IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, March 2026
Impact Factor: 8.2

E-Tuition: Mobile Platform for Student-Teacher Interaction and Tuition Management

Ms. V. B. Asavale, Mr. Rajwardhan Hanmant Patil, Mr. Anurag Ramchandra Lohar
Mr. Shravan Sandesh Todkar, Mr. Shreyash Shrikant Chavan
Department of Computer Engineering
Rajarambapu Institute of Technology, Rajaramnagar, India.

Abstract: *In today's digital world, managing tuition classes and communication between students and teachers can be difficult and time-consuming when done manually. Tasks such as recording attendance, sending payment request, tracking fees, and sharing information often create confusion and require extra effort. To solve this problem, we develop the E-tuition Mobile Application, a smart platform that simplifies tuition management and improves interaction between student and teachers. The system is designed for two types of uses: student and teachers. Teachers can register in application, mark student attendance, and send payment requests, while student can view their attendance records, check payment requests, chat with teachers, and make digital payments with downloadable receipts. By digitizing these process, the application reduce paperwork, save time, improve transparency, and provides a simple, fast, and efficient way to manage tuition activities for both students and teachers. In short, the E- Tuition App provides a convenient, reliable, and efficient solution that helps teachers manage their classes effectively while allowing students to stay upload with their academic activities in simple and organized way.*

Keywords*: digital world*

I. INTRODUCTION

In today's era, technology plays a major role in improving educational systems and making academic management more efficient, Tuition classes are widely used by students to improve their academic performance, but managing tuition activities manually can often be difficult and time-consuming. Traditional methods such as maintain attendance records on paper, manually managing fee payments, and lack of transparency. With the rapid growth of smartphones and internet connectivity, mobile application have become an effective solution to simplify these process. The E-Tuition Mobile Application is designed to provide a smart and user-friendly platform that connects students and teachers in a digital environment. Through this application, teachers can easily manage important tasks such as marking student attendance, sending payment requests, and communicating with student. At the same time, student can access their attendance records, receive payment notification, communicate with teachers through a chat system, and make digital payments directly through the application. The system stores all important data such as attendance details, payment records, and user information in a centralized database, making it easy to manage and access information whenever required. By digitizing the traditional tuition management process, the application reduces paperwork, saves time, improves transparency, and enhance communication between students and teachers. It also provides a more organized and convenient way for both teachers and students to manage their academic activities. Overall, the E-Tuition App aims to modernize the tuition management system by providing a simple, efficient, and reliable platform for managing academic activities in a more organized and convenient way.

II. LITERATURE REVIEW

Mobile application have become an essential part of modern life, helping people perform many tasks quickly and efficiently. In recent years, mobile-based platforms have significantly improved the way services are managed and delivered by providing users with convenient digital solutions. Many studies show that digital systems improve

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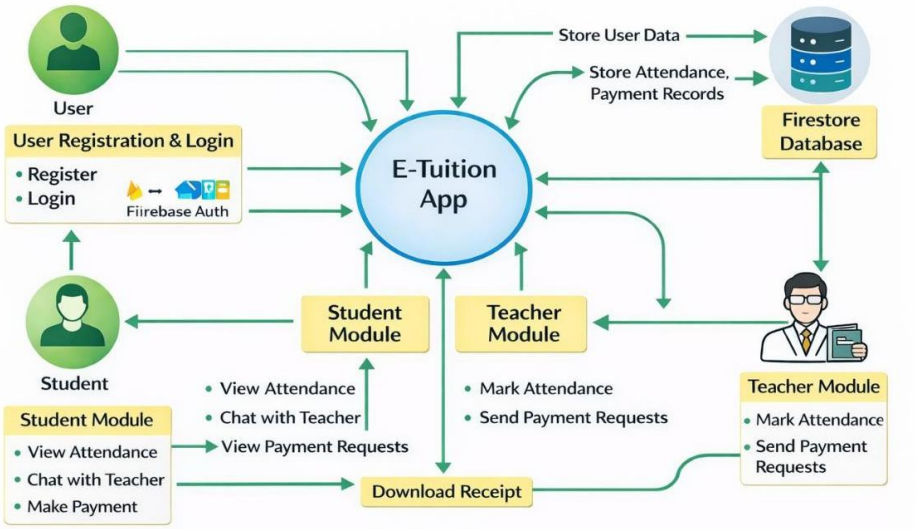
accessibility, transparency, and communication between users and service providers. Similar technological approaches are now being used in educational platform to simplify academic management and interaction between teachers and students. Research in the field of educational technology highlights that mobile application can help automate tasks such as attendance management, communication, and payment processing, which are traditionally handled manually. Secure login system, centralized databases, and real-time communication features are commonly used to improve system efficiency and reliability. Additionality, cloud-based database and wireless internet technologies support smooth data storage and accessibility, allowing users to access information anytime and anywhere. Digital payment integration and secure authentication mechanism further enhance the reliability and usability and such system. Studies also emphasize that user-friendly interfaces, data security, and transparency are key factors that influence the successful adoption of mobile application. These technological advancements have encouraged the development of modern platforms that simplify academic management process and improve communication between teachers and students, Overall, literature suggests that combining mobile technology, secure database, and digital communication systems can create efficient and reliable applications that helps streamline educational management and provide a better experience for both teachers and students.

