IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

An Efficient Priority Based Student Grievance System Utilizing Artificial Intelligence

Mrs. JB. Pradeepa[1], V. Charumathi[2], M. Atchaya[3]
Assistant Professor, Department of Computer Science and Engineering[1]
Students, Department of Computer Science and Engineering[2,3]
Anjalai Ammal Mahalingam Engineering College, Thiruvarur, India
pradeepabalaguru@gmail.com[1], charuvengat2003@gmail.com[2], atchayamohan77@gmail.com[3]

Abstract: *Currently, most of the universities and colleges have an existing system for student grievance. It is semi-electronic or manual and it is not efficient, transparent or with escalation steps. Each complaint is handled in first come, first served mode without assessing the severity or urgency of the grievance. Such a mechanism results in delay, dissatisfaction, lack of communication between students and authorities and also the failure of the system to provide foolproof mechanism to the students to know whether or not the grievance is genuine or not, hence creates distrust problems in the management of complaints. To mitigate such issues, this project proposes an Artificial Intelligence (AI) based Student Grievance Management System leveraging Natural Language Processing (NLP) and Blockchain Technology. The proposed system enables students to file a complaint through a computer interface. Using NLP processes, the text of each complaint is processed to extract the relevant information, sentiment analysis is performed, and the complaints is classified as high priority, medium priority and low priority. It ensures that the priority of an emergency case is given priority while the priority of a regular complaint gets prioritized while the urgency of the concern is not taken into account. The transparency and tamper-resistance are maintained as all the complaints are recorded on a blockchain ledger. This records every change in the status or response from departments, thus we have a track-able record of the complaint. Therefore, both students and administrators can know the situation on the basis of the complaint status in real time. Furthermore the integration of Blockchain technology provides security and trust. The priority system based on AI creates an efficient and responsive mechanism for handling complaints*

Keywords: Grievance Management System, Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), Blockchain, Sentiment Analysis, Student Engagement, Data Security, Administrative Dashboard, Multi-Language Support, Mobile Application, Cloud Storage Integration, Real-Time Monitoring, Automated Routing

I. INTRODUCTION

A grievance system at schools Especially the colleges and universities must be well designed transparent and efficient to deal with complaints, problems, and issues. There are many complaints like these, regarding academic, student agitation, governing board, infrastructure, hostel facilities, harassment by faculty and vice versa. As is normal in our society, students complain about school manually using physical forms, suggestion boxes or email. Such complaint form submissions are laborious, incomplete, and not well structured. Students are not aware of how they can escalate their complaints, and the report takes too long to get them resolved. The lack of intelligent automation in such form submissions results in pre-filing for problems and having them put in the queue in a day or so, whereas in proper online mechanisms, complaints can be done automatically and sent to arbitrary teams in real time. Such types of problem filing process can result in human error, favoritism, or complete lack of response.

A major shortcoming of these systems is their inability to differentiate between the severities of complaints. For instance, a minor issue like a classroom maintenance request may get resolved before a serious harassment case simply

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

because it was logged earlier or by someone known to the authority. This "first-come, first-served" or manually filtered process can cause major distress among students whose critical issues are delayed. In addition, the lack of data traceability and transparency means that students often do not receive timely updates, and there is no accountability from the administrative side. Many times, complaints are either lost in communication or mishandled, with no auditable proof of what actions were taken and when.

To overcome these limitations, the proposed project implements a smart, artificial intelligence-based grievance system with the help of NLP to process the analysis, classification, and prioritization of the complaints automatically. When a complaint is received in natural language from a student, the system employs NLP algorithms to parse the tone, sentiment, and keyword to identify the complaint urgency and therefore set a priority level (High, Medium, or Low) based on how severe and what the context is. Sentiment analysis and keyword extraction from TF-IDF or transformer-based models is employed to pull outnot just what is said, but also how it is said. Therefore, using this system, important complaints get automatically routed to the concerned department and get fixed in time.

