INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD)
© 2026 IJNRD | Volume 11, Issue 4, April 2026 | ISSN: 2456-4184 | IJNRD.ORG

ATTENDEASE

An Automated Event-Integrated and Defaulter Detection Solution

[1]Disha Chaudhari, [2]Pranali Dhore, [3]Shravani Dabhade, [4]Deepa Padwal, [5]Vidya Dhoke

[1]Student, [2]Student, [3]Student, [4]Professor, [5]Professor
[1]Artificial Intelligence and Data Science,
[1]Indira College of Engineering and Management, Pune, India

Abstract: AttendEase: The smart attendance management system is created to streamline and streamline the student attendance record, tracking and analysis in institutions of learning. The attendance of students is crucial in their study process. The conventional attendance systems are mostly manual, time consuming and subject to errors that may result into incorrect records and defaulters not identified appropriately.Certain systems do not provide real time monitoring either, and do not offer systematic ways of dealing with leave requests and medical document checks, leading to inefficiencies and lack of transparency. Some systems also lacks real time monitoring capabilities and fail to provide structured mechanisms for handling leave requests and medical documents verification, resulting in inefficiencies and reduced transparency. The attendance of academically approved seminars, workshops etc. we're not included in the overall attendance percentage which made the students to fall in the defaulter list.

The proposed system can counter these issues by merging the lecture attendance and academic event participation into one platform, so that the student involvement can be evaluated more comprehensively and equally. The system will automatically calculate overall attendance percentages as well as the particular subject attendance, identifies defaulters based on a predefined threshold which has been set by the institution. It also includes leave and medical requests and verification procedures to guarantee transparency and genuineness in the updates of attendance. The faculty can be able to verify and validate the uploaded documents and then be able to process the attendance. Firebase provides real-time data synchronization, which allows storing data in a secure location, managing data efficiently, and making it accessible immediately. Moreover, the system has data organization and reporting capabilities, which facilitate attendance pattern, and also enhances the administrative burden and reduces human errors and increases the accuracy and reliability of the attendance records. In general, the solution presented provides a scaled, efficient, flexible and user-friendly solution to sustain the contemporary attendance management.

INTRODUCTION

In the learning institutions, attendance tracking and management is important because it assists in tracking of student interaction, general performance and disciplining in academics which is time consuming because most of the traditional systems are manual and are subject to human error and inefficiency. This usually causes wrong records and adds work load to the administration and lessening decision making efficiency. Additionally, these types of systems cannot be used to track in real time and cannot be properly procedures to handle the leave requests and medical approvals[1].

Though the various automated methods introduced in the last few years do increase the accuracy and decrease the manual workload, it has a few limitations including, high costs of implementation, privacy issues and reliance on hardware infrastructure and limited attention on classroom attendance alone.

In a bid to overcome these shortcomings, this paper has put forward AttendEase, a smart and integrated attendance management system that integrates lecture attendance with participation in academic events in one platform. The system is developed with the latest technologies of real time cloud databases and web interfaces to facilitate the seamless data synchronization and accessibility. It incorporates automated attendance calculation, defaulter detection based on predefined thresholds and a structured leave and medical verification mechanisms to enhance fairness.

The system workflows would start with a secure user authentication and then with the digital attendance during lecture and academic events. Data gathered is then processed on a real time basis to calculate attendance percentages as well as defaulters. Students have an opportunity to request leave and upload a supporting medical document, which is confirmed by the administrator and attendance records are updated. Additionally, the system generates reports and sends notifications through integrated communication services, ensuring timely alerts and improved monitoring.

Moreover, the proposed system will minimize the shortcomings of the traditional systems by offering scalable, reliable, real time, cost effective and user friendly solution. AttendEase improves the efficacy of institutions and facilitates the use of data in decision making. The system also preconditions the further development of the system, such as predictive analysis and intelligent risk assessment based on machine learning methods.

1. NEED OF THE STUDY

In the digital age, use of registers or spreadsheets to keep track of attendance is inefficient, time consuming, and subject to error. The traditional processes have been known to cause problems like wrong data input, loss of records and inability to record the attendance properly. This poses issues with decision-making, performance analysis and administration.

