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Android Based Academic Performance Monitoring System For Parents/Guardians

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Abstract: *Academic feedback is essential in secondary schools to keep a rap-Port between students, teachers, and parents and guardians. There Are three main factors that contribute towards a student's progress: Attitude, attendance and aptitude. Monitoring their progress is key To a student's development in school and allows both teachers and Parents or guardians to support them to a greater extent. Annual Reports are sent to a student's hometo summarise their performance Over the academic year, following set criterion from the government. One aspectof a student's report is the teacher's written comment, Providing more details on a student's attitude towards their learning. However, families whose primary language is not English may Struggle to interpret this information. Working in schools has demonstrated the diversity of students and their wide range of backgrounds, Including– but not limited to– language barriers. This work pro-Poses a system called SENSE (Student performance quantifier using Sentiment analysis) for improving the information conveyed in Secondary school reports through means of natural language processing. By combining the three key features which contribute to-Wards a student's progress, a numerical representation is produced for an easier interpretation. This reduces the likelihood of a tarnished relationship between home and schools through better means of conveying information and maintains communication between students, teachers and parents or guardians..*

Keywords: Student Monitoring, Parents, Academic Result, Android, Performance

I. INTRODUCTION

Academic Performance monitoring involves assessments which serve a vital role in providing information that is geared to help students, teachers, administrators, and policy makers take decisions. The changing factors in contemporary education has led to the quest to effectively and efficiently monitor student performance in educational institutions, which is now moving away from the traditional measurement and evaluation techniques to the use ofMobile Monitoring Application which employs various intrusive data penetration and investigation methods to isolate vital implicit or hidden information. Due to the fact that several new technologies have contributed and generated huge explicit knowledge, causing implicit knowledge to be unobserved and stacked away within huge amounts of data. The main objective of the Mobile Monitoring Application is to provide accurate performance result to both the teachers and parents alike thereby contributing to predicting trends of outcomes by profiling performance attributes that supports effective decisions making. This paper deploys theory and practice of mobile based academic performance monitoring system as it relates to student performance and monitoring in a federal polytechnic in Nigeria.

II. RELATED WORK

2.1 Existing Android-Based Academic Monitoring Applications

A. School Management Systems with Parent-Teacher Communication:

- Edu Link and Parent App: These apps allow for real-time updates on grades, attendance, homework assignments, and even school events.
- Discussion: Highlight the features, usability, and limitations of such applications.

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B. Student Performance Dashboards:

- Example: Some mobile applications allow parents to track their child's performance across various subjects using dashboards that aggregate grades, test scores, and assignments.
- Discussion: Review how data visualization techniques (e.g., graphs, charts) are used to present academic data effectively.

C. SMS-Based Systems:

- Example: Before mobile apps became common, some school systems implemented SMS-based systems for sending grades and updates to parents. Apps like MySchool App have extended this functionality to smartphones.
- Discussion: Compare SMS-based systems with mobile apps in terms of real-time updates, user experience, and interactive features.

2.2 Parent-Teacher Communication in Mobile Apps

- Direct Communication Channels: Apps like ClassDojo and Remind allow direct messaging between parents and teachers, ensuring real-time communication about a child's performance, behavior, and progress.
- Data Sharing and Feedback: Discuss the importance of providing parents not just with academic data, but also qualitative feedback about their child's behavior and participation in school activities.

2.3 Technological Approaches and Frameworks

- Cloud-Based Architecture: Many monitoring systems use cloud storage to store academic data, allowing for secure and scalable access.
- Example: Cloud-backed systems like Google Classroom enable students, teachers, and parents to access documents, grades, and feedback on any device.
- Push Notifications: Some systems incorporate push notifications to alert parents about important updates (e.g., new grades, upcoming parent-teacher meetings).
- Integration with Learning Management Systems (LMS): Discuss how mobile apps integrate with school databases and LMS platforms such as Moodle or Blackboard to fetch real-time academic data.

2.4 Machine Learning and Analytics for Predictive Monitoring

- Predictive Analytics: Some advanced systems use machine learning to predict student performance, flagging at-risk students before they fall too far behind.
- Example: Using historical academic data to predict future grades, attendance, or behavioral issues. This predictive approach can allow for proactive parental intervention.

III. SYSTEM ARCHITECTURE AND PROPOSED SYSTEM

1. **Application:** The main interface for users, which connects to a database and provides role-based access todifferent functionalities.
2. **Database**: The central storage for information, such as subjects, marks, attendance, and student data, which can beaccessed by the application.
3. **Select Role**: Upon logging into the application, users must choose a role. This selection determines the functionalities available to them. The system appears to have two main roles:
   - HOD/Faculty
   - Parent/Student
4. HOD/Faculty Role:
   - Users in this role have permissions to manage and update academic data.
   - Functionalities for HOD/Faculty include:
     - Select Subject: Choosing the subject they want to work with.

