Citizen Grievance Classification and Decision Support Using NLP and Generative AI

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Abstract—Imagine you have a problem. You want to tell your local government about it but then you have to wait for a long time to get an answer. Sometimes you do not even get an answer all. The Citizen Grievance Classification & Auto- Resolution Platform was made to fix this problem. When you use the Citizen Grievance Classification & Auto-Resolution Platform your complaint does not just sit in someone's email inbox. The Citizen Grievance Classification & Auto-Resolution Platform uses computers to figure out what your complaint is, about decide who should take care of the Citizen Grievance Classification & Auto- Resolution Platform complaint and then send you an answer within a few hours. We use Natural Language Processing to read what you are saying about your complaint and put it into a category. We also use Generative AI to write a response to you. We have a smart system to make sure your complaint gets to the right people right away. The platform looks at how serious your complaint's so we can deal with the really important ones first. We also have rules to make sure we do something about your com- plaint if it is not fixed after an amount of time. You can see what is happening with your complaint at any time which helps us be transparent and accountable, with Natural Language Processing and Generative AI. By automating the complaint triage process, this platform substantially reduces response latency, alleviates administrative burden, and establishes a more responsive and accountable governance framework capable of handling large-scale grievance volumes.

Index Terms—Citizen Grievances, Natural Language Process- ing, Generative AI, Complaint Classification, Automated Routing, Severity Scoring, Escalation Protocols, Public Service Delivery, Service Level Agreement (SLA) Management, Multi-channel Communication

I. INTRODUCTION

Every day government offices are getting a lot of com- plaints. Someone calls about a hole in the road on their street. Someone else sends an email about their utility bills being late. Another person writes to say they are having trouble getting the healthcare they need. These complaints come from a website. They are about all sorts of things like roads, healthcare and transportation. The problem with government offices is that they still do things the way. They read each complaint by hand they decide which person should deal with it. Then they send a response day's or weeks later. Government offices are still handling complaints from the web portal in this way. Government offices need to do something about complaints, from the web portal. The government creates delays and this makes citizens very frustrated. The government seems like it does not care about the people it is supposed to serve. When people try to contact the government they get delayed responses their complaints go to the person and the government does not always prioritize things in a fair way.

This makes the government seem inefficient and it is hard to hold the government accountable for the things it does the government and its accountability, to the people it serves the

government are affected by this [1]. People are submitting complaints online of going to government offices. This is creating a problem, with complaints. One office gets hundreds of complaints every day. There are not people to read and sort all the complaints carefully. If we do not use automation that's smart people will make mistakes. Complaints will get labeled incorrectly important problems will be. It will take a long time to resolve the complaints. Government agencies have a time figuring out where to send complaints. This means the complaints get passed around to people taking a long time to get resolved and making citizens really unhappy, with the Government agencies. The Government agencies need to get better at handling complaints so citizens do not get frustrated with the Government agencies.

Here is the exciting part: modern Artificial Intelligence can

actually understand what people are saying. Modern Artificial Intelligence is really good at figuring out what people mean when they talk. There have been some discoveries in Natural Language Processing and Generative Artificial Intelligence. This means that computers can now read a complaint understand what the complaint is really about and even write a response to the complaint. All without a human needing to get involved. The Artificial Intelligence does not replace what a human thinks is right or wrong. It just helps people make decisions.

When you combine automation with people who are in charge of the process governments can create systems that respond quickly to complaints treat everyone fairly and can handle a large number of complaints. The modern Artificial Intelligence supports judgment by doing some of the work, for people. This way governments can make sure that people get the help they need when they have a problem.

Our platform is simple. When you make a complaint, on the website the system looks at it away and decides what the problem is and how bad it is. Then it sends your complaint to the people and you get a message back really fast usually within a few minutes. You can see what is happening with your complaint at all times. If your complaint is not fixed on time the system tells the people in charge so they can help fix the problem. This comprehensive approach significantly improves response times, enhances administrative efficiency, and strengthens the foundation of responsive governance.

