A
Mini Project Report on

Smart Attendance Monitoring System

Submitted in partial fulfillment of the requirements
for the degree of
BACHELOR OF ENGINEERING
IN
Computer Science & Engineering
Artificial Intelligence & Machine Learning

by

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2024-2025**

A. P. SHAH INSTITUTE OF TECHNOLOGY

CERTIFICATE

This is to certify that the project entitled **"Smart Attendance Monitoring System"** is a bonafide work of Krishna Dongre (22106089), Devang Dhuri (22106036), Sumedh Gadpayle (22106076) submitted to the University of Mumbai in partial fulfillment of the requirement for the award of **Bachelor of Engineering** in **Computer Science & Engineering (Artificial Intelligence & Machine Learning).**

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Prof. Snehal Kangane

Mini Project Guide

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PROJECT REPORT APPROVAL

This Mini project report entitled "**Smart Attendance Monitoring System**" by **Krishna Dongre, Sumedh Gadpayle, Devang Dhuri** is approved for the degree of *Bachelor of Engineering* in *Computer Science & Engineering*, (AIML) *2024-25*.

External Examiner: _____

Internal Examiner: _____

Place: APSIT, Thane

Date:

DECLARATION

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission hasnot been taken when needed.

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ABSTRACT

Effective student management is crucial for academic institutions, yet traditional manual systems lead to inefficiencies, disorganization, and poor tracking of attendance. Conventional methods, such as paper-based records, disrupt classes and consume valuable time. To address these challenges, a mobile-based attendance system using the Android platform is proposed, integrating a database to store student records and providing an intuitive interface for lecturers and administrators.

With advancements in educational technology, features like online study materials, academic calendars, and automated attendance tracking enhance institutional productivity. The proposed system enables teachers to record attendance via smartphones, track student progress, and send automated SMS notifications when attendance falls below the threshold, ensuring timely interventions and improved student performance.

Keywords: Android, Attendance management, E-learning, GPRS, smart phone, etc.

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CHAPTER 1

INTRODUCTION

1. INTRODUCTION

Nowadays, mobile devices have become a way of life for students especially in higher education. Computers are now replaced by compact smart phones that can be fit into pocket and can be carried anywhere. The rapid progress in mobile technology has created a new area which is known as mobile learning. Mobile learning is the next generation of e-learning that leads attractive way of knowledge delivery especially used in teaching and learning process. With development of this Android application the student preferred to use mobile devices as technology supported educational tool. This system is designed because notes dictation in the class is difficult considering semester duration, student might miss the exam and important notice displayed due to unawareness, chances of false marking of attendance is more due to more paper work and manual attendance entry, evaluation and report generation is tedious and time consuming job. Timely updates to parent are not possible. With this system teacher can upload notes, time tables, assignment on server and broadcast it to the registered mobile numbers so that it is easily accessible to student by their own smart phone. This system enables student to learn anywhere, anytime and at their own convenience. This system makes students to be active, responsive while learning their academic. Another application that is provided by this system is smart attendance evaluation and report generation.Traditional methods for price prediction, including statistical models like ARIMA and GARCH, as well as technical analysis techniques, often struggle to accurately forecast Bitcoin's price movements due to its high volatility, nonlinear behavior, and unpredictable market dynamics. Given these limitations, researchers and financial analysts have turned to artificial intelligence (AI) and deep learning techniques, which have shown significant potential in financial time-series forecasting. One of the most effective deep learning models for sequence-based prediction is the Long Short-Term Memory (LSTM) network, a specialized type of Recurrent Neural Network (RNN) that is particularly well-suited for capturing long-term dependencies in time-series data.

Smartphones have revolutionized communication and digital access, with Android leading as the most widely used operating system, holding a 70% market share. Its open-source nature allows developers to customize applications freely, fostering innovation and accessibility. This project leverages Android's flexibility to create an educational app compatible with versions from Gingerbread 2.3 to Lollipop 5.0.1, ensuring inclusivity for students with limited resources. By supporting older devices, the application bridges the digital divide, making essential educational tools accessible to a broader audience and empowering students

