

Map-Based Attendance Monitoring System

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Abstract - It is thought to be inefficient to take attendance the old-fashioned way, where a lecturer calls out each student's name and logs attendance. To overcome this issue, the proposed system integrates geolocation, GPS, and OTP technology to provide a more efficient and secure attendance monitoring system. Geolocation and GPS technology are used to verify the user's location, ensuring that the student is present in the classroom or lecture hall. The integration of geolocation, GPS, and OTP technology ensures that attendance records are accurate and reliable, while also providing an added layer of security to prevent proxy attendance. The OTP is dictated by Faculty to the students. It is used for Two-Factor Authentication. This system has the potential to revolutionize the way attendance is managed in educational institutions and provide significant benefits to both students and faculty. The system also provides real-time monitoring of attendance, allowing instructors and administrators to track attendance data and generate reports on attendance trends. This can be useful in identifying students who may be struggling academically or are frequently absent.

Key Words: OTP Authentication, GPS tracking, Attendance monitoring, Google Sheets, Geolocation, etc

1. INTRODUCTION

Today's technological advancements are moving closer to the field of education. The use of sustainable technology for effective learning and the delivery of high-quality education has reached its peak. Nowadays, nearly all businesses and educational institutions place a great emphasis on attendance management. The two most prevalent types of attendance systems are automatic and manual. Manual methods involve paper and a pen. The paper sheets used in traditional techniques could be lost or damaged, making them unreliable. Additionally, extracting significant information takes a lot of effort. Instead of paper, attendance systems and automated time call for the use of Digital tags, barcode stickers, and biometrics. Here's how to utilize GPS on your smartphone to monitor attendance and time. We have proposed an Android location-based efficient attendance management system. Since our proposed efficient system only needs smartphones as peripherals, computation time

and the expense of installing extra devices are reduced. Students use mobile devices and apps that are automatically tracked. OTPs can be created, the teacher physically dictates his or her OTP, and the educator selects a class to attend. Our system will help to keep track of student's attendance in the classroom. The OTP must be entered by the student. The data can be even exported in spreadsheet format and offers a customized view of student attendance records.

2. LITERATURE SURVEY

[1] Location-Based Smart Attendance System Using GPS

Using phones and an Android mobile application, a location-based time and attendance tracking system eliminate the need for additional biometric scanner devices. Items of the organization include a particular spot, which may be located using GPS. [1] The GPS on smartphones determines where each pupil is. In our work, we define this place as a key to some time and attendance tracking.

[2] A Smart, Location-Based Time and Attendance Tracking System Using Android Application

In this research paper, the smart location-based attendance and time monitoring system used in this research article is built on Android mobile applications for smartphones, which eliminates the requirement for extra biometric scanning equipment.[2]The GPS can be used to locate an organization's position, which is specific. A smartphone's GPS can be used to find each employee's position. In our paper, we define this place as a key to time and attendance tracking.

[3] Automated Student Attendance System using Fingerprint Recognition.

In this project, the detailed method is used to develop an identification system that is easier to install than any other now available. The proposed automated attendance system based on fingerprint identification achieved noteworthy results for tracking the attendance of the Department of Computer Science and Engineering students when tested on a class of student fingerprint databases. [3] The suggested system was built using a platform that uses the C# programming paradigm.

[4] Automated Attendance Monitoring System using the Android Platform

Monitoring the students' attendance during lectures is a challenging undertaking, and it gets even harder during the report-generation stage. [4] This is because the process of recording attendance and keeping the data is not entirely automated and manual computation results in inaccuracies and takes a long time. The creation of the Attendance Monitoring System (AMS) on the Android platform is suggested as a result.

[5] Geo-location Based Attendance Monitoring System

The management of attendance gets challenging when there are many students. Several strategies have been put out, but one significant obstacle is the length of time needed to finish the attendance systems. [5] Traditional biometric methods, such as fingerprint and iris, need several hardware components, including backup servers, which are frequently pricy both financially and administratively.

3. PROPOSED SYSTEM

Our paper aims to cut down on paperwork and save time while still producing accurate attendance results for the students. The Attendance monitoring system for smartphones eliminates the need for additional biometric scanners.

The system offers the best and most minimalistic user interface. This suggested method can be used to produce effective reports.

CHARACTERISTICS OF THE PROPOSED SYSTEM :

User Friendly: The suggested system is user-friendly since data is preserved effectively and is quickly retrieved and stored.

Very less paperwork: Reports can be generated using computers, and all data is quickly entered into them. Also, because there is no need to maintain data on paper, work becomes incredibly simple.

Computer operator control: No likelihood of errors due to computer operator control. Also, it is simple to store and retrieve information. Work is thus possible.

