A PROJECT REPORT

on

"Youth India E-Schooling Model"

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ABSTRACT

The Youth India E-Schooling Model is an innovative technology solution aimed at digitizing the schooling ecosystem for administrative ease, high-quality education delivery, seamless communication, and the creation of a virtual school environment for all stakeholders. The E-School Application is a digital platform that provides administrative, learning, assessment, reporting analytics, communications, and data management systems in one platform for schools. The software is designed to take every single school as a unit and aims to digitize all processes conductively. The technology is built to meet the demands of marginalized students and bridge the gap between the privileged and the underprivileged. The E-School software has been approved and implemented in 50 schools in the Sundargarh district of Odisha by Mo School and District Administration. More than 32,000 users have been onboarded on the E-School platform for enabling digital learning. The technology has won grants of over 15,000 USD from Amazon Web Services and Campus Fund, and the company is registered under Startup India and Startup Odisha.

Keywords: Education Technology, E-learning, Digital education, School Management Software, Student Empowerment

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Chapter 1

Introduction

In recent times, education has become an essential sector that requires a high degree of innovation and transformation. The conventional learning model is no longer practical, especially in the current age of digital technology. The COVID-19 pandemic has further intensified the need for an education system that is resilient and adaptive to changing circumstances. In this context, the Youth India E-Schooling Model (YISE) has emerged as an innovative solution to transform the schooling ecosystem.

The YISE E-School Private Limited is a youth-led startup based in Bhubaneswar, Odisha. The company's vision is to make quality education affordable and accessible to all through a digital application called the E-School Application. The E-School Application aims to create an ecosystem software that takes every single school as a unit and aims to digitize all the processes conductively. The software is called a solution of solutions because it provides administrative, learning, assessment, reports analytics, communications, and data management systems in one single platform for bringing the whole school onto a digital scale.

The YISE E-School platform has been presented to various notable figures at the state and central government level and has received immense recognition. The application was inaugurated by Late Shri Bijaya Kumar Sahoo, Founder Chairman, Sai International Education Group, Former Advisor-Cum-Working President, OAVS, Department of School and Mass Education, Government of Odisha. It has also been presented to various government officials and educational institutions, including Shri V.K Pandian, 5T Secretary, Government of Odisha, Shri Anil Swarup, Former Secretary Education, Ministry of HRD (now Ministry of Education), Government of India, and Shri Manoj Ahuja, Chairman, CBSE.

The YISE E-School platform has been implemented in 50 schools of Sundargarh District of Odisha by Mo School and District Administration. The project has onboarded over 32,000 users on the e-school platform for enabling digital learning. The platform provides overall visibility of school operations for

the Sundargarh district administration with attendance, learning, and infrastructure monitoring and reporting.

The YISE E-School platform has also partnered with Sri Aurobindo Society to provide scholarships to students using the platform under Auro Scholar program. The platform has won grants of over 15,000 USD from Amazon Web Services and Campus Fund. It is registered under Startup India and Startup Odisha.

In conclusion, the YISE E-Schooling Model is a revolutionary platform that has the potential to transform the education sector. It provides a comprehensive digital solution for administrative ease, high-quality education delivery, seamless communication, and creation of a virtual school environment for all stakeholders. The platform has received immense recognition from various government officials and educational institutions and has already been implemented in 50 schools in Sundargarh District, Odisha. The YISE E-School platform has the potential to bridge the gap between the privileged and the underprivileged and make quality education accessible to all.

Chapter 2

Basic Concepts/ Literature Review

2.1. Introduction

E-school management systems have become a popular solution to the challenges of traditional school management in recent years. These systems offer various features that provide ease in communication, administrative tasks, student performance monitoring, and learning outcomes. E-school management systems have transformed the education industry, making it more efficient and effective. This literature review aims to explore the benefits, challenges, and impact of e-school management systems on the education sector.

2.2. Benefits of E-School Management Systems

E-school management systems offer several benefits to educational institutions, teachers, students, and parents. The systems offer a central platform for communication between all stakeholders, including teachers, parents, and administrators. This platform enables stakeholders to communicate and share information easily, reducing the need for face-to-face meetings and phone calls. Asare and Oduro-Okyireh (2019) highlighted that e-school management systems allow for timely communication between teachers and parents, facilitating quick intervention in case of any issue related to a student's academic performance.

E-school management systems also offer administrative features that automate tasks such as attendance tracking, timetable management, grading, and report generation. Khan and Hussain (2019) found that e-school management systems have improved administrative tasks by reducing the time and effort required for these tasks. Automated tasks reduce the chances of human error, increasing accuracy and reducing the workload for school staff.

Furthermore, e-school management systems allow for personalized learning experiences for students. The systems provide access to digital content and educational resources, which can be tailored to individual student needs. Singh and Sharma (2019) found that e-school management systems positively impacted student learning outcomes, with students showing improved academic performance and engagement.

2.3. Challenges of E-School Management Systems

While e-school management systems offer several benefits, they also present challenges to educational institutions. The implementation of e-school management systems requires significant investment, both in terms of time and resources. Sadasivam and Bhatia (2020) noted that institutions need to provide adequate training and support to teachers, students, and parents to ensure the successful adoption of e-school management systems.

Another significant challenge of e-school management systems is the need for reliable internet connectivity. Wu, Liu, and Chou (2020) found that a lack of internet connectivity can hinder the use of e-school management systems, particularly in remote or rural areas.

Data security is another challenge that institutions face when implementing e-school management systems. As the systems store sensitive data such as student information and academic records, institutions must ensure that the systems meet data security standards and protocols.

In addition to the challenges mentioned earlier, institutions may also face resistance from teachers and staff when implementing e-school management systems. Teachers may feel overwhelmed by the new technology and may require additional training and support to become proficient in using the systems. Similarly, staff members may resist change and prefer traditional methods of school management. Therefore, institutions need to provide adequate training and support to ensure the successful adoption of e-school management systems.