It is becoming more and more urgent to have an automated solution such as AttendEase to address these challenges. Attendance Management System assists in keeping real-time and accurate records of attendance and minimizes human errors and enhances efficiency. It facilitates the enhancement of attendance pattern, punctuality and absenteeism, which are critical in assessing performance.

In addition, the handling of attendance manually adds more workload to the teachers/HR personnel and slows down other processes such as report generation and analysis. This can be alleviated through an automated system that simplifies the operations and allows quick access to data. It also enhances accountability and transparency among users.

Also, as the hybrid environments emerge (online/offline classes or work), there are problems with the control of attendance in the old manner. A computerized system facilitates versatile and remote monitoring, which makes operations run smoothly in all cases.

AttendEase therefore needs to be studied in order to develop an efficient, reliable and user friendly system that increases accuracy, saves time and generally improve the management of attendance.

2. RESEARCH METHODOLOGY

AttendEase is a single and automated program that will be used to control student attendance of school and curriculum activities. The approach taken by the methodology is to create a system that is accurate, transparent and real time data processing.

3.1 System overview

The system is created on the basis of client- server architecture with the front end interface accessed by students and the faculty and the back end that handles the data storage, processing and synchronization. The system will combine lecture attendance and academic event attendance to be able to fully assess student engagement. It also includes automated default detector with set attendance threshold.

2.2 System modules

The proposed system is divided into following functional modules:

2.2.1 Student module

This module allows user/student to-

- See attendance rates of lectures real-time.
- Apply for leave and upload medical documents.
- Monitor personal attendance.

2.2.2 Faculty module

This module allows the teachers to-

- Record and manage student attendance.
- Accept or deny leaves.
- keep track of the student involvement in events.
- Determine the defaulters using attendance limits.
- Generate analytical reports.

