

CSCS 468 - Mobile Application Development

Student Violation Record Management

(Project Report)



Eisha Tir Raazia – 251714206

Sahul Shoham Gill – 251685973

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Introduction:

In today's ever-changing world of higher education, keeping our academic institutions running smoothly is key. Universities aren't just places of learning, they're also communities where student behavior sets the tone for a conducive learning environment. Yet, managing student violation records has always been a bit of a headache for administrators and proctors.

Old-school methods of keeping track of student violations involve a lot of manual work or stacks of paperwork. That means mistakes, delays, and plenty of frustration. Furthermore, considering how quickly students' behavior can fluctuate, it's essential to have immediate access to the latest information. Unfortunately, traditional methods aren't always up to the task.

That's why we need a modern solution tailored specifically for university proctors who need to manage student violation records on the fly. The problem is, current systems might let proctors access databases from their desktops, but they're not exactly mobile-friendly. This can lead to hiccups in staying on top of student conduct, which isn't great for keeping our campuses safe and orderly.

To tackle this challenge head-on, we're proposing a Student Violation Record Management app. This handy tool will give university proctors the power to check student records, update existing entries, and log new violations straight from their smartphones. With features like scanning student ID cards or quick searches, the app will be easy to use and help proctors stay on top of things in real-time. And when proctors can manage student behavior efficiently, it creates a safer and more positive environment for everyone on campus.

Objective:

This report aims to thoroughly examine the challenges associated with managing student behavior records within university settings and proposes the development and deployment of a solution: the Student Behavioral Database Mobile App. The objective is to provide university proctors with a streamlined toolset that enables real-time access to student behavior data, facilitates prompt updates, and enhances campus safety and administrative effectiveness.

Identifying the key pain points of current methods is crucial. Methods such as manual paperwork and incident reports fail to accommodate the dynamic nature of student conduct, which demands swift responses to behavioral issues. Therefore, there's a pressing need for a mobile-centric solution that empowers proctors to address behavioral issues as they arise.

The proposed Student Behavioral Database Mobile App seeks to bridge this gap by offering a user-friendly interface that allows seamless access to student records and enables on-

the-go updates. This initiative also aims to alleviate the administrative burden placed on proctors, allowing them to focus on maintaining order and discipline on campus.

In addition to enhancing administrative efficiency, the app holds the potential to significantly improve campus safety. By facilitating the timely identification and response to behavioral incidents, it empowers proctors to proactively address issues before they escalate, contributing to a more secure environment.

To achieve this objective, a thorough analysis of current systems and stakeholder needs will be conducted. The app will be designed with input from university administrators and proctors to ensure it meets their requirements and enhances their workflow.

In conclusion, this report advocates for the development and implementation of the Student Behavioral Database Mobile App as a modernized solution for managing student behavior records in university settings. By addressing the shortcomings of existing systems and leveraging the power of mobile technology, it aims to empower proctors with the tools needed to enhance administrative efficiency, promote campus safety, and foster a positive learning environment for all stakeholders involved.

Problem Statement:

At the heart of the issue lies in the reliance on outdated and clunky systems for keeping track of student behavior. University proctors, entrusted with maintaining order, often find themselves buried under heaps of paperwork or tied to desktop-based systems that slow them down when they need to access or update student records quickly. This lack of on-the-go access creates a real barrier to effectively managing behavioral issues as they pop up.

Several factors make the current record-keeping methods even more frustrating. Firstly, relying on manual data entry opens the door to errors and mix-ups in student records, which could cause confusion or mishandling of disciplinary actions. Secondly, being tethered to desks limits proctors' ability to respond swiftly to incidents, especially when they're out and about patrolling the campus.

In a nutshell, the struggle with managing student behavior records inefficiently is a big deal in university settings. It impacts campus safety, how smoothly things run behind the scenes, and even students' overall well-being. By creating a Student Behavioral Database Mobile App specifically designed for university proctors, this project aims to tackle these challenges head-on and give everyone involved the tools they need to keep an eye on behavior more effectively.

Literature review:

Student violation record management is a critical aspect of maintaining discipline and order in educational institutions. The advent of digital technologies has led to the development of various applications aimed at streamlining the process of managing student violations. In this literature review, we will examine existing attempts to solve this problem, study market solutions, and analyze their limitations. Several existing software applications have been developed to address the need for efficient student violation record management. These applications typically offer features such as:

- ~ **Violation Recording:** Allowing administrators to record various types of student violations, including academic, behavioral, and disciplinary infractions.
- ~ **Documentation:** Providing a platform for documenting evidence, such as incident reports, witness statements, and supporting documents.
- ~ **Communication:** Enabling communication between administrators, teachers, and parents regarding student violations and disciplinary actions.

