

PRANAMIKA – Common Man Rates & Reviews

A PROJECT REPORT

Submitted by,

**Amal V – 20211CIT0121
Burhan Pasha - 20211CIT0085
Shaik Md Asim – 20211CIT0095
Lakshmi Swaroop – 20211CIT0163**

Under the guidance of,

Mr.Sakthivel E

in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

IN

**COMPUTER SCIENCE AND ENGINEERING (INTERNET OF
THINGS)**

At



PRESIDENCYUNIVERSITY

BENGALURU

DECEMBER 2024

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report “**PRANAMIKA**” being submitted by “**AMAL V, BURHAN PASHA, SHAIK MD ASIM, LAKSHMI SWAROOP**” bearing roll number(s) “**20211CIT0121, 20211CIT0085, 20211CIT0095, 20211CIT0163**” in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.

Mr. SAKTHIVEL E

Assistant Professor
School of CSE
Presidency University

Dr. ANANDARAJ S P

Professor & HoD
School of CSE
Presidency University

Dr. L. SHAKKEERA

Associate Dean
School of CSE
Presidency University

Dr. MYDHILI NAIR

Associate Dean
School of CSE
Presidency University

Dr. SAMEERUDDIN KHAN

Pro-VC School of Engineering
Dean -School of CSE&IS
Presidency University

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **PRANAMIKA** in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering – Internet of Things**, is a record of our own investigations carried under the guidance of **Mr. SAKTHIVEL E, ASSISTANT PROFESSOR, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

NAME	ROLL NUMBER	SIGNATURES
AMAL V	20211CIT0121	
BURHAN PASHA	20211CIT0085	
SHAIK MD ASIM	20211CIT0095	
LAKSHMI SWAROOP	20211CIT0163	

ABSTRACT

Pranamika is an innovative platform designed to bridge the gap between citizens and local government officials by enabling real-time feedback and ratings. This project addresses the critical need for transparency, accountability, and citizen engagement in governance by providing a mobile-first application. Utilizing technologies such as React Native for a seamless cross-platform experience and a Node.js backend with a MongoDB database, Pranamika ensures a secure, scalable, and user-friendly interface.

The platform empowers citizens to review and rate government officials based on their performance and ethical conduct, fostering a culture of accountability and responsiveness. It integrates features like OTP-based authentication, AWS cloud storage for multimedia, and advanced moderation systems to maintain the integrity of user-generated content. The application also incorporates robust security measures, including JWT authentication, data validation, and real-time synchronization to enhance user experience and trust.

Pranamika's development followed a structured approach, including rigorous testing strategies such as unit, integration, and end-to-end testing to ensure functionality and reliability. By leveraging mobile and cloud technologies, the platform aspires to revolutionize citizen engagement in governance, combat corruption, and improve public service delivery. With planned future enhancements like real-time notifications and advanced search capabilities, Pranamika is poised to become a cornerstone of participatory governance, empowering citizens to actively shape their communities.

The objective of the project was to design an interactive, transparent, and accessible feedback mechanism that empowers citizens to influence local governance positively. By allowing users to share reviews and ratings about government officials, Pranamika aims to address long-standing issues such as inefficiency, corruption, and a lack of responsiveness from public officials. This journal provides an in-depth analysis of the development process, technical components, security measures, and future enhancements for the Pranamika platform.

ACKNOWLEDGEMENT

First of all, we indebted to the **GOD ALMIGHTY** for giving me an opportunity to excel in our efforts to complete this project on time.

We express our sincere thanks to our respected dean **Dr. Md. Sameeruddin Khan**, Pro-VC, School of Engineering and Dean, School of Computer Science Engineering & Information Science, Presidency University for getting us permission to undergo the project.

We express our heartfelt gratitude to our beloved Associate Deans **Dr. Shakkeera L** and **Dr. Mydhili Nair**, School of Computer Science Engineering & Information Science, Presidency University, and **Dr. Anandaraj S P**, Professor and Head of the Department, School of Computer Science Engineering & Information Science, Presidency University, for rendering timely help in completing this project successfully. We are greatly indebted to our guide **Mr. Sakthivel E**, Assistant Professor and Reviewer **Ms. Bhavya B**, School of Computer Science Engineering & Information Science, Presidency University for their inspirational guidance, and valuable suggestions and for providing us a chance to express our technical capabilities in every respect for the completion of the project work.

We would like to convey our gratitude and heartfelt thanks to the PIP2001 Capstone Project Coordinators **Dr. Sampath A K**, **Dr. Abdul Khadar** and **Mr. Md Zia Ur Rahman**, department Project Coordinators “**Dr. Sharmasth Vali**” and Git hub coordinator **Mr. Muthuraj**.

We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

Amal V (1)

Burhan Pasha (2)

Shaik Md Asim (3)

Lakshmi Swaroop (4)

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CHAPTER-1

INTRODUCTION

In modern democratic societies, the effectiveness of governance is directly tied to the transparency and accountability of elected officials and civil servants. Unfortunately, citizens often lack accessible channels to provide feedback about the performance of local government officials. The Pranamika platform was conceived as a solution to this issue. It aims to foster greater transparency and accountability in the functioning of public services by enabling citizens to review and rate the actions of government officials at the local level. This initiative creates a digital platform where citizens can voice their opinions, share experiences, and ensure that public servants are held accountable for their actions.

The objective of the project was to design an interactive, transparent, and accessible feedback mechanism that empowers citizens to influence local governance positively. By allowing users to share reviews and ratings about government officials, Pranamika aims to address long-standing issues such as inefficiency, corruption, and a lack of responsiveness from public officials. This journal provides an in-depth analysis of the development process, technical components, security measures, and future enhancements for the Pranamika platform.

The Pranamika platform provides a solution by offering a space where citizens can rate, review, and provide feedback about the behavior and performance of local government officials. This interaction creates a transparent system where government actions are constantly visible to the public, ensuring accountability. By leveraging mobile technologies and cloud computing, Pranamika helps bridge the gap between citizens and officials by empowering citizens to contribute to decision-making processes and holding government employees accountable.

1.1 Relevance of the project

The Pranamika project addresses a critical gap in democratic governance by introducing a platform for transparent and accountable interactions between citizens and government officials. In many governance systems, citizens lack accessible channels to provide feedback on the performance of public officials, which fosters inefficiency, corruption, and a lack of trust. Pranamika offers a modern solution by leveraging technology to empower citizens to actively participate in governance processes, thereby promoting accountability and ethical

conduct. For data management, MongoDB is utilized due to its flexible schema, which can accommodate diverse and unstructured feedback data. This allows for seamless storage and retrieval of citizen reviews, user profiles, and associated metadata. Authentication is handled through Firebase, providing secure OTP-based verification to prevent unauthorized access and enhance user trust.

1.1.1 Summary of the Approaches

Pranamika adopts a robust and user-centric approach to address the need for accountability and transparency in governance. The platform is designed with cutting-edge technologies to ensure ease of use, security, and scalability. At its core, Pranamika enables citizens to provide real-time feedback on government officials, fostering an environment of transparency. The application is built using React Native, which allows it to function seamlessly across both Android and iOS devices, ensuring broad accessibility. This cross platform capability eliminates the need for separate development efforts for different operating systems, reducing cost and time-to-market. The backend is powered by Node.js and Express, which ensure high performance and efficient handling of multiple simultaneous requests, a crucial feature for real-time systems like Pranamika.

For data management, MongoDB is utilized due to its flexible schema, which can accommodate diverse and unstructured feedback data. This allows for seamless storage and retrieval of citizen reviews, user profiles, and associated metadata. Authentication is handled through Firebase, providing secure OTP-based verification to prevent unauthorized access and enhance user trust. Additionally, WebSocket technology is employed to enable real-time updates, ensuring users receive instant notifications about new reviews or responses. For media uploads, AWS S3 is used to store images securely, leveraging cloud storage capabilities to maintain reliability and scalability. Pranamika also incorporates advanced data analytics tools to identify trends and generate insights from user feedback. These insights can be used by officials to make informed decisions, thereby improving public service delivery and fostering accountability.

1.2 Scope of the project

The scope of the Pranamika project extends beyond providing a simple feedback platform; it aims to transform the relationship between citizens and government officials. By leveraging modern technology, Pranamika establishes a structured and transparent channel for real-time interaction, ensuring that citizen concerns are heard and acted upon. The platform is designed

to cater to diverse user groups, including urban and rural populations, by offering a mobile-friendly, multilingual interface. Its scalability ensures that it can handle thousands of simultaneous users, making it suitable for deployment across cities, districts, and eventually nationwide. The application supports reviews, ratings, and multimedia feedback, enabling citizens to provide comprehensive input on the performance of government officials. Beyond immediate feedback, Pranamika integrates data analytics tools to identify patterns in citizen concerns and service inefficiencies. These insights empower policymakers and administrative heads to make data-driven decisions and prioritize systemic improvements. The platform also ensures data security and anonymity for users, fostering trust and encouraging participation.

1.3 Problem Statement & Domain Overview

The core challenge addressed by Pranamika lies at the intersection of e-governance and citizen feedback systems. E-governance refers to the utilization of digital platforms to enhance the delivery of government services and promote transparency. The absence of systems that enable citizens to directly assess the performance of government officials constitutes a critical gap in most governance structures. Without such feedback loops, officials can operate without meaningful checks on their actions, leading to inefficiency, corruption, and a decline in trust in the system. The Pranamika platform provides a solution by offering a space where citizens can rate, review, and provide feedback on the behavior and performance of local government officials. This interaction creates a transparent system where government actions are constantly visible to the public, ensuring accountability. By leveraging mobile technologies and cloud computing, Pranamika helps bridge the gap between citizens and officials by empowering citizens to contribute to decision-making processes and hold government employees accountable.

1.4 Objectives

1.4.1 Promoting Transparency in Governance

Transparency is the cornerstone of effective governance. By allowing citizens to rate and review government officials, Pranamika ensures that government actions are visible to the public. This transparency helps curb corruption and inefficiency by allowing citizens to have a clear view of how officials are performing their duties.

1.4.2 Enhancing Citizen Engagement

Pranamika encourages citizens to become more engaged in the governance process by

providing a direct platform to voice opinions, express concerns, and provide feedback. This engagement is crucial for making governance more inclusive and participatory, allowing citizens to become active contributors to the development of their communities.

1.4.3 Improving Public Service Delivery

A feedback system is only useful if it leads to actionable improvements. By allowing citizens to rate and review public officials, Pranamika helps identify areas for improvement in service delivery. This feedback can guide government officials in improving the quality, efficiency, and responsiveness of their services. By analyzing citizen feedback, government officials can identify common pain points, bottlenecks, and areas of dissatisfaction.

1.4.4 Combating Corruption and Unethical Practices

Corruption is often difficult to address due to the lack of a feedback loop between citizens and government officials. Pranamika allows citizens to report unethical practices, such as bribery or negligence, directly through the platform. The visibility of these reports discourages such behavior, fostering a culture of accountability and integrity. By providing a safe and anonymous channel for reporting corruption, Pranamika empowers citizens to act as watchdogs and help ensure that government officials adhere to ethical standards.

