

# Enhancing Student Attendance and Placement Management Through Artificial Intelligence

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**Abstract**—In order to make the attendance management and placement communication effective, the AI-Based Student Attendance and Placement Monitoring System has been developed. As the conventional ways of handling attendance are quite time consuming, less accurate and required manual efforts and the students miss the updated placements, College activities and events, this system has been developed using the Artificial Intelligence and Autonomous Systems (Artificial Intelligence) to overcome it.

This future system saves manual efforts, improves communication between students and the Placement officer, avoid mistakes in attendance, and more efficiency to the college administration. It is a secure, robust, and easy to interact system which can be used in all the institutions for smart attendance and placement

## I. INTRODUCTION

All over the world, with the advent of computer technology, educational institutions are utilizing the benefits of smart technologies to upgrade the management system and its efficiency. Attendance management and placement monitoring are thus, two of the crucial activities in colleges and universities which needs constant tracking and communication. Maintaining attendance by registering it manually or, using RFID cards and fingerprint systems is a time-consuming method which can also be imprecise and may result in proxies. The students also, sometime overlook/s in attending the placement drives, workshops, interviews and college updates owing to bad communication or improper monitoring system. To address these issues, this research led to development of an AI-Based Student Attendance and Placement Monitoring System that employs artificial intelligence and automation technologies to streamline these procedures. The system automatically

recognizes students by their face and marks their attendance on line using face recognition technology. Automated alerts and notifications are also integrated in the system regarding placement opportunities, workshops and other pivotal sessions.

The system which has been proposed will help to eliminate the need for manual work, give accurate attendance information, provide a channel of communication between students and the placement officer and will act as a database for managing student records. The proposed system will integrate the use of artificial intelligence and smart monitoring techniques. The system not only concentrates on attending but also on placements related activity occurring in the college. Many students could not take part in the placements drive due to unawareness of company information, attending dates, eligibility, training sessions and interviews arrangements. The proposed system will solve this by delivering notifications, reminders and alerts regarding the placements, workshops, seminars and important college updates automatically. This will provide him/her with updates/information and help him/her in growth and development. The system can be developed using technologies such as Artificial Intelligence, Machine Learning, Face Recognition, Java, Flask and database management through MySQL. AI can be used to apply the algorithms on the face features gained through a webcam. It matches the face features with the student records stored in the database and provides instant feedback of student with his/her statistics. It updates the attendance in the database with time and date, and accessibility to the record is made ease by storing in a centralized database along with placement details, eligibility, student record and notification.

## II. LITERATURE SURVEY

The development of Artificial Intelligence and automated technologies has brought a drastic change in the way academic record keeping and student attendance management takes place within educational institutions. Several researchers and developers have put forward various smart attendance management systems and placement monitoring solutions, which are helped to significantly reduce human efforts in all these cases. This section explains current research aspects and technological developments in the domains of attendance management systems, face recognition technology, and placement monitoring applications. Conventional systems are highly time-consuming and resource intensive to maintain and are highly prone to error. Some of the existing methods used are manual registers, ID cards, smart card or RFID tags, and biometric fingerprint readers. Using such technologies require the initial investment of installing hardware devices and inherent risks of card or fingerprint clones. The manual method demands additional efforts from the teachers and has the potential to create false records or miss out on a few students. The fingerprint recognition systems eliminate manual mark creation but still involve physical contact with the device which introduces hygiene issues and long-term hardware maintenance problems. Hence researchers have focused on a new era of AI based attendance systems using face recognition techniques.

Traditional technologies like existing attendance systems are mainly based on the manual methods around 1950s. Usually the attendance was taken by calling students names on the white or blackboard and the teacher wrote down attendance information in a register book. Although it is easy and cheap, it is time-consuming during the lesson and easy-made errors in data updating process. Some institutes have been keeping RFID cards and biometric cameras for attendance systems. RFID cards can be transferred among students and be misused for proxy attendance. Biometric cameras need contact between students and attenders. They require often maintenance. Due to these reasons, researchers have been designed automated systems to prevent human effort and mistakes and improve efficiency. Several researches involves a smart attendance system depending on web apps and automated data storage methods. Teachers

can mark attendances digitally and store records in central databases. They see that the digital attendance systems help to the institutions to generate reports, reduce paperwork, and also manage records easier. Some systems also automatically send SMS or email to the students regarding about their attendance shortages and educational things.

