

Streamlining Student Profile and Continuous Comprehensive Evaluation Record Management

Allhad Jiddewar^{1,*}, Kanchan Joshi², Abhinav Bhadge¹, Rohini Satale¹

Abstract

Streamlining student profiles and continuous comprehensive evaluation record management is a mobile computing software application that focuses on activities such as taking attendance, recording marks, and generating student reports according to faculty preferences. Compared to traditional attendance systems, the proposed system is faster and more efficient, making it easier for teachers to manage attendance and generate mark sheets. The system is designed exclusively for teachers and institutes adopting a modern approach. Over the years, manual attendance management has been prevalent in educational institutions. To address the challenges associated with manual attendance, we developed this application. It automatically calculates students' attendance percentages without the need for manual paperwork. The system utilizes technologies like Flutter for development and a Firebase Firestore database for storing student information. The administration of student data and assessment systems has experienced major redesigning in the age of digital revolution. More effective, precise, and technologically advanced alternatives are replacing conventional, paper-based methods for keeping track of student profiles and carrying out continuous comprehensive evaluations (CCE). This article examines cutting-edge methods and tools for expediting these important learning procedures.

Keywords: Flutter, dart, Firebase, Firestore database, mobile application, effective attendance tracking, user-friendly interface, data security and privacy, record management

INTRODUCTION

Effective administrative tools are essential for maintaining seamless operations and improving the educational experience of teachers and students in the rapidly changing field of education. With the advent of technology, manual tasks such as student attendance tracking, mark recording, and report card generation can now be seamlessly automated, freeing up valuable time for educators to focus on teaching and enriching their educational journey.

Our innovative software application was designed to revolutionize the way educational institutions manage student attendance, mark records, and report card generation. This comprehensive solution amalgamates cutting-edge technology with the intricacies of educational administration, providing a user-friendly interface that empowers educators and administrators to streamline their tasks.

The days of manually recording attendance and calculating marks had long gone. Our software offers a modern approach to attendance tracking, enabling teachers to mark attendance in real-time and effectively maintain accurate records. With customizable grading criteria, educators can input

*Author for Correspondence

Allhad Jiddewar
E-mail: Allhadjiddewar2221@gamil.com

¹Student, Department of Electronics and Communication Engineering, Smt. Kashibai Navale College of Engineering, Vadgaon, Pune, Maharashtra, India

²Assistant Professor, Department of Electronics and Communication Engineering, Smt. Kashibai Navale College of Engineering, Vadgaon, Pune, Maharashtra, India

Received Date: December 16, 2024

Accepted Date: December 19, 2024

Published Date: December 24, 2024

Citation: Allhad Jiddewar, Kanchan Joshi, Abhinav Bhadge, Rohini Satale. Streamlining Student Profile and Continuous Comprehensive Evaluation Record Management. Recent Trends in Electronics & Communication Systems. 2025; 12(1): 28–35p.

and manage student marks for various assessments, while the software performs complex calculations, ensuring precision and consistency in grading.

LITERATURE SURVEY

Ghosh and Mohammed [1] proposed a biometric attendance recorder that uses a fingerprint sensor in conjunction with an Arduino. Through the enrolment process, this system stores the fingerprint impressions of all faculty members and students at an institute. During attendance, the students' registered fingerprints were matched with those in the enrolled database. To make the best use of teaching-learning time, Ghosh et al. described how to design and construct an intelligent attendance system for students in schools or colleges. The suggested gadget is an Arduino UNO-powered biometric attendance recorder that uses a fingerprint sensor. All faculty members' and students' fingerprint impressions were saved by the device during the enrolment process. The students' registration fingerprints were compared with the enrolled database during the attendance process. If there was a match, the student's name was stored on that device and wirelessly transmitted via the Bluetooth protocol service to an Android application created in the lab.

Cisar and Pinter [2] found that most students own smart devices, which can be leveraged to create an application for logging attendance. An app called a muffin is a possible remedy. Muffin consists of a desktop program, an Arduino Uno board with a module that supports Bluetooth, and an iOS or Android application that is loaded on students' personal gadgets. The concept is straightforward: When students wish to log their attendance, they simply send login data to the Arduino board, which then forwards it to the desktop PC application connected directly to the board.

Islam and Hasan [3] designed a system that offers online access from any location, enabling course teachers to track student attendance easily. The proposed solution involves a student attendance system in which teachers use smartphones to take attendance. The smartphone application processes the data and allows teachers to save it on both the web and phone servers.