Advantages of the Proposed System:

1. It is simple to operate.
2. It takes only a short amount of time to enter attendance.
3. Is a rough user outcome that has a high degree of reliability.
4. Optimal user interface.
5. Dependable reports.

4. METHODOLOGY

The steps to start the process(Faculty):

1. The Faculty accesses the system by logging in using their credentials, which include their username and password.
2. After logging in, the faculty creates a class in the system.
3. When it's time to record attendance, the faculty starts the attendance process and generates a One-Time Password (OTP).
4. The Faculty dictates the OTP to the students in the class.
5. Each student uses the OTP to mark their attendance in the system.
6. After all students have marked their attendance, the faculty stops the attendance process.
7. The attendance record is then stored in the system.
8. Finally, the Faculty logs out from the application to complete the process.

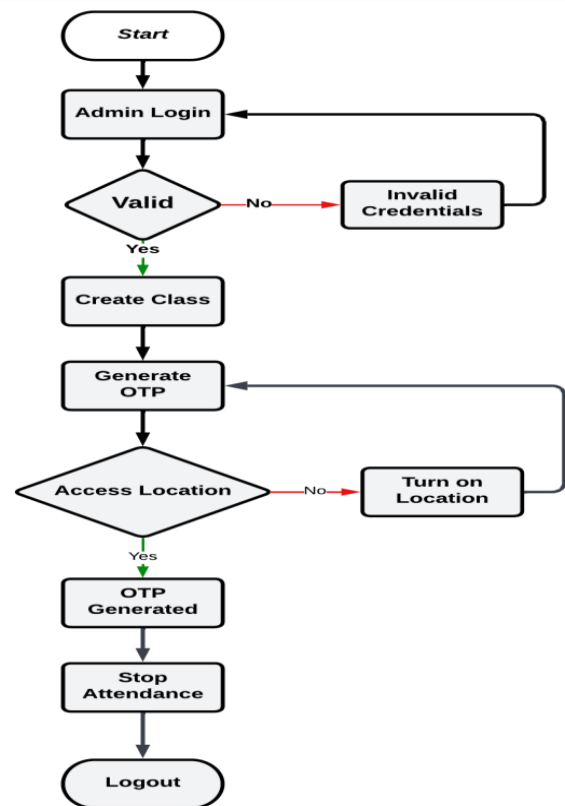


Fig 4.1: Flowchart for Faculty

The steps to mark the attendance(Student):

1. The student logs into the system using their login credentials, which include their password and username.
2. On logging, the student joins the class they need to attend.
3. Once the student has joined the class, there are two-factor authentication methods i.e OTP and GPS.

4. The student enters the OTP that is dictated by the faculty for that specific class.
5. The system then accesses the student's GPS location to determine whether they are inside the boundary area or not.
6. If the student is inside the boundary area and the OTP is incorrect, the attendance of the student is marked successfully.
7. If the student is outside the boundary area or the OTP is incorrect, the attendance of the student is not marked.
8. Finally, the student can log out of the system.

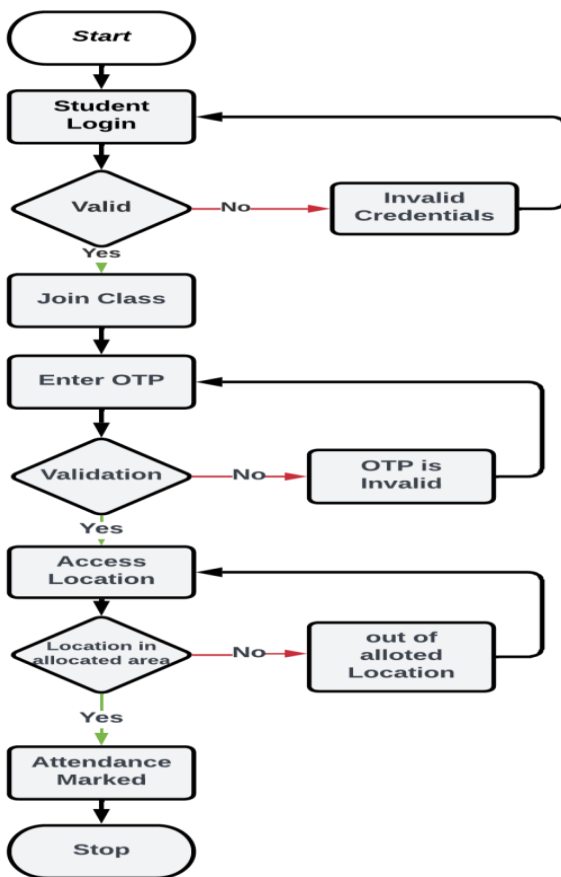


Fig 4.2: Flowchart for Student

- The student list displays the profiles of all registered students, enabling teachers to keep track of their attendance and progress.
- When the teacher clicks the start button, an OTP (One-Time Password) is generated.
- The admin is responsible for creating student login registrations. After this process is completed, students enter their OTP to mark their attendance.

