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Digital Gram Panchayat

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Abstract: The Digital Gram Panchayat project is designed to simplify and modernize rural governance by offering villagers an easy-to-use digital platform for essential services. Through this system, citizens can register complaints, apply for certificates, check information on welfare schemes, and stay updated with official announcements—all without needing to visit the Gram Panchayat office. It reduces paperwork, saves time, and ensures smoother communication between villagers and local authorities. The platform securely stores all citizen data in a centralized database, reducing errors and duplication. With features like real-time status tracking, automatic alerts, and document verification, it increases transparency and efficiency in administrative work. By introducing technology into local governance, the project supports the Digital India initiative and helps create a more connected, accountable, and digitally empowered rural community.

Keywords: Digital Governance, MERN Stack, E-Governance, Rural Development, Web Application

I. INTRODUCTION

In today's world, digital technology is transforming the way people communicate, work, and access government services. However, in many rural parts of India, a large gap still exists between citizens and their local governing bodies. Villagers often face difficulties in submitting requests, tracking issues, or receiving timely updates from their Gram Panchayats. Traditional systems involve paperwork, long queues, and communication delays, which slow down decision-making and reduce transparency. To overcome these problems, the Digital Gram Panchayat App has been designed as a step toward achieving a smarter and more connected village administration.

The Digital Gram Panchayat App aims to bring all essential Gram Panchayat services under one digital platform that is simple, secure, and easy to use for both citizens and officials. Through this app, residents can register grievances, make service requests, check announcements, share feedback, and track the progress of their applications—all from their mobile devices. On the other hand, Panchayat officials can manage records, respond to issues, and share updates instantly, improving communication and efficiency across the community.

One of the key goals of this project is to promote transparency and accountability in local governance. By providing real-time updates and digital records, the system helps reduce corruption and ensures that every complaint or request is properly addressed. It also helps build trust between villagers and their elected representatives by keeping all communication.

The app also supports the national Digital India campaign, which focuses on transforming India into a digitally empowered society. By encouraging the use of mobile applications and online services in rural areas, this initiative helps bridge the digital divide between urban and rural communities. In addition, it promotes sustainable development by reducing the need for physical paperwork, travel, and manual processes.

Furthermore, the Digital Gram Panchayat App is designed with a user-friendly interface, local language support, and secure data management features to ensure inclusivity. Even users with limited technical knowledge can easily navigate and benefit from the platform. The app not only improves administrative performance but also empowers citizens to actively participate in local decision-making.

In summary, the Digital Gram Panchayat App is an innovative approach to modernizing rural governance. It provides a convenient and transparent way for villagers to interact with their local bodies, improves efficiency for officials, and strengthens the foundation of e-Governance in India's rural areas, traditional rigid surfaces.

II. NEED OF THE PROJECT

In many villages, administrative activities are still carried out manually, which often causes delays, mismanagement, and a lack of proper documentation. Citizens have to visit the Panchayat office multiple times for small requests, leading to inconvenience and inefficiency. Moreover, there is limited transparency in how issues are resolved or how services are delivered.

The Digital Gram Panchayat App is needed to overcome these problems by offering an online platform for villagers to easily interact with the Panchayat. It helps in storing data securely, automating routine tasks, and tracking progress in real-time.

This digital transformation improves service delivery, builds trust among citizens, and creates a more accountable and transparent governance system in rural areas.

III. LITERATURE SURVEY

- 1) Parade, R. D., Badgular, N. R., & Shinde, R. R. (2024), "Digital Gram Panchayat." This paper presents the concept of a web-based system for rural governance that digitalizes citizen records and daily administrative work. It proposes modules for certificate issuance, grievance registration, and financial management within panchayat offices. The study emphasizes improved transparency, record accuracy, and reduction in manual effort through the introduction of ICT tools. The authors also discuss user interface design and future scalability of the system.
- 2) Dhamale, R., & Patil, V. (2025), "Smart Governance in Rural India: Designing an E-Gram Panchayat System for Efficient Public Service Delivery." This research focuses on designing a digital governance platform aimed at automating essential panchayat functions such as tax collection, certificate management, and welfare-scheme monitoring. It highlights the integration of databases and secure login systems for both citizens and administrators. The authors underline that digital platforms can improve communication, speed of service delivery, and accountability in rural administration.
- 3) Thorat, M., Jadhav, R., Kharade, J., Kudapane, M., & Nimse, R. (2023), "E-Gram Panchayats: Enhancing Accountability and Transparency in Rural Administration." This paper explores the implementation of e-Panchayat systems to create transparent and traceable workflows in village governance. The authors propose mobile and web portals enabling villagers to access information on government schemes and register complaints. They argue that such systems build trust between citizens and authorities while improving administrative efficiency. The study concludes that digital records minimize corruption and support long-term data storage.
- 4) Putri, A., Rahayu, D., & Dwisnu, E. (2024), "Smart Village Program: Challenges of Implementation in the Digitalization Era." This Indonesian study analyzes how rural governments adopt digital technologies under the Smart Village initiative. It identifies challenges such as limited connectivity, lack of trained personnel, and resistance to change among village officials. The authors recommend capacity-building workshops and public-private partnerships to ensure successful digital transformation. The paper serves as a comparative case for similar rural projects like India's Digital Gram Panchayat.
- 5) Geohansa, A., Sumarna, E., & Kania, I. (2025). "Digitization of Village Government as a Sustainable Development Strategy Towards Smart Villages." This study outlines a governance model where digital tools are integrated with rural administrative processes to support sustainable development goals. The proposed model focuses on efficient resource allocation, real-time data reporting, and participatory decision-making. The authors conclude that smart governance in villages can reduce inequalities and improve infrastructure planning. The research provides conceptual support for technology-driven Panchayat reforms.

