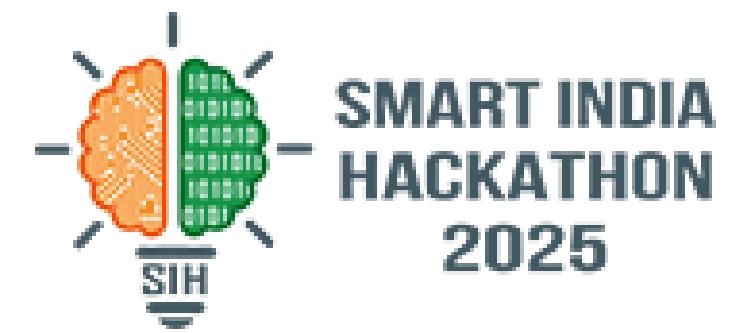
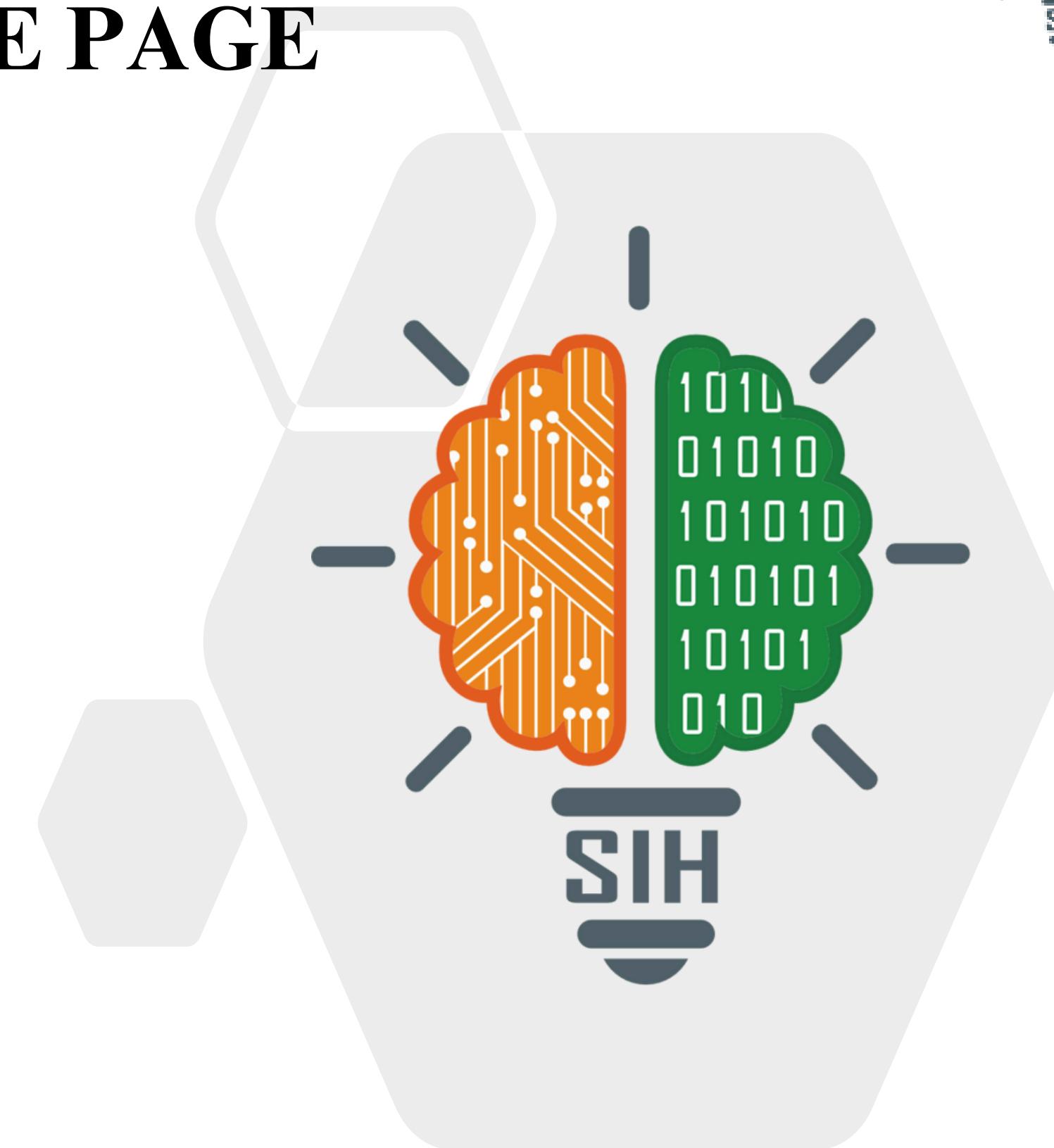


