

**VIVEKANAND EDUCATION SOCIETY'S
INSTITUTE OF TECHNOLOGY**
(An Autonomous Institute Affiliated to University of Mumbai)

Department of Computer Engineering



Project Report on

VILLAGE INFORMATION SYSTEM

In partial fulfillment of the Fourth Year, Bachelor of Engineering (B.E.) Degree in
Computer Engineering at the University of Mumbai
Academic Year 2023-24

Submitted by
Mohit Gangwani - D17A - 16
Divya Makhija - D17A - 39
Vanshika Makhijani - D17A - 40
Jasmine Dhirwani - D17B - 23

Project Mentor
Dr. Prashant Kanade
(2023-24)

**VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF
TECHNOLOGY**
Department of Computer Engineering



Certificate

This is to certify that **Mohit Gangwani(D17A, 16), Divya Makhija(D17A, 39), Vanshika Makhijani(D17A, 40), Jasmine Dhirwani(D17B, 23)** of Fourth Year Computer Engineering studying under the University of Mumbai have satisfactorily completed the project on "**Village Information System**" as a part of their coursework of PROJECT-II for Semester-VIII under the guidance of their mentor **Dr. Prashant Kanade** in the year 2023-24 .

This project report entitled **Village Information System** by **Mohit Gangwani, Divya Makhija, Vanshika Makhijani, Jasmine Dhirwani** is approved for the degree of **B.E. Computer Engineering**.

Programme Outcomes	Grade
PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12 PSO1, PSO2	

Date:

Project Guide: Dr. Prashant Kanade

Project Report Approval

For

B. E (Computer Engineering)

This project report entitled **Village Information System** by *Mohit Gangwani, Divya Makhija, Vanshika Makhijani, Jasmine Dhirwani* is approved for the degree of **B.E. Computer Engineering**.

Internal Examiner

External Examiner

Head of the Department

Principal

Date:
Place: VESIT,Chembur

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Mohit Gangwani(16)

Divya Makhija(39)

Vanshika Makhijani(40)

Jasmine Dhirwani(23)

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Computer Engineering Department
COURSE OUTCOMES FOR B.E PROJECT

Learners will be to,

Course Outcome	Description of the Course Outcome
CO 1	Able to apply the relevant engineering concepts, knowledge and skills towards the project.
CO2	Able to identify, formulate and interpret the various relevant research papers and to determine the problem.
CO 3	Able to apply the engineering concepts towards designing solutions for the problem.
CO 4	Able to interpret the data and datasets to be utilized.
CO 5	Able to create, select and apply appropriate technologies, techniques, resources and tools for the project.
CO 6	Able to apply ethical, professional policies and principles towards societal, environmental, safety and cultural benefit.
CO 7	Able to function effectively as an individual, and as a member of a team, allocating roles with clear lines of responsibility and accountability.
CO 8	Able to write effective reports, design documents and make effective presentations.
CO 9	Able to apply engineering and management principles to the project as a team member.
CO 10	Able to apply the project domain knowledge to sharpen one's competency.
CO 11	Able to develop a professional, presentational, balanced and structured approach towards project development.
CO 12	Able to adopt skills, languages, environment and platforms for creating innovative solutions for the project.

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ABSTRACT

The Village Information System is a comprehensive platform designed to address various needs and challenges faced by rural communities. This system offers a multifaceted approach by integrating functionalities such as Complaints and Assistance, Income Prediction, Poverty Prediction, Online Payments, and a Barter System. With these features, the system aims to empower villages by enhancing communication, predicting financial trends, facilitating transactions, and fostering community engagement.

The Complaints and Assistance module of the system serves as a vital communication channel between villagers and local authorities. It enables residents to report issues or seek assistance promptly, leading to quicker resolution of problems and improved service delivery. By streamlining the process of reporting and addressing concerns, this feature promotes transparency, accountability, and efficiency within the community governance framework.

Furthermore, the predictive capabilities embedded within the system are invaluable tools for socio-economic development planning. The Income Prediction and Poverty Prediction models utilize data analytics and algorithms to forecast income levels and identify households at risk of poverty. This proactive approach enables policymakers and stakeholders to allocate resources effectively, implement targeted interventions, and devise strategies for sustainable development. Additionally, the integration of Online Payments and a Barter System simplifies financial transactions and promotes economic exchange, thereby fostering entrepreneurship and financial inclusion in rural areas. Overall, the Village Information System represents a significant leap towards leveraging technology for the holistic advancement of rural communities, addressing their diverse needs and aspirations. Technologies that we would be using include HTML, CSS, BOOTSTRAP, DJANGO, MYSQL, PYTHON RAZORPAY, TWILIO, JAVASCRIPT, etc.

Chapter 1: Introduction

1.1. Introduction to the project:

All services are currently provided either offline or online. In India, a panchayat is an elected village council. Panchayat is an assembly of five people (ayat), and raj is the word for rule. These gatherings have historically served to resolve conflicts between villages and individuals. Everyone in this digital generation uses the internet on both computers and mobile devices. Farmers and employees now work on farms in rural areas. The people work on the farm every day to earn a living, and whenever they need any paperwork about a certificate (Dakhala) for any reason, they come to the gram panchayat. With e-services, the amount of paperwork at Gram Panchayats would be reduced, and this paper offers a solution.

The project's major goal is to deliver government services digitally. The public can access this online service to view a list of government services on their mobile device and apply for services online. This project could improve communication between the public and those who deliver government services, which would be beneficial for information dissemination. The application will be accepted and verified by the administrator. Moreover, the application status option allows users to view information about all processes.

In all of the transactions the government engages in, information technology is essential. It aids in reducing bureaucracy, preventing corruption, and directly communicating with the public. The daily transactions in the Gram Panchayat would be maintained with the aid of this application. With e-services, the amount of paperwork at Gram Panchayats would be reduced, and this paper offers a solution.

1.2. Motivation for the project:

The motivation behind the project titled "Village Information System" is to bridge the digital divide in rural areas and empower local governance through technology. Rural areas, particularly in developing countries, often lack access to essential government services and information due to geographical barriers and limited resources. This project aims to leverage digital tools and connectivity to:

1. **Enhance Access to Services**: Provide rural communities with easy access to government services such as healthcare, education, agriculture support, and social welfare programs, which are vital for their well-being and development.
2. **Transparency and Accountability**: Promote transparency in the functioning of Gram Panchayats by digitizing records, enabling citizens to track expenditures, and reducing opportunities for corruption.
3. **Efficiency and Convenience**: Streamline administrative processes, reducing paperwork, and bureaucratic delays, making it easier for both citizens and government officials to interact and manage local affairs.
4. **Empowerment**: Empower rural citizens by providing them with information and tools to participate actively in local decision-making, thereby strengthening grassroots democracy.
5. **Digital Literacy**: Promote digital literacy and skills development among rural populations, fostering their ability to adapt to the evolving technological landscape.
6. **Sustainable Development**: Contribute to the overall development of rural areas by leveraging digital technologies to address specific challenges, such as agricultural productivity, healthcare delivery, and education access.

1.3. Problem Definition:

The objective of this project is to identify and address the existing problems within the Village Information system and propose solutions to modernize and strengthen its functioning. The focus will be on improving transparency, efficiency, and accessibility in delivering public services, managing local governance, and fostering community participation.

Key Problem Areas:-

1. **Digital Divide:** Many rural areas still lack access to reliable internet connectivity and technological infrastructure, limiting the reach and effectiveness of the E-Gram Panchayat system.
2. **User Education and Awareness:** Limited digital literacy and awareness among villagers, elected representatives, and Panchayat staff hinder the optimal utilization of the E-Gram Panchayat system.
3. **Integration and Interoperability:** The E-Gram Panchayat system may not seamlessly integrate with other government databases and systems, leading to data duplication and inefficiencies.
4. **Service Delivery:** Some essential services may still require physical presence due to a lack of proper online alternatives, undermining the convenience and effectiveness of the system.
5. **Community Engagement:** The E-Gram Panchayat system might not effectively involve local communities in decision-making and governance processes, leading to a disconnection between citizens and the system

1.4. Lacuna of Existing Systems:

Several existing digital platforms have been developed to provide services for gram panchayats, focusing on streamlining administrative processes, improving governance, and enhancing citizen engagement. One prominent example is e-Panchayat, a comprehensive solution launched by the Ministry of Panchayati Raj. It facilitates various functions such as accounting, planning, monitoring, and reporting, enabling online submission of forms, electronic fund management, and project tracking. Similarly, Bhoomi, deployed in Karnataka, digitizes land-related documents and processes at the gram panchayat level, offering online access to land records, mutation of land titles, and online payments for land-related transactions.

Another notable platform is the Panchayat Enterprise Suite (PES), developed by the National Informatics Centre (NIC). PES includes modules for finance management, asset management, works monitoring, and citizen services, facilitating digital transactions, generating reports for decision-making, and offering citizen-centric services such as certificate issuance and grievance redressal. Additionally, e-Gram Swaraj, an initiative by the Ministry of Panchayati Raj, empowers gram panchayats through technology, providing modules for financial management, planning, monitoring, and citizen services to promote participatory governance and accountability.

These digital platforms, including GramaNet in Kerala, signify the ongoing efforts to digitize and decentralized governance at the grassroots level. By leveraging technology, these systems aim to empower gram panchayats, improve service delivery, and foster greater citizen participation in local governance processes. Through online services, streamlined workflows, and enhanced transparency, these platforms contribute to the overall development and efficiency of gram panchayat administration, benefiting rural communities across India.

1.5. Lacunas of the Existing System:

While digital platforms for gram panchayats offer numerous benefits, they also come with certain drawbacks:

1. **Digital Divide:** In rural areas, especially in remote regions, limited internet connectivity and low literacy levels can hinder the adoption and usage of digital platforms. This can lead to marginalized communities being excluded from accessing essential services provided through these platforms, exacerbating existing inequalities.
2. **Technical Infrastructure:** Many rural areas still lack adequate infrastructure, leading to issues such as slow internet speeds, frequent power outages, and insufficient technical support. These challenges can affect the usability and reliability of digital platforms, hindering their effectiveness in serving gram panchayats.
3. **Capacity Building:** There may be a lack of awareness and technical skills among stakeholders, making it challenging to fully leverage the functionalities offered by these systems. Without proper training programs and ongoing support, adoption rates may remain low, limiting the potential impact of digital platforms on improving governance and service delivery.
4. **Data Security and Privacy Concerns:** Digital platforms for gram panchayats involve the collection and storage of sensitive citizen data, raising concerns about data security and privacy. Inadequate safeguards and cybersecurity measures could lead to breaches, compromising the confidentiality and integrity of personal information.
5. **Financial Sustainability:** The implementation and maintenance of digital platforms require significant financial resources. However, many gram panchayats may struggle with limited budgets and competing priorities, making it challenging to sustain these platforms in the long term. Ensuring financial sustainability through innovative funding mechanisms and cost-effective solutions is essential to avoid the risk of digital platforms becoming underutilized or obsolete over time.

1.6. Relevance of the Project:

The Village Information System holds significant relevance for rural communities by addressing various needs and challenges they face, ultimately contributing to their overall development and well-being. The functionalities offered by the system, including Complaints and Assistance, Income Prediction, Poverty Prediction, Online Payments, and Barter System, play crucial roles in enhancing governance, economic empowerment, and social welfare in villages.

Firstly, the Complaints and Assistance module of the system provides a vital channel for residents to report issues and seek assistance promptly. By facilitating efficient communication between villagers and local authorities, this feature ensures timely resolution of problems, improves service delivery, and fosters a sense of trust and accountability within the community governance framework.

Secondly, the predictive capabilities embedded within the system, such as Income Prediction and Poverty Prediction, offer valuable insights for socio-economic development planning. By forecasting income levels and identifying households at risk of poverty, the system enables policymakers and stakeholders to allocate resources effectively, implement targeted interventions, and devise strategies for sustainable development, thus reducing poverty and improving overall living standards.

Moreover, the integration of Online Payments and a Barter System in the system promotes financial inclusion and economic exchange in rural areas. Online Payments facilitate secure and convenient transactions, reducing dependency on cash and expanding access to financial services for villagers. Simultaneously, the Barter System encourages local economic activities and resource sharing, fostering entrepreneurship and community resilience against economic uncertainties.

Overall, the Village Information System represents a holistic approach to leveraging technology for the holistic advancement of rural communities. By providing essential services such as complaints management, predictive analytics, financial transactions, and economic exchange, the system empowers villages, enhances governance effectiveness.