III. SYSTEM WORKING



The diagrams above illustrate the structure and functionality of the E-Tuition mobile application clearly. The E-Tuition system is designed to connect students and teachers through a centralized digital platform that helps manage tuition activities efficiently. It works like a smart academic management system where students can view attendance, receive payment requests, communicate with teachers, and access important information through a single application. Teachers can easily manage their classes by marking student attendance, sending payment requests, and communicating with students through the integrated chat feature. This digital approach improves accessibility, transparency, and efficiency in tuition management. The front-end of the application is developed using XML and Java, which helps creates a simple, interactive, and user-friendly interface for both students and teachers. The backend logic is implemented using Java, which handles the application processes and communication between different modules. For data storage and authentication, the system uses Firebase, which securely stores user data, attendance records, payment details, and chat messages in a centralized cloud database. This architecture ensures smooth communication between the mobile application and the database while maintaining reliability, security, and fast data access. Overall, the E-Tuition system provides a structured and efficient platform that simplifies tuition management and improves interaction between student and teachers.

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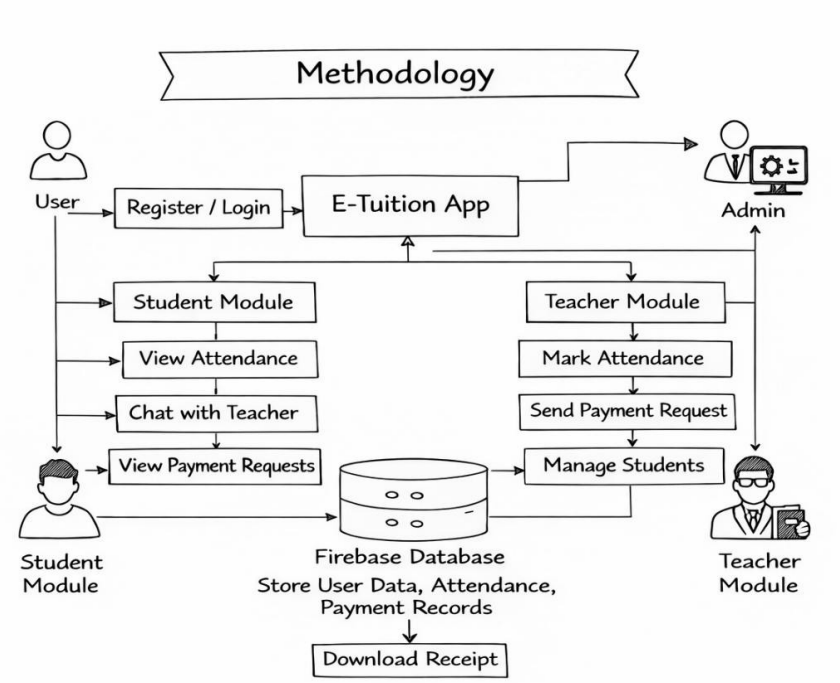
IV. METHODOLOGY TO SOLVE THE PROBLEM



E-Tuition – System Architecture and Methodology

The proposed system E-tuition Mobile Application is designed using a three-tier architecture model. This architecture approach is selected because it provides a well-organized structure, better scalability, improved security, and easier system maintenance. The application is divided into three main layers: Presentation Layer, Application Layer, and Database layer. This separation ensures that each component performs a specific task while maintaining smooth communication between Students, Techers, and enhances the overall performance of the application.

