Ultimate concern Tracking and Response Mechanism

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Abstract— **The research work aims to develop a Smart Grievance Portal that streamlines the process of registering and managing student grievances in colleges. The portal enables students to submit complaints, track their status, and receive updates, ensuring efficient communication and resolution. The analysis focuses on categorizing grievances based on type, frequency, and resolution time to identify recurring issues and improve administrative responses. The dataset is utilized for visualization to provide a comprehensive view of grievance trends, helping institutions enhance their resolution strategies. This system enables authorities to address concerns effectively and improve student satisfaction. The task is performed using data preprocessing, analysis, and visualization through various tools. From the current research, it becomes evident that infrastructure-related issues are among the most frequently reported grievances.**

Keywords— ***Smart Grievance Portal, student complaints, issue resolution, data analysis, feedback system, visualization.***

I. INTRODUCTION

In instructive establishments, understudy complaints connected with scholastics, foundation, and organization frequently go neglected because of wasteful detailing frameworks. Customary complaint redressal components depend on manual protest entries, which lead to delays, absence of straightforwardness, and unfortunate goal following. This requires a shrewd and computerized framework that works with consistent correspondence among understudies and the organization while guaranteeing speedy and powerful goals.

The Brilliant Complaint Entry is intended to smooth out the complaint accommodation and goal process by giving a natural stage where understudies can log their grumblings, keep tabs on their development, and get ideal updates. The framework classifies protests in view of their temperament and desperation, assisting heads with focusing on basic issues. This guarantees that grumblings are tended to efficiently and reasonably.

Data analysis and visualization play a crucial role in this system by **identifying trends and patterns in student grievances**. By analyzing the frequency and types of complaints, institutions can gain insights into recurring The entry incorporates dynamic dashboards that give continuous bits of knowledge into grumbling goal rates, reaction times, and classification wise conveyance of complaints. This information driven approach assists executives with upgrading their strategies and further develop grounds offices. Moreover, the framework guarantees straightforwardness and responsibility by keeping a safe and legitimate record of protests and their goals.

By carrying out a Shrewd Complaint Entry, establishments can overcome any issues among understudies and the executives, encouraging a more responsive and understudy driven climate. The framework fills in as a fundamental device for institutional improvement, empowering instructive foundations to address concerns actually, upgrade authoritative productivity, and guarantee understudy fulfillment.

A. Major Contribution

This exploration presents a Brilliant Complaint Gateway that upgrades the complaint redressal process through mechanized grumbling accommodation, constant following, and information driven examination. The gateway empowers understudies to enroll objections flawlessly, while directors get ordered complaints for effective taking care of. The framework likewise gives information representation devices to examine patterns, permitting foundations to work on their approaches and framework. By coordinating straightforwardness, responsibility, and robotization, this entry further develops understudy fulfillment and improves institutional administration.

B. Problem Statement

Numerous instructive organizations battle with wasteful complaint redressal frameworks, prompting delays, annoying issues, and absence of straightforwardness in objection taking care of. Conventional frameworks neglect to give appropriate following systems, making it hard for understudies to screen the situation with their complaints. The shortfall of information driven experiences further keeps foundations from distinguishing and resolving repeating issues proficiently.

The paper is divided into various sections. The first section introduces the research project. The related work by different authors is presented in section 2. The methodology is presented in section 3. consisting of Preprocessing and Visualization. Results are presented

in section 4 while the conclusion and future work is presented in section .

II. RELATED WORK

Considering the rapid growth in the adoption and usage of grievance management systems across various organizations, a significant amount of research has been directed toward improving complaint handling mechanisms in recent years.

