SMART INDIA HACKATHON 2025

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TITLE PAGE

- **Problem Statement ID – SIH25065**
- **Problem Statement Title - Design & development of an application for on-spot assessment of Roof Top Rain Water Harvesting and artificial recharge potential and size of the RTRWH and AR.**
- **Theme - Smart Automation**
- **PS Category- Software**
- **Team ID- SIH_PU_250**
- **Team Name - Team Aeturnus**

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PROPOSED SOLUTION

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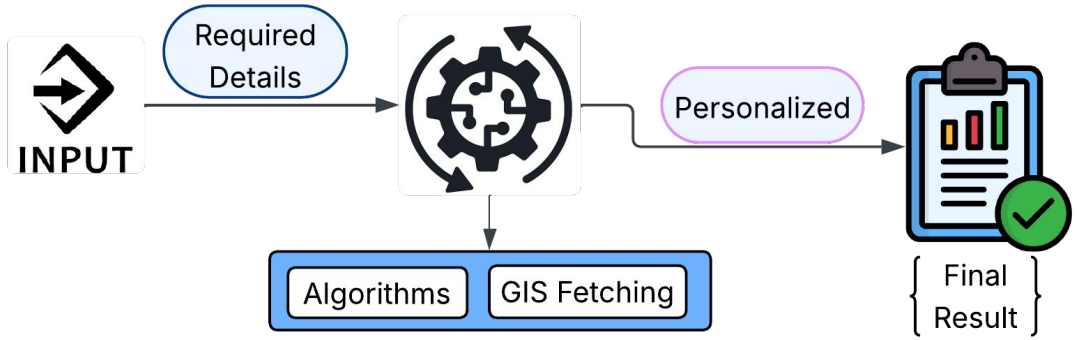

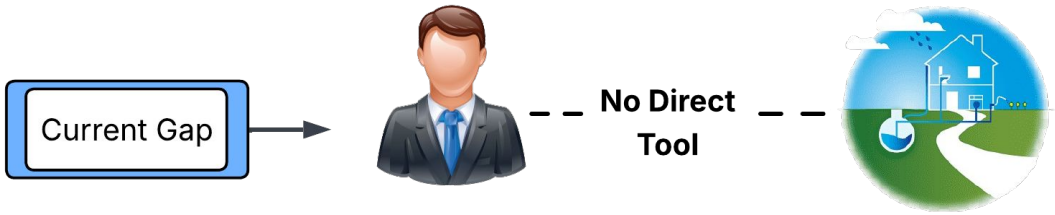

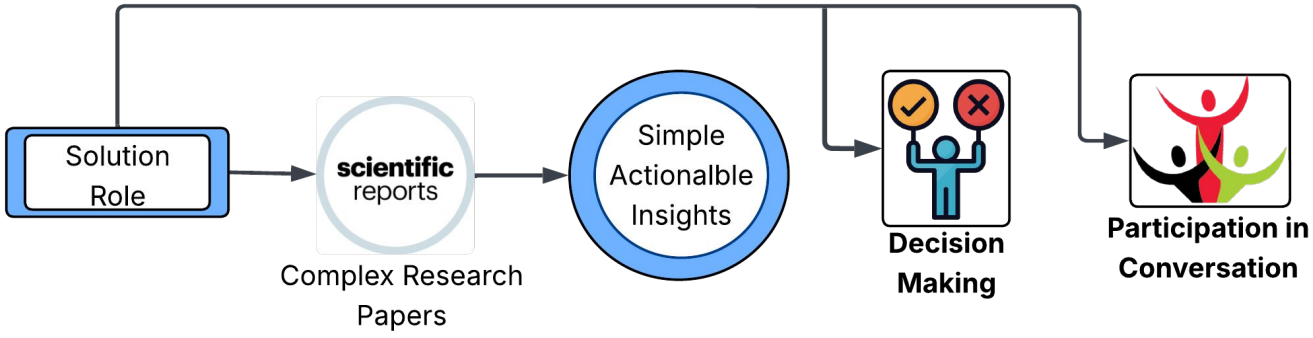

Impact

- **Promotes Rain water harvesting adoption**
- **Aids ground water recharge & sustainability**
- **Strengthens urban & rural water security**

Innovative Edge

- **First Digital tool for rooftop rain water harvesting in india.**
- **Combines GIS, hydrological model & User inputs**

Unique Features

- **Personalized feasibility check.**
- **Provides both technical + financial analysis.**
- **Multilingual support for inclusivity.**

Future Potential

- **Scalable across regions and cities.**
- **Can be integrated into Smart City and Jal Shakti Mission initiatives.**
- **Encourages community-driven conservation at a national scale.**