Apart from attendance monitoring, another essential activity in educational institutes is placement monitoring. Several activities are included in placement monitoring such as managing placement drives, maintaining updates of companies, updating students, managing student records, spreading information about interviews, workshop and placement drives. Conventional placement systems are mainly dependent on notice boards, messaging groups or manual communication techniques. Due to this problem, many students missed placement camp updates because of no or delayed communication. To overcome these difficulties, many researchers proposed Online placement management systems which help placement officers and students interact effectively. These applications manage student registration, eligibility criteria for students, placement notifications, interview dates and various other details, maintains student academic records and filters students according to placement skills. Various research studies concluded that the implementation of digital placement activities resulted in more efficient placement management, better communication between students and placement officers and lesser manual work. Recent researches also proved the role of Artificial Intelligence applications and automation in learning institutes. AI-based online placement management applications can help colleges track student attendance, generate automatic report generation and filter inactive students, timely reminders about placement drives, seminars and regular college functions by automatic notifications.

It is clear from the literature survey that the new automated system can enhance the management process generally, in the education institution. The attendance monitoring and placement monitoring can be integrated in the single system which reduces manual work, enhances communication and efficiency, and better support for student/educator/placement officer., and placement officers. Top of Form Bottom of Form

### III. METHODOLOGY

#### 3.1. Requirement Analysis

Requirement analysis is the first phase of the design of AI Based Student Attendance and Placement Monitoring System. During this phase, the problems in conventional management system are studied. Various conventional method involves registration using manual records, paperwork, communication system that take lot of time and involve errors. The data is collected from T&P Officer, faculty and students regarding the need of the project and its specifications. From this data, various features (digital attendance management, placement alerts, students tracking, automated generating the reports, etc) of the proposed system, are identified.

#### 3.2 System Design

On analysing the requirements, we created an overall system design. The system is designed as a simple and easy to use web interface so that students, teachers and placement officers do not face any difficulty while using the system. Different modules are created for different users which have better management and security. Student module will enable students to see attendance and placement updates. Teachers can set attendance and download reports, Placement officers can update company details, placement drives and student eligibility. proper database structure is designed so as to store all the records securely and efficiently.

#### 3.3 Database Management

Database management is an essential part of the system. It involves creating a central database using MySQL database server. All the information related to the student are stored in the centralized database such as student information, attendance, placement, notifications, and academic reports. The data is stored in a secured manner and can be retrieved according to the need. This centralized database decreases paper work that can be invested in reducing the load of managing records. It also adds up to reducing the inaccuracies in the data and ease of generating reports for teachers and placement officers.

#### 3.4 Attendance Monitoring Module

The attendance monitoring module has been created to make it easier to manage attendance records. Every

teacher can take attendance easily and quickly via web application. It also saves time from manually marking attendance in class. After attendance is submitted, it will be checked time and date of the submission before stored in the database. Moreover, it will keep monitoring users absent.

This feature can easily give teacher to check individual student attendance at glance. Even the attendance percentage and low attendance record is clearly displayed. It can be used to help the institution to keep the attendance in well following.

#### 3.5 Placement Monitoring Module

The placement monitoring module facilitates the Training and Placement officers to plan and execute their placement activities more effectively and efficiently. By using the placement monitoring module the placement officers can update their details like the details of the companies, the dates of their placement drive, eligibility criteria of students required for their placement drive, conduct and dates of workshops organized and dates of their interview etc. The system automatically updates the eligibility status of the students depending upon their attendance, GPA etc. to the reported conditions. It sends mails and reminders to the students regarding the placement drives and other activities. This enhances the communication between the students and placement departments and also makes the students aware of the various placement drives happening.