Not only is this project applying smart processing, this project utilizes the blockchain system so that the recording is tamper-proof and visual complaint tracking. Once a complaint is sent in for processing, the metadata surrounding the complaint (ID, hash of content, current status) is placed upon a permissioned blockchain ledger. Any alteration(s) to the complaint (change in status, etc.) is also posted as new transaction; this provides a clear and chronological chronology of all the transactions (so no unauthorized changes can be made and nobody can take cover behind it). Students can actively see what's happening at present in the progress of their grievances, which increases transparency and trust of the system.

Blockchain and AI modernize the process of complaint and encourage a culture of transparency, fairness, and accountability within the organization. Blockchain and AI reduce human intervention, eliminate bias, and ensure all complaints are treated without any concealed modifications. This strategy is simple to implement on a large scale, maintains things secure, and supports the process of going digital in current education systems. Finally, this project will build a system for addressing grievances that will empower students, make admin more effective, and sustain the principles of justice and honesty in colleges and universities.

II. RELATED WORK

Rao et al. [1] reported a voice-input grievance categorization system with NLP integration using pre-processing algorithms such as stemming and lemmatization. Although their system was made for spoken data we implement the system for written data using their low-power pre-processing pipeline for best performance.

Rawat and Kaushik [2] proposed an Indian Railways plugin for NLP learning of complaint semantics from tweets. This work in itself was the inspiration to our real time complaint tracking module, especially in investigating incoming student complaints coming from feedback portals or online surveys.

Singh et al. [3] had used sentiment analysis and NLP classification algorithms to identify the emotional tone of user-posted complaints in online forums. Our model combines their aspect-level sentiment detection framework to identify the emotional tone of the complaint (and therefore its urgency).

As noted by Jin and Aletras [4], transformer-based networks (BERT) were used in social complaints with very high F1 scores to identify complaint domains. Here, we apply an identical transformer-based approach trained on domain-specific educational data to help categorize complaints with respect to context.

Banga and Peddireddy [5] proposed an AI-based complaint pattern recognition system for customers complaints, using their clustering method our complaint history analysis module could identify patterns of customer complaints that are repeated with a high frequency and rank them accordingly for resolution time.

Hussain et al [6] proposed an automated university system based on Nave Bayes and SVM. While their system was rudimentary, it didn't have a priority mechanism and a secure ledger, whereas our work includes blockchain for the purpose of tamperproof monitoring and an hybrid sentiment + classification model for the purpose of prioritizing based on urgency.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

Tripathi et al. [7] have study the web based grievance redressal system of IGNOU and has proposed integration with AI, this paper is a direct refutation of their proposal by automatically processing the complaints, sentiment analysis and priority setting using machine learning.

Roy et al. [8] used NLP to handle rural complains in local languages using the local text-handling method; we employ local text-handling in our system to support multilingual grievance filing for students of different linguistic backgrounds.

Lee et al. [9] suggested a grievance classification system for healthcare, and based on their multi-label framework our system provides a way to categorize different kinds of issues (e. g. hostel, academic, administrative) on each grievance to better routing.

Preotiuc-Pietro et al. (2009) proposed social media grievance detection using annotated data and we leverage their annotation schema to categorize labeled datasets and trained the classification model with academic domain-specific labels.

Venkatesh et al. (2011) proposed RE-GrievanceAssist with multi-agent AI pipeline, and their module-based architecture further leads to our system architecture, in which modules for complaint ingestion, NLP processing, priority scores, and blockchain tracking are implemented.

Das et al. [12] proposed an order priority model using text mining and sentiment polarity and we extend their scoring in our system to an urgency-weighted model with respect to complaint type, sentiment strength and institution impact.

CNN and TF-IDF were used by Alamsyah et al. [13] in their large scale bank complaint classification effort. We derive our system from their hybrid feature extraction pipeline but in specific to college-specific taxonomies and class imbalances.

Qurat-ul-ain et al. [14] developed a hybrid model (SVM, Naive Bayes, RF) for the classification of e-complaints. Comparing their methods the baseline implementation adopted the Nave Bayes model for base case because of its accuracy and reasonable training time on text grievance data.

Das et al. [15] used repeated prioritization of public complaints via sentiment analysis as their baseline, here we extend this model with context-aware embeddings and complaint source verification to help improve the mapping of credibility and urgency.