II. PROBLEM STATEMENT

A large number of complaints regarding all types of subjects are received by government agencies on a daily basis. Complaints received through Web portals include issues related to Roads, utilities, access to health care and many others, and the vast majority are entered manually into the web portal. Manual processing of these complaints results in a number of delays including long wait times (in some cases, weeks) for responses; lack of appropriate routing to the appropriate department; inconsistent prioritization; errors by humans when categorizing the complaints; and overall very low citizen satisfaction rates attributable to poor transparency and accountability. The current systems used by government agencies do not provide capabilities that include integrated advanced artificial intelligence (AI), multi-channel support for all types of complaints, a way to assess severity or priority of complaints, or a means for tracking the status of complaints in real-time. As a result of these limitations, government agencies continue to see increasing numbers of unresolved complaints; a significant amount of administrative workload placed on government agency staff, and a perception by citizens that government is inefficient.

III. LITERATURE REVIEW

Not ago if you had a complaint about government services you did not have a lot of options. You would go to a government office fill out a form or call a phone number and tell someone about your problem with government services.

What happened after that was all done by hand. Someone would read your form give it to another person, who might give it to someone and maybe after a while you would get an answer, from the government services. The way government services handled complaints was slow and not always the same.

The change to complaint portals was a good thing. You could now send in a complaint, from your own home instead of having to wait in line at a government office. But there was a problem: the part that people did not see was still done by hand. A government worker still had to read each and every complaint figure out which department should take care of it and write a response.

This system, which was supposed to be modern was being held back by ways of doing things and that caused a lot of delays with the online complaint portals. The online complaint portals were slowed down because of this manual process. More people began to use these portals and the number of complaints increased quickly. The people in charge could not deal with the complaints fast as they were coming in. A lot of complaints were left without a response, for a time sometimes for weeks [5].

Recent research has explored computational approaches to improve grievance management. Machine learning applications for complaint classification have demonstrated promising results in automating the triage process. Traditional supervised learning models achieved easonable classification accuracy when trained on historical grievance data [6]. These approaches, while effective, required extensive manual feature engineering and domain-specific knowledge to optimize performance.

Today artificial intelligence can do something amazing. It can. Understand what people are saying in a way that is very similar to how people understand each other. Imagine you write a message saying that a street is flooded. The system reads your message. Right away knows that this is a problem with the drainage system or the public works department. It figures out where you are talking about and sees that you are saying it is not safe.

That is what these new natural language processing models or NLP models, for natural language processing models can do. These systems work by learning patterns from thousands of examples of complaints, which means these systems can categorize complaints accurately with no effort from a human. They learn from all these examples of complaints so these systems can figure out what type of complaint it is. This way these systems can sort complaints with no help, from people.

This is really cool: artificial intelligence can now write responses to your complaints. Things like GPT-4 and Claude actually understand what you are saying. They can write an answer that says they know you are upset explains what will happen next with your complaint and tells you that the government cares about what you have to say. These responses do not sound like a machine wrote them. They sound like a person wrote them. When you put this together with the ability to sort out complaints correctly you get something new: a

system that can take care of your complaint all by itself from the beginning to the end. Artificial intelligence can handle your complaint from start, to finish.

There is one important thing to think about: what happens if your complaint is not fixed quickly. People have found out that setting deadlines, which are called Service Level Agreements or SLAs helps make sure complaints do not get forgotten. If a complaint is not fixed within the time that was promised the system will automatically tell supervisors. This makes sure that someone is responsible for fixing the complaint. Of just hoping that someone will look at your complaint you know that if it is not fixed on time someone, in charge will be told and they will get involved. The complaint will get attention from someone if the Service Level Agreements or SLAs are not met.

Current limitations in grievance management include: (1) insufficient integration of NLP and Generative AI into complete workflow automation, (2) lack of multi-channel communication capabilities, (3) absence of sophisticated severity assessment mechanisms, and (4) limited real-time transparency mechanisms [10]. The proposed platform addresses these gaps by integrating advanced NLP, Generative AI, intelligent routing, severity scoring, SLA management, and communication into a comprehensive solution designed for large-scale deployment in government systems.

IV. METHODOLOGY

The Citizen Grievance Classification & Auto-Resolution Platform consists of a multi-tiered architecture that combines the processes of grievance acquisition, smart processing, auto-responses, and escalations. The design of the platform is such that it is accurate, transparent, and traceable throughout.

