SMART INDIA HACKATHON 2025

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TITLE PAGE

- **Problem Statement ID –** SIH25006
- **Problem Statement Title -** Development of a Digital Farm Management Portal for implementing Biosecurity measures in Pig and Poultry Farms
- **Theme -** Agriculture, FoodTech & Rural Development
- **PS Category -** Software
- **Team ID-** 108216
- **Team Name (Registered on portal) -** Code-Veda

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FarmGaurd

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Proposed Solution :

Digital Biosecurity Platform for Preventing Livestock Disease Outbreaks

- **AI-Powered Biosecurity Platform:** Using AI for smart risk assessment and early detection of livestock diseases.
- **Computer Vision & Image Recognition:** Detect sick livestock, nutritional deficiencies, and injuries via uploaded images for timely intervention.
- **Farmer-Veterinarian Network:** Direct connection for advice, consultations, and appointments, promoting collaboration and rapid response to disease incidents.
- **Unified Command Dashboard:** Real-time monitoring, heat maps, and role-based secure access for admins, authorities.
- **AI Chatbot :** AI Chatbot makes biosecurity guidance simple and accessible for rural Indian farmers.
- **Interactive Training Hub:** The training hub teaches and aware farmers how to keep cattle healthy and increase income.
- **By offering multiple languages (16+ local language support) & Voice guidance**, the platform makes biosecurity guidance simple and accessible for rural Indian farmers.

The platform empowers farmers with real-time tools to protect their livestock. It also enables authorities to use data-driven insights and predictive analytics for better surveillance, policy-making, and rapid containment of outbreaks.

Problem Resolution :

- **End-to-End Farm Protection –** Functions as a digital shield for livestock, safeguarding farmers against transboundary diseases through a holistic biosecurity ecosystem.
- **Stronger Outbreak Response –** Equips authorities, veterinarians, and communities with a unified, real-time surveillance and early-warning platform for rapid, data-driven, and coordinated interventions.
- **Smart & Secure Technology –** Employs AI for intelligent risk assessment, training hub for farmer awareness, mobile-first design for accessibility, and blockchain-backed records for transparent compliance and traceability.

By addressing biosecurity gaps and aligning with One Health, the platform safeguards livestock, protects livelihoods, and strengthens food security.

Unique Value Propositions (UVP) :

- **Data Storage (Blockchain-Enabled):** Farm and disease records are securely stored on a decentralized ledger, ensuring tamper-proof compliance while protecting farmer privacy.
- **Image recognition:** AI checks your photo of a sick animal to identify the disease and give you quick advice.
- **Infrastructure-Resilient Design "Offline-First":** Offline mode stores critical data locally, auto-syncing once reconnected.
- **AI-Powered Smart Alerts:** AI minimizes false warnings by analyzing farm conditions and regional risks.
- **Farmer-to-Farmer Training Hub:** A multilingual space that builds trust and adoption by delivering practical knowledge in local languages.

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TECHNICAL APPROACH

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Frontend (Welcome page, Dashboard)

HTML, CSS, JS, CSS Tailwind, Bootstrap, React.js

AI & ML (AI Prediction, Image recognition, heatmaps)

Python, Tensorflow, Pandas, NumPy, Shapely

BlockChain (Farm Data Storage)