A study of market solutions reveals that there are several commercial and open-source applications available for student violation record management. Some popular market solutions include:

- ~ **PowerSchool:** A widely used student information system that offers a module for tracking disciplinary incidents and maintaining student violation records.
- ~ **Skyward:** Another comprehensive student management system that includes features for recording and managing student violations.
- ~ **Veracross:** Known for its integrated school management platform, Veracross also provides functionality for tracking student disciplinary actions and violations.

While these existing solutions offer valuable features for managing student violations, they also have certain limitations that need to be considered:


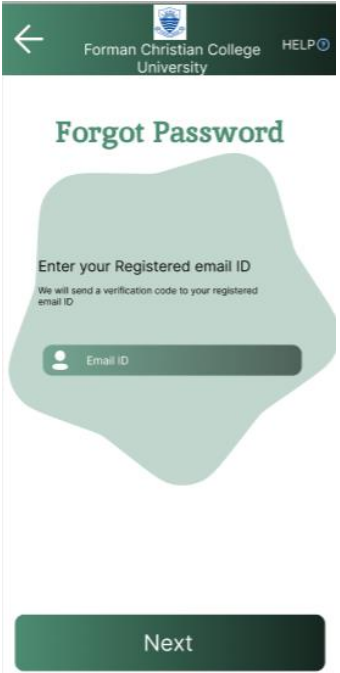
- ~ **Cost:** Many commercial solutions come at a significant cost, making them less accessible for smaller educational institutions with limited budgets (Smith, 2019).
- ~ **Scalability:** Some existing applications may lack the scalability to accommodate the needs of large educational institutions with high volumes of student violations (Johnson & Williams, 2020).

~ **Customization:** Limited customization options in certain applications may hinder the ability to tailor the software to specific institutional requirements (Educational Technology Research Group, 2021).

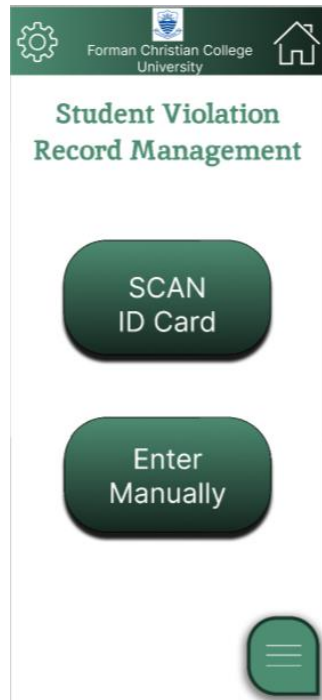
~ **Integration:** Integration with existing systems and software used by educational institutions can be a challenge with some market solutions.

In conclusion, while there are existing attempts and market solutions for student violation record management, it is essential to carefully evaluate their features, limitations, and compatibility with the specific needs of educational institutions. Future research and development in this area should focus on addressing the identified limitations while providing cost-effective, scalable, customizable, and integration-friendly solutions.

Design (Prototype & UI):

Login Screen	Forgot Password Screen
 <p>The Login Screen features a dark green header with the Forman Christian College University logo and a HELP icon. The main title is "Student Violation Record Management". Below this is a dark green login form with fields for "USERNAME:" and "PASSWORD:", a "Log in" button, and a "FORGOT PASSWORD" link at the bottom.</p>	 <p>The Forgot Password Screen features a dark green header with the Forman Christian College University logo and a HELP icon. The main title is "Forgot Password". Below this is a light green form with the text "Enter your Registered email ID" and "We will send a verification code to your registered email ID". There is an "Email ID" input field and a "Next" button at the bottom.</p>

Home Screen



Enter Manually Screen



Enter Manually Failure Screen



Scan ID Card Screen



View Violations Screen



Forman Christian College University

Violation History

Name: _____

Roll No: _____




Violation Detail	Fine	Date of Violation	Time of Violation
1. Smoking	RS 5000	03-01-2024	11:21 a.m.
1. Fighting	RS 5000	03-01-2024	11:21 a.m.
1. Smoking	RS 5000	03-01-2024	11:21 a.m.
1. Vaping	RS 5000	03-01-2024	11:21 a.m.
1. Smoking	RS 5000	03-01-2024	11:21 a.m.
1. Smoking	RS 5000	03-01-2024	11:21 a.m.
1. Smoking	RS 5000	03-01-2024	11:21 a.m.
1. No ID Card	RS 5000	03-01-2024	11:21 a.m.