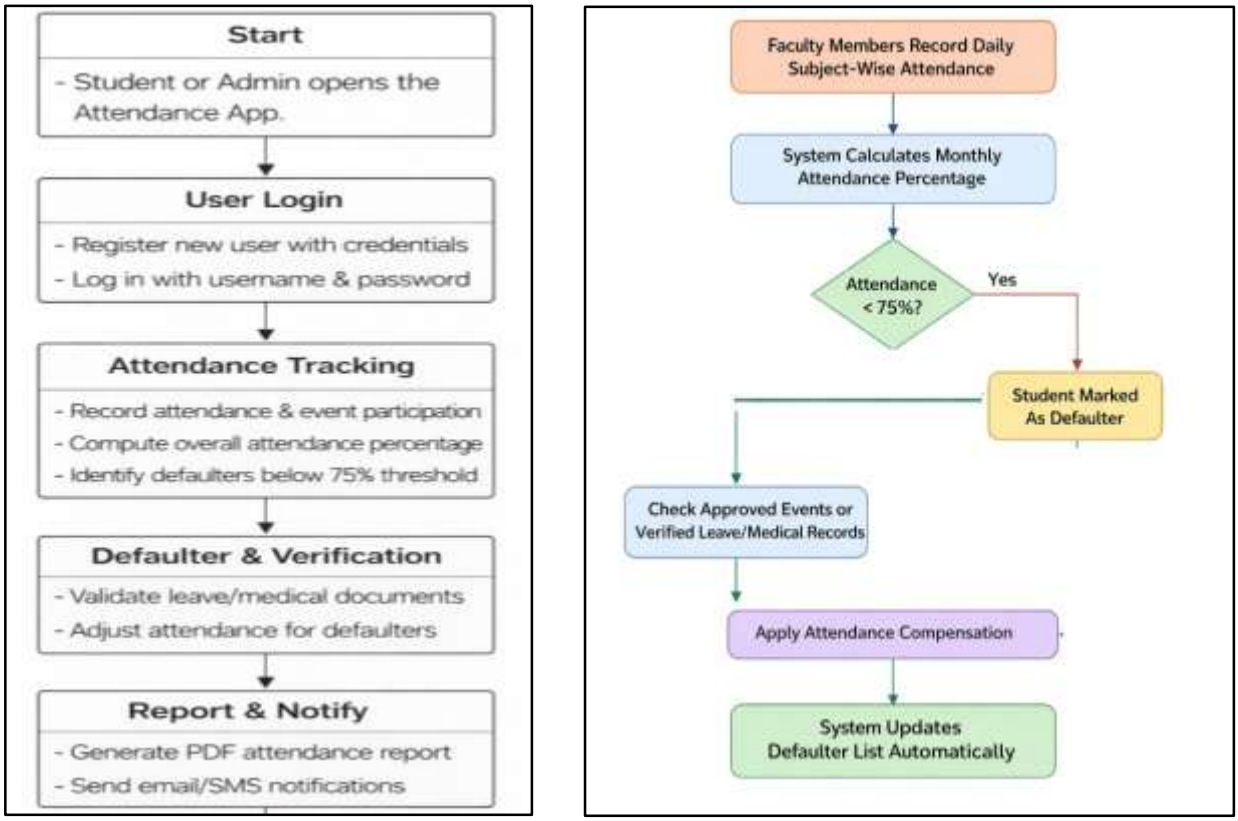

Fig. 1 Data flow diagram

- Users can log in securely using login credentials.
- Digitally, the attendance is taken in every lecture session and event.
- The system will automatically compute the total attendance percentage.
- Find out the defaulters that were below the set limit e.g. 75%
- Students can apply for medical leave and the faculty and approve/reject the same, so it can affect the attendance accordingly.
- Reports on attendance are possible to create and download.

2.3 System architecture

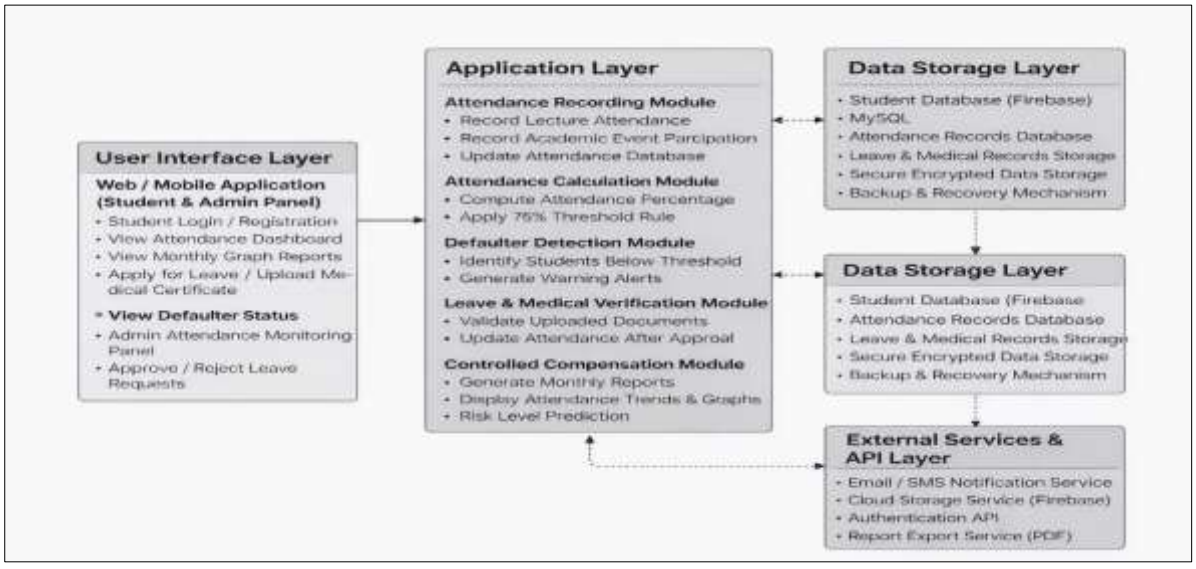

Fig.2 System architecture

To achieve a level of modularity, scalability and effective data management, the system is based on a multi layered architecture as depicted in Fig.2. The architecture is composed of four major layers: User interface layer, Application layer, Data storage layer and External services and API layer.

2.3.1 User interface layer

This layer is the point of interaction between the system and the users (students and faculty). It is deployed as web based application, which offers user registration and login, dashboard visualization of attendance, viewing attendance reports, requesting leave, uploading medical documents and defaulter status check.