1.7. Summary:

The "Village Information System" project is a comprehensive initiative aimed at modernizing rural governance in India by harnessing digital tools and connectivity. Rooted in the recognition of the digital divide prevalent in rural areas, the project endeavors to empower local governance structures such as Gram Panchayats by providing easy access to government services, promoting transparency, and streamlining administrative processes. Through this initiative, rural communities will gain enhanced access to vital services like healthcare, education, and social welfare programs, which are pivotal for their development and well-being. Additionally, by digitizing records and facilitating online interactions, the project seeks to foster greater transparency and accountability within Gram Panchayats, thereby reducing opportunities for corruption and bureaucratic inefficiencies.

Building upon existing digital platforms like e-Panchayat, Bhoomi, and Panchayat Enterprise Suite (PES), the Village Information System aims to address key challenges such as the digital divide, technical infrastructure limitations, and capacity building needs. By leveraging predictive analytics, online payments, and a barter system, the project endeavors to empower rural citizens, enhance governance effectiveness, and promote sustainable development. Through these initiatives, the project not only aims to bridge the digital gap but also strives to empower rural communities, foster economic exchange, and improve overall living standards, thereby contributing to the holistic advancement of villages across India.

Chapter 2: Literature Survey

A. Overview

Smart village development is a promising approach to addressing the challenges of rural India by leveraging technology and green initiatives to uplift impoverished villages, providing essential services, reducing urban migration, and addressing climate change through sustainable living.

The success of the Javalgaon smart village initiative in Maharashtra demonstrates the potential of smart village development to transform rural communities and improve the lives of millions of Indians. However, scaling up smart village development in India requires addressing challenges such as limited financial resources, lack of digital infrastructure and literacy, weak institutional capacity, and socio-cultural barriers.

Strategies to overcome these challenges include:

- Increased investment in smart village development
- Strengthening institutional capacity
- Promoting community participation
- Developing a holistic approach to smart village development

Smart village development in India has the potential to improve the lives of millions of rural Indians and make India a more sustainable and inclusive society.

2.1 Smart Village: A new dynamic to end rural urban gap and move towards sustainable development for all[1]

In the paper presented by Ce Dr Sumanta Bhattacharya and Bhavneet Kaur Sachdev Smart rural development, characterized by the implementation of green technology, private-public partnerships, and sustainable practices, is crucial for achieving Sustainable Development Goals (SDGs). This approach has been successful in transforming some villages in India by providing essential amenities like energy security, water access, housing, internet connectivity, education, and employment opportunities. As a result, migration from rural to urban areas has decreased, leading to a reduction in urban slums and alleviating pressure on urban infrastructure. Furthermore, smart villages contribute to poverty alleviation, education improvement, and climate change mitigation through green technologies and sustainable living practices.

2.2 Study and Development of Village as a Smart Village[2]

The project report presented by Rutuja Somwanshi, Utkarsha Shindepatil, Deepali Tule, Archana Mankar, Namdev Ingle Guided By- Dr. V. S. Rajamanya, Prof. A. Deshmukh delves into the concept and implementation of a smart village, focusing on the transformation of Javalgao village. It defines a smart village as a bundle of services delivered efficiently to residents and businesses, with modern energy access acting as a catalyst for development in education, health, security, productive enterprise, and environment.

The report emphasizes improved resource use efficiency, local self-governance, access to basic amenities, and responsible behavior as key pillars in building a happy and sustainable society. By leveraging smart technologies and services, the village has witnessed significant improvements in cultural preservation, social well-being, economic prosperity, environmental sustainability, educational standards, and overall living conditions.

This transformation has not only made the village more self-reliant but also positioned it as a contributor to the nation's development, showcasing the potential of smart decision-making and technology utilization in rural development initiatives.

2.3 A Boon to Rural Development[3]

Dr. Subramanya A1 , Sandesh paper sheds light on the post-73rd amendment scenario in India, focusing on the challenges and impact of Information and Communication Technology (ICT) adoption in rural development, particularly regarding Grama Panchayats. Despite the constitutional aim to empower Panchayati Raj institutions, the performance of Grama Panchayats has fallen short of rural expectations, leading to the integration of ICT for enhancing transparency and efficiency. The analysis delves into the hurdles faced, including low digital literacy, inadequate infrastructure, e-waste management issues, and concerns about digital addiction. Recommendations put forward include establishing common contact counters for digital assistance and incorporating digital education to bridge the digital divide and advance e-governance initiatives. The development of e-Panchayat systems is viewed as a means to mitigate regional disparities and environmental pollution while promoting participatory democracy and reducing corruption through improved citizen-administrator-politician interactions.

2.4 Effectiveness of E-Panchayat in Andhra Pradesh: A Study[4]

The main idea conveyed by Oruganti Venkateswara Rao is the significance of efficient and responsive local administration at the grassroots level. This is facilitated by streamlined administrative processes and resource conservation through Information and Communication Technology (ICT), leading to the development of districts, states, and ultimately the entire nation. The emphasis is on addressing grassroots-level issues through initiatives like the e-Panchayat project, which aims to empower citizens and enhance governance at the local level. The inference drawn suggests that prioritizing local-level development and harnessing technology can have a cascading impact on broader socio-economic progress.

2.5 Development of Village as a Smart Village[5]

This paper was presented by J. Choudhary, S. D. Kale, S. P. Patode, R. S. Kamble, and S. R. Aatkhe. The paper explores the relevance of technology and digitalization in addressing social and economic challenges in both rural and urban communities. It emphasizes the importance of digital transformation in rural areas and its application in the Smart Village concept. The insights gathered from various regions contribute to the international project "Smart Digital Transformation of Villages in the Alpine Space." The paper evaluates projects and identifies energy access as a key challenge in developing strategies for underdeveloped countries. Furthermore, it assesses projects based on criteria that define "smartness" more broadly.

2.6 Study and development of village as a smart village[6]

The inference from the abstract provided is that the research paper presented by Bansode, Chavan, Urunkar, Satpute, Salunkhe, Toraskar, Pawar focuses on the transformation of a village into a smart village through the integration of smart technologies, communication, and innovation. The key idea is to empower the community, both individuals and collectively, to make informed decisions using technology, thereby benefiting rural areas and reducing urban migration. The paper suggests that educated rural youth can contribute significantly to national development, emphasizing the importance of village development for overall progress. The implementation of smart village initiatives in Javalgao village has led to reduced problems across various aspects, including cultural preservation, social well-being, economic prosperity, environmental sustainability, education enhancement, and overall living standards. This transformation makes the village self-sufficient and a contributor to national development.

2.7 Health Care Facilities in Rural Areas[7]

The passage presented by R. Kapur, underscores the significance of healthcare as a fundamental need for people from diverse backgrounds, particularly in rural areas where access to medical facilities is limited. It highlights the historical development of primary healthcare in India through various committees and initiatives. To address rural healthcare challenges, programs such as the National Rural Health Mission (NRHM), Janani Suraksha Yojana (JSY), and health insurance schemes have been introduced. The key takeaway is the importance of raising awareness and building the necessary skills among rural individuals to improve their health and overall quality of life through the effective implementation of these programs and schemes.

2.8 DIGITALIZATION OF RURAL INDIA[8]

In the paper presented by S.Tanwar and M. Bhardwaj in an effort to create a large pool of skilled workforce required to power the 'Make in India' initiative, Prime Minister Narendra Modi launched the Skill India Mission on Wednesday. However, the Digital India, the Make in India and the Skill India Mission will have to go hand in hand says S Ramodarai, Chairman, National Skill Development Corporation (NSDC), adding "because each feeds into the other to make it a productive nation and create the 21st century jobs rather than the 19th century jobs". Our aim is to achieve the vision of Digital India, where every Indian is digitally empowered and every information is digitally available. Digitize India Platform offers an opportunity for government agencies to transform themselves into digital enterprises and for Digital Contributors, rewards for doing simple data entry jobs.

2.9 Comparison with the Existing Systems:

Aspect	New System	Existing System
Login Page	Secure login page for users and admins	Basic login page with limited security
Dashboard	Separate dashboards for users and admins	Single dashboard for all users
User Features	Complaints and Assistance, Income Prediction, Poverty Prediction, Online Payments	Limited features and functionalities
Complaints and Assistance	Users can lodge complaints and request assistance online	Manual process for lodging complaints
Online Payments	Users can make tax and fee payments online	Manual payment processes
Predictive Analytics	Admins have access to real-time analytics and predictive trends	Limited data analytics capabilities
Feedback Collection	Tools for gathering feedback from citizens	Limited or no feedback collection mechanisms

Table 2.9.1 - Comparison with Existing System

2.10 Summary:

The presented research papers delve into smart village development, rural healthcare facilities, and digitization initiatives in India. They highlight the transformative potential of technology and sustainable practices in uplifting rural communities, reducing urban migration, and addressing healthcare disparities. Emphasizing community empowerment and holistic approaches, these studies underscore the importance of digital transformation in bridging rural-urban gaps and fostering inclusive growth. Through smart village initiatives and digitization efforts, India aims to create self-sufficient, sustainable communities, advancing towards a more equitable and technologically empowered society.

Chapter 3: Requirement Gathering for Proposed System

In this chapter, we are going to discuss the resources we have used and how we analyzed what the user needs and what we can provide. We will also discuss the functional and non-functional requirements and finally the software and hardware used.

3.1. Introduction to Requirement Gathering

The Requirement Gathering is a process of requirements discovery or generating list of requirements or collecting as many requirements as possible by end users. It is also called as requirements elicitation or requirement capture. The requirements-gathering process consists of six steps :

- Identify the relevant stakeholders
- Establish project goals and objectives
- Elicit requirements from stakeholders
- Document the requirements
- Confirm the requirements
- Prioritize the requirements

USE CASE	DESCRIPTION
Register and Login	Admin and User can login and register on the website
Women Welfare Section	Users can access pages dedicated to women's welfare policies and programs implemented by the government, providing information and resources.
Submissions of grievances in various languages	Users can submit grievances through a form, specifying their issues and concerns, which will be directed to the appropriate administrative authority.
Payment of bills	Users can make payments for various services and bills securely through Razorpay integration, facilitating online transactions.
Income Prediction	Users can input relevant data to predict their household income, leveraging algorithms to provide estimates and insights for financial planning.
Poverty Risk Prediction	Users can input data to predict the risk of poverty for their household, receiving insights and recommendations for potential support or assistance.
Grievance Analysis	Administrators can analyze the grievances submitted by users, categorizing, prioritizing, and addressing them effectively to ensure timely resolution.
Barter System	Users can engage in a barter system, exchanging goods or services directly with others within the community, fostering economic cooperation and support.

Table 3.1.1 - Requirement Gathering for the System

3.2. Functional Requirements

The functional requirements are as follows:

Feature	Need	Method
User Registration and Authentication	To ensure secure access to the system.	Gather user information during registration and employ authentication mechanisms like email verification
Complaints and Assistance	Enable villagers to lodge complaints and request assistance online	Implement a user-friendly interface for submitting complaints and assistance requests, with options to describe the issue and attach relevant documents.
Document Management	Simplify administrative processes by allowing document uploads and retrieval	Create a document management system that categorizes and stores uploaded documents, enabling easy access for authorized users.
Online Payments	Provide an online platform for tax and fee payments to save time and reduce administrative overhead.	Implement secure payment gateways and integrate them with the system for seamless transactions

Table 3.2.1 - Functional Requirements of the System

3.3. Non-Functional Requirements

The non-functional requirements are as follows:

Metric	Need	Method
Performance	Ensure the system operates efficiently even with a large user base.	Optimize code, use a responsive design, and conduct performance testing to meet expected response times
Security	Protect user data and system integrity	Employ encryption for data transmission, implement access control measures, and regularly update security protocols
Usability	Ensure the system is user-friendly and accessible to individuals with varying digital literacy levels.	Conduct user testing and gather feedback for continuous improvement of the user interface

Table 3.3.1 - Non-Functional Requirements of the System

3.4. Hardware, Software, Technology, and Tools Utilised:

Hardware and software requirements for the project are as follows:

- Hardware:**

Processor: Intel i3 or AMD equivalent

Disk Space: 4GB

RAM: 8GB

- Software:**

Frontend: Django

Database: SQL Server

Backend: Django

- Techniques:**

HTML: HTML is the standard markup language for creating web pages and web applications. It provides the structure and content of a webpage through tags and elements.

CSS: CSS is used to style the appearance of HTML elements on a webpage. It controls layout, colors, fonts, and other visual aspects to enhance the presentation and user experience.

Bootstrap: Bootstrap is a front-end framework that provides pre-designed templates, CSS, and JavaScript components for building responsive and mobile-first websites and web applications, speeding up development and ensuring consistency across different devices.