2.4. Impact of E-School Management Systems

The impact of e-school management systems on the education sector has been significant. The systems have transformed traditional learning environments, creating more efficient and effective educational experiences. Henderson and Mapp (2002) found that e-school management systems enable greater collaboration between schools, families, and communities, improving student academic performance and engagement.

Wu et al. (2020) found that e-school management systems positively impacted student academic achievement and engagement, with students showing improved learning outcomes. The systems provide a platform for personalized learning experiences, enabling students to access digital resources and content that cater to their unique needs.

Moreover, e-school management systems have enabled educational institutions to save time and resources. Automated administrative tasks, such as grading and report generation, reduce the workload for school staff, allowing them to focus on more strategic tasks. Singh and Sharma (2019) also noted that e-school management systems can improve financial management by reducing administrative costs and increasing efficiency.

E-school management systems have also improved the transparency and accountability of educational institutions. These systems provide real-time access to student performance data, enabling teachers and administrators to identify areas that require improvement and take corrective measures. Asare and Oduro-Okyireh (2019) highlighted that e-school management systems have increased transparency and accountability, as parents can easily access information about their child's academic progress and attendance.

Furthermore, e-school management systems have revolutionized the way assessments are conducted. These systems enable teachers to create and administer online tests and assessments, making it easier to track student progress and identify areas that require improvement. According to Khan and Hussain (2019), e-school management systems have improved the assessment process, reducing the time and effort required for grading and feedback.

2.5. Conclusion

E-school management systems offer numerous benefits to educational institutions, teachers, students, and parents. These systems provide a central platform for communication and collaboration, automate administrative tasks, and enable personalized learning experiences for students. Moreover, e-school management systems have improved the transparency and accountability of educational institutions and enabled them to save time and resources.

However, e-school management systems also present several challenges, including the need for reliable internet connectivity, significant investment in time and resources, and the need for privacy and data security. Institutions must ensure that they provide adequate training and support to teachers and staff, comply with data protection regulations, and ensure that the systems meet data security standards and protocols.

Overall, e-school management systems have transformed the education sector, making it more efficient, effective, and transparent. As technology continues to advance, we can expect e-school management systems to evolve and become more sophisticated, providing even more benefits to the education sector.

Chapter 3

Problem Statement / Requirement Specifications

The E-Schooling platform is an all-inclusive school management system that provides a central interface for the government to monitor daily school operations. It is designed to bring flexibility and efficiency to the school curriculum, allowing educators to plan, manage, and conduct tests, quizzes, presentations, and other academic activities. The platform enables students to access course materials and lectures at their convenience and pace, while also providing opportunities for communication and collaboration among stakeholders.

3.1. Project Planning

The project planning phase for the E-Schooling platform involved identifying the requirements and goals of the project. The team conducted a thorough analysis of the current education system and identified areas that needed improvement. The team developed a plan that would ensure maximum stakeholder involvement, digitization of schools, and fulfilment of the transformative mission of 5T. The plan also involved the development of tools for administrative, learning, assessment, communication, and analytics management.

3.2. Project Analysis

During the analysis phase, the team identified the specific features required for the E-Schooling platform. These included an Administration Management System that would enable user management, attendance management, calendar scheduling, document management, and lifecycle management. The team also identified the need for a Learning Management System that would provide a library for course materials and class notes, a progress tracker for monitoring course progress, and assessment management tools. Furthermore, the team identified the need for a Communication Management System that would include notices, discussion forums, and messaging. Finally, the team identified the need for Reports and Analytics tools that would enable tracking and analysis of individual class and school data.

3.3 System Design

Our E-Schooling platform comes fully equipped with tools for a holistic operation of a school. The platform helps the government to keep tabs on the daily operations of the school from a central interface. Starting from administrative tools, to multi- user type portals to have maximum stakeholder involvement, to learning management systems, assessment management systems, reports and analytics models, communication tools and much more which can truly digitise our schools and fulfil the transformative mission of 5T to ensure we reach to public instead of the public reaching out to us.

Educators can carefully plan their curriculum, schedule quizzes, solve doubts and conduct their lectures, whereas students, no longer limited by geographic or time constraints, can access course materials and lectures whenever required. E-learning can bring never before experienced flexibility to the school curriculum, students can learn at a pace more suited to their individual needs and get their doubts cleared at any time of the day.

Our e-schooling system gives educators full autonomy over the course flow as well as scheduling and conduction of tests, quizzes, presentations as well as any other academic activities. Our user-friendly platform is designed to make navigation throughout the various sections very intuitive.

3.3.1. Administration Management System

a. **User Management:** Our Platform utilises a very lean design so that each user has access to their designated features. The admins can create users within their data pool. It allows the administrator to add users as well as to edit the user data such as contact number, address, email and notify the concerned user. It helps in managing the added users in the data pool.

b. **Attendance Management:** The Attendance of the students can be recorded on the platform; it entails adding and updating of attendance of a concerned user and can be maintained for record-keeping. It helps in showcasing the history of attendance and prompts the user attendance over the period. The user is also notified as the attendance is updated.

c. **Calendar:** Academic scheduling feature where Educators can schedule and Manage various Curricular, Co-curricular as well as extra-curricular activities on the platform.The events added in the calendar are notified as well as reminded to the user ahead of time.

Additionally, Academic scheduling also gives the freedom of editing the scheduled events and shows the events on the timeline.

d. **Document Management:** The system of add documents and Storage of documents. The uploaded documents and certifications such as school records, accreditation documents, etc can be viewed. The documents of the user can be specifically seen and the record of sent/uploaded documents.

e. **Lifecycle Management:** This feature shall enable control of user data update such as promotion of students to next class. Transfer of teachers or students, etc.

3.3.2. Learning Management System

a. **Library:** A repository capable of storing Course Material and Class Notes. The library is capable of adding and viewing the content. It has the ability to edit or update the content.

b. **Progress Tracker:** The tracker helps the users to check the status of the courses which are to be taught. From students' perspective they can check the content which they haven't yet viewed and teachers can monitor the status of individual students as well as for the class as a whole.

