

PROJECT PROPOSAL - AI-Powered Grievance Redressal System

1. Major Area:

Artificial Intelligence & Machine Learning, Big Data - Spark, Natural Language Processing (NLP), and Public Service Automation, Security protocols.

2. Problem statement:

To build an AI-powered solution based on Big data Spark to efficiently analyze massive real-time data related to petitions, categorize them into relevant departments, flag urgent and important cases, and send reminders to officials, while also identifying repetitive grievances and tracking progress until resolution. To develop a centralized system facilitating submission of petitions, routing to respective Departments and monitoring progress in coordination with particular Department Grievance Redressal Systems (GRS). The system also includes a feature to communicate the status of the grievance to the petitioner, ensuring transparency, accountability and data security.

3. Total Cost(in Rs.): 10,000

4. College Code & College Name: 3111 & Loyola – ICAM College of Engineering and Technology

5. Guide Name : Ms Sathia Priya R

Designation : Assistant Professor

Mobile No. : 9790803727

Email id : sathiapriya.r@licet.ac.in

6. Student Team details:

S. No.	Student Reg. No.	Name of the student	Branch	Mobile No.	email id
1	311121104007	Anonanciya Rose M	CSE	7695925029	anonnanciyarose.25cs@licet.ac.in
2	311121104029	Joshna Acsha S	CSE	8438046224	joshnaacsha.25cs@licet.ac.in
3	311121104037	Mithra Y	CSE	7604981442	mithra.25cs@licet.ac.in
4	311121104035	Matsya Manian B S	CSE	9600249006	matsyamanian.25cs@licet.ac.in

7. Project Summary:

The proposed AI-Powered Grievance Management System ensures efficient grievance processing, monitoring and resolution through a centralized platform. The system provides for grievances to be submitted by a petitioner, both to the Central GRM (Grievance Redressal Machinery) or to the individual Department GRM. If the petition is posted to the Central GRM, a robust classification algorithm like **Gradient Boosting for classification** and **XGBoost for prioritization**, will be applied to classify and route the petition to the particular Department GRM. The Department GRM feeds details regarding the nature of the petition (urgent/normal), the handling personnel, time and resources required to resolve the issue. Based on this information, progress can be tracked by the Central GRM, Department GRM and the petitioner. It is acknowledged by the system with a tracking ID, initiating the process. The grievance details, including type, location, and priority, are then analyzed using advanced **Natural Language Processing (NLP)** techniques, powered by **BERT** for semantic understanding and context extraction. NLP algorithms process and extract relevant data from the grievance text, categorizing it based on its content.

When the grievance is resolved, the system notifies the petitioner, marking the case as closed and updating the resolution status in the system. The resolution is then verified by the Centralized master node using a

centralized dashboard to oversee all departmental workflows. This system ensures accountability, providing audit trails, and transparent tracking of each case. Finally, once the case is verified as resolved, the master node adds it to the historical database, ensuring all data is securely stored with **security protocols** for data protection.

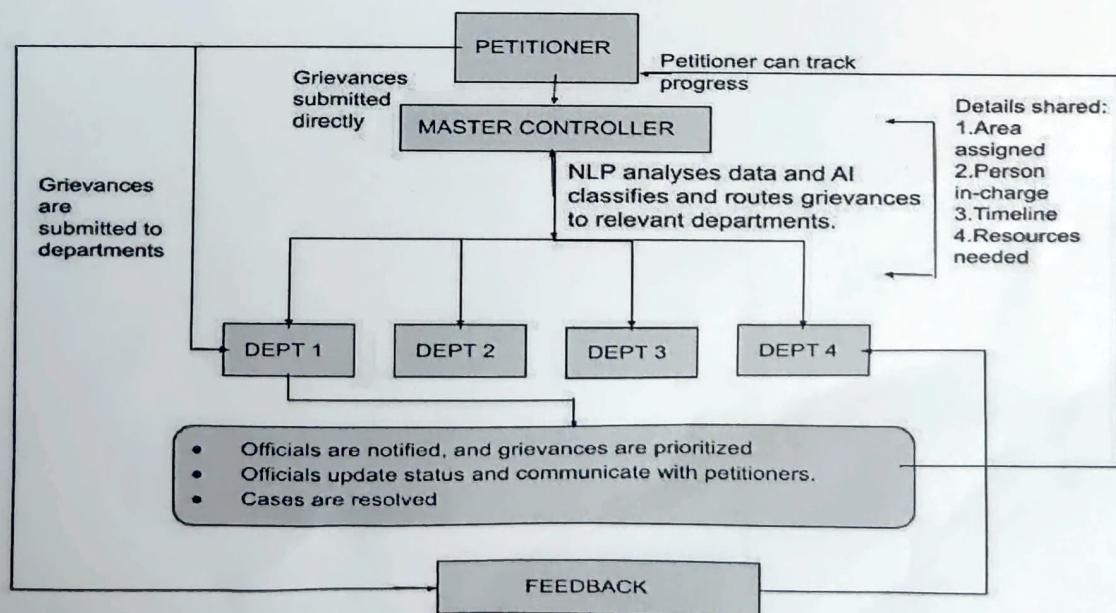
8. Proposed solution with methodology:

