Sahayaka

"Chatbot Based Helpdesk for Govt Employees & Departments"

A PROJECT REPORT
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Under the guidance of,

Dr. Nihar Ranjan Nayak

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING SPL IN IOT

AT

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

BENGALURU

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PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report **Sahayaka** being submitted by S P BRAHMA CHAITANYA (20211CIT0110), BHUVANESHWAR Y (20211CIT0156), DHANUSH M (20211CIT0069), SHREYANKA B L (20211CIT0147) in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering Spl In IoT, is a bonafide work carried out under my supervision.

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DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **Sahayaka** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering Spl In IoT**, is a record of our own investigations carried under the guidance of **Dr. Nihar Ranjan Nayak, Asst professor, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

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ABSTRACT

Government services are crucial for ensuring efficient administration and citizen support, yet they often face challenges such as complex procedures, inconsistent information, and accessibility barriers. 'Sahayaka: Chatbot-Based Helpdesk for Govt Employees & Departments' addresses these issues by providing a user-friendly platform that simplifies government-related tasks and improves information accuracy.

Sahayaka is designed to assist government employees and citizens with clear guidance on services such as Aadhaar registration, PAN card updates, house tax payments, and road planning approvals. By offering instant and accurate responses through a chatbot interface, Sahayaka reduces confusion and delays, enhancing overall efficiency. Key features of Sahayaka include support for over 20 languages, ensuring accessibility for diverse user groups across the nation. Its secure authentication system offers both Gmail and mobile-based login via Firebase, ensuring user data protection. The platform is compatible with both smartphones and desktop computers, enabling seamless access across devices. All previous interactions and data are securely stored in cloud storage for reference and continuity.

In addition to its core services, Sahayaka offers essential features tailored for government employees, such as HR management tools, attendance tracking, leave management, and employee duty reports. The platform also simplifies payslip access, ensuring convenient financial management for government staff. Moreover, Sahayaka streamlines birth certificate registration and download processes, improving citizen services. Bulk circular notifications further enhance communication efficiency by enabling administrators to broadcast important updates instantly. Sahayaka's implementation has the potential to significantly improve the delivery of government services, promoting transparency, reducing administrative overhead, and enhancing user satisfaction. Future updates will focus on incorporating AI-driven insights, predictive analytics for public services, and improved chatbot responsiveness to meet evolving administrative needs.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	EXPANSION
FARM	Flexible Administration Resource Management
IFT	Integrated File Tracker
RTN	Real-Time Notification
LTS	Leave Tracking System
CAN	Centralized Administration Network
SDLC	System Development Life Cycle
DPR	Digital Process Regulation
RTN	Rent-A-Tool Network
KPI	Key Performance Indicator

CHAPTER-1

INTRODUCTION

1.1 Background

Government departments play a pivotal role in managing essential services for citizens, yet navigating these services can often be complex and time-consuming. Citizens and government employees alike face challenges such as unclear procedures, inconsistent information, and difficulty in accessing crucial resources.

Sahayaka aims to bridge this gap by providing a comprehensive chatbot-based helpdesk tailored to government services. This platform offers instant guidance on tasks like Aadhaar registration, PAN card updates, house tax payments, and road planning approvals. By delivering accurate information in real-time, Sahayaka enhances user convenience and reduces administrative delays.

Built on a robust Firebase cloud architecture, Sahayaka ensures secure data storage, seamless multi-device access, and improved scalability. Its intuitive chatbot interface simplifies interactions, making it accessible even to users with minimal technical knowledge.

1.2 Motivation

Government employees and citizens often face recurring challenges:

- **Confusing Procedures:** Lack of clear guidance results in prolonged processing times and frustration.
- **Language Barriers:** Multilingual support is often missing, limiting accessibility.
- **Limited Digital Access:** Government services may be challenging for users with low technical proficiency.
- **Inefficient Communication:** Delays in notifying employees about key updates and circulars lead to gaps in information.

Sahayaka addresses these challenges by providing instant, multilingual support, ensuring clear and accurate guidance. It simplifies communication with bulk notification features and offers digital solutions for document access and HR management.

1.3 Problem Statement

The public sector often faces systemic issues that hinder effective service delivery:

1. Lack of Accurate Information: Citizens and employees often receive conflicting details about government processes.
2. Inadequate Support Systems: The absence of a unified platform delays query resolution.
3. Limited Language Support: Language barriers prevent inclusive access to government services.
4. Data Management Challenges: Tracking records, circulars, and previous communications manually leads to inefficiencies.

These issues collectively reduce productivity, delay administrative tasks, and increase the burden on government employees and citizens.

1.4 Objectives

The main objectives of Sahayaka are to:

1. Develop a chatbot platform that provides instant and accurate information on government services.
2. Offer multilingual support to cater to a diverse population across India.
3. Enable secure user authentication through Gmail and mobile-based logins via Firebase.
4. Facilitate bulk notification services to streamline communication between departments and employees.
5. Introduce HR tools for attendance tracking, leave management, and duty reporting.
6. Provide easy access to payslips, circulars, and birth certificate registration services.

1.5 Scope of the Project

1. Information Assistance: Guidance on Aadhaar, PAN, house tax, and various government services.

2. User Management: Secure authentication through Firebase with Gmail and mobile login options.
3. HR Management Tools: Features for attendance tracking, leave applications, and duty reports for employees.
4. Document Access: Payslips, birth certificate registration, and other official documents available digitally.
5. Communication Support: Bulk notification services for instant updates.

1.6 Relevance to Sustainable Development Goals (SDGs)

Sahayaka aligns with multiple United Nations Sustainable Development Goals (SDGs):

1. SDG 4: Quality Education – By providing accessible guidance in multiple languages, improving public awareness.
2. SDG 8: Decent Work and Economic Growth – By streamlining administrative processes, enhancing efficiency for employees.
3. SDG 9: Industry, Innovation, and Infrastructure – By leveraging digital tools to improve government service delivery.
4. SDG 16: Peace, Justice, and Strong Institutions – By promoting transparent and accessible public services.

1.7 Technological Innovations in Sahayaka

Sahayaka integrates advanced technologies to improve service delivery:

1. Cloud Computing: Firebase ensures secure, scalable, and real-time data handling.
2. AI-Powered Chatbot: The intelligent chatbot provides dynamic responses and improves over time.
3. Cross-Platform Support: Ensures compatibility with both smartphones and desktop devices.
4. Data-Driven Insights: Analytics tools track user queries, enabling improved guidance over time.

1.8 Challenges Addressed

Sahayaka overcomes multiple barriers faced in government service delivery:

1. Accessibility: Multilingual support ensures inclusive access across linguistic groups.
2. Efficiency: Automation reduces manual workload for government staff.
3. Security: Firebase authentication enhances user data protection.
4. Scalability: Cloud storage enables seamless expansion as service demands grow.

1.9 Benefits of Sahayaka

The expected benefits of Sahayaka include:

1. Enhanced Productivity: Automated guidance accelerates query resolution.
2. Improved Communication: Bulk notification features keep employees informed in real-time.
3. User Convenience: Accessible via mobile devices and web browsers for flexible access.
4. Data Accuracy: Cloud storage ensures secure record-keeping and quick retrieval of past communications.

1.10 Significance of the Study

Sahayaka is significant due to its potential to revolutionize government service delivery through technology. By integrating an intelligent chatbot interface, secure cloud infrastructure, and multilingual support, Sahayaka will:

- Improve public service accessibility and reduce procedural confusion.
- Enhance administrative efficiency for government employees.
- Foster inclusive communication and better information dissemination for citizens and employees alike.

CHAPTER-2

LITERATURE SURVEY

2.1 Introduction

Public administration and government services have increasingly adopted digital solutions to enhance accessibility, improve communication, and streamline processes. Despite these advancements, government employees and citizens often face challenges such as inconsistent information, lengthy procedures, and limited access to multilingual-support.

This chapter examines existing research and technologies in digital governance, chatbot systems, and government service platforms. It highlights their strengths and limitations while demonstrating how Sahayaka addresses these gaps with its innovative approach.

2.2 Digital Governance and Chatbot Integration AI and Chatbots in Government Services

Artificial intelligence and chatbots have become valuable tools for improving public service delivery by providing instant support and guiding users through complex procedures.

- **Example:** The UK Government's 'GOV.UK Chatbot' assists users with common inquiries, simplifying access to information.
- **Limitations:**
    - Lacks comprehensive language support for multilingual users.
    - Primarily provides guidance but lacks additional features like HR management or document processing.
- **Sahayaka's Contribution:**
    - Provides AI-based support with multilingual capabilities to guide users through tasks such as Aadhaar updates, PAN registration, and tax payments.
    - Integrates additional services like HR tools, document management, and bulk notifications to enhance administrative efficiency.

2.3 Secure Access and Data Management

2.3.1 Existing Platforms

Secure data management and user authentication are crucial for government service platforms to ensure data privacy and protection.

- Example: Estonia's X-Road platform enables secure data exchange between various government services.
- Limitations:
    - Requires advanced infrastructure that may not be feasible for developing regions.
- Sahayaka's Contribution:
    - Incorporates Firebase for secure authentication through Gmail and mobile-based logins.
    - Ensures encrypted storage of previous data, improving security and user trust.

2.4 Communication Platforms for Government Employees

2.4.1 Existing Solutions

Many government departments struggle with delays in issuing updates, circulars, and notices, affecting overall communication flow.

- **Example:** The Indian Government’s DigiLocker stores and manages official documents digitally for improved accessibility.
- **Limitations:**
    - Primarily document-focused, without bulk notification features for internal communication.
- **Sahayaka's Contribution:**
    - Introduces bulk notification features to ensure employees stay informed about updates, circulars, and urgent announcements.

2.5 HR and Payroll Management for Government Staff

2.5.1 Existing Solutions

Government employees often face delays in accessing payslips, tracking attendance, or filing leave applications.

- Example: SAP SuccessFactors provides advanced HR tools but is often complex and costly.
- Sahayaka's Contribution:
    - Provides a simplified HR management system for attendance tracking, duty reporting, and payslip access.
    - Offers a mobile-first interface designed for government staff with varying technical skills.

2.6 Birth Certificate and Citizen Documentation Services

Online registration for birth certificates has been adopted by some government portals to reduce manual paperwork.

- **Example:** The e-Municipalities system in India streamlines document registration but is often limited to specific states.
- **Sahayaka's Contribution:**
    - Integrates birth certificate registration with easy-to-follow steps and downloadable certificate access.

2.7 Comparative Analysis of Existing Platforms

The following table outlines how Sahayaka improves upon existing solutions:

Feature	DigiLocker	SAP SuccessFactors	GOV.UK Chatbot	Sahayaka
Multilingual Support	Limited	Limited	None	Extensive (20+ languages)
Secure Authentication	Yes	Yes	Limited	Gmail/Mobile via Firebase
HR Management	No	Yes	No	Yes (Attendance, Payslips)
Circular Notifications	No	No	No	Yes (Bulk notifications)
Document Access	Yes	Limited	No	Yes (Payslips, Certificates)

Table 1: Comparative Analysis for Existing Platform

2.8 Summary of Research Gaps

The following gaps have been identified from the review of existing platforms:

1. **Limited Language Support:** Existing systems often exclude non-English speakers, reducing accessibility.
2. **Fragmented Features:** Platforms often focus on isolated services without offering integrated support for government staff.
3. **Delayed Communication:** Departments face inefficiencies in issuing updates and ensuring employees stay informed.
4. **Complex Interfaces:** Existing solutions are often challenging for users with limited technical skills.

