

E-Gram Panchayat Management System

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Abstract - The rapid digitalization of governance in India has significantly improved urban administrative processes. However, many rural Gram Panchayats still follow traditional, paper- based systems for tax collection, certificate issuance, complaint management, and public communication. These outdated methods create delays, data inconsistency, excessive manual workload, and a lack of transparency. In response to these challenges, the E-Gram Panchayat Management System is proposed as a comprehensive, web-based solution aimed at transforming rural governance through technology.

The system integrates modern web technologies—HTML, CSS, Bootstrap, JavaScript for the frontend, Java for backend processing, and Cloud SQL for secure data management. Additionally, it implements an automated WhatsApp Reminder System for notifying citizens about water tax dues, house rent payments, Gram Sabha meeting Reminders, and other Panchayat updates. This ensures timely communication and reduces administrative burden.

This research paper presents the full development cycle including problem analysis, literature survey, methodology, architecture, database design, implementation, results, and future scope. The system demonstrates that digital tools can significantly improve governance efficiency, accessibility, and citizen satisfaction. By providing transparent, fast, and accurate services, the proposed system contributes to the Digital India initiative and empowers rural communities.

I. INTRODUCTION

The Panchayati Raj system is the backbone of rural governance in India. For decades, Gram Panchayats have played a pivotal role in managing local development, maintaining village records, collecting taxes, issuing certificates, and addressing citizen complaints. Despite significant advancements in technology, many Panchayats still operate using manual processes.

This leads to:

- Time-consuming and repetitive administrative tasks
- Frequent errors in record keeping
- Loss or mismanagement of paper documents
- Delays in issuing certificates
- Poor communication with citizens
- Lack of transparency in financial transactions
- Inefficient handling of complaints and grievances

In the context of the Digital India Mission, it is essential that local governance systems also adopt modern digital tools to improve service delivery. As rural populations increasingly use smartphones and the internet, digitizing Panchayat operations has become both feasible and necessary.

The E-Gram Panchayat Management System (EGPMS) is designed as a centralized digital platform that allows villagers to access services easily while reducing the workload of Panchayat staff. The system supports administrators, Gram Sevaks, Panchayat members, and citizens through an integrated, user-friendly application that streamlines processes such as:

- Water tax and house rent collection
- Certificate requests and approvals
- Complaint registration
- Meeting scheduling
- Record management
- Notifications and reminders

Through automation and digital workflows, the system minimizes bureaucracy, reduces corruption, increases transparency, and enables efficient public service delivery.

II. HISTORY

The foundation of the modern Panchayati Raj system began with the 73rd Constitutional Amendment Act of 1992, which granted constitutional status to Panchayats and introduced a three-tier decentralized governance structure:

1. Gram Panchayat
2. Panchayat Samiti
3. Zilla Parishad

Following this, Maharashtra amended the Zilla Parishads and Panchayat Samitis Act in 1994 to align with national reforms. The State Election Commission was also established in 1994 to conduct elections for local bodies.

Over time, Panchayats have grown from basic administrative units to entities responsible for social, economic, and infrastructure development. However, while their responsibilities have expanded, their administrative tools have not evolved equally, leaving large gaps in efficiency and transparency.

With the rise of Information and Communication Technology (ICT), digital governance has emerged as a powerful tool for improving public administration. While urban areas quickly adopted digital solutions, rural areas still lag behind due to lack of infrastructure, awareness, and digital tools. Thus, systems such as E-Gram Panchayat Management System become crucial in transforming traditional Panchayats into modern, digital service centers.

III. EXISTING SYSTEM

In most Gram Panchayats, the majority of administrative work is still handled manually using registers, paper files, and offline records. This traditional system creates several operational challenges that directly affect both Panchayat staff and villagers:

1. Manual Certificate Processing Applications for birth certificates, death certificates, residence certificates, 7/12 extracts, and other documents are written on paper. Processing them requires villagers to visit the Panchayat office, causing delays and loss of working hours.
2. No Digital Record Management Citizen information, household details, tax records, and complaint logs are stored in physical registers. This makes data retrieval slow, error-prone, and difficult to maintain over long periods.
3. Water Tax & House Tax Managed Offline Tax bills are prepared manually. Villagers must visit the office to know their pending dues. Payments and receipts are recorded in notebooks, increasing the chances of calculation mistakes and data loss.
4. Lack of Automated Reminders There is no system to notify citizens about water tax due dates, house rent payments, upcoming meetings, or important announcements. As a result, dues are often paid late, and meeting participation is low.
5. Complaint Registration Is Not Systematic

Villagers verbally inform ward members about problems like drainage issues, water supply problems, or streetlight failures. These complaints may get lost, delayed, or ignored due to no tracking mechanism.