I.K.S. Buana and D. Irwansyah [4] Using the Flutter framework, the system was created for the Android platform with an emphasis on incorporating two key functions: time for attendance certification and authentication. To assess the accuracy of the face recognition algorithm as an authentication measure, the system was subjected to scenario testing in five different areas: camera quality, distance, light intensity, facial emotions, and image-taking location. This test involved a sample of 40 respondents. Facial recognition was used in this system.

Gowtham et al. [5] created a program that uses the current fingerprint device to create a statistical report and track attendance in real-time at the workplace or school regularly. Input data are taken from the biometric device in the app and then updated to the Firebase cloud storage using the Google Apps script.

An integrated fingerprint timekeeping system with remote surveillance was proposed by Peter et al. for use by higher institution staff and students. Additionally, it has a web-based, real-time remote monitoring interface that allows management-level personnel to see students and staff as they enter and exit the system [6].

Our everyday work procedures have grown, advanced, and become more modern thanks, in large part, to automated information systems. Using biometrics and radio frequency identification (RFID) systems based on a multi-tier architecture, Srinidhi et al. created a safe and secure web-based attendance monitoring system that works with cell phones and PCs. Both students', faculty members', and staff members' attendance records can be kept up to date using the system [7].

Enhancing education and fostering teachers' professional development are priorities for the Department of Education (DepEd). However, educators face a substantial administrative burden. In response, Monsalve et al. created a system that makes it easier to create school forms, leveraging technology to improve educational efficiency. Analysis, planning, design, testing, deployment, and maintenance are the seven steps in the System Development Life Cycle (SDLC), which is in line with this developmental technique. This method guarantees that the final solution is precisely tailored to the requirements of teachers. This study created a validated tool that was examined by professionals to assess the effectiveness and usability of the system. The system was evaluated by senior high school instructors, and the findings were encouraging [8].

GSPS, which was created to enhance the educational process, uses machine learning algorithms to analyze student performance data and offers tailored academic counseling and support. The platform prioritizes user roles to guarantee that all stakeholders, including students and Heads of Departments (HoDs), have an effective and customized interface to perform their duties. For example, HoDs can easily add and manage employees, thereby maximizing a department's use of its resources. However, staff personnel can supervise and guide pupils, which promotes a cooperative learning environment. This relationship enhances communication channels and promotes an all-encompassing approach to academic administration [9].

Seeman et al. investigated customer relationship management (CRM) in an academic context. The benefits of deploying CRM were investigated along with the planning and execution of a CRM project at a state community college [10].

PROPOSED SYSTEM

An essential component of school administration is the management of students' profiles. Academic accomplishments, extracurricular activities, attendance, and personal data were all contained in comprehensive student records. The block diagram of the system is shown in Figure 1. This information is essential for tracking student development, spotting patterns, and customizing learning opportunities to meet each student's needs [6].

An Effective System Guarantees

Accuracy

Reducing mistakes made when entering and retrieving student data.

Accessibility

Making pertinent records available to parents, teachers, and students at any time and location.

Sustainability

Reducing reliance on paper and physical storage while adhering to environmental objectives.

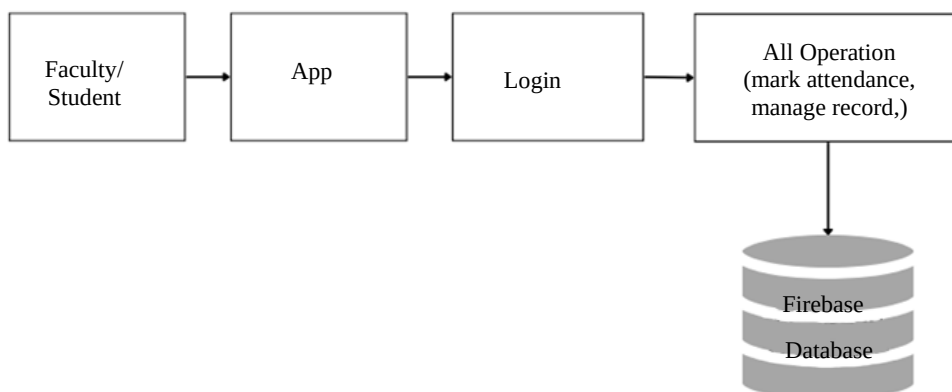


Figure 1. System block diagram.