SMART INDIA HACKATHON 2025

TITLE PAGE

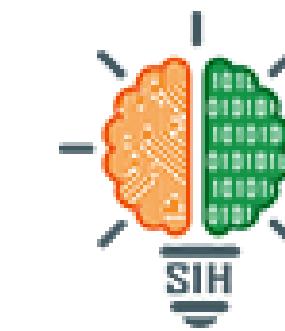


- Problem Statement ID – 25066
- Problem Statement Title- Development of an AI-driven Chatbot for INGRES as a virtual assistant
- Theme- Smart automation
- PS Category- Software
- Team ID-
- Team Name - Mercury

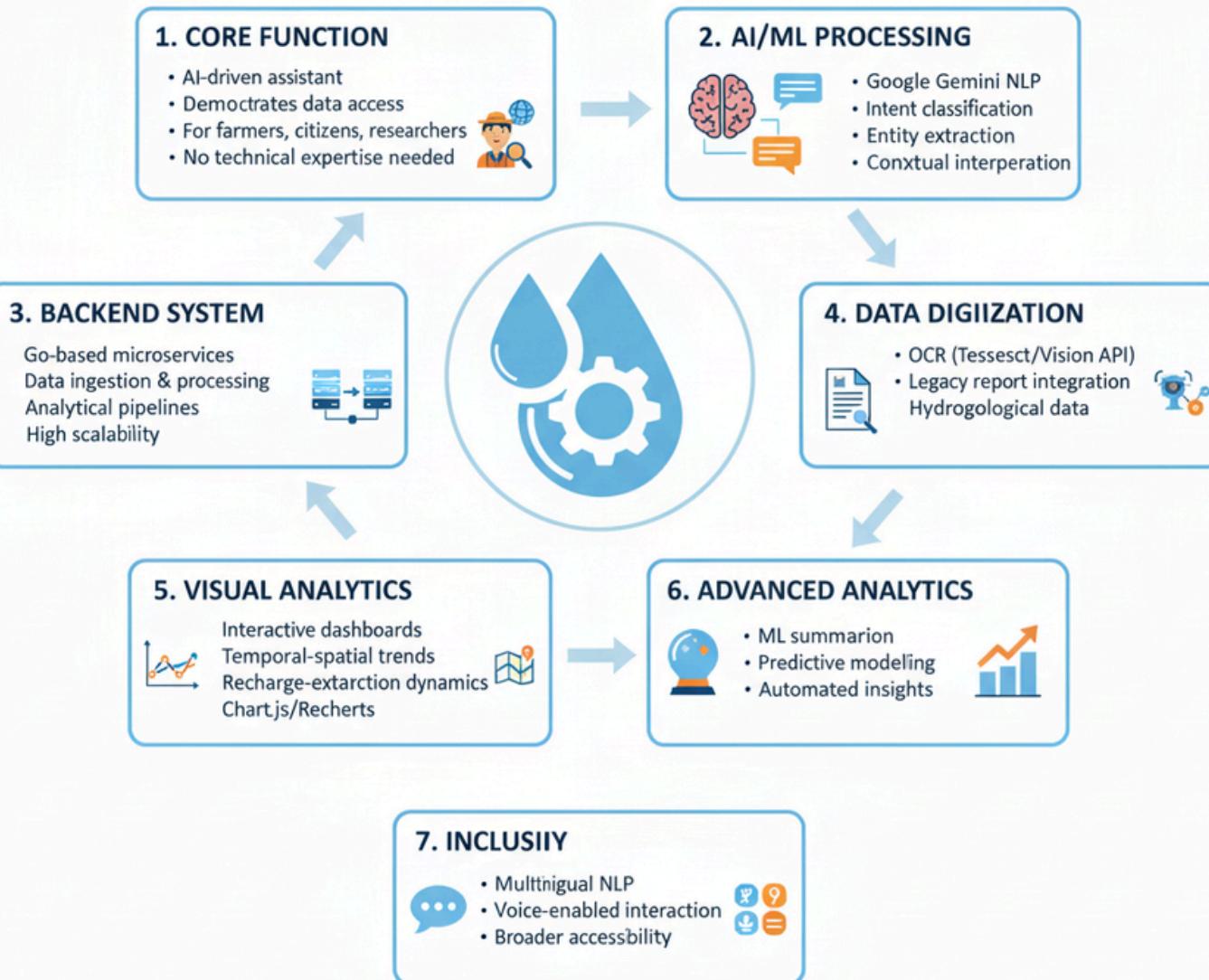




Proposed Solution



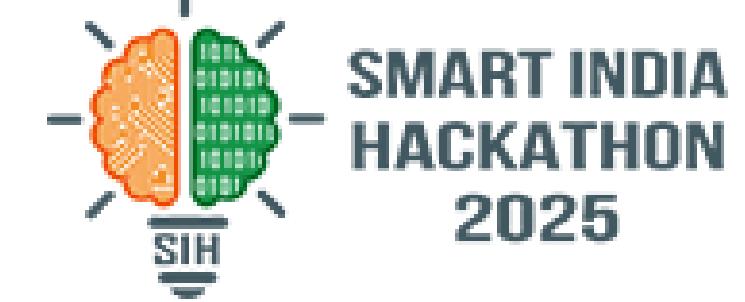
- An **AI-driven groundwater intelligence assistant** that democratizes data accessibility for farmers, citizens, researchers, and policymakers with zero prerequisite technical expertise.
- Leveraging **Google Gemini NLP + AI/ML models** for intent classification, entity extraction, and contextual interpretation.