III. EXISTING SYSTEM

Most colleges now have some form of digital platform for handling student complaints. These systems make it easier to file a grievance, but they still have some major gaps. One big issue is that complaints are usually handled in the order they come in, without looking at how serious each one is. So, something urgent might get stuck behind a bunch of smaller problems just because it was submitted later.

Another common frustration is not knowing what's going on after you've submitted a complaint. Students often don't get any updates or feedback, and there's no way to track the status. This leaves them wondering if anyone even saw it, or if it's just sitting in a queue somewhere .

Even though these systems are digital, they don't actually "understand" the complaints. They just store them. There's no smart feature that can figure out how urgent a problem is or sort them based on what really matters. In busy institutions, this can slow everything down and make students feel like their concerns aren't being taken seriously.

IV. PROPOSED SYSTEM

The proposed system reflects an AI-powered student grievance redressal system that replaces a conventional first-come-first-served (FCFS) process model for preference-based complaint handling; it utilizes Natural Language Processing (NLP), sentiment analysis, machine learning, and blockchain technology for automated handling, prioritization, and monitoring of complaints. It is meant to be a modular design comprising web-based user interface, text preprocessing pipeline, sentiment analysis and classification module, blockchain ledger, and administrative dashboard.

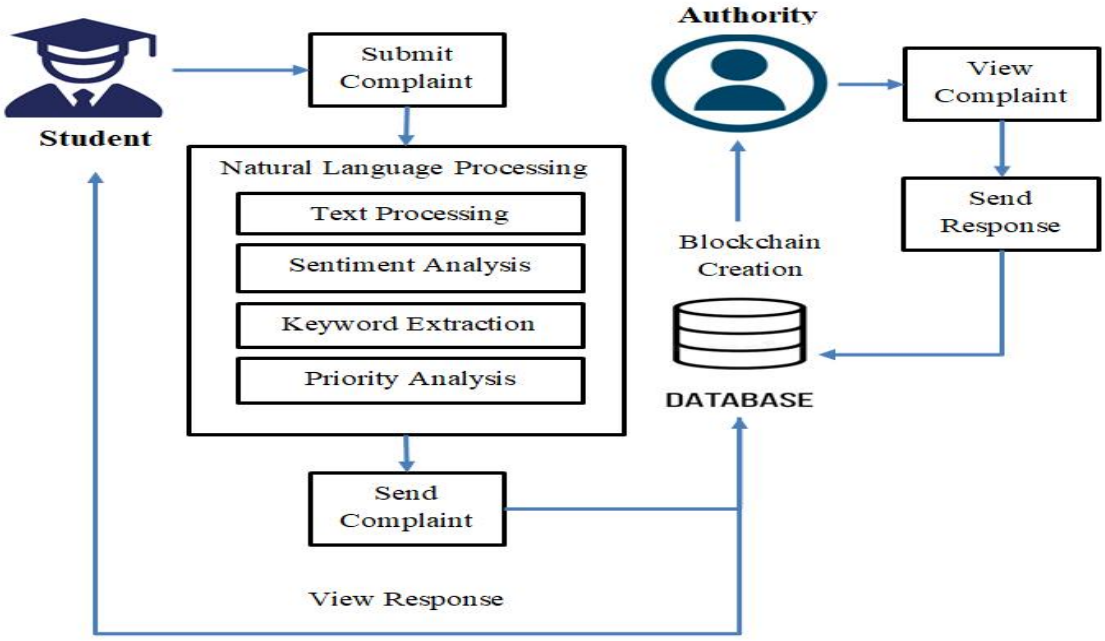
As first step, students communicate with the system via a safe, user-friendly Web portal, which is developed with HTML, CSS, JavaScript and Flask. Complaints received by this system are stored in the backend and preprocessed by

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

NLP methods like tokenization, stop-word elimination, stemming and TF-IDF vectorization. Preprocessed text is then processed by a Naive Bayes classifier which takes sentiment polarity and emotional urgency into account to calculate a priority level (High, Medium, or Low). At the same time, the system determines classification of a complaint according to predefined categories such as Academics, Infrastructure or Administration, using supervised machine learning algorithms.

