Sri Lanka Institute of Information Technology

Information Technology Project (IT2080)

Assignment 1

Project Proposal

WD_B05_ITP_ T60

Online Educational Institute Management System

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1. Background

The client is Nawamaga Institute, an educational institute that currently handles everything manually and does not offer any online services like online payment, registration, and learning management system. They face difficulties in handling physical documents and are looking for a solution to manage their processes more efficiently. The client has agreed to work with the development team to create a web application to automate their processes and improve their services. The nature of client is an educational institution seeking to improve its operational efficiency and provide better services to its students.

The institution has a staff of teachers and administrators who manage day-to-day operations such as class scheduling, assignment creation and grading, and student record management, but the fact that the institution does not offer any online services suggests that it is lagging behind in terms of technology and infrastructure. This can lead to inefficiencies such as long processing times for administrative tasks and difficulties in managing student records. It also suggests that the institution may be missing out on potential opportunities to attract and retain students who prefer the convenience of online services.

Nawamaga demonstrates its willingness to adapt to changing trends and improve its offerings to students by looking for a solution to automate its processes and provide online services. The decision to work with a development team to create a web application using the MERN technology stack demonstrates a desire to use the latest technology and best practices in software development.

2. Problem and Motivation

Currently, Nawamaga institute is running everything manually. Covid pandemic situation period they launched an online payment system through their website for the student that's why curfew times anyone can't come to the institute to pay monthly fees. [1] but at this present, that system not currently working now, and It doesn't offer any online services such as an Assignment management system, Quiz management system, Student management system, Support services management system, Timetable & notice management system, Staff management System, and Module Management system(Figure 1). They need to launch a new system for these problems.

- **Registrations & documentation are done manually**.
  If someone wants to register for a new class, they should come to the institute physically. Also, they must fill in registration forms manually and hand them over to the Institute. it is a very difficult situation for students far from Monaragala. The institution has a staff of teachers and administrators who manage day-to-day operations such as class scheduling, assignment creation and grading, and student record management, but the fact that the institution does not offer any online services suggests that it is lagging in terms of technology and infrastructure. This can lead to inefficiencies such as long processing times for administrative tasks and difficulties in managing student records. It also suggests that the institution may be missing out on potential opportunities to attract and retain students who prefer the convenience of online services.
    - Implementing online services in the institution can bring benefits to both students and the administration. For students, it will provide convenience by eliminating the need to travel and physically fill in forms. It will also provide accessibility to those who are far away. For the administration, it will streamline administrative processes, resulting in faster processing times, more accurate record keeping, and a reduction in errors. Automation of routine tasks will free up time for teachers and administrators to focus on more important work, such as student engagement and academic excellence. Finally, the use of online services will also help the institution attract and retain tech-savvy students.

- **Difficulty in conducting exams.**

  Since the exam is conducted at least once a month, it costs a lot of paper, and it is difficult to find papers according to the current situation in the country, so having to spend a lot of money on it is a loss for the institution. As the institute hopes to provide education for students outside Monaragala, the fact that students outside Monaragala is not able to attend the examinations conducted by their institute on time is one of the issues.

  - By transitioning to online exams, the client can experience a range of benefits, including reduced costs, increased accessibility, improved efficiency, enhanced flexibility, and improved security. Online exams can help the institution save money on paper and printing costs, and reduce the time and labor required to administer exams. They also offer the opportunity for students who are outside of Monaragala to participate in exams at the same time as students who are physically present, increasing access to education. Additionally, online exams can be administered more efficiently, providing faster feedback for students, and improving operational efficiency. They also offer greater flexibility in terms of scheduling and location, reducing the burden on students and allowing them to better manage their schedules. Lastly, online exams can provide better security features, such as randomized question orders, question banks, and timed tests, helping to prevent cheating and ensuring the integrity of the exam.

- **Support services are done manually.**

  Students and parents must come and make inquiries to the institution to get the services and information they need. Since there is only one person for the support service, most of the time students and parents come at the same time, so they have to spend a long time in queues. The available time will be wasted and due to the job work of some parents, they will not be able to come to the institution to get some information.

  - by building an online institute, the institution can provide a range of benefits to students and parents, including 24/7 access to information, efficient communication, flexibility for working parents, increased engagement, and cost savings. These benefits can help to improve the overall customer experience and attract and retain students in the long run.

- **Limit reach & High overhead costs.**

  Navamaga education institute faces some limitations in their capacity to accommodate a larger number of students due to the constraints of their physical infrastructure for some Subjects. Classroom and lab space, limited faculty availability, scheduling conflicts, and resource limitations are some of the reasons that limit the number of students who can access education in these institutions. Maintaining physical infrastructure is a significant expense for educational institutions, adding to their overhead costs. The costs of utilities, maintenance of equipment, and construction and maintenance of buildings can be prohibitively expensive. High overhead costs can strain finances and result in reduced student programs, resources, and class development investments.

  - By building an online institute system, Navamaga education institute can overcome the limitations of physical space and faculty availability for high-demand subjects. This will lead to increased enrollment and revenue and expand the institute's reach beyond its physical location. Additionally, an online institute system can significantly reduce overhead costs by eliminating the need for physical infrastructure and utilities, freeing up resources that can be invested in student programs and class development. Overall, an online institute system can provide Navamaga education institute with the opportunity to expand, thrive and provide a more diverse academic offering.