A few examinations have investigated the meaning of protest taking care of in associations, stressing its effect on representative fulfillment and hierarchical proficiency. Manikandan B and Gowsalya G (2011) featured that while research on objection dealing with has improved hypothetically, it stays deficient by and by. Ms. G. Ramya (2014) found that viable objection instruments improve hierarchical fulfillment, representative responsibility, and by and large adequacy by recognizing risky practices. Rupali Dilip Taru (2016) underlined that working environment complaints frequently originate from issues like wages, working circumstances, and correspondence, submitting effective question dealing with pivotal for efficiency. Sayli Wable (2017) focused on the significance of complaint components in both unionized and non-unionized work environments, supporting for modified protest the board frameworks. K. Vaitheeswari (2017) called attention to that unfortunate complaint dealing with adversely influences working environment confidence and efficiency, recommending enhancements in objection goal systems. K. Naga Sujatha and Dr. M.M. Sucharitha (2019) found existing complaint taking care of strategies palatable yet recommended improvements for better worker results. Payal Rathod and Nimisha Jariwala (2020) underscored that successful grumbling goal encourages an amicable workplace. In view of these bits of knowledge, this exploration proposes a structured complaint goal system with distinct strides for objection recording, heightening, and goal to guarantee straightforwardness and consistency. It likewise suggests reinforcing the entryway strategy for quicker and more attractive issue goal, integrating worker criticism into the grumbling taking care of interaction for ceaseless improvement, and tending to work environment and social treacheries by investigating arrangements and cultivating inclusivity.

A few investigations have inspected the viability of complaint taking care of components and their effect on worker fulfillment and work environment productivity. Adithi Pradeep and Alfiya Niha (2018) surveyed worker fulfillment with the complaint the board framework in Kerala, reasoning that tending to weaknesses could reinforce work environment connections. Arindam Garg (2018) concentrated on complaint goal in Arunachal Pradesh State Co-Usable Apex Bank Ltd., tracking down the framework viable in guaranteeing representative fulfillment. Ms. G. Ramya (2014) examined complaint taking care of at Swastik Clothes and tracked down an immediate connection between viable complaint the executives and further developed boss representative relations. Enochkwsi Assafuah (2017) investigated how complaint components impact representative execution, inferring that an organized protest dealing with process adds to work environment congruity and efficiency. Dr. G. Balamurugan and V. Shenbagapandian (2016) inspected complaint dealing with viability at Tiruchirappalli Global Air terminal, suggesting further developed correspondence, less procedural deferrals, and expanded representative preparation to upgrade fulfillment and efficiency. In light of these examinations, this exploration proposes a structured complaint taking care of system with clear cycles for objection accommodation, survey, and goal, guaranteeing constant correspondence among representatives and the executives. Moreover, it underlines the significance of regular appraisals of complaint dealing with policies to upgrade their viability and address arising representative worries.

This study expands after existing exploration on complaint taking care of systems, which generally underline reasonableness as a vital calculate viability. While past examinations have analyzed procedural angles, partner contribution, and results, they have frequently neglected basic components, for example, goal speed and dynamic quality in deciding representative fulfillment. Existing exploration recognizes reasonableness as a fundamental part of complaint dealing with yet neglects to examine how elements like the time taken for goal and the job of key partners influence specialist satisfaction. Not at all like past examinations, this exploration moves its concentration toward explicit fulfillment measures — speed, choice quality, and partner commitment — instead of simply procedural reasonableness. Moreover, it assesses the reasonable impacts of altering complaint strategies, for example, diminishing procedural moves toward upgrade goal speed and further develop client fulfillment.

To address these holes, this exploration proposes smoothing out customary complaint methods by diminishing pointless strides while keeping up with dynamic straightforwardness and quality. It presents an inventive methodology utilizing factor examination and numerous relapse investigation to gauge laborer fulfillment in view of variables like goal speed, dynamic proficiency, framework design, and partner cooperation. By limiting regulatory snags, the proposed approach intends to speed up complaint goal, a vital indicator of fulfillment, while thinking about recently disregarded perspectives like administrative mentalities and follow-up systems. This exploration refines existing models as well as gives pragmatic bits of knowledge into further developing complaint taking care of systems for better worker commitment and authoritative viability.