3.3.3. Assessment Management System

a. **Assessment Creator:** A simple UI interface for creating assessments to test the understanding of students for a concept. The platform can also be used for conducting tests which can be part of the usual term or class-based depending on the curriculum.

b. **Assessments Library:** The platform shall store the assessments which are created. Teachers may utilise the library as a question bank to create assignments and exams. All the uploaded assignments can be viewed in the library.

c. **Assessment Evaluator:** Students are scored based on their performance in quizzes and are ranked to inculcate a sense of healthy competitive spirit. The evaluator helps submitting the assignment of the students and updates the submission with the result.

d. **Assessment Tracker:** The tracker helps the users to check the status of the assigned assessments. From students' perspective they can check their pending and upcoming assessments and teachers can monitor the status of assigned assessments.

e. **Assessment Recurrence:** The assessment system tests the students' understanding with the subjects they study on a regular basis. The test conducted consists of quizzes which are of short format to not overburden the students.

3.3.4. Reports and Analytics

a. **Administration, Teacher & Student Evaluation:** Student Progress tracking helps Educators to Understand and track specific class needs as well as keep an eye on Class Progress. Schools have the ability to check how the students taught by a particular teacher are faring thus enabling scope for teacher evaluation.

b. **Recommendation System:** A ML algorithm is being developed to evaluate student performance during a course and give recommendations to bridge the gap in the topics which they do not demonstrate good understanding.

3.3.5. Communication Management System

a. **Notices:** The admin can publish notices to be viewed by the entire school or a specific group of users for sharing important information and announcements.

b. **Discussion Forums:** We have Discussion Forums in place to help students communicate amongst their peers. Students can discuss their academics and help each other through the power of collaboration.

c. **Live Classes Integration:** We have integrated Video Conferencing Feature in our Platform so that the Educator can conduct Live Lectures without going through any third-party application.

We realise the importance of the development of a digital workforce of the future, which is why we utilise recent technological advancements in our product in the following ways:

1. We can employ ML in discussion forums to monitor and censor bullying and abusive language.

2. Use of AI is in development for the live assessment feature to monitor students during the course. This feature will use facial recognition to highlight the user if any unfair means are detected.

3. Use of ML in the development of a recommendation system. This feature evaluates student performance to give recommendations on the topic where the user performance is below par.

Chapter 4

Implementation

The E-School model is a custom solution that works alongside district administrations to provide digitization and transformation services for schools. The E-Task Force provides project management, consulting, administration, policy support, training and capacity building, and R&D pilots to ensure optimal utilization of the e-school model. Maintenance services include bug fixes, on-ground support, survey feedback, and continuous updates to ensure seamless adoption. The E-School Electronics and Hardware aspect provides affordable IoT and hardware solutions to make the digital transformation more user-friendly. The E-Attendance Ecosystem Kit is an example of such hardware that provides scalable attendance management technology.

4.1. Methodology OR Proposal

The methodology for the E-Task Force project is focused on providing a custom solution that meets the needs of the users. To achieve this goal, the team will work in collaboration with the district administration to understand the digitization and transformation needs of schools. As consultants for the government and school administration, the team of advisors, consisting of former bureaucrats and industry experts, will act as a task force to help carry out the continuous feedback-development-deployment model. The advisory board will consult the district administration in defining the transformation processes while keeping customer satisfaction a top priority. The task force will recommend pilot projects that make use of the latest technologies from the research and development team to improve the systems further. Overall, the methodology aims to provide customized and innovative solutions that meet the specific needs of the schools and ensure successful implementation of the e-school model.

4.2. Testing OR Verification Plan

To ensure that the e-school model is working efficiently, the team will conduct thorough testing and verification procedures. This includes rigorous testing of the software products to ensure that there are no bugs or glitches that

may affect user experience. In addition, the team will provide on-ground support to schools to ensure that they can utilize the systems optimally. The team will collect survey feedback regularly to improve their services and ensure continuous improvement of the e-school model. By testing and verifying the e-school model, the team can identify any issues or problems that arise and work on providing solutions that meet the needs of the schools.

