

Campus Issue Resolution and Management System for Students

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ABSTRACT: In educational institutions, students often face various problems related to academics, hostel facilities, transportation, maintenance, internet connectivity, and other campus services. In many colleges, the process of reporting and resolving these issues is still carried out manually, which can be slow, inefficient, and difficult to track. As a result, students may experience delays in getting their problems resolved, while administrators find it challenging to manage complaints effectively. To address these challenges, the Smart Student Issue Resolution System is proposed as a web-based platform that simplifies and automates the complaint management process. The system allows students to register securely using email-based OTP verification, submit complaints, upload supporting images, and monitor the status of their complaints in real time. It also includes an anonymous complaint feature that enables students to report sensitive issues such as ragging, harassment, or misconduct without revealing their identity.

The system consists of three main modules: Student, Department, and Admin. Students can submit and track complaints, departments can view and resolve assigned issues, and administrators can monitor the overall complaint management process. The admin also manages department accounts and handles anonymous complaints to ensure privacy and proper action. A major feature of the proposed system is the integration of Natural Language Processing (NLP). NLP techniques are used to analyze complaint content, detect duplicate complaints, identify priority levels, and automatically assign complaints to the appropriate department. Similar complaints are grouped together using a voting mechanism, which helps highlight common issues affecting multiple students. The system also supports automatic escalation of unresolved complaints to higher authorities, ensuring accountability and timely resolution. By combining modern web technologies with intelligent automation, the Smart Student Issue Resolution System improves transparency, reduces response time, minimizes manual effort, and enhances communication between students and institutional departments. The project demonstrates how emerging technologies such as Full-Stack Web Development and Natural Language Processing can be effectively applied to improve administrative processes and student satisfaction within educational institutions.

KEYWORDS: Student Complaint Management, Natural Language Processing, Issue Resolution System, Duplicate Detection, Complaint Prioritization, Full-Stack Development, Web Application.

I. INTRODUCTION

Educational institutions often face challenges in handling and resolving student complaints efficiently. Students may encounter various issues related to academics, infrastructure, hostel facilities, transportation, internet connectivity, and administrative services. Traditional complaint management systems generally rely on manual processes such as written applications or email communication, which often lead to delays, lack of transparency, and poor tracking mechanisms. To overcome these limitations, the Smart Student Issue Resolution System is proposed as an intelligent web-based solution that digitizes and automates the

complaint management process. The system enables students to submit complaints online, monitor progress, and receive updates throughout the resolution cycle.

The main objectives of the project are:

- To provide a centralized complaint management platform.
- To automate complaint routing and prioritization.
- To enable anonymous reporting for sensitive issues.
- To utilize NLP techniques for intelligent complaint processing.
- To reduce complaint resolution time.

I. Literature Survey:

2.1 Complaint Management Systems

Complaint management systems are designed to help organizations collect, track, and resolve issues reported by users. In educational institutions, students often face problems related to academics, hostel facilities, transportation, and campus infrastructure. Traditional complaint handling methods usually involve manual processes such as written applications or emails, which can be time-consuming and difficult to monitor. Modern complaint management systems provide online platforms where users can submit complaints and track their status. However, many existing systems lack intelligent features such as automatic categorization, duplicate complaint detection, and priority-based handling.

2.2 Natural Language Processing in Complaint Analysis

Natural Language Processing (NLP) is a branch of Artificial Intelligence that enables computers to understand and process human language. NLP is widely used in applications such as chatbots, text classification, sentiment analysis, and information retrieval. In complaint management systems, NLP helps analyze complaint descriptions, identify important keywords, detect duplicate complaints, and classify issues into appropriate categories. By automating these tasks, NLP improves the accuracy and efficiency of complaint handling while reducing manual effort.

2.3 Web-Based Management Systems

Web-based management systems have become increasingly popular because they provide users with easy access to services through a web browser without requiring additional software installation. These systems allow users to access information and perform tasks from any location with an internet connection. In educational institutions, web-based platforms are commonly used for student information management, attendance tracking, online examinations, and administrative processes.