#### 3.6 Notification System

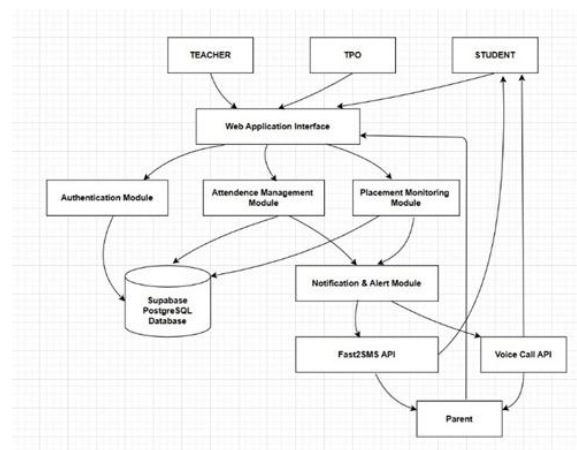
The notification system has been built to ease the communication with in the institute. By this system, the institute would send reminders and notifications regarding attendance shortage, placement drives, workshops, seminars, interviews and any other announcement. Based on the requirements of the institute notification could be sent through SMS, mail or through system alerts. With this feature, users would be able to get regular updates of the academic and placement activities. Teachers and placement officers can also share any important information using this system.

#### 3.7 Testing and Implementation

Once the system is built, the system is then tested under different environment to check whether the system is working with needs and deliver the expected

results. Testing is done to validate the accuracy of the system, database security, interface performance and error identification. Once the system is working successfully, it can be deployed in various educational institute to monitor student's placement and attendance on daily basis, it will then help the colleges to cut down paper work, enhance communication, and enhance efficiency.

#### IV. SYSTEM ARCHITECTURE



The System Architecture of the AI Based Student Attendance and Placement Monitoring System explains the architecture and working flow of the proposed system. It provides a structure through which smooth communication can be ensured between students, teachers, placement officers, and the central database of the system. The system architecture is modular in nature where each module performs a particular function and the modules integrated together enhances the efficiency of attendance management and placement monitoring. System architecture of the system is mainly categorized under the following components: User Layer, Web Application Interface, Attendance Monitoring Module, Placement Monitoring Module, Notification System, Database Layer, Report Generation Module.

Layer 1 in the architecture is the User Layer. The different types of Users utilized in our system are the students, teachers, T & P Officers and the Administrator. Each user has a user login for the purpose of authentication and the access of their accounts is assigned according to their roles. Users in our system can be categorized as follows, Students - can see the attendance, placements and notifications. Teachers- can manage the attendance and student

activities. Also generate the reports. T & P Lecturer can Input company details, and also can track placements of the students. Administrator- manages the system completely. Users' accounts and database settings.

The 2nd layer is the Web Application Interface, which is a medium of communication between user and system. The Web Application Interface layer provides an Interactive, Simple, User-Friendly interface to the users so that they can easily explore system. Web Application Interface layer manages login authentication, dashboard access, attendance management, placement updates, Notification services and Reports. Technologies like HTML, CSS and JavaScript are used to develop a attractive User Interface which is responsive Attendance Monitoring Module is the module which maintains student attendance in electronic form. Once teachers take attendance using the system, it will be stored in the database automatically. Student attendance history can be viewed, attendance percentage can be calculated, absent students can be identified by the software. This helps to reduce the paper work, and allows the accurate attendance monitoring.

The Placement Monitoring Module helps Training & Placement Officers to organize placement activities efficiently. The placement officers can record details of a company, interview dates, workshop days, eligible criteria, placement drive updates. The students are automatically mailed about the placement opportunities based on the eligibility criteria decided by the placement officer. This module improves the communication between students and placement department and helps in better management of placement activities. The Notification system is a key module in this architecture. It is responsible for providing notifications/reminders to students about attendance shortfalls, placement drives, interviewes, workshops and courses, e. G. via SMS, email and system alerts. Students are always kept in the loop so that they do not miss critical events, deadlines and opportunities.