Django: Django is a high-level Python web framework that enables rapid development of secure, scalable, and maintainable web applications. It follows the model-view-template (MVT) architectural pattern and includes built-in features such as authentication, URL routing, and ORM (Object-Relational Mapping).

MySQL: MySQL is an open-source relational database management system (RDBMS) that is widely used for storing and managing structured data. It offers features such as transactions, indexing, and querying to ensure efficient data storage and retrieval.

Razorpay: Razorpay is a payment gateway solution that allows businesses to accept online payments securely. It supports various payment methods, including credit/debit cards, net banking, UPI, and wallets, and provides features such as easy integration, real-time analytics, and automated settlements.

Twilio: Twilio is a cloud communications platform that enables developers to integrate voice, SMS, and other messaging services into their applications using APIs. It provides features such as programmable voice, SMS, chat, video, and authentication to build communication solutions for businesses and developers.

- **Tools:**

Vscode: Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE. 23.

Google Colab: Colaboratory, or “Colab” for short, is a product from Google Research. Colab allows anybody to write and execute arbitrary Python code through the browser, and is especially well suited to machine learning, data analysis and education. More technically, Colab is a hosted Jupyter notebook service that requires no setup to use, while providing access free of charge to computing resources including GPUs.

3.5. Constraints

In our project, the constraints include:

	Need	Method
Internet Connectivity	Reliable internet connectivity is essential for system functionality	Collaborate with local authorities and internet service providers to address connectivity issues
Budget	Project funding may be limited	Seek grants and partnerships to secure necessary funds for development and maintenance

Table 3.5.1 - Constraints of the System

3.6. Summary

The proposed system encompasses functional aspects like user registration, complaints lodging, document management, and online payments, ensuring secure and efficient operations. Non-functional requirements emphasize performance optimization, security measures, and usability enhancement. Hardware and software specifications include Django, SQL Server, and integration of tools like Razorpay and Twilio. Constraints such as internet connectivity and budget limitations highlight practical considerations, necessitating collaboration and external funding sources for effective implementation.

Chapter 4: Proposed Design

The proposed design of the system entails a comprehensive digital platform catering to both village users and administrators, facilitating efficient governance and user engagement. With a secure login page ensuring data privacy and controlled access, separate dashboards for users and admins optimize the user experience. The integrated approach aims to foster responsive governance, promote efficient resource allocation, and align the platform with the diverse needs of rural communities.

4.1. Block diagram representation of the proposed system

System starts with login credentials, depending on the role (admin/client), the user can perform various actions as shown in fig 4.1.

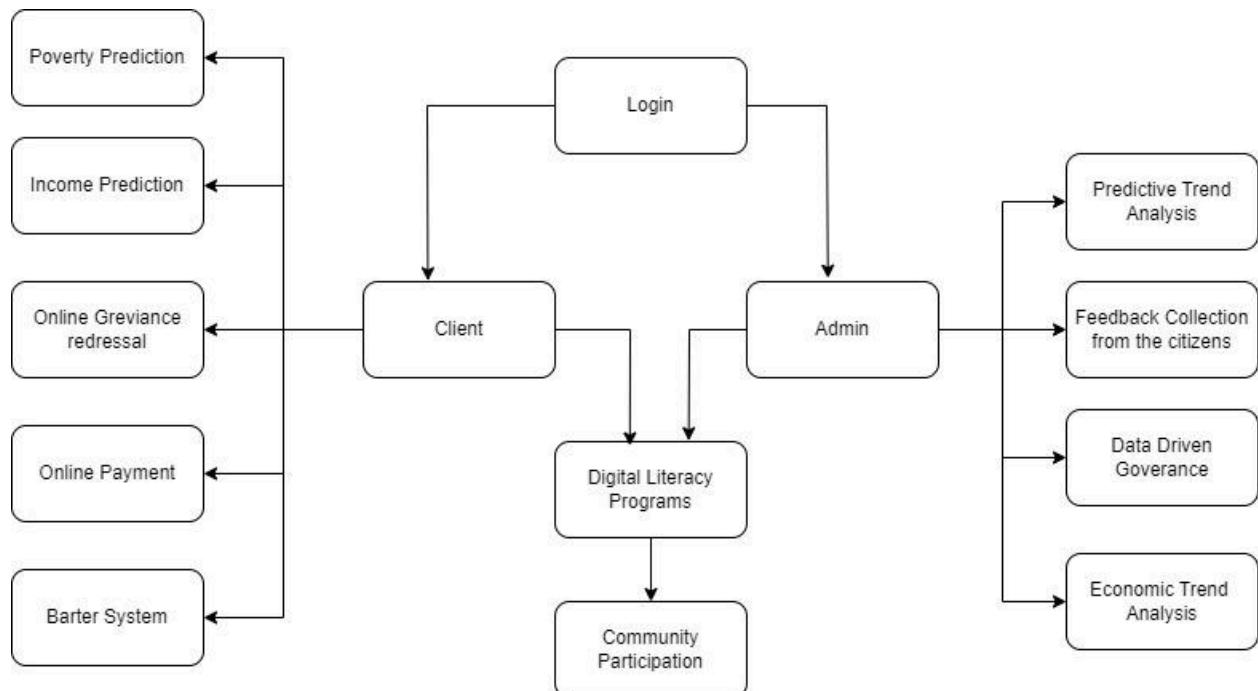


Fig 4.1 :Block diagram of VIS

1) Login Page for Village Users and Admin:

The login page ensures secure access to the system, enhancing data privacy and control. It's a fundamental step toward efficient user management and data protection. Admin will approve the signup of the villager after all the verification and validations

2) Separate Dashboard for User and Admin:

Separate dashboards optimize the user experience. Users and administrators can access features relevant to their roles swiftly, streamlining their interactions and tasks.

3) User-Centric Features:

- Complaints and Assistance: The ability for villagers to lodge complaints and request assistance online ensures timely problem resolution, contributing to their convenience and well-being.
- Document Management: Enabling document uploads and retrieval simplifies administrative processes and minimizes manual effort, enhancing the efficiency of bureaucratic tasks.
- Online Payments: Offering an online platform for tax and fee payments simplifies financial transactions for villagers, saving time and reducing administrative overhead.
- Poverty Prediction: The users(villagers) will get to know whether they are above the poverty line or not based on various parameters
- Income Prediction: The users(villagers) will get to know about their income based on various parameters

4) Admin-Centric Features:

- Predictive Trends and Analytics: Real-time analytics and predictive trends empower administrators to make informed decisions based on data insights, promoting efficient resource allocation and strategic planning.
- Feedback Collection: Gathering feedback from citizens fosters a responsive governance model. Admins can use this feedback to drive system enhancements, making the platform more aligned with user needs.
- The admin will have the overall access to the necessary things from the system

4.2. Modular diagram representation of the proposed system

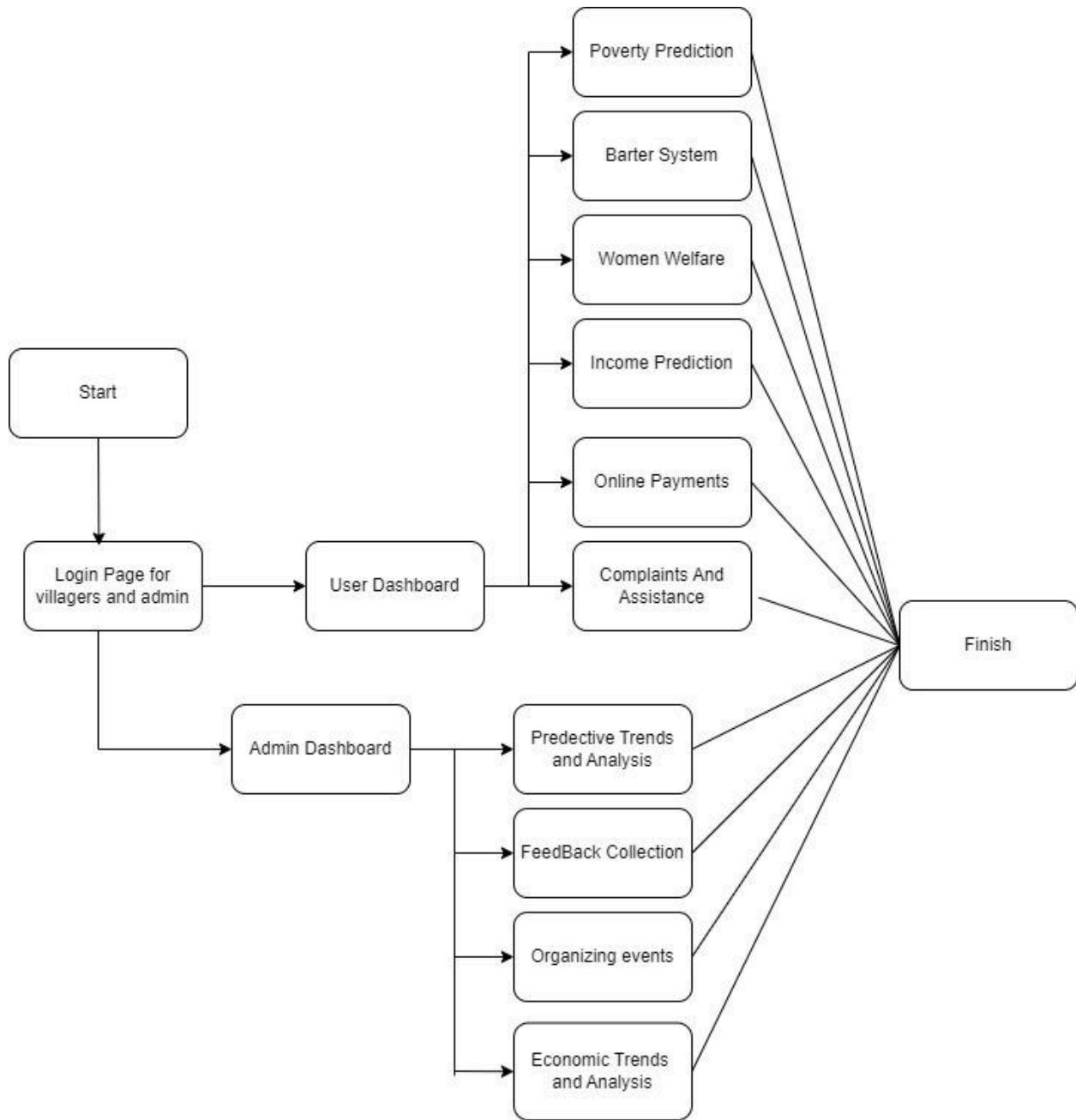


Fig 4.2 : Modular Diagram of VIS

Start: The process begins here.

Login Page for Village Users and Admin: Users initiate the process by accessing the login page for secure system entry.

Separate Dashboard for User and Admin: After logging in, users and administrators are directed to separate dashboards tailored to their respective roles.

User-Centric Features: Users can access features specific to their needs, including Complaints and Assistance, Complaints and assistance, Income Prediction, Poverty Prediction, and Online Payments.

Complaints and Assistance: Users can lodge complaints and request assistance online, ensuring timely problem resolution.

Online Payments: Users can make tax and fee payments online, streamlining financial transactions

Income Prediction: Users can predict their income based on various parameters

Poverty Prediction: Users can predict whether they are above the poverty line or not based on various parameters

Admin-Centric Features: Administrators have access to predictive trends and analytics, as well as feedback collection tools.

Predictive Trends and Analytics: Admins can utilize real-time analytics and predictive trends to inform decision-making and resource allocation.

Feedback Collection: Administrators gather feedback from citizens to enhance system responsiveness and drive improvements.

End: The process concludes here.