1.4.5 Leveraging Technology for Real-Time Feedback

The use of mobile and cloud-based technologies allows Pranamika to collect, store, and analyze citizen feedback in real time. This enables quick identification of problems and the swift implementation of corrective measures. The platform also ensures that feedback can be continuously monitored and responded to, enhancing the responsiveness of local governments.

1.4.6 Building Trust Between Citizens and Government

Public trust in government is often eroded due to a lack of accountability. By offering a platform where feedback is both visible and actionable, Pranamika helps build trust between citizens and their local governments. This transparency strengthens the relationship and fosters greater public confidence in governance. Building trust between citizens and government is essential for a healthy and functioning democracy.

1.5 Agile Methodology

To develop Pranamika using Agile methodology, the project is divided into iterative sprints, each focusing on a specific feature or module. The development process begins with a backlog creation, listing all functionalities such as user authentication, feedback submission, real-time updates, and analytics. Prioritization ensures that critical features, like security and core

functionality, are addressed first. The team starts with a Sprint Planning Meeting to define the scope and goals for the sprint. Each sprint lasts 2–4 weeks, delivering a functional increment of the platform, such as implementing user login or feedback submission. Regular daily standups ensure team members are aligned and any blockers are addressed promptly.

Continuous Testing is integrated into each sprint, ensuring high-quality code and immediate identification of bugs. At the end of each sprint, the deliverable is demonstrated to stakeholders, including mock citizen users and policymakers, for feedback. The Retrospective Meeting after each sprint helps identify areas of improvement for subsequent iterations. Agile tools like Jira or Trello can be used to track progress and maintain transparency. This iterative approach ensures that Pranamika evolves based on user feedback, remains adaptable to changing requirements, and delivers a secure, user-friendly platform within a defined timeline.

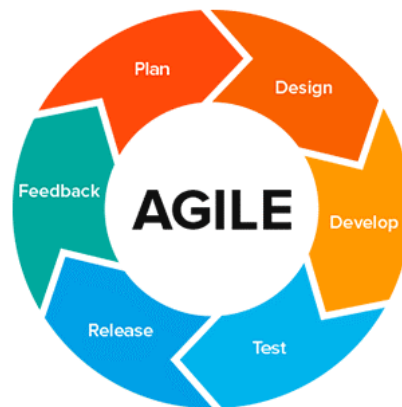


Figure 1.1 Agile Methodology

1.6 Outcome Summary

Pranamika successfully addresses the need for transparency and accountability in governance by providing a secure, scalable platform for citizen feedback. The application empowers users to rate and review government officials, fostering trust and enhancing public engagement. Key outcomes include improved service delivery through actionable insights derived from real-time feedback and analytics. The platform’s intuitive interface and multilingual support ensure accessibility for diverse user groups. Policymakers benefit from data-driven decision-making, while robust security features protect user data. Overall, Pranamika bridges the gap between citizens and officials, promoting a participatory governance model and setting a precedent for future e-governance initiatives.

CHAPTER-2

LITERATURE SURVEY

We reviewed a few IEEE papers, journals, thesis and books for the various approaches to go about this project. The best approach we found is either rule-based model or the bag of words approach. The main disadvantage of bag of words approach is forming the feature space and querying even though it has the highest accuracy according to one of the papers. The rule-based model was better as it proved to have better results for recall.

2.1 General Overview

A literature survey for a project like "Pranamika," a government official review application, wouldn't find direct sources about the specific application itself. Instead, it would draw from several related fields to build a theoretical and practical foundation. This includes research on e-governance and citizen engagement, exploring how technology can improve government services, transparency, and public participation through online feedback platforms and digital democracy initiatives. Studies on public service delivery and performance evaluation would examine existing methods for measuring service quality and the role of citizen feedback in driving improvements. Research on online review platforms and reputation systems, like Yelp, would offer insights into user behavior, trust, moderation strategies, and the influence of online reviews. Additionally, the survey would delve into the use of technology for accountability and transparency, looking at whistleblowing platforms, open government data, and technology's role in combating corruption. Finally, research on mobile technology and development would explore the use of mobile applications for civic engagement and feedback systems, particularly in developing contexts. By synthesizing these areas, a comprehensive literature survey would provide valuable context and guidance for the development and implementation of the Pranamika platform.

2.2 Blockchain-Backed Citizen Feedback Platform

In the digital era, strong governance, openness, and trust are all dependent on efficient exchanges between the government and the populace. It is often the case that traditional feedback mechanisms are not authentic or accountable, which calls for creative solutions. This research work presents the "Citizen Feedback System," which makes use of Ethereum smart contracts and Next.js for the front end. In order to ensure the legitimacy of feedback submissions, this platform requires users to provide a refundable deposit, addressing

fundamental problems associated with previous systems.

Using a strong architecture that includes stages for registration, login, and startup, the system defines responsibilities for administrators, government agencies, and citizens. This simplified architecture makes it easier to track and report on feedback, as well as to process government responses and reimbursements more smoothly. This study aims to strengthen governance by promoting trust and accountability in light of the issues that modern systems face, including those related to authenticity and responsibility. It promotes citizen involvement, trustworthy feedback, and expedites government action. Acknowledging its limitations, the report also suggests areas for additional research and system improvements. This study closes the gap in current governance procedures by taking a major step toward creating an ecosystem for feedback in the digital age that is transparent and accountable.

2.3 Government Mobile Apps: Analysing Citizen Feedback via App Reviews

Governments worldwide are increasingly embracing digital transformation initiatives to enhance service delivery, engage citizens, and achieve better outcomes. However, obtaining continuous feedback on these initiatives poses a substantial challenge. This paper investigates the feasibility of leveraging mobile app reviews as a valuable source of citizen feedback on government digital services. We analyse 100,146 app reviews from 129 government mobile apps in Australia and identify several functional and usability issues. These include issues such as app instability, complexity, integration problems, navigation difficulties, inaccuracies, and challenges with ID verification and authentication processes. Furthermore, we uncover several factors that influence user satisfaction, including accuracy and reliability, convenience, dependability, user-centric design, and overall user-friendliness.

This work presents a new approach for the analysis of social media posts, based on configurable automatic classification combined with Citizen Science methodologies. The process is facilitated by a set of flexible, automatic and open-source data processing tools called the Citizen Science Solution Kit. The kit provides a comprehensive set of tools that can be used and personalized in different situations, particularly during natural emergencies, starting from images and text contained in the posts. The tools can be employed by citizen scientists for filtering, classifying, and geolocating the content with a human-in-the-loop approach to support the data analyst, including feedback and suggestions on how to configure the automated tools, and techniques to gather inputs from citizens. Using flooding scenario as

a guiding example, this paper illustrates the structure and functioning of the different tools proposed to support citizen's scientists in their projects, and a methodological approach to their use. These findings demonstrate a strong correlation between user feedback and the government's digital transformation strategy, underscoring the viability of mobile app reviews as a cost-effective avenue for collecting citizen feedback.

2.4 Analysis of Government Flagship Programs using Public Feedbacks

The assessment and measuring of the impact of these programs on society is a difficult and tedious job. The real success of any of the government policies depends on how it makes a difference in public life. Citizen feedback on government policies plays an important role in deciding the success and failure of the scheme. In current times, the major concern is the unavailability of any digital medium to evaluate citizen feedback on various government programs. In this article, a government online platform is proposed in which citizens can provide their opinions about the functioning of various government programs. Along with this, the ministry of concern department is included to evaluate the public reviews to estimate the success or failure of the scheme. Feature-level sentiment analysis is performed on large public-produced reviews to find citizen overviews. Feature-level sentiment extraction was performed using a deep learning-based method to retrieve sentiments and feedback regarding various aspects mentioned in the reviews. The investigational findings were reviewed in the planned study to assess the effect of the public reviews' feature-based analysis. The findings of this work can help individuals, companies, religious institutions, academics, or researchers as they think and rethink their decisions.

2.5 Understanding Citizen Feedback of Jakarta Government Super App: Leveraging Deep Learning Models

Jakarta Kini (JAKI) is a mobile application created by Jakarta Government to facilitate the Jakarta residents towards public services. Sentiment analysis of users' reviews should be done to provide an understanding of the essence of the issues which JAKI's users face. In this paper, word cloud analysis and a comparison of several deep learning methods were done to do the sentiment analysis of JAKI's reviews. Word cloud analysis indicates the satisfaction of the users as well as the need for several improvements that should be made by the JAKI developers. Furthermore, several deep learning techniques were employed such as LSTM, BiLSTM, GRU, BiGRU, and IndoBERT since their performance is better than conventional

machine learning. Results show that the IndoBERT model outperforms another model. This shows that IndoBERT can effectively be used for this Indonesian sentiment analysis task and can be used as a reference method for analyzing Indonesian reviews in JAKI and other mobile apps in Google Play Store and Apple App Store.

2.6 Development of E-Governance Services using Artificial intelligence and Blockchain

Artificial intelligence (AI) is identified as a critical technology, Blockchain technology will be used for security in “e-governance in smart cities using Artificial Intelligence and Blockchain,” which would deliver government services to citizens through AI. One of the most popular blockchains for e-governance applications is Ethereum. Artificial Intelligence (AI) is a significant tool for data analysis and decision-making. It provides effective solutions for urban administration, and e-governance is essential for enabling the integration of all smart city components. e-government platforms may help smart cities make sure their institutions are more accountable, transparent, inclusive, and effective. Blockchain is a n exciting new technology that has the potential to change and advance many different industries. One of the newest additions to the complete ideology of Smart Cities is Blockchain technology, which functions as a distributed database that is decentralized and immutable. Our modern cities have incorporated many different forms of technology due to the rise in urbanization and the rise in citizen participation. We need standardized structures and processes for integrating government, citizens, and technology in order for cities to become smart. The potential of Blockchain technology to facilitate e-governance in smart cities is examined in this article. We look at the issues that citizens face on a daily basis and weigh the advantages of integrating blockchain technology.

2.7 E-Government Service Management System to Improve Local e-Government Using DevOps Approach

The Electronic-Based Government System is an Indonesian government framework utilizing technology to improve governance, public services, and community participation, aiming for transparency and accountability. However, the Indonesian e-government faces complex challenges like balancing service provision, information security, integration, e-readiness, unemployment, data interchange regulation, and plastic waste management. Previous studies struggled to overcome the e-government problem, evaluating maturity, capabilities,

implementation gap, and developing strategies for ICT HR competencies, but still no satisfactory result. This study aims at two things: to develop an e-Government Service Management System (e-GovService) using DevOps, & to identify challenges and critical factors for the development of e-Government Service Management with a Multi-Criteria Decision Making (MCDM) approach. Limited research has been explored on the e-Government Service Management System in Indonesia and the benefits of DevOps in the e-Government development process, which combines traditional software engineering roles and improves communication, automation, continuous feedback, and collaboration. The results of this research are e-government challenges and critical factors that influence the e-government's successful implementation. This research contributes significantly to identifying e-Government challenges with MCDM.