A. Presentation Layer

The Presentation Layer represents the user interface of the E-Tuition system. It is developed using XML and Java, which provides a responsive, structured, and user-friendly interface For mobile devices. Separate dashboards are designed for each type of user to provide a role-based experience

1. Students Interface

The student interface allows students to:

- Register and log in securely
- View their attendance records
- Chat with teachers for communication
- View payment requests sent by teachers
- Make digital payments
- Download payment receipts

The interface is designed to be simple and easy to navigate so that students can access information without technical difficulty.

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2. Teacher Interface

The teacher panel allow teachers to:

- Register and log in securely
- Mark student attendance
- Send payment requests to students
- Communicate with students through chat
- Manage student records

This interface helps teachers manage tuition classes efficiently and keep track of student activities

B. Application Layer

The Application Layer acts as the core processing unit of the E-Tuition system. It is developed using Java, which handles server-side logic and manages the communication between the user interface and the database.

Core Functionalities

1. Authentication and Role-Based Access Control

- Secure login system for students and teachers
- Clearly defined access levels for each user role
- Session management to prevent unauthorized access

2. Attendance Management

- Teachers can send payment requests to students
- Students receive payment notifications
- Students can complete payments digitally

3. Payment Request Management

- Teachers can send payment requests to students
- Students receive payment notifications
- Students can complete payment digitally

4. Communication System

- Students and teachers can communicate through a chat feature
- Message are stored securely in the database
- Enable faster communication and doubt solving

5. Receipt Generation

- After successful payment, the system generates a digital payment receipt
- Student can download the receipt from the application

6. Security Mechanism

To ensure system security and data protection, the application includes:

- Input Validation to prevent incorrect data entries
- Secure request handling
- Encrypted authentication using Firebase Authentication
- Protected access to sensitive information

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C. Database Layer

The Database Layer uses Firebase Firestore, a cloud-based NOSQL database that securely store and manage application data. The database maintains different collection to organize data efficiently.

Main Database Entities

- Users Collection(students and teacher details)
- Attendance Collection
- Payment Collection
- Student Request Collection
- Chat Message Collection The database ensures:
- Fast data retrieval
- Secure storage of attendance records
- Accurate payment tracking
- Reliable storage of communication data

Working Methodology of E-Tuition System

The working of the E-Tuition application follows a systematic process.

Step 1: Registration and Login

Students and teachers first register themselves on the platform. After registration, they log in using secure credentials.

Step 2: Access Dashboard

After login, the system redirect users to their respective dashboard on their role(Student or Teacher).

Step 3: Attendance Management

Teachers mark student attendance, which is stored in the Firebase database. Students can view their attendance records anytime.

Step 4: Payment Requests

Teachers send payment requests to students for tuition fees.

Step 5: Payment Processing

Students view payment requests and make digital payment through the application.

Step 6: Receipt Generation

After successful payment, the system generates a digital receipt that student can download.

Step 7: Communication

Students and teachers can communicate using the built-in chat feature for sharing updates or solving doubts.

Objectives of E-Tuition System

- To develop a digital platform for the managing tuition activities efficiently.
- To provide secure role-based access for students and teachers.
- To automate attendance management and payment tracking.
- To improve communication between student and teachers.
- To reduce manual paperwork and improve transparency in tuition management.