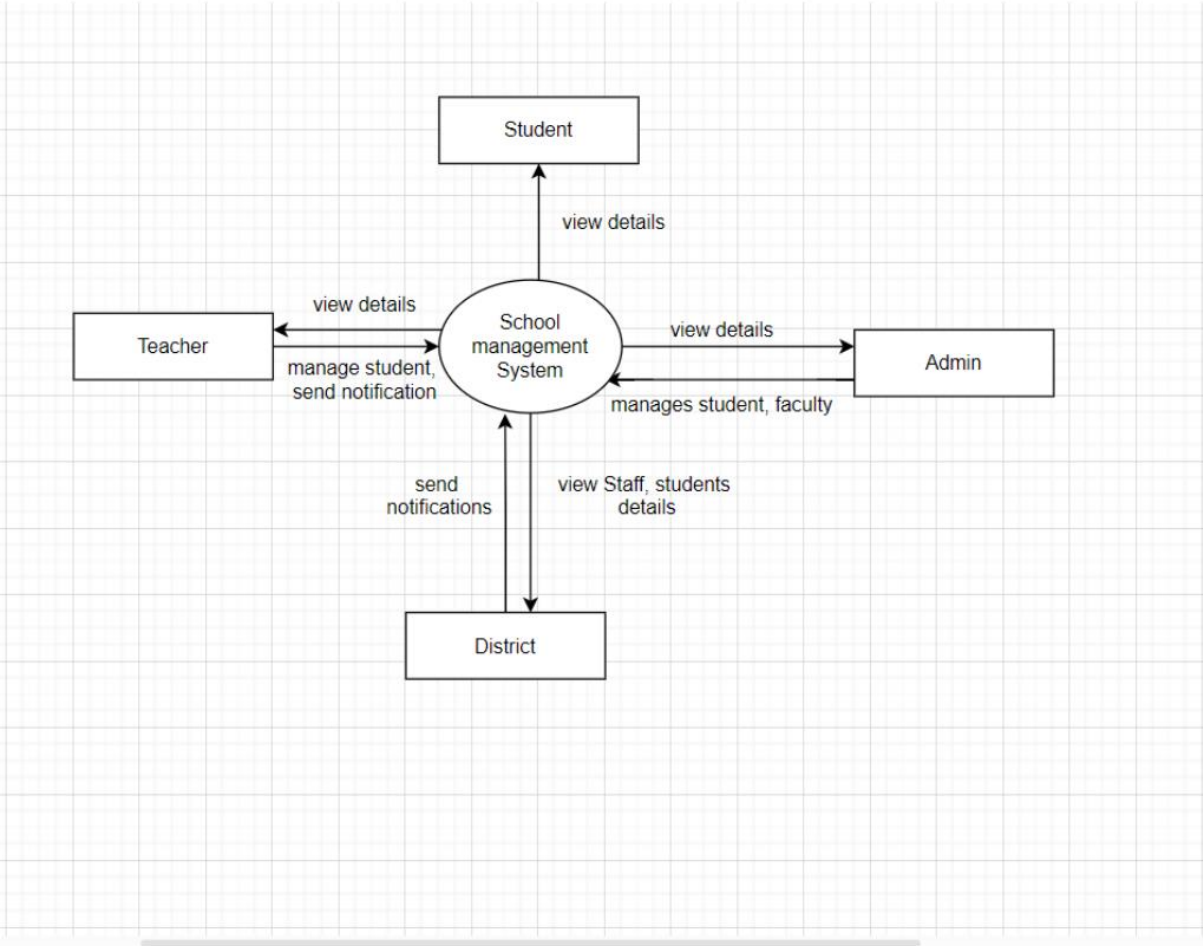

Fig 4.2.1 Basic Model

4.3. Result Analysis OR Screenshots

After conducting testing and verification procedures, the team will analyze the results to gain insights and identify areas for improvement. The data from the e-school model will be analyzed to get key insights that can help the district administration in strategy formulation for digitization and transformation of schools. By analyzing the data, the team can gain valuable insights that can help improve the operations of schools with the use of technology and IoT. The team

will run pilot projects in designated schools to check the feasibility of certain digital solutions and share the findings with the district administration. The analysis of results aims to identify opportunities for improvement and ensure that the e-school model is continually optimized to meet the needs of the schools.