2.3.2 Application layer

This layer is responsible for core processing and business logic of the system. It has several modules:

- Attendance calculation- Calculates the attendance percentage and uses the predefined threshold (e.g. 75%). Percentage attendance = (Number of attended sessions/ number of sessions) 100.
- Defaulter detecting - Students below the threshold are detected and defaulter lists are generated. Defaulter, when percentage of attendance is less than threshold (e.g. 75%)
- Leave and medical verification - Verifies uploaded documents and records the attendance upon faculty approval.
- Analytics and reporting module - create reports and show attendance trends.

2.3.3 Data storage layer

This layer handles all the operations of data. It is based on Firebases Real-time Database and MySQL to store the student record, attendance record and leave/medical record. It provides a secured and encrypted storage of data and back-up and recovery systems. Real time synchronizations allow real-time updates throughout the system.

2.3.4 External services and API layer

This layer incorporates external services like authentication APIs, notification services and cloud synchronization mechanisms to improve functionality and reliability of the system.

3. OBJECTIVES

The objectives of the proposed AttendEase system are as follows:

4.1 To track and analyse student attendance in real time :

The system will be effective in giving the correct and continuous monitoring of the attendance of the students to establish a pattern and enhance academic monitoring.

The attendance data of students was collected and categorized based on the predefined attendance threshold. The resulting data was analysed to find the number of the students who exceeded and fell short of the necessary attendance percentage.

Table 1: Attendance status of students

Attendance category	Number of students	Percentage (%)
Above 75%	70	97.33
Below 75%	2	2.77
Total	**72**	100

Source: System Generated Data

The statistics indicate that a substantial majority (97.33) of students are above the mandatory attendance, and just 2.77% below the mandatory attendance. This means that there is need to monitor and identify defaulters at an early stage to enhance the overall attendance performance.

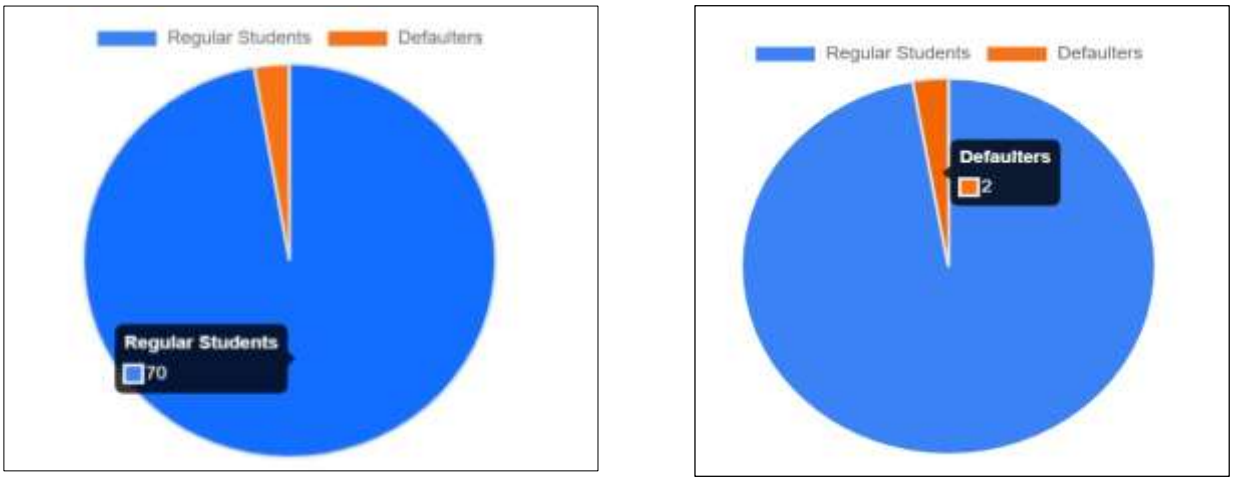

Fig.3 Number of regular students and defaulters

4.2 To calculate attendance percentage and identify defaulters:

The system will automatically determine the percentages of attendance and students lower than the pre-specified threshold will be identified as indicated in Fig. 3, and timely intervention can be done.