For greater security and immutability of complaint records, each complaint also sits on a private blockchain which contains complaint metadata in the form of an ID, timestamp, priority level and a hashed summary of the complaint text itself. Each block is cryptographically linked to the last and as such is a chain which is virtually impossible to tamper with. Complaints are routed to the appropriate target department depending on category as well as priority and administrators can see them via a dynamic dashboard that allows filtering and a prioritized response.

In addition, students are informed about the status of their complaint in real time and via notifications. The administrative actions trigger an automatic generation of the statuses “Received”, “In Progress”, “Escalated” and “Resolved” – which are displayed on the student dashboard and sent via email or SMS notifications. The combination of NLP, AI based classification, and blockchain logging allows to achieve better transparency, fairness and efficiency in handling student grievances.



V. METHODOLOGY

The method in this work is designed to develop a safe and intelligent grievance resolution system besides conventional first come first served paradigm. The proposed system uses natural language processing (NLP), machine learning and blockchain technologies to automatically categorize the complaints of students, prioritize them and securely record them. Methods followed include several stages including data preprocessing, sentiment analysis, category definition, blockchain integration, application deployment and status tracking.

Data Acquisition and Preprocessing

The First of all, we collect all student grievances from academic grievance websites in a form similar to "plaintiffs" and enrich the dataset with "synthetic data" to compensate for class imbalance. Each grievance is preprocessed using common NLP methods for semantics: that is, we tokenize the page to remove all stop words (high-frequency terms that do not have much semantic meaning), stemming and lemmatization (in order to reduce words to their base or root form)

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 2, May 2025 Impact Factor: 7.67

and convert to vectors. For each complaint we use the term frequency-inverse document frequency method to convert to a vector that we can input to machine learning algorithms.

Sentiment Analysis and Priority Classification

In addition to deciding severity of the complaints, a sentiment analysis is done by a supervised machine learning classifier trained by Multinomial Naive Bayes algorithm to determine the emotion of the complaint as positive, neutral or negative. Deduced from the sentiment score and the presence of critical keywords, each complaint is assigned a priority level (high, medium, or low). The high priority is given to the complaints with high emotional distress or the complaints that point to safety issues (e. g. harassment, safety, infrastructure failure): the system can identify and effectively resolve critical issues better than a time-based queue.

Complaint Categorization

Once the priority is determined, complaints are classified in predefined categories (academic, infrastructure, administrative, disciplinary or general problem) and supervised machine learning model is applied on labeled data. Keyword based heuristics are also applied to improve classification accuracy for sensitive complaints (in cases where the text of the complaint is unclear). Categorization makes it possible to automatically route complaints to the department concerned, resulting in a reduction in human triage time.

Blockchain Integration

First preserving data integrity and traceability - use private blockchain network. Every complaint is stored in a block with its complaint ID, timestamp, category, priority and a cryptographic hash of the content of the complaint. The blocks are chained based on SHA-256 hashing thus forming an tamperproof record chain The blockchain design guarantees that no unauthorized changes are possible and gives the public, open record of all complaints received. Any modification to the content of the complaint breaks the hash chain which indicates possible tampering.

Web Application Development

A full-stack web application is created as the main user interface. Frontend is achieved with the use of HTML5, CSS3, and JavaScript to make the application responsive and user-friendly. Backend is created with the use of Flask (a web framework for Python), and SQLite or MySQL is used to store data. The web application has user authentication, complaint submitting, and dashboard views for both administrators and students. It also incorporates the NLP pipeline and blockchain logging system to enable convenient, real-time operation.

Real-Time Monitoring of Status

It has a notification system that provides updates on complaint status to the students through email or SMS. The statuses like "Submitted," "In Review," "In Progress," and "Resolved" are updated automatically following administrative actions in the dashboard. The updates are also available on the user interface and in the blockchain, keeping synchronization between frontend, backend, and the unchangeable record.

VI. IMPLEMENTATION ALGORITHM

A. Natural Language Processing

Natural Language Processing (NLP) is the intelligence of the system to enable it to understand and analyze student grievancesThe system preprocesses and normalizes the input data by passing the text (grieve) through a number of preprocessing operations that include tokenization of the text into words, removing stop words, and stemming of words into their root form.