Docker, Hyperledger Aries, Fabric & Indy

Backend and Database

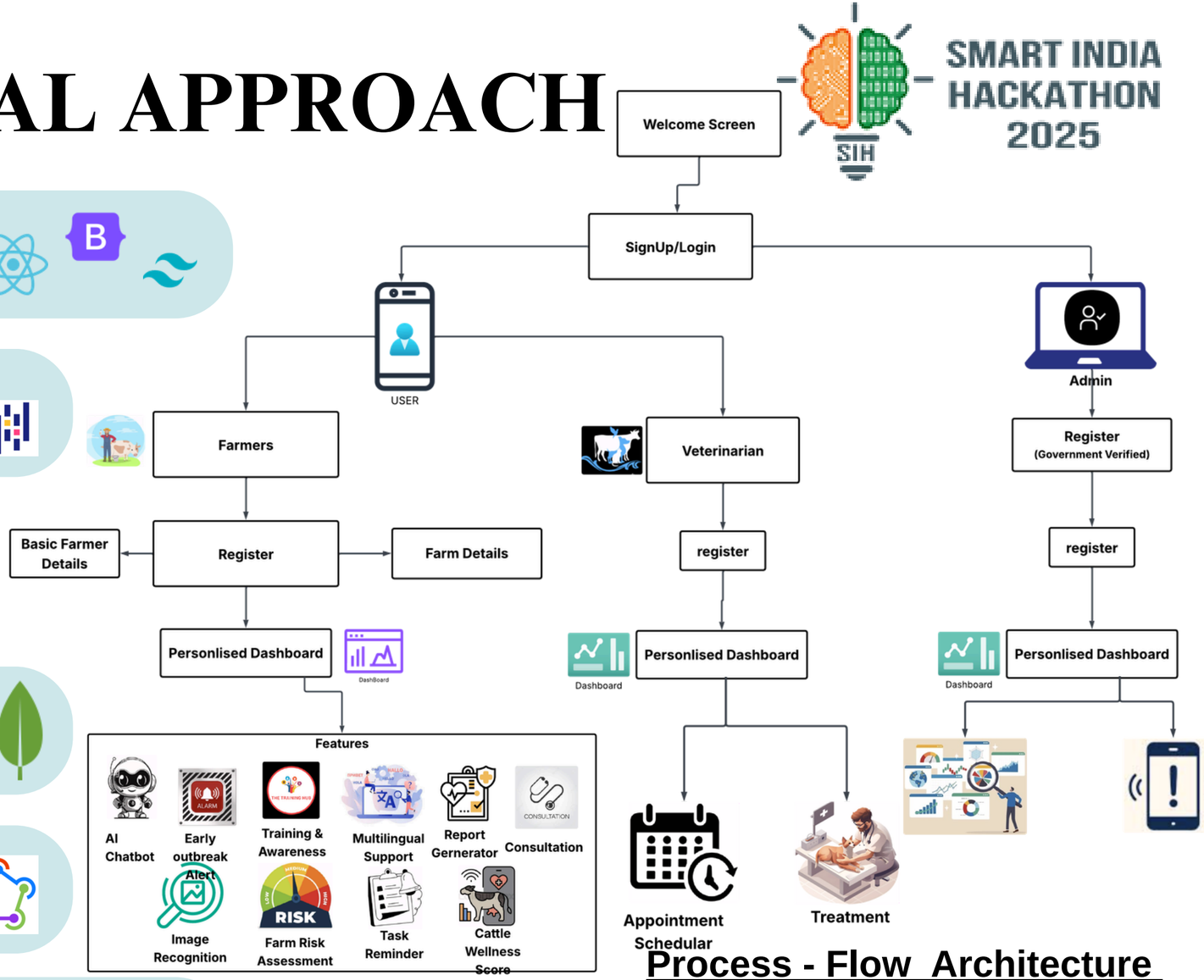
Express, Node.js, SQL, Mongodb, JsonWebToken

Mobile Development

Android Studio, Firebase, React native, Fastlane

Common Technologies

Github, Git, AWS cloud, APIs



Process - Flow Architecture

Product Status : Currently at 40% completion with continued progress underway.

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FEASIBILITY AND VIABILITY

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Feasibilty Analysis :

- **Technology:** Uses existing AI, cloud, blockchain and mobile app tech → easy to build & scale.
- **Operational:** Farmers only need a smartphone, local language + simple UI ensures adoption.
- **Economic:** Can be supported by govt/NGO schemes; cost-effective mobile-first deployment.
- **Social:** Farmers have a strong incentive to use it since it protects livestock & income.

Challenges & Risks	Strategies to Overcome
Low farmer awareness and distrust of new technology.	multilingual, peer-to-peer learning
Low digital literacy and poor rural infrastructure.	A hybrid model using human intermediaries and an offline-first app.
Farmer concerns over data privacy and ownership.	A transparent data policy compliant with India's DPDP Act. (using blockchain)
High costs for farmers and the need for long-term platform funding.	A Public-Private Partnership (PPP) model using government funds.

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IMPACT AND BENEFITS

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Potential Impact on the Target Audience :

- Smallholder farmers shift from a reactive to a proactive and preventative biosecurity posture.
- Farmers reduce devastating economic losses from outbreaks and can improve their market access.
- Farmers gain critical expertise through accessible and multilingual learning.
- Veterinarians and health workers are equipped with digital tools to provide better, data-driven advice.
- The public benefits from a more resilient food supply chain and stable food prices.

SMART BIOSAFETY

Enhancing health | Protecting livelihoods

Benefits of the Solution :

- **Economic:** Prevents financial losses, improves market access, and stabilizes food prices.
- **Public Health:** Boosts food security, improves disease preparedness & supports the One Health mission
- **Farmer Empowerment:** Creates proactive farmers through accessible and multilingual learning.
- **National Resilience:** Builds livestock resilience, improves surveillance, and closes information gaps.
- **Governance:** Unified dashboard improves coordination and transparency.

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RESEARCH AND REFERENCES

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Comparison with existing solutions

Features	Existing	Proposed solution
Image Recognition	✖	✏️ In progress
Heat Maps	✖	✅ Completed
Veterinary connect	✔	👀 Under review
Multilingual support	✔	✅ Completed
Early Outbreak Alert	✖	✅ Completed
Farm Risk Assessment	✖	✏️ In progress