Fig.4 Defaulters List (Students below Threshold)

4.3 To implement leave and medical verification mechanisms:

The system enables students to place leave requests with supporting documents will guarantee transparency with faculty approval and validation.

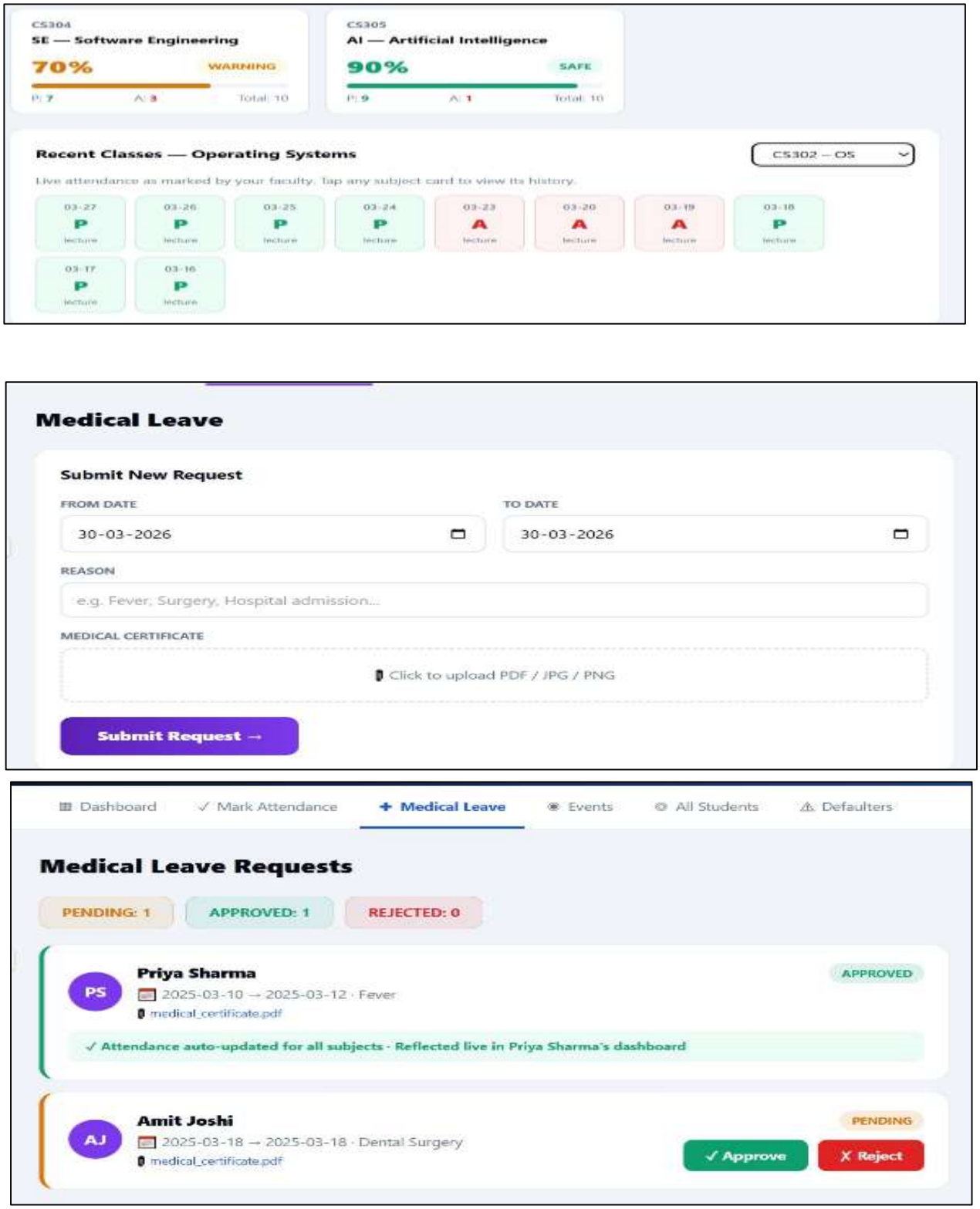

Fig. 5 Medical Leave Application

4.4 To implement a controlled attendance compensation:

The system will be enable to calculate the adjustments such as leave based on the educational institution's policies. This brings about impartiality, effectiveness and adherence to student code.