4.3. Detailed Design(Flowchart):

After login , the admin can perform the following tasks , viewing the admin dashboard or verifying a villager's profile . The villager can perform various tasks on the dashboard such as accessing women welfare services , online payments as shown in fig 4.3

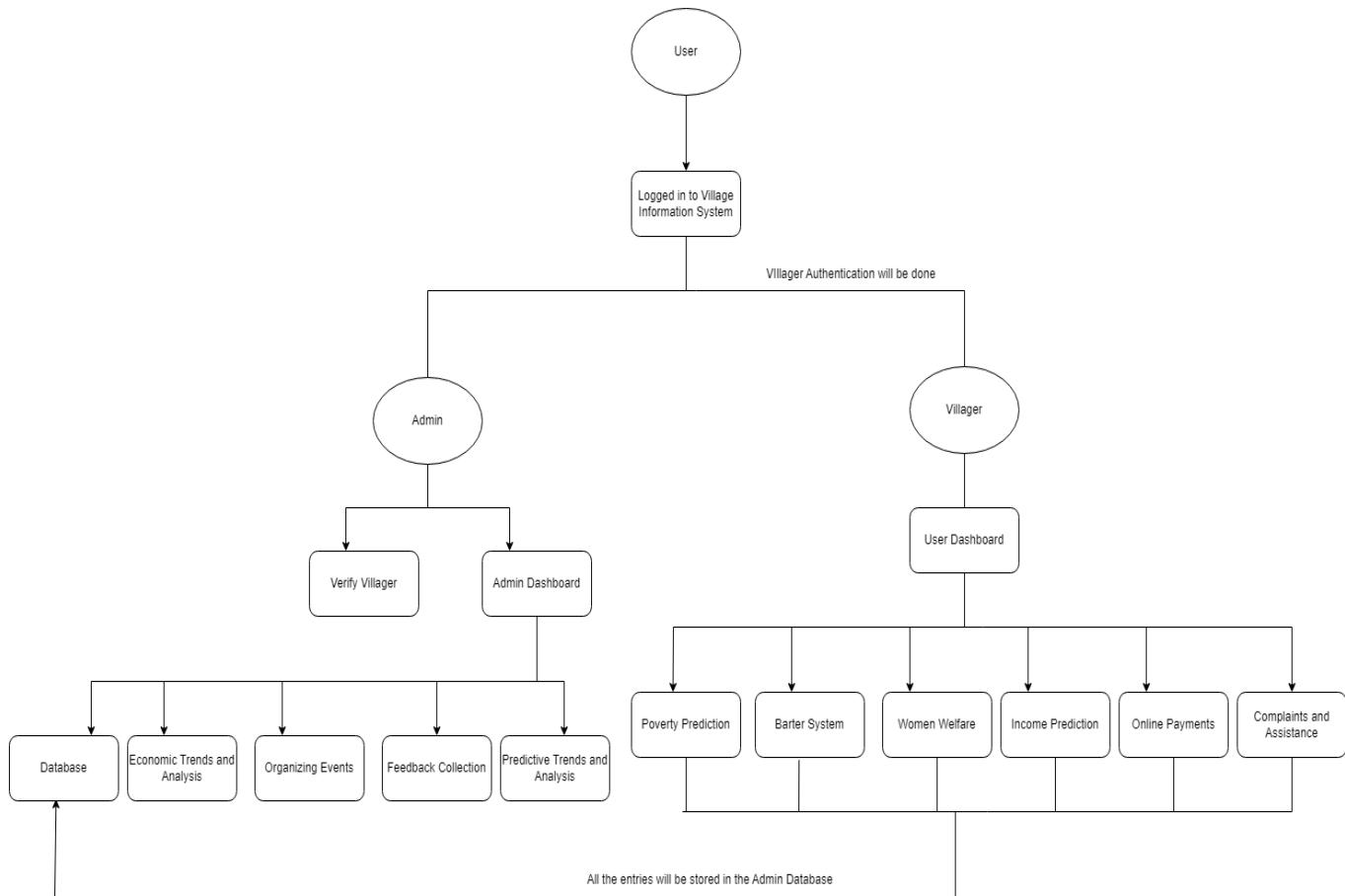


Fig 4.3 : Flow of System

4.4. Project Scheduling & Tracking using Timeline / Gantt Chart:

The Gantt chart of our project where we worked for the whole semester to create this model is shown in a timeline pattern. It is the most important part to think and design the planning of your topic and so we planned our work like the gantt chart shown.

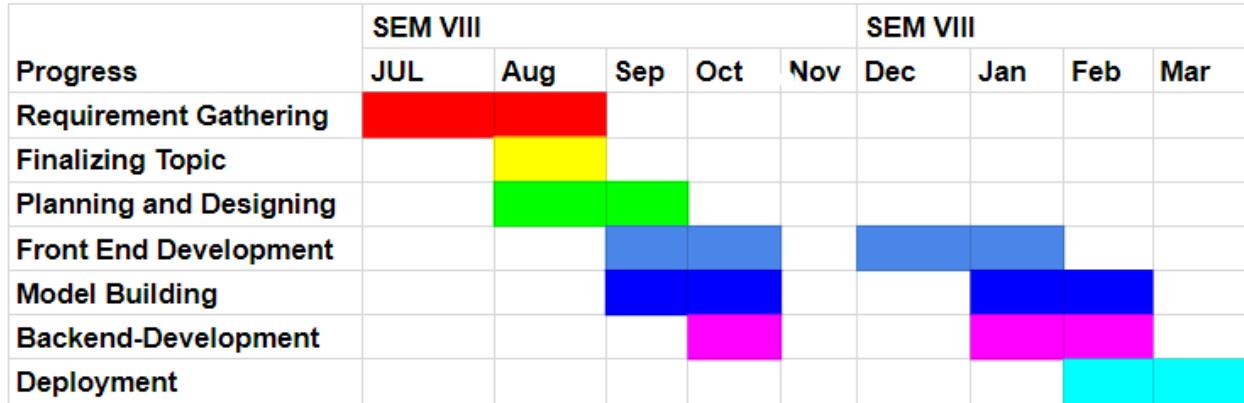


Fig 4.4 :Gantt Chart

4.5. Summary:

The proposed Village Information System (VIS) offers secure login for users and administrators, separate dashboards, and user-centric features such as complaints lodging, document management, online payments, and predictive analytics. Administrators access tools for analytics and feedback collection. A modular diagram and flowchart detail system processes, while a Gantt chart demonstrates project scheduling. VIS aims to enhance village governance and community engagement efficiently.

Chapter 5. Implementation of the Proposed System

5.1. Methodology employed for development

The development methodology for the Village Information System (VIS) is driven by the core objective of addressing the diverse needs of rural communities while fostering their overall development and well-being. The system's functionalities, including Complaints and Assistance, Income Prediction, Poverty Prediction, Online Payments, and Barter System, are meticulously designed to enhance governance, economic empowerment, and social welfare in villages.

- Complaints and Assistance Module: Implement a user-friendly interface for submitting complaints and assistance requests. Utilize efficient communication channels to ensure timely resolution and accountability.
- Predictive Analytics Modules: Develop algorithms to forecast income levels and identify households at risk of poverty. Enable policymakers to allocate resources effectively and implement targeted interventions for sustainable development.
- Financial Inclusion and Economic Exchange: Implement secure payment gateways for online transactions, reducing dependency on cash and expanding access to financial services. Facilitate local economic activities and resource sharing through the Barter System, fostering entrepreneurship and community resilience.

By adhering to this methodology, the VIS aims to empower villages, enhance governance effectiveness, and contribute to their sustainable development and prosperity through the seamless integration of essential services and innovative technological solutions.

5.2. Algorithms and Flowcharts for the respective modules developed:

We have mainly used two algorithms for our project:

a) Random Forest Classifier :

Random Forest is a versatile and powerful ensemble learning technique used in classification and regression tasks. It belongs to the family of decision tree-based methods, where multiple decision trees are trained and aggregated to make predictions. Each decision tree in the forest is constructed independently based on random subsets of the training data and features, hence the name "random forest."

At its core, a random forest classifier consists of a collection of decision trees. During training, each decision tree is built using a random subset of the training data. This process, known as bagging (Bootstrap Aggregating), involves sampling the training data with replacement, ensuring that each tree is trained on a slightly different subset of the data. Additionally, at each node of the decision tree, a random subset of features is considered for splitting. This randomness helps to decorrelate the individual trees, leading to a more robust and accurate ensemble model.

Mathematically, it is determined by:

$$y_{RF} = \operatorname{argmax}_i \left(\sum_{j=1}^N I(y_j = i) \right)$$

Where:

- y_j is the predicted class by the j th decision tree.
- $I(\cdot)$ is the indicator function, which returns 1 if its argument is true and 0 otherwise.
- i represents each class label.

In our project, it is used as:

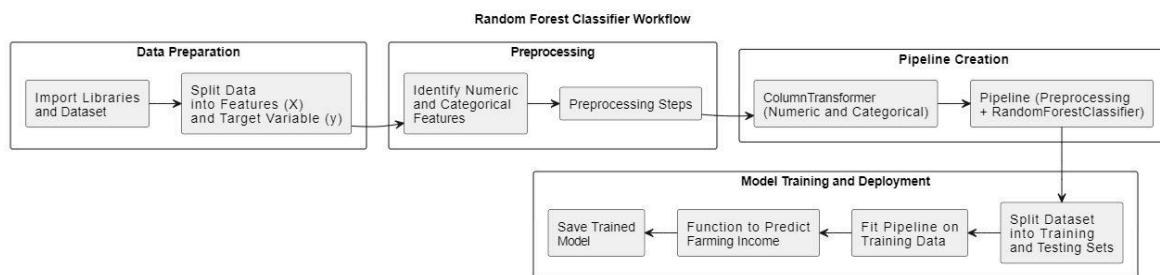


Fig 5.1: Random Forest Classifier Workflow for Income Prediction

b) Random Forest Regressor:

Random Forest Regressor is a powerful ensemble learning technique used for regression tasks. It belongs to the family of decision tree-based methods, where multiple decision trees are trained and aggregated to make predictions. Each decision tree in the random forest is constructed independently based on random subsets of the training data and features, hence the name "random forest."

To make predictions using a random forest regressor, each tree in the forest independently outputs a continuous value based on the input features. The final prediction is then determined through an averaging or voting scheme, where the predicted values from all trees are aggregated to obtain the final prediction.

Mathematically, it is determined by:

$$y_{RF} = \frac{1}{N} \sum_{j=1}^N y_j$$

Where:

- y_j is the predicted value by the j th decision tree.
- N is the total number of decision trees in the forest.

In our project, it is used as:

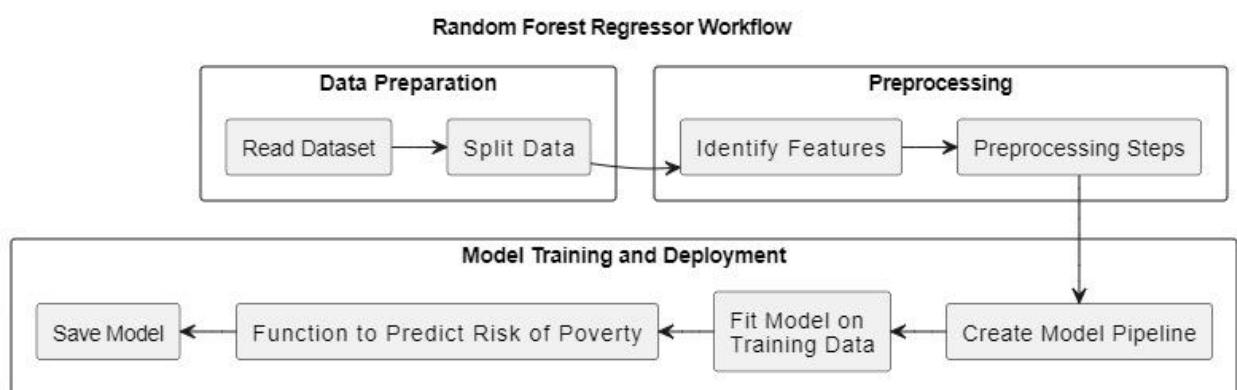


Fig 5.2: Random Forest Regressor Workflow for Poverty Prediction

5.3. Datasets source and utilization:

We have generated customized datasets using Python libraries using the Pandas and NumPy libraries. This approach allows for the creation of a synthetic dataset that can be used to train machine learning models to predict poverty status and Income Prediction based on various socio-economic factors. It provides a useful tool for researchers and policymakers to explore poverty dynamics and income prediction and develop interventions to alleviate poverty.

We have used these labels for **Income Prediction**:

- Historical Income of the user
- Crop type
- Market Conditions
- Investment Machinery
- Income of the farmer

We have used these labels for **Poverty Prediction**:

- Income
- Level of Education
- Size of Family
- Access to Healthcare
- Access to Employment
- Access to Education
- Access to Sanitation
- Access to Water
- Distance to Market
- Household Ownership
- Employment Type
- Access to Internet
- Poverty Status

5.4. Summary:

The development methodology for the Village Information System (VIS) revolves around addressing rural communities' diverse needs while fostering their overall development and prosperity. By meticulously designing functionalities such as the Complaints and Assistance module, Predictive Analytics modules for Income and Poverty Prediction, and facilitating Financial Inclusion and Economic Exchange through Online Payments and Barter System, the VIS aims to enhance governance, economic empowerment, and social welfare in villages. Through efficient communication channels for complaint resolution, predictive algorithms for resource allocation, and secure payment gateways for financial transactions, the VIS endeavors to seamlessly integrate essential services and innovative technological solutions, empowering villages and contributing to their sustainable development.

