ACADEMIC STATUS TRANSPARENCY NOTIFICATION SYSTEM FOR PARENTS

PROJECT SYNOPSIS

OF MINOR PROJECT

BACHELOR OF TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

SUBMITTED BY

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1 Introduction

1.1 Background

The modern educational landscape is increasingly data-driven, yet communication between Higher Education Institutions and the parents / guardians of students remains limited. Many parents are not directly aware of their children's academic performance, semester results, or detention status. This communication gap can lead to misinformation, delayed intervention, and reduced academic transparency.

1.2 Project Overview

The proposed **Academic Status Transparency Notification System for Parents** is a web-based application developed in the field of Educational Technology to improve communication between institutions and parents. The system is designed using modern web technologies such as the MERN stack (MongoDB, Express.js, React.js & Node.js) to ensure scalability, security, and ease of access.

1.3 Problem Context

Currently, students often act as the solo messenger of their academic information to parents. This may result in mis-representation of academic standing or hiding of important and crucial information such as low attendance or detention. In some cases, penalty fees may be mis-communicated, leading to financial mis-understandings and lack of trust.

1.4 Proposed Approach

To address this issue, the project introduces a low-friction academic status dashboard that pro- vides aggregated semester-wise information instead of daily micro-updates. The system uses secure tokenized links and passwordless access mechanisms to share verified academic details with parents via Email or SMS.

1.5 Scope of the System

The system provides semester-wise reports including SGPA, subject-wise marks, pass or fail sta- tus, and detention information. By enabling secure, direct, and automated reporting, the project aims to enhance transparency, accountability, and parental involvement in a student's academic progress.

2 Rationale

There is a growing need for transparency and accountability in academic communication between institutions and parents. In many cases, parents rely entirely on students words for information regarding attendance, results, or detention status. This indirect communication can lead to mis- information, delayed corrective action, and reduced parental involvement in a student's academic progress. As academic performance directly influences a student's future opportunities, timely and accurate information sharing becomes essential.

Furthermore, lack of direct communication may sometimes result in financial misunderstandings where penalty fees or academic shortages are not clearly conveyed. A system that provides verified and automated academic updates to parents helps eliminate confusion, promotes ethical academic conduct, and builds trust between institutions and families. Therefore, a secure and easy-to-access notification system is necessary to ensure reliable communication and improved academic monitoring.

3 Objectives

The primary objective of this project is to improve academic transparency between institutions and parents. The specific objectives are:

1. To develop a system that provides semester-wise academic reports and performance summaries to parents.
2. To automate academic notifications through Email/SMS for timely and reliable information delivery.
3. To ensure secure and simple access for parents for their student performance data while maintaining privacy and data protection.

4 Literature Review

School-Home Communication has evolved from traditional paper-based report cards to digital communication systems. Many educational institutions now use Enterprise Resource Planning (ERP) portals to share academic information. However, these portals generally require login credentials and active searching by parents, which reduces usability for non-technical users.

Benablo et al. (2014) proposed a system for monitoring students' academic records with automatic SMS notifications to parents. Their study demonstrated that push-based notifications significantly improved parental awareness and student accountability compared to passive information systems. This work highlights the importance of proactive communication.

Several studies on educational management systems indicate that while digital portals centralize academic data, they often suffer from low parent engagement due to complex interfaces and forgotten passwords. Research in Human-Computer Interaction (HCI) also shows that simpler access mechanisms increase user participation.

Modern communication platforms such as school mobile apps and email alert systems provide faster updates but often generate excessive notifications. This leads to "alert fatigue," where parents start ignoring frequent messages. Researchers suggest that aggregated and meaningful summaries are more effective than daily micro-updates.

Recent technological trends such as password less authentication and secure deep-link sharing have been successfully used in banking and e-commerce applications. These methods improve accessibility while maintaining security. However, their adoption in academic communication systems remains limited.

Based on the review, it is evident that existing systems either lack simplicity, cause notification overload, or require complex logins. Therefore, there is a need for a system that provides secure, aggregated, and easy-to-access academic updates for parents. The proposed project aims to address these gaps by combining automated notifications, dashboard visualization, and pass- wordless access.

