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One Platform – The Social Media App

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Abstract-- The growing need for an integrated, secure, and scalable academic management system in educational institutions has been fueled by the accelerated digital transformation process in the sector. Despite this, the current practice in many institutions is the use of disjointed communication platforms such as manual notice boards, messaging apps, spreadsheets, and third-party form services for the management of events, competitions, attendance, and student records. This has been associated with potential delays in communication, lost opportunities, a lack of transparency in event registration, and inefficient coordination between students, staff, and administrative authorities. In a bid to overcome the aforementioned challenges, this paper presents One Platform, an integrated cloud-based academic management and competition tracking system that aims to bring all activities in an institution under one digital platform. The proposed system combines secure enrollment-based authentication, real-time event notifications, organized event registration processes, attendance tracking, and administrative approval processes in a scalable cloud infrastructure. Through the use of modern technologies such as Firebase Authentication, Cloud Firesto

re, and real-time notification services, the platform provides a safe handling of data, role-based access, and efficient communication between all stakeholders.

Keywords-- Authentication Mechanism, Firestore Database, Secure Access Control, Institutional Event Management, Centralized Data System, Mobile Application Framework.

I. INTRODUCTION

The rising trend of digitalization in educational institutions has resulted in the use of different software solutions to handle academic records, communication with students, event registration, and administrative tasks. However, institutions still rely on unorganized systems like messaging applications, physical notice boards, spreadsheets, and third-party form tools. This has resulted in a delay in communication, unorganized data management, a lack of transparency in event participation, and a higher administrative burden.

Cloud computing has been identified as a scalable and effective solution for organized data storage, real-time synchronization, and secure access management. Cloud-based academic solutions enable institutions to store organized databases while ensuring data availability, reliability, and controlled access.

Additionally, mobile-based solutions have improved accessibility by allowing users to access institutional services at any time and from any location. Secure authentication systems and role-based access control systems further improve data security and protect against unauthorized access in educational information system. However, despite these developments, many current academic systems in existence today are primarily designed for learning management or attendance tracking, without incorporating competition tracking, event registration, notification systems, and administrative management based on roles into a single, comprehensive system. The lack of a comprehensive academic system in place often results in the overlooking of competition announcements, inefficient attendance consideration processes, and disorganized institutional information.

The purpose of this research is to develop and implement One Platform, a comprehensive cloud-based academic management and competition tracking system that integrates student login and authentication, event registration, notification management, attendance tracking, and administrative management into a single online platform. The scope of this research includes system design, secure login implementation, database design, role-based access management, and real-time notification system integration. The main contribution of this research is the development of a systematic, secure, and scalable online campus solution that removes disorganized communication channels.

II. LITERATURE SURVEY

Studies have shown that centralized cloud infrastructure can enhance operational efficiency and efficiently manage structured data in a digital environment. There has been significant research into security solutions in the cloud; these research studies generally support the use of authentication protocols, encryption strategies and access control mechanisms as the key components used to protect data in a secure cloud environment. Mobile-based academic platforms have also found that real-time communication systems enhance user engagement and improve the responsiveness of institutions to users.



However, the majority of the existing systems provide discrete functions such as the management of attendance, learning management systems, and digital document storage but do not provide a fully integrated solution for all academic needs. There is an opportunity to develop an all-inclusive unified platform for delivering secure authentication and managing event registration, administrative approval, attendance tracking, and real-time notifications to users from a single point of access at all times.

III. PROPOSED SOLUTION

To address the aforementioned limitations, the proposed solution in this study is One Platform, a cloud-based academic management system that provides a comprehensive online platform for the integration of various services offered by an institution. The system uses enrollment-based authentication and role-based access control to ensure that users can only access authorized resources. The cloud-based system provides centralized storage and real-time synchronization of institutional data.

The proposed system provides the ability to create structured events, online registration processes, attendance tracking systems, and administrative approval processes. Real-time notification systems are also used to ensure that information is disseminated to all stakeholders in a timely manner.

The proposed system provides an efficient way to manage academic activities by integrating them into one scalable and secure platform. The system reduces manual processing, increases transparency, and improves communication efficiency in an educational institution. The system provides a platform that shows how data security and reliability can be ensured while streamlining competition tracking and academic coordination in an institution.