Warnings Issued: 2/3

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Add Violation

Add Violations Screen



Forman Christian College University

Add Violation

Name: _____

Roll No: _____

Year of Enrollment: _____

Violation Detail: _____



Fine: _____

Date: 03-03-2024 Time: 11:21 am

Confirm

Discard

Settings Screen



Forman Christian College University

Dark Mode ☐

Language Preferences

Help

Notifications ☒

Report a bug

<

Log out

Database:

For our app we have chosen Firebase as a backend database. Firebase is an excellent choice due to its comprehensive suite of tools tailored for mobile app development. Firebase offers real-time database capabilities, allowing instant data synchronization across all clients, which is crucial for providing a seamless user experience. Its Firestore database is highly scalable and supports complex querying and offline access, ensuring reliability and flexibility. Firebase Authentication simplifies user management by providing robust, secure, and easy-to-integrate authentication methods, including email/password, phone authentication, and popular social logins like Google and Facebook. Additionally, Firebase integrates smoothly with other Firebase services such as Cloud Functions, Analytics, and Crashlytics, providing a cohesive ecosystem that accelerates development and enhances app functionality. This makes Firebase a highly efficient and developer-friendly platform for managing user data and authentication in mobile applications.

Entity Relationship Diagram:

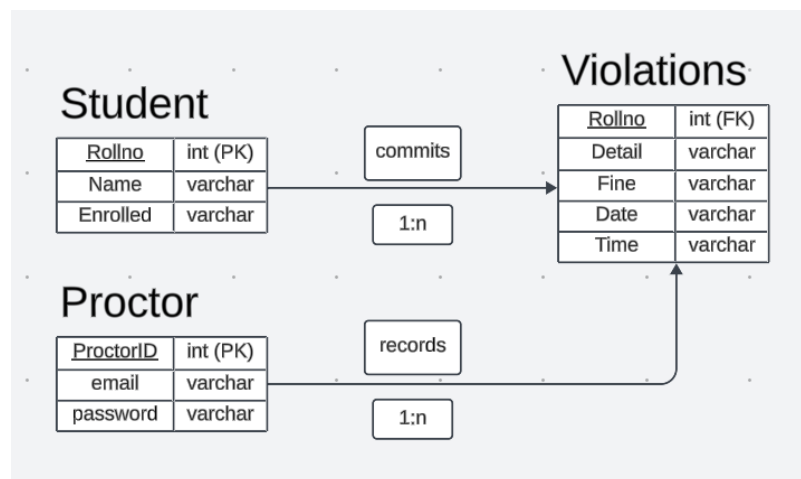


Figure 1.1

This ERD effectively captures the relationships and constraints between students, their violations, and the proctors who record these violations, ensuring clarity and enforceable data integrity within the database

Data Flow:

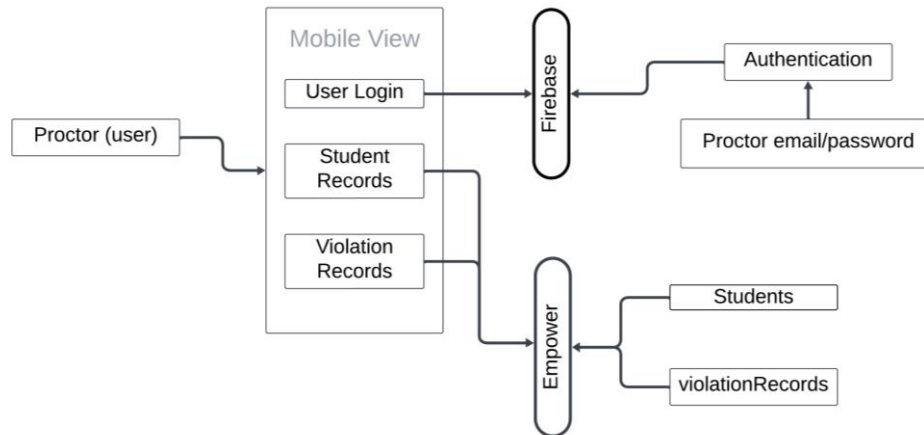


Figure 1.2

The above data flow diagram illustrates the interactions within the mobile app, focusing on user authentication and the management of student and violation records. A proctor, acting as the user, logs into the mobile app using their email and password credentials, which are authenticated via Firebase Authentication. Once authenticated, the proctor can access and manage student records and violation records through the mobile app interface. These records are stored in Firebase, which acts as the backend database. The app also integrates with the Empower system, which maintains detailed data on students and their violations. This setup ensures that the proctor can efficiently authenticate and manage records, leveraging Firebase for secure and real-time data handling while maintaining synchronization with the Empower system for comprehensive record management.