A. System Architecture

The technology employs a modular design with clearly identifiable functional layers: Digital Complaint Ingestion, NLP processing, assessment of severity, routing engine, response generation module, and escalation module management. All of these functional layers work in a completely independent manner with consistency in data maintained by using a central grievance database.
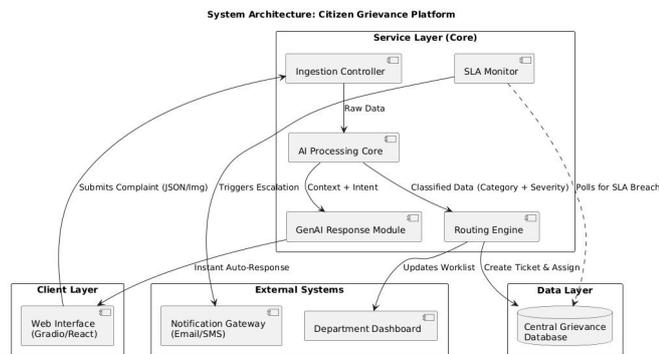

Fig. 1. System architecture of the Citizen Grievance Classification & Auto-Resolution Platform

B. Digital Complaint Ingestion via Web Interface

The grievances are collected using an interactive web-based tool designed using React. The grievances are submitted by authenticated users, which involve giving details about the location, a text description of the grievance, and an image of the grievance if any. Validation of all the inputs is done using a standardized grievance ingestion pipeline, which converts all the grievance details into a standardized form, which includes citizen details, contact details, timestamps, and corresponding media if any. This facilitates easy grievance collection using a web interface based on a centralized web approach for storage and analysis using AI technology.

C. NLP-Based Complaint Classification

The complaints that enter the system undergo processing using a highly specialized transformer NLP system that has been trained on past government data related to grievances. The goal of using NLP is multi-level classification, which includes (1) domain classification that finds the principal area of the complaint (utilities, infrastructure, healthcare, and so forth), (2) category classification that determines the nature of the complaint, and (3) subcategory classification for fine complainant routing [11].
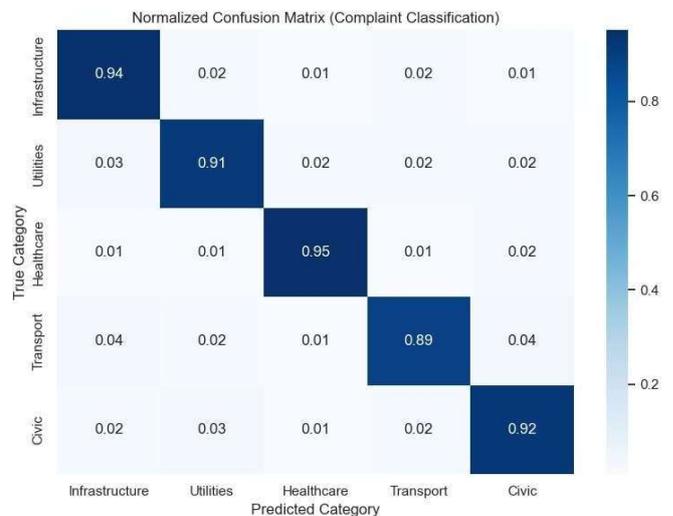