In implementing the VIS, two key algorithms are employed: Random Forest Classifier and Random Forest Regressor. These ensemble learning techniques enable classification and regression tasks essential for predicting income levels and identifying households at risk of poverty. Utilizing customized datasets generated using Python libraries such as Pandas and NumPy, the VIS leverages socio-economic factors like historical income, crop type, education level, and access to essential services to train machine learning models. By incorporating these algorithms and datasets, the VIS enhances its predictive capabilities, aiding policymakers and stakeholders in making informed decisions to alleviate poverty and foster economic growth in rural communities.

Chapter 6: Testing of the Proposed System

6.1. Introduction to Testing:

Software testing is the sequence of activities that happen during software testing. By employing a sane software testing life cycle, an organization ends up with a quality strategy more likely to produce better results. Why is this so important, though? It all boils down to customer satisfaction. Presenting a perfect product to the customer is the end goal of every organization. Nothing puts off customers more than a bug-filled user experience. So when enterprises realized this, they began to include testing as a mandatory part of the SDLC. Since then, testing has become an integral part of every organization.

Project Testing Phase means a group of activities designated for investigating and examining the progress of a project to provide stakeholders with information about actual levels of performance and quality of the project. It is an attempt to get an independent view of the project to allow stakeholders to evaluate and understand the potential risks of project failure or mismatch. The purpose of the testing phase is to evaluate and test declared requirements, features, and expectations regarding the project prior to its delivery in order to ensure the project matches the initial requirements stated in specification documents.

6.2. Types of tests Considered:

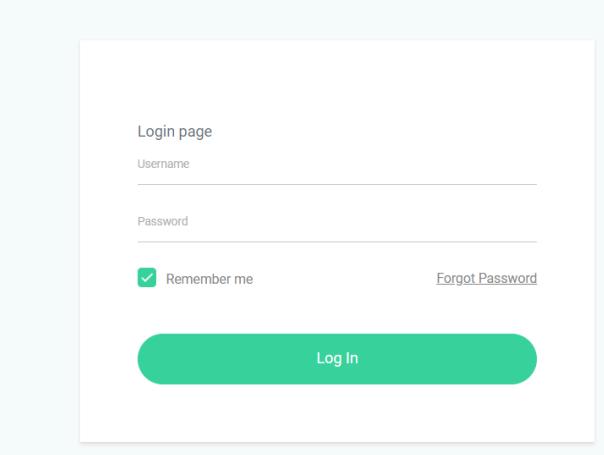
A. Unit Testing:

Unit testing involves testing individual components or modules of the system in isolation to ensure they function correctly according to specifications. For the Gram Panchayat digital services platform, unit testing would involve verifying the functionality of components such as the women's welfare pages, grievance form, Razorpay integration, income prediction, poverty risk prediction, and barter system. Each component would be tested thoroughly to identify and rectify any defects or inconsistencies before integration with other modules.

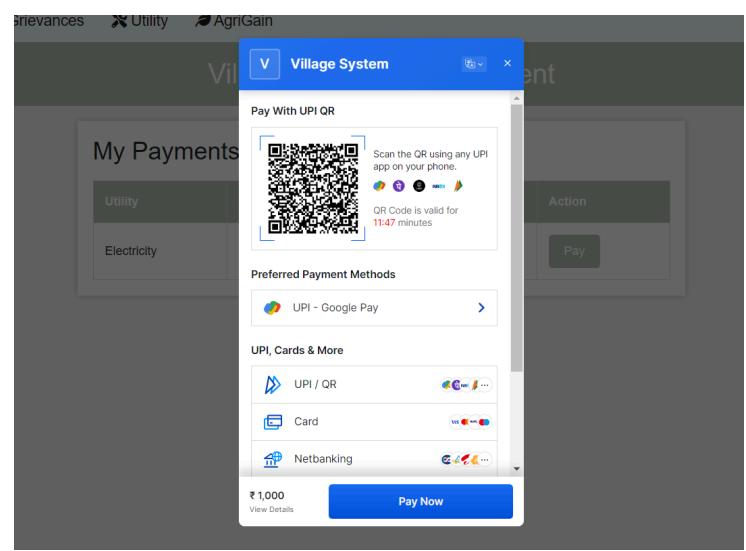
B. Integration Testing:

Integration testing focuses on verifying the interaction between different modules or components of the system to ensure they work together seamlessly. In the context of the Gram Panchayat digital services platform, integration testing would involve testing the integration of various features such as Razorpay integration with payment forms, the interaction between user and admin sides, and the flow of data between different modules. This phase ensures that all components collaborate effectively to deliver the intended functionality.

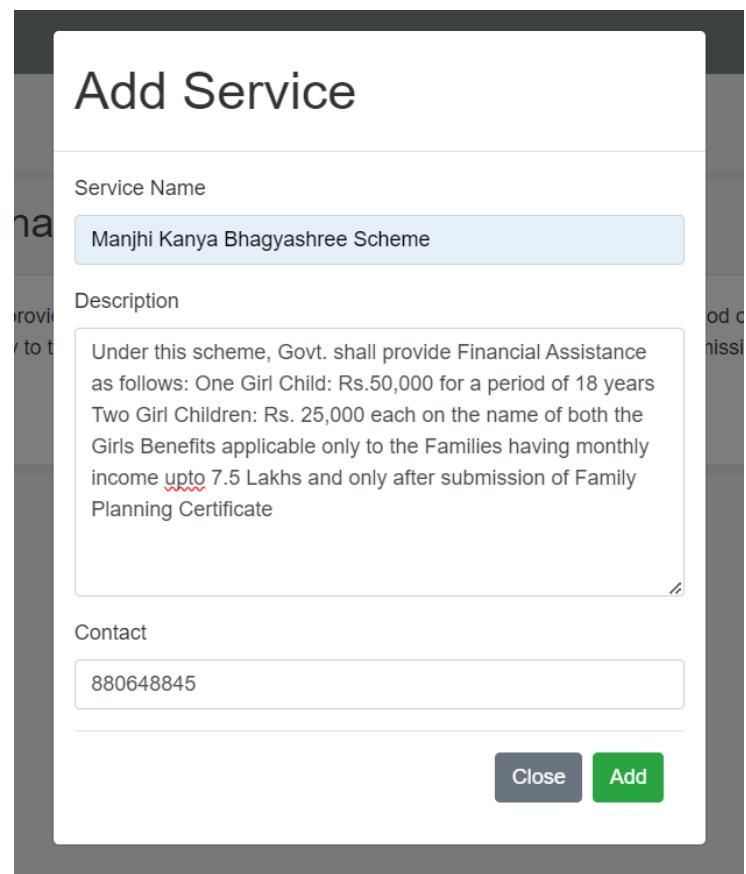
6.3. Various test case scenarios considered:

	Test Cases
Case 1: When the user or admin is logging into their account	

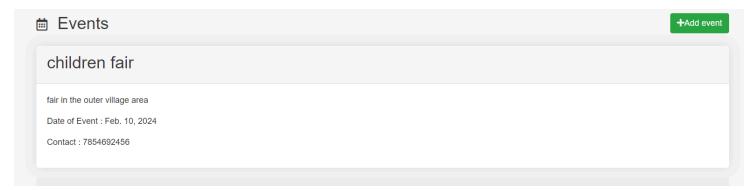
Case 2:
When the user is making payments for their respective bills



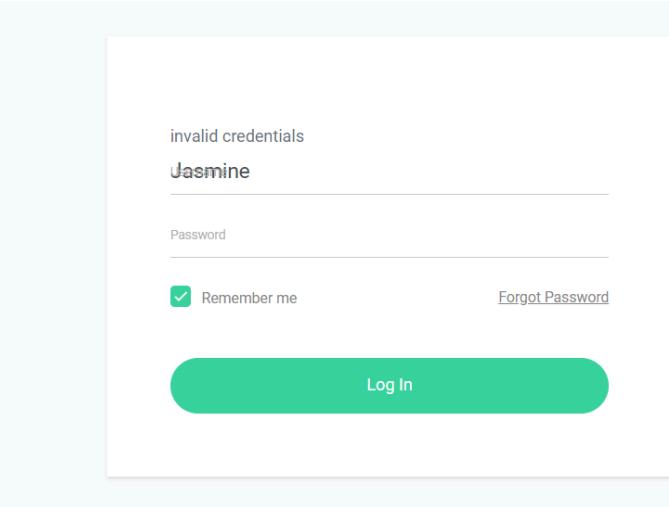
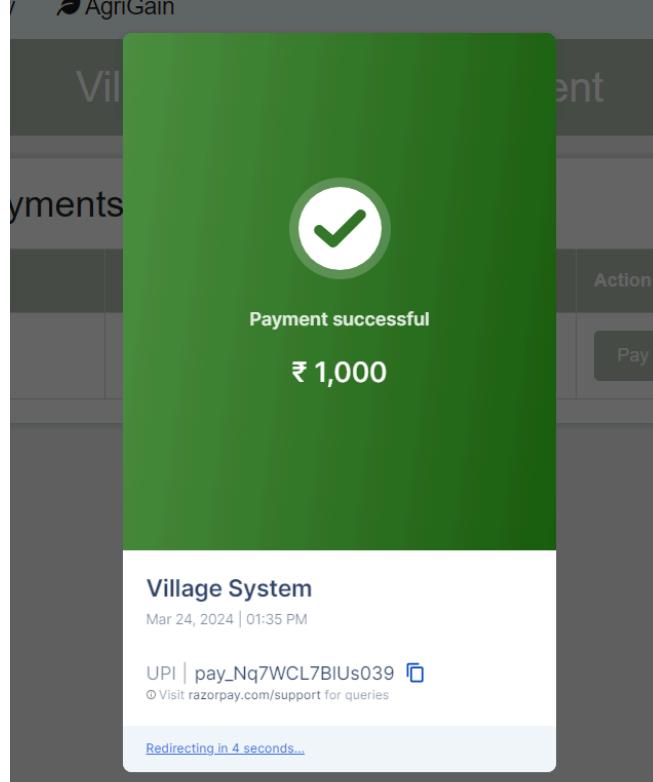
Case 3:
When the admin adds a service for users



Case 4:
When the admin adds an event, the SMS will be sent to all the existing users



6.4. Inference drawn from the test cases:

	Test Cases
Case 1: When a user or administrator attempts to log into their account and their credentials do not match, an error message stating "Invalid credentials" is displayed.	 <p>The screenshot shows a login form with the following fields and buttons:</p> <ul style="list-style-type: none"> Username: <input type="text" value="Jasmine"/> Password: <input type="password"/> Remember me: <input checked="" type="checkbox"/> Forgot Password: Forgot Password Log In: A large green button. <p>An error message "invalid credentials" is displayed above the login button.</p>
Case 2: Upon successful payment of their respective bills, the user will be presented with a confirmation message indicating that the payment has been completed.	 <p>The screenshot shows a payment confirmation page with the following details:</p> <ul style="list-style-type: none"> Payment status: Payment successful Amount: ₹ 1,000 Merchant: Village System Date: Mar 24, 2024 01:35 PM UPI ID: pay_Nq7WCL7BIUs039 Support: Visit razorpay.com/support for queries Redirect message: Redirecting in 4 seconds...

Case 3:
When the admin adds a service, it is stored within the system and subsequently retrieved on the services page for users to access.

Services

Manjhi Kanya Bhagyashree Scheme

Under this scheme, Govt. shall provide Financial Assistance as follows: One Girl Child: Rs.50,000 for a period of 18 years Two Girl Children: Rs. 25,000 each on the name of both the Girls Benefits applicable only to the Families having monthly income upto 7.5 Lakhs and only after submission of Family Planning Certificate

Contact : 880648845

+Add service

Case 4:
Upon the addition of an event by the admin, SMS notifications will be dispatched to all existing users, informing them about the newly added event successfully.