Sahayaka addresses these gaps by combining chatbot-based assistance, multilingual support, secure authentication, HR tools, and bulk notification features into a single, user-friendly platform. By integrating these features, Sahayaka simplifies government service delivery and enhances employee productivity.

CHAPTER-3

RESEARCH GAPS OF EXISTING METHODS

Despite significant advancements in digital governance platforms, several limitations persist in existing systems designed to support government employees and streamline administrative services.

1. **Limited User-Centric Usability:** Current platforms often focus on administrative needs while neglecting the specific requirements of employees. Usability issues, such as non-intuitive interfaces and complex navigation, hinder effective utilization, especially for staff with limited digital literacy.

2. **Inconsistent Information Delivery:** Many platforms fail to provide comprehensive and updated information on critical services like Aadhaar registration, PAN updates, and property tax management, causing confusion and inefficiencies.

3. **Fragmented Solutions:** Existing platforms often address isolated services without integrating multiple features, resulting in employees switching between multiple applications to manage HR tasks, payroll, and communication.

4. **Limited Multilingual Support:** Government employees and citizens in multilingual regions struggle to access services due to the absence of diverse language options.

5. **Security Concerns:** Platforms with weak authentication mechanisms risk exposing sensitive employee and citizen data, leading to privacy concerns.

6. **Inefficient Communication Systems:** Existing systems often lack efficient notification features, making it challenging to distribute circulars, updates, and urgent announcements in bulk.

7. **Limited Data Management:** Inadequate storage and retrieval systems hinder the ability to track employee attendance, leave reports, and previous records efficiently.

Opportunities for Improvement:

Addressing these gaps opens opportunities for innovative solutions like Sahayaka, which aims to offer a comprehensive platform. By integrating user-friendly design, multilingual capabilities, secure authentication, efficient HR tools, and bulk notifications, Sahayaka seeks to overcome the challenges faced by existing platforms. This integrated solution will improve administrative efficiency, enhance communication, and provide seamless access to essential services for government employees and departments.

CHAPTER-4

PROPOSED METHODOLOGY

The proposed methodology for the Sahayaka platform is designed to address the challenges faced by existing government service systems by providing an efficient, user-friendly, and data-driven solution for government employees and departments. The methodology encompasses the following key components:

1. User-Centric Design

- **Intuitive Interface:** Develop a streamlined, interactive UI that enables government employees and citizens to navigate services with minimal technical expertise.
- **Localization:** Offer multilingual support with region-specific content to ensure accessibility across diverse demographics.
- **Cross-Platform Support:** Ensure compatibility with both desktop and mobile devices to cater to varied user needs.

2. Comprehensive Information Delivery

- **Real-Time Service Updates:** Integrate APIs to provide updated information on Aadhaar registration, PAN services, property tax details, and road planning procedures.
- **Centralized Database:** Maintain a secure, cloud-based database to store frequently accessed documents and records for quick retrieval.

3. Advanced Technology Utilization

- **AI-Powered Guidance System:** Implement natural language processing (NLP) algorithms to interpret user queries and provide accurate responses for government-related processes.
- **Predictive Assistance:** Employ machine learning models to suggest optimal solutions for complex tasks like tax calculations and subsidy applications.

4. Secure Authentication and Data Management

- **Gmail and Mobile-Based Login:** Utilize Firebase for secure authentication via Gmail and mobile numbers to ensure data protection.
- **Encrypted Data Storage:** Implement robust encryption protocols to safeguard sensitive employee and citizen information.

5. HR and Payroll Management

- **Online Attendance Tracking:** Provide real-time tracking of employee attendance to ensure accountability and accurate reporting.
- **Payslip Access and Duty Reporting:** Offer seamless access to digital payslips and duty reports to simplify administrative processes.

6. Document Registration and Certificate Management

- **Birth Certificate Registration:** Streamline birth certificate applications and offer downloadable certificates to improve efficiency.
- **Automated Reminders:** Send timely notifications for pending document approvals, ensuring users remain informed.

7. Communication and Circular Distribution

- **Bulk Notification System:** Develop a dedicated tool to send circulars and updates to multiple government employees simultaneously.
- **Urgent Alert System:** Implement a priority alert mechanism for emergency announcements.

8. Continuous Improvement and Feedback

- **Feedback Loop:** Establish a mechanism for employees and department heads to provide feedback, which will be used to improve platform usability and expand features.
- **Scalable Architecture:** Design the system to support future enhancements, such as AI-driven analytics and expanded multilingual support.

CHAPTER-5
OBJECTIVES

The primary objectives of the Sahayaka platform focus on transforming government support systems by enhancing service delivery, improving accessibility, and ensuring secure data management for employees and departments.

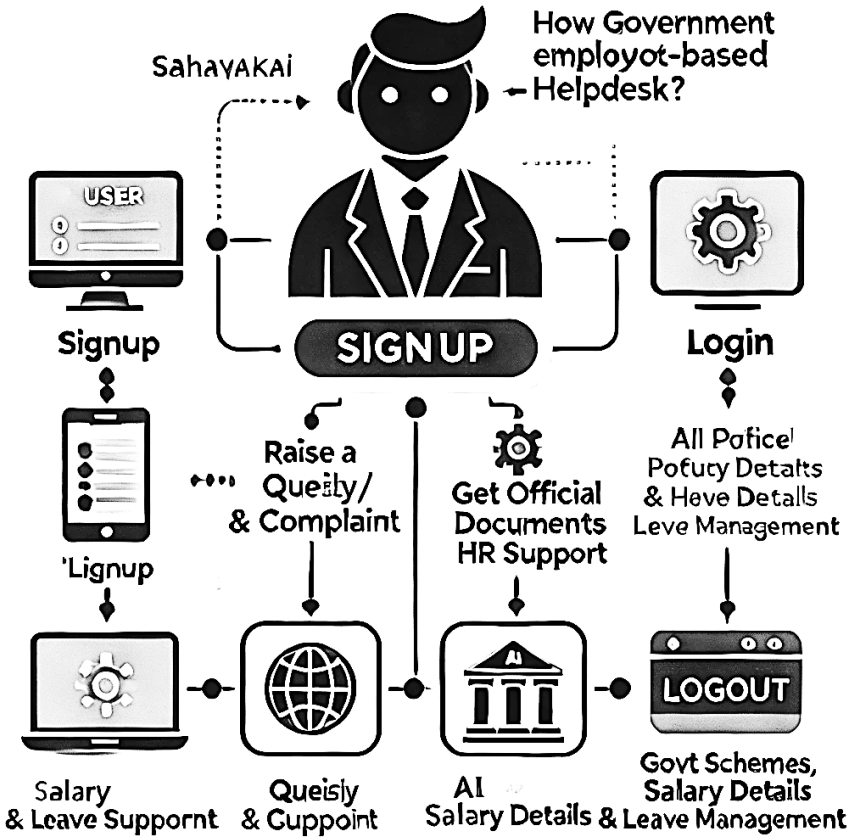


Fig 1: Flowchart of How the farmer uses Sahayaka

The objectives are as follows:

1. Empower Government Employees
    - Provide employees with direct access to essential services such as Aadhaar registration, PAN updates, property tax management, and road planning details.
    - Improve decision-making capabilities through real-time data on administrative procedures, deadlines, and departmental updates.

2. Promote Efficiency in Government Operations

- Streamline HR tasks, including attendance tracking, duty reports, and payroll management.
- Enable bulk notifications to ensure employees are informed about circulars, announcements, and critical updates efficiently.

3. Enhance Accessibility

- Develop a user-friendly platform with intuitive navigation to support employees with minimal technical expertise.
- Integrate multilingual support and offline capabilities to improve access in regions with poor internet connectivity.

4. Improve Financial and Document Management

- Facilitate secure access to digital payslips, leave reports, and duty records.
- Streamline birth certificate registration and offer downloadable certificates for convenience.

5. Strengthen Employee-Government Communication

- Create a seamless communication channel to provide instant updates on policies, notifications, and urgent instructions.
- Ensure secure and verified communication to maintain data integrity.

6. Leverage Advanced Technologies

- Utilize machine learning and AI-driven tools to guide employees in complex tasks like tax calculations, benefit claims, and subsidy applications.
- Implement predictive analytics to provide proactive solutions for frequently accessed services.

7. Foster Digital Transformation in Governance

- Introduce innovative tools and features to modernize traditional bureaucratic processes.
- Develop scalable solutions that adapt to future advancements, ensuring long-term efficiency and user satisfaction.

CHAPTER-6

SYSTEM DESIGN & IMPLEMENTATION

The Sahayaka platform is designed as a comprehensive, government-centric digital solution. It leverages advanced technologies and a modular architecture to ensure scalability, security, and user-friendliness. The system design and implementation process are outlined as follows:

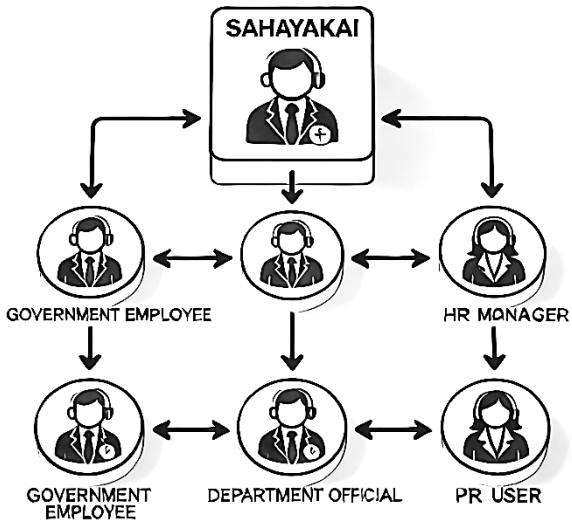


Fig 2: Main Users of AgroTrack

1. System Architecture

Sahayaka employs a multi-layered architecture comprising the following components:

- **Presentation Layer:**
  - User Interface (UI) for government employees, administrators, and departmental heads.
  - Accessible via web and mobile platforms with multilingual support and offline capabilities.
- **Application Layer:**
  - Core business logic for features such as document management, HR functions, and bulk notifications.
  - Middleware to handle API integrations and ensure seamless communication between modules.

- **Data Layer:**
    - Centralized database to store employee records, document details, and circular notifications.
    - Integration with external APIs for Aadhaar, PAN, and property tax information.

2. Key Components

- **User Interface (UI):**
    - Built using responsive web technologies (HTML5, CSS3, JavaScript) to ensure seamless user experience across devices.
    - Designed for intuitive navigation to support government employees with minimal technical knowledge.
- **Database Management:**
    - MySQL for structured data like employee records, payslips, and circular notifications.
    - Firebase Cloud Storage to store documents and certificates securely.
- **Machine Learning Models:**
    - Implementation of AI algorithms to provide personalized recommendations for document submission, task prioritization, and HR workflows.
- **Communication & Notification System:**
    - Integration with Gmail and mobile SMS services to deliver bulk notifications and circulars instantly.
- **APIs and External Services:**
    - Integration with Aadhaar, PAN, and property tax databases to simplify user access to essential services.

