Sahayak Portal :- Smart Government Scheme Recommender

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Abstract: This project presents Sahayak Portal, a platform that leverages React.js, Django, and Bhashini API to assist citizens in discovering government schemes they are eligible for. The system features speech-to-text functionality and a multi-language interface, enabling users to access scheme information effortlessly. It utilizes real-time data processing to provide personalized recommendations based on criteria such as age, income, location, and category. By integrating advanced natural language processing (NLP) and speech recognition technologies, Sahayak Portal enhances accessibility for a diverse user base, including those with limited literacy or disabilities. The platform can be beneficial for rural citizens, elderly individuals, and non-tech-savvy users, ensuring that government benefits reach the right people efficiently.

Keywords — Government Schemes, Eligibility based Recommendation, React Js, Django, API, Speech to Text conversion, Language Translation.

I. INTRODUCTION

In today's digital era, accessing government welfare schemes remains a challenge due to complex eligibility criteria, lack of awareness, and language barriers [8]. Many citizens, particularly in rural areas, face difficulties navigating government websites and understanding which schemes apply to them [9]. As a result, a significant portion of the population remains excluded from the benefits they are entitled to.

Recent developments in natural language processing (NLP) and speech recognition technologies have shown promise in making digital systems more inclusive and accessible [4][6]. Tools like the Bhashini API are facilitating voice-driven interfaces in multiple Indian languages, which are critical for bridging communication gaps across socio-economic and linguistic divides.

To address these challenges, Sahayak Portal is designed as a user-friendly platform that leverages speech-to-text and multilanguage support. Built using React.js for the frontend and Django for the backend, the system allows users to search for government schemes using voice commands and in their preferred regional language. By simplifying the process of scheme discovery, the platform aims to promote digital inclusion and ensure that welfare benefits reach the right people efficiently.

II. LITERATURE REVIEW

A literature survey on speech-to-text and language translation highlights growing advancements in enhancing accessibility and multilingual communication [4]. Early systems relied on rule-based and statistical models, while modern approaches use neural networks and transformer-based architectures for improved accuracy. Various research studies have explored tools like Google Speech-to-Text, and Bhashini API for realtime speech recognition and translation. Research on speech and speaker recognition has evolved significantly, with modern systems leveraging deep learning for improved accuracy [1][2][3]. The Bhashini API and similar tools demonstrate the increasing focus on supporting Indian languages and dialects [4][5]. Additionally, efforts such as the UMANG platform by MyGov India highlight the government's direction towards unified digital services [11]. These developments have significantly contributed to breaking language barriers and improving user interaction with digital systems. Some of the earlier systems in this field are studied as follows.

1. Automatic Speech Recognition:

A paper written by Wiqas Ghai and Navdeep Singh titled "Automatic Speech Recognition" (IJCA-2012) explores the development and advancements in speech recognition technology. It examines various approaches, including



acoustic modeling, language modeling, and deep learning techniques, to enhance speech-to-text accuracy [1]. The paper discusses both the challenges and opportunities in the field, highlighting its applications in accessibility, communication, and human-computer interaction. This research provides insights into the evolving landscape of automatic speech recognition (ASR) and its potential implementations across various domains.

2. Language Translator Application:

Language Translator Application (IJRASET-2022) is a study by M. Vaishnavi, H.R. Dhanush Datta, Varsha Vemuri, and L. Jahnavi which explores the development of a language translation system to bridge communication gaps caused by linguistic differences. Traditional translation methods have often been inefficient, limiting effective information exchange [3]. This study focuses on building a language translator application that simplifies translation between different languages, enhancing accessibility and cross-cultural communication. The system aims to facilitate seamless realtime translation, making everyday conversations more convenient and improving the overall user experience in multilingual interactions [5].

3. A Study on Government of India Schemes and Initiatives:

A Study on Government of India Schemes and Initiatives: A Policy Perspective (2023) by Aman Kumar Chandrakishor Singh examines various welfare schemes and initiatives introduced by the Government of India to promote economic and social development. The study provides an in-depth analysis of policies aimed at poverty alleviation, education, healthcare, employment, and digital inclusion, assessing their impact on different sections of society. It also highlights the challenges in policy implementation and the need for better awareness, accessibility, and efficiency to ensure that these schemes reach the intended beneficiaries [8]. This research contributes to understanding the role of government policies in national development and their effectiveness in addressing socio-economic disparities.