Events

job fair

Job openings available at Vijay Chowk

Date of Event : March 30, 2024

Contact : 8459182791

+Add event

1:42 pm

Texting with 57575711 (SMS/MMS)

Sent from your Twilio trial account
- New event added: job fair on 2024-03-30. Description: Job openings available at Vijay Chowk
You can contact on this for more details : 8459182791

1:42 pm

Text message

+

Text message

Smiley face icon

Speaker icon

Navigation icons: back, forward, search

6.5. Summary:

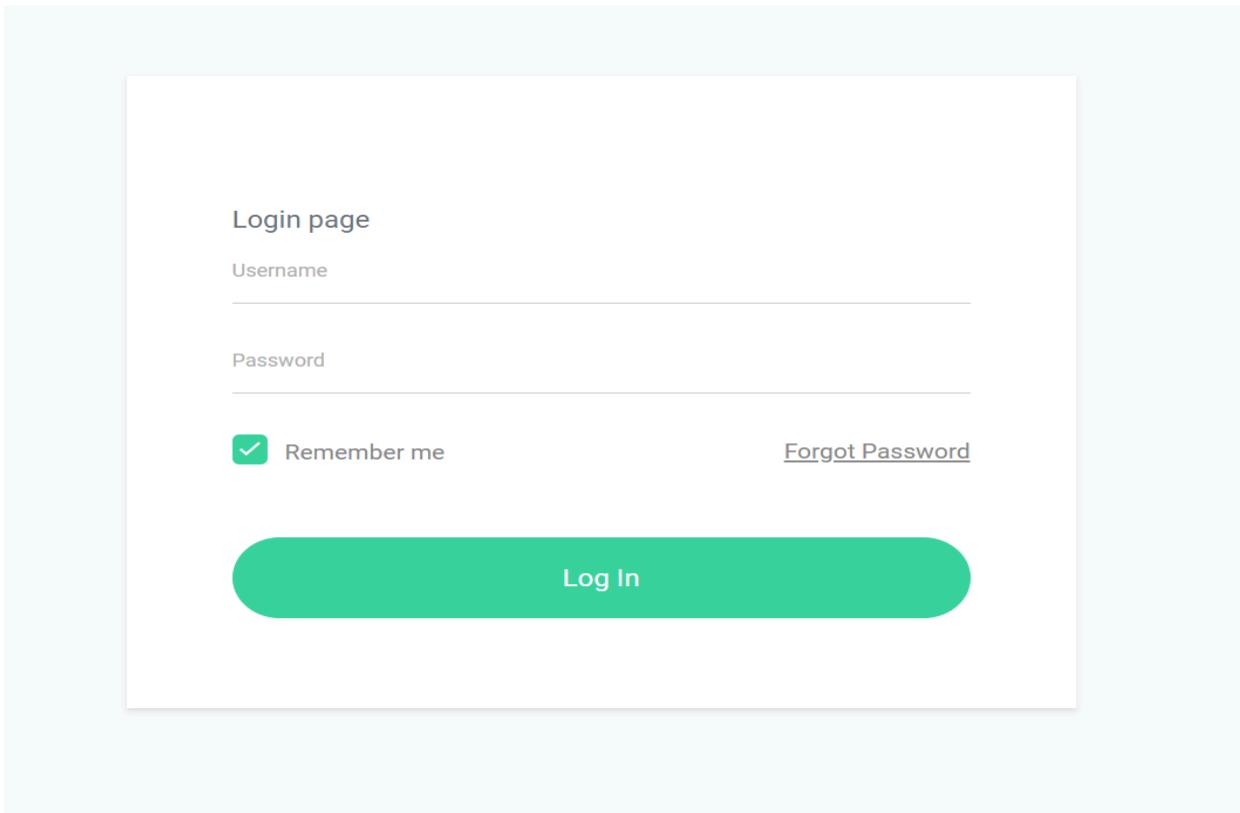
Software testing plays a crucial role in ensuring the quality and reliability of digital projects, particularly in the context of the Gram Panchayat digital services platform. The testing phase is indispensable as it provides stakeholders with valuable insights into the actual performance and quality of the project, allowing them to assess potential risks and ensure alignment with specified requirements. By incorporating various types of tests such as unit testing and integration testing, organizations can systematically verify the functionality and interaction of different components within the system, thereby minimizing the likelihood of defects and inconsistencies that could compromise user experience and satisfaction.

In the case of the Gram Panchayat digital services platform, test cases are carefully devised to cover essential scenarios, including user authentication, payment processing, service addition, and event notification. These test cases are instrumental in validating the platform's functionality and ensuring that it meets user expectations and specifications outlined in the project documentation. Through thorough testing and analysis of test case results, organizations can draw valuable inferences about the platform's performance, identify areas for improvement, and ultimately deliver a high-quality product that enhances user satisfaction and contributes to the success of digital initiatives in rural governance.

Chapter 7: Results and Discussions

7.1. Screenshots of User Interface (UI) for the respective module

Figure 7.1.1 - The registered users can login to the system and explore the various features provided by the system



7.1.1 Login Page

Figure 7.1.2 - The user can register itself on the system by providing their details and documents for verification

User Registration Page

[Login page](#)

First Name

Last Name

Username

Email

Password

Confirm Password

Aadhaar Card Image
 Choose File **No file chosen**

Aadhaar Card Text

PAN Card Image
 Choose File **No file chosen**

PAN Card Text

Address Proof Image
 Choose File **No file chosen**

Address Proof Text

Income Certificate Image
 Choose File **No file chosen**

Income Certificate Text

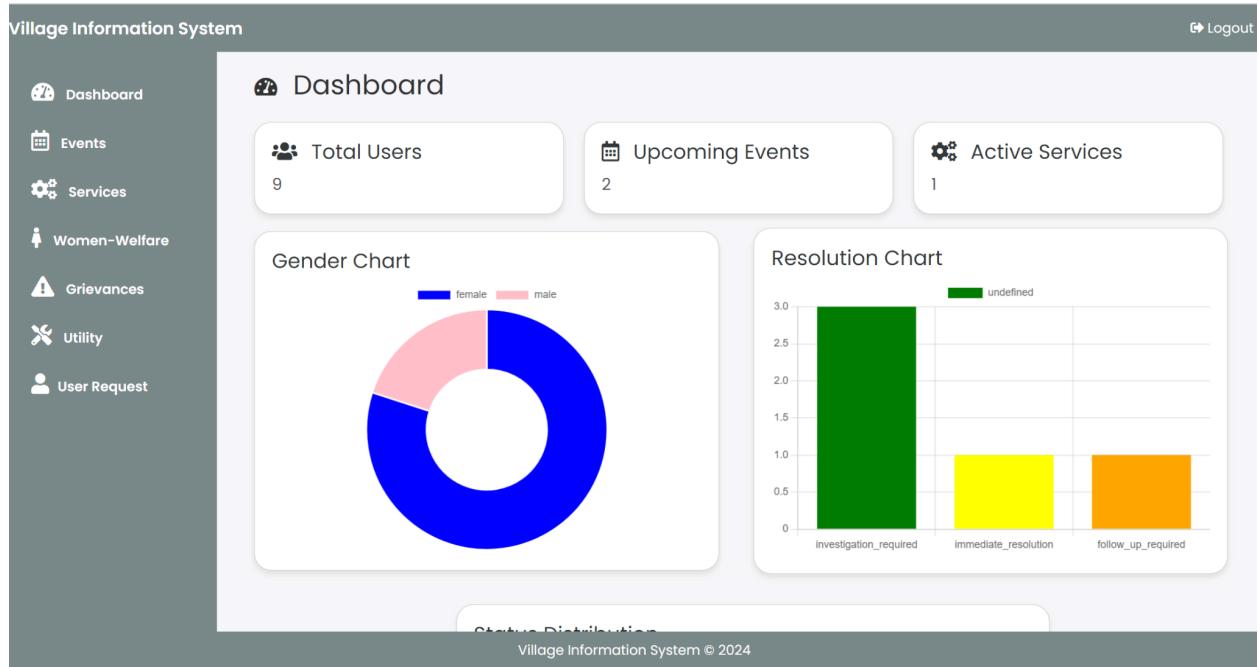
Ration Card Image
 Choose File **No file chosen**

Ration Card Text

Register

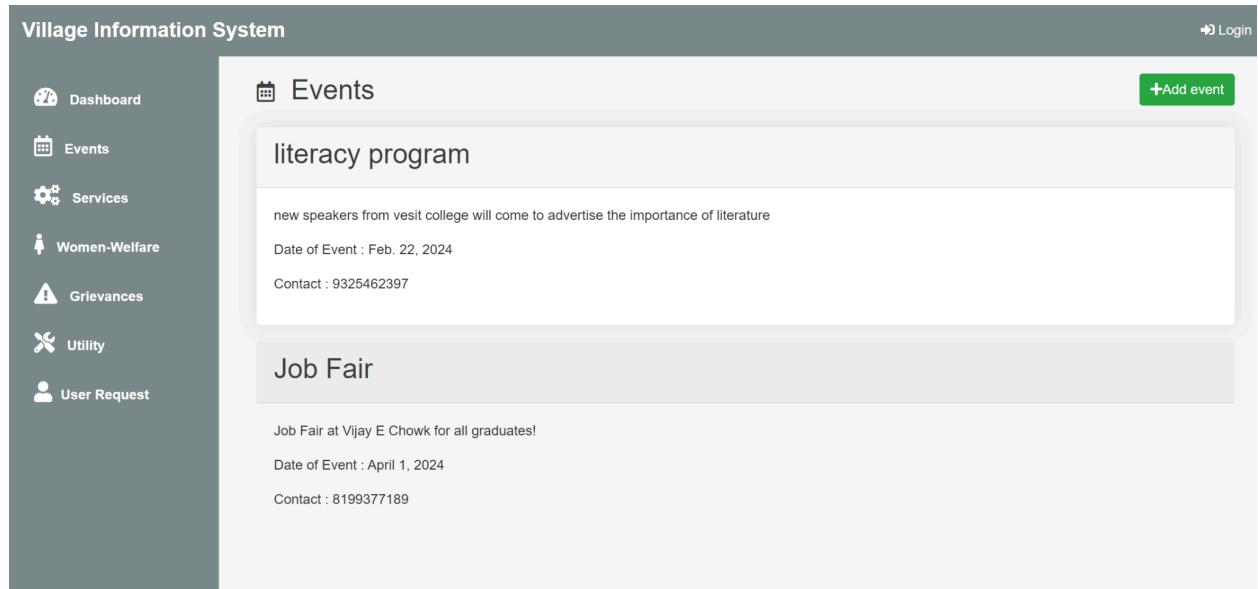
7.1.2 Register Page

Figure 7.1.3 - The admin can see the progress and various visualizations of the system



7.1.3 Admin Dashboard

Figure 7.1.4 - The admin can add events that are newly launched and an sms would be sent to all the existing users for the details of the event



7.1.4 Add Events Page

Figure 7.1.5 - Similarly, the admin can add various new government services and benefits that are launched in the recent time

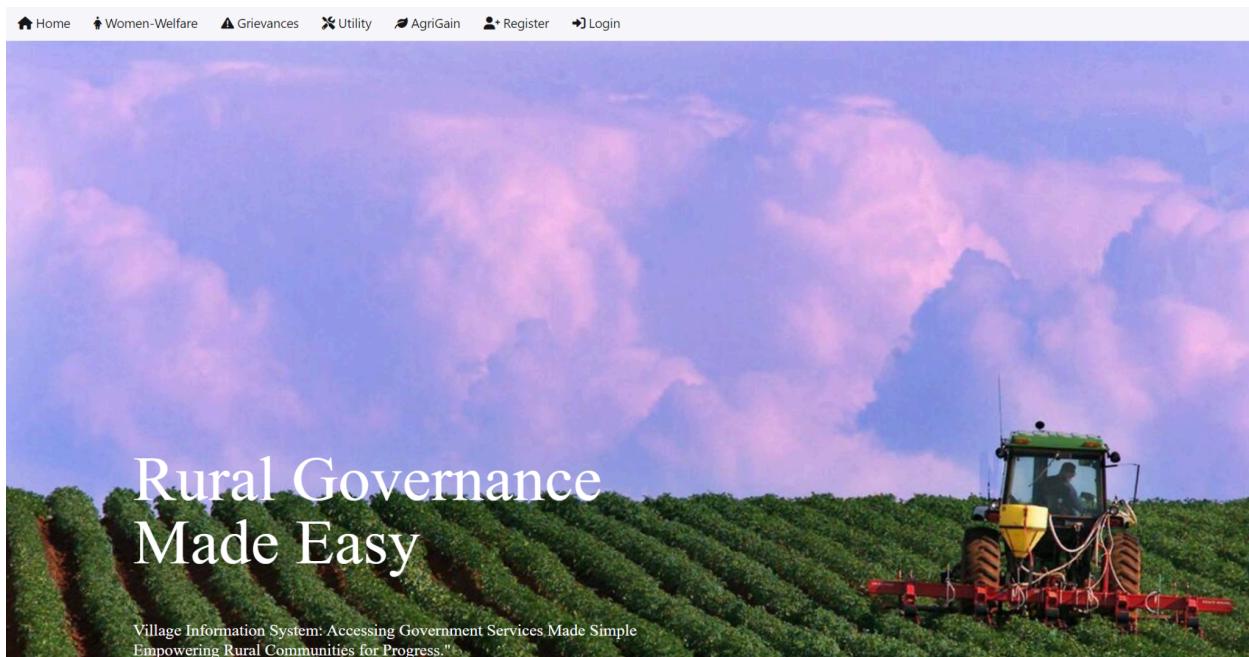
7.1.5 Add Services Page

Figure 7.1.6 - The admin can see the registered user list and their details and can approve or reject their registration by checking the documents submitted by the user