- **Difficult marketing campaign.**

  There is a shortage of students for some subjects even though there are more students for some subjects. The reason for this is that students from outside Monaragala are not able to come to the institution and participate in educational activities. and another reason is the competitive tuition of other teachers in the country. Since many teachers have become Converted to online education, the marketing business of their educational institution has become fail to the extent that students participate in those online educational institutions for their respective subjects.

  - Building an online institute system can help to address the shortage of students for certain subjects by providing access to a wider pool of students. This can lead to increased enrollment and revenue. Offering competitive tuition rates for online courses can help to retain existing

students and attract new ones. Online education provides the opportunity to reach students who may live too far away to attend in-person classes, increasing the diversity of the student body. Embracing online education can also lead to a more innovative and dynamic learning environment by staying up to date with current trends and technology. [2]

3. Aim and Objectives

Aim

Past months ago Students are currently confronted with several obstacles, including the maintenance. of handwritten documents because of lack of papers, transportation issues, and the COVID-19 pandemic.

The following solutions are used to solve these issues.

- Students encounter a variety of transport challenges as a result of limited fuel in the country's current circumstances. Because of this difficulty, Students can do their educational activities through our website.
- This application will be helpful to minimize the number of Student participate physical classes because of fuel issues.
- Handwritten documents can be lost at any time. hence storing information in a database can be more secure than maintaining handwritten documents.
- Maintaining a database is easier than using handwritten documents.

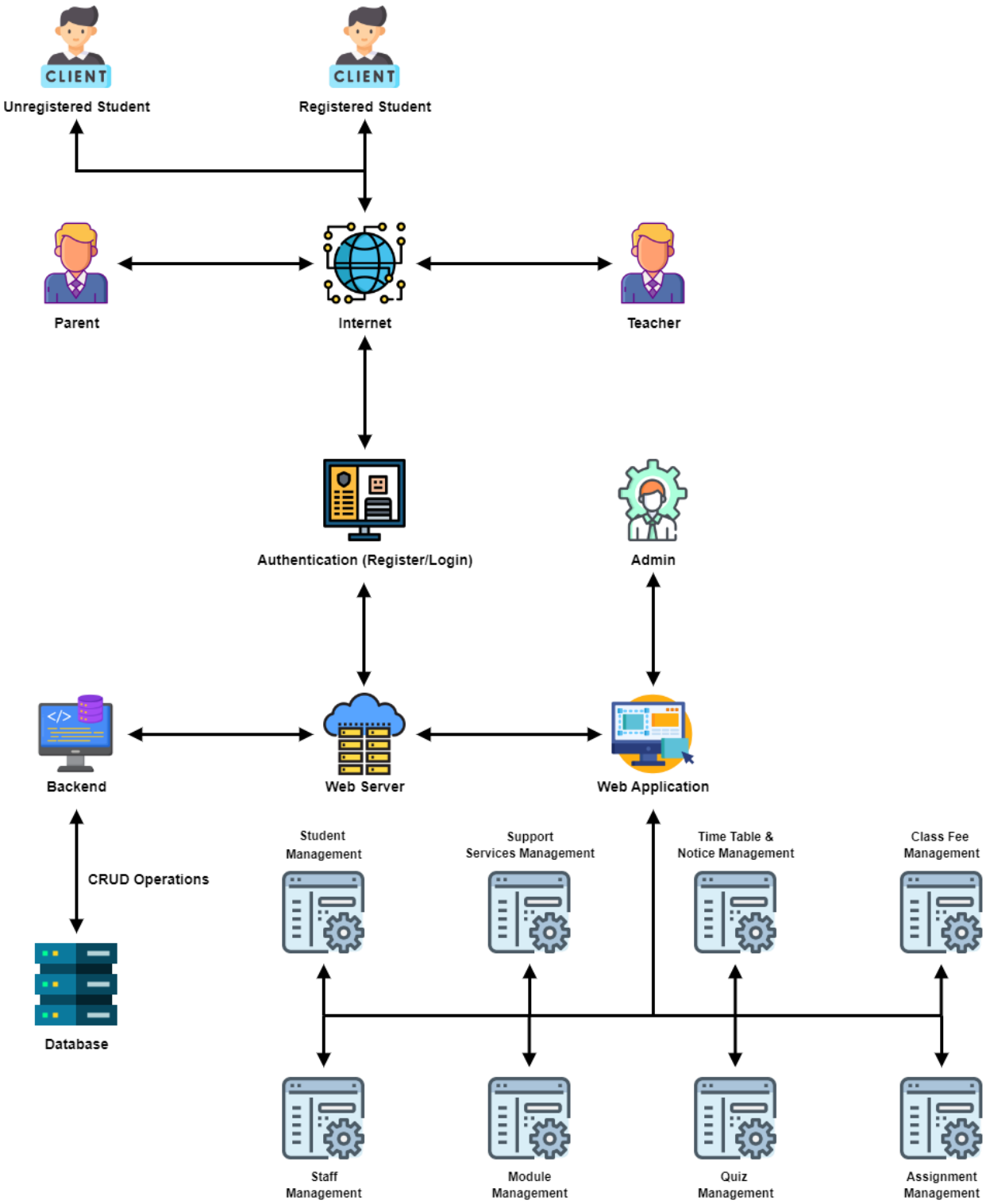
Objectives

- Always try to provide good education to students for the lowest price.
- Try to seek bigger and new opportunities because of this integrated system and this system helps company to make virtual appointments between students, teachers and Parents.