4.5 To integrate lecture attendance with academic event participation:

It offers a single platform that takes into consideration both school attendance and attendance in seminars, workshops and any other academic programs.

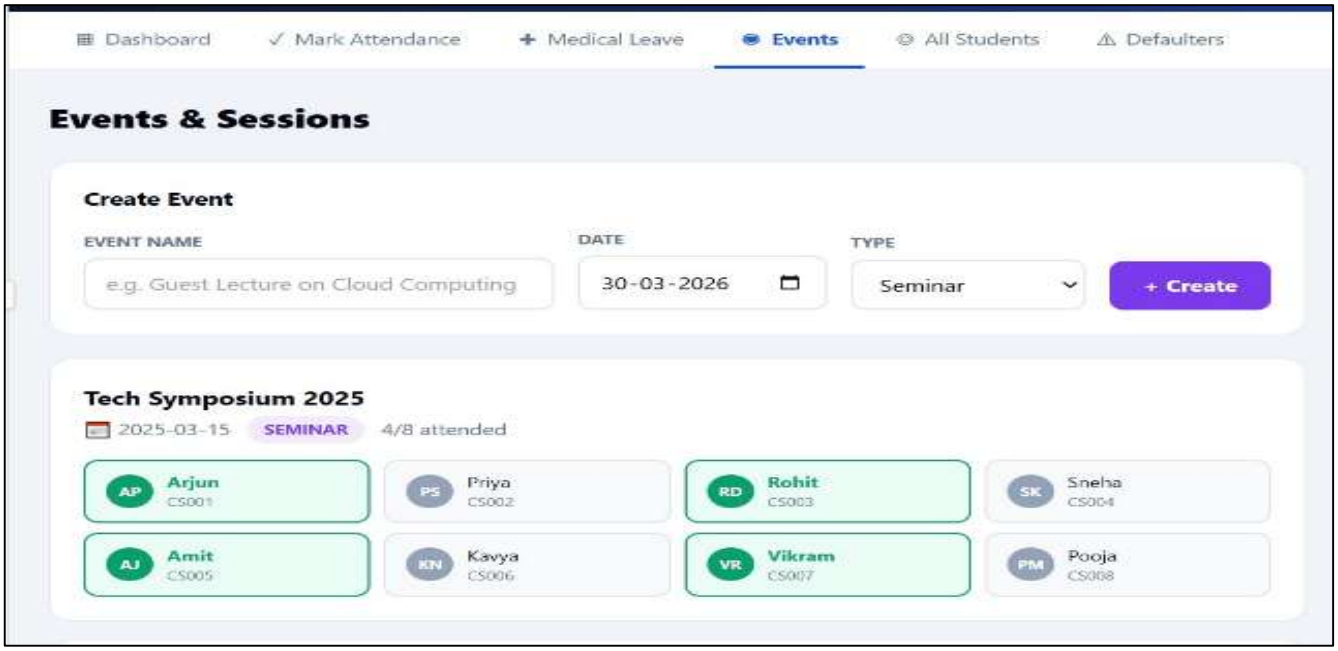

Fig. 7 Event Integration

4. RESULTS AND DISCUSSION

Data collection- The sample set of students obtained the data on attendance collected by the implemented system during a specific period in the academic year. The data set consists of lectures attendance, event attendance and leave data.

Attendance distribution analysis-

As Fig. 3 shows, the attendance data of students was analysed based on the predefined threshold of 75%. These findings show that 70 students out of 72 students (97.33) have attendance rate higher than the required level, with only 2 students (2.77) having lower attendance.

This is a clear indication that most of the students will be able to uphold good attendance rates when under the proposed system. The very low rate of defaulters shows that the AttendEase system is very effective in enhancing the attendance keeping process, making students more aware and allowing students who are at risk to get timely intervention.