Following this preparation, the system determines the level of emotion in the grievance and classifies it either positive, negative, or neutral, using a scoring system (i. e., from 1 to +1), so a higher degree of negative emotion relates to the need to address it earlier in the grievance processing. The system uses a technique called Term Frequency–Inverse Document Frequency (TF-IDF) to find the significant words or themes in the grievance, such as "exam result", "hostel problem", "harassment".

Those attribute values then come to the use of a trained machine learning classifier (e. g. Logistic Regression, Support Vector Machine (SVM), Random Forest, or Neural Network) to choose between High / Medium / Low class, the classification based on the attributes of the complaint i. e. sentiment score, existence of word urge such as Urgent / Emergency, and length of the complaint (this segment is essential to understand priority of urgent complaints).

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

B. Blockchain Creation

The Blockchain Creation module provides an assurance for the integrity, security and transparency of the complaint life cycle: following submission each complaint is recorded on a private blockchain ledger using smart contracts. The captured data comprises complaint ID, timestamp, priority level and a cryptographic hash of the complaint document.

Once it has been determined that a complaint is no longer valid, or when an internal decision has to be made, the subsequent data and documents needed to make that decision are simultaneously recorded as non-transmissible transactions done by the blockchain technology. This methodology helps ensure no unauthorized attempts to edit or delete the record of the complaint and ensures the highest level of trust and accountability.

VII. MODULE OVERVIEW

A series of modules composed of the six core modules are interlinked within a system pipeline to give effective, automated and secure grievance resolution, each module doing its own special job – from initial contact with users to data storage – in an attempt to achieve minimum manual intervention and scalability of the system.

A. INTERFACE CREATION

A simplistic front end for students and administrators can be created in the Interface Creation module. Students will be able to securely register, log into and lodge complaints in a neat and responsive web or mobile interface. File attachments i. e. image or document can be added to the complaint forms and features like complaint history and status monitoring can be built in.

Admins also get a specific dashboard where they can see, filter and respond to complaints by priority, department or category. UX was made very easy (and usable for non-technical people) to make it accessible to a wide audience.

Secure login using password management and restrict access (only authorized users can modify the system) This module is the main communication channel between users and the backend (details of proper grievance management from registration to disposal are handled by this module).

B. COMPLAINT POSTING

The Complaint Posting module gathers complaints submitted by students from the user interface and sends them to the grievance processing server. The module reads natural language complaints and puts the information into a form for the complaint post. This includes things like complaint category, description, urgency, department (if available) and optionally attachments. Once submitted the data goes through a initial validation procedure before being processed. The Complaint Posting module is very important as it begins the grievance processing process as the module will organize the data gathered in a normalized format after it's sent to the NLP module. The mechanism of posting the complaints ensures that each complaint gets a unique ID and a timestamp so that the records within the system can be kept consistent. In addition, the complaint is temporarily stored in a secure database before being hashed and written on the blockchain. The student receives a confirmation message upon successfully submission. It's a great tool that makes it easy for the students to raise their concerns and does so regularly.

C. AUTOMATED GRIEVANCE ANALYSIS MODULE

The NLP (Natural Language Processing) Processing module is the heart of the system where complaints are processed and interrogated using AI methods. The module receives the raw complaint text and executes initial preprocessing operations such as tokenization (breaking a complaint text into words), stopword removal (removing common words which do not contribute to understanding of the content), and lemmatization (converting words to their root form). Once the data is cleaned, the system performs sentiment analysis to determine whether or not the complaint is emotional in nature. If the complaint is emotionally frustrated or contains urgent rhetoric it will most likely be classified as high priority. The module also conducts keyword and topic extraction via techniques like TF-IDF (Term Frequency–Inverse Document Frequency) to discover keywords like "harassment", "fees issue", or "internet problem". Finally, the features extracted (sentiment score, urgency keywords, complaint length) are fed into a machine learning classifier that classified the complaint as High, Medium, or Low priority. This smart classification ensures efficient handling and prioritization of complaints by the admin panel.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