One of the key advantages of web-based systems is centralized data management. All information is stored in a central database, making it easier to retrieve, update, and maintain records. These systems also support real-time communication and updates, allowing users to receive instant notifications regarding the status of their requests. Modern web technologies such as React, Node.js, Express, and MongoDB have further improved the performance, scalability, and user experience of web applications.

By adopting a web-based architecture, complaint management systems can provide students, departments, and administrators with a convenient and transparent platform for issue reporting and resolution.

2.4 Automated Workflow Systems

Automated workflow systems help organizations streamline processes by automatically assigning tasks, monitoring progress, and generating notifications. In complaint management, workflow automation can route complaints to the appropriate department, prioritize urgent issues, and escalate unresolved complaints to higher authorities. This reduces manual intervention, improves response time, and ensures accountability. As a result, workflow automation has become an important component of modern issue resolution systems.

The study of complaint management systems, NLP techniques, web-based platforms, and workflow automation highlights the importance of integrating these technologies into a single solution. The proposed Smart Student Issue Resolution System combines these features to provide an efficient, transparent, and intelligent complaint management platform for educational institutions.

II. System Analysis And Design

3.1 Existing System

In many educational institutions, student complaints are still managed through traditional methods such as written applications, emails, or direct communication with faculty and administrative staff. Although these methods allow students to report issues, they are often inefficient and difficult to manage when the number of complaints increases. The absence of a centralized platform makes it challenging for students to know the status of their complaints and whether appropriate action has been taken.

Most existing systems rely heavily on manual processes for complaint registration, assignment, and resolution. This increases the workload on administrative staff and may lead to delays in addressing student concerns. Since complaints are handled manually, there is often a lack of transparency and accountability throughout the resolution process.

Another major drawback is the inability to identify duplicate complaints. When multiple students report the same issue, each complaint is treated separately, resulting in redundant records and additional effort for departments. Existing systems also lack intelligent mechanisms to prioritize urgent complaints, which can cause important issues to be overlooked or delayed.

Furthermore, students often face difficulties in tracking the progress of their complaints, leading to poor communication between students and departments. As a result, the overall complaint management process becomes slow, less efficient, and unable to meet the expectations of a modern educational environment.

Limitations of Existing System

- Lack of transparency in complaint resolution.
- Delayed response and issue resolution.
- No mechanism for duplicate complaint detection.
- Absence of automatic priority assignment.
- Difficulty in tracking complaint status.
- Limited accountability and monitoring.
- Increased administrative workload.
- Poor communication between students and departments.

3.2 Proposed System

To overcome the limitations of traditional complaint management methods, the proposed Smart Student Issue Resolution System provides an intelligent and centralized platform for handling student complaints efficiently. The system is designed using modern web technologies and integrates Natural Language Processing (NLP) to automate various tasks involved in complaint management.

The platform allows students to submit complaints online, upload supporting images, and track the progress of their complaints in real time. Unlike conventional systems, the proposed solution provides a transparent and user-friendly environment where students can easily communicate their concerns and receive timely updates regarding their resolution status.

One of the key features of the system is the anonymous complaint facility, which enables students to report sensitive issues such as ragging, harassment, or misconduct without revealing their identity. This encourages students to report problems without fear and helps institutions maintain a safer campus environment.

The integration of NLP enhances the intelligence of the system by automatically analyzing complaint content. Based on the complaint description, the system can identify the appropriate department, detect duplicate complaints, and determine the priority level of issues. Similar complaints are grouped together

using a voting mechanism, helping departments focus on common problems affecting multiple students.

The system also includes an escalation mechanism that automatically forwards unresolved complaints to higher authorities after a specified period. This ensures accountability and prevents complaints from being ignored or delayed. Through automation, real-time monitoring, and intelligent complaint analysis, the proposed system improves efficiency, reduces manual workload, and enhances the overall complaint resolution process within educational institutions.