Streamlining student profiles and continuous comprehensive evaluation record management through a mobile application enhances the process of recording student attendance in educational institutions. Various smartphone-based methods and systems have been explored to design this system. While some systems use fingerprint sensors [1] or RFID cards [7] for attendance tracking, others combine applications with the Arduino hardware [2].

Our system is purely application-based, allowing all operations to be completed within the app. It offers a secure and interactive user interface and operates swiftly without the need for additional hardware. The three primary components of the proposed system are faculty, students, and administration.

Admin Module

The mobile application offers administrators the same level of access as the (HOD). Administrators can add or remove faculty and students, monitor student attendance and performance, and generate reports based on this data. The flow of the admin module is shown in Figure 2. All information was stored in a Firebase database and retrieved in real-time from the database. Administrators have direct access to the Firebase database, which enables them to access and manage the entire database.

Faculty Module

The mobile application allows faculty members to access all the students in their respective classes. The faculty can add or remove students, mark and monitor student attendance, and assess student performance based on the set grading criteria. The flow of the faculty module is shown in Figure 3. Every piece of information is stored in the Firebase database and retrieved instantly. Faculty members can also input test marks and generate reports for all the students.

Student

The mobile application provides the student with access to their attendance, manages the schedule, and sees the attendance percentage of all the data fetched from the Firebase database. The flow of the student module is illustrated in Figure 4.

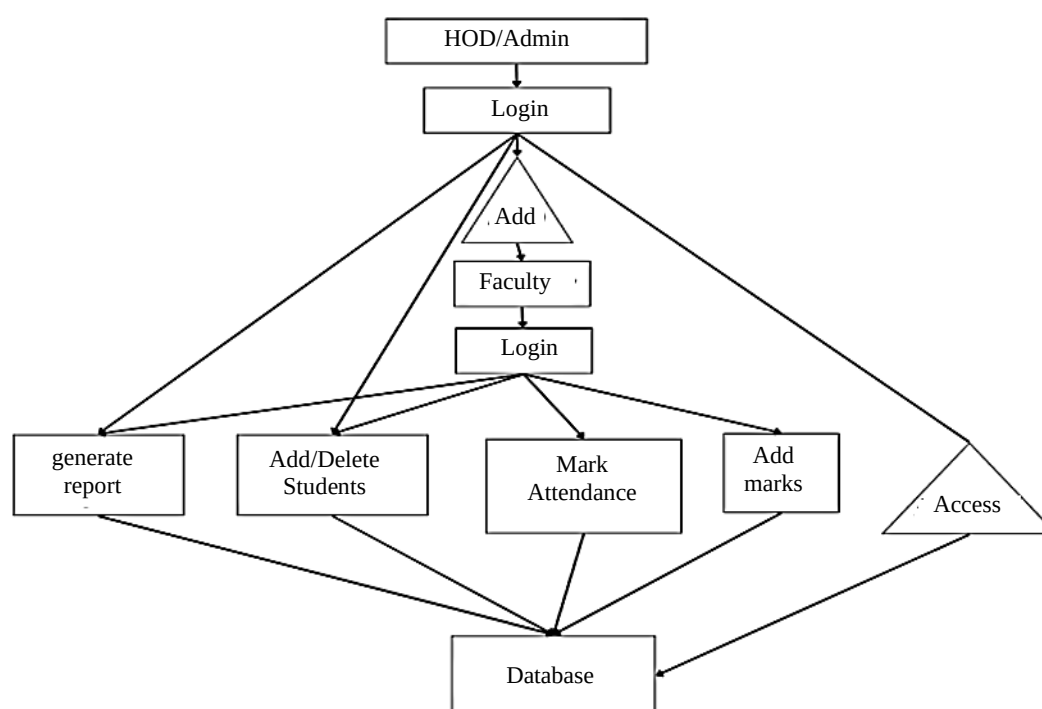


Figure 2. Flow of admin module.