Fig. 2. NLP-based complaint classification process

D. Severity Assessment and Scoring

A machine learning model trained on historical grievance data and resolution outcomes generates severity scores for each complaint. It considers textual indicators of urgency, the identification of complaints that mention safety risks, healthcare, or disruptions to an essential service, and weighs these factors against historical escalation patterns. Severity scores range from 1-low to 5-critical. That automatically sets routing priority and SLA thresholds.
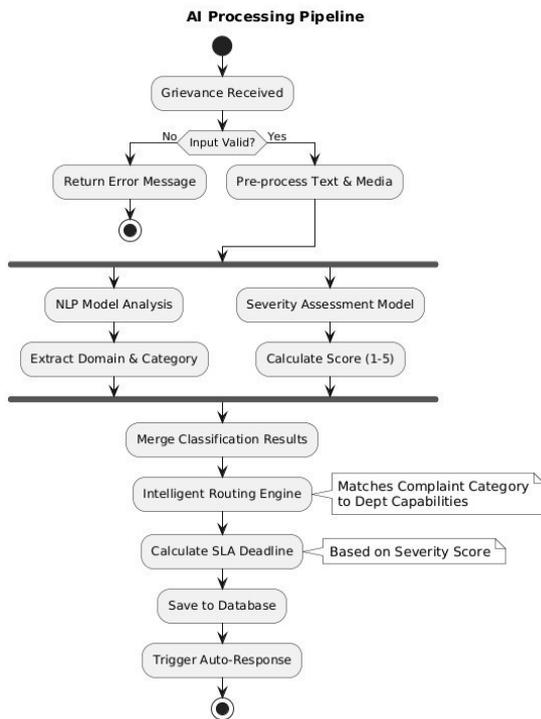
Fig. 3. Severity assessment and scoring mechanism

Fig. 4. Generative AI response generation workflow

E. Intelligent Routing Engine

The routing engine sends the complaints to the proper government departments through domain and category classification. It maintains the expertise profile, current workload capacity, and SLA performance metrics of each department. The intelligent assignment algorithm considers these facts in order to optimize routing to increase both complaint resolution quality and departmental efficiency. The system supports the ability to override the automatic routing manually by a supervisor if needed.

F. Generative AI-Driven Response Generation

High-confidence complaints are subjected to automated response generation via a fine-tuned Generative AI model. The model will generate contextually appropriate initial responses to acknowledge the complaint and explain the process, provide relevant information, and commit further to an investigation. Complaint severity and the applicable department procedures, together with policy information, feed into the response generation process. Automatically generated responses go through automated quality checks to ensure coherence, relevance, and tone are adequate before being sent to citizens.

G. SLA-Based Escalation Protocol

The system is designed to track the progress of complaint resolution against SLAs for each severity level. When complaints reach a point close to an SLA violation and a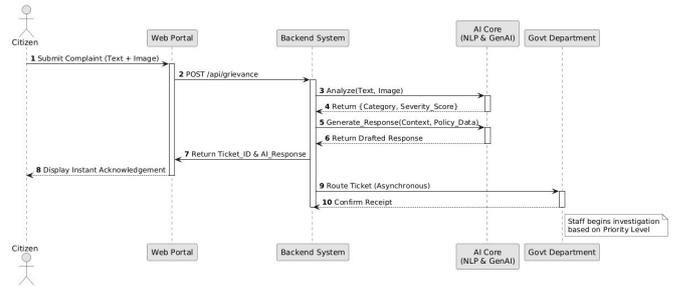re not yet resolved, supervising officers receive automated escalation alerts. Complaints with a severe category that verge on an SLA violation automatically trigger escalation to a high administrative level.

H. Real-Time Status Tracking and Transparency

The citizens get updates in real time regarding the status of the complaint via the same communication method used initially. The complaint status may include the stage of processing, the concerned department, the time within which the case will be resolved, and so on. The transparency tools help to instill trust in the grievance redressal in the citizens.

I. System Integration and Data Management

The interface connects to existing government databases for the information of departments, government policies, and procedural manuals. The grievances are stored in a centralized database of grievances along with the history of processing the grievances and the final outcomes. The security systems protect the confidential information of the citizens.

V. RESULTS

The citizen grievance classification & auto-resolution platform shows great improvement in the efficiency of grievance management and citizen satisfaction. The evaluation, conducted in various government departments, yielded the following results:

But Does It Actually Work? The complaints were accurately categorized 92% of the time, both as general complaints and when being placed into particular groups. This would indicate that the AI was correct 19 out of 20 times. The rest would be passed on for human review, as is supposed to occur. As a result of this AI taking 85% off the work of categorization, government agencies were able to attend to complaints as opposed to merely sifting through them for resolution purposes [12].