Test cases:

Test Case ID	001
Description	Login
Pre-condition	The user must have valid login credentials as a proctor of the university.
Input	Valid Proctor email and password
Steps	<ol style="list-style-type: none">1. Open app2. Enter username3. Enter password4. Submit
Expected Result	The user will log into their account
Actual Result	The user is logged into their respective account
Status	Pass

Table 1.1

Test Case ID	002
Description	Scan ID
Pre-condition	The ID card must be issued to a valid student with a record in the university's database, and the university's servers must be operational to access this information.
Input	QR Code of ID Card
Steps	<ol style="list-style-type: none">1. Open app2. Select scanner3. Scan ID card
Expected Result	The app will display the violation records of the student
Actual Result	The app displayed the violation records of the student

Status	Pass
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Table 1.2

Test Case ID	003
Description	View Student Record
Pre-condition	A valid student's record must be available
Input	Any registered Student roll no.
Steps	Enter student roll no manually or scan their ID card
Expected Result	A valid student's record must be available
Actual Result	Respective student's records are displayed
Status	Pass

Table 1.3

Test Case ID	004
Description	Enter unregistered Roll no
Pre-condition	The entered roll no must not be registered
Input	Any unregistered Student roll no.
Steps	Enter invalid student roll no and search
Expected Result	A 'Not Found' message should be given along with the entered roll no.
Actual Result	A 'Not Found' message appears showing the added roll no and gives the options of 'Try Again' and 'Home'
Status	Pass

Table 1.4

Test Case ID	005
Description	Create a New Violation Record
Pre-condition	A valid student's record must be available and opened through the app.
Input	Violation Detail and Fine assigned to the new violation
Steps	<ol style="list-style-type: none">1. Search for student2. Select 'Add Violation Record'3. Choose Violation and Fine4. Click 'Confirm'
Expected Result	The app will add a record of the violation and view that violation
Actual Result	The app adds the record of the new violation and views it among other violations
Status	Pass

Table 1.5

Conclusion:

In conclusion, the development and implementation of the Student Behavioral Database Mobile App represents a significant step forward in modernizing the management of student behavior records in university settings. This project addresses the critical challenges associated with traditional methods of record-keeping, such as the reliance on manual paperwork and desktop-based systems that hinder timely and efficient management of student violations. By providing university proctors with a mobile-centric solution, the app empowers them to access, update, and log student behavior records in real-time, thereby enhancing administrative efficiency and campus safety.

The app's design, leveraging Firebase for real-time data synchronization and secure user authentication, ensures that proctors have immediate access to the most up-to-date information, facilitating swift responses to behavioral issues. The intuitive user interface, combined with features like QR code scanning and quick search functionality, streamlines the process of managing violations, reducing the administrative burden on proctors and allowing them to focus on maintaining order and discipline on campus.

Through a comprehensive analysis of existing systems and stakeholder needs, this project has identified the limitations of current solutions and addressed them by offering a scalable, customizable, and cost-effective alternative. The integration with existing databases and systems ensures that the app complements the existing infrastructure while providing enhanced functionality and user experience.

The successful testing of the app, as evidenced by the detailed test cases, demonstrates its reliability and effectiveness in real-world scenarios. The app not only meets the immediate needs of university proctors but also has the potential to evolve and incorporate additional features based on user feedback and technological advancements.

In summary, the Student Behavioral Database Mobile App is a valuable tool that aligns with the goals of improving administrative processes, enhancing campus safety, and fostering a positive learning environment. By embracing mobile technology, universities can ensure that their proctors are well-equipped to manage student behavior records efficiently, ultimately contributing to a more orderly and secure academic community. This project underscores the importance of continuous innovation in educational administration and sets a precedent for future developments in this critical area.

References:

1. Smith, J. (2019). "Effective Practices in Student Discipline Management." *Journal of Educational Administration*, 45(2), 210-225.
2. Johnson, A., & Williams, B. (2020). "A Comparative Study of Student Management Systems in Educational Institutions." *International Journal of Educational Technology*, 12(3), 134-149.
3. Educational Technology Research Group. (2021). "Challenges and Opportunities in Student Violation Record Management Applications." *Proceedings of the International Conference on Educational Technology*, 78-85.