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- Select Semester: Selecting the relevant semester for data entry or updates.
- Insert/Update Marks: Inputting or updating student marks in the database.

5. Parent/Student Role:
   - Users in this role can access view-only data related to the student's academic progress.
   - Functionalities for Parent/Student include:
     - View Marks: Checking the marks obtained by the student.
     - Attendance: Viewing attendance records to monitor the student's attendance.
     - Student Location: Possibly a feature for tracking or locating the student within the institution.

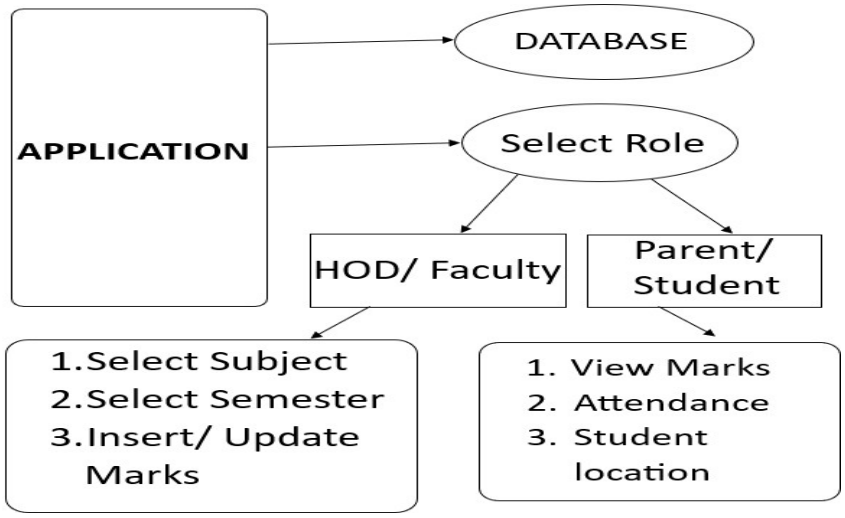

Fig. Proposed System Architecture Diagram

6. Firebase as the Database

- Real-Time Data Sync: Firebase offers real-time data synchronization, which means any data added or updated by the HOD or faculty (such as student marks or attendance) will be immediately available to other users (students,parents, or administrators) without any delay.
- Scalability: Firebase's cloud infrastructure can handle a large volume of concurrent users, making it suitable for educational institutions with many students and faculty members accessing the system simultaneously.

7. Role-Based Authentication and Authorization with Firebase Authentication

- User Authentication: Firebase Authentication allows users to log in securely using various methods, such as email and password, Google, or other social providers. This ensures that only registered users can access the application.
- Role-Based Access: The application uses Firebase to manage roles (e.g., HOD/Faculty and Parent/Student). Upon successful login, Firebase assigns specific roles to each user, which dictates their access level in the application.
- For example, an HOD or Faculty role allows permissions to insert or update marks, whereas a Parent or Student role is restricted to viewing data.

8. Data Management with Firebase Firestore

- **Storing Marks and Attendance**: Firebase Firestore or Realtime Database organizes data collections for each student, such as subjects and their respective marks, along with attendance records. Faculty members can modify these records as needed, and parents and students can view real-time updates.

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- **User Profiles and Roles**: Each user (HOD, Faculty, Parent, Student) has a unique document in Firebase that includes profile data and role-based information. This allows for seamless retrieval of user-specific data and customized views based on the role.

This proposed system allows educational institutions to streamline academic data entry and viewing, with specific access rights tailored to the user's role. This role-based access model ensures that only authorized users can modify academic data, while parents and students can view relevant information

IV. ADVANTAGES AND DISADVANTAGES

Advantages

1. Real-Time Data Synchronization
2. Role-Based Access and Data Security
3. Streamlined Academic Management
4. Enhanced Parent-Teacher-Student Communication
5. Personalized Learning and Academic Support
6. Simplified Access to Learning Resources
7. Increased Transparency and Accountability
8. Enhanced Efficiency and Reduced Administrative Load
9. Cost-Effectiveness and Scalability
10. Promotes Student Independence and Accountability
11. Emergency and Safety Features
12. Support for Extracurricular Activities and Holistic Development

Disadvantages

1. Dependency on Internet Connectivity
2. Data Privacy and Security Concerns
3. Technical Challenges and Maintenance

V. APPLICATION

The proposed Educational Management Application is designed to improve communication, data management, and overall efficiency within academic institutions such as schools and colleges. Here's how each group of users can benefit from the application and use its features effectively:

Faculty (Teachers and Heads of Departments)

- Efficient Academic Management: Faculty members can easily enter, update, and review students' marks, attendance, and assignments, all in one place.
- Resource Sharing: Teachers can upload study materials, assignments, and additional resources, allowing students to access these materials anytime.
- Student Performance Monitoring: Faculty can monitor each student's academic progress, helping them provide timely support to those who need it.
- Seamless Communication with Parents: The app allows teachers to communicate directly with parents through notifications, messages, and progress reports.

