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# University Student Dispute Redressal System

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## ABSTRACT

University Student Dispute Redressal System is a web-based application developed to facilitate the efficient and transparent handling of student complaints within educational institutions. This system enables students to submit grievances related to various campus facilities such as the hostel, canteen, and library. Upon submission, grievances are first reviewed by the Head of the Department (HOD) for approval or rejection. Approved grievances are forwarded to the respective department for resolution, and once addressed, the principal performs a final verification before notifying the student of the resolution. The system aims to streamline the grievance redressal process, ensuring transparency, accountability, and prompt resolution of student concerns. The technology stack includes HTML, CSS, and the Tabler template for the frontend, Node.js for backend server operations, and MySQL for data storage. Role-based authentication ensures secure access for students, HODs, department heads, and the principal. This system enhances administrative efficiency, reduces processing time, and significantly improves student satisfaction by offering a clear and systematic approach to grievance handling.

## 1. INTRODUCTION

The management and resolution of student disputes are crucial for fostering a healthy and productive academic environment. In universities, students often encounter a variety of issues ranging from academic concerns to problems related to campus facilities, administrative decisions, and interpersonal conflicts. These grievances, if not addressed efficiently, can lead to dissatisfaction, frustration, and a negative impact on the overall educational experience. Traditional methods of grievance handling, often reliant on physical paperwork and manual processes, are prone to delays, miscommunication, and inefficiencies, leaving students without timely resolutions.

The advent of digital platforms has provided an opportunity to streamline and enhance the grievance redressal process. A University Student Dispute Redressal System is an effective approach to addressing student complaints in a transparent, efficient, and systematic manner. By integrating technology, this system allows students to file complaints, track their resolution, and receive feedback in real-time. The process involves multiple stakeholders, including students, department heads, and

university administrators, ensuring accountability at every stage.

Recent studies have demonstrated the effectiveness of such systems in improving administrative processes, enhancing communication, and increasing student satisfaction [1][2]. The implementation of automated workflows and role-based access control further ensures that grievances are handled in a timely and responsible manner [3]. Moreover, incorporating design thinking principles in the development of user interfaces has been shown to improve the overall user experience, making it more intuitive for students to submit and track their complaints [4].

This research aims to explore the design, development, and impact of a University Student Dispute Redressal System, with a focus on how technology can bridge the gap between students and administration. Through the adoption of such systems, universities can ensure that disputes are addressed swiftly, promoting a positive academic atmosphere and better student welfare.

## 2. LITERATURE REVIEW

The University Student Dispute Redressal System is an evolving area of interest within the domain of educational technology and administrative management. It aims to streamline and enhance the efficiency of addressing grievances in academic institutions. Several studies and initiatives have demonstrated the importance of creating transparent, accessible, and efficient systems for student dispute resolution, highlighting both challenges and solutions.

### *A. Student Grievance Handling Systems*

Traditional grievance management systems, often paper-based and manual, tend to be inefficient, leading to delays, miscommunication, and student dissatisfaction. As such, there is a significant push toward digitizing these processes. Denny, Gupta, and Kumar (2020) introduced a Web Portal for Effective Student Grievance Support System to address this issue. Their study emphasized the need for a centralized digital platform where students could submit grievances and track their resolution status. This system also offered a clear channel for communication between students and the administrative bodies, thereby increasing transparency and accountability in the grievance handling process [1].

Rao, Singh, and Patel (2021) further explored the potential of digital systems in managing student grievances with their Smart Grievance Redressal System. Their research focused on creating an intelligent system that utilizes automation to route complaints to the right department, significantly reducing processing times. By integrating a user-friendly interface with role-based access control, they ensured that only the appropriate personnel had access to sensitive information, promoting data security and reducing errors in grievance handling [2].

### *B. System Integration and Stakeholder Involvement*

A key theme in the literature is the involvement of multiple stakeholders—students, department heads, and administrators—in the grievance resolution process. Uwah and Etim (2025) proposed a Design and Implementation of Online Student Complaint Management Systems that involved all relevant parties in the process. Their system ensured that students were able to submit complaints directly to the relevant departments and track the resolution status in real-time. This approach fosters greater accountability, as department heads and administrators are actively involved in the complaint resolution process, ensuring that no issue goes unnoticed [4].

