testing**: The system will undergo acceptance testing to ensure that it meets the requirements and expectations of the client. This includes testing the system's functionality, usability, and performance in real-world scenarios.

Overall, the system's evaluation will be a continuous process to ensure that it is meeting the needs of its users and stakeholders. The results of the evaluation will be used to make necessary improvements and enhancements to the system.

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