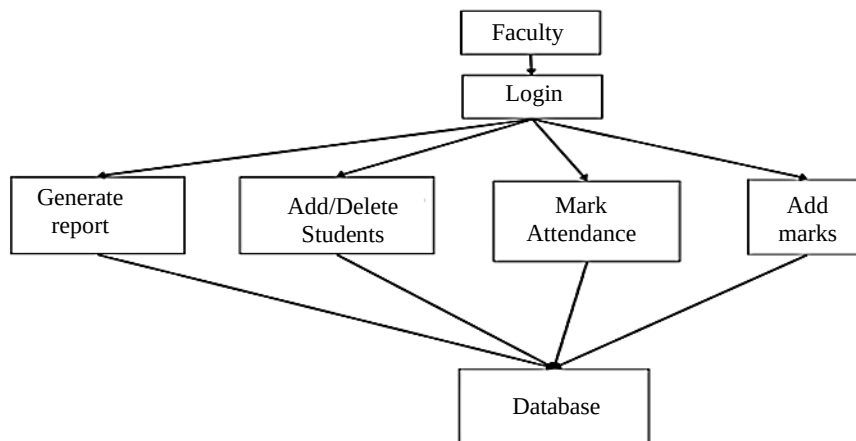


Figure 3. Flow of faculty module.

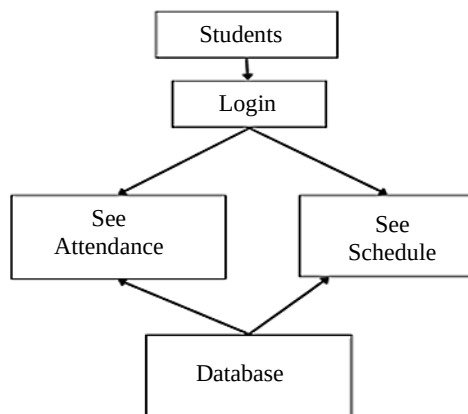


Figure 4. Flow of student module.

METHODOLOGY

The First step was the collection of research papers pertinent to the student attendance system. I conducted thorough research on this topic, utilizing both online and offline resources. These papers were meticulously studied, categorized based on their content, and comprehensively analyzed. The detailed steps are outlined below:

1. *Defining Scope and Objectives:* First, we established the study's goals, finalizing various aspects related to student management and continuous and comprehensive evaluation (CCE) record management.
2. *Literature Search Strategy:* A thorough search across numerous scholarly platforms and databases was part of the study for this survey report. A preliminary Google search was performed to identify the primary sources. Many uses were made of online resources and databases, such as Google Scholar and IEEE Xplore.
3. *Inclusion and Exclusion Criteria:* Articles and research papers were chosen according to how well they addressed the survey report's emphasis on analyzing and summarizing scholarly works. Peer-reviewed articles were preferred.
4. *Data Collection and Analysis:* Important details such as publication date, authorship, title, abstract, methodology, results, and conclusions were extracted from the identified publications and articles.
5. *Data Synthesis and Report Compilation:* Key points, summaries, and conclusions were recorded once the information obtained from the chosen publications was combined.
6. *Citations and References:* To ensure the academic integrity and recognition of the original authors' work, appropriate citations and references were included for every publication or article that was part of the report.

It is crucial to remember that the search for papers and articles was restricted to easily accessible Internet sources and was conducted mostly in English. This could result in a selection bias and leave out important research that is not accessible through these routes. Using this methodology, a wide range of pertinent research papers and publications were found and examined to produce an extensive survey report on the student attendance system.

Technology-Based Streamlining Solutions

Technology integration provides scalable solutions to these problems. The handling of student profiles and assessments is changing because of the emergence of tools and platforms. Some of the technologies that caused this shift are listed below.

Student Information Systems (SIS) on the Cloud

All student data were centralized on cloud-based technologies in a safe and easily accessible setting. The Infinite Campus, Blackboard, and PowerSchool are examples. Real-time updates and smooth stakeholder cooperation are made possible using these solutions. Analytical technologies driven by artificial intelligence (AI) and machine learning (ML) offer insights into student performance, assisting teachers in spotting learning gaps early on. Based on past data, ML models can also forecast future performance trends.

Blockchain Technology for Safe Documents

Blockchain technology guarantees secure and unchangeable student records. This technology is especially helpful in keeping academic documents, such as grades and certificates, for the rest of one's life.

Web and Mobile Applications

Students and parents can promptly receive evaluation reports, attendance logs, and updates using specially designed applications. These programs help teachers to automate feedback generation and streamline grading.

Automated CCE Resources

Digital learning platforms and CCE tools work together effortlessly. These technologies follow preset grading schemes and rubrics while automating formative and summative exams.