5 Feasibility Study

A feasibility study is the initial step in software development that evaluates whether a proposed system is practical and beneficial. It helps determine the viability, need, and significance of the project before full-scale development. The feasibility of the proposed Academic Status Transparency Notification System is analyzed in terms of technical, operational, and economic aspects.

5.1 Technical Feasibility

The proposed system is technically feasible as it is developed using the MERN stack (MongoDB, Express.js, React.js, and Node.js), which is widely used for modern web applications. These technologies support scalability, data security, and responsive user interfaces. Since these tools are well-documented and commonly taught in academic environments, implementation and maintenance are achievable.

5.2 Operational Feasibility

The system is operationally feasible because it integrates smoothly with existing academic data management practices. Colleges already maintain digital records of attendance and results, which can be uploaded in CSV format. The system reduces manual communication efforts and provides automated reporting, making it practical for daily institutional use. Parents can easily access information without technical knowledge, increasing usability.

5.3 Economic Feasibility

The project is economically feasible as it relies on open-source software and free or low-cost cloud hosting platforms. No expensive hardware or licensed software is required. Therefore, the overall development and deployment cost is minimal, making the system affordable for educational institutions.

6 Methodology / Planning of Work

The development of the proposed system will follow a structured and iterative methodology to ensure systematic progress and quality output. The research type for this project is applied research, as it focuses on solving a practical problem in academic communication.

The primary data for the system will be academic records such as attendance and semester results collected from institutional databases or CSV files. These records will be analyzed and organized to generate meaningful academic summaries for parents.

The project will adopt an Agile development approach, allowing continuous improvement and testing during development. The major steps involved are:

1. **Requirement Analysis:** Identifying system requirements, data fields, and user needs.
2. **System Design:** Designing database structure and overall system architecture.
3. **Backend Development:** Developing APIs and logic for data processing and report generation.
4. **Frontend Development:** Creating a user-friendly dashboard interface for viewing reports.
5. **Notification Integration:** Implementing Email/SMS services for automated alerts.
6. **Testing and Validation:** Testing the system for accuracy, usability, and reliability.

Modern development tools such as Visual Studio Code, Node.js, MongoDB, and testing tools will be used during implementation. This methodology ensures that the project objectives are achieved in a systematic and efficient manner.

7 Facilities Required

To successfully develop and deploy the application, the following resources are required:

7.1 Hardware Requirements

- **Development Systems:** Laptops with Intel i5 processor (or equivalent) and 8GB RAM.
- **Testing Devices:** Mobile devices to ensure the dashboard remains readable on small screens.

7.2 Software Requirements

- **Development:** Visual Studio Code, Node.js (v14+) or Next.js.
- **Database:** MongoDB Compass / Atlas.
- **Testing:** Postman (for API testing).
- **Version Control:** Git/GitHub.

7.3 Data Requirements

To generate accurate semester summaries and status reports, the system requires specific data points from the institution's existing records:

- **Identity Data:** Student Name, University Roll Number, Course/Branch, and Semester.
- **Contact Data:** Verified Parent Mobile Number and Email Address (for dispatching links).
- **Academic Aggregates:** Total Lectures Delivered vs. Total Lectures Attended per subject (calculated monthly), and Sessional results.
- **Status Flags:** Binary or categorical flags (e.g., Eligible, Provisionally Detained, Detained) and Fee Context markers.

8 Expected Outcomes

The proposed system aims to enhance the academic ecosystem by ensuring verified, timely communication between the institution and parents. The key expected outcomes include:

- **Holistic Transparency:** Parents gain a complete view of the student's semester performance, moving beyond disconnected daily updates to a clear, consolidated picture.
- **Reduced Detainments:** Monthly status reports provide early warning signs, allowing parents to intervene before low attendance or poor results lead to official detainment.
- **100% Accessibility:** The system ensures no parent is excluded by using "No-Login" links, removing technical barriers to access.
- **Fraud Prevention:** Verified communication channels eliminate the risk of false financial claims regarding penalty fees or fines.
- **Enhanced Parental Involvement:** By simplifying academic monitoring, the system encourages active parental participation in the student's progress.

References

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