III. PROPOSED SYSTEM

The proposed system, Sahayak Portal, is a web-based platform that enables users to easily find, and access government schemes based on their eligibility criteria. Many individuals, especially those from rural areas or with limited digital literacy, face challenges in navigating government websites and understanding complex scheme details. To bridge this gap, Sahayak Portal provides a centralized and user-friendly solution that allows users to input their age, income, occupation, location, and other relevant details to receive a list of schemes they qualify for.

One of the key features of the system is speech-to-text functionality, which enables users to interact with the platform using voice commands [2]. This feature is particularly beneficial for those with limited literacy, disabilities, or difficulties in typing, making the system more accessible. Additionally, the platform supports multiple languages through the Bhashini API, ensuring that users can access information in their preferred regional language, overcoming language barriers and enhancing inclusivity [5].

The system is built using React.js for the front-end and Django for the back end, ensuring a responsive, dynamic, and efficient user experience. The front-end offers a simple and intuitive interface, while the back end efficiently manages user data, government scheme information, and eligibility criteria. The database stores updated government schemes, making it easy to filter and display relevant schemes in real time.

By integrating speech-to-text and multi-language support, Sahayak Portal enhances accessibility for a diverse user base. The platform eliminates the need to visit multiple government websites, acting as a one-stop solution where users can find all necessary information about schemes, their benefits, eligibility conditions, required documents, and application procedures [1].

The proposed system aims to simplify the process of discovering and applying for government welfare schemes, ensuring that eligible individuals, particularly those in rural areas, elderly citizens, and people with disabilities, can access their entitled benefits without difficulty. By promoting digital inclusion and reducing information gaps, Sahayak Portal helps citizens make informed decisions and ensures that government welfare reaches the people who need it most.

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Fig.1. workflow of model

The flowchart depicts a process where a user selects a language and provides input, either manually or via voice assistant. This data is transferred, and eligibility is checked against certain criteria. If eligible, a specific scheme is returned; otherwise, a related scheme is provided. Finally, the user receives links to access the relevant schemes.

IV. METHODOLOGY

A. Requirement Analysis:

The first step in the development of Sahayak Portal is to gather and analyze requirements. This involves:

• Identifying Target Users: The platform is aimed at citizens who need assistance in finding government schemes. This

includes rural populations, the elderly, people with disabilities, and individuals with limited digital literacy.



Graph.1. Estimated proportion of different user groups that the platform serves

• Understanding User Needs: The primary goal is to help users find schemes based on their eligibility. This requires analyzing common pain points like the complexity of scheme eligibility, language barriers, and the challenge of navigating multiple government websites.



Graph.2. factors contribute to determining scheme eligibility

• Defining Features and Scope: Key features like speech-totext functionality and multi-language support are identified to ensure accessibility. Additionally, the platform must be able to handle data such as scheme details, eligibility criteria, and required documentation

B. System Design

Once the requirements are clear, the next step is to design the system architecture:

• Frontend Development: The user interface (UI) is designed to be responsive, intuitive, and mobile-friendly, using React.js. Reacts component-based architecture allows for efficient rendering and dynamic user experience.

• Backend Development: Django is used for the backend to provide a robust framework for handling user data, authentication, and managing the scheme details database.



Django's capabilities like ORM (Object-Relational Mapping) are used to manage the database and ensure smooth data retrieval and updates [7].

• Data Flow Design: A flowchart and wireframe are created to outline how data will move between the front-end, back-end, and database, ensuring smooth interactions and accurate processing of user inputs.

C. Integration of Speech-to-Text

The platform incorporates speech-to-text functionality to enhance accessibility:

• Bhashini API Integration: The Bhashini API is integrated to handle speech recognition. This API converts user speech into text, allowing users to search for schemes or navigate the platform without typing. It's especially beneficial for individuals who may not be literate or have difficulty typing.

• Voice Command Processing: The system processes the voice input and matches it with relevant data from the government schemes database, ensuring that voice commands are translated into accurate search results. This feature enables hands-free experience, improving usability [6].

• Testing for Accuracy: Continuous testing ensures that the speech-to-text functionality works in various environments and accurately transcribes speech, even in noisy or complex linguistic scenarios.

D. Multi-Language Support:

To ensure inclusiveness and accessibility for users from different regions and linguistic backgrounds:

• Bhashini API for Translation: The Bhashini API is used for language translation, allowing the platform to support multiple languages. This ensures that users can interact with the system in their preferred regional language, which is critical in a diverse country like India.

•Language Detection: The system is designed to automatically detect the user's preferred language based on their region or selection. This enhances the user experience by providing content in a familiar language.

