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REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

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BANGALORE

PRESIDENCY GROUP OVER 40 YEARS OF ACADEMIC WISDOM

A Project Report

On

POLLUTION

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INTRODUCTION

Pollution is a pervasive issue that affects our environment, health, and quality of life. From contaminated rivers and polluted air to hazardous waste and noise disturbances, the impact of pollution is felt across various facets of our daily existence. Despite growing awareness, many communities lack the tools and knowledge to effectively identify and report these issues to the appropriate authorities.

This report proposes an innovative solution to empower individuals to take an active role in combating pollution in their neighbourhoods. By leveraging technology, we can create a comprehensive platform that enables citizens to identify sources of pollution, prioritize them through community voting, and escalate these concerns to the relevant authorities.

Our approach emphasizes collaboration and transparency, ensuring that community members remain informed about the progress of their reports and the actions taken to address pollution. This initiative aims to foster a sense of shared responsibility and strengthen the partnership between citizens and government agencies in the fight against environmental degradation.

Through the implementation of this end-to-end tool, we envision a future where communities are empowered to advocate for cleaner air, water, and land, creating healthier environments for generations to come. This report outlines the framework for our proposed solution, detailing its features, benefits, and the positive impact it can have on both local communities and broader environmental efforts.

Every day we come across several sources of pollution, polluting the very basics of our lives- Rivers, Land, Air and Noise. We know nothing about who/where to report it and how. We suggest an Innovative way to identify the sources of pollution in your area, get it prioritized through people votes,

escalate it to the concerned authorities, keep a track of the progress and get notified of the actions taken. It will provide an End-2-End tool to battle pollution democratically partnering with Government

LITERATURE REVIEW

There are several applications and web platforms that allow users to report pollution incidents, typically involving the submission of photos and descriptions. However, these systems often lack automation in escalation and rely on users sending manual reports via emails or forms to the concerned authorities. This creates delays in addressing urgent environmental issues. Most current reporting platforms do not incorporate a community voting mechanism to prioritize issues based on public concern. As a result, critical pollution problems may not get the attention they need, and authorities are often left to manually sort through reports without public input, leading to inefficient resource allocation.

Existing Methods Drawbacks

As with any online platform, there may be technical issues that could hinder the user experience, such as connectivity problems, app crashes, or difficulties in scheduling notifications.

Lack of a Centralized System: Most people are unaware of where or how to report environmental pollution, leading to fragmented efforts.

Manual and Time-Consuming Process: Current systems for reporting pollution, if they exist, are often manual, requiring individuals to contact specific departments or authorities. This process is slow and inefficient.

Proposed Method

An innovative, community-driven pollution reporting and monitoring platform using a mobile app or web interface. The platform aims to:

- Allow users to report pollution via photos, descriptions, and geotagged locations.
- Enable a voting system where community members can vote on reported issues, helping authorities prioritize.
- Automate escalation of issues to the appropriate government bodies once certain thresholds are met.
- Track and notify users of the progress and actions taken on their reports.
- Provide government bodies with a data dashboard to monitor pollution levels, complaints, and trends.

OBJECTIVES

Data-Driven Decision Making for Government Bodies Through a Centralized Dashboard

- **Enhanced Insight**: By aggregating community-reported data on pollution sources, the centralized dashboard will provide government agencies with valuable insights into environmental issues affecting specific areas. This will enable them to identify trends, prioritize resources, and allocate budgets more effectively.
- **Real-Time Analytics**: The dashboard will facilitate real-time monitoring and analysis, allowing authorities to respond promptly to emerging pollution issues and make informed decisions based on comprehensive data sets.

Improve Transparency by Keeping Users Informed of the Progress and Actions Taken on Their Reports

- **User Engagement**: Regular updates will be provided to users who report pollution incidents, ensuring they are informed about the status of their

reports and any actions being taken. This fosters a sense of involvement and accountability within the community.

- **Public Reporting**: By sharing aggregate data and outcomes with the community, we promote transparency in governmental processes. Citizens can see how their contributions lead to tangible actions, enhancing trust in public institutions.

Improve Existing Methodologies for Efficient User Experience

- **Streamlined Reporting Process**: The platform will feature an intuitive interface that simplifies the reporting process, making it accessible to users of all ages and technological proficiency. This includes clear instructions, user-friendly navigation, and a straightforward submission process.
- **Feedback Mechanism**: Implementing a feedback system will allow users to provide insights on their experiences with the platform, helping to continuously refine and improve functionalities based on user needs and preferences.