1. **Teacher Section:** The Teacher Section is a comprehensive platform designed for class management. Teachers or lecturers can register their assigned classes on this activity and access class information at any time. To view the student list, the teacher or lecturer can check the Excel sheet and select the appropriate class to view the complete list using the Pivot Table concept. With the click of the "Start Attendance" button, an OTP will be generated for the student to mark attendance efficiently.

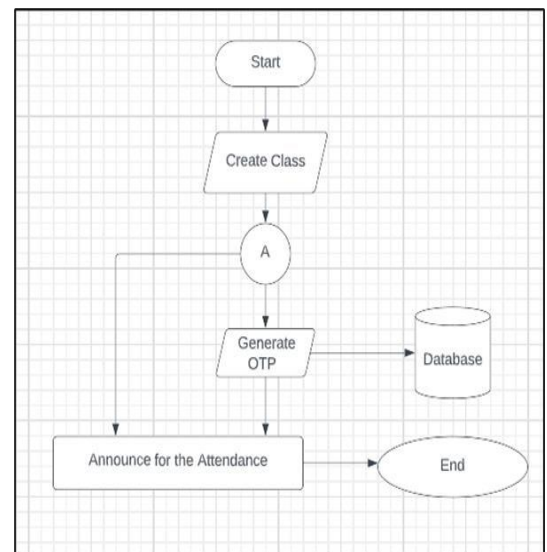


Fig 5.1: Teacher generating OTP for attendance sheet

5. IMPLEMENTATION

In this application, there are two sections.

1. Teacher Section
2. Student Section

The Teacher Section offers several key features, including:

- To access the application, a teacher must first log in. This requires the entry of the teacher's ID and password.
- Once logged in, the teacher can create a class and select the appropriate section for attendance-taking purposes.

2. **Student Section:** The Student Profile Section is a platform that allows students to mark their attendance by entering the OTP generated by the teacher. Additionally, the position of the student can be located using a Google Positioning System module for more accurate synchronization. By incorporating a GPS module, the platform can instantly locate the student's position, enabling better attendance tracking and synchronization.

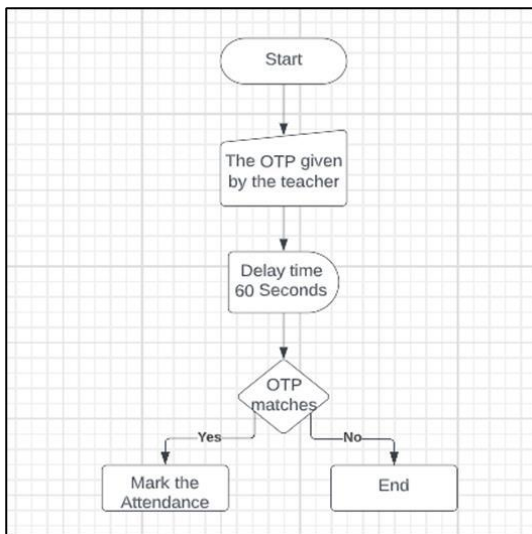


Fig 5.2: Student Giving Attendance

6. EXPERIMENTSL RESULTS

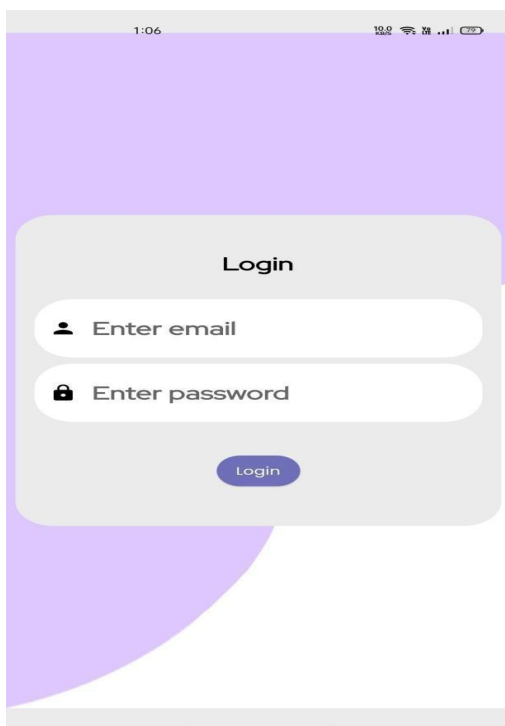


Fig 6.1 - Login Page

Both students and teachers can access this page by entering their login credentials, which consist of a username and password.