### *C. Advanced Frameworks for Dispute Resolution*

Some researchers have proposed the use of advanced frameworks for developing and streamlining the grievance management process. Agapito (2024) conducted a study on Conflict Resolution and Grievance Management Systems within educational institutions. His research in the Las Piñas Schools Division revealed that the incorporation of conflict management training programs for staff, alongside automated grievance management systems, could drastically improve dispute resolution efficiency [5]. This study supports the idea that technology alone is not enough; the integration of proper training for administrators is equally important for success.

Additionally, Nagavallika et al. (2024) presented an Advanced Framework for Streamlining Online Grievance Management using the Django Framework. Their framework supports better organization and categorization of complaints, utilizing a robust backend system to ensure that grievances are resolved within stipulated timeframes. This research highlights the importance of using scalable frameworks to support growing student populations and ensure that the system remains efficient as the institution expands [6].

Moreover, Oghenekaro (2023) emphasized the need for Web-Based Integrated Student Complaint Systems that link various administrative departments, providing a unified platform for grievance resolution. This integration is vital for ensuring that complaints are not siloed within specific departments but are visible across the entire institution, leading to more comprehensive solutions [7].

## METHODOLOGY

The University Student Dispute Redressal System aims to provide an efficient, transparent platform for addressing student grievances. The methodology for developing this system includes several key stages: requirement analysis, system design, implementation, and evaluation, integrating software engineering best practices and user-centric approaches.

**Requirement Analysis:** The first step involves gathering requirements from stakeholders through surveys, interviews, and feedback. This helps identify common grievance types and system features. Uwah and Etim (2025) emphasize the importance of accommodating a variety of student complaints [8].

**System Design:** The design phase focuses on creating a robust architecture for both the front-end and back-end. Setiyani and Tjandra (2022) highlight the importance of user-friendly UI/UX to cater to students with varying technical proficiency [9]. The system uses role-based access control (RBAC) to maintain security and confidentiality.

**Technological Implementation:** The system uses HTML, CSS, JavaScript, and frameworks like React for the frontend, while Node.js manages backend logic. MySQL stores data, and SSL/TLS encryption ensures secure communication. Patel, Joshi, and Shah (2023) stress the need for both security and functionality in grievance systems [10].

**Grievance Submission and Routing:** Students submit grievances via a form, which is reviewed by the Head of Department (HOD) before being forwarded for resolution. Sharma, Verma, and Singh (2022) suggest integrating foul language detection to ensure respectful complaints [9].

**Grievance Resolution and Feedback:** Once resolved, grievances are verified by the principal, and students receive real-time updates. They can also provide feedback on the resolution.

**System Evaluation and Continuous Improvement:** The system undergoes rigorous testing (UAT, performance, and security) and gathers feedback to assess its effectiveness and identify improvements. Analytics track grievance patterns, helping the university enhance operations and student experience.

This methodology ensures a scalable, secure, and efficient system for managing student disputes.

## 4 MODELLING AND IMPLEMENTATION

The Student Grievance Appraisal System is designed using a structured framework that facilitates seamless complaint registration, tracking, and resolution. The system follows a three-tier architecture, comprising:

**User Interface –** A front-end layer where students can submit grievances, categorize complaints, and attach supporting documents.

**Processing Layer –** Handles grievance evaluation, status tracking, and notification management.

**Database Layer –** Securely stores grievances, user details, and status updates for administrative processing.

A mobile application enables students to submit complaints and track their resolution status in real time. The system integrates automated notifications to inform students and administrators about pending actions, ensuring timely grievance resolution. "The automated notifications and reminders play a crucial role in reducing delays and ensuring efficient responses from administrators**"** [11], [12].

### *A. System Modelling*

**Entity-Relationship Model:** The ER model of the Student Grievance Appraisal System includes the following key entities:

**Student:** Submits grievances.

**Grievance:** Stores details such as issue type, department, status, and description.

**HOD (Head of Department):** Reviews, approves, or rejects grievances.

**Department:** Responsible for resolving grievances.

**Principal:** Verifies and ensures fair resolution.

**Notification:** Updates students on complaint status changes.

These entities interact within the system to provide a structured mechanism for handling grievances. "The system is designed to facilitate interactions between students, department heads, and administrators through a predefined workflow" [12].