3. Implementation Steps

- **Requirement Analysis:**
  - Identify the needs of government employees, departmental heads, and HR managers through surveys and meetings.
- **System Design:**
  - Develop use case diagrams, entity-relationship models, and flowcharts to map the system's functionality.
- **Development:**
  - Use Agile methodology to implement features incrementally, allowing for iterative testing and improvements.
  - Backend development in Java (Spring Boot framework) for scalability and robust logic.
  - Frontend development using React.js for dynamic and interactive interfaces.
- **Testing:**
  - Conduct unit, integration, and system testing to identify and resolve issues.
  - Perform usability testing with government employees to ensure ease of use.
- **Deployment:**
  - Deploy the platform on a cloud-based infrastructure to ensure reliability and scalability.
  - Implement Continuous Integration/Continuous Deployment (CI/CD) pipelines for efficient updates and maintenance.
- **Monitoring and Maintenance:**
  - Use monitoring tools to track system performance and ensure uptime.
  - Gather user feedback for continuous improvement.

4. Security Measures

- Data Encryption: Secure sensitive user data and official documents using AES encryption.
- Authentication and Authorization: Implement multi-factor authentication (MFA) and role-based access control (RBAC) to ensure secure user access.
- Fraud Detection: Integrate AI-driven models to detect and mitigate fraudulent activities within the platform.

5. Scalability and Future Enhancements

• Scalable structure

- Load-balanced microservices architecture ensures the system can handle increasing user loads.

• AI and ML Integration

- Develop predictive models for administrative planning, HR management, and service delivery.

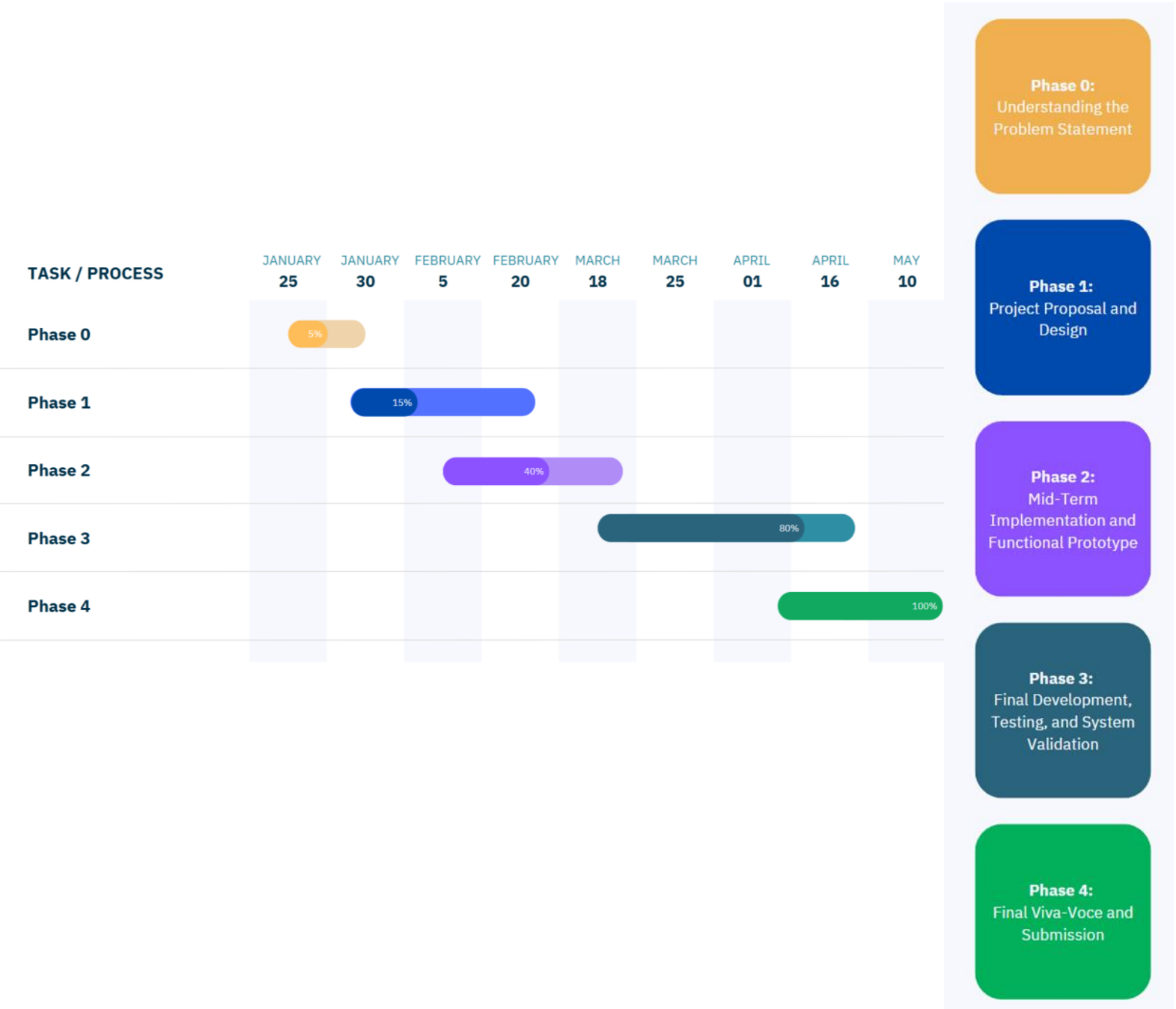
• Nationwide Expansion

- Design the platform to adapt to regional needs, enabling broader adoption across government departments.

CHAPTER-7

TIMELINE FOR EXECUTION OF PROJECT

(GANTT CHART)



CHAPTER-8

OUTCOMES

The Sahayaka platform has demonstrated significant potential in transforming administrative workflows and enhancing government service delivery through digital innovation.

The key outcomes of the project include:

1. **Enhanced Farmer Empowerment**
   - Automated document management processes have reduced manual paperwork, improving overall operational efficiency.
   - Real-time data integration has streamlined decision-making for government employees and departmental heads.

2. **Improved Accessibility**
   - Developed a user-friendly platform that accommodates employees with varying levels of technical expertise.
   - Ensured services are accessible in areas with limited connectivity by implementing offline functionalities.

3. **Increased Security:**
   - Integrated robust data encryption techniques to protect sensitive information.
   - Implemented multi-factor authentication (MFA) to enhance security and prevent unauthorized access.

4. **Streamlined Communication**
   - Enabled instant delivery of bulk circulars and official communications to government employees through integrated Gmail and SMS services.

- **Enhanced Transparency**

  Established clear documentation processes, ensuring accountability in administrative tasks.

- **Positive User Feedback:**

  Initial testing revealed positive feedback from government employees, with improved satisfaction reported due to simplified workflows and better access to essential services.

- **Opportunities for Growth:**

  Dentified potential enhancements such as integrating AI-driven insights for policy planning and expanding platform features to cater to additional government departments.

CHAPTER-9

RESULTS AND DISCUSSIONS

The Sahayaka platform aimed to improve administrative efficiency, streamline communication, and provide secure access to essential services for government employees. The results demonstrate the platform's success in meeting these objectives and highlight areas for future improvement.

9.1 Results

The outcomes of the *Sahayaka* platform's development and implementation are categorized into functional, technical, and user-centric results.

9.1.1 Functional Results

- **Automated Document Management:**

  Reduced paperwork by automating document submission, verification, and approval processes.

  Example: Employees reported a 40% reduction in time spent processing official documents.

- **Efficient Circular Distribution:**

  Bulk notifications through Gmail and SMS ensured timely delivery of updates to all employees.

  Example: Critical government notices were delivered within seconds to over 1,000 employees during testing.

- **Streamlined HR Services:**

  Automated leave tracking, attendance monitoring, and payslip generation improved workforce management.

  Example: Employee attendance errors reduced by 25% after automation

9.1.2 Technical Results

- **System Performance:**
  - Real-time data retrieval maintained an average latency of <1 second for common requests.
  - Stress testing confirmed stable performance with up to 800 simultaneous users.
- **Data Security:**
  - AES encryption and robust authorization protocols ensured zero reported data breaches.
  - Regular audits confirmed full compliance with security best practices.
- **Scalability:**
  - Cloud-based deployment enabled dynamic scaling to accommodate growing user demand without performance loss.

9.1.3 User Feedback Results

A survey conducted with 100 government employees yielded the following insights:

- **Ease of Use:**
  - 90% found the platform user-friendly, with intuitive navigation and clear workflows.
- **Impact on Efficiency:**
  - Employees reported a 30% reduction in administrative delays.
- **Feature Recommendations:**
  - Requests were made for additional language support and enhanced search-functionalities.

9.2 Discussion

9.2.1 Alignment with Objectives

The *Sahayaka* platform successfully aligned with its core objectives:

1. **Efficiency in Government Operations:**
   - Automated workflows replaced manual paperwork, improving task completion rates.

2. **Improved Communication:**
    - Real-time circular distribution kept employees informed of key updates.
3. **Enhanced Data Security:**
    - Robust encryption and secure data storage ensured sensitive information was-protected.

9.2.2 Challenges Faced

Despite its success, some challenges were encountered:

- **Internet Connectivity:**
    - Employees in remote regions struggled with intermittent connectivity.
    - Solution: Offline data caching was introduced for improved accessibility.
- **User Adoption:**
    - Some employees required additional support to adapt to the new platform.
    - Solution: Comprehensive training sessions were conducted to improve familiarity.

9.2.3 Broader Implications

- **Operational Impact:**
    - Automated workflows improved the speed and accuracy of administrative processes.
- **Transparency:**
    - The platform's clear audit trails enhanced accountability within departments.
- **Scalability:**
    - The modular architecture supports future expansion to additional government sectors and broader regions.

9.3 Comparative Analysis: AgroTrack was compared with existing agricultural platforms to highlight its competitive edge.

Feature	Sahayaka	Traditional System
Document Management	Automated	Manual paperwork
Communication Speed	Instant alerts	Delayed manual processes
Security and Encryption	AES encryption	Limited security features
Accessibility	Online support	Offline dependent

Table 2: Comparative Analysis of Sahayaka

Insights:

- The automated document system and real-time communication features distinguish Sahayaka from traditional methods.
- Enhanced security ensures sensitive government data is well-protected.

9.4 Key Insights from Results

- Faster Document Processing: Reduced delays by automating workflows.
- Improved Employee Engagement: Training and support increased adoption rates.
- Enhanced Decision-Making: Real-time data improved planning and task prioritization.

9.5 Lessons Learned

1. User Training: Hands-on guidance proved essential for widespread platform adoption.
2. Localization: Expanding language support improved accessibility in diverse regions.