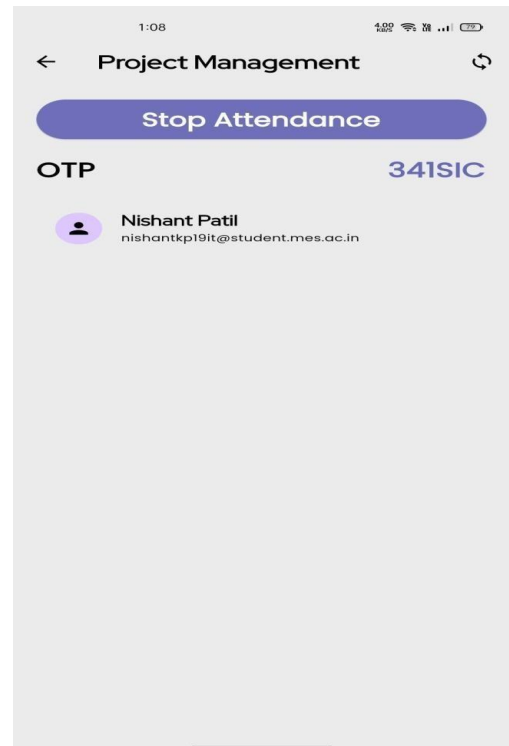


Fig 6.2 - Recording Attendance.

When it's time to record attendance, the Faculty starts the attendance process and generates a One-Time Password (OTP). Then the Faculty dictates the OTP to the students in the classroom.

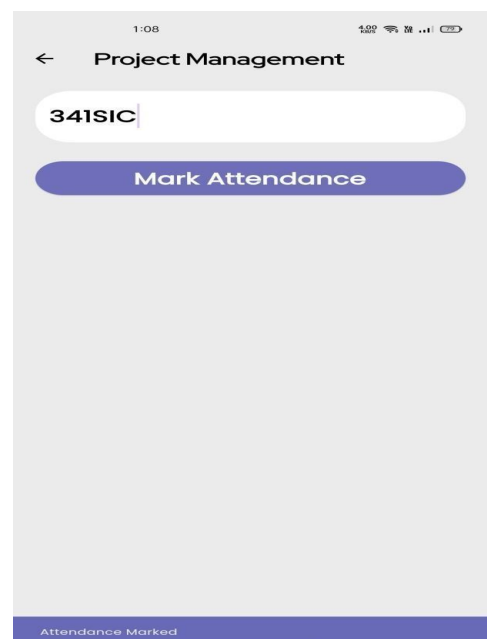


Fig6.3 - Marking Attendance.

The student enters the OTP that is dictated by the faculty for that specific class.

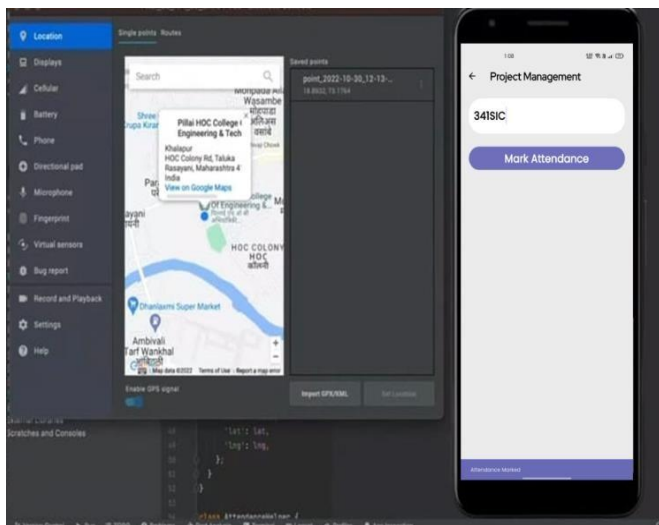


Fig 6.4 – Accessing Student’s Location.

The system then accesses the student's GPS location to determine whether they are inside the boundary area or not. If the student is inside the boundary area and the OTP is correct, the attendance of the student is marked successfully.

7. CONCLUSION

The attendance monitoring system using OTP authentication and GPS is a useful tool for tracking the attendance of students. By using a unique OTP and GPS technology, the system can accurately record the time and location of an individual's attendance. The system provides a secure and reliable way to monitor attendance, as the OTP authentication ensures that only authorized personnel can mark attendance. Additionally, the GPS feature ensures that the attendance is marked at the correct location, reducing the possibility of proxy or errors. This system has several benefits, including increased accountability, improved accuracy, and reduced administrative burden. It also provides real-time tracking, enabling teachers to monitor attendance remotely and take appropriate action if necessary. Overall, the attendance monitoring system using OTP authentication and GPS is an effective solution for organizations seeking to improve attendance tracking and management.

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BIOGRAPHIES



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