.• To provide convenient payment gateway for students

- To expand a large online student base through this system

4. System Overview



Functions

I. Student Management

This student management system is a function that simplifies the administrative tasks of managing students in the "Nawamaga" educational institution. Login and Registration management, Managing Student profiles, taking feedback from students and Handling parental appointments are the four functional requirements.

1.The login and registration requirements are specifically designed for students to create unique login credentials to access the system. Students can register for the system by providing their details such as name, age, gender, address, contact number, e-mail, and other academic details such as grade, and class and they can edit their password anytime if they want. The admin can delete student accounts from the system if they no longer require access.

2.The managing student profiles requirement allows students to view and edit their personal details only, and the administrator has no control over the information that the students provide. Students have complete control over their personal information, which includes storing and updating personal information such as their name, email address, contact information, and other important details.

3.Taking feedback from students requirement is designed to collect feedback from students on their courses, teachers, and overall experience at the educational institution. Information like the Student's name, e-mail, and feedback description will be stored in the system. The system has CRUD operations for this task, and it also has a report-generating facility that allows administrators to generate reports and analyze the feedback data to identify areas for improvement.

4.The handling parental appointments requirement provides a feature that enables parents to schedule appointments with teachers and Institute administrators to discuss their children's academic progress. The system has a form and respective CRUD operations for this task. Parents can enter details about the appointment and edit them if they want to delete it, they can delete it. it also has a report-generating facility that allows administrators to generate reports and track the appointments made by the parents.

To ensure that the system is operating at its best, the following three nonfunctional requirements must be met:

- Performance: To ensure that the system is operating at its best, it must be able to handle numerous users at once, process requests quickly, and respond to user input without noticeable delays.
- Security: Security for the whole system is covered by the registration and login functionality. Secure personal data of users(students) is a requirement and preventing cyber-attacks is an additional goal.
- Availability: The system must be available for all authorized users 24 * 7 And the system must be able to perform any task that the respective user is requesting.

There are three technical requirements:

- Human error: Software can recognize when users have entered false information.
- Facilities: Internet connection, Web – browser, Device (Mobile or PC)
- Development: Mongo DB, Express JS, Node JS, React JS [3]

II. Staff Management

The administrator manually registers staff in the system. When an administrator registers a new employee, the system creates a personal profile for the employee with their own information. Only the administrator can add a new staff member and create a new profile for that individual.

Administrator can manage all the employee details in the system and if he wants to retrieve the details of Staff Members/Teachers, it can be done efficiently by searching Staff ID through the search bar. Each Staff Member/Teacher or Administrator can update their profiles when there are changes to be done. If Teacher/Staff Member leaves the Institute, then they can delete his profile as he is no longer available. Administrators should be able to inactivate the records of the existing staff and teachers when such a requirement arises.

All the Teachers and Staff Members salary details are managed here. Administrator want to pay salary for Staff Members and Teachers in suitable time administrator redirect to salary payment section. In this section administrator fill some details such as the staff member's name and amount and other information. Finally, the Administrator will be redirected to the payment gate and do the relevant payment and an Email will be sent to the Staff Member with the payment slip. The Salary Payment is Only reachable to the administrator and the Administrator will be able to search salary history, Calculate, add, and remove salaries from the staff members and teachers.

At the end of every month, the Administrator can generate a report of services done by all the Teachers and Staff Members under their ID and, can generate a monthly report which is containing the new employees who registered to the system each month.

Non-Functional Requirements

- Speed
- Security
- Reliability
- data integrity

Technical Requirements

- Mongo DB
- Express JS
- Node JS
- React JS

III. Module Management

This is the Module Management function to develop the system in the Nawamaga Educational Institute in Monaragala to solve one of the common issues of many students. According to the client's requirements, this function is going to be developed to solve the problems of a student who missed their lectures for unavoidable causes. Those who want to refer to study materials also they can download and refer to them.

This function is mainly divided into two main parts the client side as a Student and Admin side as a Tutor.

According to the system, the order of the function can be aligned as follows:

If any student missed the lecture, he/she can download and refer to it. If any student wants to access this page, they want to register this system as a registered student. After registering process, they want to verify their login details. Then the student can navigate to the module page, and he/she can find what study materials they want. If they cannot find they have facility a search option and they can find what they want immediately. If students want to refer to the materials late, they can download the study materials and the lecture recordings anytime they want.

The tutor also wants to register and log in to the system to access the module page contents. After logging in tutor can upload the lecture materials like lecture notes, tutees, short notes, past papers, and lecture recordings to the system through the module page. The tutor can delete any study materials or lecture recordings at any time if he/she wants. Also, the tutor can upload module content to give a brief idea about the lecture content to the student.