Principal Advantages of System Streamlining

- *Improved Security and Accuracy of Data:* Removing human error and ensuring data privacy laws are followed.
- *Better Ability to Make Decisions:* Improved academic planning and individualized teaching methods are made possible by data-driven insights.
- *Time Efficiency:* Teachers have more time to engage in innovative teaching strategies owing to automated assessments.
- *Transparency and Engagement:* Improved contact with teachers is fostered by providing parents and children with real-time insights into academic progress.

RESULT

All the pages of the websites are presented in Figure 5.

CONCLUSION

The integration of comprehensive student attendance, marks record software application, addresses the critical challenges faced by educational institutions in managing student data and assessment processes. This multifaceted solution offers a range of benefits that significantly enhance administrative efficiency, teacher productivity, and overall educational quality. Real-time attendance updates reduce administrative burdens and provide insights into attendance patterns. Automated generation offers quick insight into student performance and transparency.

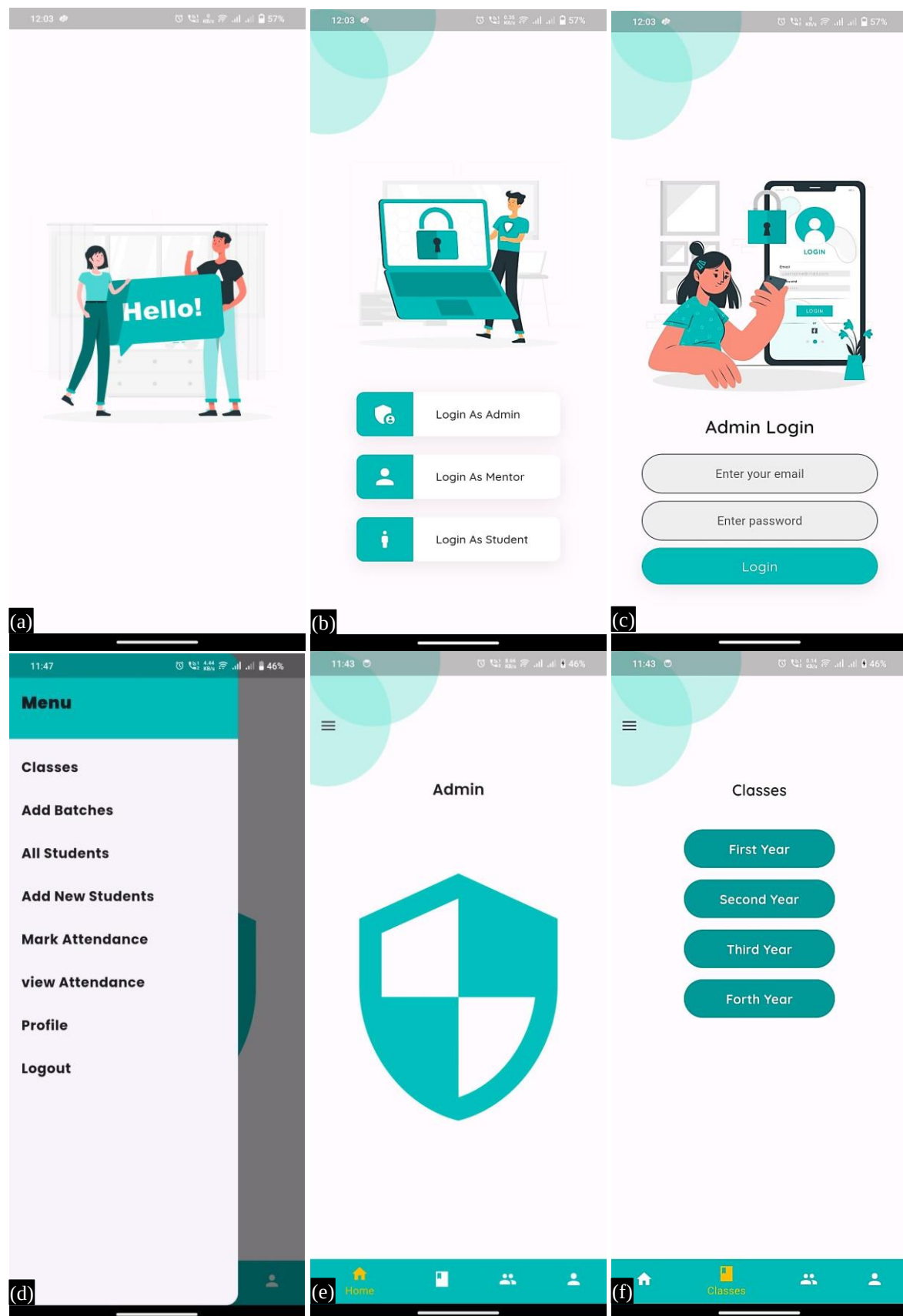


Figure 5. (a) Welcome page, (b) login page, (c) admin login, (d) page menu, (e) home page, (f) group classes.