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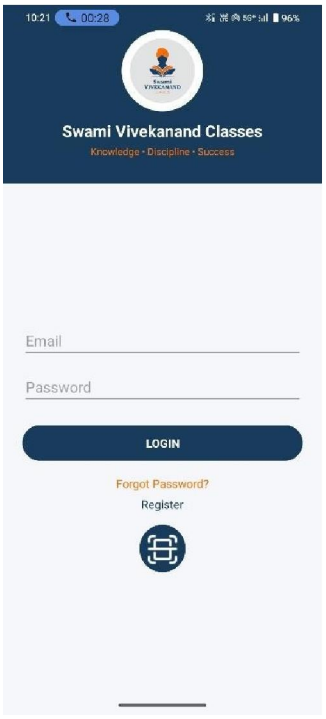
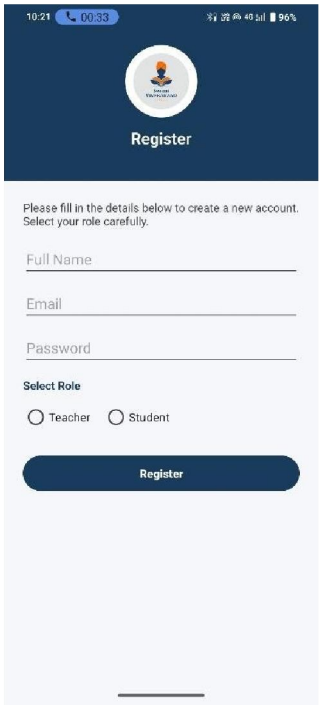
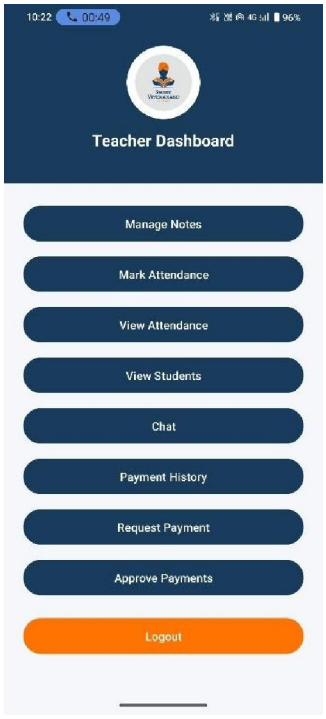
V. RESULT



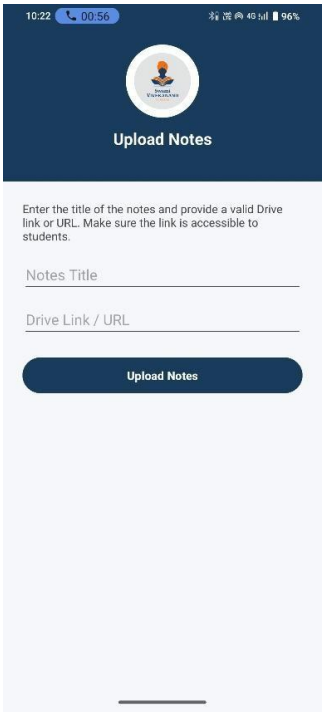
1. Login page



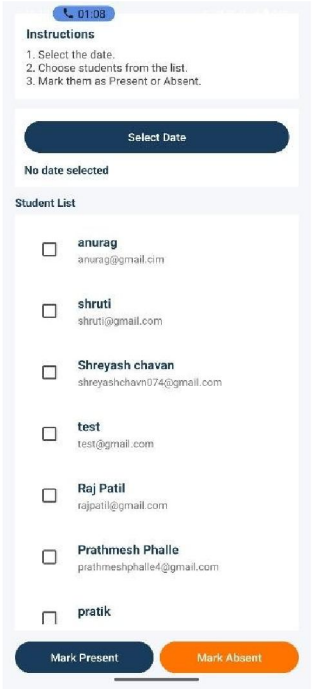
2. Registration page (Student and Teacher)