Database Layer: This stores all data of the system in a reliable, flexible and secure manner. MySQL database management is used to maintain Students data, Attendance data, Placement information, Notifications, Administration details, and other data about the system. The database used in the system is centralized. It maintains security and faster access to

the contents and easy maintenance of data records. It also helps in generating report files regarding student activities etc.

## V. RESULT AND DISCUSSION

A successfully designed system known as AI-Based Student Attendance and Placement Monitoring System had been implemented in an institution to ensure efficient management of attendance and placement activities. It significantly reduced the manual effort required in preparation of attendance sheets and placement related records. The teachers used to mark the attendance for the students electronically, the details were taken from the server with no usage of manual papers. The attendance records could be viewed on to the instant generated reports. The low attendance percentage students could be easily identified. The placement monitoring module worked the same way where the company details, time schedule, eligibility and workshop requirements were uploaded on the server by the placement officer. The notifications about the placement drives, interviews and workshops could be sent to the students on time. The Notification and Database management system functions also worked efficiently during testing. Successful notification regarding attendance dearth, placement, workshop and seminar was sent through the System. The Centralized database stored the student records, Attendance records, Placement details and Notification details for the quick access and easy handling of the data. The system is very simple to work, reliable and user friendly. The results showed that the proposed system improved the efficiency, had less errors and provided a saving time solution for managing attendance and placement activities in the colleges and universities. So, it proved to be a smart and effective system.

Example Output:



Student Attendance & Placement System

Student List

| Name          | Branch                           | Attendance | Status  |
|---------------|----------------------------------|------------|---------|
| Sahil Jadhav  | Polymers Electrical              | 45%        | Active  |
| Abhi          | Computer Science And Engineering | 75%        | Active  |
| Sameer        | Computer Science And Engineering | 77%        | Active  |
| Sameer Jadhav | Computer Engineering             | 85%        | Active  |
| Arav Verma    | IT                               | 85%        | Defunct |
| Rahul Sharma  | CSE                              | 85%        | Active  |

Student Attendance & Placement System

Placement Tracking

Track company rounds & placement records

Buttons: Add Placement, Download PDF

Summary:

- Total Placements: 7
- Selected: 3
- Pending: 1
- Rejected: 2
- Cleared: 1

| Student Name  | Company   | Round               | Status   | Date      |
|---------------|-----------|---------------------|----------|-----------|
| Sameer Jadhav | capgemini | Appellate Test      | Cleared  | 5/10/2020 |
| Vishal        | Yes       | Group Discussion    | Pending  | 5/10/2020 |
| Aditya        | google    | Technical Interview | Rejected | 5/10/2020 |
| Prithvish     | Yes       | Coding Round        | Rejected | 5/10/2020 |

## VI. CONCLUSION

The AI Based Student Attendance & Placement Monitoring System is a noble and most efficient system to attend the regular class sessions and Placement Monitoring activities. Traditional system for storing student attendance and placement information would require a lot of human effort, would take more time, space and also the data errors can take place. The solution with the proposed system is to make a monitor of the attendance of student, placement, Notification information, generate reports on the selected system, and maintaining the data in the centralized digital system. The system is integrated with the notification services for the placement activities. The system achieves communication between student, teacher, and Training & Placement Officers to send the latest information about the student, placement and participation in the workshops, interviews and all other academic activities.

This implemented system takes less workload of paper work, accuracy, saves time, and improves efficiency of colleges and universities. The system is user friendly and fully automated, and provides fast service using a few clicks in colleges and universities. Thus the proposed project proves how Artificial Intelligence and recent technologies can be used to create a smarter, organized and far more efficient system of education. AI Healthcare Bot providing initial medical

assistance is quite efficient by providing initial medical support and guidance. It also helps in reducing unnecessary visits to hospital, raises awareness among patients and supports areas where immediate medical attention is not available. Though it is not similar to doctors but it provides first level health care assistance.

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