CHAPTER 2

LITERATURE SURVEY

2. LITERATURE SURVEY

2.1-HISTORY

The paper titled *"Android Based Smart Learning and Attendance Management System"* was published in the *International Journal of Advanced Research in Computer and Communication Engineering* in June 2015. The study was conducted by researchers from the MIT College of Engineering, Pune, India. It was motivated by the rapid advancements in mobile technology and the increasing role of smartphones in the education sector. The research aimed to address common challenges in academic institutions, such as attendance tracking, distribution of learning materials, and communication between teachers, students, and parents. Traditional attendance systems, including manual roll calls, RFID-based tracking, and Bluetooth-based attendance, were found to have limitations, such as inefficiency, security risks, and time consumption. To overcome these issues, the researchers proposed an Android-based application that automates attendance tracking, provides real-time academic updates, and enables easy access to study materials. The application supports Android versions from Gingerbread 2.3 to Lollipop 5.0.1, ensuring compatibility with a wide range of devices, particularly benefiting students in rural and economically disadvantaged areas. The system also integrates SMS notifications for attendance alerts and academic updates. The study concluded that this Android-based solution enhances efficiency, reduces paperwork, and promotes a seamless learning experience. The researchers suggested that future enhancements could include cross-platform compatibility and further automation of educational processes.

2.2-LITERATURE REVIEW

1. Android Based Smart Learning and Attendance Management System

An Education system in India has become so advanced in last decade due to the development of the technology. Smart class, video conferencing are some of the examples of modern trends in educational system. These applications help the institute to move forward quickly, fulfil their vision and accomplish their goals, E-way. The core idea of research project is to implement Android based application for attendance management system for advancement of institution and educational system. The proposed project will be implemented in applications such as online study material, notices, academic calendar and online reminders of examination, online attendance record, performance record, and parent intimation system using Android applications. This system helps teacher to take attendance through smartphone and keep record of students for their progressive assessment. This system gives a prior intimation to student as soon as their attendance goes below the specified attendance threshold in the form of an SMS.

2. Real-time Student Management Application Using Google Firebase and Android Studio

Student management is basic to the accomplishment of any scholastic establishment. Numerous sorts of exploration uncover that helpless management is influencing the nature of instruction and furthermore brings about the inappropriate following of workers. Instructive establishments can't meet the desires for guardians in light of the disarranged manual management framework. With a machine-driven management framework, foundations can responsively follow student's time in the study hall. Overseeing things has expectedly been moved toward utilizing time tickers, timesheets, and time following programming, yet management goes past this to give a workplace that augments and propels students. Student Management System is vital when expressed as far as profitability of a foundation.

3. Student Attendance System Using An Android Based Mobile Application

The emergence of internet of things (IoT) in the digital era arises the need to substitute the traditional attendance records in the universities. Frequently, students record of attending classes is being carried out traditionally on a piece of paper, where the sheets were circulated among the students in the class. This method can deter the students' focus during the class and

the time taken to record attendance increase significantly to the masses. Hence, an attendance system on mobile application using Android platform was developed. The attendance system connected to a database that stored student information and attendance records. In addition, the user interface displayed the attendance records in an attractive approach and ease to managed by lecturers or system administrators.

4. Student Attendance Management System Based on Fingerprint Identification Technology.

Accurate and efficient management of student attendance is a prerequisite for ensuring the healthy development of students and cultivating high-quality talents, and is also a top priority in school work. The establishment of attendance management system can solve the problems of delays and low efficiency in human resource management and attendance rate statistics in the past. The aim of this paper is to study the design and implementation of a student attendance management system based on fingerprint recognition technology. The design requirements and principles of the fingerprint recognition assisted management system are analysed, the overall structure of the system is designed, the functions and applications of fingerprint recognition technology are reasonably designed and adopted, and finally the fingerprint recognition assisted management system is implemented. The results show that after the system is implemented, it makes attendance more convenient, fast and standardized compared with the traditional methods of punching cards and signing on behalf of students, which greatly improves the learning efficiency of students in universities.

CHAPTER 3

PROBLEM STATEMENT

3. PROBLEM STATEMENT

Manual attendance systems are time-consuming, error-prone, and insecure, requiring extensive administrative effort while being vulnerable to data loss, tampering, and proxy attendance. Educators also struggle to track attendance trends and identify at-risk students efficiently. To address these challenges, technology-driven solutions like RFID, IoT, and mobile applications provide a secure and automated alternative. These systems enhance accuracy, reduce workload, and offer real-time attendance tracking, eliminating paperwork and errors. By integrating with student information systems, they generate reports and send notifications, ensuring transparency and timely interventions for improved academic outcomes.