D. SECURE GRIEVANCE RECORD SYSTEM MODULE

The Blockchain Creation module is responsible for storing and protecting complain data in a way that is decentralized and tamper-resistant. After the NLP module is notified of a complaint and is assigned priority, its complaint metadata (complaint ID, timestamp, content hash, and status) is converted into a blockchain transaction which is written on a private or permissioned blockchain. These contracts define the issue registration, status, and access control logic associated with a complaint. Every block on the chain contains a cryptographic hash of the previous block, thus forming an indestructible chain of complaint history. Any modification in the complain data would be accompanied by a change of the hash and this would alert the system to potential tampering (data integrity). With status updates ongoing, new transactions are added to the blockchain, thus creating a complete timeline on-chain of complaint resolution actions. This allows students and administrators to fully view each action on a complaint and also build up confidence that the systems fairness and integrity can not be tampered with or deleted.

E.COMPLAINT PROCESSING

The Complaint Processing module is the first step to administrative action and decision-making. Once the complaint has been described as a priority and given a priority, the module forwards it to the appropriate department/administrator that corresponds to the complaint. If the complaint refers to “hostel” that is sent to the Hostel Department, and if it refers to “exam” that is sent to the Academic Department, priority complaints are added to the admin dashboard. The priority complaints are in the front-of-the-admin dashboard, so that the actions being taken for them will be much faster. The module also sets the workflow status of the complaint to “Received” and waits till the authority takes the first action on them. Complaint queues are dynamically managed in a fair way (but has priority where applicable) and handled with urgency when applicable for an urgent problem. The module stores the metadata of the complaint (priority, department associated, complaint category) to the database and forwards the complaint to the blockchain so that it makes it to the step where it gets processed. This module helps automate the process and prevent delays related to the manual forwarding/filtering of complaints. So that the system responds very quickly.

F. UPDATE STATUS

The Update Status module allows authorized staff (e. g. grievance officers or department heads) to update complaint status as they process the complaints. What’s more, each status change is not only stored in the system database but also written into the blockchain through smart contracts to create an audit trail so that after a status change it cannot be modified without trace.- Any student is informed by e-mail, SMS or in-app notification when their complaint status has been modified, thus increasing transparency and credibility for the administrator. The admin interface gives access to batch update, filtering by complaint status or department and instant visibility of open and/or high priority cases. This module completes the feedback loop. By keeping administrators up-to-date and providing students with information, it keeps the system intact, allowing timely action to be taken on student issues, as well as traceability of every action.

VIII. EXPERIMENTAL RESULT

Implementation of the proposed AI-based Student Grievance Management System has proven to be a big improvement in comparison with old grievance redressal methods: in particular, with regard to automation, transparency, response time and satisfaction by students.

One of the most helpful responses to this has been the use of sentiment analysis and natural language processing to determine the tone and urgency of complaints about students so that the system can prioritize complaints by emotional intensity and category so that critical problems are addressed as promptly as possible, and as much attention as possible is paid to them.

- Prioritization and classification of grievances It has been critical to improving the effectiveness of the grievance process as by automatically sorting grievances and sending them in the proper departments, we have been able to reduce delay and administrative cost and have given students a quicker response time.