- A **Go-based microservices backend** orchestrates data ingestion, processing, and analytical pipelines with high scalability.
- **OCR (Tesseract / Vision API)** integration enables digitization of legacy, non-digital hydrogeological reports, ensuring comprehensive dataset utilization.
- **Interactive visual analytics (Recharts / Chart.js)** render temporal-spatial groundwater trends, recharge-extraction dynamics, and comparative evaluations.
- **ML-driven summarization & predictive modelling** → forecasts & automated insights.
- Enhanced inclusivity via **multilingual NLP** and **voice-enabled interaction**, broadening accessibility across user groups.



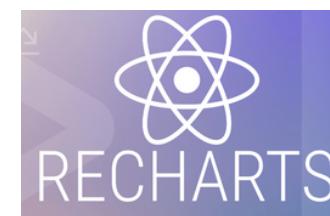
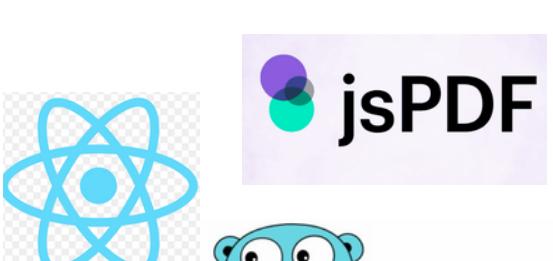
Mercury