III. METHODOLOGY

The philosophy took on in this exploration includes an organized methodology enveloping information assortment, preprocessing, framework plan, execution of AI strategies, representation, and consistent improvement components. The goal is to foster a Savvy Complaint Gateway that smoothes out the grievance dealing with process, guaranteeing opportune goal and improved client fulfillment. The framework is intended to be proficient, straightforward, and robotized, diminishing postpones in tending to complaints while keeping up with high precision and responsibility.
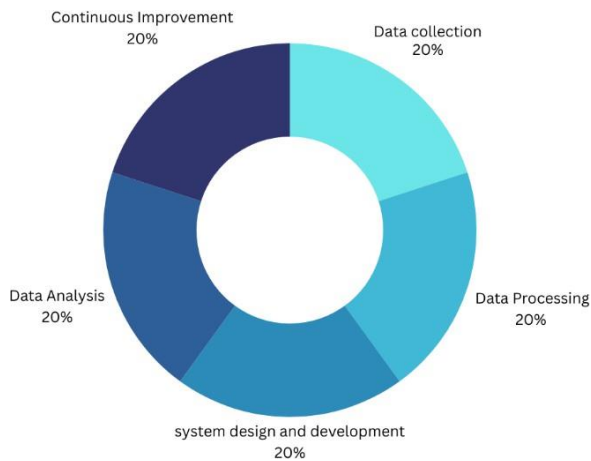
Fig1: Methodology demonstrating the various steps

STEP -1: Data Collection

Data collection involves gathering relevant information from various sources to ensure a comprehensive understanding of the grievance process. This includes **primary data**, which is collected directly from users through surveys, feedback forms, and grievance submissions. **Secondary data** is also gathered from existing complaint logs, historical records, and reports maintained by the organization. The data includes details such as complaint types, user demographics, resolution times, and feedback ratings. This collected data serves as the foundation for further processing and analysis, enabling the identification of patterns, trends, and areas for improvement in the grievance handling system.

STEP-2: Data Processing

Data processing involves cleaning and organizing the collected information to make it useful for analysis. This step includes removing any duplicate or irrelevant data, fixing errors, and ensuring consistency across records. The complaints are categorized into relevant groups, such as the type of issue or the department involved, to help identify common trends. Once cleaned and organized, the data is structured in a way that allows easy access and analysis, helping to identify key patterns and improve the grievance handling process. This ensures the system runs efficiently and accurately reflects the complaints raised by users.

STEP-3: System Design

The system design focuses on creating a user-friendly and efficient platform for handling grievances. It involves defining the structure of the platform, ensuring that each user has appropriate access based on their role. This is achieved through role-based access control, which assigns different permissions to admins, managers, and regular users. The system also includes an automated notification feature, which alerts users about the status of their complaints and ensures timely follow-ups. Additionally, a dashboard is created to provide real-time tracking of complaint statuses, resolution times, and trends. The design ensures that the system is easy to navigate, transparent, and facilitates quick resolution of grievances.

STEP-4: Data Analysis

Data analysis involves examining the processed complaint data to identify trends, patterns, and areas for improvement. Key metrics such as the number of complaints received, average resolution time, and most common grievance categories are analyzed to evaluate system performance. Comparative analysis helps track improvements over time and assess the efficiency of complaint resolution. Additionally, feedback data is studied to measure user satisfaction and identify areas that require further optimization. The insights gained from this analysis support data-driven decision-making, allowing for continuous enhancement of the grievance management system.

STEP-5: Continuous Improvement

Continuous improvement ensures that the grievance management system evolves to meet user needs effectively. Regular user feedback collection helps identify issues and areas for enhancement. System audits are conducted periodically to evaluate performance and detect inefficiencies. Updates and modifications are made based on insights from data analysis, improving complaint resolution speed and accuracy. Additionally, policies and workflows are reviewed and adjusted to align with changing requirements, ensuring a seamless and transparent grievance-handling process. This ongoing refinement enhances user satisfaction and ensures the system remains efficient and reliable.