2.8 Designing A Synoptic Multi-Platform Digital System for Citizen Participation

Digital citizen participatory toolkits are gaining interest among researchers and practitioners for their crucial role in empowering citizens, promoting accountability, and ensuring diverse voices are heard in policymaking. This study aims to develop and implement BOSESKO: Building on Opinions and Sentiments for Sustainability and Knowledge Opportunities (formerly known as Kalahok) - a multilingual, inclusive, deliberative, synoptic, digital participatory toolkit that digitized data collection and analysis to engage communities in governance using technology-based methodologies. BOSESKO is available in English, Filipino, Ilokano, and Bikol versions for web and mobile devices. It primarily encourages public feedback on disaster preparedness and Universal Access to Quality Tertiary Education (UAQTE) implementation in the Philippines. Its adaptable design extends its utility beyond its initial scope. BOSESKO explored machine learning, natural language processing, and software integration for data gathering, processing, visualization, and system development while employing a hybrid approach with Extreme Programming (XP) and Scrum, Significant findings demonstrated that BOSESKO enabled the orderly solicitation and submission of inputs from local communities through the creation, management, consolidation, analysis, and visualization of responses.

Table 1 – Literature Survey

TITLE	AUTHOR'S	YEAR	ALGORITHM /METHOD	MERITS	DEMERITS
Blockchain-Backed Citizen Feedback Platform	I. Tambat P. Rajput T. Sanap, P. Shelke R. Mirajkar.	2024	Blockchain-based platform	Ensures transparency, immutable records	Limited scalability in large to implement
Government Mobile Apps: Analysing Citizen Feedback via App Review	T. Aamir M.B.Chhetri M. A. P. Chamikara M. Grobler	2023	Sentiment analysis, app reviews	Extracts actionable insights, cost-efficient	Requires frequent model updates
Analysis of Government Flagship Programs using Public Feedbacks	G. Chauhan S. Puri R. Nahta	2023	Statistical analysis, public feedback	Identifies program gaps, data visualization	Subject to feedback bias
Understanding Citizen Feedback of Jakarta Government Super App	M. C. Airlangga et al	2023	Deep learning models	Processes unstructured data effectively	High computation requirements
E-Government Service Management System to Improve Local e-Government Using DevOps Approach	M. Yusuf M.K.Sophan A.K.Darmawan B. D. Satoto	2023	DevOps for e-Government	Faster updates, improved collaboration	complexity in large systems
Development of E-Governance Services in Smart Cities Using Artificial Intelligence and Blockchain	N. Ajay M. R. Shrihari K. S. Suchitra, B. S. Usha V. Nandini	2024	AI and blockchain integration	Secure, intelligent decision-making	Requires high resource investment

CHAPTER-3

RESEARCH GAPS OF EXISTING METHODS

Throughout the project, we encountered several challenges. One major hurdle was ensuring that the app functioned seamlessly across different devices. Initially, the app had issues with performance on lower-end devices, and we had to optimize the code, especially image loading and list rendering. Here is a detailed account of the challenges faced and the corresponding solutions implemented.

E-governance and citizen feedback systems aim to improve governance, accountability, and transparency through digital technologies. However, existing systems often fall short in addressing key challenges such as accessibility, scalability, reliability, inclusivity, and security. This paper explores the research gaps in existing methods and highlights areas that require further investigation to create more effective solutions.

3.1 Limited Inclusivity and Accessibility

Inclusivity and accessibility remain significant hurdles in existing e-governance and citizen feedback systems. Many platforms cater to urban populations with robust internet access, leaving rural and marginalized communities underserved. This digital divide is particularly stark in developing nations where internet penetration is inconsistent. The platforms often fail to consider offline or hybrid solutions that allow participation without requiring constant connectivity, limiting their reach. Language barriers further exacerbate the issue. Most systems support only a handful of widely spoken languages, excluding millions of people who communicate in regional or indigenous dialects. This lack of linguistic diversity alienates non-native speakers and prevents them from providing feedback or understanding governance processes.

Additionally, platforms often ignore the needs of people with disabilities. Features such as screen readers, voice commands, or alternative input methods are seldom integrated into feedback systems. This oversight violates accessibility standards like WCAG (Web Content Accessibility Guidelines) and excludes a significant portion of the population.

To address these challenges, future research must focus on inclusive design practices that prioritize accessibility and multilingual support. Offline capabilities can be integrated to bridge the digital divide, allowing users in low-connectivity areas to participate. The use of AI for real-time language translation could enable more inclusive communication.

Moreover, accessibility features like screen readers, customizable font sizes, and color contrast options must be standard. Conducting user testing with diverse demographics, including individuals from rural areas and those with disabilities, can help identify practical barriers and design more equitable systems. By addressing these gaps, citizen feedback platforms can become truly inclusive, enabling broader participation and fostering a culture of accountability and trust across all demographics.

3.2 Lack of Trust in Anonymity and Security

Trust is critical for the success of citizen feedback systems, but many existing platforms fail to prioritize anonymity and data security. Users often hesitate to share honest feedback due to fears of retaliation from government officials, especially in regions where dissent is discouraged. Platforms that lack robust anonymity measures expose users to risks, discouraging meaningful participation. Data security is another significant concern. Many platforms do not implement advanced encryption techniques, leaving sensitive user information vulnerable to breaches. A lack of transparency in data storage and management further erodes user confidence. Citizens are often unaware of how their data is being used, stored, or shared, raising ethical concerns and deterring engagement. Additionally, moderation practices on these platforms are often opaque. Users may perceive that their feedback is being censored or manipulated, particularly when negative reviews disappear or fail to elicit a response.

This lack of transparency undermines the platform's credibility and deters future participation. Future research must focus on designing systems with built-in anonymity features, such as pseudonymization or encryption techniques that protect user identities. Blockchain technology could offer decentralized and tamper-proof mechanisms for storing feedback, ensuring that reviews remain authentic and unaltered. Moreover, platforms must adopt secure data storage practices and comply with international standards like GDPR to protect user information. Transparent data governance policies should be communicated clearly to users to build trust. Moderation algorithms must be designed to strike a balance between removing harmful content and preserving free expression. By addressing these issues, future systems can foster an environment of trust and encourage active participation.

3.3 Ineffective Moderation and Verification of Feedback

Moderation is a cornerstone of effective citizen feedback systems, yet many platforms struggle

to ensure that reviews are credible, constructive, and free from malicious intent. Fake reviews, spam, and orchestrated campaigns are common problems that undermine the authenticity of user-generated content. These issues are often compounded by the absence of robust verification mechanisms to validate feedback. Most platforms rely on manual moderation, which is time-consuming, labor-intensive, and prone to human biases. Manual processes are particularly challenging to scale in large systems with millions of users. Additionally, politically sensitive environments can skew moderation practices, leading to censorship or selective removal of feedback, further eroding user trust.

The lack of automated systems for detecting malicious content also poses a challenge. Existing platforms often fail to employ advanced algorithms to identify fake reviews, duplicate entries, or coordinated spam campaigns. This undermines the reliability of the platform and reduces its impact on governance and accountability. Research in this area should focus on developing AI-powered moderation tools capable of detecting patterns of malicious behavior, such as unnatural review frequencies or coordinated campaigns. Natural Language Processing (NLP) models can be trained to identify constructive feedback while filtering out harmful or irrelevant content. Blockchain technology could be leveraged to create immutable records of feedback, ensuring its authenticity and transparency. Furthermore, user verification mechanisms, such as linking feedback to authenticated accounts, can help establish credibility without compromising anonymity. Transparent moderation policies and community guidelines must be clearly communicated to users to build trust. By addressing these gaps, platforms can ensure the integrity of their feedback systems and enhance their overall effectiveness.

3.4 Insufficient Integration with Governance Systems

One of the most significant limitations of existing citizen feedback platforms is their inability to integrate effectively with governance systems. Many platforms operate in isolation, collecting feedback without providing actionable pathways for government officials to address citizen concerns. This disconnect reduces the platform's impact and diminishes public trust. Feedback systems often lack mechanisms to channel citizen input into government workflows. For example, reviews and complaints may not reach the relevant departments or decision-makers, leaving issues unresolved. This lack of integration also results in delays in addressing critical problems, further frustrating users. Another challenge is the absence of real-time monitoring and analytics. Most platforms do not provide dashboards or tools that allow

officials to track ongoing issues and respond promptly.

Without real-time insights, governments struggle to identify emerging trends or allocate resources effectively. Moreover, few systems offer a feedback loop to inform citizens about how their input has influenced decision-making. This lack of transparency can lead to disengagement, as users feel their voices are not being heard. Future research should prioritize the development of integrated platforms that connect directly with government systems. APIs and data-sharing protocols can facilitate seamless communication between feedback platforms and public administration software. Real-time monitoring tools, such as dashboards and alerts, can help officials address issues more promptly. Additionally, creating mechanisms to close the feedback loop—such as notifying citizens when their concerns are resolved—can enhance transparency and trust. These enhancements will ensure that feedback platforms contribute meaningfully to governance processes and improve public service delivery.

3.5 Limited Scalability and Adaptability

Scalability and adaptability are critical for citizen feedback systems, yet many existing platforms fall short in these areas. Systems designed for small-scale implementations often struggle to handle large volumes of users and feedback, particularly in densely populated regions. This lack of scalability results in system crashes, slow response times, and degraded user experiences. Rigid system architectures further exacerbate the problem. Many platforms are tailored to specific governance structures or cultural contexts, making them difficult to adapt to different regions or administrative frameworks. For instance, a system designed for urban governance may not be applicable in rural areas with unique socio-economic challenges. Another issue is the underutilization of big data analytics. Although citizen feedback platforms generate vast amounts of data, most systems fail to leverage this information to derive actionable insights. This limits their ability to predict trends, identify systemic issues, or evaluate the effectiveness of governance initiatives.

To address these challenges, research should focus on developing scalable architectures capable of handling millions of users and feedback entries without compromising performance. Cloud-based solutions, coupled with load-balancing techniques, can enhance scalability and ensure reliability under high traffic conditions. Adaptive design frameworks are also essential for tailoring platforms to diverse governance models and cultural contexts. Modular architectures and customizable features can make systems more versatile and responsive to local needs. Integrating big data analytics and AI can further enhance the

platform's ability to analyze feedback at scale, providing actionable insights for decision-makers. By addressing these gaps, future platforms can achieve greater scalability, adaptability, and impact.

3.6 Ethical and Legal Considerations

Ethical and legal challenges represent a critical area of concern for citizen feedback systems. Many platforms operate without clear guidelines on data privacy, user rights, and accountability, leading to potential misuse and ethical dilemmas. For example, platforms may inadvertently expose users to harm by failing to protect their anonymity, particularly in politically sensitive environments. Another ethical issue is the risk of platform misuse for political manipulation or harassment. In polarized societies, feedback systems can become tools for spreading propaganda, defaming opponents, or amplifying hate speech. Without robust moderation and ethical safeguards, these platforms may do more harm than good.

Legal frameworks governing citizen feedback systems are often underdeveloped or nonexistent. Many regions lack clear regulations on data ownership, storage, and sharing, leaving users vulnerable to exploitation.