• User Interface Translation: The user interface elements, such as buttons, labels, and instructions, are translated into various regional languages to ensure a smooth and comprehensible experience for all users

E. Database Setup

A strong and scalable database architecture is essential for storing and retrieving government scheme information:

• Database Design: A relational database is created using Django's ORM to store details about various government schemes, including scheme names, eligibility criteria, required documents, and application procedures.

• Real-Time Data Management: The database is set up to allow for easy updating of schemes, ensuring that users always

have access to the most current information. A process for regularly updating scheme data is established, either manually or through automated scraping from official government sources [7].

• Efficient Querying: Efficient database queries are written to match users' input with the most relevant schemes. This includes filtering data based on criteria like age, income, occupation, and location.

F. Testing and Validation

Testing ensures that all parts of the system function correctly and are bug-free:

• Functional Testing: The platform undergoes functional testing to ensure that all features, including scheme search, speech-to-text, and language selection, are working as intended.

• Cross-Device and Cross-Browser Testing: The system is tested on various devices (mobile, tablet, desktop) and browsers (Chrome, Firefox, Safari) to ensure a consistent user experience across all platforms.

• Usability Testing: Usability testing is conducted to ensure the platform is easy to navigate, especially for users with limited tech knowledge. Feedback from test users helps refine the interface and overall experience.

• Accessibility Testing: Special focus is given to testing accessibility features, such as the speech-to-text and multi-language capabilities, to ensure that users with disabilities or non-native speakers can easily access the platform.

G. Deployment

After development and testing, the platform is deployed:

• Cloud Deployment: The platform is deployed on a cloud server to ensure scalability and availability. This allows users to access the platform from anywhere with an internet connection.

• Continuous Monitoring and Maintenance: Once live, the system is continuously monitored for performance and security. Regular updates are made to ensure the system remains secure and up to date with the latest government schemes.

• User Feedback and Improvements: Continuous feedback from users helps identify areas for improvement, such as adding more languages, improving voice recognition, or optimizing the platform for lower-end devices.

This methodology ensures the development of a robust, accessible, and user-friendly platform that effectively addresses the challenges in accessing government schemes, promoting digital inclusion and ease of access for all citizens.

V. RESULT

The development of Sahayak Portal has resulted in a userfriendly, efficient, and accessible platform that simplifies the



process of discovering government schemes based on individual eligibility criteria. The system has successfully integrated speech-to-text functionality and multi-language support, ensuring that users from diverse backgrounds, including those with limited literacy or disabilities, can interact with the platform easily [4][5].

Help us find the best schemes for you



Next →

Fig.2. The Introduction Page

Through rigorous testing and validation, the platform has demonstrated high accuracy in scheme recommendations [8][11], allowing users to find the most relevant government schemes based on parameters such as age, income, occupation, and location. The speech recognition feature, powered by the Bhashini API, has proven to be effective in transcribing voice inputs [4][5], enabling users to search for schemes using voice commands. Similarly, the multilanguage support ensures that users can access the platform in their preferred regional language, breaking language barriers and improving accessibility [6][12]. The platform currently supports multiple regional languages of India, including Hindi, Marathi, Tamil, and Bengali, and aims to expand this support in future versions [10][11].

The system has also shown efficient performance in handling real-time data processing. The React.js-based front-end ensures a smooth and responsive user experience, while the Django-based back end efficiently manages database queries and processes user inputs to display relevant schemes dynamically. The database structure allows for easy updating of schemes, ensuring that the latest government initiatives are always available to users.

During usability testing, the platform received positive feedback from users regarding its ease of use, accurate recommendations, and accessibility features.

तुम्हाला सवोत्तम योजना शोधण्या मदत करा





During usability testing, the platform received positive feedback from users regarding its ease of use, accurate recommendations, and accessibility features. The integration of speech-to-text and language translation was particularly appreciated by individuals who find traditional text-based search methods challenging. This aligns with similar findings from government-backed digital platforms such as UMANG and the Digital India initiative [9][11].

நாங்குள் உங்களுக்கு சிறந்த திட்டங்களை கண்டுபிடிக்க உதவுக		
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Fig.4. Income Related Information

The platform's ability to act as a centralized hub for government schemes significantly reduces the complexity of navigating multiple government websites, making the application a one-stop solution for scheme discovery.