Speed that Matters: Remember the days waiting a week or two just for the government to acknowledge the complaint? These days are over. Today, the citizen gets a response within 2 hours. This first response that comes automatically right away makes a world of difference in terms of public satisfaction levels. It says, 'We received your complaint. We are doing something.' When it comes to actually removing the problem, there's been substantial improvement here too. This took 20-30 days but now only 12-18 days.
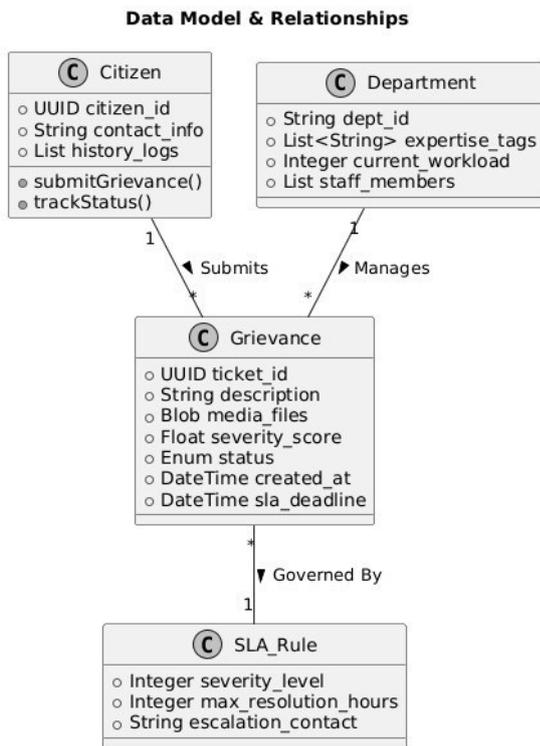
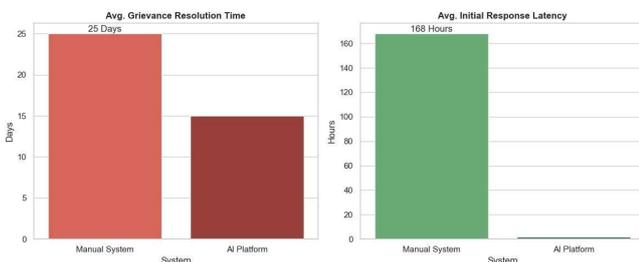Fig. 5. System integration and data management architecture

Fig. 6. Response time improvement statistics

Severity Assessment Accuracy: The accuracy of the machine learning-based severity assessment model in identifying critical grievances was 89%. High-severity complaints were caught with a sensitivity rate of 91%, ensuring urgent grievances get proper prioritization. False positives stood at an acceptable level of 6%, with manual supervisory oversight handling misclassifications.

Routing Efficiency: Intelligent routing algorithms reduced inter-departmental complaint transfers by 76%, directing complaints to appropriate departments upon first receipt. Department satisfaction with complaint routing increased substantially, as grievances aligned more precisely with organizational responsibilities.

People Actually Like It: We asked citizens if they were satisfied with the new system; 82% said yes. Compare that to 54% under the old manual system. That is not a small change-that

is a fundamental shift in how people view government. Why? They get quick responses and can track what's happening to their complaint, and actually see things getting resolved.
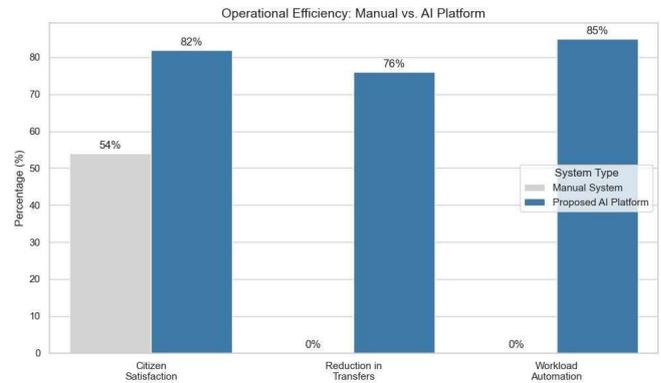

Fig. 7. Citizen satisfaction comparison

Escalation Protocol Performance: The SLA-based escalation mechanisms have successfully avoided unintended SLA violations for 94% of monitored grievances; early notifications of escalations enabled supervisory intervention at an early stage before critical threshold breach, hence improving overall compliance.