6. No Online Access to Panchayat Information Details such as schemes, development activities, budget reports, village notices, and public documents are not available online. People must physically visit the office to access even basic information.

7. Inefficient Communication Between Staff and Citizens Important announcements are made verbally or via printed notices. This leads to miscommunication and delays in reaching the public.

8. Security Issues in Manual Records Paper documents are prone to damage, misplacement, unauthorized access, and manipulation, leading to trust issues and lack of transparency.

Because of these limitations, the existing system becomes time-consuming, less transparent, and inconvenient for citizens, particularly daily wage workers who lose income when visiting the office repeatedly. The lack of digitization also reduces administrative efficiency and slows down rural development processes.

IV. PROPOSED SYSTEM

The E-Gram Panchayat Management System (EGPMS) is proposed as a digital alternative to resolve all shortcomings of the manual system. It is a complete online platform that provides:

1. Online Certificate Services
 - Residents can request certificates like Income, Domicile, Birth, Death, and Residence Certificates.
 - Panchayat staff can review, approve, or reject applications digitally.
2. Digital Tax and Rent Management
 - Villagers can view and track water tax and house rent dues.
 - Payments can be recorded digitally.
3. WhatsApp Reminder System
 - Sends automated messages for:
 - Due payments
 - Meeting notifications
 - Public announcements
 - Document approval alerts
4. Complaint Management System
 - Villagers can submit grievances online.
 - Status can be updated by Panchayat staff.
5. Transparent Data Management
 - Cloud SQL ensures fast, secure, and scalable data storage.

6. Dashboard for Admin

- Visual charts
- Payment analytics
- Application statistics
- Complaint reports

7. Accessibility

- Available online 24/7
- Can be accessed on mobile and computer
- User-friendly interface for villagers

This system significantly improves operational efficiency, reduces administrative burden, and enhances public satisfaction.

V. OBJECTIVES

1. Provide villagers with access to Panchayat services digitally from any location.
2. Reduce paperwork and manual workload for Panchayat staff.
3. Improve transparency and accuracy in governance processes.
4. Maintain secure digital records of certificates, taxes, and complaints.
5. Reduce citizens' need to physically visit Panchayat offices.
6. Improve communication through automated WhatsApp and SMS alerts.
7. Support the Digital India mission by modernizing rural governance.
8. Enable faster decision-making through real-time data access.
9. Reduce corruption by creating a transparent online service process.

VI. LITERATURE SURVEY

Dipali Mane, Harshad Yadav, Dhanraj Pawar, Yadunath Yadav, Shubham Zhambre – “E-Gram Panchayat Management System” - MAR 2024 [1] It is a web and mobile-based application that digitalizes rural governance by making Gram Panchayat services more transparent and accessible. It helps officials manage records, billing, and certificates while enabling villagers to apply for services, pay taxes, and track complaints online. By reducing paperwork, ensuring data security, and improving efficiency, EGPMS promotes e-governance, transparency, and accountability, supporting the Digital India initiative for sustainable rural development.

Prof. S. D. Dhage, Prof. G. A. Ghone, Akash R. Bhojane, Prathamesh B. Thorat, Naim Y. Shaikh – “E-

Gram Panchayat Management System” – FEB 2028 [2]

It is a web-based application designed to digitalize Gram Panchayat operations, making administration more transparent, efficient, and accessible. It allows Panchayat officials to manage records, certificates (birth, death, residential, 7/12), billing, and government schemes, while villagers can apply for services, view information, and download documents online. By reducing paperwork, improving data security, and streamlining workflows, the system enhances accountability, minimizes corruption, and saves time for both citizens and officials, supporting effective e-governance at the village level.

Sagar Hanumant Totare, Priyanka Vasant Ipkal, Poonam Balusing Pardeshi, Satish R. Shelar - E- Gram Panchayat Management System – MAY 2020

[3] It is a web and Android-based application designed to digitalize Gram Panchayat operations, enabling efficient, transparent, and secure governance. It allows villagers to apply for certificates (birth, death, residential, 7/12, income), track requests, lodge complaints, and access information online, while administrators manage records, billing, and scheme updates. By automating processes, reducing paperwork, and providing remote access, EGPMS improves service delivery, enhances accountability, minimizes corruption, and supports e-governance in rural India.