It is proposed to approach some Government bodies to gain knowledge about the existing GRM in each Department and so that the centralized system can be developed to pull/push Department specific petition data through APIs. The AI-Powered Grievance Management System is designed to provide a secure and efficient solution for managing grievances. It ensures data privacy with security protocol, while also implementing role-based access control to maintain secure interactions among users. The system automates the grievance handling process by intelligently categorizing and routing cases to the appropriate departments. Through real-time tracking, users can monitor the status of their cases, while automated notifications and dashboards ensure transparency and timely updates. Officials are empowered to resolve cases efficiently and provide updates to petitioners, while the centralized public controller can oversee and manage all workflows, ensuring accountability throughout the process.

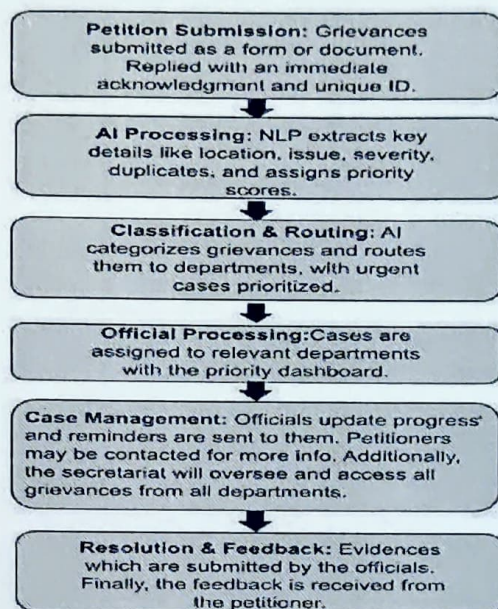
Tracking in the Grievance Management Process:

1. **Complaint Received:** Grievance submitted and acknowledged with a tracking ID.
2. **Approval of Inspection:** Grievance categorized and routed to the relevant department.
3. **Inspection:** Official processes grievance, updates status, and communicates with petitioner.
4. **Approval of Action as per Law:** Resolution of grievance approved as per legal requirements.
5. **Action Taken:** Necessary actions are taken to resolve the grievance.
6. **Information to the References:** Petitioner is informed of the resolution and the grievance is logged.
7. **Feedback:** Gets the rating and experience from the petitioner.

Architecture:



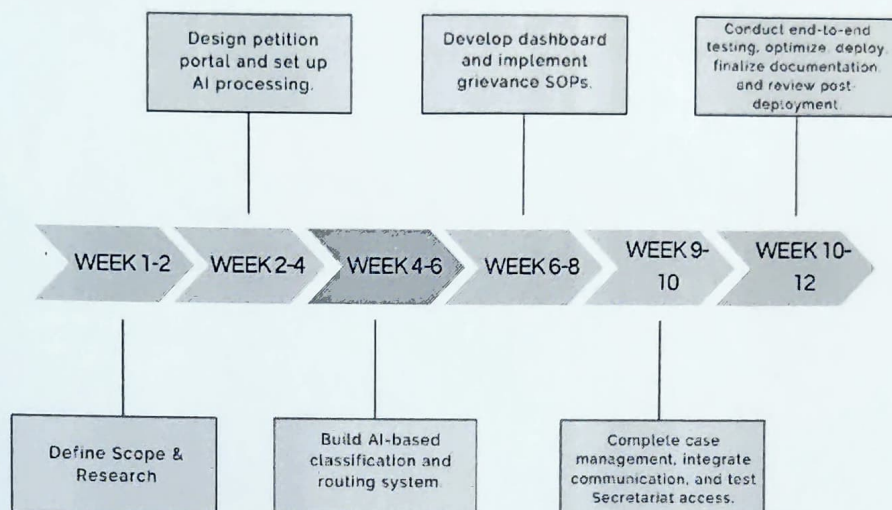
Methodology:



8. Work plan / time schedule indicating the project milestone

Key Action Steps	Week					
	1-2	2-4	4-6	6-8	9-10	10-12
Research & Planning: Define scope, gather requirements, finalize team roles, and begin AI/NLP research.						
System Design: Develop the petition submission portal, set up AI processing pipeline for NLP analysis.						
Software Development: Build the classification and routing system using AI models, design priority scoring system..						
Implementation: Develop the official dashboard and implement SOPs for grievance handling.						
Integration: Complete case management features, integrate communication flow and test access for the Centralized GRM.						
Finalization: Develop secure login for public access, maintain a historical database for resolved cases.						
Testing: Conduct end-to-end system testing, optimize performance, and deploy the application.						
Documentation: Finalize project documentation, prepare the report, and conduct post-deployment reviews.						

10. Plan of action of implementation



1. Define scope, gather requirements, assign roles, and research AI/NLP models.
2. Design the system architecture, develop the grievance portal, and set up AI processing.
3. Build and integrate AI models for classification, priority scoring, and repetitive case detection.
4. Develop dashboards for Centralized master node and notification systems for officials and petitioners.
5. Enable officials to submit evidence/reports upon resolution.
6. Implement the Centralized master node login system to oversee the entire working of grievances from all departments.
7. The Centralized master node to access all grievances.
8. Automate the addition of resolved cases to the historical database.
9. Conduct system testing, fix bugs, and optimize performance.
10. Deploy the system to production and monitor for issues.

11. List of facilities available in the college to develop the prototype of the project

Center of Excellence Laboratory: Software Development and Predictive Analytics and Server for running AI models.

12. Nature of Industry support for the project, (if any)

To interact with the state government officials regarding the data collection and understand how they process the grievances sent to them.

13. Details of Financial assistance required

Component	Cost (Rs.)
Cloud Services and API	3,000
Software Licenses	2,500
Development Tools	2,000
Miscellaneous	2,500
Total	10,000

14. Expected outcomes / results

Real-Time Grievance Tracking: Centralized platform for real-time tracking of grievances, ensuring efficient case management.

Efficient Resource Allocation: AI-driven grievance routing will ensure appropriate department handling, reducing delays and improving resolution efficiency.

Improved Citizen Engagement: Petitioners will receive timely updates on the status of their grievances, enhancing transparency and trust.

Enhanced Grievance Resolution: AI models for prioritization and categorization ensure quick identification of critical grievances, improving overall response times.

Accountability and Transparency: Centralized oversight by the public controller ensures transparent tracking, boosting accountability in grievance resolution.

Data Security: Robust encryption and secure access control mechanisms protect sensitive grievance data, ensuring privacy and compliance.

Adaptability and Scalability: The system's design allows it to be expanded for integration with other public service domains, improving future scalability.

Operational Efficiency: Automation of grievance categorization, routing, and tracking improves the overall efficiency of grievance management processes.

Improved Public Trust: Faster resolutions and transparent tracking foster greater trust between citizens and public departments.

UNDERTAKING

1. ALL the students are studying in final year engineering. All the students are registered only once for this scheme.
2. The college will provide the basic infrastructure and other required facilities to the students for timely completion of their projects.
3. The college assumes to undertake the financial and other management responsibilities of the project. We are aware that the amount is to be utilized only for the purpose sanctioned i.e. to meet the expenses for developing the prototype and not for purchase of computer consumables, stationeries, honorarium, overhead etc. Unutilised balance amount will be returned back to the University after the time of completion of the project.

Anonandya

M. Anonandya Raja
Name and Sign
of Student 1

Joshna ACSHAAS

JOSHNA ACSHAAS
Name and Sign
of Student 2

Y. Mithra

Y. Mithra
Name and Sign
of Student 3

B.S. Matsya Manian

B.S. MATSYA MANIAN
Name and Sign
of Student 4

[Signature]
Signature of the Mentor



[Signature]
Signature and seal of the principal

PRINCIPAL
Loyola - ICAM College of
Engineering & Technology (LICET)
Loyola College Campus
Chennai - 600 034.