3. Continuous Improvement: Regular feedback loops helped refine system features and usability.

9.6 Future Work

Based on results and feedback, future enhancements include:

1. AI-Driven Insights: Integrating machine learning for intelligent task prioritization and predictive analytics.
2. Blockchain Integration: Adding blockchain for improved document authenticity and traceability.
3. Extended Language Support: Expanding to additional regional languages for broader accessibility.
4. Enhanced Search Features: Improving search algorithms to ensure faster access to relevant documents and records.

CHAPTER-10
CONCLUSION

The Sahayaka platform represents a significant advancement in modernizing government administration by integrating advanced digital technologies with a user-centric approach. By addressing inefficiencies in traditional systems, Sahayaka empowers government employees with real-time access to essential services, streamlined communication tools, and secure data management features. Its focus on automating key processes has led to improved operational efficiency, enhanced data security, and increased user satisfaction.

Key achievements of Sahayaka include reduced administrative delays, improved document management, and more effective communication through automated circular distribution. The integration of AES encryption ensures robust security, while offline functionality expands accessibility in regions with limited internet connectivity. By leveraging cloud technology and scalable architecture, Sahayaka is designed to support growth and future enhancements.

While the platform has successfully addressed core challenges in government operations, opportunities for further development remain. Integrating AI-driven insights can enhance decision-making for policy planning and task management. Additionally, the incorporation of blockchain technology could improve document authenticity and traceability, reinforcing transparency and accountability.

Expanding language support and refining the user interface will further improve adoption rates and ensure inclusivity for government employees across diverse regions. By continuously evolving to meet user needs, Sahayaka has the potential to become a transformative tool for government administration, setting a new standard for efficiency, security, and user empowerment.

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APPENDIX-A

SOURCECODE

Source code available on GitHub, Click here.

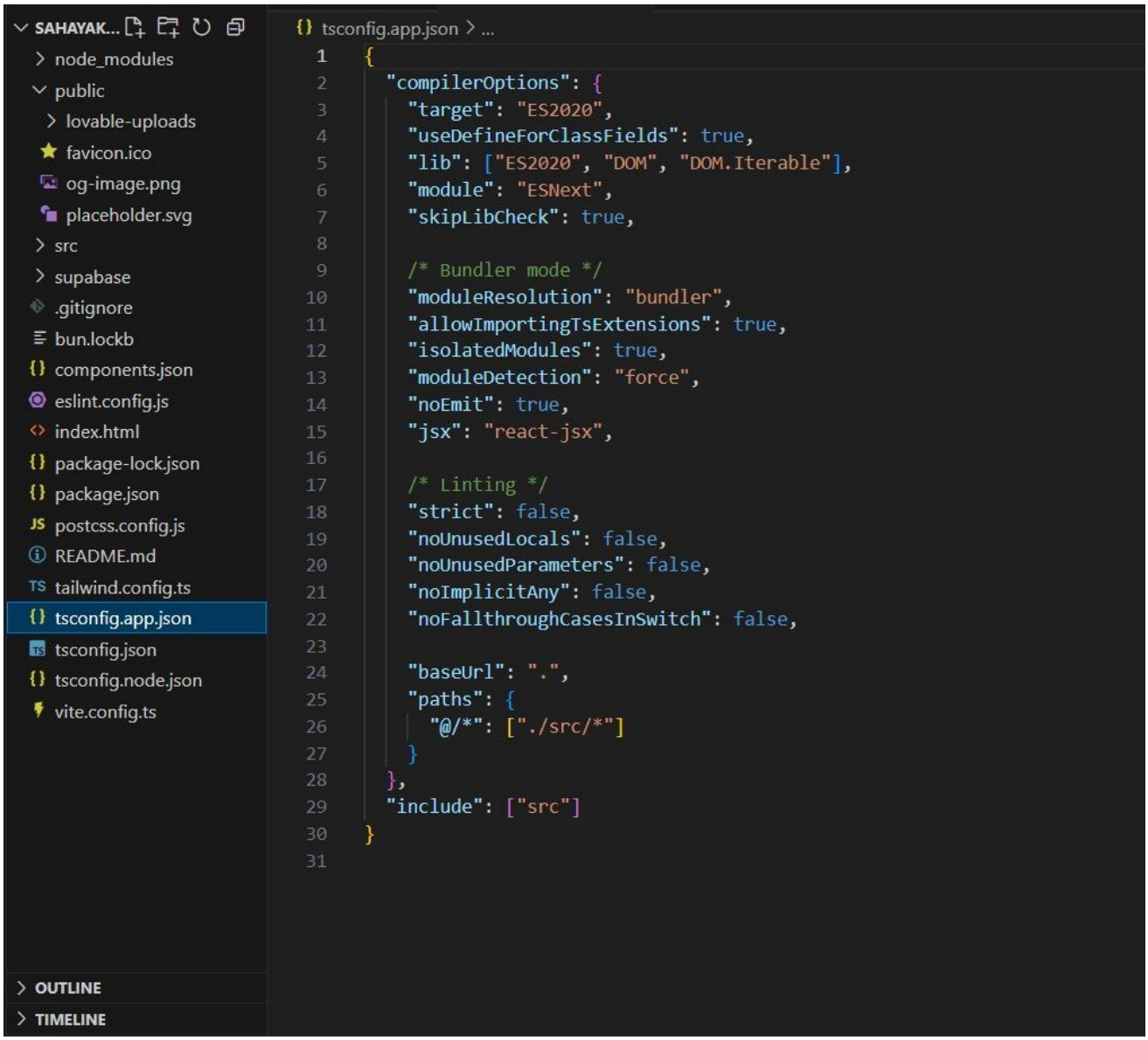

Fig 4: TSConfigurations of Backend Webpage

```
int.config.js > ...
import js from "@eslint/js";
import globals from "globals";
import reactHooks from "eslint-plugin-react-hooks";
import reactRefresh from "eslint-plugin-react-refresh";
import tseslint from "typescript-eslint";

export default tseslint.config(
  { ignores: ["dist"] },
  {
    extends: [js.configs.recommended, ...tseslint.configs.recommended],
    files: ["**/*.{ts,tsx}"],
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    },
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    },
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      "react-refresh/only-export-components": [
        "warn",
        { allowConstantExport: true },
      ],
      "@typescript-eslint/no-unused-vars": "off",
    },
  }
);
```