Empower Citizens to Report Pollution in Their Community Easily and Effectively

- **Accessible Reporting Tools**: By providing mobile and web-based tools for reporting pollution, we ensure that citizens can easily document and submit issues from anywhere at any time. This increases the likelihood of timely reports and encourages more community members to participate.
- **Educational Resources**: Offering educational materials on pollution sources and their impact will empower users to identify and understand the issues affecting their environment better. This knowledge can motivate more proactive engagement with the platform and foster a culture of environmental stewardship.

EXPERIMENTAL DETAILS/METHDOLOGY

Software used:

- Frontend: React.js.
- Backend: Node.js/Express.js.
- Database: MongoDB or Firebase.
- APIs: Google Maps API, Geolocation API.
- Notifications: Firebase Cloud Messaging, NodeMailer.

METHODOLOGY

- Reporting : Users report pollution incidents by uploading geotagged photos, descriptions, and optional tags.

Frontend: React.js for building the user interface for web and mobile compatibility.

Geolocation: Use HTML5 Geolocation API or Google Maps API to capture and display geotagged locations.

- Community Engagement: Other users vote on the submitted reports to prioritize critical isuues. This crowdsourced ranking increases visibility for urgent matters.

Voting system built using JavaScript and integrate into UI.

Node.js/Express for handling vote submissions and tallying votes.

MongoDB or Firebase for storing report and vote data in a structured format.

- Escalation: Once a report crosses a set vote threshold, it is automatically escalated to the concerned authorities with a detailed incident report.

Business logic in Node.js that triggers an escalation using thresholds stored in the database.

Email integration for sending escalation emails to authorities.

- Progress Tracking: Authorities update the status of reports and users are notified via push notifications or email.

A React.js based dashboard for authorities to update report statuses.

Firebase Cloud Messaging (FCM) for sending notifications to users' devices.

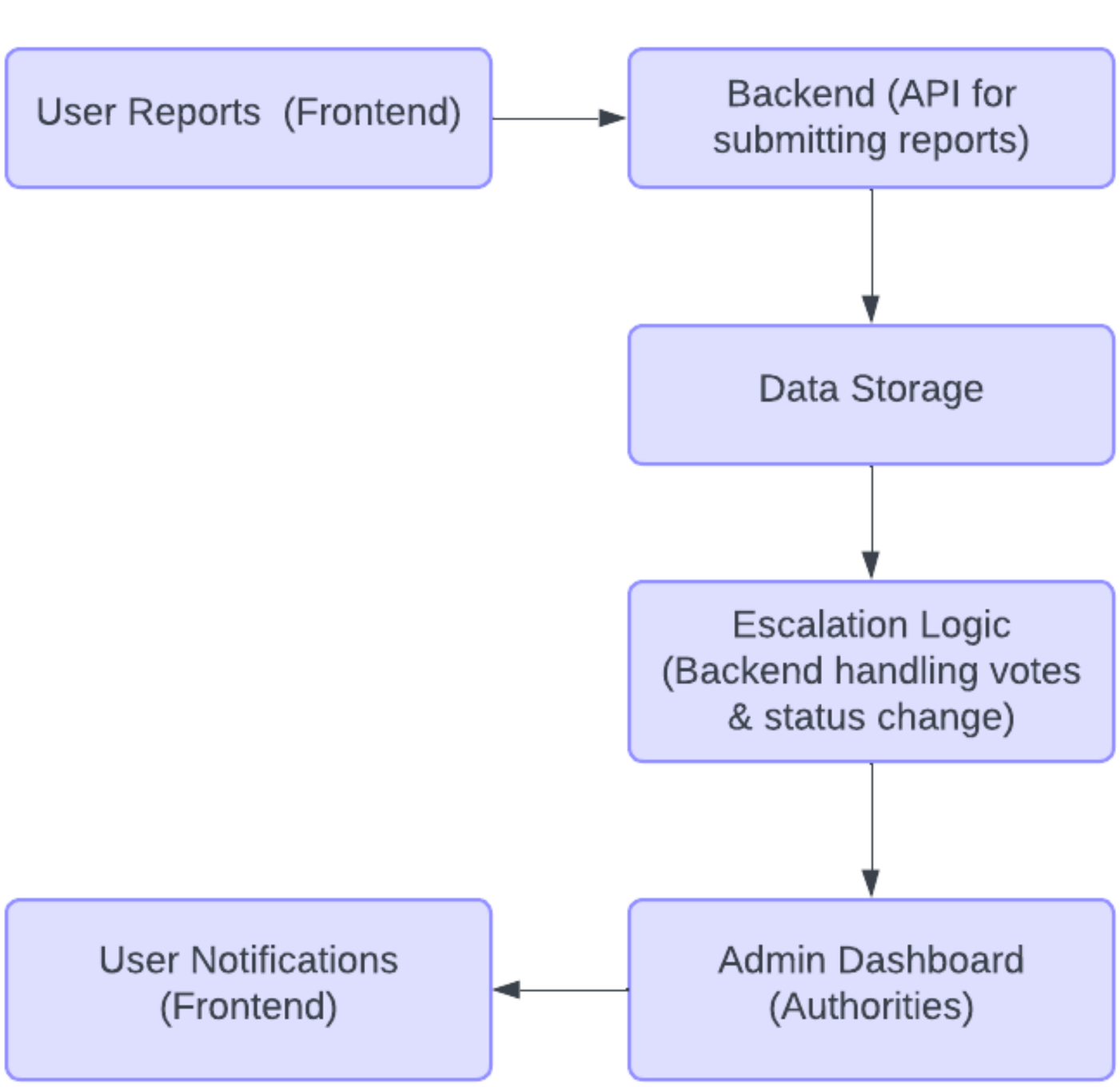
- Dashboard and Analytics: Government officials access a data dashboard with aggregated data, showing pollution trends, and high-priority regions.