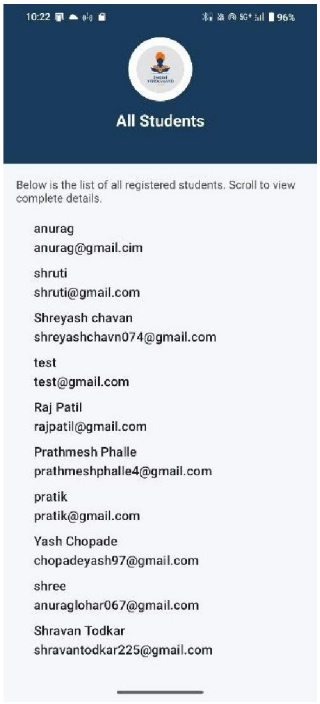
3.Teacher dashboard



4. Upload notes



5. Mark attendance



6. Student details

DOI: 10.48175/IJARSCT-31914

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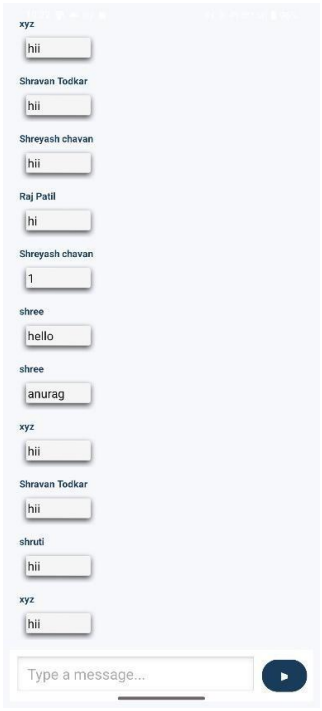
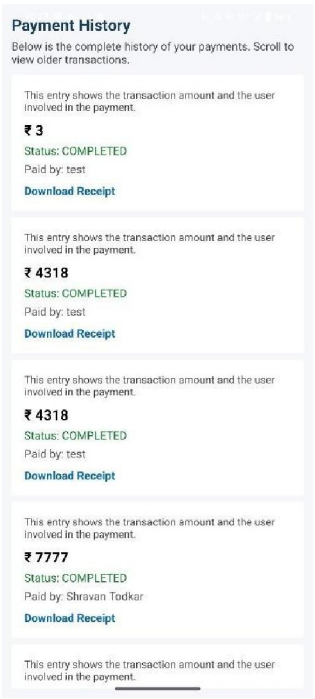
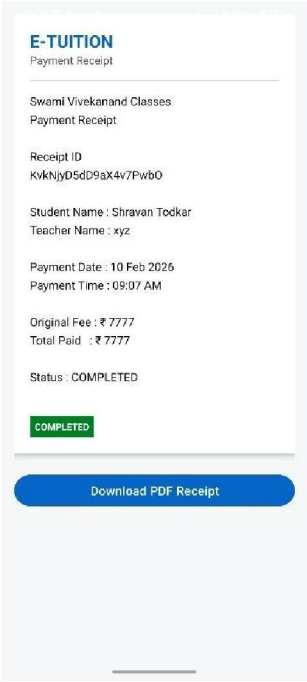