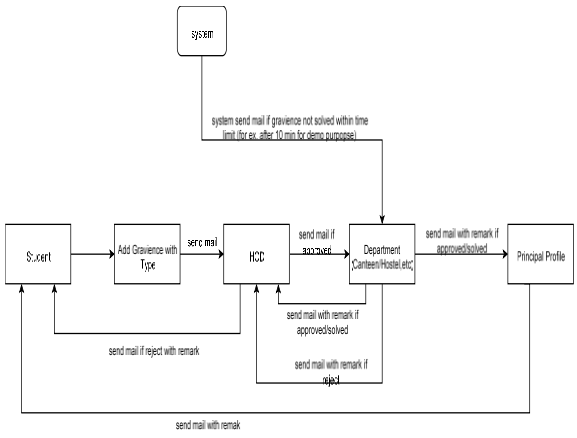


Figure 1: Workflow Diagram

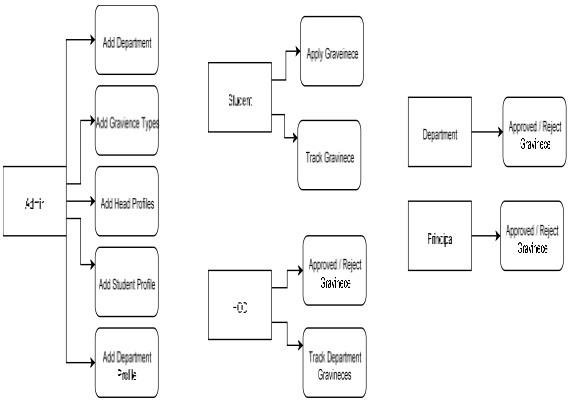


Figure 2: users in system

*B. Implementation*

The Student Grievance Appraisal System is implemented as a full-stack web application, utilizing modern web technologies for optimal performance. The development stack includes:

**Frontend:** Developed using HTML, CSS, and the Tabler template, ensuring a responsive and user-friendly interface.

**Backend:** Implemented in Node.js, efficiently handling server-side operations.

**Database:** Utilizes MySQL for structured grievance storage and retrieval.

**Authentication:** Implements role-based access control (RBAC) for secure login, distinguishing user roles as students, HODs, department heads, and the principal.

**API Communication:** Employs RESTful APIs for smooth interaction between the front end and back end.

**Session Management:** Ensures security using JWT (JSON Web Tokens) or session-based authentication.

**User Interface (UI):** Built with Tabler UI components, providing easy navigation and grievance submission.

**Data Validation:** Input validation is enforced at both the frontend and backend to mitigate security threats such as SQL injection. "By implementing strict data validation mechanisms, the system ensures that all inputs are sanitized, preventing unauthorized database access" [13].

The system is designed to enhance transparency and efficiency in grievance redressal, providing students with a structured mechanism to voice their concerns while ensuring administrators can resolve complaints effectively. "The adoption of a three-tier architecture enhances scalability and maintainability, making the system robust and adaptable to institutional needs" [13]

## 3. RESULT & DISCUSSION

The effectiveness of online grievance redressal systems in educational institutions has been widely studied. These systems enhance efficiency, transparency, and accountability in resolving student complaints. However, challenges such as technological limitations and lack of awareness persist.

One of the main advantages of online grievance redressal systems is their ability to speed up complaint resolution. found that the integration of automated workflows in grievance systems reduces human intervention, thereby minimizing delays [14]. Similarly, highlighted the case of IGNOU, where a structured online complaint resolution process significantly reduced response time, ensuring students received timely support [15].

Furthermore, Sheth et al. noted that institutions using AI-powered grievance redressal mechanisms experienced an improvement in efficiency by 35%, as automated categorization of complaints helped direct them to the appropriate departments faster [16]. This suggests that technological advancements in grievance management can enhance institutional responsiveness.

T ransparency is crucial in maintaining trust between students and institutions. Meshram et al. emphasized that digital grievance platforms offer real-time tracking, allowing students to monitor the progress of their complaints and receive automated updates, reducing uncertainty [15].