Username	Email	Aadhaar Card	Aadhaar Number	PAN Card	PAN Number	Address Proof	Income Certificate	Ration Card	Actions
diya	diya@gmail.com		None		None				Approved
jasmine_dhirwani	jasmine_dhirwani@gmail.com		None		None				Approved
vishal_m	vishal@gmail.com		304004892989		GJJPM0324R				<button>Approve</button>
karan_m	karan@gmail.com		304004892989		GJJPM0324R				<button>Approve</button>
mohit_g	mohit@gmail.com		304004892989		GJJPM0324R				Approved
vanshii	vanshii@gmail.com		304004892989		GJJPM0324R				Approved
gunjan_c	gunjanchawla0307@gmail.com		304004892989		GJJPM0324R				Approved
sagar_k	sagar@gmail.com		304004892989		GJJPM0324R				Approved
divyamakhija	divyamakhija0307@gmail.com		491183728957		AEVPO9182L				Approved

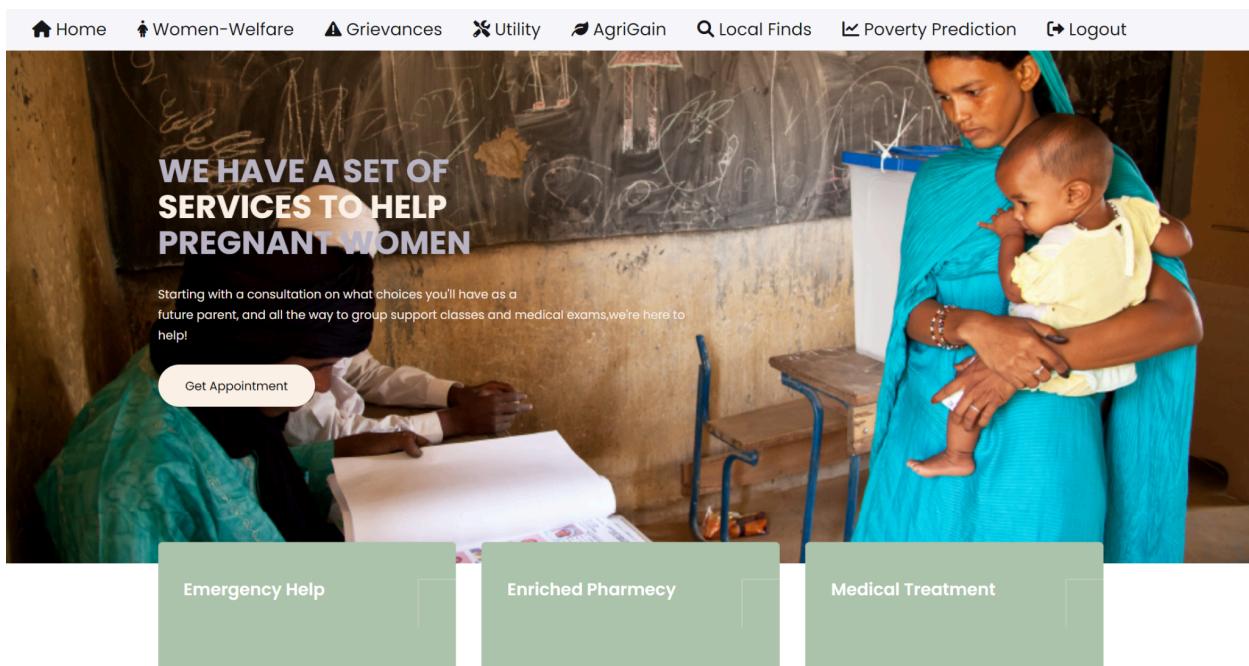
7.1.6 User Approval List

Figure 7.1.7 - After Login, The user can access various services that are offered by the system



7.1.7 User DashBoard

Figure 7.1.8 - The user can access various schemes which are introduced by the government for women



7.1.8 Women Welfare Page

Figure 7.1.9 - The user can submit their grievances through any language like marathi,hindi or english and their complaints will be assisted by admin

Grievance Form

Full Name

Contact Number

Address

Gender

Grievance Category

Grievance Description

Attachment

No file chosen

Preferred Resolution

Select target language

7.1.9 Grievance Form

Figure 7.1.10 - The user can pay their pending bills through our portal

The screenshot shows a user interface for utility payments. At the top, a green header bar displays the text "Village Tax & Utility Payment". Below this, a white section titled "My Payments" contains a table with four columns: "Utility", "Amount (USD)", "Status", and "Action". A single row in the table shows an "Electricity" bill of "1000" USD in a "Pending" status. To the right of the "Status" column, there is a green "Pay" button.

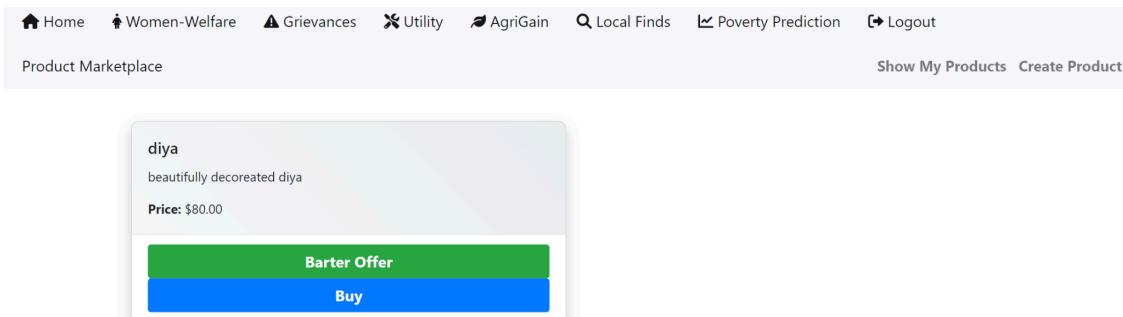
7.1.10 Utility Page

Figure 7.1.11 - The user can predict his farming income by giving information about various parameters and based on that an income would be generated

The screenshot shows a form titled "PREDICT FARMING INCOME". The form contains several input fields arranged in pairs: "Historical Income" and "Market Conditions", "Weather Forecasts" and "Investment Machinery", "Crop Type" and "Expenses", and "Profit Margin". Each pair of fields has a horizontal line between them. Below these fields is a large blue "Predict" button.

7.1.11 Predict Farming Income

Figure 7.1.12 - The user has also been provided with a digital barter system where he can view his list of products and their barter offers requested by another people



7.1.12 List of Products

Figure 7.1.13 - The user can also create their products and submit for the barter offer and exchange products with other people

A screenshot of a 'Create Product' form. The form has a title 'Create Product' at the top. It includes fields for 'Product Name' (with a text input box), 'Description' (with a large text area), 'Price' (with a text input box), 'Product Image' (with a 'Choose File' button and a message 'No file chosen'), and a checkbox labeled 'Is Barter'. At the bottom of the form is a large blue 'Create Product' button.

7.1.13 To add a Product in market

Figure 7.1.14 - The user can predict whether they are at a risk of poverty or not by providing various parameters and based on the inputs, the system will generate its poverty status

Predict Poverty Status

How much money you make each month (in your local money):

How much schooling you've had:

None (You haven't gone to school)

How many people live with you:

If you can easily see a doctor when you're sick:

Yes

If you can easily find a job:

Yes

If schools are close by:

Yes

If you have clean bathrooms and places to wash:

Yes

If you have clean water to drink and use:

Yes

How far away the nearest market is (in kilometers):

If you own or rent your home:

Owned

What kind of work you do:

Farming or working with crops or animals

If you can use the internet:

Yes

Predict Poverty Status

7.1.14 Poverty Prediction

Chapter 8: Conclusion

8.1. Limitations

1. Limited internet access and infrastructure in rural areas may hinder widespread adoption.
2. Language barriers could impede accessibility despite multi-language support.
3. Data accuracy concerns may arise due to reliance on incomplete or outdated information.
4. Financial constraints might challenge the implementation of online payment systems like Razorpay.

8.2. Conclusion

By addressing the outlined problem areas and implementing the proposed solutions, the Village Information system can be modernized and strengthened to effectively serve rural communities, enhance governance, and promote citizen participation and empowerment. This project aims to create a more inclusive, transparent, and efficient local governance system through the integration of technology and community engagement. The Expert Village System is poised to be the cornerstone of next-generation problem-solving methodologies, harmonizing leading-edge technologies with expert acumen.

8.3. Future Scope

1. Expand service offerings to encompass healthcare, education, and agriculture support.
2. Enhance data analysis capabilities for deeper insights into community needs and trends.
3. Develop a mobile application version to improve accessibility, especially in areas with limited internet connectivity.
4. Forge partnerships with local organizations and government agencies to broaden impact and resources.

SUMMARY

The Village Information System is a comprehensive platform designed to empower rural communities by addressing various needs and challenges they face. It integrates functionalities such as Complaints and Assistance, Income Prediction, Poverty Prediction, Online Payments, and a Barter System.

The Complaints and Assistance module facilitates communication between villagers and local authorities, streamlining the reporting process for issues and enhancing service delivery efficiency. Predictive models for income and poverty enable proactive socio-economic development planning, aiding policymakers in resource allocation and targeted interventions.

Moreover, the system incorporates Online Payments and a Barter System to simplify financial transactions and promote economic exchange, fostering entrepreneurship and financial inclusion in rural areas. By leveraging technologies like HTML, CSS, Bootstrap, Django, MySQL, Python, Razorpay, Twilio, and JavaScript, the Village Information System represents a significant advancement in using technology to address diverse rural needs and aspirations.

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1. S. Bhattacharya and B. K. Sachdev, "Smart Village: A new dynamic to end rural urban gap and move towards sustainable development for all," International Journal of Multidisciplinary Research and Growth Evaluation, pp. 110–113, Nov. 2021, doi: 10.54660/anfo.2021.2.6.7.
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4. O. Venkateswara Rao, "Effectiveness of E-Panchayat in Andhra Pradesh: A Study," IJAR, vol. 8, no. 4, pp. 236-239, 2022.
5. J. Choudhary, S. D. Kale, S. P. Patode, R. S. Kamble, and S. R. Aatkhe, "Development of Village as a Smart Village," International Journal of Current Research and Technology (IJCRT), vol. 9, no. 6, June 2021, ISSN 2320-2882.
6. International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 08 Issue: 06 | June 2021 www.irjet.net p-ISSN: 2395-0072 © 2021, IRJET | Impact Factor value: 7.529 | ISO 9001:2008 Certified Journal | Page 1616 Research Paper on Development of Ahirwadi Village as Smart Village Bansode A A1, Chavan P S2, Urunkar D D3, Satpute P L4, Salunkhe S S5, Toraskar A B6, Pawar N S7 1-6PG Student, NanaSaheb Mahadik College of Engineering Peth, Maharashtra, India 7 Asst. Professor, Dept. of Civil Engineering, NanaSaheb Mahadik College Of Engineering Peth, Maharashtra, India.
7. R. Kapur, "Health Care Facilities in Rural Areas," Acta Scientific Agriculture, vol. 3, no. 6, pp. 62-70, May 10, 2019
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Appendix

1] Paper I details:

a. Paper I:-

VILLAGE INFORMATION SYSTEM

Abstract—In India, Gram Panchayat is an elected local body to resolve disputes and regulate community affairs. As the digital age continues to evolve, the internet is becoming more widespread and can be accessed via computers and mobile devices even in rural areas where agriculture is still the main occupation of farmers and workers. This article highlights the urgent need to launch e-services within the framework of Gram Panchayats to streamline government operations and reduce information burden.

Keywords-village,community,reduce-paperwork,resources

I. INTRODUCTION

In India, where Panchayats have historically resolved disputes, electronic services today have reduced Panchayat paperwork and facilitated communication between the public and the government. Information technology plays an important role in reducing bureaucracy and making access to government affairs and services transparent and effective for citizens.