Table 1
Focus & Scope of the Proposed System

Focus	Scope
Academic Management	Centralized student and event data management
Cloud Computing Architecture	Firestore-based cloud backend infrastructure
Secure Authentication	Enrolment-based login with email verification
Role-Based Access Control	Separate dashboards for Student and Admin
Event Management	Event creation, registration, and tracking
Real-Time Notification	Instant announcements using cloud messaging
Database Management	Structured storage using Cloud Firestore
Mobile Application Development	Flutter-based responsive mobile interface
Data Security	Firestore security rules and controlled access

IV. RESEARCH & REVIEW

A thorough research and review process was adopted to design the One Platform by understanding the existing academic management practices and the limitations faced by the existing systems. The research process was focused on analyzing the existing academic management practices such as announcements for events, registration mechanisms, attendance management, and communication practices adopted by the academic institutions. It was identified that existing academic institutions use multiple tools such as messaging platforms, spreadsheets, and manual record-keeping systems to manage academic activities. However, these systems often cause delays in communication and reduce transparency in the academic management process.



The review process of cloud-based academic systems and authentication mechanisms helped identify the significance of data storage and synchronization mechanisms to improve the efficiency of academic management systems. Based on the research and review process, the need to adopt academic platforms was identified to improve the efficiency and effectiveness of academic management systems.

V. METHODOLOGY

The development of the One Platform was based on a structured and requirement-based approach. Initially, an in-depth study of the existing academic workflow was conducted to identify the inefficiencies present in the communication of events, handling of registrations, and overall administrative workflow. The study revealed inefficiencies like the absence of proper communication channels, manual approval mechanisms, and the absence of centralized data handling mechanisms. Subsequently, the overall system requirements were defined, which included authentication mechanisms, role-based access control, real-time database synchronization, and structured event management mechanisms.

The overall system architecture was developed based on the cloud-based client-server model to ensure scalability and proper handling of data security. Firebase Authentication was implemented to enable enrollment-based login mechanisms with email verification capabilities. Similarly, Cloud Firestore was used to enable centralized data handling of users, events, and registrations. Role-Based Access Control (RBAC) was also implemented to provide differentiation between Students and Admin users. The overall user interface of the mobile application was developed using the Flutter framework, which ensured proper usability and interaction between the frontend and backend mechanisms.

After implementation, system testing was carried out for system validation. Unit testing confirmed the functionality of individual system modules such as login, event creation, and registration. Integration testing confirmed the synchronization of system modules such as login, database, and user dashboards. The system security rules were also tested for proper implementation. Finally, the system was deployed in a controlled environment for performance monitoring for confirmation of system stability and real-time update functionality, thus validating the effectiveness of the proposed approach.

VI. SYSTEM ARCHITECTURE

The One Platform architecture is built using a cloud-based client-server model to provide scalability, security, and real-time data synchronization. The architecture has three main layers: the Presentation Layer (Mobile Application), the Application & Authentication Layer (Firebase Services), and the Cloud Database Layer (Cloud Firestore). The mobile application is the user interface for Students, Admins, and HODs, allowing them to conduct operations like login, event registration, approval management, and attendance management. All login operations for users are done securely using Firebase Authentication, providing login functionality based on enrollment.

The backend is supported by Cloud Firestore, which provides structured collections of data such as users, events, registrations. Real-time communication between the client and server is provided using secure APIs and Firebase Cloud Messaging (FCM) for real-time notifications. Role-Based Access Control (RBAC) is implemented to ensure that only authorized users can access authorized resources. This cloud-based architecture provides a centralized system for data synchronization, controlled access, and scalability, creating a digital academic environment.

VII. FLOW OF ONEPLATFORM

The functional process of One Platform starts with a user logging into the mobile app through secure enrollment-based authentication. The platform checks the authenticity of the login credentials via Firebase Authentication and determines the user's corresponding role from the cloud database. Depending on the role, the platform allows the user to access the corresponding dashboard and privileges, ensuring proper access control to system functionality.

For the Student role, users can access available events, register for competitions, check the status of their registration, and get instant notifications. Students can only access their own information and are not allowed to edit event information or access other users' information.

For the Admin role, users possess more advanced privileges. Admins can create, edit, or manage events, access all student registrations, and send announcements. Their operations are restricted by pre-defined database security rules to ensure data consistency and protect against unauthorized access.