Renuka Jadhav, Jaydeep Dongale, Tabasum Attar, Sakshi Dhobale, Kaushik Parab, Parth Dalavi - E-GRAM SWARAJ – APRIL 2024 [4] The E-Gram Swaraj web application is a digital platform designed to modernize Gram Panchayat governance in rural India by enhancing transparency, efficiency, and accessibility. It enables villagers to apply for certificates (birth, death, domicile, marriage, voter), pay property and water taxes, and track requests online, reducing the need to visit Panchayat offices. By digitizing records, providing personalized user access, and incorporating data-driven decision-making, the system improves administrative efficiency, strengthens citizen engagement, minimizes corruption, and supports informed resource allocation, ultimately empowering rural communities through convenient e-governance solutions.

VII. METHODOLOGY

The methodology adopted for the E-Gram Panchayat Management System follows a structured and systematic approach to ensure accurate, reliable, and scalable development. The complete methodology is divided into the following phases:

1. Requirement Analysis

The development process began with an in-depth study of the traditional processes of Gram Panchayats. Interviews with Gram Sevaks, villagers, and local administrative staff helped identify the core problems:

- Manual certificate issuance
- Offline tax collection
- Lack of reminders and communication tools
- Inefficient complaint tracking
- Paper-based information storage

2. Technology Selection

To ensure scalability and ease of use, the following technologies were chosen:

- Frontend: HTML, CSS, Bootstrap, JavaScript
- Backend: Java (Servlet/JSP or Spring Boot)
- Database: Cloud-based SQL
- Communication: WhatsApp API for reminders

These technologies offer reliability, cross-device compatibility, and faster development.

3. System Design

The system architecture was designed using:

- UML diagrams (Use Case, DFD, ERD)
- Module-wise breakdown (Certificates, Taxes, Complaints, Reminders, Citizen Records)
- Database schema for structured storage

4. Implementation

Each module was developed and connected with the backend through REST APIs or JSP controllers. Key features implemented include:

- Application form submission
- Certificate generation
- Tax management system
- WhatsApp reminder automation
- Complaint registration and tracking
- Admin dashboard with role-based access

5. Testing

Multiple testing strategies were used:

- Unit Testing: For all backend functions
- Integration Testing: For connecting frontend, backend, and SQL
- User Acceptance Testing (UAT): Feedback taken from Panchayat staff

6. Deployment

The system was deployed using:

- Cloud database
- Local server / college server
- Configured WhatsApp Business API number

7. Documentation & Presentation

A detailed research paper, project documentation, and user manual were prepared. System demonstration was

given to the guide, and modifications were made based on feedback.

VIII. FUTURE SCOPE

The system has the potential for multiple enhancements to strengthen its capability and rural governance impact:

1. Android Mobile Application

A dedicated mobile app can improve accessibility and usability for villagers.

2. Integration With Government APIs Linking with state government portals like:

- MahaOnline
- UIDAI
- PM-SWAMITVA
- Digital Land Records will create a unified digital governance ecosystem.

3. AI-Based Analytics Dashboard

Machine learning can be used to analyze village trends in:

- Tax collection
 - Service usage
 - Complaint patterns
 - Population growth
- ### 4. Biometric Authentication

Aadhaar-based login for citizens and staff can improve security.

5. GIS Mapping for Village Assets Mapping village infrastructure like roads, water tanks, pipelines can help better planning.

6. Emergency Alert System Automated messages for:

- Natural disasters
- Water supply issues
- Panchayat announcements

7. Multilingual Interface

Support for Marathi, Hindi, and English for easier adoption by villagers.

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X. CONCLUSION

The E-Gram Panchayat Management System successfully demonstrates how digital technology can transform rural governance and service delivery. By replacing manual processes with automated, cloud-based modules, the system significantly reduces paperwork, enhances accuracy, and saves time for both villagers and Panchayat staff.

Key achievements of the project include:

- Digital certificate generation
- Online tax management
- WhatsApp-based reminder notifications
- Easy complaint registration
- Centralized village data storage

The system increases transparency, reduces human errors, and simplifies access to essential services—ultimately improving the quality of life for rural citizens. It aligns with the Digital India vision and showcases how technology can empower grassroots governance. With further enhancements and real-world adoption, the proposed system has the potential to revolutionize Panchayat administration across India.

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