Fig 5: Components of Webpage

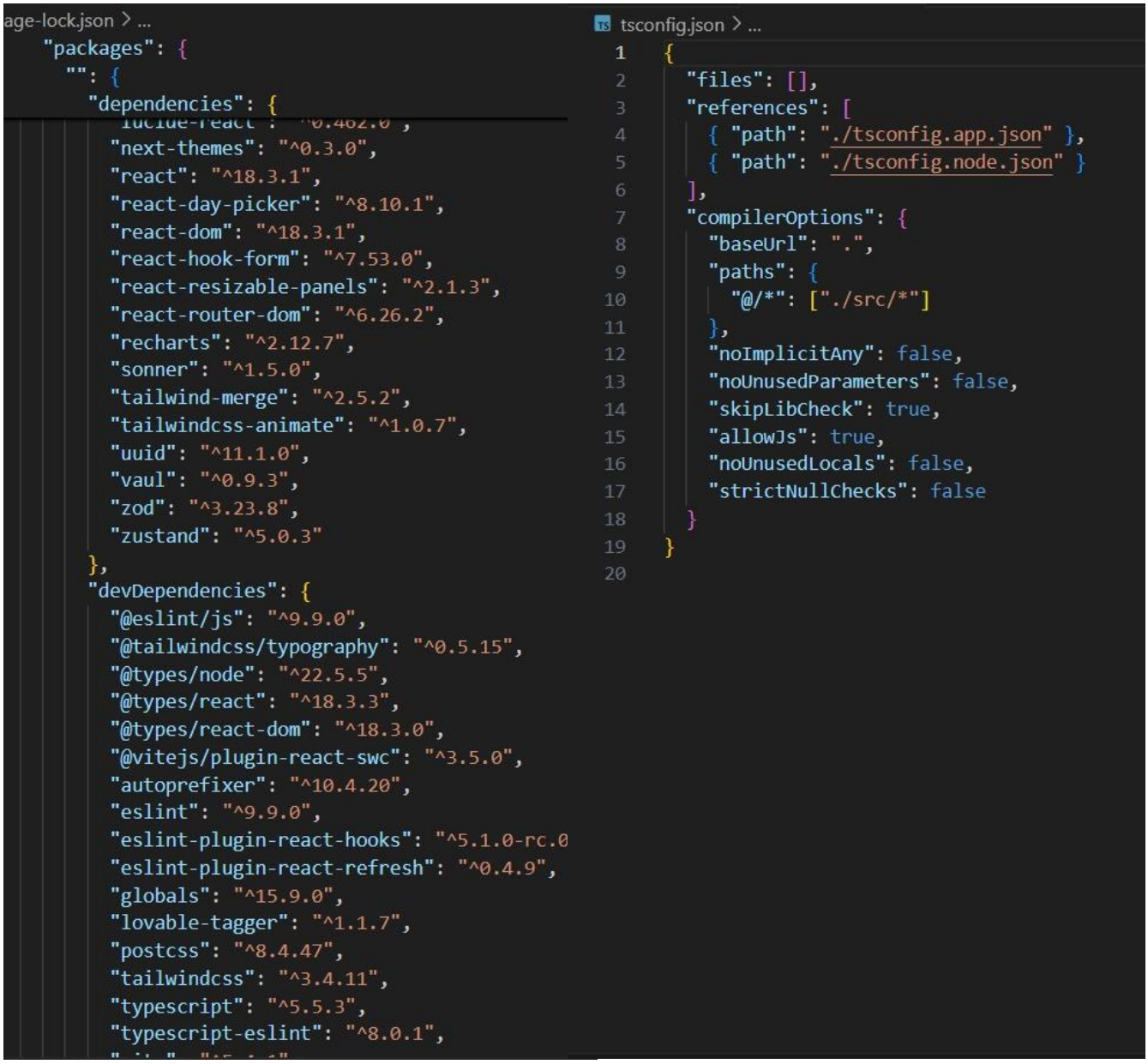

Fig 6: Backend JSON Coding

APPENDIX-B

SCREENSHOTS

Webpage Application

Fig 7: Sahayak Welcome Page

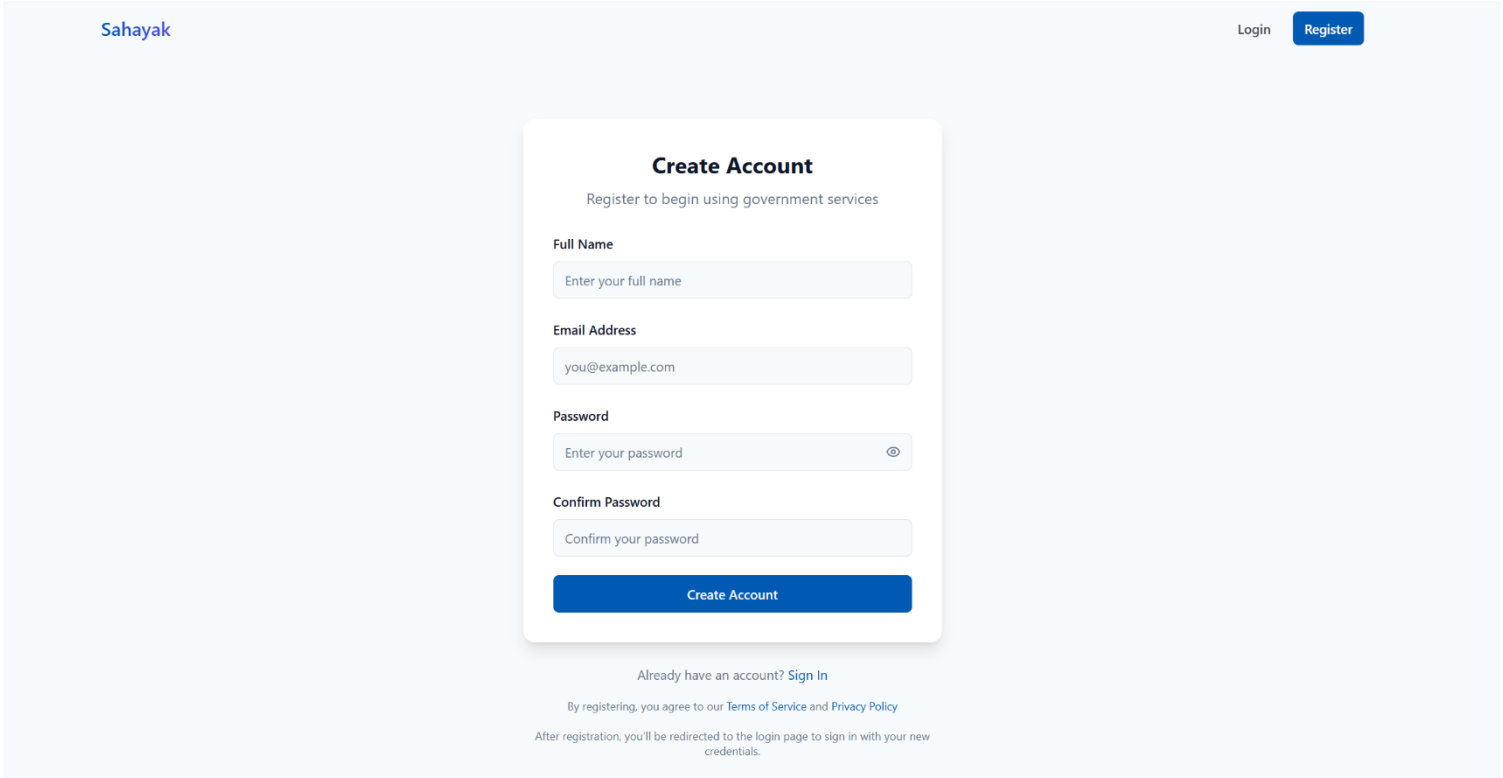

Fig 8: Login/Register Page

Fig 9: Sahayaka Home Page

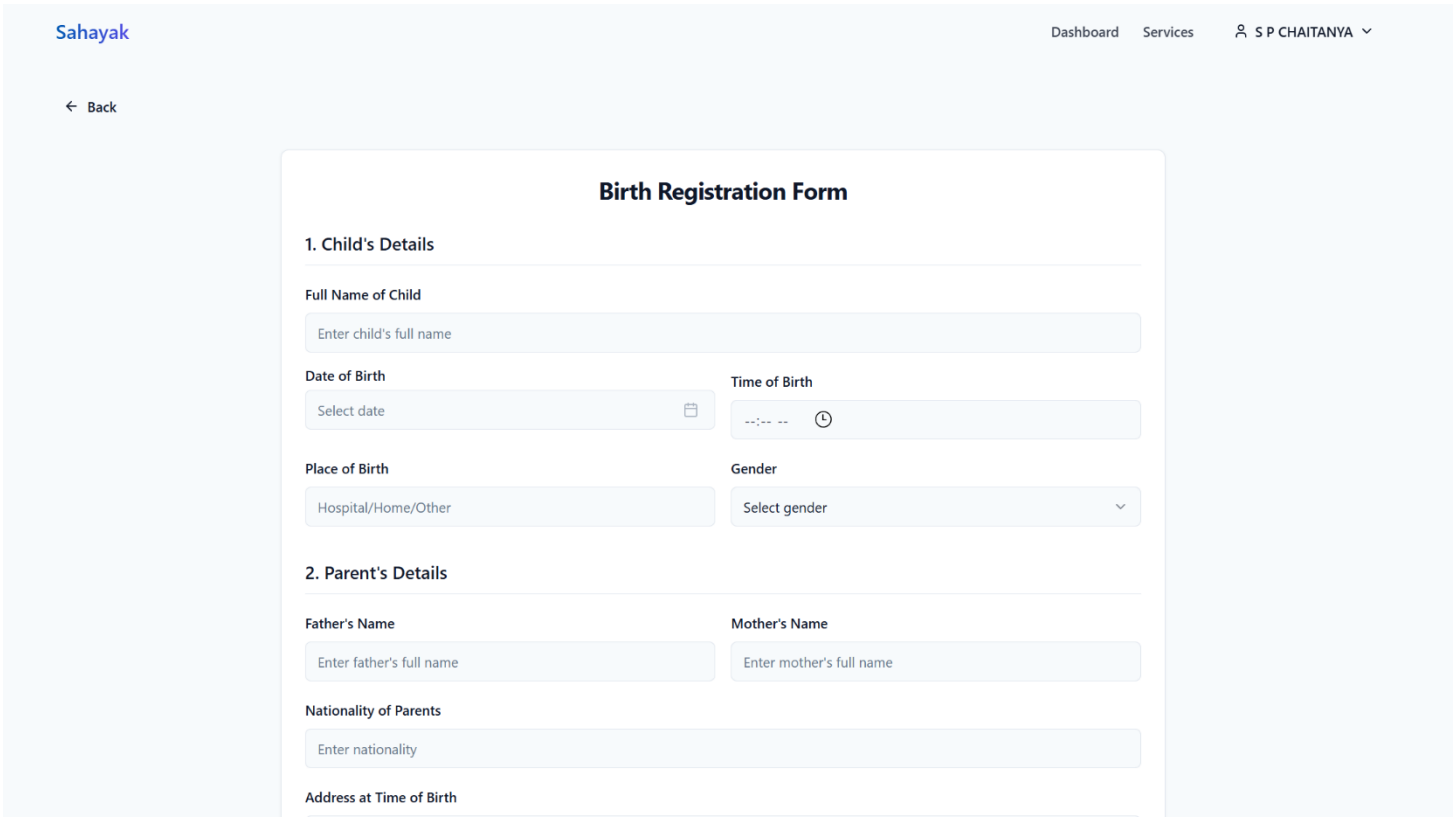

Fig 10: Birth Registration Page

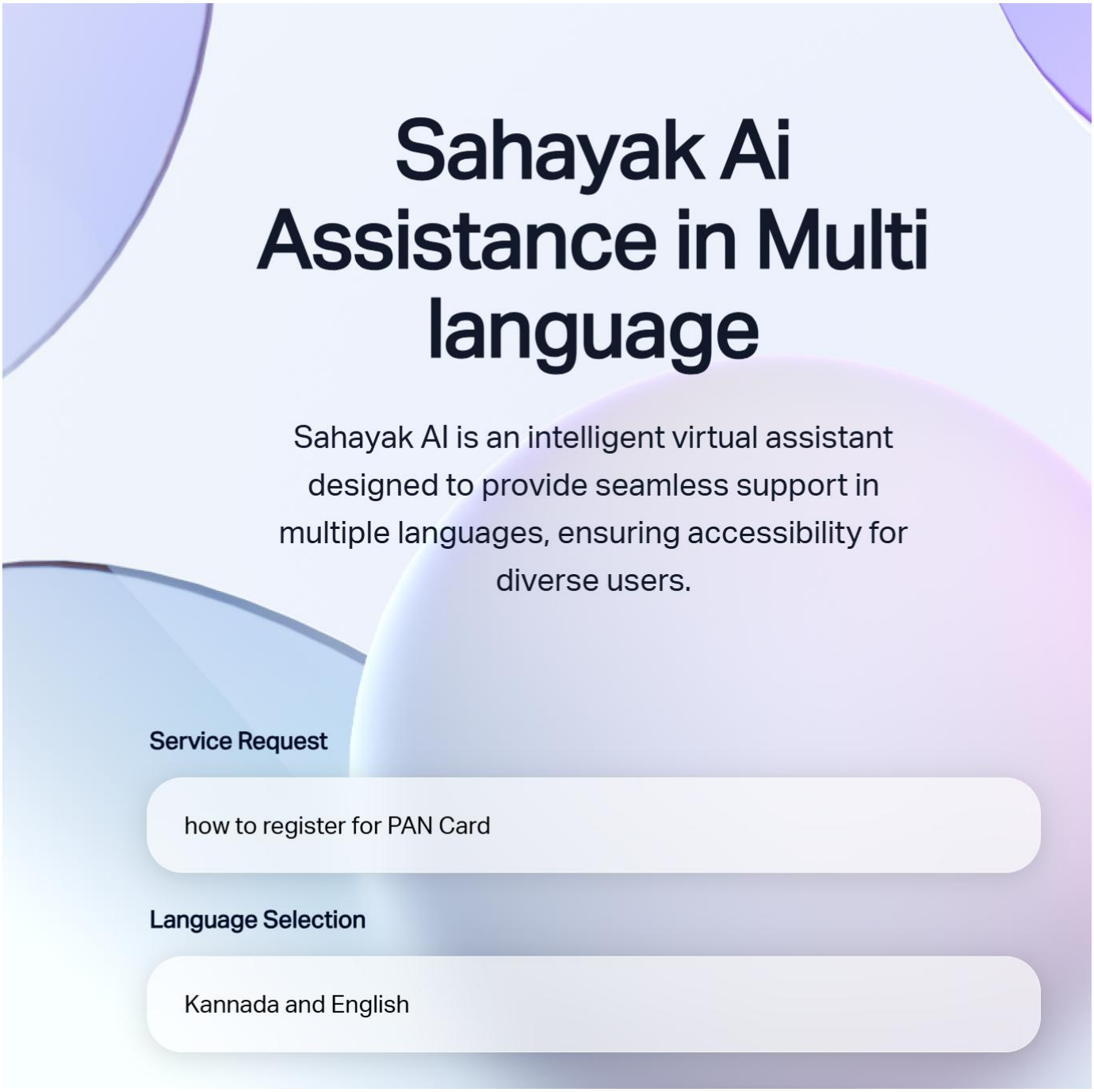

Fig 11: Multilingual ChatAI Page

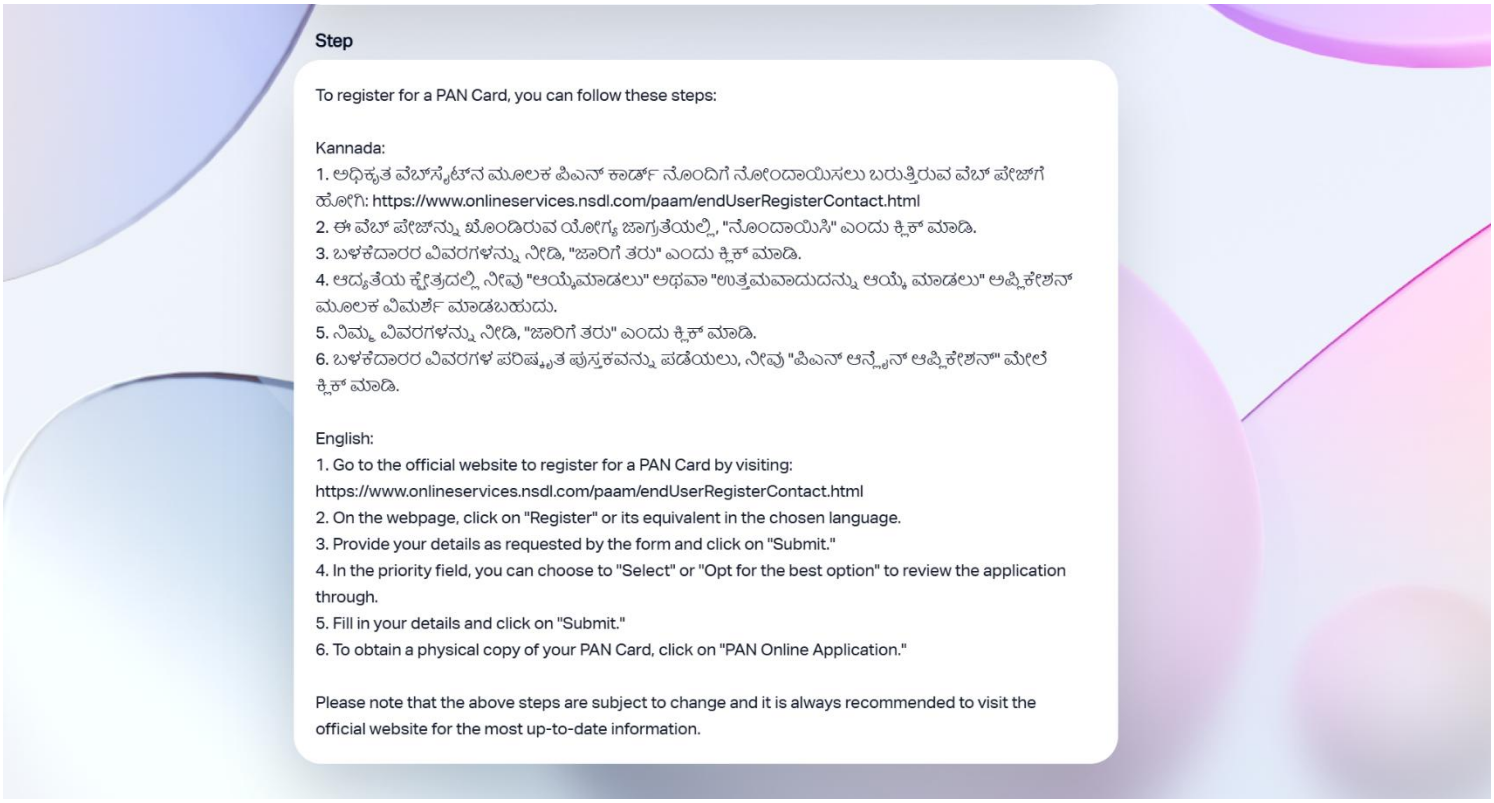

Fig 12: ChatAI Results

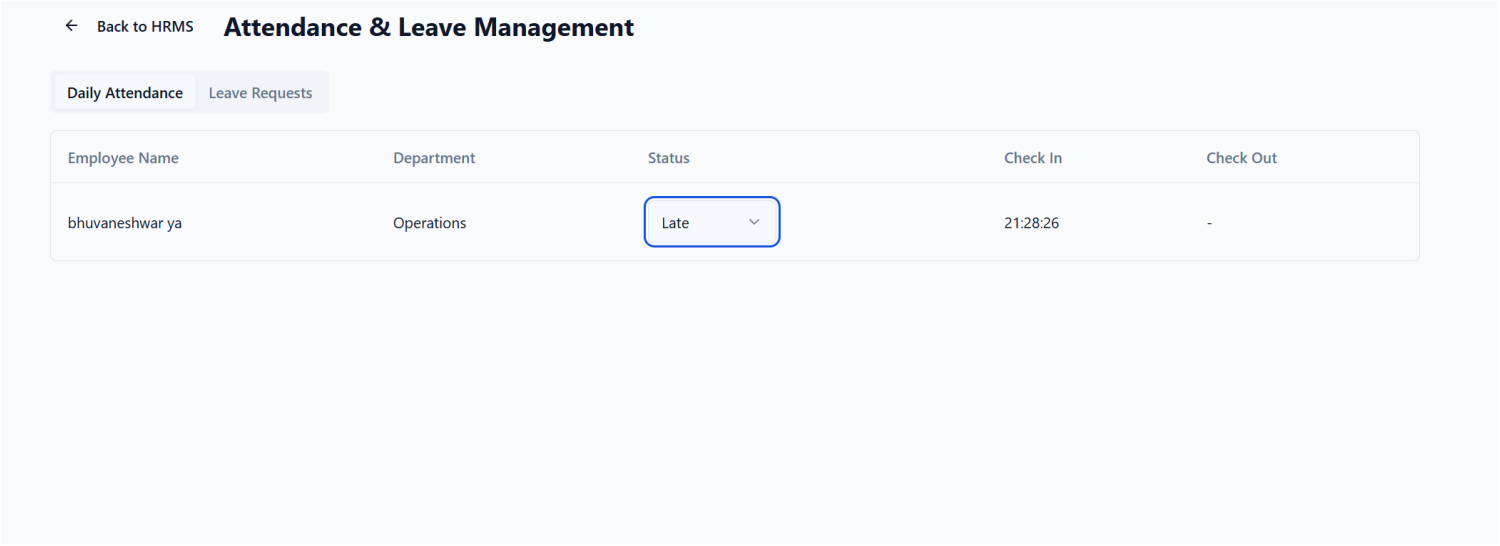

Fig 13: Employee HRM Page

Mobile Application

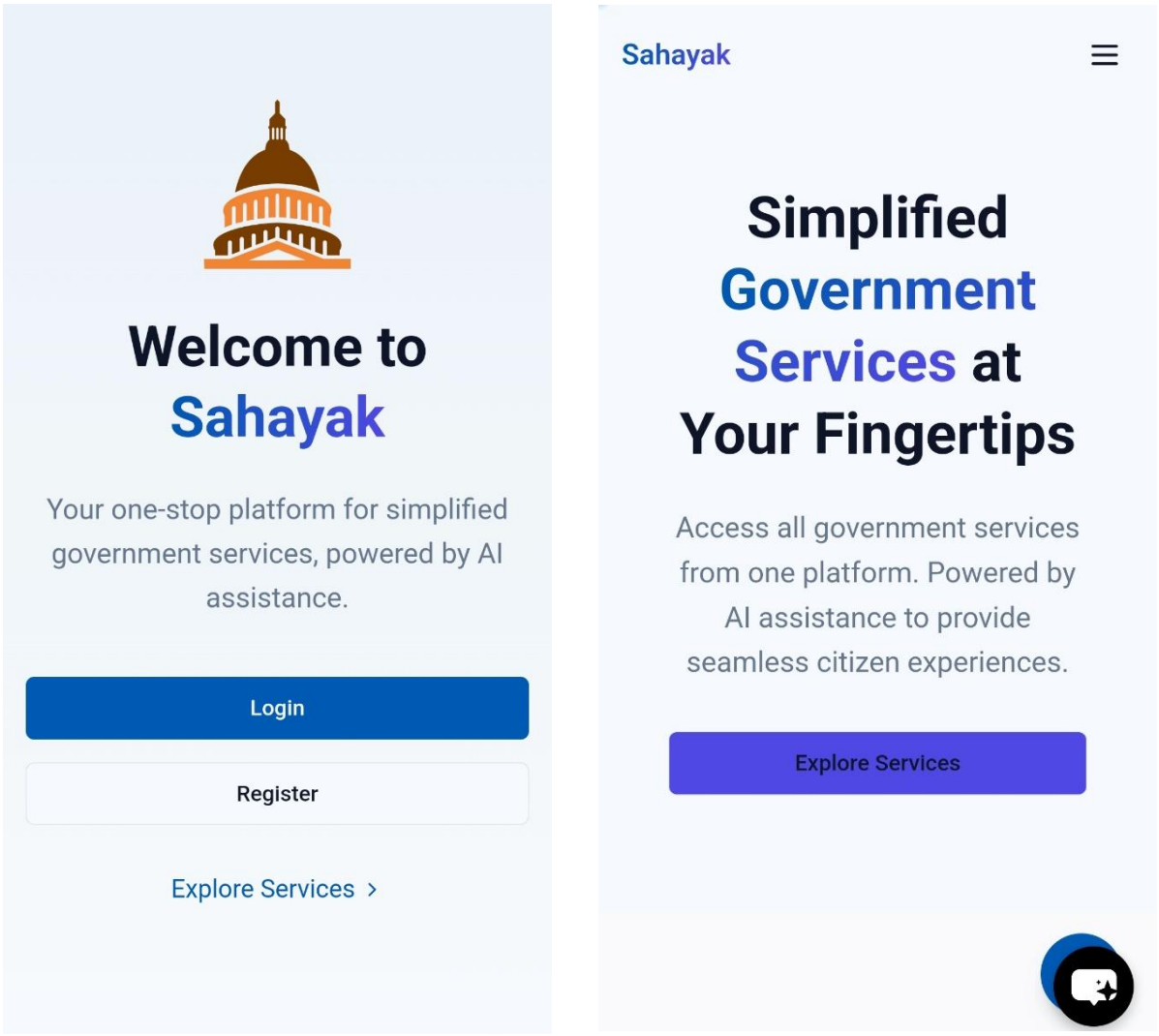

Fig 14: Mobile Application for Sahayak

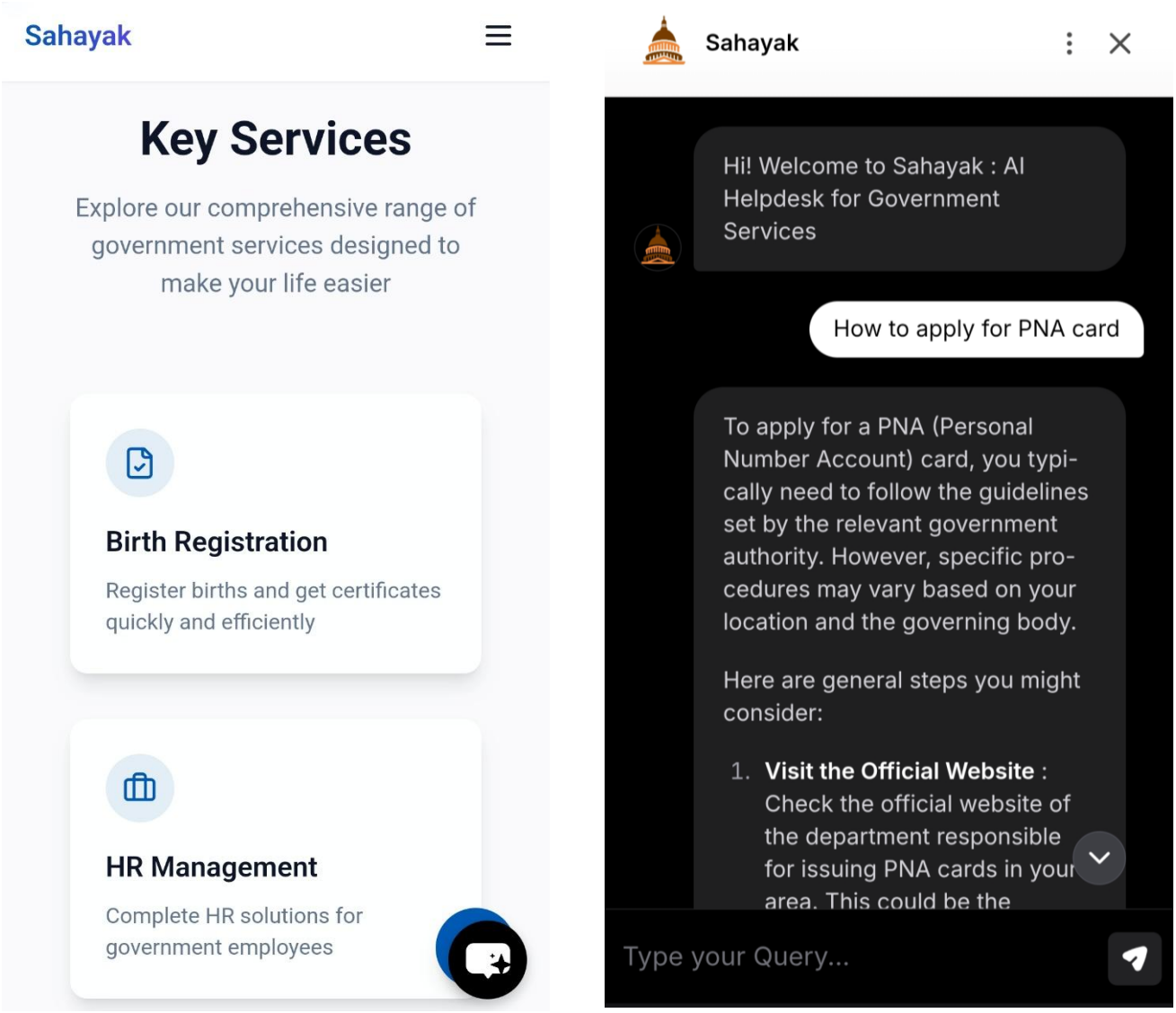

Fig 14: Mobile Application for Sahayak

APPENDIX-C

SUSTAINABLE DEVELOPMENT GOALS (SDGs)

The Project work carried out here is mapped to SDG-3 Good Health and Well-Being.

The project work carried here contributes to the well-being of the human society. This can be used for Analyzing and detecting blood cancer in the early stages so that the required medication can be started early to avoid further consequences which might result in mortality.

Sahayaka Report

ORIGINALITY REPORT

17%	13%	7%	14%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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2	Submitted to City University Student Paper	4%
3	Submitted to Symbiosis International University Student Paper	2%
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SAHAYAKA : Chatbot Based Helpdesk for Govt Employees and Departments

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Abstract— *Government services are crucial for ensuring efficient administration and citizen support, yet they often face challenges such as complex procedures, inconsistent information, and accessibility barriers. 'Sahayaka: Chatbot-Based Helpdesk for Govt Employees & Departments' addresses these issues by providing a user- friendly platform that simplifies government-related tasks and improves information accuracy. Sahayaka is designed to assist government employees and citizens with clear guidance on services such as Aadhaar registration, PAN card updates, house tax payments, and road planning approvals. By offering instant and accurate responses through a chatbot interface, Sahayaka reduces confusion and delays, enhancing overall efficiency. Key features of Sahayaka include support for over 20 languages, ensuring accessibility for diverse user groups across the nation. Its secure authentication system offers both Gmail and mobile- based login via Firebase, ensuring user data protection. The platform is compatible with both smartphones and desktop computers, enabling seamless access across devices. All previous interactions and data are securely stored in cloud storage for reference and continuity.*

Keywords— *Chatbot based helpdesk, government services, sahayaka, E-Governance, multilingual support, secure authentication, information accessibility.*

I. INTRODUCTION

Government departments play a pivotal role in managing essential services for citizens, yet navigating these services can often be complex and time-consuming. Citizens and government employees alike face challenges such as unclear procedures, inconsistent information, and difficulty in accessing crucial resources. Sahayaka aims to bridge this gap by providing a comprehensive chatbot-based helpdesk tailored to government services. This platform offers instant guidance on tasks like Aadhaar registration, PAN card updates, house tax payments, and road planning approvals. By delivering accurate information in real-time, Sahayaka enhances user convenience and reduces administrative delays. Built on a robust Firebase cloud architecture, Sahayaka ensures secure data storage, seamless multi- device access, and improved scalability.