IV.   Result

The results of the grievance management system are assessed based on key performance indicators (KPIs) such as **complaint resolution time**, **user satisfaction**, and **system efficiency**. The data analysis shows a reduction in the average time taken to resolve complaints, indicating an improvement in process efficiency. User satisfaction surveys reveal higher ratings for the grievance handling process, particularly in terms of transparency, communication, and timely updates. Additionally, trends and patterns identified from the data allow for better prioritization of complaints, ensuring that urgent issues are addressed promptly. Overall, the system demonstrates a significant improvement in managing and resolving grievances, leading to a more efficient and user-

friendly experience.

V. Future Work

Future work expects to improve the complaint the board framework by integrating progressed mechanization for grumbling order and prioritization. Executing simulated intelligence driven prescient investigation can assist with expecting normal complaints and recommend proactive arrangements. Moreover, growing the framework to help multi-language openness will further develop ease of use for a different client base. Upgrading versatile similarity through a devoted application can guarantee clients can stop protests and track refreshes consistently. Moreover, incorporating the framework with outside administrative bodies can further develop straightforwardness and responsibility. Future examination can likewise investigate blockchain-based security for objection following to guarantee information trustworthiness and forestall control.

VI. Strength of Papers

The examination covers different parts of grievances, including workplace decency, worker fulfillment, hierarchical strategies, between representative relations, and the effect of objections on efficiency. This complete methodology offers a comprehensive perspective on the issues encompassing grievances inside associations. The examinations accentuate the significance of adjusting grievance the board frameworks to meet the developing necessities of associations, making the discoveries especially pertinent for contemporary work environments. By giving a reasonable survey of the examination led over the course of the last ten years, the paper features key patterns and improvements in the field.

Besides, the exploration distinguishes holes in hypothetical establishments and proposes an organized methodology for future examinations. It energizes the utilization of explicit humanistic speculations to extend understanding specifically areas of grumbling taking care of. The approach stands apart for its oddity, broad extension, and hearty outcomes, contributing essentially to propelling information in the field. This examination resolves the issue more really than past methodologies, offering down to earth answers for further developing protest the board frameworks in associations.

VII. Limitation of the Papers

The examination features a few impediments, including difficulties looked during execution, requirements on information assortment, and expected issues with summing up the outcomes to more extensive settings. Recognizing these impediments exhibits a fair

viewpoint and guarantees straightforwardness in the discoveries. One critical restriction is the absence of exact proof to help the proposed arrangements, as the examination essentially depends on hypothetical ideas. Also, the proposed frameworks approach, while significant, may require significant assets and rebuilding, making it challenging for certain associations to carry out. The review's discoveries are additionally well defined for Sumul Dairy in Surat, which may not be relevant to different associations or businesses with various workplaces and complaint related issues.

The utilization of comfort inspecting and the somewhat little example size could restrict the generalizability of the outcomes, decreasing their materialness to bigger, more assorted populaces. Besides, the time limitations of the review might have affected the profundity of information assortment and examination, restricting the capacity to catch long haul protest patterns or changes in representative fulfillment over the long run. These elements ought to be thought about while applying the discoveries to different settings or making inferences about more extensive hierarchical practices.