IV. METHODOLOGY

The development of the Digital Gram Panchayat App is carried out using the MERN stack – MongoDB, Express.js, React.js, and Node.js. The methodology involves the following steps:

1) Requirement Analysis

Collected requirements from Panchayat officials and rural citizens. Identified key modules such as citizen registration, complaint management, tax records, and scheme information.

2) System Design

Designed a three-tier architecture: frontend (React.js), backend (Node.js + Express.js), and database (MongoDB).

Created data flow diagrams and database schemas for storing user and Panchayat data.

3) Front-End Development (React.js)

Developed a simple and responsive user interface using React.js. Implemented pages for login, complaint submission, and viewing Panchayat notices.

4) Back-End Development (Node.js and Express.js)

Built RESTful APIs using Express.js to handle all data requests from the frontend, created routes for managing complaints, schemes, and records. Ensured smooth communication between the client and server.

5) Database Management (MongoDB)

Used MongoDB to store citizen details, complaints, and Panchayat information.

Managed data using Mongoose for schema creation and validation.

6) Testing and Deployment

Performed manual testing for all modules to check functionality and performance. Deployed the backend and frontend on a cloud platform for real-time access.

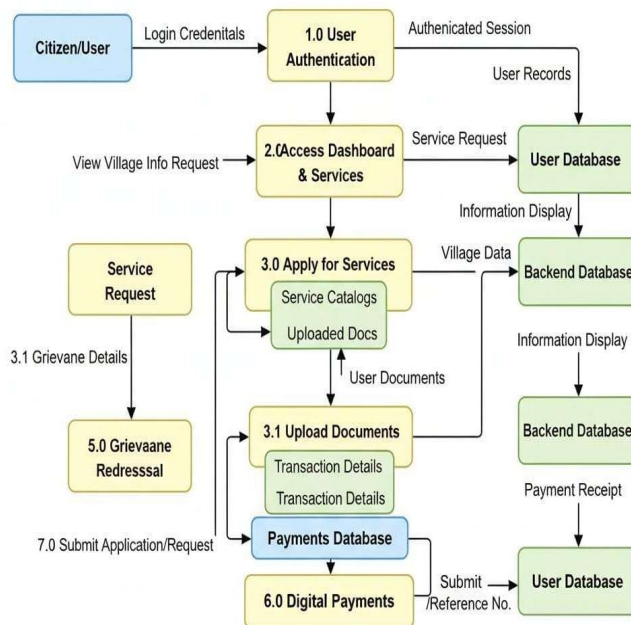


Fig1. System Architecture

V. FLOWCHART

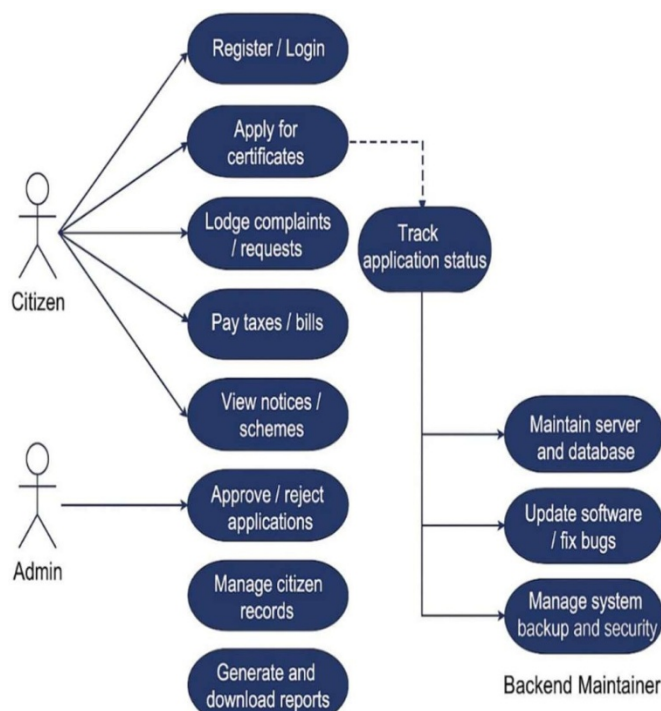


Fig2. Data Flow Diagram

VI. RESULTS AND DISCUSSION

The Digital Gram Panchayat App, developed using the MERN stack, successfully digitalizes core Panchayat activities such as citizen registration, complaint management, tax record handling, and the display of village schemes and notices. The system was tested module-wise to verify its performance and integration between the frontend, backend, and database. The application showed smooth data flow, quick response times, and consistent functionality across different modules. The interface was user- friendly and provided easy navigation for both citizens and administrators, while the backend ensured accurate and reliable data management through MongoDB. The overall system performance proved stable, demonstrating that the MERN architecture is efficient for real-time digital governance applications.