Advantages of Proposed System

- Centralized complaint management platform.
- Real-time complaint tracking and status updates.
- Anonymous complaint submission for sensitive issues.
- Automatic department assignment using NLP.
- Duplicate complaint detection and voting mechanism.
- Intelligent complaint prioritization.
- Automatic escalation of unresolved complaints.
- Enhanced transparency and accountability.
- Reduced administrative workload.
- Faster and more efficient complaint resolution.

3.3 System Architecture

The Smart Student Issue Resolution System is designed using a modular architecture to ensure efficient complaint management and easy system maintenance. The architecture consists of several interconnected modules that work together to handle complaint submission, processing, monitoring, and resolution.

1. Student Module

The Student Module allows students to register using email-based OTP verification and log in securely. Students can submit complaints, upload supporting images, vote on existing complaints, and track the status of their complaints in real time. The module also provides an anonymous complaint feature for reporting sensitive issues.

2. Department Module

The Department Module enables departmental staff to view complaints assigned to their department. Departments can review complaint details, update complaint status, mark issues as resolved, or reject

requests when necessary. This helps ensure timely resolution of student issues.

3. Admin Module

The Admin Module provides overall control of the system. Administrators can monitor all complaints, manage department accounts, handle anonymous complaints, and view complaint statistics through graphical reports and dashboards.

4. NLP Processing Module

The NLP Processing Module analyzes complaint content to perform automatic department assignment, duplicate complaint detection, and priority classification. This reduces manual effort and improves complaint handling efficiency.

5. Escalation Module

The Escalation Module monitors unresolved complaints and automatically forwards them to higher authorities if they remain pending beyond a specified time limit. This ensures accountability and timely action.

6. Database Module

The Database Module stores all system information, including student details, department records, complaints, complaint history, votes, and system logs. It ensures secure storage and efficient retrieval of data whenever required.

Together, these modules form a complete and intelligent complaint management system that improves transparency, reduces response time, and enhances communication between students and institutional departments.

III. PROPOSED METHODOLOGY

The Smart Student Issue Resolution System follows a structured and intelligent workflow to manage student complaints efficiently. The system combines modern web technologies with Natural Language Processing (NLP) to automate complaint handling, reduce manual effort, and improve response time. The complete process begins with complaint submission and ends with issue resolution and student feedback.

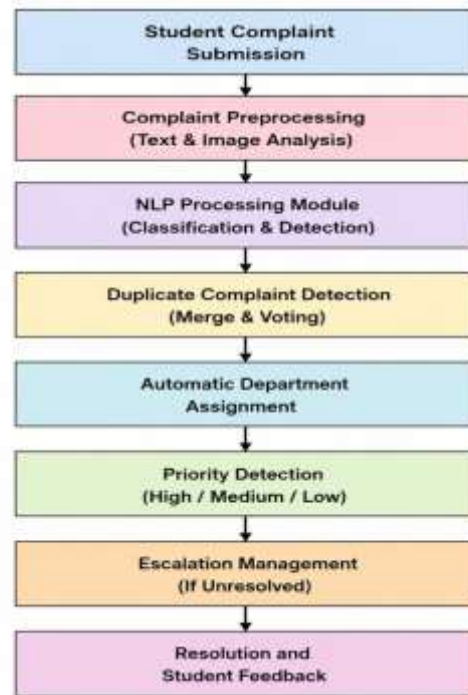


Fig1. This figure shows the methodology

4.1 Complaint Submission

The complaint management process starts when a student logs into the system and submits a complaint. The student provides details such as the complaint subject, description, and supporting images if required. The system also offers an anonymous complaint option for reporting sensitive issues such as ragging or harassment. Once submitted, the complaint is stored in the database for further processing.

4.2 NLP-Based Analysis

After a complaint is submitted, the NLP module analyzes the complaint text. The system examines keywords and phrases present in the description to understand the nature of the issue. This analysis helps in classifying complaints, identifying relevant departments, and determining the priority level of the complaint. The use of NLP reduces manual intervention and improves the accuracy of complaint processing.

4.3 Duplicate Complaint Detection

The system compares newly submitted complaints with existing complaints stored in the database. If similar complaints are identified, they are grouped together instead of creating separate records. Students can vote on existing complaints, allowing common issues to gain more visibility. This feature helps departments focus on frequently reported problems and reduces redundancy in complaint management.