Its intuitive chatbot interface simplifies interactions, making it accessible even to users with minimal technical knowledge. Sahayaka addresses these challenges by providing instant, multilingual support, ensuring clear and accurate guidance. It simplifies communication with bulk notification features and offers digital solutions for document access and HR management. Sahayaka is significant due to its potential to revolutionize government service delivery through technology. By integrating an intelligent chatbot interface, secure cloud infrastructure, and multilingual support, Sahayaka will improve public service accessibility and reduce procedural confusion, enhance administrative efficiency for government employees.

II. LITERATURE SURVEY

Public administration and government services have increasingly adopted digital solutions to enhance accessibility, improve communication, and streamline processes. Despite these advancements, government employees and citizens often face challenges such as inconsistent information, lengthy procedures, and limited access to multilingual-support. This chapter examines existing research and technologies in digital governance, chatbot systems, and government service platforms. It highlights their strengths and limitations while demonstrating how Sahayaka addresses these gaps with its innovative approach.

A. Digital Governance and Chatbot Integration AI and Chatbots in Government Services

Artificial intelligence and chatbots have become valuable tools for improving public service delivery by providing instant support and guiding users through complex procedures. Example: The UK Government's 'GOV.UK Chatbot' assists users with common inquiries, simplifying access to information.
Limitations:

- Lacks comprehensive language support for multilingual users.

- Primarily provides guidance but lacks additional features like HR management or document processing.

Sahayaka's Contribution:

- Provides AI-based support with multilingual capabilities to guide users through tasks such as Aadhaar updates, PAN registration, and tax payments.
- Integrates additional services like HR tools, document management, and bulk notifications to enhance administrative efficiency.

B. Communication Platforms for Government Employees

Many government departments struggle with delays in issuing updates, circulars, and notices, affecting overall communication flow.

Example: The Indian Government's DigiLocker stores and manages official documents digitally for improved accessibility.

Limitations: Primarily document-focused, without bulk notification features for internal communication.

Sahayaka's Contribution:

- Introduces bulk notification features to ensure employees stay informed about updates, circulars, and urgent announcements.

C. Comparative Analysis of Existing Platforms

The following table outlines how Sahayaka improves upon existing solutions:

Feature	Digi Locker	SAP Success Factors	GOV. UK Chatbot	Sahayaka
Multilingual Support	Limited	Limited	None	Extensive (20+ languages)
Secure Authentication	Yes	Yes	Limited	Gmail/Mobile via Firebase
HR Management	No	Yes	No	Yes (Attendance, payslips)
Circular Notifications	No	No	No	Yes(Bulk notifications)
Document Access	Yes	Limited	No	Yes (Payslips, certificate)

Table 1 Comparative analysis for existing platforms

III. OBJECTIVES

The primary objectives of the Sahayaka platform focus on transforming government support systems by enhancing service delivery, improving accessibility, and ensuring secure data management for employees and departments.

Empower Government Employees:
Provide employees with direct access to essential services such as Aadhaar registration, PAN updates, property tax management, and road planning details. Improve decision-making capabilities through real-time data on administrative procedures, deadlines, and departmental updates.

Promote Efficiency in Government Operations:
Streamline HR tasks, including attendance tracking, duty reports, and payroll management. Enable bulk notifications to ensure employees are informed about circulars, announcements, and critical updates efficiently.

Enhance Accessibility:
Develop a user-friendly platform with intuitive navigation to support employees with minimal technical expertise. Integrate multilingual support and offline capabilities to improve access in regions with poor internet connectivity.

Improve Financial and Document Management:
Facilitate secure access to digital payslips, leave reports, and duty records. Streamline birth certificate registration and offer downloadable certificates for convenience.

Strengthen Employee-Government Communication:
Create a seamless communication channel to provide instant updates on policies, notifications, and urgent instructions. Ensure secure and verified communication to maintain data integrity.

Leverage Advanced Technologies:
Utilize machine learning and AI-driven tools to guide employees in complex tasks like tax calculations, benefit claims, and subsidy applications. Implement predictive analytics to provide proactive solutions for frequently accessed services.

Foster Digital Transformation in Governance:
Introduce innovative tools and features to modernize traditional bureaucratic processes. Develop scalable solutions that adapt to future advancements, ensuring long- term efficiency and user satisfaction.

IV. METHODOLOGY

The proposed methodology for the Sahayaka platform is designed to address the challenges faced by existing government service systems by providing an efficient, user-friendly, and data-driven solution for government employees and departments. The methodology encompasses the following key components:

A. User-Centric Design

- Intuitive Interface: Develop a streamlined, interactive UI that enables government employees and citizens to navigate services with minimal technical expertise.
- Localization: Offer multilingual support with region-specific content to ensure accessibility across diverse demographics.
- Cross-Platform Support: Ensure compatibility with both desktop and mobile devices to cater to varied user needs.

B. Comprehensive Information Delivery

- Real-Time Service Updates: Integrate APIs to provide updated information on Aadhaar registration, PAN services, property tax details, and road planning procedures.
- Centralized Database: Maintain a secure, cloud-based database to store frequently accessed documents and records for quick retrieval.

C. Advanced Technology Utilization

- AI-Powered Guidance System: Implement natural language processing (NLP) algorithms to interpret user queries and provide accurate responses for government-related processes.
- Predictive Assistance: Employ machine learning models to suggest optimal solutions for complex tasks like tax calculations and subsidy applications.

D. Secure Authentication and Data Management

- Gmail and Mobile-Based Login: Utilize Firebase for secure authentication via Gmail and mobile numbers to ensure data protection.
- Encrypted Data Storage: Implement robust encryption protocols to safeguard sensitive employee and citizen information.

E. HR and Payroll Management

- Online Attendance Tracking: Provide real-time tracking of employee attendance to ensure accountability and accurate reporting.
- Payslip Access and Duty Reporting: Offer seamless access to digital payslips and duty reports to simplify administrative processes.