II. MOTIVATION

Access to basic services and limited resources in rural and remote areas is long overdue. These communities often face significant barriers to accessing government services, education, healthcare, and economic opportunities. The problem is exacerbated by the lack of digital technology and internet connectivity, causing delays in administrative procedures, notification and delivery. In response to these challenges, the drive to create e-village systems has emerged. The e-Village system aims to bridge the urban-rural digital divide, improve business management and support rural communities by leveraging technology and digital infrastructure. Through digital literacy programs and better access to government services and information, the system can improve the quality of life of people living in remote areas and promote development and prosperity.

III. LITERATURE SURVEY

[1] Smart Village: A new dynamic to end rural urban gap and move towards sustainable development for all: Dr. Sumanta Bhattacharya

1 , Bhavneet Kaur Sachdev 2 1 Research Scholar, Maulana Abul Kalam Azad University of Technology, Kolkata, West Bengal, India
2 Department of Political Science, Calcutta University, Kolkata, West Bengal, India Corresponding Author: Dr. Sumanta Bhattacharya

Abstract-Smart rural development in India combines technology and green initiatives to uplift impoverished villages, reduce urban migration, and promote sustainable living while addressing climate change.

[2] Study and development of village as a smart village: Rutuja Somwanshi, Utkarsh ShindePatil, Deepali Tule, Archana Mankar, Namdev Ingle Guided By- Dr. V. S. Rajamanya, Prof. A. Deshmukh:

Abstract-This project report focuses on establishing a smart village that efficiently delivers essential services, promotes modern energy access, and prioritizes resource efficiency, local self-governance, and responsible behavior for overall development and happiness through technology-driven decisions.

[3] ICT in Grama Panchayat: A Boon to Rural Development: by Dr. Subramanya A1 , Sandesh:

Abstract-The 73rd Amendment aimed to empower Panchayati Raj institutions, but challenges like low digital literacy and infrastructure hinder progress. Solutions proposed include common contact counters and digital education to bridge the digital divide, enhance transparency, reduce corruption, and promote participatory democracy.

[4] Effectiveness of E-panchayat in Andhra Pradesh: A study:by Oruganti Venkateswara Rao:

Abstract-The e-Panchayat project focuses on streamlining administrative processes, conserving resources, and empowering citizens with efficient local administration to drive development at all levels, from villages to the entire nation.

[5] Development Of Village As a Smart Village: JAYESH CHOUDHARY, SURAJ DASHARATH KALE, SUSHIL PADMAKAR PATODE, 4RUSHIKESH SARJERAO KAMBLE, SANDESH RAMESH AATKHILE:

Abstract:Over recent decades, people's (rural and urban) communities are facing numerous social and economic changes and challenges. Some of those challenges have been increasingly addressed through the lenses of technological developments and digitalization. In this paper, we have made a review of already existing practices while focusing on the existing implementations of

the Smart Village concept and the importance of digital transformation for rural areas.

[6] R. Kapur, "Health Care Facilities in Rural Areas," *Acta Scientific Agriculture*, vol. 3, no. 6, pp. 62-70, May 10, 2019

Abstract: The main objective of this research paper to acquire an understanding of health care facilities in rural areas. In rural communities, the health care facilities are not in a well-developed state. In some cases, the rural individuals do not have access to these facilities and are required to travel to distant places or urban areas. With the advent of globalization and industrialization, there have been initiation of technical, scientific and innovative methods in the health care centers.

[7] S. Tanwar and M. Bhardwaj, "Digitalization of Rural India," *Journal of the Institution of Engineers (India)*, December 2021.

Abstract: Digital India, spearheaded by Prime Minister Narendra Modi, represents a significant stride in leveraging technology to empower society. This visionary program promises transformative advancements across sectors, fostering innovation and progress. The core aim is to establish a participative, transparent, and responsive system, harnessing the potential of digitalization.

[8] J. Choudhary, S. D. Kale, S. P. Patode, R. S. Kamble, and S. R. Aatkhile, "Development of Village as a Smart Village," *International Journal of Current Research and Technology (IJCRT)*, vol. 9, no. 6, June 2021, ISSN 2320-2882.

Abstract: The main idea is if the administrative processes are streamlined and resources are conserved and citizens are empowered with efficient and responsive local administration at every village, then it results in development of districts, states and subsequently the entire nation. So grass root level problems were taken up for ICT application under the e-Panchayat project.

IV .PROPOSED IDEA

After reviewing the requirements, the project proposal is to further develop the E-Gram Panchayat system with a focus on improving customer experience, increasing efficiency and improving security measures. We will also make solving these problems a priority by working with local governments, providing the necessary resources and establishing relationships in remote areas of the city. The concept is designed to create a powerful, user-friendly and accessible platform to enable rural people to access government services easily and efficiently, ultimately bridging the gap between the population of Gram Panchayats and their service providers.

A. Block diagram

The research paper provides an overview of the Smart Village System, a computer system designed to improve rural governance and citizen participation. The system starts with a secure login page accessible to local users and administrators, which redirects them to separate control panels customized to their roles. Rural users benefit from user-friendly features such as online complaints and assistance, information management, and online payment capabilities. At the same time, managers have access to management-centric features such as real-time analytics and feedback tools, allowing them to make informed decisions and improve their business. This case study shows that the system is user-friendly and capable of creating a positive impact on rural governance and public participation, making it important for improving the lives of people living in smart villages.

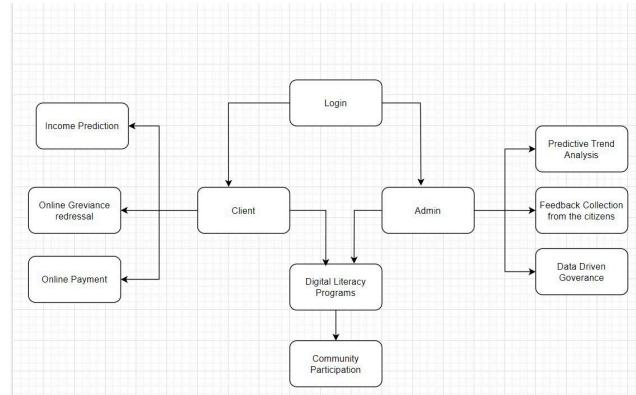


Fig 1: Village Information System Block Diagram

B. Modular diagram

The research paper provides an overview of the Smart Village System, a computer system designed to improve rural governance and citizen participation. The system starts with a secure login page accessible to local users and administrators, which redirects them to separate control panels customized to their roles. Rural users benefit from user-friendly features such as online complaints and assistance, information management, and online payment capabilities. At the same time, managers have access to management-centric features such as real-time analytics and feedback tools, allowing them to make informed decisions and improve their business. This case study shows that the system is user-friendly and capable of creating a positive impact on rural governance and public participation, making it important for improving the lives of people living in smart villages.

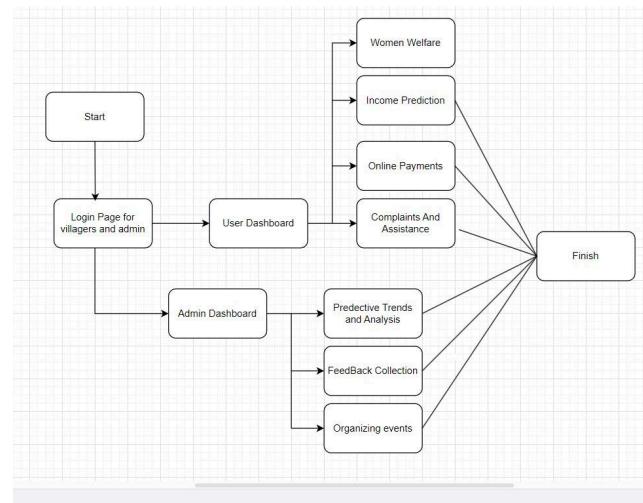


Fig 2: Village Information System Modular Diagram

- Start: The process begins here.
- Login Page for Village Users and Admin: Users initiate the process by accessing the login page for secure system entry.
- Separate Dashboard for User and Admin: After logging in, users and administrators are directed to separate dashboards tailored to their respective roles.

- User-Centric Features: Users can access features specific to their needs, including Complaints and Assistance, Document Management, and Online Payments.
- Complaints and Assistance: Users can lodge complaints and request assistance online, ensuring timely problem resolution.
- Document Management: Users can upload and retrieve documents, simplifying administrative processes.
- Online Payments: Users can make tax and fee payments online, streamlining financial transactions.
- Admin-Centric Features: Administrators have access to predictive trends and analytics, as well as feedback collection tools.
- Predictive Trends and Analytics: Admins can utilize real-time analytics and predictive trends to inform decision-making and resource allocation.
- Feedback Collection: Administrators gather feedback from citizens to enhance system responsiveness and drive improvements.
- End: The process concludes here.

V. CONCLUSION

By addressing the outlined problem areas and implementing the proposed solutions, the Village Information system can be modernized and strengthened to effectively serve rural communities, enhance governance, and promote citizen participation and empowerment. This project aims to create a more inclusive, transparent, and efficient local governance system through the integration of technology and community engagement. The Expert Village System is poised to be the cornerstone of next-generation problem-solving methodologies, harmonizing leading-edge technologies with expert acumen.

Acknowledgments

“Acknowledgment(s)” is spelled without an “e” after the “g” in American English.

As you can see, the formatting ensures that the text ends in two equal-sized columns rather than only displaying one column on the last page.

This template was adapted from those provided by the IEEE on their own website.

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- [1] S. Bhattacharya and B. K. Sachdev, “Smart Village: A new dynamic to end rural urban gap and move towards sustainable development for all,” International Journal of Multidisciplinary Research and Growth Evaluation, pp. 110–113, Nov. 2021, doi: 10.54660/anfo.2021.2.6.7.
- [2] R. Somwanshi, U. Shindepatil, D. Tule, A. Mankar, N. Ingle,

“Study and Development of Village as a Smart Village,” International Journal of Scientific & Engineering Research, vol. 7, no. 6, June. 2016, ISSN 2229-5518.

[3] Dr. Subramanya A and Sandesh, “ICT in Grama Panchayat: A Boon to Rural Development,” IOSR Journal of Economics and Finance (IOSR-JEF), vol. 11, no. 3 Ser. VIII, pp. 28-32, May-Jun 2020. DOI: 10.9790/5933-1103082832.

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[7] R. Kapur, “Health Care Facilities in Rural Areas,” Acta Scientific Agriculture, vol. 3, no. 6, pp. 62-70, May 10, 2019

[8] S. Tanwar and M. Bhardwaj, “Digitalization of Rural India,” Journal of the Institution of Engineers (India), December 2021.

b.PLAGIARISM REPORT

Date	March 30, 2024	
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	Unique Content	90
	Plagiarized Content	10

CONTENT CHECKED FOR PLAGIARISM:

VILLAGE INFORMATION SYSTEM

c.Project review sheet;

Project review sheet 1:

Project Evaluation Sheet 2023 - 24												Class: D17 A/B/C Group No.: 16			
Title of Project: Village Information System												Project Evaluation Sheet 2023 - 24			
Group Members: Jasmine Dhiawan (D17B/23), Divya Makhija (D17A/31), Vanshika Makhijani (D17A/40), Mohit Gangwani (D17A/16)												Project Evaluation Sheet 2023 - 24			
Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
5	4	4	2	4	2	2	2	2	2	2	2	2	2	3	40
Comments:														Name & Signature Reviewer 1	
Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
4	5	4	2	4	2	2	2	2	2	2	2	2	2	3	40
Comments:														Name & Signature Reviewer 2	
Date: 8th February, 2024															

Project review sheet 2:

Project Evaluation Sheet 2023 - 24												Class: D17 A/B/C Group No.: 16			
Title of Project: Village Information System												Project Evaluation Sheet 2023 - 24			
Group Members: Vanshika Makhijani (D17A/40), Divya Makhija (D17A/31), Mohit Gangwani (D17A/16), Jasmine Dhiawan (D17B/23)												Project Evaluation Sheet 2023 - 24			
Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
5	4	4	3	4	2	2	2	2	2	3	3	3	3	4	45
Comments:														Name & Signature Reviewer 1	
Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (2)	Applied Engg&Mgmt principles (3)	Life - long learning (3)	Professional Skills (3)	Innovative Approach (3)	Research Paper (5)	Total Marks (50)
4	4	4	3	4	2	2	2	2	2	3	2	3	3	3	42
Comments:														Name & Signature Reviewer 2	
Date: 9th March, 2024															