TECHNICAL APPROACH



Technologies used

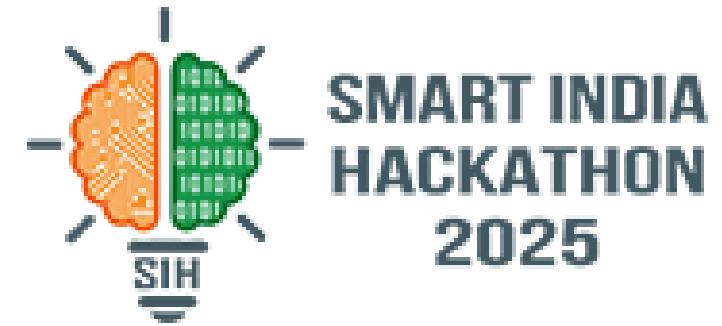


Golang





FEASIBILITY AND VIABILITY



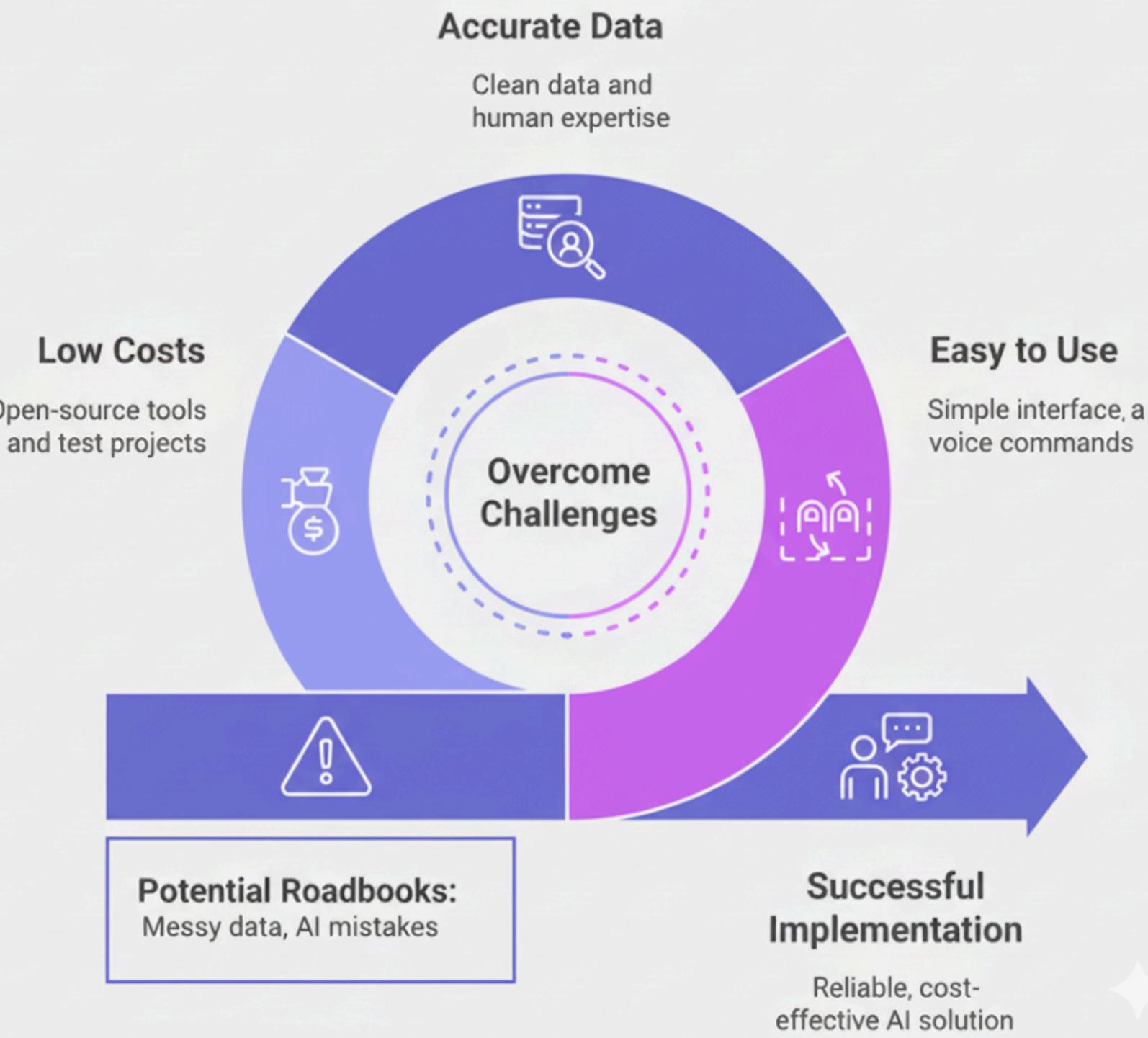
Why We Know This Can Work

- We're using proven technology:** Our idea uses well-known tools like AI, photo-reading (OCR), and voice commands that are already available and reliable.
- Good information is available:** We'll use official government reports and maps, so we know our data source is trustworthy and consistent. Possible Roadblocks

Some challenges

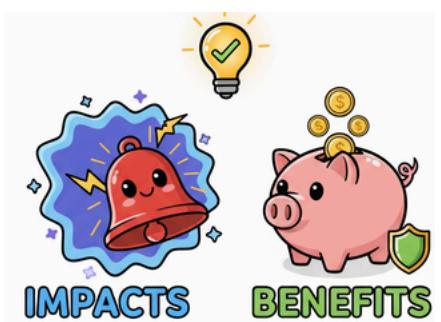
- Messy data and AI mistakes:** Sometimes, data from different sources is in weird formats, which can cause errors. The AI might also misunderstand complex information.
- People might not use it:** Some users may find new technology confusing. Also, running powerful AI can get expensive.