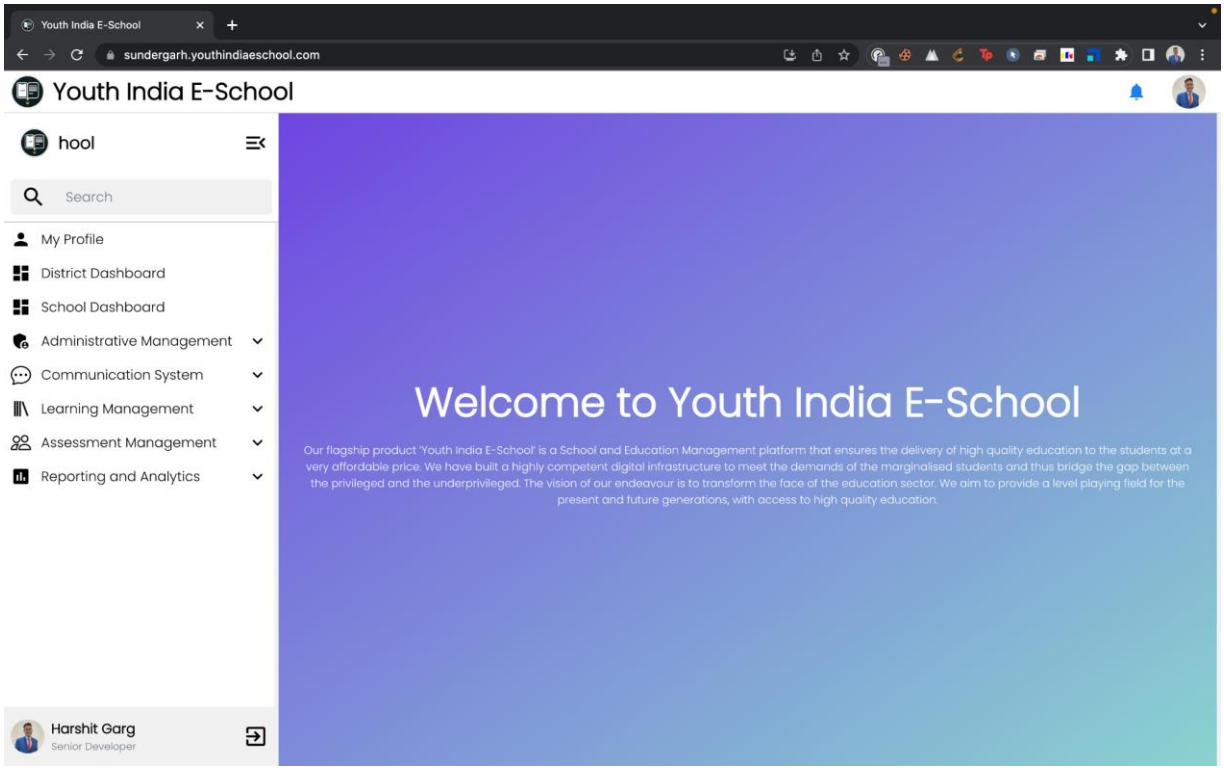

Fig 4.3.1 Home Page

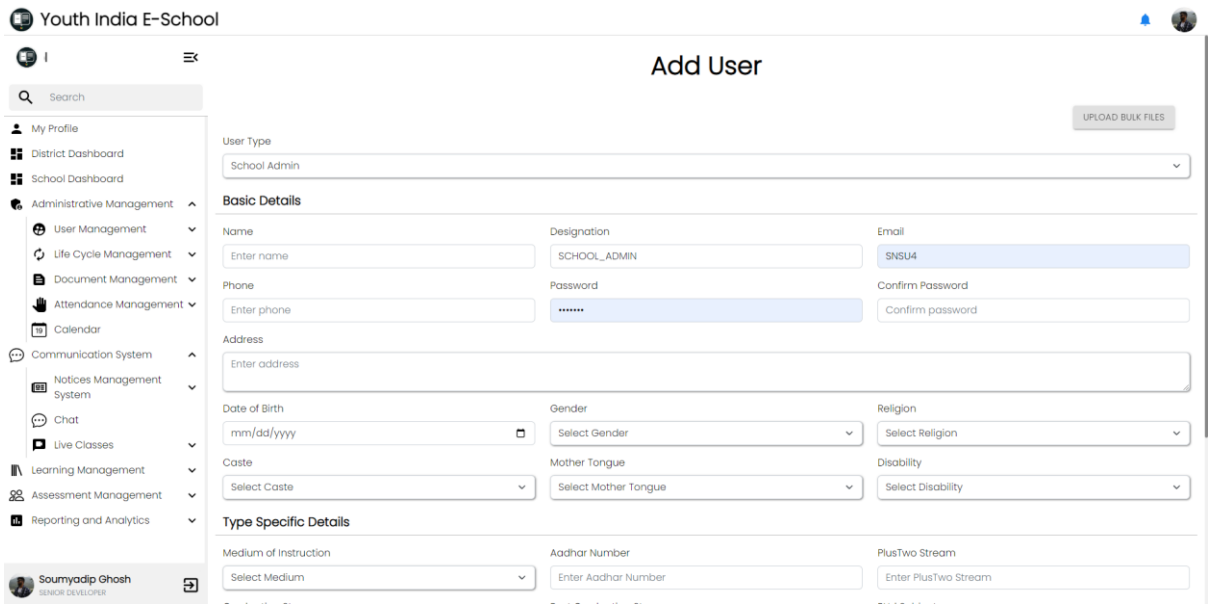

Fig 4.3.2 User Management

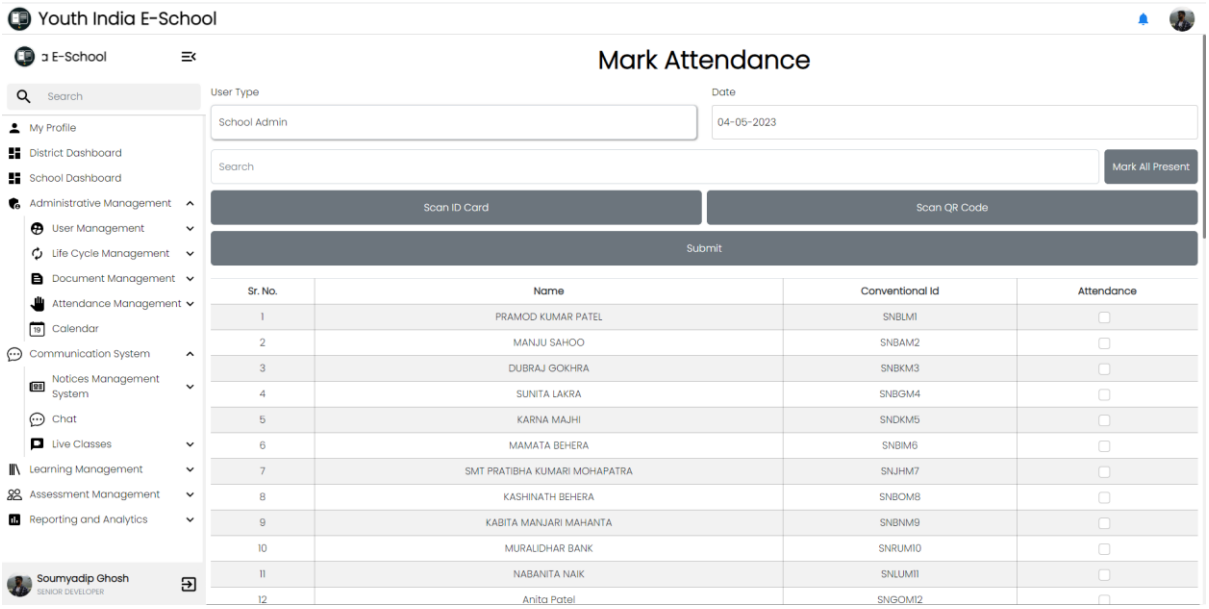

Fig 4.3.3 Attendance Management

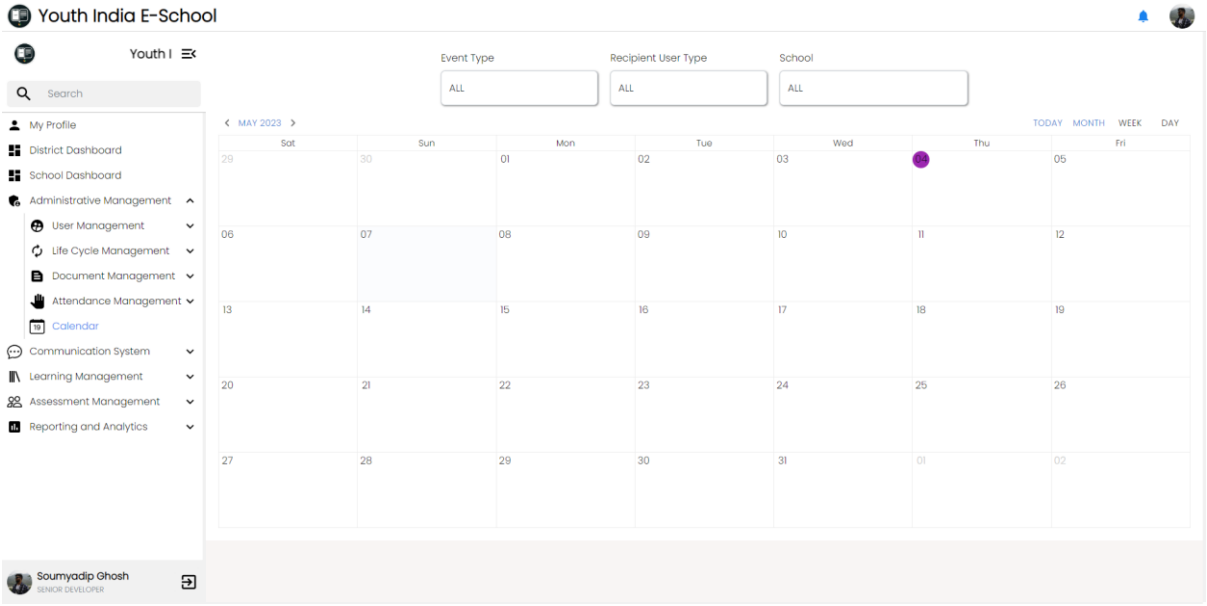

Fig 4.3.4 Calendar

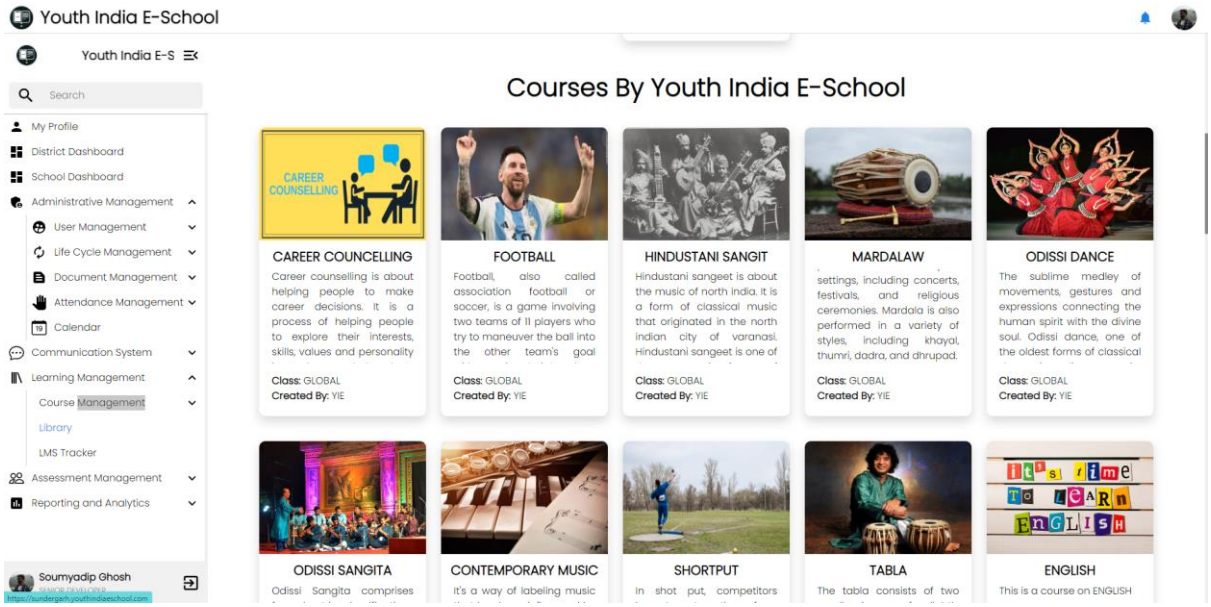

Fig 4.3.5 Learning Management

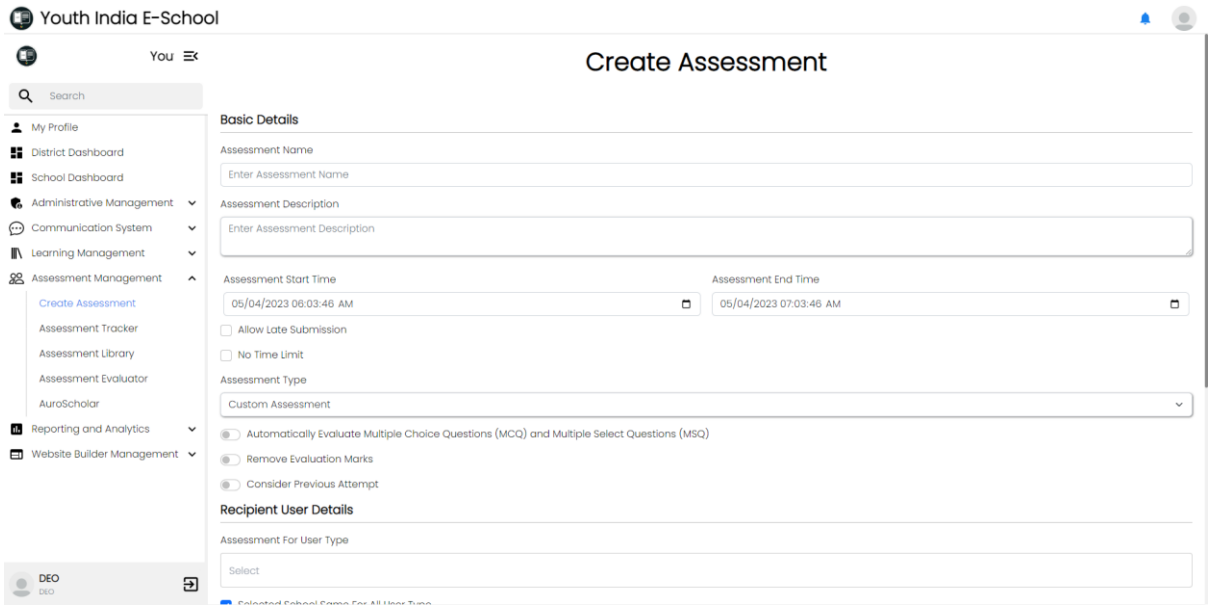

Fig 4.3.6 Assessment Management

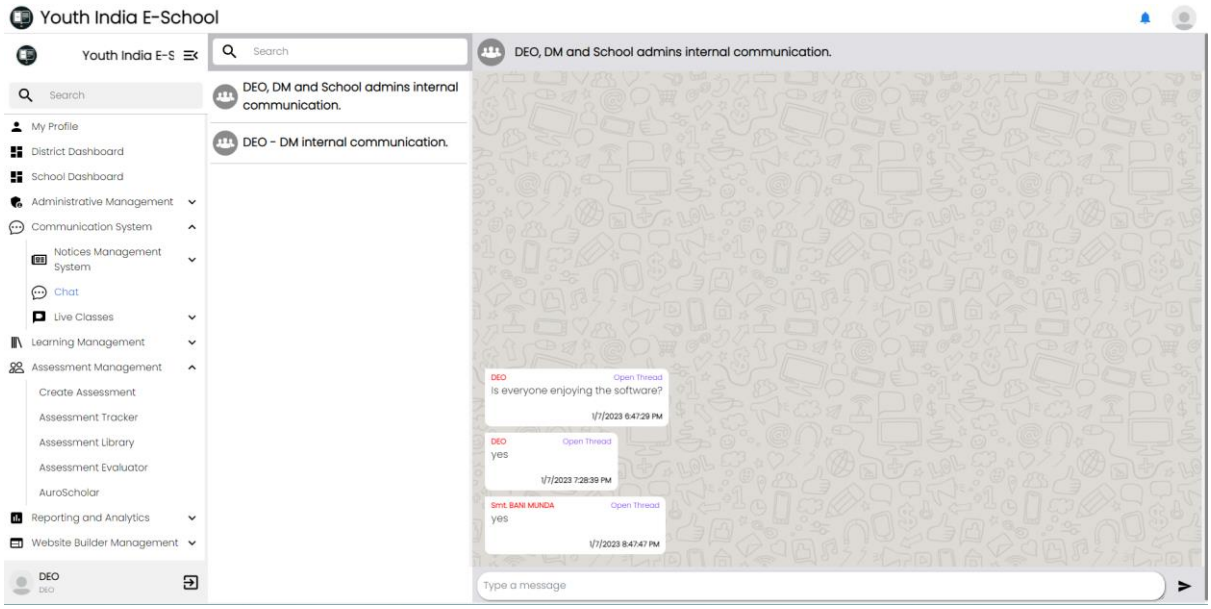