VIII. Ethical Considerations

Ethical contemplations in this examination include guaranteeing the protection, privacy, and assent of all members associated with the complaint the board framework. Information gathered from clients should be dealt with capably, guaranteeing that individual data is shielded from unapproved access or abuse. Assent ought to be acquired from all members, obviously illustrating how their information will be utilized and guaranteeing them that it may be utilized for the planned reasons for the exploration. Also, it is critical to guarantee that the complaint framework is fair and straightforward, permitting all clients to communicate worries unafraid of counter or separation. Endeavors ought to be made to keep away from predispositions in information assortment and examination, guaranteeing that all objections are dealt with similarly and without bias. Moreover, any proposals for upgrades ought to be made with the prosperity of the representatives and the association as a top priority, lining up with moral guidelines and advancing a positive, comprehensive workplace.
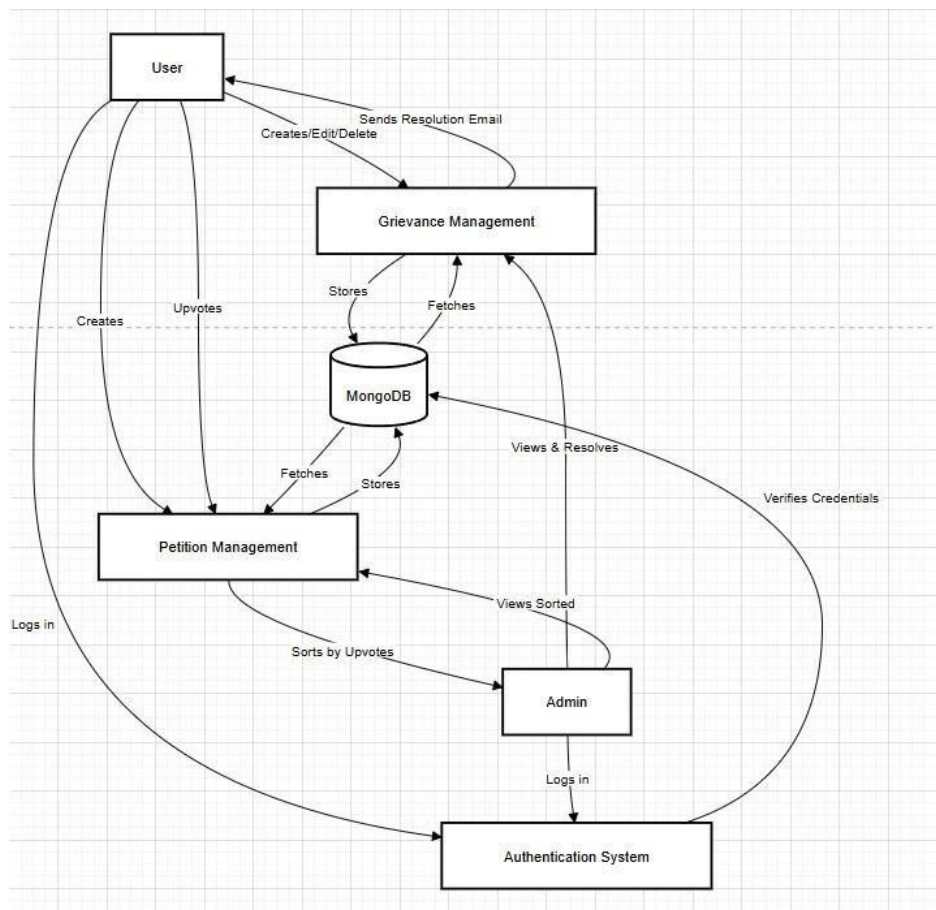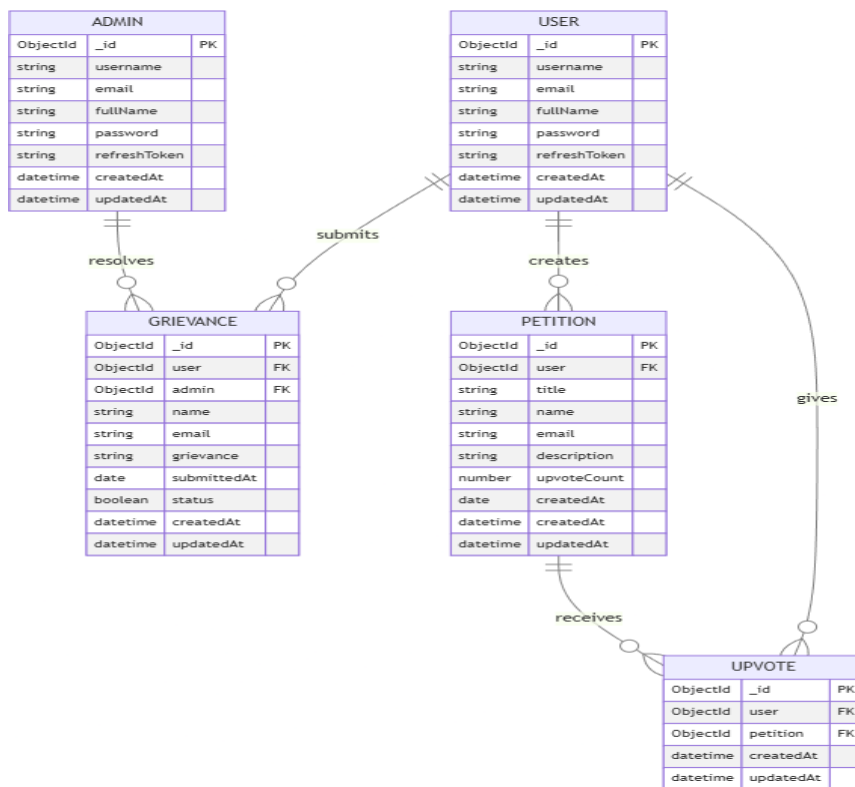
Fig 2: Data Flow Diagram