The developed system simplifies day-to-day Panchayat operations by reducing paperwork, ensuring transparency, and improving communication between citizens and officials. It provides an accessible digital platform that enables villagers to register complaints, check ongoing government schemes, and view notices conveniently. Minor challenges were noted in low-network areas, slightly affecting real-time data updates, which can be resolved in future versions through offline data synchronization. Overall, the Digital Gram Panchayat App meets its objectives of promoting efficiency and accountability in rural administration, supporting the broader vision of the Digital India and Smart Village initiatives.

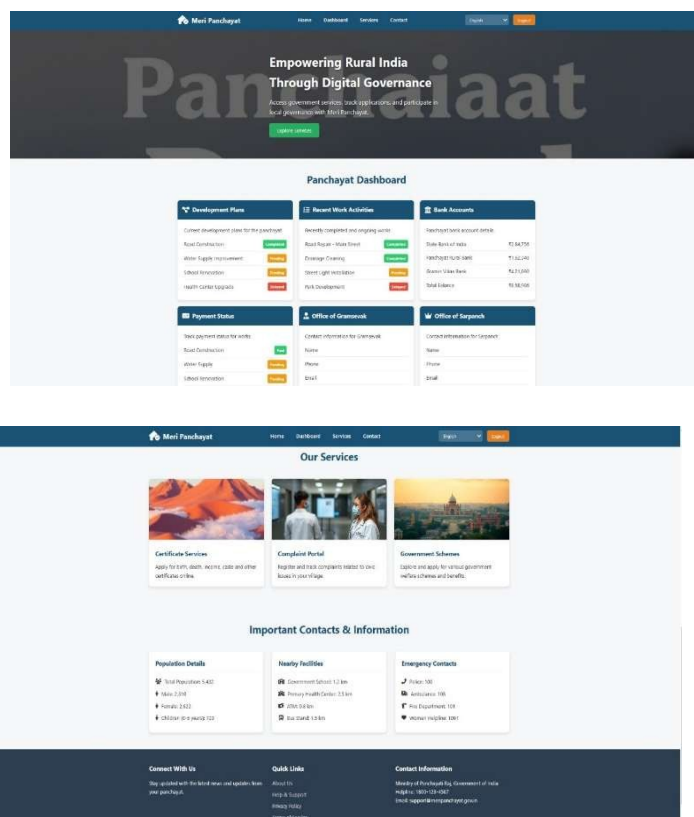


Fig3. User Interface of Application

VII. FUTURE SCOPE

- 1) Integration with Government Portals: The system can be linked with official government databases for certificate verification and record updates.
- 2) Addition of New Modules: Future updates can include modules for financial management, village development tracking, and public feedback analysis.
- 3) Performance Optimization: The system can be further improved for faster loading times and better scalability to support multiple villages simultaneously.
- 4) Awareness and Training Programs: Training sessions can be conducted to help villagers and panchayat members efficiently use the application and adopt digital governance practices.

VIII. CONCLUSION

The Digital Gram Panchayat App represents a significant step toward digital transformation in rural governance. By providing an integrated platform for citizens and officials, it simplifies administrative processes, increases transparency, and supports efficient communication. The project aligns with the Digital India mission and contributes to building a self-reliant and connected rural India. Future enhancements can include mobile app integration, multilingual support, and analytics for better decision-making.

IX. ACKNOWLEDGEMENT

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