VIII. RESULT & DISCUSSION

Table 2
 Performance Evaluation of One Platform

Parameter	Result	Remark
Authentication System	Successful	Enrolment-based login
Email Verification	Functional	Secure account validation
Role-Based Access	Accurate	Student/Admin separation
Event Creation	Operational	Admin-controlled
Event Registration	Real-time	Instant Firestore update
Database Security	Enforced	Firestore rules applied
System Stability	Stable	No crash during testing

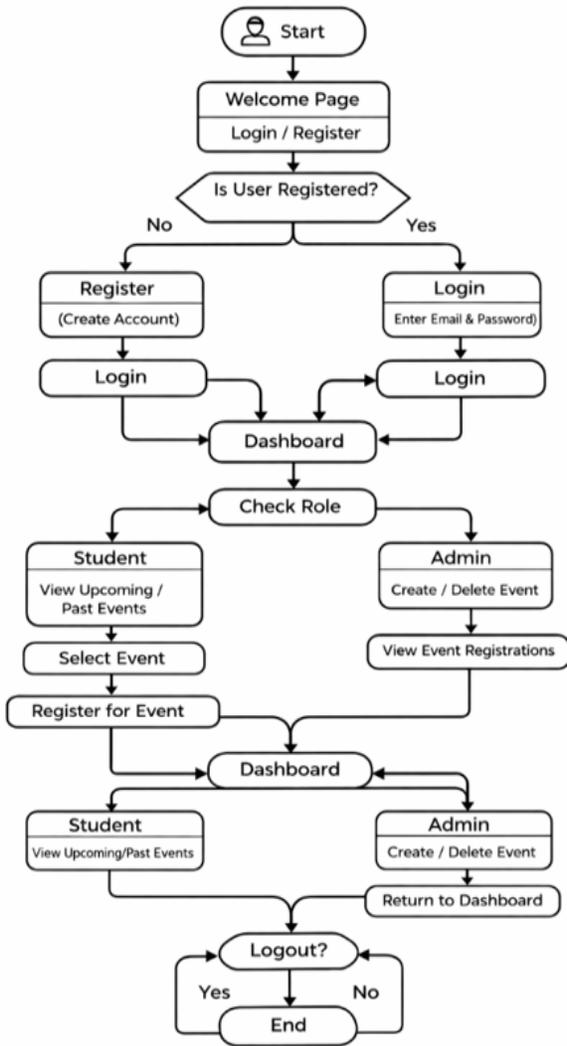


Fig: OnePlatform -Flowchart with Process-Flow

All event creation, registration, and editing are maintained in the cloud database and are synchronized in real-time, ensuring transparency, secure data management, and efficient coordination between Students and Admins.

IX. FUTURE SCOPE

The existing implementation of One Platform offers a centralized system for academic event management, secure authentication, and role-based access control. However, there are a few improvements that can be implemented in the future versions of the software to enhance functionality, scalability, and efficiency.

One of the most significant improvements that can be implemented in the future versions of the software is the integration of a secure online payment system for paid events, workshops, seminars, or certification courses. A payment system can be integrated to enable students to pay registration fees directly from the application. The system can automatically update the payment status in the database and provide digital receipts.



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Another improvement that can be implemented in the future versions of the software is the inclusion of a digital certificate generation module, where participation or achievement certificates can be automatically generated and stored in the student's profile after the completion of the event.

X. CONCLUSION

The design and development of One Platform, a cloud-based academic event management and competition tracking system, has been discussed in this research work. The system has been developed to overcome the drawbacks of the fragmented institutional processes. The system has been designed to overcome challenges such as delayed communication, unorganized event registration processes, the lack of centralized data management, and the lack of role-based access control. The proposed system uses secure authentication, cloud-based databases, and real-time notification systems to create a centralized and scalable digital academic space.

The system design shows that the use of a cloud-based client-server architecture and Role-Based Access Control (RBAC) ensures secure data management with a clear distinction between the roles of Students and Administrators. The real-time synchronization of event data, organized registration processes, and managed administrative access have greatly improved the transparency and efficiency of the system.

In conclusion, One Platform is a structured, secure, and efficient digital solution for the management of academic events. The research has confirmed that centralized cloud-based systems can make a significant difference in communication reliability, administrative control, and overall academic engagement in an educational institution.

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