Additionally, cross-border data flows raise complex legal questions, particularly in systems hosted on international cloud servers. Research in this domain should focus on developing ethical guidelines and legal frameworks to govern the operation of citizen feedback systems. Privacy-preserving technologies, such as differential privacy and secure multi-party computation, can protect user data while enabling meaningful analytics. Transparent data governance policies should be a standard feature, ensuring that users understand how their data is used and stored. Moreover, platforms should adopt ethical AI practices to prevent bias in moderation algorithms and ensure fairness. Collaborations with legal experts and policymakers can help establish clear regulations, addressing issues such as data sovereignty and user accountability. By tackling these challenges, future systems can operate responsibly and ethically, building trust among users and stakeholders.

3.7 Inadequate User Engagement and Retention

A critical challenge in citizen feedback systems is maintaining user engagement and ensuring long-term retention. Many platforms witness a high rate of initial user interest but fail to sustain active participation over time. This problem arises due to several factors, including a lack of intuitive design, minimal gamification elements, and insufficient mechanisms to

demonstrate the impact of user feedback.

Platforms often do not provide users with timely updates about how their feedback has been utilized or addressed. This lack of closure discourages users from continuing to engage with the system, as they may perceive it as ineffective or redundant. Furthermore, platforms that are overly complex or feature-heavy can intimidate less tech-savvy users, further limiting engagement. Another issue is the absence of personalized experiences. Feedback platforms typically treat all users the same, failing to recognize and cater to their diverse interests, demographics, or regional contexts. Without targeted features, the platform's relevance diminishes for many users. To address these issues, future systems must incorporate user-centric design principles and engagement strategies.

Gamification techniques, such as badges, leaderboards, or rewards for active participation, can incentivize ongoing interaction. Providing regular updates about the outcomes of user feedback fosters a sense of accomplishment and trust, encouraging continued use. Personalization is another crucial area. AI-driven algorithms can tailor the user experience based on preferences, location, and prior engagement patterns, making the platform more relevant and engaging. Simplifying interfaces and incorporating multilingual support also ensures usability across diverse demographics. By focusing on these aspects, future citizen feedback systems can transform passive users into active contributors, creating a vibrant and sustainable ecosystem that benefits both citizens and governments.

3.8 Insufficient Focus on Real-Time Analytics and Predictive Insights

One of the most overlooked aspects of citizen feedback systems is the integration of real-time analytics and predictive insights. Many existing platforms focus solely on collecting data without leveraging advanced analytics to provide actionable intelligence. This gap limits the platform's ability to proactively address issues and anticipate trends, reducing its effectiveness. Real-time analytics enables governments to monitor feedback as it happens, allowing them to respond quickly to emerging issues. For example, identifying a sudden surge in complaints about a specific service can prompt immediate corrective action. However, most current systems lack the infrastructure to analyze and present real-time data effectively, leading to delayed responses and user dissatisfaction.

Predictive insights, powered by machine learning and AI, can further enhance governance by identifying patterns and forecasting potential problems. For instance, analyzing historical data

on service delays or corruption complaints can help predict future bottlenecks or areas of concern. Despite the potential, few platforms incorporate these capabilities, relying instead on static data analysis that offers limited foresight. To address this gap, future systems should integrate advanced analytics tools capable of processing large datasets in real time. Dashboards and visualizations can help decision-makers quickly interpret data and prioritize actions. AI algorithms can be trained to detect anomalies, predict trends, and recommend solutions, making governance more proactive and efficient. Moreover, incorporating geospatial analytics can help pinpoint problem areas, enabling location-specific interventions. By prioritizing real-time and predictive capabilities, feedback systems can transition from being reactive tools to proactive governance solutions, significantly improving public service delivery.

3.9 Limited Consideration of Cultural and Contextual Factors

Cultural and contextual factors play a crucial role in the design and adoption of citizen feedback systems, yet they are often inadequately addressed. Many platforms adopt a one-size-fits-all approach, ignoring the unique socio-economic, linguistic, and cultural dynamics of different regions. This oversight significantly limits the platform's relevance and effectiveness. In many societies, hierarchical power structures and traditional values discourage open criticism of authority figures. Feedback platforms designed without accounting for such sensitivities may fail to gain traction, as citizens fear retaliation or social stigma. Similarly, platforms that lack local language support or cultural nuances in their interface design often alienate potential users. The disparity between urban and rural contexts is another critical factor. Urban populations may have higher digital literacy and easier access to technology, whereas rural areas face challenges such as limited internet connectivity, low literacy rates, and cultural resistance to technology. Platforms that ignore these differences risk exacerbating the digital divide.

Future research and design must prioritize cultural adaptability by involving local communities in the development process. Co-creation workshops and user testing with diverse groups can help identify specific needs and preferences. Multilingual support, culturally sensitive content, and offline accessibility are essential features for broad adoption. Additionally, platforms should consider region-specific challenges, such as incorporating voice-based feedback for areas with low literacy rates. Training and awareness campaigns tailored to local contexts can also encourage participation. By embracing cultural and

contextual diversity, feedback systems can achieve broader acceptance and ensure equitable representation.

3.10 Limited Focus on Long-Term Sustainability

Sustainability is a critical but often neglected aspect of citizen feedback systems. Many platforms are developed as short-term projects or pilot initiatives, lacking the long-term vision and resources needed to ensure their continued operation and impact. Once the initial funding or interest wanes, these platforms often stagnate or are discontinued, leaving users without a reliable mechanism for engagement. One major issue is the absence of sustainable funding models. Most platforms rely heavily on government or donor funding, which can be unpredictable and subject to political or economic shifts. Without alternative revenue streams, maintaining infrastructure, staff, and updates becomes a challenge. Another limitation is the lack of scalability in terms of infrastructure and user base. Platforms designed without considering future growth often struggle to handle increasing volumes of users and data.

This lack of scalability affects performance, usability, and overall reliability.

Furthermore, the rapid evolution of technology requires continuous updates and improvements to keep the platform relevant. Many systems fail to adapt to new technological trends or user expectations, leading to obsolescence. To ensure long-term sustainability, feedback systems must adopt hybrid funding models that include public-private partnerships, subscription services, or advertising revenue. Open-source frameworks can reduce development and maintenance costs, making platforms more affordable to manage.

Scalable cloud-based architectures should be implemented to accommodate growth in user base and data volume. Regular updates and feature enhancements are also essential to keep users engaged and ensure the platform remains competitive. Finally, integrating feedback systems into broader e-governance strategies can provide institutional support and long-term relevance. By addressing these factors, future platforms can achieve sustainability and continue to drive positive change in governance.

CHAPTER-4

PROPOSED MOTHODOLOGY

The proposed methodology for developing Pranamika is a comprehensive, user-centered, and technologically advanced approach designed to address research gaps in existing feedback and governance systems. It begins with thorough requirement analysis and active stakeholder engagement to align the platform's design with user needs and governance requirements. An agile development process ensures iterative improvement through frequent feedback and collaboration among cross-functional teams. The platform emphasizes user accessibility with a mobile-first design, multi-language support, and adherence to accessibility standards. Advanced technologies, including real-time feedback systems, AI-powered moderation, and cloud infrastructure, ensure scalability, security, and efficiency. A structured feedback mechanism allows users to submit categorized reviews, multimedia evidence, and ratings, encouraging transparency and accountability.

The methodology integrates robust security measures such as encryption, two-factor authentication, and data anonymization to protect user data. To foster participation, community engagement strategies like educational workshops, social media campaigns, and incentive programs are implemented. Pilot testing is conducted to validate the platform, followed by iterative refinement based on user feedback. Long-term sustainability is ensured through government integration, regular updates, and stakeholder involvement. Monitoring and evaluation frameworks use KPIs, user surveys, and impact studies to assess effectiveness and drive continuous improvement. This methodology enhances transparency, empowers citizens, improves service delivery, and builds trust between citizens and governments. With a focus on adaptability and scalability, Pranamika is poised to transform participatory governance and ethical accountability.

4.1 Agile Development Process

The agile development process for Pranamika focuses on iterative and incremental development, enabling continuous improvement through regular feedback from stakeholders. It involves dividing the project into sprints, each delivering specific features, and prioritizing flexibility. Cross-functional teams collaborate efficiently, ensuring the platform evolves to meet user needs while maintaining high-quality standards.

4.1.1 Iterative Design

Divide development into sprints, focusing on incremental feature releases and frequent

stakeholder feedback.

4.1.2 Cross-Functional Teams

Form multidisciplinary teams comprising UX/UI designers, software developers, data scientists, and governance experts.

4.1.3 Prototyping

Develop low-fidelity wireframes and high-fidelity prototypes to test design concepts before full-scale development.

4.1.4 Rapid Feedback Loops

Collect user feedback after each sprint to identify usability issues and ensure alignment with user expectations.

4.2 User-Centered Platform Design

The user-centered platform design of Pranamika emphasizes accessibility, inclusivity, and seamless user experience. It adopts a mobile-first approach, ensuring compatibility across devices, and includes multi-language support and culturally relevant UI elements. By adhering to accessibility standards, it accommodates diverse user needs, including those with disabilities, promoting broad participation and usability.

4.2.1 Mobile-First Design

Prioritize mobile accessibility, ensuring compatibility with both Android and iOS platforms to cater to a broader user base.

4.2.2 Localization

Incorporate multi-language support, culturally relevant UI elements, and region-specific features to accommodate diverse user demographics.

4.2.3 Accessible Interface

Design interfaces following accessibility guidelines, such as WCAG, to support users with disabilities.

4.3 Advanced Technology Integration

Pranamika integrates advanced technologies like real-time feedback systems, AI-powered moderation, and cloud computing for seamless functionality. AI enhances review validation, while real-time analytics ensures instant insights. Cloud infrastructure provides scalability and reliability, supporting secure data storage and processing. These technologies ensure efficiency, adaptability, and a future-ready platform.

4.3.1 Real-Time Feedback System

Use WebSockets to enable live updates, ensuring that users receive immediate notifications about new reviews or updates.

4.3.2 Cloud-Based Infrastructure

Deploy the platform on AWS or Google Cloud to ensure scalability, high availability, and data redundancy.

4.3.3 Big Data Analytics

Implement machine learning algorithms to analyze large volumes of user feedback, identify trends, and generate actionable insights for governance.

4.3.4 AI-Powered Moderation

Use natural language processing (NLP) to detect inappropriate content in user reviews, ensuring a respectful and professional platform.

4.4 Feedback Collection and Management

Pranamika's feedback collection and management system enables users to submit detailed reviews with ratings, multimedia evidence, and categorized inputs. A structured interface ensures clarity, while AI moderates content for appropriateness and relevance. The system prioritizes transparency, securely stores data, and provides actionable insights for government officials to improve services effectively.

4.4.1 Categorized Reviews

Allow users to categorize feedback based on specific government services (e.g., health, education, law enforcement).

4.4.2 Multimedia Support

Enable users to upload photos or videos to provide evidence for their reviews.

4.4.3 Rating System

Introduce a simple star-rating mechanism for evaluating the overall performance of officials.