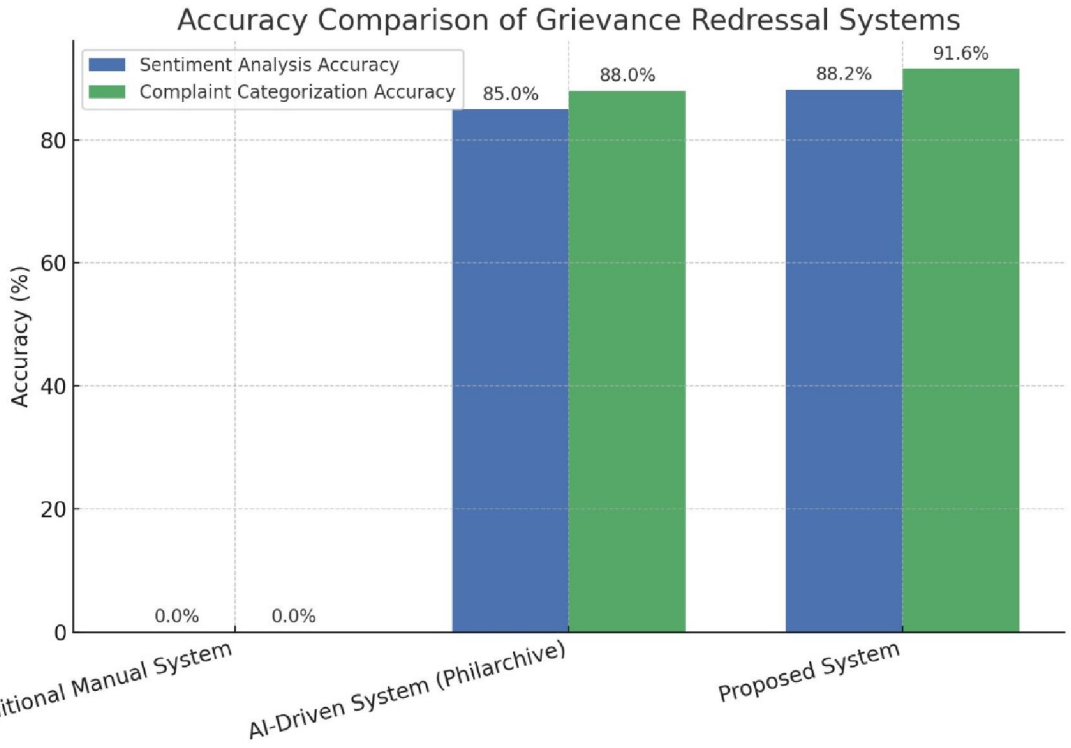
Another significant innovation in the system is the use of blockchain technology for storing information related to grievance resolution. In an organized system whereby a grievance is resolved, the relevant information is hashed and

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

stored on the blockchain. This makes it impervious and traceable. Gathers also establish institutional credibility by guaranteeing the authenticity and immutability of all grievance records.

It also provides a fully featured dashboard where Administrative users can see the real-time trends in current grievance activity, department performance and current resolutions. This way they can make informed decisions to address issues, improve their current response practices and respond to high priority problems.

Compared with traditional grievance management systems AI-based solution offers better security, efficiency and transparency. In addition cooperation between AI and blockchain not only reduces time used for grievance processing but also creates an institution accountability record which can be audited.



IX. CONCLUSION

Finally, the proposed system, a highly efficient and secure process for addressing student complaints in educational institutions is provided. By using advanced sentiment analysis and natural language processing coupled with intelligent reasoning abilities, the system can accurately categorize and prioritize complaints, thus timely addressing of such complaints will prevent costs from increasing significantly. Through the application of AI, the grievance management system will automatically send the complaints to the appropriate departments, improving the grievance resolution process.

Another great feature of this system is their use of blockchain technology to store grievance records which can be trusted and cannot be altered. The secure and tamperproof storage not only provides transparency but also creates trust and accountability as students and administrators can view and audit grievance records at all times.

The system also provides administration users with a live dashboard to view trends in grievances, monitor resolutions, and make data-driven decisions to improve overall student satisfaction, faculty/staff effectiveness, and response time.

Back to Future: The system could be upgraded to provide predictive analytics that will provide information about trends in risky grievances and allow for more proactive grievance management. The system could also be expanded to support multi-language environments (to enable larger numbers of students to use the system) and integrated into other campus management systems to make it easier to roll out.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

Overall, the AI-assisted grievance management system significantly improves the efficiency, transparency and effectiveness of grievance processing in educational institutions and makes a valuable complement to student support services.

X. FORTHCOMING DEVELOPMENT

In future, the development of the proposed AI-powered Student Grievance Management System will probably be focused on the implementation of several key upgrades to improve functionality and user experience. One such improvement is that the proposed system would incorporate personalized grievance handling — whereby the system automatically considers each student's grievance history and recommends a customized resolution or support resources which will tailor it to the students' needs and priorities.

Moreover, it would also be possible to incorporate advanced analytics to identify the trends in the numbers of grievances and give the institutions actionable insight into what may be the underlying cause of the grievance which would help them take corrective measures before the grievance escalates and will also result in higher efficiency of the grievance process and improved satisfaction in the system among students.

We are also planning to add multi-language support to our platform to accommodate a wider cross-section of students from different language groups, so that they can submit grievances and get responses in their native language, this way ensuring equal accessibility for all students globally.