Table 2: Impact

Parameter	Traditional system	AttendEase
Accuracy	Low	High
Time required	High	Reduced
Real time tracking	Not available	Available
Defaulter detection	Manual	Automatic

System impact -

The findings are also represented in graphs in order to visualize the attendance distribution and percentage of defaulters as depicted in Fig.3.The findings show that the introduction of AttendEase leads to a substantial increase in efficiency and a decrease in the amount of work of the administration. The inclusion of event participation means that more of student engagement is evaluated, something that was not done with traditional systems. Also, real time monitoring facilitate early detection of defaulters which interventions can be timely administered.

5. CONCLUSION

The paper introduces AttendEase as a highly efficient and innovative product that can remove the inefficiencies of the traditional attendance management system. The system will be used to record and monitor student attendance accurately and cut down on the reliance on manual processes by automating and processing real-time data. By combining the lecture attendance with the academic event participation, one gets a more comprehensive assessment of student participation which in the traditional systems is often neglected.

The suggested system presents an organized system of calculating the percentage attendance and defaulters according to the institutional set standards. This allows prompt identification of attendance problems and helps take corrective measures in time, which will eventually lead to better academic discipline and student performance. Moreover, the introduction of leave and medical verification functions contributes to the increased transparency and accountability since the attendance updates will be fair and properly documented. The other great thing that AttendEase has brought is that it has simplified administration. The system cuts down on workload of faculty and administrative staff by reducing manual intervention and automating routine tasks and enhances operational efficiency. Data storage in cloud-based technologies is secure, real-time synchronized and can be easily accessed, making the system reliable and scalable to use in institutions. Moreover the system has analytical capabilities that enable institutions to derive valuable information about student behaviour and attendance patterns. Such insights will be able to aid in the use of data-driven contributions to decision-making and policy refinement, thus improving the overall institutional performance. Its convenient user interface and flexible design ensure its applicability in various learning contexts.

Altogether, AttendEase proves to be a viable and scalable method of contemporary attendance management since it unites accuracy, efficiency, and transparency. The system does not only overcome the shortcomings of the current approaches but also offers a solid basis to future improvements (in the form of predictive analytics, smart monitoring, and incorporation of highly developed technologies) and, therefore, leads to the development of smart educational systems.

ACKNOWLEDGMENTS

The authors would like to thank Prof. Deepa Padwal, the guide of the project, with all her heart because she gave invaluable advice, constant encouragement and support during the development of the AttendEase system. Her knowledge, insightful recommendations, and constructive feedback were instrumental in steering the focus of this research and the successful success of the project. The authors also wish to express their gratitude to Prof. Vidya Dhoke, who is the mentor of the project, and gave her heartfelt support, directions, and helpful contributions at different phases of the research. Her encouragement and guidance assisted in the harnessing of the ideas and the general work quality.

The researchers owed their success in conducting this research work to the support of the faculty members of the Department of Artificial intelligence and data science, Indira College of Engineering and management, Pune, who also provided a conducive academic environment, resources, and support needed to accomplish this research work. The authors also recognize the assistance of the institution in allowing them to have the opportunity to work on this project as a part of the academic curriculum. The facilities, infrastructure and academic structure that the institution was offering played a major role in ensuring the successful deployment of the AttendEase system. Moreover, the authors would like to thank their peers and colleagues who helped them in the development and testing stages of the project and gave their suggestions and help. Whether direct or indirect, their contribution was worth making a difference in eliminating challenges and enhancing the system.

Last but not least, the authors have done well to acknowledge all these people and organizations that helped in one way or another to complete this research work successfully although they are not named here.

REFERENCES

[1] R. Kapur, "Extracurricular Activities Attendance Management Monitoring System with SMS Notification," *International Journal of Research in Engineering and Science*, vol. 10, no. 6, pp. 212–217, 2022.

[2] A. Kumar, P. Sharma, and R. Verma, "Automated School Attendance and Analytics System," *International Journal for Research in Applied Science and Engineering Technology (IJRASET)*, 2025.

[3] N. Singh and R. Gupta, "Review on Student Activities Monitoring System," *International Journal for Research in Applied Science and Engineering Technology (IJRASET)*, 2021.

[4] D. S. Anggraeni, D. P. Anisa, and N. G. Ginasta, "Design and Analysis of Financial Management and Budget Application System in Student Business," *Journal of Digital Business and Innovation Management*, vol. 3, no. 1, pp. 21–35, 2024.