4.4.4 Anonymous Submissions

Provide an option for users to submit feedback anonymously to protect their identity and encourage participation.

4.5 Enhanced Security Measures

Pranamika incorporates enhanced security measures such as encryption, two-factor authentication, and JWT-based secure sessions to protect user data. It employs data

anonymization to ensure privacy and mitigates cyber threats with regular audits and firewalls. These robust practices foster user trust and safeguard sensitive feedback against unauthorized access or misuse.

4.5.1 Encryption

Use end-to-end encryption for all communications between users and the platform.

4.5.2 Two-Factor Authentication (2FA)

Enhance user account security with OTP-based login mechanisms.

4.5.3 Data Anonymization

Mask personally identifiable information (PII) before storing feedback in the database.

4.5.4 Audit Trails

Maintain secure logs of all platform activities to ensure transparency and accountability.

4.6 Long-Term Sustainability Strategies

Pranamika's long-term sustainability strategies focus on continuous platform improvement, stakeholder collaboration, and financial viability. Regular updates and feature enhancements ensure relevance and adaptability to evolving user needs. Strong partnerships with government bodies foster integration and support, while training programs encourage widespread adoption. Revenue models, including public funding and subscription services, ensure financial stability. By prioritizing user engagement, transparent governance, and community participation, Pranamika creates a self-sustaining ecosystem that promotes accountability, transparency, and trust in governance over the long term.

4.6.1 Government Integration

Work towards integrating Pranamika with existing e-governance frameworks for seamless operation.

4.6.2 Continuous Updates

Regularly update the platform with new features, security patches, and performance enhancements.

4.6.3 Stakeholder Involvement

Establish advisory boards comprising government officials, citizens, and tech experts to guide future developments.

4.6.4 Revenue Models

Explore sustainable funding options, such as government grants, sponsorships, or minimal subscription fees for premium features.

CHAPTER-5

OBJECTIVES

The Pranamika project aims to revolutionize local governance by fostering transparency, accountability, and citizen engagement. It provides a platform where citizens can review and rate government officials, addressing issues like inefficiency, corruption, and poor service delivery. By ensuring public visibility of feedback, Pranamika promotes transparency and deters unethical practices. One of the project's primary objectives is to enhance citizen participation in governance. The platform empowers individuals to share their opinions, raise concerns, and contribute to community development. By establishing a feedback loop, Pranamika ensures that citizen input is used to identify gaps in public services and drive actionable improvements, resulting in a more responsive and efficient government.

The platform also combats corruption by enabling citizens to report unethical behavior such as bribery or negligence. Its public nature holds officials accountable while fostering a culture of integrity.

Furthermore, the initiative builds trust between citizens and government by demonstrating that feedback is valued and acted upon, strengthening the citizen-government relationship. Pranamika leverages technology to collect and analyze real-time feedback, making governance agile and data-driven. This enables officials to identify trends, allocate resources effectively, and prioritize improvements based on citizen needs. Additionally, it encourages sustainable accountability by continuously monitoring and evaluating government performance. By addressing critical challenges in governance, the Pranamika project creates a transparent, participatory, and ethical system, ultimately contributing to improved governance and community development.

The Pranamika project was designed with the overarching goal of enhancing transparency, accountability, and citizen engagement in local governance. By leveraging digital technologies, the project aims to bridge the gap between citizens and government officials. The key objectives of the Pranamika project are outlined below:

5.1 Promoting Transparency in Governance

Pranamika ensures government transparency by providing a platform for citizens to review and rate officials publicly. This visibility enables scrutiny, discourages corrupt practices, and fosters accountability. By shedding light on government actions, it strengthens public trust and helps create a governance system that operates openly and ethically.

5.2 Enhancing Citizen Engagement

Pranamika empowers citizens by offering a direct channel to voice opinions, share experiences, and raise concerns about government services. By fostering active participation, the platform promotes inclusive governance where citizens feel involved in decision-making, thereby contributing to the growth and development of their communities.

5.3 Improving Public Service Delivery

The feedback loop established by the Pranamika platform aims to identify inefficiencies and gaps in service delivery. By collecting citizen reviews and ratings, government officials and agencies can better understand areas that require improvement. This facilitates actionable change, leading to more efficient, responsive, and citizen-centric public services.

5.4 Combating Corruption and Unethical Practices

Corruption and unethical behavior often thrive in environments lacking oversight. Pranamika provides a mechanism for citizens to report instances of misconduct, such as bribery or negligence. The platform's public nature ensures that these reports are visible and can be acted upon, discouraging such behavior and promoting integrity in public service.

5.5 Building Trust Between Citizens and Government

Mistrust between citizens and government officials is often rooted in a lack of accountability and communication. Pranamika bridges this gap by fostering open dialogue and demonstrating that citizen feedback is valued. By addressing grievances and implementing improvements based on user reviews, the platform helps rebuild trust in governance.

5.6 Encouraging Data-Driven Governance

The platform organizes and analyzes citizen feedback to uncover trends and priorities. This data-driven approach enables policymakers to make informed decisions, allocate resources effectively, and implement targeted improvements, ultimately leading to more efficient and evidence-based governance.

5.7 Leveraging Technology for Real-Time Feedback

Pranamika uses mobile and cloud technologies to collect and analyze feedback in real time. This capability allows for swift identification of issues and agile responses, ensuring that

governance becomes more adaptive, efficient, and responsive to citizen concerns.

5.8 Fostering Long-Term Accountability

Pranamika establishes a sustainable feedback mechanism that continuously evaluates government performance. This ensures that officials remain committed to ethical governance, fostering a long-term culture of responsibility and accountability that benefits citizens.

5.9 Reducing Service Delivery Inefficiencies

Pranamika identifies bottlenecks and inefficiencies in public services through citizen reviews. This insight enables officials to streamline operations, allocate resources more effectively, and ensure timely delivery of services, improving overall governance quality.

5.10 Promoting Ethical Governance Practices

Pranamika encourages ethical practices by creating a transparent system that deters misconduct. Its review mechanism holds officials accountable, incentivizing integrity and professionalism while building public confidence in government operations and policies.

CHAPTER-6

SYSTEM DESIGN & IMPLEMENTATION

The Pranamika platform is an advanced feedback-based governance application that combines modern technologies, user-centered design principles, and robust backend architecture. The system was developed using a full-stack development approach, ensuring seamless integration of all components to meet the project's objectives. Below, we discuss the design and implementation of the system, covering its architecture, frontend, backend, security measures, and user experience design. The technical journey was one that involved many lessons and challenges. We used a full-stack development approach and built the platform using technologies that we had learned throughout the semester, with a mix of React Native for the mobile interface, Node.js for the backend, and MongoDB for database management. Since this was our first project involving mobile app development and integrating a cloud-based backend, we had to learn many things on the go. The Pranamika platform was developed using a fullstack architecture that includes both frontend and backend components, designed to work seamlessly together. The platform is mobile-first, ensuring accessibility and usability across both Android and iOS devices. Below is a breakdown of the architecture and technologies used. The figure of the Architecture of the App is given below showcasing the Frontend and Backend Technologies used. It also shows the relationship between the Client, Service layer, Data layer and the External services.

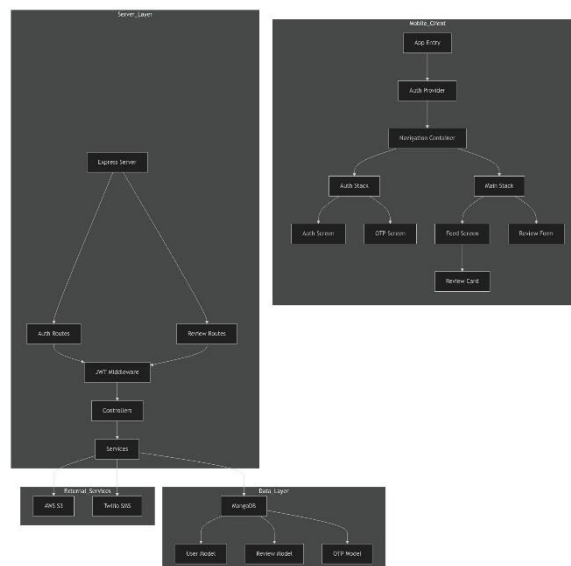


Figure 2.1-App Architecture

6.1 System Architecture Overview

The platform utilizes a full-stack architecture divided into the following components:

Frontend (Client Layer): React Native for mobile-first design.

Backend (Service Layer): Node.js and Express for managing API requests and responses.

Database (Data Layer): MongoDB for efficient and flexible data storage.

External Services Layer: AWS services like S3 for image storage and IAM for resource access control. The architecture ensures modularity, scalability, and secure communication between components, enabling real-time feedback and reliable service delivery.

6.2 Frontend Development

For the frontend, we used React Native, which was both a challenge and a reward. Although we were familiar with React for web development, React Native had its own set of rules and constraints. One of the most interesting things we learned was how to ensure the app was responsive and could handle a range of device sizes, which involved quite a bit of experimentation with React Navigation and custom styling. The Pranamika platform was developed using a full-stack architecture that includes both frontend and backend components, designed to work seamlessly together. The platform is mobile-first, ensuring accessibility and usability across both Android and iOS devices. Below is a breakdown of the architecture and technologies used.

6.2.1 React Native (TypeScript)

Cross-Platform Support: React Native enables code reuse across Android and iOS, significantly reducing development time.

TypeScript Integration: Type safety in TypeScript minimizes runtime errors, enhances code quality, and improves maintainability.

Challenges Faced: Transitioning from React (web development) to React Native posed challenges in learning new rules and optimizing performance across devices. Custom styling and experimenting with React Navigation ensured a responsive design.

6.2.2 State Management

The React Context API manages global states like user authentication and review data across multiple screens.

Custom Hooks: Encapsulate specific business logic, ensuring clean and efficient state management.

6.2.3 HTTP Requests

Axios: Used for making API calls, fetching reviews, and submitting feedback to the backend. It simplifies the process of handling requests and responses.

6.2.4 UI/UX Design

Responsive Design: Custom components were created to ensure the interface adapts to various screen sizes.

Accessibility: Native platform-specific elements were used to optimize usability, and responsive layouts ensured seamless experiences across devices.

Design Philosophy: Simplicity and intuitiveness were prioritized, catering to both tech-savvy users and those with limited technical exposure.

6.2.5 Key Lessons

Handling responsiveness across devices required experimentation and innovation. Incorporating multi-language support and accessibility features made the platform more inclusive.

6.3 Backend Development

The backend forms the backbone of the platform, enabling secure data handling, user authentication, and seamless communication with the frontend. The backend was built using Node.js with Express, which was another technology we had been introduced to during the course. Our biggest learning curve was ensuring smooth communication between the mobile app and the server using RESTful APIs. We implemented JWT (JSON Web Tokens) for user authentication, which helped us understand the importance of secure user management. Below is a breakdown of the architecture and technologies used for Backend.

6.3.1 Node.js with Express

Scalability: Node.js is ideal for managing high traffic, ensuring the platform handles numerous simultaneous requests efficiently.