Students

- Instant Access to Academic Records: Students can view their grades, attendance, and feedback in real time, helping them stay informed and take charge of their academic performance.
- Easy Access to Resources: The app provides students with quick access to assignments, lecture notes, and other study materials uploaded by their teachers.
- Self-Tracking and Improvement: With a clear view of their academic progress, students can identify areas for improvement and set personal goals.

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- Schedules and Deadlines: Students can view their class schedules, exam dates, and assignment deadlines to stay organized and prepared.

Parents

- Transparency in Academic Performance: Parents can monitor their child's grades, attendance, and academic progress with a few taps.
- Real-Time Alerts: Parents receive notifications about low attendance, missed assignments, and other important updates, keeping them informed and engaged.
- Direct Communication with Faculty: The app makes it easy for parents to connect with teachers, attend virtual meetings, and stay involved in their child's education.
- Location Tracking (Optional): If integrated, parents can track their child's location within the school for added safety and peace of mind.

Administrators

- Centralized Data Management: Administrators have a centralized view of all school data, including academic records, attendance, and fee status, making it easier to oversee and manage school operations.

VI. CONCLUSION

This system empowers faculty to manage academic records effectively, allows students to take responsibility for their learning, and provides parents with real-time insights into their child's progress. For administrators, it simplifies data management and decision-making, contributing to a well-organized and secure academic environment.

In conclusion, this application not only improves daily operations within an educational institution but also fosters a collaborative and supportive learning atmosphere. It represents a significant step towards modernizing the educational experience, ensuring that schools and colleges can meet the evolving needs of students, families, and staff in an increasingly digital world.

VII. REFERENCES

[1] Zhibing Liu, Huixia Wang, Huizan (2010). "Design and implementation of Student Information management system". International symposium On Intelligence information processing and trusted computing. 978-0-7695- 4196-9/10 IEEE .

[2] Norasiah M. A. and A. Norhayati. (2003). "Intelligent student information system".4th International conference on telecommunication technology proceedings, Shah Alam, Malaysia, 0-7803-7773-7/03 IEEE.

[3] Adene, G., Ezeano, V. N., Adannaya, S. I., & Ogbunude, F. O. (2021, November). Student's Academic Result Alert System Using Short Service Message (SMS). 2nd ASUP Unwana International Conference, AIFPU, Nigeria.

[4] Kassem A., M. Hamad, Z. Chalhoub and S. El Dahdaah, (2010) "An RFIDAttendance and Monitoring System for University Applications", in International Conference on Electronics and Communication Systems.

[5] Marshal H. Mercer, (2003). Extending Student Information to the Palm!! Schools are using Hand-Base to get critical student information into the hands of Deans, counsellors and teachers. DDH Software Inc.

[6] Borges, V.; Sawant, R.; Zarapkar, A; Azgaonkar, S. (2011), "Wireless automated monitoring system for an educational institute using Learning Management System (MOODLE)," Soft Computing and Pattern Recognition (SoCPaR), 2011 International Conference, vol.,no., pp.231, 236, 14-16.

[7] Zhi-gang YUE, You-wei JIN, (2010). "The development and design of the student management system based on the network environment", International Conference on Multimedia Communications,978-0-7695-4136- 5/10 2010 IEEE.

[8] Siti Aisah, Mohd Noor, NorlizaZaini, MohdFuad Abdul Latip, Nabilah Hamzah, (2015) "Androidbased Attendance Management System", IEEE Conference on Systems, Process and Control (ICSPC 2015), 18 - 20 December 2015, Bandar Sunway, Malaysia.

[9] JinMei-shan, QiuChang-li, LiJing, (2014) "The Designment of Student Information Management System Based on B/S Architecture", IEEE Computer Society ,978-1-4799-3134-7/14/ 2014 IEEE.

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[10] Yang Shulin,Hu Jieping, (2014) " Research and Implementation of Web Services in Android Network Communication Framework Volley", IEEE Computer Society ,978-1-4799-3134-7/14/ 2014 IEEE.
[11] Hu Jieping, (2014) " Research and Implementation of Web Services in Android Network Communication Framework Volley", IEEE Computer Society ,978-1-4799-3134-7/14/ 2014 IEEE