End of the month tutor can get an auto-generated report to get an idea about how students are involved with this module page and refer to the module contents and lecture recordings.

Using this module management function can provide several benefits:

- Accessibility:

The tutor can upload the lecture notes and recordings to the module page and the students can refer them from anywhere with a proper internet connection, making it easier for students to keep interacting with their educational activities.

- Organization:

The module page can help to organize lecture notes and lecture recordings into subjects based on topics, units, or weeks, making it easier for students to find the materials that they need.

- Customization:

This module page allows tutors to customize the study materials in each module.

- Timesaving:

The module management function can save time for both tutors and students.

Overall, a Module page can improve the learning experience for students by providing them with easy-to refer educational resources and collaborating with them properly.

IV. Timetable and Notice Management

This function aims to create real time timetable for classes. They can be updated according to different conditions. And all this happens in real time. For example, any teacher cancels his/her lecture due to some reasons the real timetable can be updated accordingly by any student in the class and updated timetables changes can be easily viewed by other students in the class.

Management of timetable is a complex in institute. Scheduling a class requires one to consider the nature of class, the number of students, the subject and the teacher who teaches it, time of the day. Manual designing of timetables thus is a complex and time-consuming affair, which contributes to the loss of valuable time, not to forget the complaints from both students and lectures over errors in timetables.

After that, the user the user designated to generate a timetable. The expected results include:

- A room allocated for class at a particular time cannot be assigned another class at the same time.
- A lecture having a class at a particular time cannot be allocated to other classes at the sometimes
- A unit cannot be added twice on the same day.
- Time allocation should be fair.

In this section, only the admin can create, edit, and delete the class timetable. Through this function, administrators should fill out some forms such as subject, teacher, and classroom. In the subject form, the administrator must fill out details such as subjectId, subject name, and relevant teacher name. And also, In the teacher form administrator must fill out details such as subjectId, subject name, teacher name, and teacherId. In the classroom, the form administrator must fill out details such as classroom number, capacity, subjectId, teacherId. Finally, after filling out those forms, the administrator redirects to the timetable dashboard and automatically creates a timetable. When updating any class time, the administrator sends notifications about the changes.

Functional requirements

- View timetable
- Create/Update timetable.
- Send notifications.
- Create/update notices

Nonfunctional requirements

- Accuracy
- Performance
  Reliability
- Use friendly.

Technical Requirements

- MongoDB
- Express.js
- ReactJS
- NodeJS

V. Class Fee Management

In this section system will able to manage all transaction within student and institute which are done through in this learning management system. Only admin can delete and update record of the student class fees.

- Create payment –Under student payment section, whenever student is going to pay a payment first student should add subjects to the cart. After that system calculate class fee according to the student's cart. Student will be redirected to this payment section, in this payment section student must select their payment method. Student can select bank deposit method or card payment method. If student select card payment method student can enter card detail in the editable format form provided by the system. Student should enter Student number, card number, expiration date, security code. System can use security code as front-end validation. Amount is automatically display in the system. Student also can use bank deposit method. In that method, students should send their slips as proof. When a student does a bank deposit student should enter the student number, name, and amount. The system will take in their slip id number as front-end validation. Also, the system will check the payment amount as back-end validation. Finally, the student will be redirected to the bank payment gate and do the relevant payment. At that time system email will be sent to the student with an e-receipt. If the student wants to refund his/her amount student can send a request within forty-eight hours. That request should include the student number, description, and reason. The system can use student id as the front-end validation.

- Read payment –The system will record all transaction details about student class fees. The system will record all transaction details. There will be a search bar to search and display relevant transaction details by using the payment id. After the student sends the slip system scans the slip and gets the student's details. There will be a search bar to search and display relevant refund detail by using the student number and by using that student number admin can read that detail.

- Delete payment – If any student wants to refund the class fee that request will be sent to the admin with the student id within forty-eight hours. Admin checks that refund request and can approve or decline the refund request. Whenever an admin refund request is approved, that relevant transaction will be erased from the database.

- Update payment – If the refund request is approved by the admin the student class fee updated with the new amount. Finally, the system will be able to generate reports of transactions for financial purposes and send those reports to the owner. The system will also generate the report for refund requests and send that report to the owner.

Nonfunctional Requirements

- Usability
- Availability
- Maintainability

Technical Requirements

- React
- Node.js
- Mongo dB
- Express js

VI. Quiz Management

This is the Quiz Management System function to develop the system in the Navamaga Educational Institute in Monaragala to solve one of the main issues of their institute. According to the issue they did not have a quiz management system. they need to create new system for this because they hope to market around Sri Lanka in their company. then far away of Monaragala student will not be able come to their institute. so, in this case we will by create this function, all the student can participate easily questionnaires in online.

This function is mainly divided into two main parts the client side as a Student and Admin side as a Tutor.

According to the system, the order of the function can be aligned as follows.

If any student wants to access this page, they need to register with this system as a registered student. After the registering process, they want to verify their login details. Then the student can navigate to the quiz module page, and he/she can find what quiz module they want. If they cannot find they have a facility a search option by module code and they can find what they want immediately. After searching they will redirect to the quiz module and if they need to attend the quiz by Clicking the "Attend Button", first they need to enter the Quiz code by the correct scheduled time.