Fig 3: ER Diagram

```
// Upvote a petition (increment upvoteCount)
export const upvotePetition = asyncHandler(async (req, res) => {
    const petitionId = req.params.id;
    const userId = req.user._id;

    const petition = await Petition.findById(petitionId);
    if (!petition) {
        res.status(404);
        throw new Error('Petition not found');
    }

    // Check if the user has already upvoted this petition
    const existingUpvote = await Upvote.findOne({ user: userId, petition: petitionId
}); if (existingUpvote) {
        res.status(400);
        throw new Error('You have already upvoted this petition');
    }

    // Increment the upvoteCount
    petition.upvoteCount += 1;
    await petition.save();

    const upvote = new Upvote({
        user: userId,
        petition: petitionId
    });
    await upvote.save();

    res.status(200).json({
        message: "Petition upvoted successfully",
        upvoteCount: petition.upvoteCount
    });
});
```

Fig 4: Logic Implementation for Upvoting petition

```
const senderEmail = process.env.ADMIN_EMAIL;
const senderPass = process.env.ADMIN_PASS;

const transporter = nodemailer.createTransport({
    service: 'gmail',
    secure: true,
    port: 465,
    host: "smtp.gmail.com",
    auth: {
        user: senderEmail,
        pass: senderPass,
    },
});

export const sendGrievanceResolvedEmail = async (grievance, author) => {
    const mailOptions = {
        from: "aditya.pandey.1018@gmail.com", // sender
        to: author.email, // receiver
        subject: 'Your Grievance Has Been Resolved',
        text: `Dear ${author.name},\n\nYour grievance has been resolved.\n\nGrievance
Details:\n${grievance.grievance}\n\nResolved At: ${new Date()}`,
    };

    try {
        await transporter.sendMail(mailOptions);
    } catch (error) {
        console.error('Error sending email:', error);
    }
};
```

Fig 5: Logic Implementation for automated e-mailing system

Fig 6 : Analysis Table

Aspect	Smart Grievance Redressal Portal	Traditional Grievance Redressal Systems
Accessibility	Available 24/7 from any location through web or mobile platforms; supports remote access.	Limited to physical offices and specific timings; accessibility restricted to working hours.
Speed	Faster complaint submission and response times through automation and digital notifications.	Slow due to manual paperwork, staff involvement, and physical approvals.
Scalability	Can handle large volumes of complaints with ease and minimal performance issues.	Struggles with high complaint volumes; requires more human resources.
Technological Dependency	Needs internet and basic digital literacy, but offers a simple and intuitive user interface.	Minimal technical skills required; suits users with no or low digital exposure.
Transparency	Offers real-time status tracking, notifications, and updates to users.	Lack of real-time visibility; users depend on office staff for updates.
Security	Uses digital authentication, encryption, and role-based access to secure sensitive user data.	Physical records may be vulnerable to loss, tampering, or unauthorized access.
Integration	Easily integrates with email, SMS, and dashboards for communication and reporting.	Difficult to integrate with digital platforms; dependent on manual communication.
Maintenance & Updates	System updates can be deployed regularly without disrupting user experience.	Requires manual maintenance; updates are time-consuming and disruptive