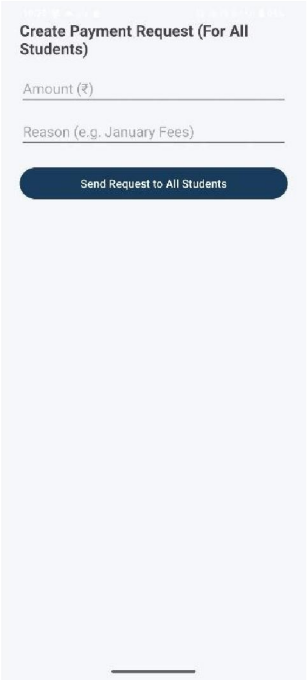
7. Live Chat



8. Payment history

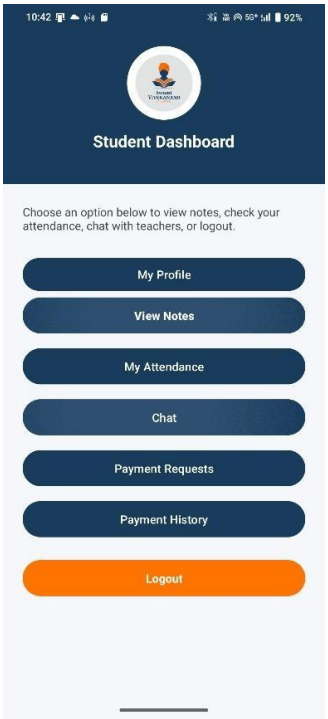


9. Download receipt



10. Request payment

11. Approve payment



12.Student Dashboard

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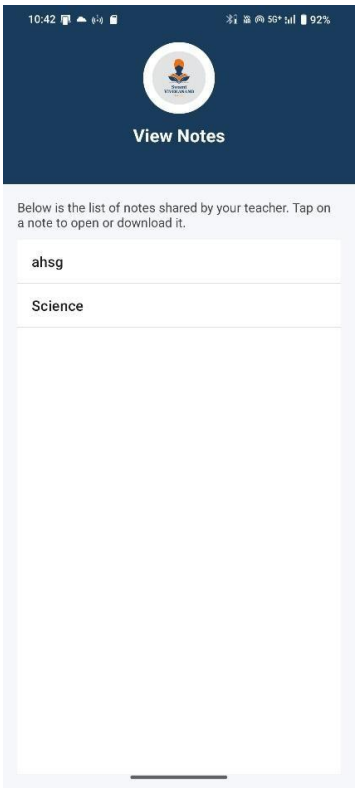
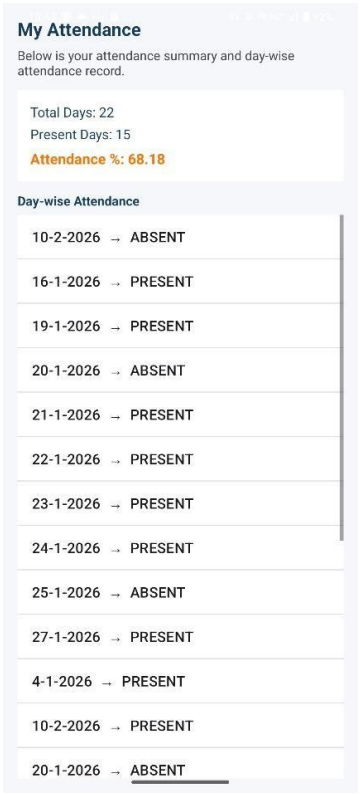


13.Notes



14. Attendance

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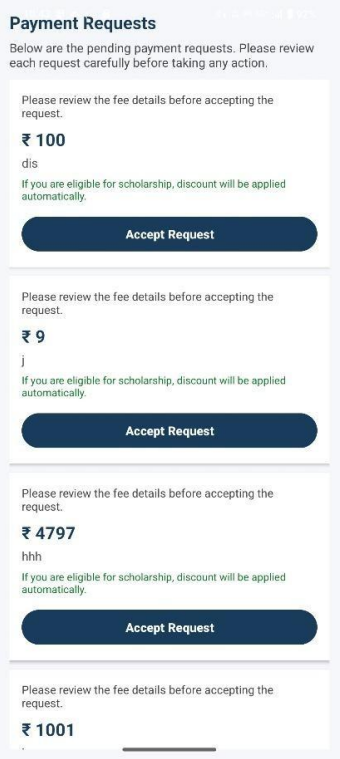
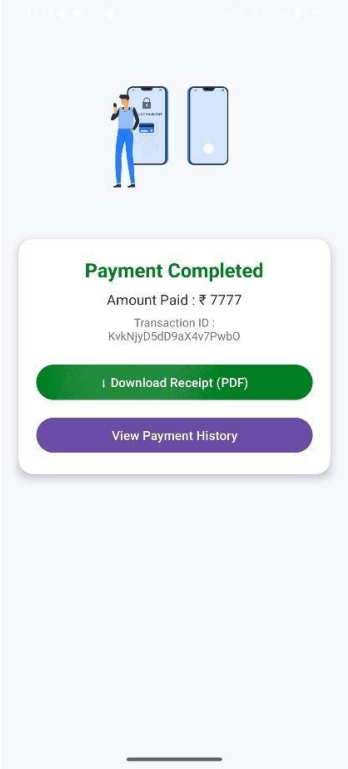


15.Payment Requests



16.Payment history & notification

VI. CONCLUSION

In conclusion, the E-Tuition mobile application provides a practical and efficient digital platform that improves communication and management between students and teachers. With the increasing use of mobile technology in education, digital solution such as tuition management system are becoming essential for organizing academic activities effectively. The application simplifies important processes such as attendance management, payment requests, communication, and record keeping through a centralized system.

The system is carefully designed with two main modules student and Teacher each playing an important role in the smooth functioning of the platform. Students can register and log in securely, view their attendance records, communicate with teachers through chat, check payment requests, and make digital payments with downloadable receipts. This helps students stay updated with their academic activities in convenient and organized manner.

Similarly, teachers can log in to manage classes efficiently by marking student attendance, sending payment requests, and communicating with students directly through the application. All important information such as attendance records, payment details, and user data is securely stored in the Firebase database, ensuring reliability, security, and easy data access.

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