The tutor also wants to register and log in to the system to access the Quiz module page contents. After logging in tutor can upload questionnaires to the system through the quiz module page. Teachers have the ability to delete the exam after the deadline has passed. This ensures that students cannot access the exam or their answers after the deadline. If a teacher needs to make changes to the exam questions, the quiz management system allows them to update the questions. This is particularly useful if there is an error in a question, or if the question needs to be updated for future use. The tutor can enable or disable backward navigation, which allows students to go back and review previous questions during the exam. Teachers can set a time limit for completing the exam. The system will automatically close the exam once the time limit has been reached, and students will no longer be able to submit answers. After the quiz ends, the tutor is able to get a report like the attendance of Students and the quiz result sheet as a document.

Using this quiz management function can provide several benefits:

- As students answer MCQ questions, the quiz management system will allocate marks in real-time. Once the student has completed the exam, the system will provide a final grade based on the total number of correct answers.
- The quiz management system can enable and disable backward navigation, which allows students to go back and review previous questions during the exam. This feature can be particularly helpful for longer exams or exams with complex questions.
- This quiz page allows tutors to customize the quizzes easily.

VII. Assignment Management

In this function, the process is done by Teachers and students. This function analyses all the assignment details. Assignments are given for respective modules. Teachers can log in to the system using the user's name and password. Only the teacher can add assignments to the system. And also, if assignments have some errors teacher can edit assignments and delete assignments from the system. Students also can log in to the system using their username and password. After that, they can check the assignment management page for new assignments and marks for their submissions. And Students can read and download the new assignments. After that, they can submit complete assignments to the given link under the given time period. And they can edit or delete submissions if it has errors under the given time period.

Teachers can add marks to the submitted assignments, and they must generate mark sheets. Then students can check their marks. To achieve this task Information like Assignment name, Module, time, and Instructions are needed.

Functional Requirements

- Create – Adding assignments to the system.
- Read –Read the Assignments
- Update – Check submissions and edit if it has errors.
  Check adds assignments.
- Delete – When assignments or submissions have errors teacher and student can delete them.
  Generate mark sheets.

Non-functional Requirements

- Data Integrity
- Availability
- Security

Technical Requirements

- Access Control
- Data quality
- Uploading files

VIII. Support Services Management

The service allows students to raise tickets, which are essentially support requests that are submitted through a dedicated system. Once a ticket is raised, the relevant staff member can access it and provide support to the student.

If a student no longer needs a ticket, they can delete it. On the other hand, if they need to modify the details of their ticket or add more information, they can update it.

In addition to the ticketing system, the service also provides access to a forum where students can post questions or seek help from their peers. The forum is a place where students can share knowledge, discuss course material, and collaborate on assignments.

Overall, this support service is designed to provide students with a range of tools and resources to help them succeed in their online courses. By providing a dedicated ticketing system and a forum, students can get the support they need quickly and efficiently, while also benefiting from the knowledge and expertise of their peers.

Some common online support services offered by institutions,

- Q & A session: This service provides answers to the questions
- Collection of questions: This service provide list of all questions, calculator recent question and most popular question
- Technical support: This service provides assistance with technical issues related to online learning platforms, software, and hardware.
- Academic advising: This service offers guidance on course selection, degree requirements, and academic planning.
- Online learning support: This service provides to help students better understand course material and prepare for exams.

5. Literature Review

There are two other solutions that can fulfill clients' requirements: Updating the existing system and purchasing ready–made system. Each of these solutions got own benefits and drawbacks as follows.

Updating Existing System:

To ensure that this solution satisfies the client's new expectations, the developing team must analyze the existing system and update it. Online examination management, Parental management, Registration and login management, and Support services are necessary additions to this system.

Benefits:

- Economical: Modernizing an old system could be less expensive than creating a brand-new one from the beginning.
- Familiarity: Since the current system is currently in use, employees and students are already familiar with it, which may mean that no further training is required.
- Preserves data: Updating the current system makes sure that old records and historical data are not lost.

Drawbacks:

- Limited functionality: The current system might be functionally restricted, which could make it challenging to satisfy future requirements.
- Lack of Adaptability: The current system could not be adaptable or able to interface with other systems or processes.
- Technical issues: Updating an existing system can be a challenging and time-consuming process that requires a high level of technical understanding. It can also be challenging if it is not done by the system's developers. [4]

Purchasing Ready-made System: On the internet, pre-built Web apps with a variety of features are for sale. The customer has the option of making purchases that suit their demands.

Benefits:

- Speed: Buying a pre-built system could be quicker than designing a brand-new system.
- Features: An acquired system might offer more powerful features and functions than the one it replaces, which would make managing student data and processes easier.
- Support: Many systems that are purchased include technical support, which can be useful in resolving technical problems or difficulties.