Overcoming AI/ML Technology Challenges,

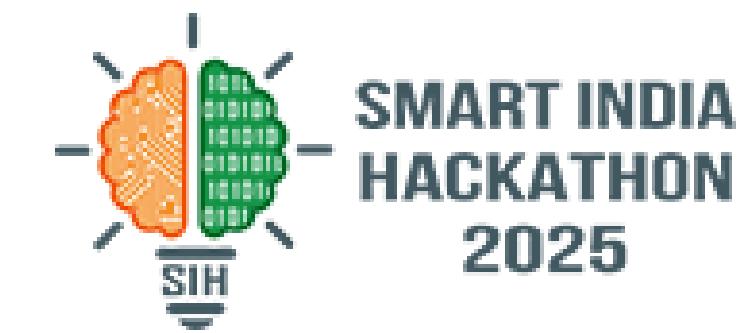


Our Plan to Overcome These Challenges

- Making it super easy to use:** We'll design a simple screen and make sure the voice commands work really well, so anyone can use it, even if they aren't tech-savvy.
- Keeping our data accurate:** We will have a system to clean up the data before the AI sees it. We'll also have human experts double-check the AI's work to catch mistakes and help it learn.
- Keeping costs low and proving it helps:** We'll use free, open-source tools and smart tech choices to manage costs. By running small test projects, we'll show everyone how useful our solution is and build their trust.