Based on report data , generating graphs, heatmaps, and other visual analytics.

Firebase or MongoDB to store pollution reports and metrics.

- Notifications: Both citizens and authorities receive updates on the status of reports, including actions taken, follow-ups, or the completion of an issue.

Socket.io for real-time updates to the web interface, enabling live status changes.



OUTCOMES

Increased Public Participation

- Active Engagement: The platform will serve as a vital tool for community involvement, enabling residents to report pollution incidents with ease. By transforming citizens from passive observers into active participants, we create a grassroots movement focused on environmental protection. This engagement can lead to organized community efforts, such as clean-up drives and awareness campaigns, amplifying the collective impact on local environmental issues.
- Community Empowerment: As individuals see their reports lead to tangible actions, a sense of empowerment will emerge. This empowerment fosters pride and responsibility, encouraging citizens to look out for one another and advocate for sustainable practices. Increased participation can also result in a more informed citizenry that understands the importance of environmental stewardship.

Faster Pollution Control

- Prioritization through Public Voting: The platform's voting mechanism allows users to highlight the most pressing pollution issues, effectively prioritizing them for governmental action. This democratic approach ensures that resources are allocated where they are most needed, reducing the time between identification and resolution of pollution problems.
- Automated Issue Escalation: By integrating automated workflows that escalate reports to the appropriate authorities, the system can minimize bureaucratic delays. This streamlined process means that urgent issues, such as hazardous waste spills or air quality alerts, receive immediate attention, leading to quicker mitigation efforts and enhanced public safety.

Transparency

- Real-Time Updates: Citizens will receive ongoing notifications about the status of their reports, including acknowledgment of receipt, updates on investigations, and final outcomes. This communication builds trust between the community and government, reinforcing the idea that citizen input is valued and acted upon.
- Public Dashboard: A user-friendly public dashboard will display key metrics, such as the number of reports filed, categories of pollution, and response times. This transparency not only keeps the community informed but also allows residents to understand the broader environmental landscape, fostering a sense of collective responsibility.

Better Data for Decision-Making

- Informed Policy Development: The data collected from community reports will provide government bodies with actionable insights into pollution trends and hotspots. This information can guide the development of targeted policies that address specific issues, such as increased regulations in heavily polluted areas or enhanced funding for clean-up initiatives.
- Trend Identification: By analyzing data over time, authorities can identify patterns in pollution sources, enabling proactive measures. For example, if a particular industrial area consistently reports high pollution levels, targeted inspections and regulations can be implemented to address these issues before they escalate.