Mobile application development is another area in which we intend to develop the system, as would allow students to submit grievances, track down complaints and receive notifications from us directly on their mobiles increasing their accessibility and flexibility.

In terms of scalability, cloud storage integration will be implemented to improve data management and ensure that the system can accommodate an increased volume of grievance data securely. Cloud integration also enables reliable, long-term access to grievance records, which in turn will make data storage and retrieval more efficient.

Furthermore, the use of voice interaction in the grievance submission process may also help simplify the grievance submission process for students who prefer to communicate their grievance through voice rather than through text; and, emotional profiling may be used to understand what triggers the emotions that students have regarding complaints in order to provide an empathetic response to sensitive complaints.

We plan to make these next enhancements happen to improve customer experience, enhance system intelligence and expand the platform's impact globally to create an overall more efficient, dynamic and responsive grievance management system for schools.

REFERENCES

[1] R. S. Rao, S. G. Suhasi, R. M., P. Kumar, and K. G. R., "Implementing NLP to Categorize Grievances Received Via A Voice Input Mechanism," *Int. J. Eng. Res. Technol.*, vol. 12, no. 02, pp. 157–161, 2023.

[2] R. Rawat and M. Kaushik, "NLP-Based Grievance Redressal System for Indian Railways," *arXiv preprint*, arXiv:2111.08999, 2021.

[3] A. Singh, et al., "NLP-Based Grievance Redressal System," *Int. J. Comput. Appl.*, vol. 184, no. 12, pp. 10–15, 2022.

[4] W. Jin and N. Aletras, "Complaint Identification in Social Media with Transformer Networks," *arXiv preprint*, arXiv:2010.10910, 2020.

[5] K. Banga and N. Peddireddy, "Artificial Intelligence for Customer Complaint Management," *Int. J. Comput. Trends Technol.*, vol. 71, no. 3, pp. 101–105, 2023.

[6] M. Hussain, et al., "Automated University Complaint Management System Using Machine Learning and NLP," *Front. Linguist. Syst.*, vol. 5, pp. 85–92, 2022.

[7] P. Tripathi, et al., "Effectiveness of Online Grievance Redressal and Management System: A Case Study of IGNOU Learners," *Indian J. Educ. Technol.*, vol. 3, no. 2, pp. 35–42, 2021.

[8] S. Roy, et al., "An Automated System for Rural People Complaint Handling Using Data Analytics," *2022 IEEE 9th Int. Conf. Comput. Sustain. Glob. Dev. (INDIACom)*, 2022.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

[9] Y. Lee, et al., "An Intelligent System for Classifying Patient Complaints Using Machine Learning and NLP," *PLoS ONE*, vol. 17, no. 4, e0267652, 2022.
[10] D. Preotiuc-Pietro, H. Liu, Y. Hopkins, and L. Ungar, "Automatically Identifying Complaints on Social Media," *arXiv preprint*, arXiv:1906.03890, 2019.
[11] Venkatesh C., H. Oberoi, A. K. Pandey, A. Goyal, and N. Sikka, "RE-GrievanceAssist: Enhancing Customer Experience through ML-Powered Complaint Management," *arXiv preprint*, arXiv:2404.18963, 2024.
[12] R. K. Das, M. Panda, and S. S. Dash, "Prioritizing Public Grievance Redressal Using Text Mining and Sentimental Analysis," in *Adv. Comput. Intell. Eng.*, vol. 1082, Springer, Singapore, pp. 255–263, 2020.
[13] M. Alamsyah, et al., "Computational Methods for Information Processing from Natural Language Complaint Processes—A Systematic Review," *Computers*, vol. 14, no. 1, p. 28, 2023.
[14] Qurat-ul-ain, et al., "Computational Methods for Information Processing from Natural Language Complaint Processes—A Systematic Review," *Computers*, vol. 14, no. 1, p. 28, 2023.
[15] R. K. Das, M. Panda, and S. S. Dash, "Prioritizing Public Grievance Redressal Using Text Mining and Sentimental Analysis," in *Adv. Comput. Intell. Eng.*, vol. 1082, Springer, Singapore, pp. 255–263, 2020.