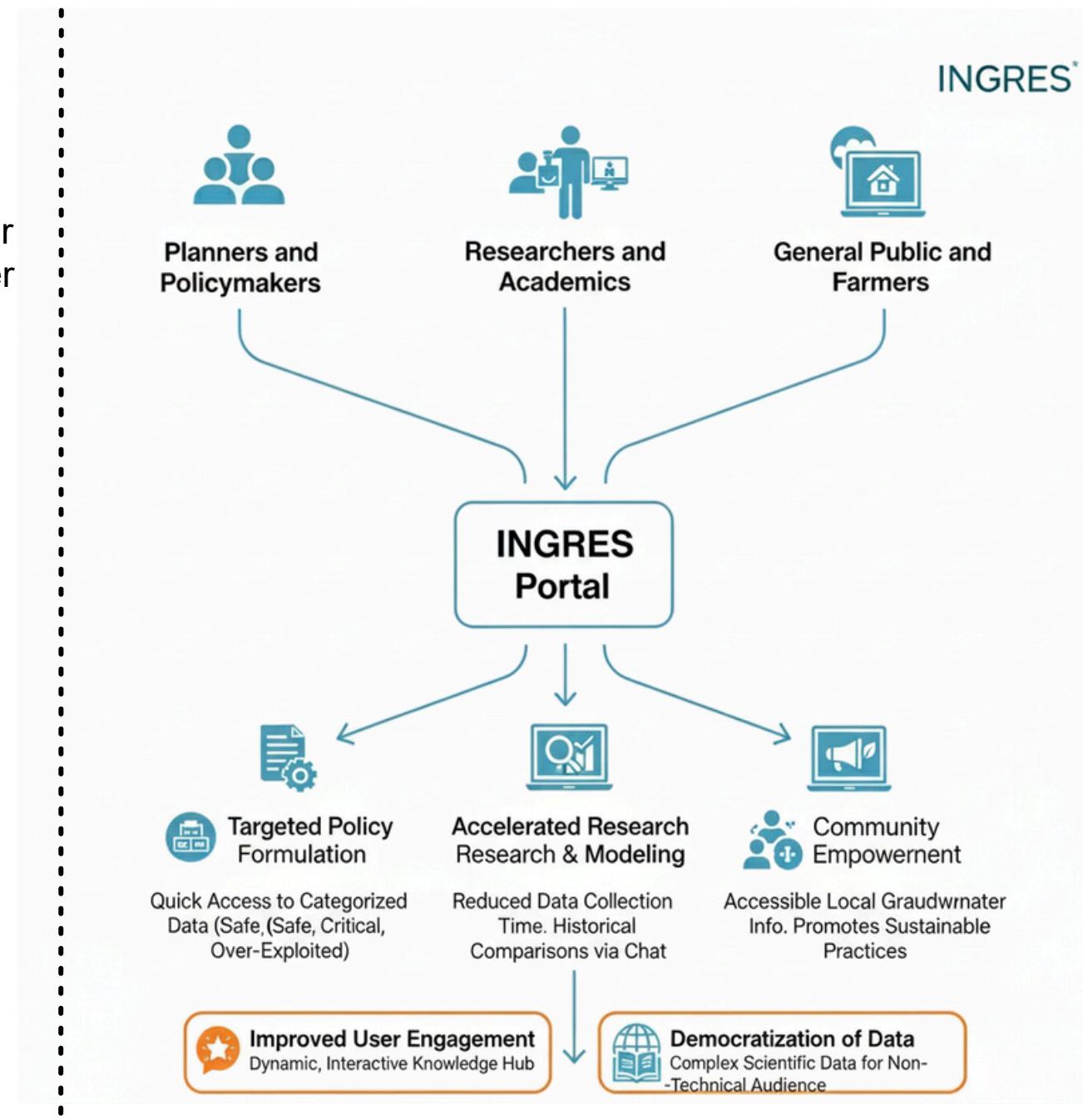
IMPACT AND BENEFITS



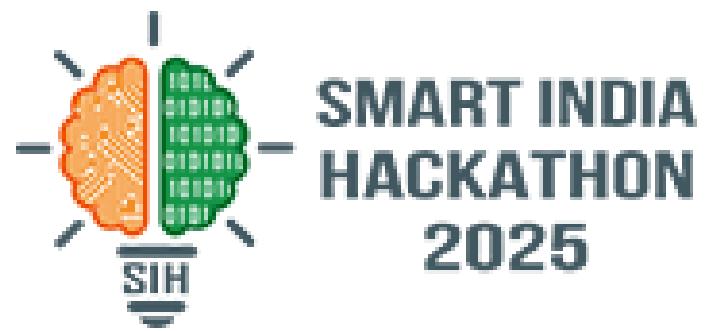
Who Our Solution Helps 🎯



- i. **For Farmers:** It's like having a farming expert on your phone. Our platform uses voice commands to give instant advice, helping farmers protect their crops and their future.
- ii. **For Government Leaders:** This tool gives a live picture of the country's water health. It provides clear insights, not just charts, helping leaders make smarter decisions to prevent water shortages.
- iii. **For Activists & Community Workers:** It helps turn confusing data into simple, powerful stories. This makes it easier to raise awareness and bring communities together to save water.
- **The Big Picture Benefits**
- iv. **A Stronger Economy:** By helping farmers use water more efficiently, we boost our country's most important sector. This leads to more stable and secure economic growth for everyone.
- v. **A Healthier Environment:** This platform helps us protect our natural water sources, like rivers and groundwater. It empowers everyone to play a part in preserving our environment for future generations.
- vi. **Easy Tech for Everyone:** Because our tool works with simple voice commands, you don't need to be a tech expert to use it. We're making sure that the benefits of modern technology can reach every person in every village.



RESEARCH AND REFERENCES



Groundwater Assessment & INGRES

Central Ground Water Board (CGWB) – <http://cgwb.gov.in>

INGRES Portal (India Groundwater Estimation System) – <https://inges.iith.ac.in>

Government Reports

Assessment of Dynamic Ground Water Resources of India (2023) – Ministry of Jal Shakti

National Water Policy & Guidelines – DoWR, RD & GR, MoJS

AI & NLP (Chatbot Development)

Google Gemini (NLP & AI Platform) – <https://deepmind.google>

OCR & Data Digitization

Tesseract OCR (Open-source) – <https://github.com/tesseract-ocr/tesseract>

Google Cloud Vision API – <https://cloud.google.com/vision>

Visualization Libraries

Recharts (React-based charts) – <https://recharts.org>

Chart.js – <https://www.chartjs.org>

Backend Development

Go (Golang) Documentation – <https://go.dev>