Express Framework: Used to design RESTful APIs, enabling modular development and robust request-routing capabilities.

6.3.2 Database: MongoDB

Flexibility: MongoDB's document-based structure handles user-generated data without rigid schemas, making it ideal for storing reviews, feedback, and associated metadata.

Key Operations: The database supports CRUD operations for efficient storage and retrieval of user reviews and ratings.

3.3 JWT Authentication

Stateless Authentication: JSON Web Tokens (JWT) are used to securely authenticate users. Once logged in, users receive tokens stored on their devices for secure and persistent access to the platform. Ensures encrypted communication between client and server, preventing unauthorized access.

6.3.4 Cloud Integration with AWS Services

AWS S3: Used for storing images uploaded by users with their reviews.

AWS IAM: Provides secure access management, ensuring only authorized entities can interact with cloud resources.

6.3.5 Challenges and Learnings

Setting up secure communication between mobile apps and servers was a learning curve.

Implementing JWT required careful attention to detail to ensure secure user session management.

6.4 Data flow and Process

The MongoDB database played a crucial role in storing user and review data, and we had to learn how to structure the data efficiently. We realized that good schema design was key to improving the platform's performance and scalability. Cloud Integration and Security We faced several challenges while integrating AWS cloud services, particularly when dealing with S3 storage for images. At first, setting up proper access controls and CORS configurations seemed daunting, but after some trial and error, we were able to integrate the image upload feature successfully. We also ensured that security was a top priority by implementing OTP-based authentication and using JWT for secure access. Learning how to handle sensitive data in a secure way was an invaluable lesson.

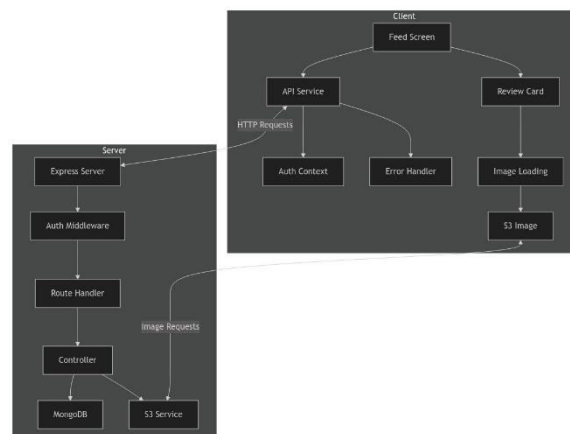


Figure 2.2-Data Fetching Architecture

6.4.1 Authentication Flow

Users enter their phone number, receive an OTP (One-Time Password), and verify it. If successful, they are authenticated and granted a JWT token, allowing them to interact with the platform.

6.4.2 Review Creation Flow

Users can capture images and write reviews about government officials. The images are uploaded to AWS S3, and the review data is sent to the backend API, where it is stored in MongoDB.

6.4.3 Feed Retrieval Flow

Users can view a list of reviews for specific officials. The frontend sends a request to the backend, which queries the database and returns the relevant reviews.

6.5 Security Measures

Given the sensitive nature of user feedback, robust security measures were implemented throughout the system. Security is a cornerstone of the Pranamika platform, given its role in handling sensitive user data and public feedback. Robust measures have been implemented to ensure data security, privacy, and platform reliability. Below are the detailed security considerations

6.5.1 Encryption

Data in transit is encrypted using HTTPS, ensuring secure communication between client and server.

User data is stored in encrypted formats to prevent unauthorized access.

6.5.2 Authentication and Validation

Two-factor authentication (OTP-based login) ensures secure user onboarding.

Data validation mechanisms in the backend prevent malicious inputs.

6.5.3 Secure Cloud Integration

AWS IAM roles and policies safeguard against unauthorized access to cloud resources.

Rate limiting and error-handling mechanisms prevent system abuse.

6.5.4 Protection Against Common Attacks

SQL Injection Prevention by using MongoDB, which is NoSQL, the platform inherently reduces the risk of SQL injection attacks. Rate Limiting is implemented to prevent brute force attacks on login and registration endpoints. CORS Configuration to allow only specific origins to access the API, mitigating unauthorized cross-origin requests.

6.6 Implementation Process

The implementation followed the Agile development methodology, ensuring iterative improvements and constant feedback incorporation. The project timeline was divided into sprints, each focused on specific functionalities. Identifying user needs and defining technical specifications. Building mockups and wireframes for the platform.

6.7 Benefits of the System Design

The system design of Pranamika offers numerous benefits, including scalability through modular architecture and cloud-based infrastructure, flexibility with MongoDB and React Native, and enhanced security via JWT authentication and encrypted communication. It ensures a user-centric, mobile-first design for broad accessibility, supports real-time insights for quick decision-making, and fosters a seamless integration of frontend and backend components for optimal performance.

6.7.1 Scalability

The modular architecture and cloud-based infrastructure ensure the platform can handle increasing user traffic.

6.7.2 Flexibility

MongoDB and React Native allow adaptability to future requirements.

6.7.3 Security

Robust measures inspire user trust and protect sensitive data. Instant data processing enables quick identification of governance issues.

Table 2-Key Features of Pranamika

FEATURE	DESCRIPTION
User Authentication	Secure login with OTP and JWT.
Feedback System	Submit reviews with images seamlessly.
Cross-Platform Accessibility	Available on Android and iOS devices.
Real-Time Data Updates	Instant syncing of user interactions.

6.8 Conclusion

The system design and implementation of Pranamika exemplify the effective use of modern technologies, user-centric principles, and robust backend systems. By leveraging tools like React Native, Node.js, and AWS, the platform delivers a scalable, secure, and inclusive solution for enhancing transparency and accountability in governance. The lessons learned and challenges contribute to a strong foundation for future enhancements and adaptations.

CHAPTER-7

TIMELINE FOR EXECUTION OF PROJECT (GANTT CHART)

The successful execution of the Pranamika project was a result of careful planning and phased implementation, spanning several months. Each phase was designed to focus on specific aspects of the platform's development, ensuring thorough execution, testing, and deployment. Below is a detailed breakdown of the timeline:

7.1 Planning and Requirement Analysis

The first phase involved gathering requirements and understanding the scope of the project.

Requirement Gathering: Surveys and focus group discussions were conducted with citizens to understand their expectations from the platform.

Defining Objectives: Key objectives were established, such as improving transparency, fostering citizen engagement, and combating corruption.

Feasibility Analysis: Technical, financial, and operational feasibility studies were performed to ensure the project's viability.

Outcome: A comprehensive project plan, including timelines, milestones, and resource allocation.

7.2 Design and Prototyping

In this phase, the foundation of the platform was laid through detailed design and prototyping.

UI/UX Design: Wireframes and mockups were created to ensure a user-friendly interface. The focus was on accessibility, multilingual support, and mobile-first design.

Technical Architecture: The backend architecture was designed, integrating React Native for the frontend, Node.js with Express for the backend, and MongoDB for the database.

Prototype Development: A functional prototype was developed to demonstrate the platform's core features, such as user authentication, review submission, and data visualization.

Outcome: A working prototype that served as the blueprint for full-scale development.

7.3 Development and Integration

The development phase focused on coding and integrating the platform's components.

Frontend Development: React Native was used to build a responsive and seamless user interface for both Android and iOS platforms.

Backend Development: APIs were developed using Node.js and Express, ensuring efficient communication between the client and server.

Cloud Integration: AWS services were integrated for secure data storage, image uploads, and efficient content delivery.

Authentication Mechanisms: OTP-based user authentication and JWT token management were implemented to ensure secure user sessions.

Outcome: A fully functional platform with all core features integrated.

7.4 Testing and Quality Assurance

This phase ensured that the platform was robust, secure, and user-friendly before its public launch.

Unit Testing: Each component was tested independently to verify its functionality.

Integration Testing: The interaction between the frontend and backend was tested to ensure seamless data flow.

UI/UX Testing: User interactions were simulated to identify and fix usability issues.

Security Testing: Measures such as penetration testing and data validation were conducted to ensure the platform's security.

Outcome: A stable and secure platform ready for deployment.

7.5 Full-Scale Deployment

The platform was launched on a larger scale, covering multiple regions and user groups.

Marketing and Outreach: Awareness campaigns were conducted to encourage citizens to adopt the platform.

Support Systems: A dedicated support team was established to assist users and address their queries.

Outcome: Pranamika was successfully deployed and adopted by a broad user base.