CHAPTER 4

EXPERIMENTAL SETUP

4. EXPERIMENTAL SETUP

4.1 HARDWARE SETUP

1. Processor (CPU & GPU):

- **Minimum**: Intel Core i3 (8th Gen) / AMD Ryzen 3

- **Recommended**: Intel Core i5/i7 (10th Gen or higher) / AMD Ryzen 5/7 (3000 series or higher)

- **Why Needed**? Android Studio requires a powerful CPU for smooth performance, quick Gradle builds, and efficient emulator execution.

2. Memory (RAM):

- Minimum: 8GB

- Recommended: 16GB or higher

- Why Needed? Android Studio, along with an emulator and Gradle builds, consumes significant RAM, so higher RAM ensures smooth multitasking.

3. Storage:

- Minimum: 256GB SSD

- Recommended: 512GB - 1TB SSD

- Why Needed? SSD speeds up Android Studio's indexing, Gradle builds, and project execution.

4. Graphics (GPU - Optional for Emulator Performance):

- Recommended: NVIDIA GTX 1650 or higher (for smooth emulator performance)

- Why Needed? If using an Android Emulator, a dedicated GPU improves rendering speeds.

4.2 SOFTWARE SETUP

1. Programming Languages and tools:

- Android Studio (Latest Version) → IDE for Android development

- JDK (Java Development Kit 11 or higher) → Required for Java-based development

- Java → Core programming language for Android development

- SQLite → Lightweight database for local attendance storage

- XML → Used for UI design in Android layouts

- Gradle → Build automation tool for project dependencies

2. Operating System:

- Windows 10/11, Linux (Ubuntu 20.04+), or macOS

- Why Needed? Android Studio supports cross-platform development. Linux/macOS is often preferred for stability.

3. Libraries and dependencies :

- Room Database (Android Jetpack) → Simplifies SQLite database operations.

- RecyclerView → Efficiently displays large datasets in a list or grid.

- iText PDF → Enables PDF generation for attendance reports.

- AndroidX Test & Espresso → Provides testing tools for UI and instrumentation tests.

- Google Material Components → Provides modern UI elements for Material Design

4. Additional Frameworks and APIs:

- Android Jetpack Components → Lifecycle-aware components for better app efficiency.

- Splash Screen API → Implements smooth app launch transitions.