Future Scope

Parent and Student Portals

Develop portals for parents and students to access attendance records, grades, and performance reports. This can improve transparency and communication between parents, students, and teachers.

AI-Powered Chatbots

Use AI-powered chatbots to provide immediate support to parents, instructors, and students. Chatbots can assist with queries related to attendance, marks, schedules, and other educational aspects.

Accessibility Features

Enhance the application's accessibility features to cater to disabled students. Features such as text-to-speech capabilities, speaking instructions, and screen readers may fall into this category.

Integration with IoT Devices

Explore integration with IoT devices to automate certain tasks. For example, IoT sensors can be used to track students' physical presence in classrooms and laboratories.

REFERENCES

1. Ghosh S, Mohammed SK, Mogal N, Nayak PK, Champaty B. Smart attendance system. 2018 International Conference on Smart City and Emerging Technology (ICSCET), Mumbai, India, 2018. p. 1–5. DOI: 10.1109/ICSCET.2018.8537298.
2. Čisar SM, Pinter R, Vojnić V, Tumbas V, Čisar P. Smartphone application for tracking students' class attendance. IEEE 14th International Symposium on Intelligent Systems and Informatics (SISY); 2016 Sep 29–30; Subotica, Serbia. 2016. p. 227–32. DOI: 10.1109/SISY.2016.7601502.
3. Islam MM, Hasan MK, Billah MM, Uddin MM. Development of smartphone-based student attendance system. IEEE Region 10 Humanitarian Technology Conference (R10-HTC); 2017 Dec 21–23; Dhaka, Bangladesh. 2017. p. 230–3. DOI: 10.1109/R10-HTC.2017.8288945.
4. Irwansyah D, Buana IKS, Setiawan H, Lestari AA. Attendance system using two factor authentication based on secure app with Flutter. IEEE 8th Information Technology International Seminar (ITIS); 2022 Nov 10–12; Surabaya, Indonesia. 2022. p. 328–32. DOI: 10.1109/ITIS57155.2022.10010049.
5. Devaprakash, Gowtham, Murali, Muralidharan, Vijayalakshmi VJ. Biometric-based attendance system with remote real-time monitoring for tertiary institutions in developing countries. 6th International Conference on Advanced Computing and Communication Systems (ICACCS); 2020 Mar 6–7; Coimbatore, India. 2020. p. 1288–91. DOI: 10.1109/ICACCS48705.2020.9074162.
6. Peter UE, Joe-Uzuegbu CKA, Uzoechi L, Opara FK. Biometric-based attendance system with remote real-time monitoring for tertiary institutions in developing countries. IEEE International Conference on Emerging & Sustainable Technologies for Power & ICT in a Developing Society (NIGERCON); 2013 Nov 14–16; Owerri, Nigeria. 2013. p. 1–8. DOI: 10.1109/NIGERCON.2013.6715633.
7. Srinidhi MB, Roy R. A web enabled secured system for attendance monitoring and real time location tracking using biometric and radio frequency identification (RFID) technology. International Conference on Computer Communication and Informatics (ICCCI); 2015 Jan 8–10; Coimbatore, India. 2015. p. 1–5. DOI: 10.1109/ICCCI.2015.7218103.
8. Monsalve CS, Streamlining Dep, editors. School forms: Excel automation for simplified teacher workflows. Int J Sci Res Multidiscip Stud. 2024;10(3):8–18.
9. Sadasivam VR, Sanjaykumar V, Imam AS, Vasanthan R. Guided student profile system: Mentor feedback integration. 2024 International Conference on Intelligent Systems for Cybersecurity (ISCS), Gurugram, India. 2024. p. 1–5. DOI: 10.1109/ISCS61804.2024.10581291.
10. Seeman ED, O'Hara M. Customer relationship management in higher education: Using information systems to improve the student-school relationship. Campus-Wide Inf Syst. 2006;23(1):24–34. DOI: 10.1108/10650740610639714.