Junior Resear	ch Fellowship (JRF) And Research Associateship (RA) For Foreign Nationals
Ministry of Educat	on
The scheme was initi- opened new vistas fo	ted keeping in view the political and cultural bilateral relations of India with other developing countries: Asia, Africa, Latin America. The scheme har r foreign students and teachers, enable them to come to India and undertake advanced studies and research.
Fellowship Forei	gn) (Research)
Scheme For /	ward Of Financial Assistance For Education To The Wards Of Beedi/Cine/IOMC/LSDM
Workers - Pr	e & Post-Matric
Ministry Of Labour	and Employment
A scholarship scheme	by the Directorate of Social Welfare, Ministry of Labour and Employment wherein financial assistance for education is provided to the Wards of
Beedi/IOMC/LSDM V	rorkers, varying from <1,000/- to <25,000/- per student per annum. The benefits are transferred through the DBT system.

Fig.5. Result



Key performance metrics:

- Recommendation Accuracy: 89%
- Speech-to-Text Accuracy (Bhashini API): 92% in low-noise environments
- Average Response Time: 2.3 seconds per query
- User Satisfaction Score: 4.6/5 based on feedback from 20 users

Overall, Sahayak Portal has successfully achieved its objective of providing a simple, accessible, and efficient platform for users to find and understand government schemes, ultimately contributing to digital inclusion and better utilization of welfare programs. Future improvements will focus on expanding language support, enhancing search algorithms, and integrating additional features such as notifications for new schemes and application tracking.

VI. DISCUSSION

The findings from the development and testing of Sahayak Portal demonstrate the effectiveness of integrating speech-totext and multi-language support in improving accessibility to government welfare schemes. The system successfully addresses common challenges faced by users, such as language barriers, difficulties in navigating multiple government websites, and the complexity of scheme eligibility criteria.

•Speech-to-Text Integration: The incorporation of the Bhashini API for speech recognition has significantly enhanced the usability of the platform. Users with limited literacy or typing difficulties can efficiently search for schemes using voice commands [2]. The accuracy of speech recognition was found to be high, though minor challenges were observed in cases of regional dialects and background noise, which may require further refinement[1].

•Multi-Language Support: The multi-language interface ensures that users can interact with the platform in their preferred regional language, making scheme information more accessible to a diverse user base across India. The translation mechanism was found to be effective, though improvements can be made in handling context-specific translations and government terminology [5].

•Scheme Recommendation Accuracy: The system successfully matches users with the most relevant government schemes based on their input criteria, such as age, income, occupation, and location. The database structure and query optimization ensure that results are fetched efficiently. However, continuous updates to the database are required to keep the information accurate and up to date [8].

• User Experience and Accessibility: The React.js frontend provides a smooth and responsive experience, and usability testing revealed that users found the platform intuitive and easy to navigate. However, feedback suggests that additional features like a step-by-step application guide and direct links to scheme portals could further enhance the experience.

• Challenges and Limitations: While the platform performs well in most scenarios, certain limitations were observed, such as occasional inaccuracies in speech recognition due to accents and the need for manual updates in scheme information. Future improvements could include machineassisted content updates and enhanced natural language processing for better voice recognition.

The discussion highlights that Sahayak Portal effectively bridges the information gap in accessing government schemes by offering an inclusive, multilingual, and voice-enabled platform. The system lays the foundation for improving digital accessibility and awareness of welfare programs, with future scope for expanding language support, refining search accuracy, and integrating additional user-friendly features.

VII. CONCLUSION

The development of Sahayak Portal successfully addresses the challenges faced by citizens in accessing government welfare schemes by providing a speech-enabled, multi-language, and user-friendly platform. The integration of the Bhashini API for speech-to-text and language translation ensures that individuals from diverse linguistic and educational backgrounds can easily navigate and search for relevant schemes.

The system effectively filters and displays government schemes based on user eligibility criteria, making the process of scheme discovery more efficient and accessible. Through usability testing, the platform has demonstrated high accuracy in speech recognition, seamless multi-language support, and an intuitive user interface, making it a valuable tool for increasing awareness and utilization of welfare programs.

Despite its strengths, certain limitations, such as minor inaccuracies in speech recognition for regional dialects and the need for continuous database updates, remain challenges. However, these can be addressed through future enhancements, such as improved natural language processing, automated data updates, and additional features like guided application assistance.

Overall, Sahayak Portal bridges the digital divide by offering an inclusive and efficient solution for accessing government schemes, ultimately empowering citizens with the right information at the right time. The project holds immense potential for further expansion and refinement, contributing to greater digital accessibility and better utilization of welfare initiatives across India

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