CHAPTER 5

PROPOSED SYSTEM &

IMPLEMENTATION

5. PROPOSED SYSTEM & IMPLEMENTATION

5.1 BLOCK DIAGRAM OF PROPOSED SYSTEM
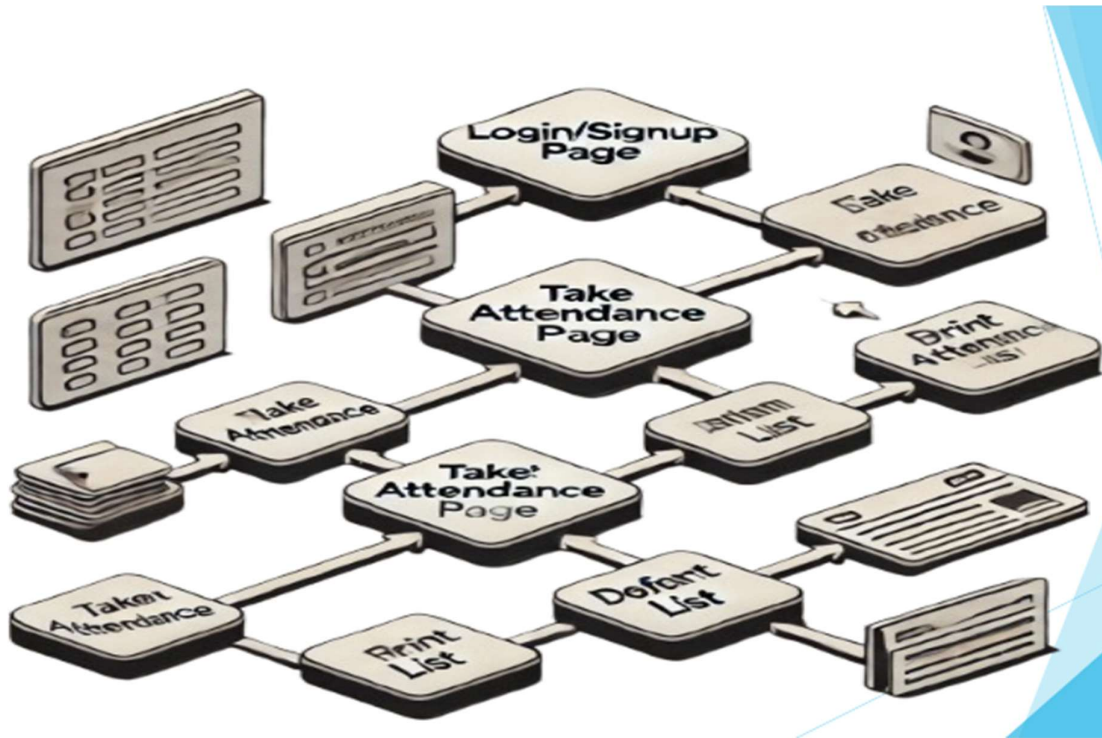
5.2 DESCRIPTION OF BLOCK DIAGRAM

1. User Authentication**:**

- The system starts with a Login/Signup Page, ensuring that only authorized users (students, teachers, or administrators) can access the attendance system.

2. Attendance Management**:**

- The Take Attendance Page serves as the central hub where attendance records are managed, allowing users to mark attendance.

3. Attendance Processing**:**

- The system includes functionalities for taking attendance, viewing attendance lists, and

detecting anomalies like fake attendance attempts.

4. Report Generation**:**

- The system provides options to print attendance lists, making it easier for administrators or teachers to maintain records.

5. Defaulter Identification**:**

- A Defaulter List is generated to highlight students with low attendance, helping in tracking and necessary follow-ups.

6. Data Storage and Retrieval**:**

- The system maintains an organized attendance record database, allowing users to access past attendance data, print reports, and analyze attendance trends.

5.3 IMPLEMENTATION

OPERATING SYSTEMS
SEPM   3   2

DATA COMMUNICATION
MACHINE LEARNING   6   4

SOFTWARE ENGINEERING & PROJECT MANAGEMENT
DBMS   3   3

DATABASE MANAGEMENT SYSTEMS
OS   3   3

+ New Class

Data Communication | MACHINE L...   SAVE ⋮
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03	3 ANISH	P
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07	7 RANJIT	P
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09	9 DURVESH	P
10	10 SIDDHARTH	A
11	111 Christopher Evans	⌄

Data Communication
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Attendance Sheet: March 2025

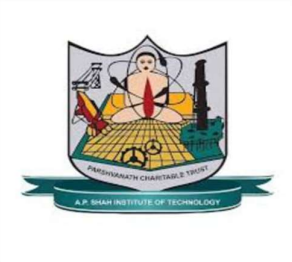| ROLL	NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Per.
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5.4 APPLICATION OF SMART ATTENDANCE MONITORING SYSTEM

1. Educational Institutions
- Used in schools, colleges, and universities to automate student attendance.
- Helps teachers save time and reduce errors in manual attendance marking.

2. Corporate Offices
- Tracks employee attendance, working hours, and late arrivals automatically.
- Generates reports for HR departments to manage payroll and productivity.

3. Government Organizations
- Ensures workforce accountability by monitoring employee attendance.
- Helps in maintaining transparency and reducing proxy attendance.

4. Healthcare Facilities
- Tracks attendance of doctors, nurses, and staff in hospitals and clinics.
- Ensures proper shift management and duty allocation.

5. Event Management
- Monitors attendance at seminars, conferences, and workshops.
- Helps event organizers analyze participant engagement and turnout.

6. Factories & Industries
- Keeps track of workers' attendance, shift timings, and overtime.
- Reduces the chances of fraudulent attendance marking.

7. Hostels & PG Accommodations
- Maintains a record of students or residents to ensure security and discipline.
- Helps hostel management track leaves and overnight stays.

8. Research & Data Analytics
- Provides attendance trends and insights for improving efficiency.
- Helps in analyzing absenteeism patterns and predicting future attendance behavior.

CHAPTER 6

CONCLUSION

6. CONCLUSION

The Smart Attendance Management System enhances efficiency, accuracy, and security by automating attendance tracking and minimizing manual errors. By leveraging real-time data, cloud integration, and biometric authentication, it prevents fraudulent practices like proxy attendance while improving transparency and accessibility. The system simplifies attendance management for institutions and organizations, ensuring seamless report generation and timely interventions. With scalability and adaptability, it serves as a reliable and future-ready solution, transforming attendance tracking into a data-driven, automated, and user-friendly process.

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