Drawbacks:

- Price: Buying a ready-made system can be expensive, particularly if it needs to be customized to fit certain needs.
- Restricted adaptability: Ready-made systems might not be able to work with other systems or procedures, which could be problematic if the Institute's requirements change in the future.
- Implementation issues: pre-built systems may not be delivered as a functional web-based application. In that kind of circumstance, Admin needs more assistance from a knowledgeable individual. [5]

Why building a new System would be better than using the existing system:

The current system is developed back then in the pandemic era, and it is only developed to maintain class fee management and module management. As the business grows over time functional requirements like Online examination management, Parental management, and Staff management and non-functional requirements like expandability, and security has emerged. To achieve all these functional and non-functional requirements updating the existing system or purchasing a ready-made system is not enough. As a result, the idea of developing a new system emerged. The requirements of the Institute can be met in the future by creating a new system that can scale as the business expands. Although developing a new system may be more costly and time-consuming, it can end up being the best alternative because it offers the most specialized and effective solution.

6. Methodology

Design Methods

For our project we are using the waterfall method as the design methodology. First, we gathered all the requirements we need to understand the project and we created a design as a blueprint. After that we are planning to do the implementation of the system. After completing the implementation, we are planning to do the verifications by testing the web application. If the system is not verified, we are fixing the errors that cause the verification to fail. After the verification is completed, we are planning to deploy the system so the company can use the system for their required purposes. After deploying, we have the responsibility of maintaining the system in its lifespan. If there is any error occurred in the system, we are taking the necessary actions to fix the error and restore the web application to its optimal execution.

Technologies

For this project we are using several software. MongoDB is used in place of conventional relational databases, Express.js and Node.js are used to design web applications and React js is used to design front-end development.

The following technologies are part of the MERN Stack.

- MongoDB – Database Management
- Express.js – Server-side Management
- Node.js – Server-Side Management
- React.js – Web Application Management

ReactJS	An open-source JavaScript package called React. js is used to create user interfaces for single-page applications. It manages the view layer for both online and mobile applications. Additionally, React.js enables us to design reused UI components.
MongoDB	An open-source NoSQL database management system is called MongoDB. NoSQL databases are used in place of conventional relational databases. Working with sizable, distributed data sets makes good use of NoSQL databases. MongoDB is a technology that can manage, store, and retrieve information that is document oriented.
Express.js	A Node js web application framework called Express.js offers a wide range of functionality for creating web and mobile applications. A single page, multipage, or hybrid web application can be created with it. It is a layer added to Node js that aids in managing servers and routes.
Node.js	Due to its single-threaded nature, Node. js is typically used for nonblocking, event-driven servers. Although it was created with real-time, push-based architectures in mind, it is utilized for conventional web pages and back-end API services. [6]

Tools

In first, we used diagrams to identify the requirements and specifications of the client. We used draw.io and Mock flow to create models like Use case diagrams (Figure 2), Class diagrams, ER diagrams, Activity diagrams, and Sequence Diagrams. [7]

To track the progression of the system development, we are using a Kanban board in Trello web application. In here everyone has the access to update and record the progress of the development and upload the issues and questions they have faced during the development. [8]

For the implementation, we use visual studio code IDE. Also, we use MongoDB compass to manage the database of the system.

As the database, we use MongoDB to manage our data in the system. To run the implemented system we use an Apache server. The connection between the user and the server can be implemented by the Apache server.

Testing Methods

After completing the development, we have to do the process of verification and validation of the system. To test the functionality of the system based on the required specification, we are going to execute black box testing on the system. In here we are using the following techniques as,

- Boundary Value Analysis
- Equivalence Partitioning
- Decision Tables
- Domain Test
- State Models [9]

For examine the program structure and the business login of the system we are using white box testing method. In here we are,

- Verifying the execution of all the independent paths within a module.
- Verifying all the logical decisions of the system.
- Discovering any types of errors like logical errors, design errors, typographical and syntax errors of the system.

Integration Methods

As the integration method for this system, we are using the Rest API method. It uses HTTP requests to access and manipulate data and typically return data in JSON or XML format. REST API provides a standardized way for different applications to communicate other over the web. [10]

Gantt Chart

This project's first step, identifying a client, should be completed during the first week of February, according to our schedule.

Firstly, we meet our client through online meeting and confirm our client. We meet our client physically and identify client requirements and discuss with that client. We also present our ideas with them and add that requirement for that project. This institute deals with teachers and students as well as academic staff. For this reason, we gather requirements by searching the Internet for E learning web applications that already implement, by referring their manually system and by speaking with institute owner. Following this, our team members decided which functions we would need to add the system, and then we divided up the functionality amongst the team members. The charter approval document was scheduled for the same week as the chart discussion.

We will enter the second week, during which we will be responsible for creating the scrum activity. It is necessary to create user stories, product backlogs, and spring backlogs during this process.

Furthermore, we are expected to complete the proposal presented by the third week of February, and we must deliver it by the middle of that week. Following the proposal presentation, we must submit the proposal document, which includes all of the requirements that we have gathered, as well as system overviews, tools, and techniques that we have used for the implementation, as well as the grant chart and references that we get information about this.

Furthermore, during the first week of March, we decided to submit a user interface (UI) sketch of the system that is like the actual output. All of us decided to create a conceptual database that has been designed using an ER diagram and a relational model during the second week of march.