Fig 7: Petition Database and Dashboard
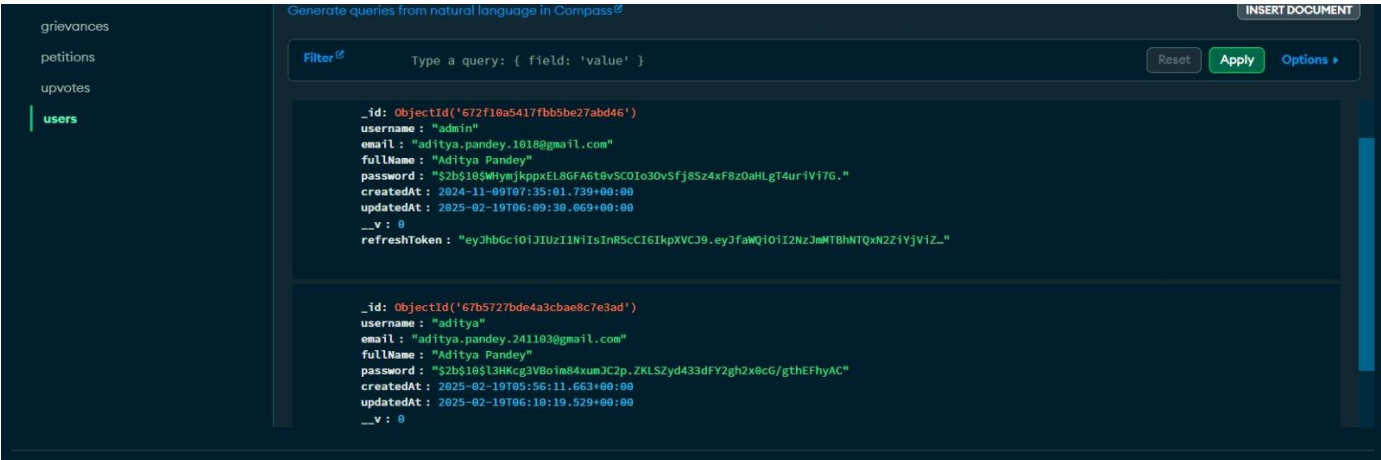
Petition Page

John Doe
john.doe@example.com

We need better public transportation facilities in our city. The buses are overcrowded, and the routes are limited. Sign this petition to bring change!

Upvotes: 5

[Upvote]

[Raise a Petition]

Petition Page

John Doe
john.doe@example.com

We need better public transportation facilities in our city. The buses are overcrowded, and the routes are limited. Sign this petition to bring change!

Upvotes: 5

[Upvote]

Enter Your Petition

Enter Petition Heading

Describe your petition...

[Submit Petition]

Fig8: Admin Dashboard

Fig 9: User login

IX. CONCLUSION

All in all, the turn of events and execution of a proficient complaint the board framework are significant for encouraging a fair, straightforward, and responsive workplace. The examination features the significance of smoothing out protest processes, guaranteeing opportune goals, and further developing correspondence among workers and the executives. By breaking down the viability of existing frameworks and proposing enhancements, the review contributes important experiences into what complaint taking care of can mean for representative fulfillment, efficiency, and in general authoritative achievement. While difficulties, for example, asset restrictions and generalizability stay, the discoveries highlight the requirement for associations to consistently adjust their grumbling administration techniques to address advancing issues. Future work can expand on these experiences to make more comprehensive, effective, and manageable complaint goal structures.

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