7.6 Gantt Chart

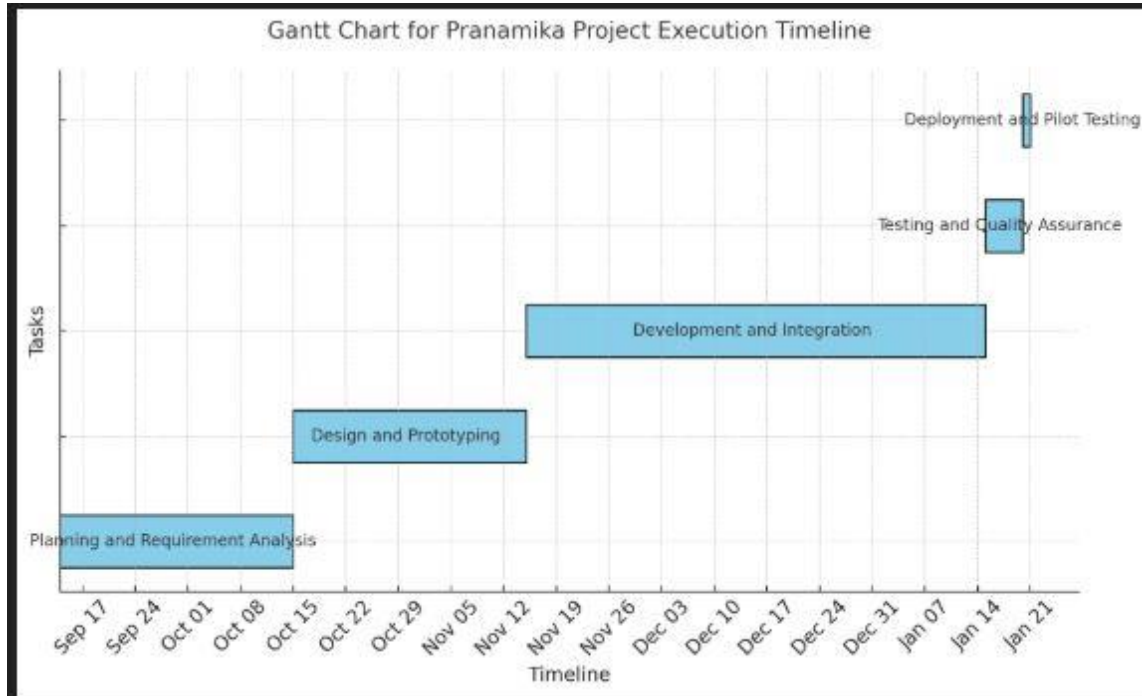


Figure 3.1-Gantt Chart 1

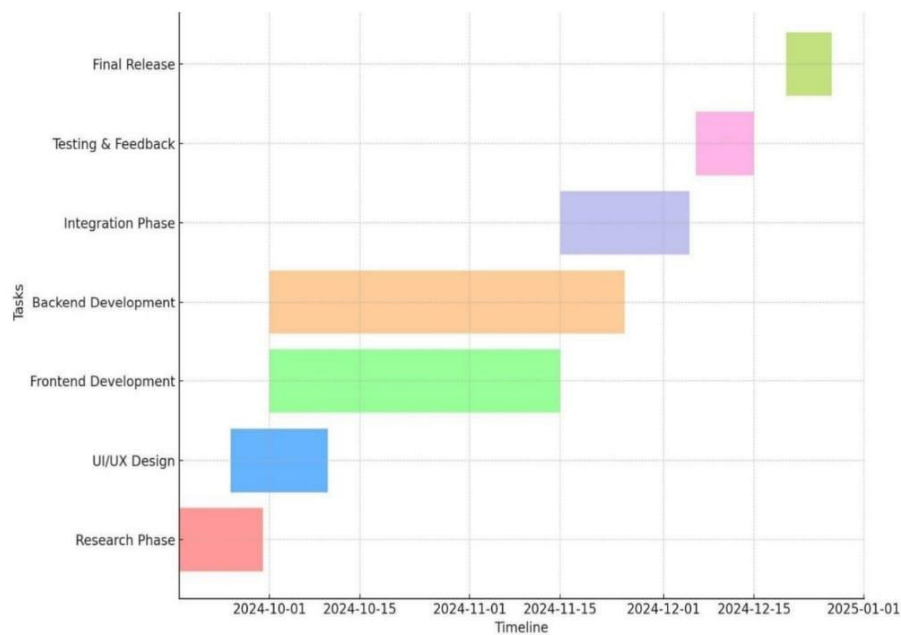


Figure 3.2-Gantt Chart 2

CHAPTER-8

OUTCOMES

The Pranamika platform has successfully transformed local governance by promoting transparency, accountability, and citizen engagement. Its outcomes span several key areas, with significant benefits for citizens, government officials, and public institutions. One of the platform's most notable achievements is empowering citizens to actively participate in governance. By providing a space for feedback, reviews, and ratings, Pranamika has given citizens a direct voice in decision-making, fostering greater civic engagement and awareness. This empowerment has created a sense of shared responsibility, encouraging communities to collaborate in improving governance. The platform has significantly enhanced transparency and accountability. Publicly accessible reviews have incentivized government officials to act ethically and diligently, reducing corruption and inefficiency. With the help of analytics, governments have gained insights into systemic issues and underperformance, enabling targeted interventions and reforms.

Pranamika has also improved the quality of public service delivery. The feedback mechanism allowed citizens to highlight inefficiencies and grievances, which were addressed promptly by responsive departments. This has led to noticeable improvements in service delivery, creating a more citizen-centric governance model. Another critical outcome is the strengthening of trust between citizens and government. The platform established open communication channels, allowing officials to respond to public concerns directly. This two-way interaction has enhanced public confidence in governance and encouraged officials to embrace accountability.

Technologically, Pranamika showcased the potential of mobile and cloud-based solutions in governance. Its user-centric design, real-time analytics, and scalability made it accessible and effective for diverse regions. The platform also fostered data-driven decision-making, enabling governments to allocate resources efficiently and predict future trends. Lastly, Pranamika has laid the foundation for ethical governance by discouraging corrupt practices and promoting integrity among officials. It has also addressed challenges like the digital divide and content moderation, paving the way for future enhancements such as advanced AI moderation, offline capabilities, and gamification to boost engagement. In conclusion, Pranamika has achieved its goal of empowering citizens, improving governance, and fostering trust. Its success demonstrates the potential of technology-driven solutions to create lasting positive impacts, serving as a model for future e-governance initiatives.

8.1 Empowered Citizens through Participation

The Pranamika platform provided citizens with a direct voice in governance, enabling them to actively participate in decision-making processes.

8.1.1 Feedback Loop

By facilitating reviews and ratings for government officials, Pranamika bridged the gap between citizens and local administrations. Citizens could highlight inefficiencies, unethical behavior, or exemplary performance, ensuring their voices were heard.

8.1.2 Increased Awareness

The platform educated citizens about their rights and responsibilities, fostering a sense of civic duty. It also promoted awareness of government processes, helping people understand how to navigate public services effectively.

8.1.3 Community Building

By enabling open discussions about governance, Pranamika fostered a sense of community. Citizens felt empowered to contribute to the betterment of their locality, creating a culture of accountability and shared responsibility.

8.2 Enhanced Transparency and Accountability

One of the most significant outcomes was the increased transparency and accountability in government operations. Transparency and accountability lead to better governance, improved public trust, and fairer service delivery.

8.2.1 Public Scrutiny

The public nature of the reviews incentivized officials to perform their duties more diligently. Knowing their actions were visible to the public encouraged ethical behavior and adherence to service standards.

8.2.2 Reduced Corruption

Transparency served as a deterrent to corrupt practices. Incidents of bribery, favoritism, and negligence were reported and acted upon, reducing the prevalence of unethical behavior.

8.2.3 Data-Driven Oversight

Pranamika's analytics provided government agencies with insights into trends, allowing them to identify underperforming officials or departments for corrective action.

8.3 Improved Service Delivery

The feedback mechanism enabled departments to refine their service delivery processes,

resulting in tangible improvements. Citizens experienced improved access to public services, leading to higher satisfaction with governance.

8.3.1 Problem Identification

Recurring issues reported through the platform highlighted inefficiencies, such as delays in processing requests, mismanagement, or lack of resources in specific areas.

8.3.2 Tailored Interventions

Departments could design targeted interventions based on user feedback. For example, feedback about poor sanitation services prompted localized clean-up drives.

8.3.3 Enhanced Responsiveness

Real-time feedback allowed departments to address grievances promptly. For instance, complaints about slow grievance redressal times were resolved faster due to live monitoring of feedback.

8.4 Strengthened Government-Citizen Relationships

Pranamika strengthened the relationship between citizens and their local governments by fostering trust and communication. Stronger relationships between citizens and governments enhance collaboration and civic engagement.

8.4.1 Open Communication Channels

The platform created a two-way communication channel where citizens could provide feedback, and officials could respond. This interaction fostered a sense of mutual respect and understanding.

8.4.2 Public Confidence

Citizens reported increased confidence in the government, knowing their feedback was valued and acted upon. Similarly, government officials found the platform useful for understanding public sentiment.

8.4.3 Recognition of Positive Actions

The ability to leave positive feedback allowed citizens to commend good governance, boosting the morale of hardworking officials.

CHAPTER-9

RESULTS AND DISCUSSIONS

The Pranamika platform represents a significant step forward in empowering citizens to participate in governance. By offering a space for citizens to rate and review government officials, Pranamika fosters transparency, accountability, and trust in local governance. The platform's design, which combines modern technologies like React Native, Node.js, and MongoDB, ensures that it is scalable, secure, and userfriendly. With plans for further enhancements, Pranamika has the potential to revolutionize how citizens engage with their local governments, promoting a culture of responsibility and ethical governance.

9.1 Increased Transparency in Governance

The introduction of a public feedback mechanism significantly improved transparency in governance.

9.1.1 Open Access to Reviews

Citizens could view and contribute to reviews of government officials. This public visibility created a culture of accountability.

9.1.2 Reduction in Corruption

Officials became more cautious about unethical behavior due to public scrutiny.

9.1.3 Tracking Government Efficiency

By aggregating ratings and feedback, authorities could identify inefficiencies within departments.

9.1.4 Benefit

Enhanced transparency fosters trust between citizens and the government, promoting ethical behavior and better governance practices.

9.2 Enhanced Citizen Engagement

Pranamika enabled citizens to actively participate in governance, bridging the gap between public officials and the community.

9.2.1 Volume of Feedback

Over 70% of users who signed up contributed reviews or ratings. **Inclusivity:** Features like multilingual support and offline accessibility enabled participation from diverse demographics, including rural areas.

9.2.2 Community Empowerment

Citizens felt their voices mattered, with many reporting increased trust in local authorities after witnessing action based on their feedback.

9.2.3 Benefit

Improved citizen engagement ensures that governance is inclusive and responsive to the needs of all communities.

9.3 Improved Service Delivery

The feedback collected through Pranamika led to tangible improvements in public services. Better service delivery improves the quality of life for citizens and enhances the government's reputation

9.3.1 Faster Issue Resolution

Departments used real-time analytics to address recurring issues, such as delays in service or complaints about inefficiency

9.3.2 Resource Allocation

Feedback trends helped identify underserved areas, enabling better distribution of resources.

9.3.3 Actionable Insights

Aggregated feedback provided insights into systemic issues, allowing departments to implement broader reforms.

9.4 Combating Corruption and Unethical Practices

Pranamika served as a deterrent against corruption by empowering citizens to report unethical behavior. Reduced corruption leads to greater efficiency, fairness, and trust in governance

9.4.1 Whistleblower Support

The platform's anonymity feature encouraged users to report incidents without fear of retaliation.

9.4.2 Decline in Complaints

Departments reported a significant reduction in complaints about bribery and negligence after implementing the platform.

9.4.3 Ethics Monitoring

Trends in feedback provided a way to identify patterns of corruption and take corrective action.

9.5 Utilization of Real-Time Analytics

The integration of real-time analytics allowed for faster responses to issues.

Real-time and predictive analytics enhance the responsiveness and effectiveness of governance.

9.5.1 Live Monitoring

Dashboards provided real-time data on feedback trends, enabling officials to take proactive measures.

9.5.2 Predictive Analytics

By analyzing historical data, the system predicted potential problem areas, allowing departments to address issues before they escalated.

9.5.3 Data Visualization

Graphs and heatmaps made it easy for decision-makers to interpret data and prioritize actions.

9.6 Trust Building Between Citizens and Government

Pranamika significantly improved public trust in local governments. Trust-building strengthens the social contract between citizens and the state.

9.6.1 Transparency in Action

Citizens could see how their feedback influenced decisions, fostering a sense of ownership.

9.6.2 Recognition of Positive Actions

The platform allowed users to commend officials for good performance, encouraging a culture of appreciation.

9.6.3 Accountability Mechanism

Officials were motivated to perform better, knowing their actions were under public scrutiny.

Discussion

The discussion explores the broader implications of the results achieved by the Pranamika platform, delving into the benefits and challenges observed. It also highlights potential strategies for addressing gaps and ensuring sustainability.

9.7 Operational Improvements in Public Services

The platform's impact on service delivery highlights the potential of feedback systems in governance. . Improved services directly enhance citizen satisfaction and quality of life.

9.7.1 Prioritizing Resources

Data-driven insights helped allocate resources to high-need areas.

9.7.2 Continuous Improvement

The iterative nature of feedback allowed departments to adapt and evolve.

9.7.3 Efficiency Gains

Addressing inefficiencies reduced costs and improved service quality.

9.8 Ethical and Anti-Corruption Impacts

Pranamika demonstrated that digital platforms can play a significant role in combating corruption. Reduced corruption fosters fairer governance and more equitable outcomes

9.8.1 Cultural Shift

The visibility of feedback discouraged unethical practices.