We expect to complete the design of the physical database and the creation of the database by the third week of March this year. Additionally, once the database has been designed, we can begin coding to put our project into action.

The system testing portion of the project is scheduled to begin during the fourth week of April. Finally, during the first week of May, we made the decision to finish our final report on the project. As a result, we have decided to finish our project during the last week of April. [11]

No	Activity	Week													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Finding a client														
2	Gathering Requirement														
3	Requirement Analysis														
4	Project charter														
5	Project presentation														
6	Submit proposal														
7	Scrum Activity														
8	ER Diagram														
9	Interface Design														
10	Coding														
11	Testing														
12	Integration														
13	Final Report Writing														
14	Final Presentation														

Work breakdown structure

	Name with Initials	Registration Number	Work distribution
1	Baddewithana P	IT21247804	Implement Student management. • Create a method to login and registration for students. • Create a method to manage student profiles. • Create a method to take student feedbacks and generate reports. • Create a method to make and handle parental appointments accordingly and generate reports. • Implement registration, login, Student profile parental appointments and Student feedback user interfaces.
2	Ilesingha I.T.S.	IT21206078	Implement Support services. • Create a method to handle Q & A session. • Create a method to raise a ticket. • Implement Raise ticket and Q & A session user interfaces.

3	Rajawasan W.H.H.S.	IT21315664	Implement Timetable and notice management. • Create a method to manage timetables. • Create a method to send notifications. • Create a method to handle notifications. • Implement timetable user interfaces.
4	Hansani K.J.M.	IT21222672	Implement Class fees management. • Create a method to manage Student class fees. • Create a method to record all transactions. • Create a method to approve refund requests. • Create a method to generate financial reports. • Implement user interface for class fee management.
5	De Silva K.T.S.	IT21328916	Implement Quiz management. • Create a method to schedule online quizzes. • Create methods to • Create a method to generate results sheets. • Implement Quiz page user interfaces.

6	Liyanage L.D.P.D.	IT21327780	Implement module management. • Create a method to upload Study materials. • Create a method to watch online lecture videos. • Create a method to download Study materials. • Implement Module page user interfaces.
7	Jayasooriya J.M.D.T.	IT21326868	Implement Assignment management. • Create a method to Add, edit, delete assignments. • Create a method to Submit Assignments for students. • Create a method to generate marks sheets. • Create a method to check student submissions. • Implement Assignment management user interfaces.
8	De Zoysa A.P.S.	IT21219634	Implement Staff Management • Create a method to manage staff profiles. • Create methods to manage salary payments and record them. • Create a method to generate salary reports. • Implement staff profile, salary payment user interfaces.

7. References

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[11]	K. Boogaard, "Togglblog | How to Create a Gantt Chart in 7 Easy Steps," [Online]. Available: https://toggl.com/blog/create-a-gantt-chart.