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TECHNICAL APPROACH

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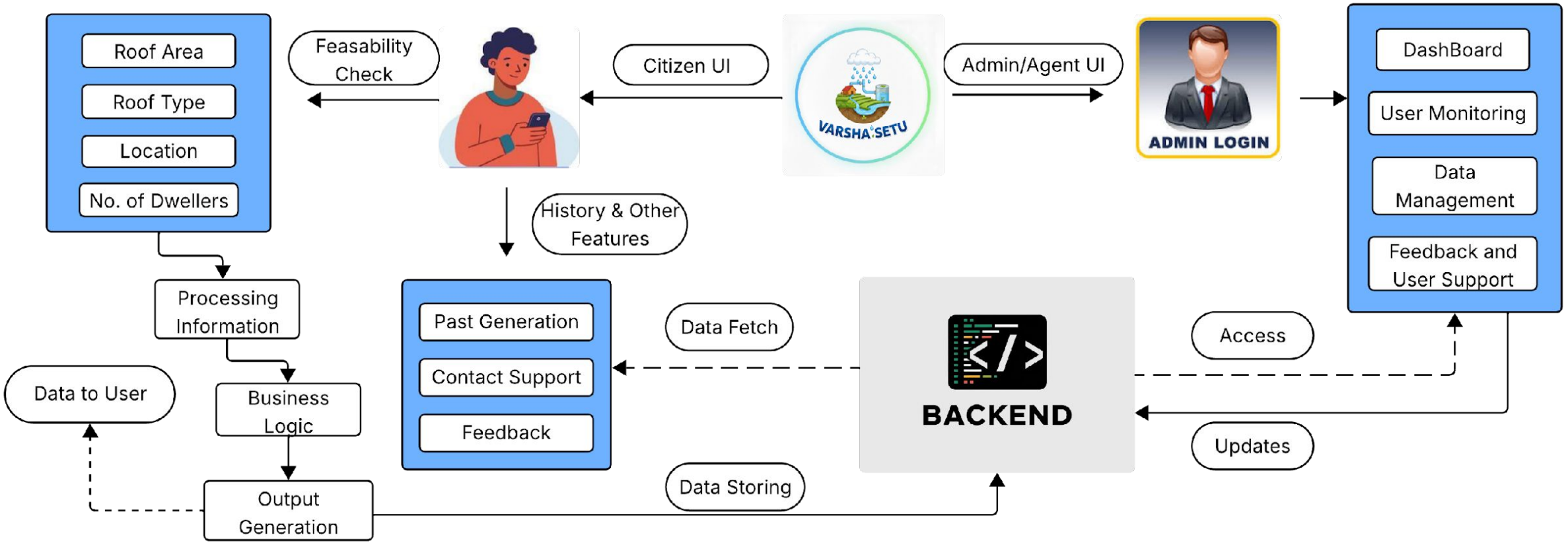

Data Sources

- Rainfall → data.gov.in, NWIC, MOSDAC
- Groundwater → data.gov.in + CGWB gwdata API
- Aquifer & maps → WRIS (WMS/WFS), ISRO Bhuvan

Technologies

REST API · node.js + Express · PostgreSQL · IONIC · AngularJS

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FEASIBILITY AND VIABILITY

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Feasibility	Challenges	Strategies
Tech: Auto fetches rainfall & soil data with step-by-step UI.	Trust issues with new technology and App reliability	Conduct Training and workshops in villages , schools and farmer groups.
Social: helps in spreading awareness and accessibility.	Lack of awareness or willingness to adopt rainwater harvesting by citizens.	Adapt guidelines based on soil type, rainfall zone and geography.
Environmental: Standardized construction guidelines , improves sustainability.	Limited space and site specific construction issues	Step by step guided app flow with icons/visuals for low literacy users.
Government : Centralized data accessibility for planning and monitoring	Variation in soil type , rainfall and land conditions --> one solution not fit for all	Subsidies and financial incentives for adoption by government.

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IMPACT AND BENEFITS

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Social

- Encourages citizen participation in water conservation drives
- Supports integration with Jal Shakti Abhiyan, Jal Jeevan Mission, and Atal Bhujal Yojana
- Enables easy self-assessment of rooftop rainwater harvesting potential

Environment

- Reduces urban flooding by diverting rooftop rainwater
- Mitigates soil erosion and surface runoff damage
- Enhances groundwater recharge, leading to improved water table levels

Economic

- Reduced dependence on costly private water tankers
- Lower government expenditure on water infrastructure (long-term savings)
- Employment generation for contractors, engineers, and local technicians

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RESEARCH AND REFERENCES

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- CGWB (Central Ground Water Board) – https://cgwb.gov.in
- Manuals on Rooftop Rainwater Harvesting & Artificial Recharge.
- India Meteorological Department (IMD) – https://mausam.imd.gov.in
- Rainfall data, monsoon reports, district-wise climatology.
- India Water Resources Information System (WRIS) – https://indiawris.gov.in
- Aquifer maps, groundwater levels, water bodies GIS data
- Open Government Data (OGD) Platform India – https://data.gov.in

- India receives 1170 mm rainfall annually, but only 8% is harvested." – CGWB Report
- "Groundwater provides 62% irrigation, 85% rural drinking, 50% urban needs." – Jal Shakti Ministry
- "By 2030, India's water demand will be twice the available supply, risking 6% GDP loss." – NITI Aayog Water Report

- Tech:
- Angular + Ionic → ionicframework.com (cross-platform apps)
- Node.js (Express.js) → expressjs.com (scalable backend)
- PostgreSQL + PostGIS → postgis.net (GIS + rainfall/groundwater queries)
- OpenStreetMap APIs → openstreetmap.org (free maps for plotting roof & recharge structures)