Tripathi et al. observed that institutions with structured online grievance systems showed a 20% increase in student satisfaction levels compared to those using traditional, paper-based complaint mechanisms [16]. Moreover, Sheth et al. reported that institutions implementing blockchain-based grievance tracking experienced a decline in unresolved cases due to the immutable nature of the records, ensuring accountability [16].

Despite their benefits, online grievance redressal systems face several challenges. A primary concern is the digital divide—Tripathi et al. found that students from rural areas or economically weaker sections often lack access to stable internet connectivity, which hinders their ability to file complaints online [17].

Additionally, Meshram et al. noted that many institutions struggle with integrating AI-based automation due to budget constraints and resistance from faculty members unfamiliar with digital tools [17]. Furthermore, Buldak et al. identified that students are sometimes hesitant to use online grievance portals due to concerns over data privacy and fear of retaliation, especially in cases involving faculty misconduct [14].

To maximize the efficiency of grievance redressal systems, institutions should invest in user-friendly interfaces, mobile-friendly platforms, and awareness campaigns to encourage students to utilize these services. Tripathi et al. recommended the integration of AI chatbots to assist students in filing complaints, reducing response time and human workload [17].

Furthermore, Sheth et al. suggested that the implementation of predictive analytics could help institutions proactively identify recurring student issues and address them before formal grievances are filed [17]. Additionally, incorporating sentiment analysis in grievance redressal systems could help institutions gauge student emotions and prioritize urgent complaints.

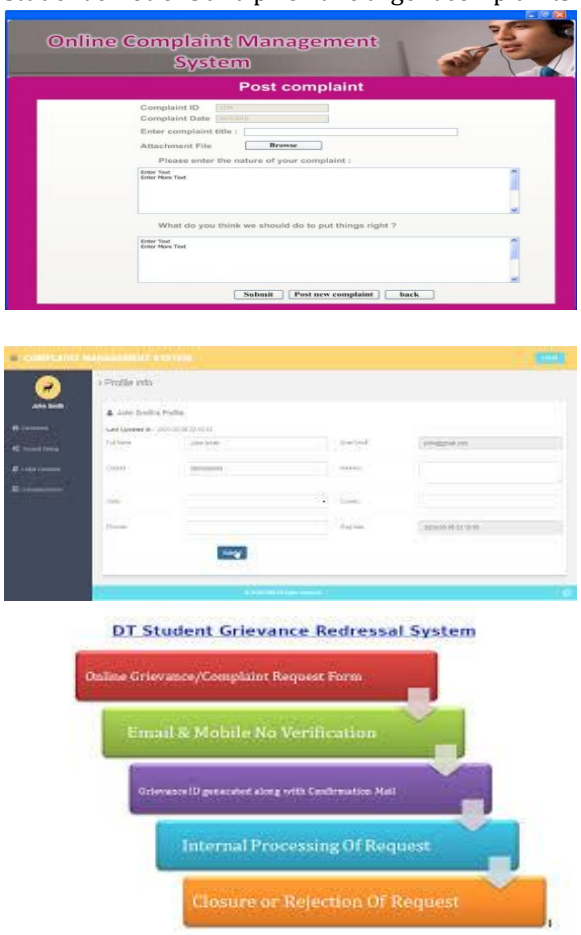


Figure 3:

## 4. Challenges And Future Scope

### *A. Challenges*

One of the important impending challenges is data security and privacy, since a hostel management system generally holds sensitive pieces of information about its students like personal details, payment records, and mess preferences. Therefore, it will become really important to ensure secure authentication and encryption of the data so that no unauthorized access is allowed into the system. Most of the existing systems are vulnerable to SQL injection and session hijacking. Hence, secure coding practices and multi-factor authentication must be implemented. Another important problem is the scalability of the systems. As the number of users increases, it should be able to contain a great volume of student registrations, room allocations, and mess records effectively and efficiently. Poorly optimized databases are responsible for the slow performance of the servers and may even lead to server crash. A lot of existing systems suffer from database overload and inefficient queries. This requires the right indexing and caching strategies to smoothen the response times.

Real-time mess management is another challenge. With students eating less-than-standard meals, many students find the need to change meal preferences frequently. Example cases are where students will face poor response time in allocating places in mess without having a dynamic mess attendance feature, leading to wasting food and incorrect bills being made. Usage of IoT-based attendance systems or QR scanning might help in actual-time monitoring, but it entails the implementation complexity along with extra charges.