4.4 Automatic Department Assignment

Based on the results of NLP analysis, the system automatically assigns complaints to the appropriate department. For example, complaints related to internet connectivity are directed to the IT department, while hostel-related issues are assigned to hostel management. This automation ensures that complaints reach the correct department quickly and efficiently.

4.5 Priority Detection

The system identifies urgent complaints by analyzing specific keywords and complaint content. Issues related to safety, security, emergencies, or critical infrastructure are marked as high priority. These complaints are highlighted for immediate attention, helping authorities respond quickly to important situations.

4.6 Escalation Management

To ensure accountability, the system continuously monitors complaint resolution timelines. If a complaint remains unresolved beyond a predefined period, it is automatically escalated to higher authorities such as the Principal or Administration Office. This mechanism prevents delays and ensures that complaints are addressed within a reasonable timeframe.

4.7 Resolution and Feedback

After reviewing the complaint, the concerned department takes appropriate action and updates the complaint status. Once marked as resolved, the student is asked to confirm whether the issue has been satisfactorily addressed. If the student approves the resolution, the complaint is closed; otherwise, it is reassigned to the department for further action. This feedback mechanism helps maintain service quality and ensures student satisfaction.

The proposed methodology provides a transparent, automated, and efficient approach to complaint management. By integrating NLP-based analysis, automatic routing, duplicate detection, and escalation mechanisms, the system significantly improves the overall complaint resolution process within educational institutions.

III. IMPLEMENTATION

5.1 Technologies Used

The Smart Student Issue Resolution System is developed using modern web technologies and software tools that ensure reliability, scalability, and

efficient performance. Each technology plays a specific role in the development and functioning of the system.

React.js

React.js is used for frontend development to create an interactive and user-friendly interface for students, departments, and administrators.

Node.js

Node.js serves as the backend runtime environment, enabling efficient handling of server-side operations and user requests.

Express.js

Express.js is used to build APIs and manage communication between the frontend and the database.

MongoDB

MongoDB is used as the database to store student information, complaint details, department records, and complaint status updates.

JWT Authentication

JWT Authentication provides secure user login and access control by allowing only authorized users to access the system.

Nodemailer

Nodemailer is used for sending OTP verification emails during user registration and authentication.

Natural Language Processing (NLP)

NLP is used to analyze complaint text, detect duplicate complaints, assign priorities, and automatically identify the appropriate department.

Cloudinary

Cloudinary is used for storing and managing images uploaded as supporting evidence for complaints.

Chart.js

Chart.js is used to generate graphical reports and dashboard statistics, helping administrators monitor complaint data effectively.

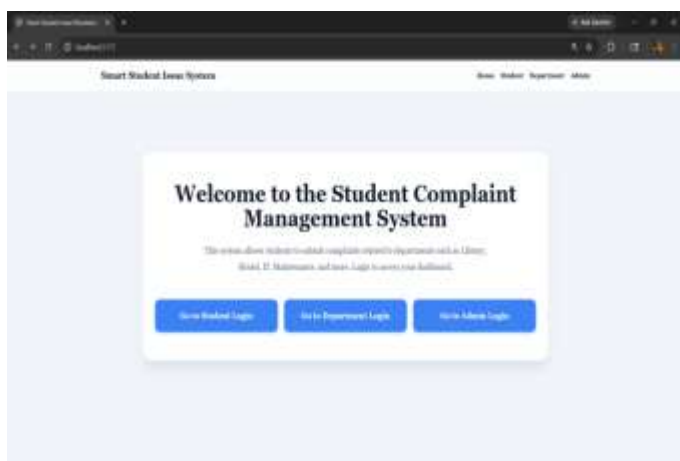


Fig 2 : Home page of the student issue resolution

5.2 Modules

Student Module

The Student Module allows students to register and log in securely using OTP verification. Students can submit complaints, upload supporting images, vote on existing complaints, track complaint status in real time, and submit anonymous complaints for sensitive issues. This module serves as the primary interface between students and the system.