Fig 4.3.7 Communication Management

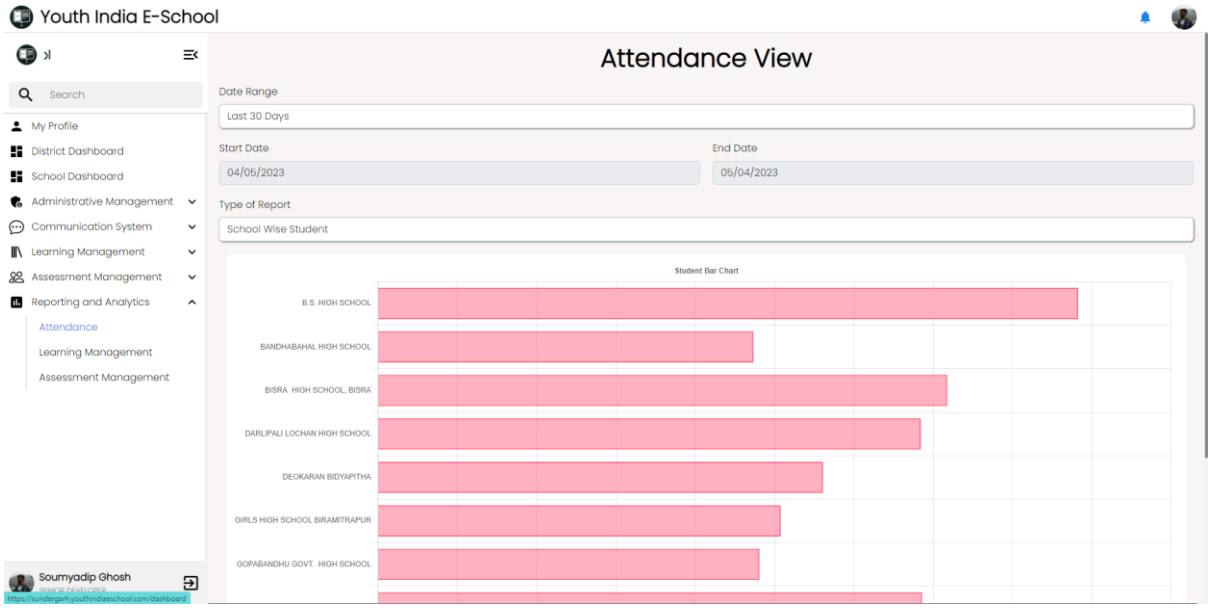

Fig 4.3.8 Reports and Analytics

4.4. Quality Assurance

Quality assurance is a crucial aspect of the E-Task Force project. The team will provide continuous assistance for seamless adoption of the e-school model through a dedicated client support team available on call, mail, and messaging. The team will provide regular support in the form of training to eliminate any bottlenecks in the adoption of the e-school model. The maintenance services include continuous software updates & upgrades, bug fixing, and developments in the current deliverables of the E-School model. The team will ensure that their model is enhanced and improved as new breakthroughs are achieved in the EdTech space. The quality assurance procedures aim to ensure that the e-school model is continually updated and optimized to meet the needs of the schools.