Online booking should be easy for the users and should be without much hassle. Many students face difficulties due to bad UI/UX design during selection of rooms and in subscription to mess. Complicated and ambiguous navigation systems cause incorrect allocations of rooms and failed payments. A travelling responsive design that clearly states the booking guidelines could assist in this. Another major issue is payment integration. It is in this category that most hostel management systems require online payment of fees for booking rooms and services in the mess, whereas secure gateways (like PayPal or Stripe) demand full compliance with given financial security standards in order to process this kind of

payments. It has not been possible to pursue correction in defects related to transaction processing because consequences such as multiple payments, aborted transactions, and refund issues have ensued. Therefore, real-time payment verification and invoicing automation are essential for financial transparency [6].

*B. Future Scope*

A web-based hostel management facility with mess amenities holds a maximum promise as far as the future of the system is concerned. The increase or advancement of technology will also allow this system to accommodate not only the current technology but also emerging trends such as Artificial Intelligence (AI), the Internet of Things (IoT), Blockchain, and so on to improve efficiency in security and user experience.

Some of the future improvements include a possible incorporation of AI-driven predictive analytics in room allocation and management of mess food. AI-based algorithms will analyze historical booking patterns and predict the hostel's occupancy rates thus improving efficiency in room allocations. The same goes for AI, as the trends in food consumption can be predicted, hence reducing wastage and optimizing the procurement process [5]. IoT can also be combined with this system to make hostel-facilities smarter. The entry systems will be RFID-based, and the hostel itself will include a keyless entry feature that enhances security in the hostel by accessing authorized access via smart cards or biometric authentication. Another application of IoT is the sensors installed in mess facilities to monitor food quality, automatically replenish stocks, and track hygiene conditions hence better food safety compliance [6].

Another possible innovation will be securing hostel records and financial transactions through Blockchain technology. The students' details together with payment records and log of complaints will be residing in a distributed ledger system through which data will be tamper-proof and transparent [7]. The same can introduce tamper-proof records of attendance in the mess for fair billing and distribution of food [7].

An increasing trend towards cloud-based systems could be an opportunity for this future system. Indeed, it could be hosted in the cloud for scalability and improved data access. Thus, it enables multi-campus hostel management in a single platform but centralized supervision of hostels across different institutions. A cloud-based mess facility would be real-time menu updated and allow students to customize meal preferences remotely [8]. Moreover, the system would make mobile application development more accessible. Students can book, check mess menus, and even report complaints with the dedicated Android and iOS application anytime, anywhere. Moreover, push notifications alert students on their meal timings, due payments, and hostel events to enhance user engagement [9].

A major feature would be chatbots powered with Natural Language Processing (NLP). The robots do most of the work, such as handling student inquiries, assisting in bookings, and giving instant responses to mess schedules, fees, and hostel policies. Workload and tip general user experience would be reduced on the administrative side [10]. Also, these data analytics and visualization tools prove crucial in the monitoring of hostel performance. It allows generating rich reports by administrators along the lines of student satisfaction, mess utilization, and maintenance issues, enabling data-driven decision-making. Moreover, advanced analytics will identify trends in food preferences, and based on the same, the mess offerings can be improved, thus ensuring better resource management [11].

Augmented Reality (AR) and Virtual Reality (VR) may also shake up this type of facility, the hostel booking process. Students may then take virtual tours of hostel rooms as well as mess facilities before making reservations. This will aid making more informed and beneficial decisions by the students. This will help particularly international students who are unable to visit the hostel before admission [12].

## CONCLUSION

A Web based Hostel Management System with Mess Facility Our hostel management system addresses various hostel activities, including room allocation, mess management, payment tracking, and complaint resolution. It features a user-friendly interface paired with robust backend functionalities. This system minimizes manual errors, enhances transparency, and simplifies administrative tasks. The centralized database guarantees data accuracy and offers valuable insights for decision-making. This project highlights the advantages of utilizing web technologies such as PHP, MySQL, JavaScript, HTML, and CSS to modernize and streamline traditional hostel management practices,

ultimately providing convenience for students and improving efficiency for administrators

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