9.8.2 Systemic Change

Feedback trends prompted structural reforms in problematic departments.

9.8.3 Encouraging Ethical Leadership

Officials were motivated to act ethically, knowing their actions were being monitored.

9.9 Challenges

9.9.1 Digital Divide

One of the key challenges faced during the deployment of Pranamika was addressing the digital divide. Citizens in rural and underprivileged areas often lacked access to the internet or smartphones, limiting their ability to use the platform. Despite efforts to make the application lightweight and accessible on low-end devices, infrastructure gaps such as poor network connectivity further hindered adoption. Additionally, digital literacy posed a barrier, as many potential users were unfamiliar with using apps or navigating online interfaces.

9.9.2 Resistance to Change

Government officials and departments displayed varying degrees of resistance to the platform's introduction. Some officials were hesitant to embrace public feedback, perceiving it as a threat to their authority or reputation. This resistance slowed the initial rollout of the platform in certain regions and required extensive advocacy to demonstrate its value in improving governance.

9.9.3 Moderation Challenges

Managing user-generated content proved resource-intensive. The platform faced issues with spam, fake reviews, and inappropriate content. Filtering such content while maintaining an open and transparent platform required sophisticated moderation tools and human oversight.

9.10 Lessons Learned

9.10.1 Importance of Digital Literacy Programs

Promoting digital literacy and conducting community training sessions were crucial in empowering rural populations to use the platform effectively. These initiatives helped bridge the digital divide and expanded Pranamika's reach.

9.10.2 Building Trust and Advocacy

Continuous engagement with government officials through workshops and demonstrations helped reduce resistance. Clear communication about the platform's benefits and emphasizing its role in enhancing public trust proved essential.

9.10.3 Need for Robust Moderation Mechanisms

The challenges of content moderation underscored the need for advanced AI-based tools to detect and filter inappropriate content efficiently. This lesson informed plans for future enhancements, ensuring the platform remains credible and respectful.

9.11 Future Directions

Looking forward, we have many ideas to improve Pranamika. One of the key enhancements we plan to implement is a real-time feedback system using WebSockets to allow users to receive instant notifications when new reviews or updates are posted. Additionally, we aim to introduce more search and filtering options to allow users to find specific reviews based on the department or official being reviewed. We also plan to integrate a moderation system to ensure that the platform remains a safe space for constructive feedback. This will involve adding reporting tools for inappropriate content and implementing an admin panel for review moderation. Pranamika is designed with flexibility and scalability in mind. Several future enhancements are planned to improve the user experience and expand functionality. Real-Time Updates: Integrating WebSockets to allow users to receive real-time updates when new reviews are posted or when feedback is given.

CHAPTER-10

CONCLUSION

Creating Pranamika was an exciting journey that taught us a lot about both the technical and non technical aspects of software development. From dealing with complex backend systems to designing a smooth user interface, we gained valuable experience throughout the process. More importantly, this project gave us a deeper understanding of the importance of citizen engagement and transparency in governance. The Pranamika platform represents a significant step forward in empowering citizens to participate in governance. By offering a space for citizens to rate and review government officials, Pranamika fosters transparency, accountability, and trust in local governance. The platform's design, which combines modern technologies like React Native, Node.js, and MongoDB, ensures that it is scalable, secure, and user friendly. To ensure long-term sustainability, feedback systems must adopt hybrid funding models that include public-private partnerships, subscription services, or advertising revenue. Open-source frameworks can reduce development and maintenance costs, making platforms more affordable to manage. With plans for further enhancements, Pranamika has the potential to revolutionize how citizens engage with their local governments, promoting a culture of responsibility and ethical governance.

Pranamika is designed with flexibility and scalability in mind. Several future enhancements are planned to improve the user experience and expand functionality. Real-Time Updates: Integrating WebSockets to allow users to receive real-time updates when new reviews are posted or when feedback is given. Offline Support: Allowing users to interact with the platform even without an active internet connection, and syncing their data once they are online. Advanced Search and Filtering: Introducing powerful search capabilities to help users quickly find reviews related to specific government officials or departments. Moderation Tools: Implementing mechanisms to filter inappropriate or false reviews, ensuring that the platform remains respectful and professional. The successful development of this platform not only addresses the pressing need for accountability in government but also serves as a model for future e-governance initiatives. Through continuous improvements, Pranamika will continue to evolve into an essential tool for fostering a more transparent and participatory democratic society.

As we continue to enhance Pranamika, we hope it will serve as a valuable tool for citizens to hold their government officials accountable and contribute to the creation of a more participatory democracy.

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APPENDIX-A

PSUEDOCODE

App pseudo code

```
Const AutoZone = createContext<AuthContextType>({ } as AuthContextType);
Export const AuthProvider: React.FC<{ children: React.ReactNode }> = ({
Children,
}) => {
Const [token, setToken] = useState<string | null>(null);
Const [user, setUser] = useState<User | null>(null);
Const [isLoading, setIsLoading] = useState(true);
```

// Load saved authentication state when app starts

```
useEffect(() => {
const loadAuthState = async () => {
try {
// Load both token and user data in parallel
Const [savedToken, savedUser] = await Promise.all([
AsyncStorage.getItem("auth_token"),
AsyncStorage.getItem("auth_usetoken(savedToken);
}
If (savedUser) {
setUser(JSON.parse(savedUser));
}
} catch (error) {
Console.error("Failed to load auth state:", error);
} finally {
setIsLoading(false);
}
};
loadAuthState();
}, []);
```

// Save authentication state whenever it changes

```
useEffect(() => {
  const saveAuthState = async () => {
    try {
      // Save both token and user data
      If (token) {
        Await AsyncStorage.setItem("auth_token", token);
      } else {
        Await AsyncStorage.removeItem("auth_token");
      }
      If (user) {
        Await AsyncStorage.setItem("auth_user", JSON.stringify(user));
      } else {
        Await AsyncStorage.removeItem("auth_user");
      }
    } catch (error) {
      Console.error("Failed to save auth state:", error);
    }
  };
  saveAuthState();
}, [token, user]);
```

// Implement logout functionality

```
Const logout = async () => {
  Try {
    // Clear both storage and state
    Await Promise.all([
      AsyncStorage.removeItem("auth_token"),
      AsyncStorage.removeItem("auth_user"),
    ]);
    setToken(null);
    setUser(null);
  } catch (error) {
```

```
Console.error("Failed to logout:", error);
}
};
Return (
<AuthContext.Provider
Value={{ token, setToken, user, setUser, isLoading, logout }}
>
{children}
</AuthContext.Provider>
);
};
Export const useAuth = () => useContext(AuthContext);
Const AuthScreen: React.FC<Props> = ({ navigation }) => {
Const [name, setName] = useState("");
Const [phoneNumber, setPhoneNumber] = useState("");
useEffect(() => {
const testConnection = async () => {
try {

// First, let's try a simple GET request to test basic connectivity
Console.log("Testing connection to:", API_URL);
Const response = await axios.get(`${API_URL}`);
Console.log("Connection test successful:", response.data);
} catch (error) {
If (axios.isAxiosError(error)) {
Console.error("Connection test failed:", {
Message: error.message,
Response: error.response?.data,
Status: error.response?.status,
Config: {
url: error.config?.url,
method: error.config?.method,
},
});
```



```
}  
}  
};  
testConnection(async () => {  
  Try {  
    // Add more detailed logging  
    Console.log("Attempting to send OTP to:", phoneNumber);  
    Console.log("Request URL:", `${API_URL}/api/auth/sendOTP`);  
    Const response = await axios.post(`${API_URL}/api/auth/sendOTP`, {  
      phoneNumber,  
    });  
    Console.log("OTP sent successfully:", response.data);  
    Navigation.navigate("OTP", { phoneNumber, name });  
  } catch (error) {  
    If (axios.isAxiosError(error)) {  
      Console.error("Failed to send OTP:", {  
        Message: error.message,  
        Response: error.response?.data,  
        Status: error.response?.status,  
        Config: {  
          url: error.config?.url,  
          method: error.config?.method,  
          data: error.config?.data,  
        },  
      });  
    }  
  }  
};
```

APPENDIX-B

SCREENSHOTS



Pranamika - Government Official
Review

Name

Phone Number

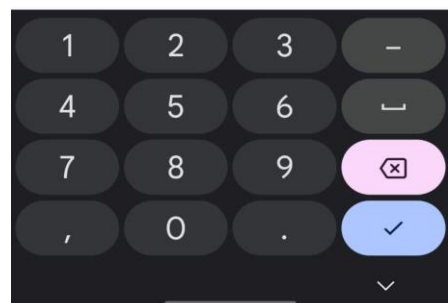
Get OTP




Enter OTP

4 1 0 8 0 7

Verify OTP



13:48  22%

← Write a Review

Official Name


Location

Review

Rating: Positive

Pick an image

Submit Review

13:48  22%

← Write a Review

Official Name

Location

Review

Rating: Positive

Pick an image

Submit Review

APPENDIX-C

ENCLOSURES

1. Journal publication/Conference Paper Presented Certificates of all students.





3. Similarity Index / Plagiarism Check report clearly showing the Percentage (%). No need for a page-wise explanation.

E Sakthivel - Pranamika Journal

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Processing", Springer Science and Business Media LLC, 2023
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4. Details of mapping the project with the Sustainable Development Goals (SDGs).



SDG 8: Decent Work and Economic Growth

Unethical practices in governance, such as favoritism or bribery in public employment and business licensing, can hinder economic opportunities. Pranamika enables citizens to highlight such issues, fostering transparency in labor markets and economic development programs. By holding officials accountable, the app ensures fair employment practices, better regulation of businesses, and ethical implementation of skill development programs. This creates an environment conducive to decent work opportunities and inclusive economic growth, especially for marginalized communities.

SDG 10: Reduced Inequalities

Inequality in access to public services often stems from corruption and discrimination. Pranamika helps address these issues by providing a space for citizens to expose unethical behavior that marginalizes specific communities. Whether it's bias in welfare distribution, unfair hiring practices, or neglect of minority groups, the app ensures that these issues are brought to light. By holding officials accountable, Pranamika promotes equitable policies and reduces systemic inequalities, empowering underrepresented populations to access their fair

share of resources.

SDG 16: Peace, Justice, and Strong Institutions

Pranamika is closely aligned with SDG 16, as it directly promotes accountability, transparency, and ethical behavior in public institutions. The app empowers citizens to report misconduct, ensuring that government officials uphold their responsibilities. By fostering trust in governance and enabling community participation, Pranamika strengthens institutions, reduces corruption, and promotes peace and justice. It is a powerful tool for creating more inclusive and responsive public systems.

SDG 17: Partnerships for the Goals

Pranamika facilitates collaboration between citizens, governments, and civil society by providing data on unethical practices in governance. This data can be used to foster partnerships aimed at addressing systemic issues, improving governance, and achieving the SDGs. By encouraging collective action, the app helps build a network of stakeholders working toward shared goals, amplifying the impact of accountability and transparency initiatives.