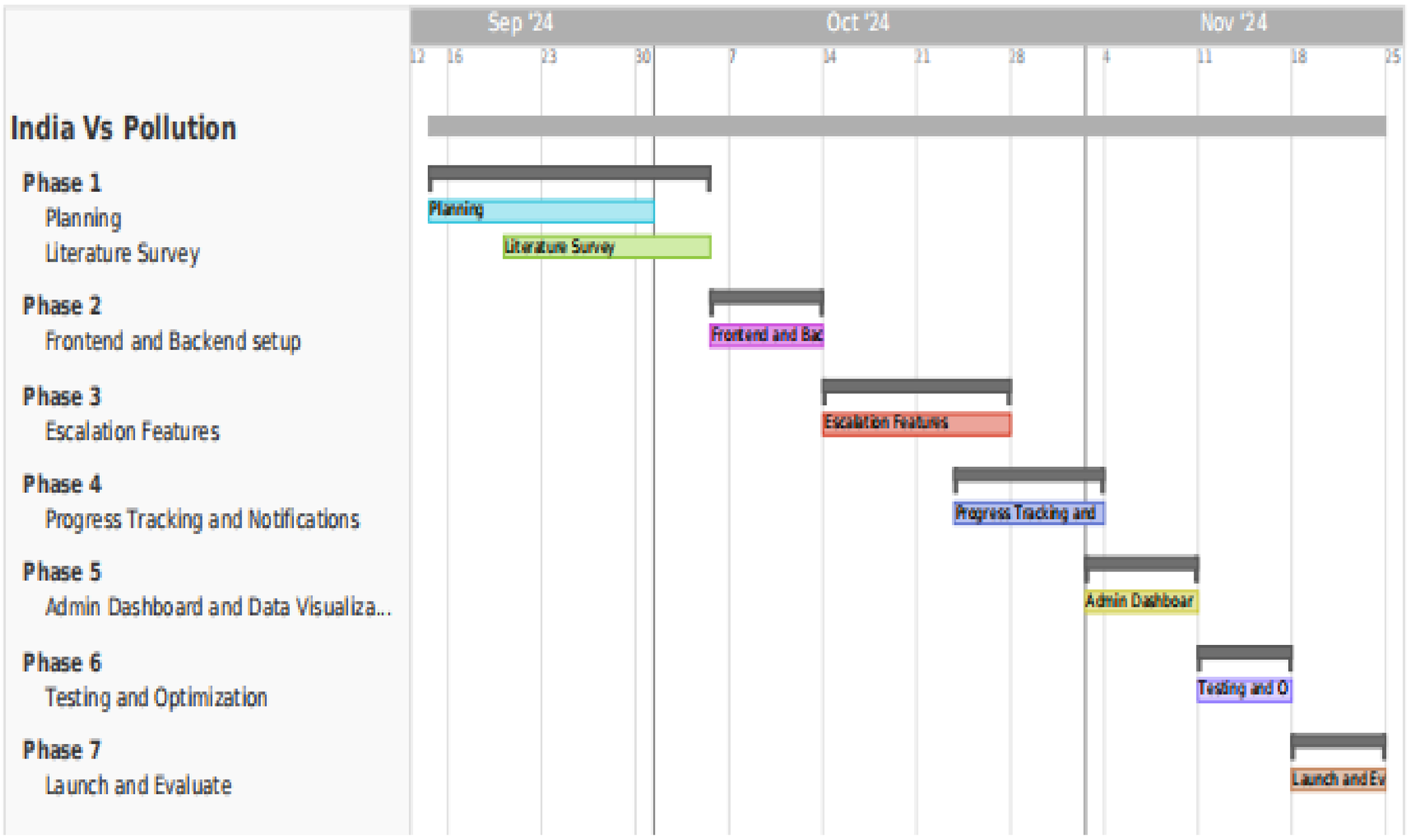
Enhanced Accountability

- Structured Reporting System: Establishing a formalized process for reporting pollution creates clear expectations for both citizens and authorities. With specific timelines for responses and resolutions, government agencies are held accountable for addressing community

concerns in a timely manner, reinforcing the importance of public trust.

- Community Oversight: By providing tools for citizens to track the progress of their reports, the platform empowers them to engage in oversight of governmental actions. This active participation cultivates a culture of accountability, where residents feel empowered to advocate for timely responses and improvements in pollution management.

TIMELINE OF THE PROJECT



CONCLUSION

This platform empowers citizens to take an active role in reporting and prioritizing pollution issues in their communities through a user-friendly, democratic process. By leveraging modern technologies like geotagging, community voting, real-time notifications, and data-driven dashboards, it streamlines communication between the public and government authorities. The integration of automation, transparency, and accountability ensures that critical environmental issues are escalated efficiently, fostering a collaborative effort to combat pollution and improve quality of life.

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THANK YOU