Department Module

The Department Module enables departments to view complaints assigned to them and take appropriate action. Department users can review complaint details, update complaint status, mark complaints as resolved, reject invalid requests, and respond to student concerns. This helps ensure timely and effective issue resolution.

Admin Module

The Admin Module provides complete control over the system. Administrators can monitor all complaints, manage department accounts, handle anonymous complaints, and view overall complaint statistics. The admin dashboard helps track system performance and ensure accountability.

NLP Module

The NLP Module analyzes complaint descriptions to identify keywords and understand the nature of complaints. It performs complaint classification, duplicate complaint detection, automatic department assignment, and priority prediction. This automation improves efficiency and reduces manual work.

Escalation Module

The Escalation Module continuously monitors complaint resolution timelines. If a complaint remains unresolved beyond a specified period, it is automatically forwarded to higher authorities for further action. This ensures that complaints are addressed without unnecessary delays.

Analytics Module

The Analytics Module generates reports, pie charts, and statistical summaries based on complaint data. It helps administrators analyze complaint trends, monitor department performance, and make informed decisions for improving institutional services.

VI. RESULTS AND ANALYSIS

The Smart Student Issue Resolution System was successfully implemented and tested in a simulated institutional environment. The system efficiently handled complaint registration, routing, tracking, and resolution through an easy-to-use web interface. Students were able to submit complaints, upload supporting images, and monitor complaint status without any difficulties.



Fig 3 : Student dashboard interface when login accepted

The NLP module successfully detected duplicate complaints and reduced redundant complaint entries. Automatic department assignment improved complaint processing speed and minimized the manual effort required for complaint categorization. This ensured that complaints were directed to the appropriate departments quickly and accurately.

The priority detection mechanism effectively identified urgent complaints and helped authorities respond to critical issues in a timely manner. The escalation module further improved accountability by automatically forwarding unresolved complaints to

higher authorities whenever predefined deadlines were exceeded.

The admin dashboard provided clear visual insights through graphical reports, complaint statistics, and departmental performance analysis. Administrators could easily monitor pending, resolved, and escalated complaints, helping them make informed decisions and improve overall system management.



Fig 4 : Admin dashboard after the complaint

The anonymous complaint feature was also tested successfully and allowed students to report sensitive issues while maintaining their privacy. This encouraged greater participation and increased trust in the complaint management process.

Overall, the system demonstrated improved transparency, faster complaint resolution, enhanced student satisfaction, and better administrative efficiency. The results indicate that the proposed solution can significantly improve complaint handling processes within educational institutions by reducing delays, increasing accountability, and providing a more organized and user-friendly platform.

VII. CONCLUSION

The Smart Student Issue Resolution System provides an intelligent and efficient platform for managing student complaints within educational institutions. By integrating Full-Stack Web Development technologies with Natural Language Processing (NLP), the system automates complaint handling, improves transparency, and reduces the administrative burden associated with traditional complaint management methods.

The system enables students to submit complaints easily, track their progress in real time, and receive updates throughout the resolution process. Features such as anonymous reporting, duplicate complaint detection, automatic department assignment, priority classification, and escalation management significantly enhance the overall effectiveness of the platform. These functionalities help ensure that complaints are addressed promptly and routed to the appropriate authorities without unnecessary delays.

The platform also improves communication between students, departments, and administrators, creating a more accountable and responsive environment. The use of graphical dashboards and analytical reports allows administrators to monitor complaint trends and departmental performance efficiently. By reducing manual effort and improving workflow management, the system contributes to better service quality and increased student satisfaction.

Overall, the proposed system demonstrates how modern web technologies and intelligent automation can be effectively utilized to solve real-world problems in educational institutions. It provides a reliable, transparent, and scalable solution for complaint management while promoting accountability and timely issue resolution.

Future enhancements may include mobile application support, AI-powered chatbots for instant assistance, sentiment analysis for better complaint understanding, multilingual complaint processing, predictive analytics for identifying recurring issues, and cloud-based deployment to support larger institutions and multiple campuses.

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