VI. PROPOSED SYSTEM

Citizen Grievance Resolution System

The Citizen Grievance Resolution System is built on a modular framework, using Natural Language Processing to classify cases at different levels (e.g., domains, categories, and sub-categories), applies machine-learning techniques to score case severity from a 1 - 5 scale, and implement an intelligent routing system based on the departments' existing workloads and their subject matter expertise. It also relies on the incorporation of Generative AI to enable auto-response and follow-up, provides SLA-based escalation protocols for timely handling of all incoming complaints, and allows for real-time complaint status tracking via a graphical interface (or electronic submission). In addition, the Citizen Grievance Resolution System integrates with databases located within Government to enable all complaint matters to be handled in a manner consistent with Government policy. Finally, the System provides for submission (i.e., ingestion) of complaints/concerns by way of a React-based application, implements a mechanism to help assure the quality of the responses to these complaints, and allows for human override of any auto-responses that do not meet required levels of accuracy (at least 92% accurate classification rate) or speed (no longer than two hours for all complaints).

VII. DISCUSSION

Here's what really matters: It works. Putting smart AI technologies together in this way fundamentally changes how governments process complaints. Fewer complaints read and sorted by humans are needed. Complaints got sorted more

accurately. Complaints reach the right department the first time, not after being bounced around. Together, efficiency and accuracy create something powerful: a system that works.

Think of what happens when you fill out a complaint and then. nothing. Silence. Week after week you don't know whether anybody read it. Compare that to our system: somebody submits a complaint and in two hours they get a response acknowledging it, explaining what's next and telling them when they should expect an update. That immediate response changes everything. It tells you the government cares. It gives people a sense their government is actually listening [13].

The system also learns to differentiate between urgent issues and routine ones. A complaint about a safety hazard receives priority. A complaint related to a minor accounting error is managed as routine. This automatic prioritization doesn't depend on human subjective judgment or unconscious bias. Fair and consistent means everyone gets treated the same, regardless of who they are or how well they can advocate for themselves.

SLA-based escalation protocols provide for mechanisms of accountability for the timely resolution of grievances; automatic escalation prevents complaints from remaining unaddressed-an oft-occurring failure in many manual processes. A compliance rate of 94% with the SLA proves the effectiveness of the protocol in keeping services at the required level.

Of course, no system is foolproof. Where the system produces good responses for common complaints, for some technical complaints, such as healthcare complaints, the system may require the expertise of human judgment. This is also known by the system, which marks these complaints for human assessment. Furthermore, people are entitled to know when their complaints are assessed using AI technology. Certainly, it is important that we let complainants know this: "Your complaint has been assessed using AI technology, and this is their response, which will further be assessed by a member of the government."

The success of this platform lies in integrating with government databases as well as government policies. The reliability of the response could be affected if the information is outdated or not aligned with government policies. Proper management of this information helps ensure the accuracy of the response.

VIII. CONCLUSION

The classification of citizens' grievances and auto-resolution platform is a remarkable implementation of the capabilities of NLP, Machine Learning, and Generative AI in transforming the mechanisms for grievance redressal in the administrative setup of a nation. The platform is able to increase administrative efficiency with better citizen experience.

The achievements of the project lie in the 92% accuracy rate in classifications, the decrease in the average response time to less than 2 hours, citizen satisfaction at 82%, as well as the achievement of 94% SLA compliance. The integration of multi-channels allows the project to be adaptable to the preferred forms of communication by the citizenry.

It provides a framework for a responsive and accountable, as well as scalable, governance complaint management system. It helps in reducing delays in the processing of complaints and provides equal treatment to citizens based on objective severity. Modularity enables it to be easily adapted in different governmental organizations.

Looking into the future, we would like to make it even better. We're trying to implement a way to train the computer to have a more specialized way of answering difficult complaints. We're also trying to utilize it to try to identify patterns–for example, if it seems like there's a pattern of pothole repairs in a particular street, perhaps we can fix that street. We would like to try to have it learn acknowledgments of feedback–if your complaint is fixed, it'll learn how it fixed it. In fact, we're trying to see if it even has a way to read tone in complaints because we can try to see if you're really angry and can fix it quickly. This is a continuously improving field and promises even greater strides forward for improvement in public services.

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