8. Appendix

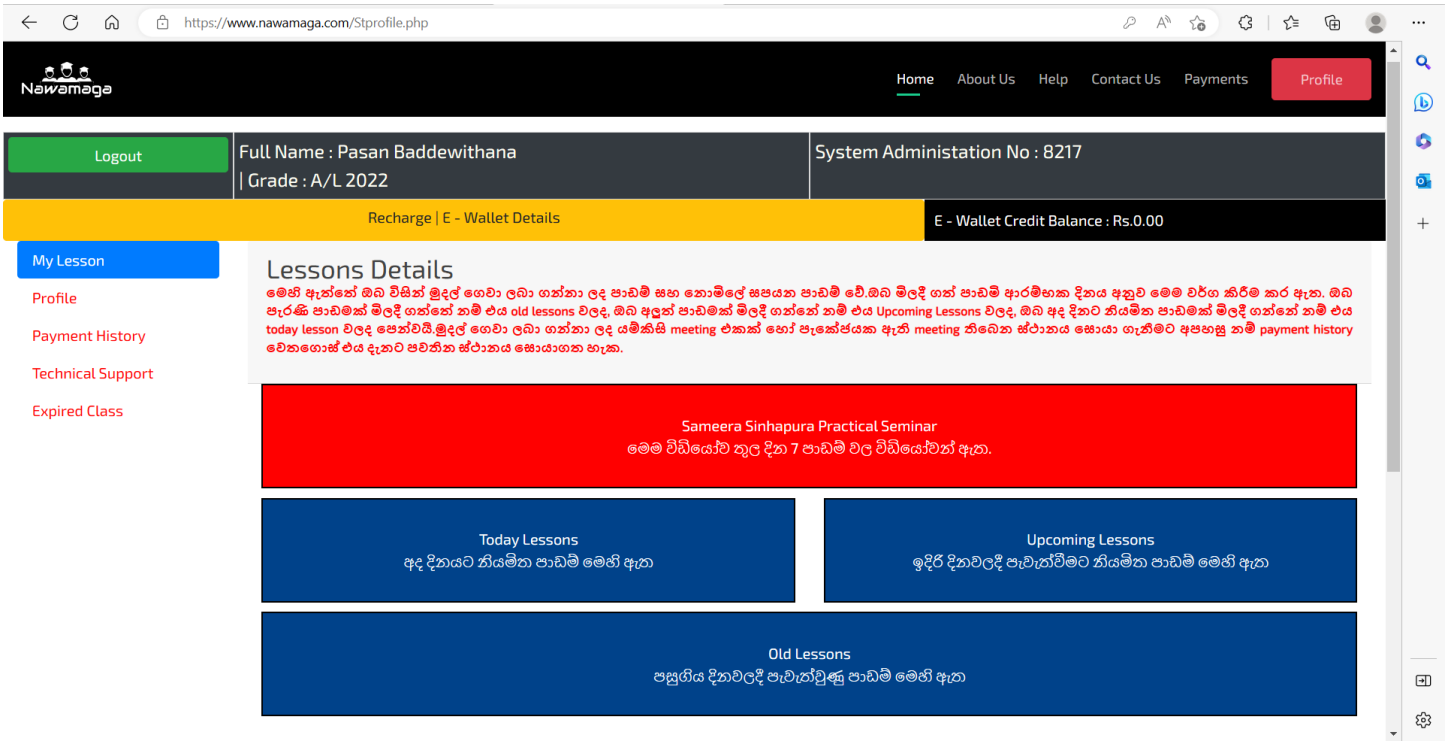

Figure 1:Dashboard

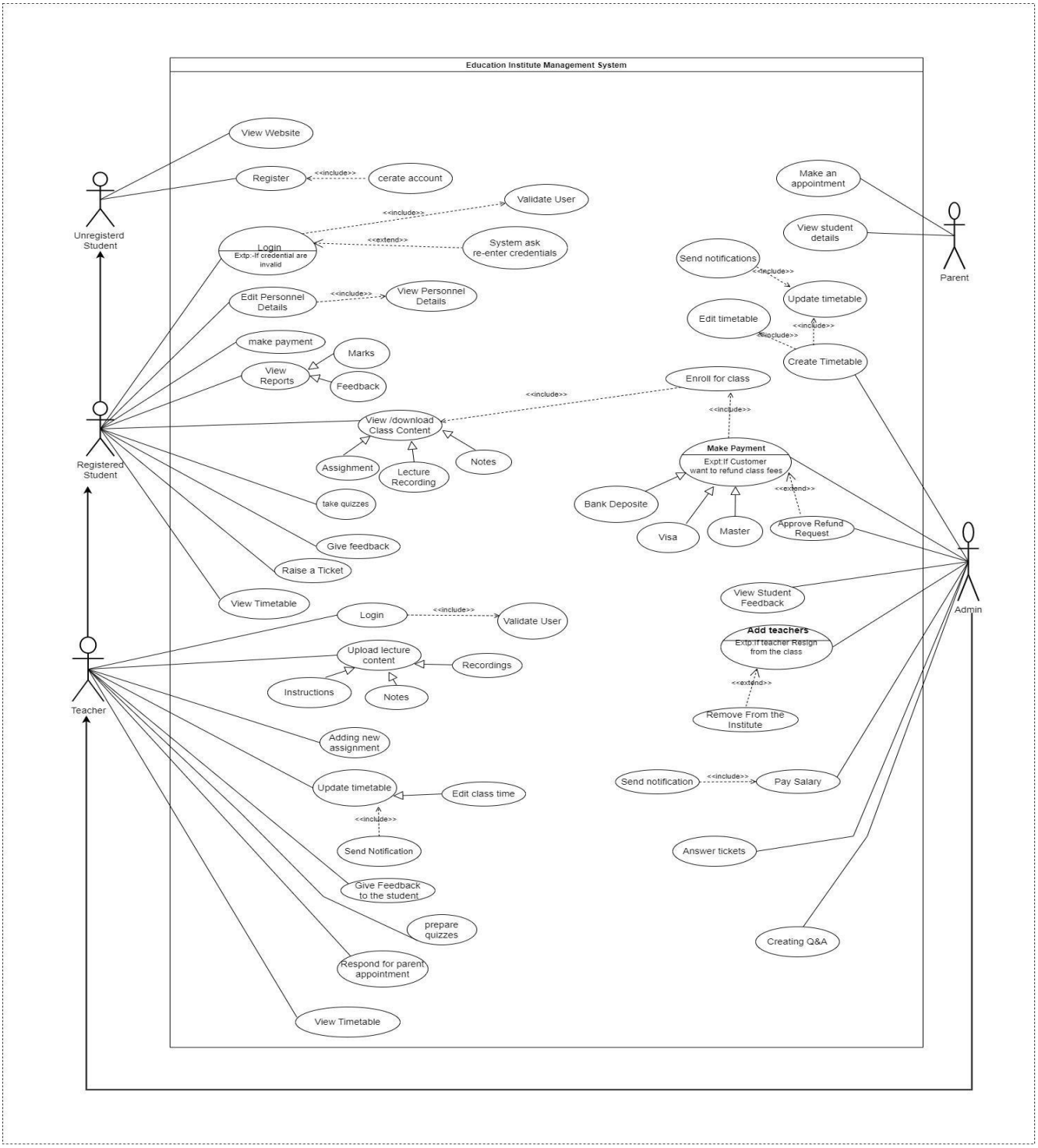

Figure 2:Use-case diagram