Maintenance Services Provided: Understanding the need for providing continuous assistance for seamless adoption of our e-schooling model, we shall provide a dedicated client support team on call, mail and messaging which shall work hand-in-hand to resolve client issues throughout the day. We shall provide regular support in the form of training to eliminate any bottlenecks in the adoption of the e-schooling model. The maintenance services also include continuous software updates & upgrades, bug fixing and developments in the current deliverables of the E-School model. Our model shall be enhanced and improved as new breakthroughs are achieved in the EdTech space.

a. **Bug Fixes:** Software products are susceptible for bugs overtime, thus to ensure seamless user experience we shall be providing continuous support. Our team of engineers shall work on any reported bugs and share solutions with clients to resolve the same.

b. **On-Ground Support:** Ensuring the adaption of our e-schooling model is a prime aspect for this project. In this endeavour our team shall provide support to schools for any concerns in using our systems. They will help the school in solving their queries and conducting regular training on the usage of the e-schooling model.

c. **Survey Feedback:** Our priority is to continuously improve our systems and make it easier for the users to utilise the systems to the maximum extent. Thus, on regular intervals we shall be collecting feedback for improving our services.

d. **Updates:** The EdTech systems are fast progressing and our model shall also work on the aspect of continuous improvement and deployment. Thus, we shall be providing updates on our features and services whenever it is

deemed necessary to avoid obsolescence. In this way our model is designed for future adaptability.

E-School Electronics and Hardware: The E-School Electronics and Hardware are a crucial aspect of the e-school model. The team understands that their transformational initiatives require an approach to hardware as well to make the ecosystem and digital transformation much more user-friendly. They will constantly deep dive into IoT, Electronics, and Hardware at an affordable cost to make the transition easier for the schools in their unique environment. The team will consistently conduct research and development and provide solutions to the district for furthering their efforts to make transformation easier and more convenient. One of the current offerings includes the E-Attendance Ecosystem Kit. The team has developed scalable technology in which they will be doing attendance management in a split second, to the tune of being able to track student attendance as they enter the room only. They will be providing all stakeholder users with Smart ID cards that help connect and track attendance whenever they are in the premises in which they want to track attendance or control.

Chapter 5

Standards Adopted

5.1. Design Standards

Designing large scale web applications is a complex task that requires careful planning and adherence to specific design standards. These design standards serve as guidelines for creating web applications that are user-friendly, scalable, and maintainable.

One of the most important design standards for large scale web apps is modular design. This involves breaking down the application into smaller, independent modules or components that can be developed, tested, and deployed separately. This approach helps to make the application more manageable, and reduces the risk of code conflicts and system crashes. Another important design standard is usability, which focuses on creating an interface that is intuitive and easy to use. This involves conducting user research and testing to understand user needs, preferences, and behaviors, and then designing the interface accordingly. Additionally, accessibility is also a key consideration, ensuring that the application can be used by individuals with disabilities.

Scalability is also a critical design standard, as large-scale web applications must be able to handle a high volume of traffic and users. This requires careful consideration of the underlying architecture, including the use of load balancers, caching, and distributed databases. Finally, maintainability is another important design standard for large scale web applications. This involves creating a well-organized and structured codebase, using standard coding practices, and implementing regular testing and debugging processes. This ensures that the application remains stable and reliable over time, even as it grows and evolves.

In conclusion, designing large scale web applications requires adherence to specific design standards that focus on modularity, usability, accessibility, scalability, and maintainability. By following these guidelines, we have been able to create a web application that is robust, reliable, and user-friendly, and that can handle high volumes of traffic and users without crashing or breaking down.

5.2. Coding Standards

Coding standards are a set of guidelines and best practices that define how code should be written and organized in order to ensure consistency, readability, maintainability, and scalability of software systems. For large scale web applications, coding standards play a crucial role in ensuring that the application is easy to understand, modify and extend by the development team over time.

Here are some key aspects of coding standards for large scale web apps in software engineering that we followed while developing our application:

1. **Consistent Naming Conventions:** It's important to have a consistent naming convention for variables, functions, and classes. This helps with readability and maintainability of the codebase.

2. **Proper Commenting:** Code comments should be used to describe the purpose of the code and how it works. This can be helpful for other developers who may need to work on the codebase in the future.

3. **Error Handling:** Proper error handling is crucial in large scale web apps to ensure that the application doesn't crash or become unresponsive. This involves catching and handling errors gracefully.

4. **Version Control:** Using a version control system, such as Git, can help with collaboration and tracking changes to the codebase over time.

5. **Security:** Security should be a top priority in large scale web apps. This involves implementing measures such as input validation, authentication, and encryption to protect user data and prevent attacks.

5.3 Testing Standards

Testing standards for large scale web applications are essential in ensuring the quality and reliability of the software. The testing process should include various types of testing, such as unit testing, integration testing, system testing, and acceptance testing. Unit testing ensures that individual units or components of the software are working correctly, while integration testing verifies that the different components work together as expected. System testing tests the entire system to ensure that it meets the functional and non-functional requirements. Acceptance testing is the final testing stage, where the software is tested by end-users to ensure that it meets their expectations and requirements.

Chapter 6

Conclusion and Future Scope

6.1 Conclusion

The E-School project aims to digitize and transform schools by providing custom solutions, advisory services, administration, policy support, training and capacity building, and R&D pilots. The project also offers maintenance services that include bug fixing, on-ground support, survey feedback, and updates to ensure seamless user experience. The project incorporates electronics and hardware solutions such as the E-Attendance Ecosystem Kit for attendance management. The advisory board consisting of former bureaucrats and industry experts acts as a task force to help in carrying out the continuous feedback-development-deployment model. The district administration is closely involved in defining the transformation processes, and certain aspects of the e-school model are customized to fit the requirement of the district administration to ensure optimal utilization. The project is expected to have a significant impact on the education sector by improving the operations of schools with the use of technology and IoT.

6.2 Future Scope

The E-School project has the potential to revolutionize the education sector by leveraging technology to enhance teaching methodologies and improve learning outcomes. Going forward, the project can be further improved by incorporating emerging technologies such as artificial intelligence and machine learning. Additionally, the project can explore the use of blockchain technology for secure record-keeping and credential verification. The project can also expand its services to cover a broader range of schools and educational institutions. Furthermore, the project can collaborate with international organizations and governments to promote global education standards and best practices. Overall, the E-School project has a bright future, and its potential impact on the education sector cannot be overstated.

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