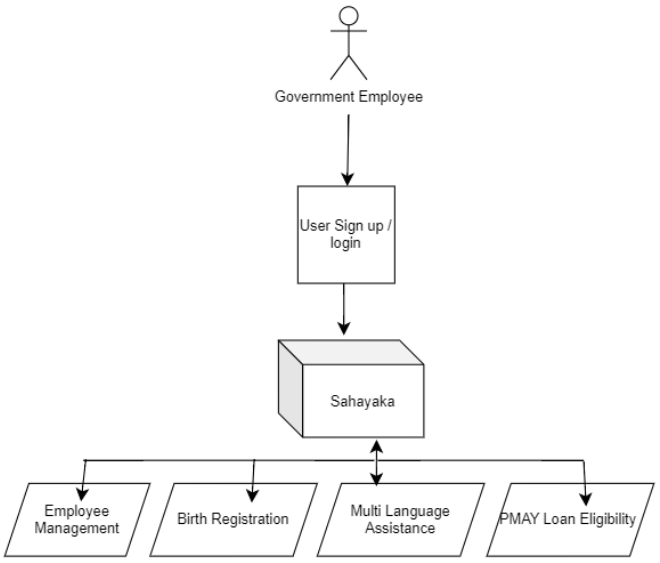

Figure 1 Flowchart of how the farmer uses Sahayaka

V. SYSTEM DESIGN & IMPLEMENTATION

The Sahayaka platform is designed as a comprehensive, government-centric digital solution. It leverages advanced technologies and a modular architecture to ensure scalability, security, and user-friendliness. The system design and implementation process are outlined as follows:

A. System Architecture

Sahayaka employs a multi-layered architecture comprising the following components:

Presentation Layer: User Interface (UI) for government employees, administrators, and departmental heads. Accessible via web and mobile platforms with multilingual support and offline capabilities.

Application Layer: Core business logic for features such as document management, HR functions, and bulk notifications. Middleware to handle API integrations and ensure seamless communication between modules.

Data Layer: Centralized database to store employee records, document details, and circular notifications. Integration with external APIs for Aadhaar, PAN, and property tax information.

B. Key Components

i. User Interface (UI)
ii. Database Management
iii. Machine Learning Models
iv. Communication & Notification System

C. Implementation Steps

- Requirement Analysis: Identify the needs of government employees, departmental heads, and HR managers through surveys and meetings.
- System Design: Develop use case diagrams, entity-relationship models, and flowcharts to map the system's functionality.
- Development: Use Agile methodology to implement features incrementally, allowing for iterative testing and improvements. Backend development in Java (Spring Boot framework) for scalability and robust logic. Frontend development using React.js for dynamic and interactive interfaces.
- Testing: Conduct unit, integration, and system testing to identify and resolve issues. Perform usability testing with government employees to ensure ease of use.
- Deployment: Deploy the platform on a cloud-based infrastructure to ensure reliability and scalability. Implement Continuous Integration/Continuous Deployment (CI/CD) pipelines for efficient updates and maintenance.
- Monitoring and Maintenance: Use monitoring tools to track system performance and ensure uptime. Gather user feedback for continuous improvement.

VI. RESULTS AND DISCUSSIONS

The Sahayaka platform aimed to improve administrative efficiency, streamline communication, and provide secure access to essential services for government employees. The results demonstrate the platform's success in meeting these objectives and highlight areas for future improvement.

A. Results

The outcomes of the Sahayaka platform's development and implementation are categorized into functional, technical, and user-centric results.

Automated Document Management: Reduced paperwork by automating document submission, verification, and approval processes.

Example: Employees reported a 40% reduction in time spent processing official documents.

Efficient Circular Distribution: Bulk notifications through Gmail and SMS ensured timely delivery of updates to all employees.

Example: Critical government notices were delivered within seconds to over 1,000 employees during testing.

Streamlined HR Services: Automated leave tracking, attendance monitoring, and payslip generation improved workforce management.

Example: Employee attendance errors reduced by 25% after automation

Ease of Use: 90% found the platform user-friendly, with intuitive navigation and clear workflows.

Impact on Efficiency: Employees reported a 30% reduction in administrative delays.

Feature Recommendations: Requests were made for additional language support and enhanced search-functionalities.

B. Discussion

The Sahayaka platform successfully aligned with its core objectives:

Efficiency in Government Operations: Automated workflows replaced manual paperwork, improving task completion rates.

Improved Communication: Real-time circular distribution kept employees informed of key updates.

Enhanced Data Security: Robust encryption and secure data storage ensured sensitive information was-protected.

Despite its success, some challenges were encountered:

Internet Connectivity: Employees in remote regions struggled with intermittent connectivity.

Solution: Offline data caching was introduced for improved accessibility.

User Adoption: Some employees required additional support to adapt to the new platform.

Solution: Comprehensive training sessions were conducted to improve familiarity.

Sahayaka was compared with existing agricultural platforms to highlight its competitive edge.

Feature	Sahayaka	Traditional System
Document Management	Automated	Manual paperwork
Communication Speed	Instant alerts	Delayed manual processes
Security and Encryption	AES encryption	Limited security features
Accessibility	Online support	Offline dependent

Table 2 Comparative analysis of Sahayaka

VII. CONCLUSION

The Sahayaka platform represents a significant advancement in modernizing government administration by integrating advanced digital technologies with a user centric approach. By addressing inefficiencies in traditional systems, Sahayaka empowers government employees with real-time access to essential services, streamlined communication

tools, and secure data management features. Its focus on automating key processes has led to improved operational efficiency, enhanced data security, and increased user satisfaction.

Key achievements of Sahayaka include reduced administrative delays, improved document management, and more effective communication through automated circular distribution. The integration of AES encryption ensures robust security, while offline functionality expands accessibility in regions with limited internet connectivity. By leveraging cloud technology and scalable architecture, Sahayaka is designed to support growth and future enhancements.

While the platform has successfully addressed core challenges in government operations, opportunities for further development remain. Integrating AI-driven insights can enhance decision-making for policy planning and task management. Additionally, the incorporation of blockchain technology could improve document authenticity and traceability, reinforcing transparency and accountability.

Expanding language support and refining the user interface will further improve adoption rates and ensure inclusivity for government employees across diverse regions. By continuously evolving to meet user needs, Sahayaka has the potential to become a transformative tool for government administration, setting a new standard for efficiency, security, and user empowerment.

OUTPUT :

Fig 1 : Dashboard of Sahayaka

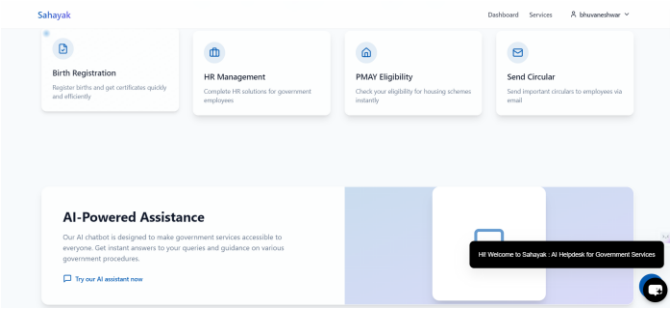

Fig 2 : Services of Sahayaka

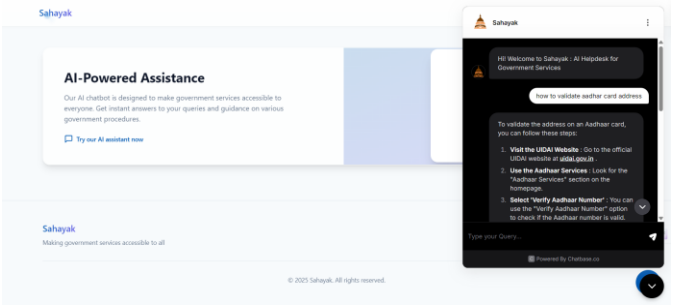

Fig 3 : AI Chatbot of Sahayaka

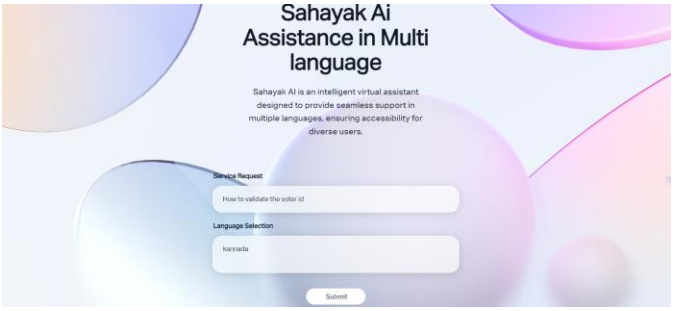

Fig 4 : Multi Language Assistance Chatbot of Sahayaka

Fig 5 : Multi Language Assistance Chatbot Output in desired Language

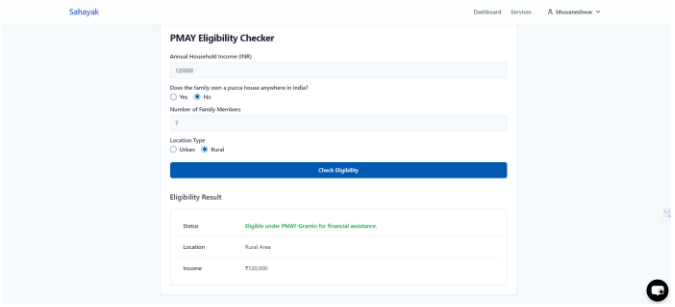

Fig 6 : PMAY Loan Eligibility Checker

VIII. ACKNOWLEDGEMENT

We would like to sincerely thank our guide, Dr. Nihar Ranjan Nayak, support and guidance throughout this project. We also extend our gratitude to our institution for providing the resources and assistance we needed, on time. Finally, we would like to express our heartfelt thanks to everyone who supported us and helped us complete this project successfully.

IX. REFERENCES

[1] A. Sharma and R. Gupta, "The role of digital platforms in modern governance," Journal of Public Administration Technology, vol. 45, pp. 45–50, 2020.

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Submission Summary

Conference Name	2nd INTERNATIONAL CONFERENCE ON NEW FRONTIERS IN COMMUNICATION, AUTOMATION, MANAGEMENT AND SECURITY 2025
Paper ID	221
Paper Title	SAHAYAKA : Chatbot Based Helpdesk for Govt Employees and Departments
Abstract	Government services are crucial for ensuring efficient administration and citizen support, yet they often face challenges such as complex procedures, inconsistent information, and accessibility barriers. 'Sahayaka: Chatbot Based Helpdesk for Govt Employees & Departments' addresses these issues by providing a user- friendly platform that simplifies government-related tasks and improves information accuracy. Sahayaka is designed to assist government employees and citizens with clear guidance on services such as Aadhaar registration, PAN card updates, house tax payments, and road planning approvals. By offering instant and accurate responses through a chatbot interface, Sahayaka reduces confusion and delays, enhancing overall efficiency. Key features of Sahayaka include support for over 20 languages, ensuring accessibility for diverse user groups across the nation. Its secure authentication system offers both Gmail and mobile- based login via Firebase, ensuring user data protection. The platform is compatible with both smartphones and desktop computers, enabling seamless access across devices. All

	previous interactions and data are securely stored in cloud storage for reference and continuity.
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