# SMART INDIA HACKATHON 2025

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- **Problem Statement ID – SIH25002**
- **Problem Statement Title - AI-Powered Tourist Safety with Geo-Fencing & Blockchain ID**
- **Theme - Travel & Tourism**
- **PS Category - Software**
- **Team ID - 54692**
- **Team Name - ByteLords**

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# SOLUTION

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## Proposed Solution - YatraRaksha

- **Tamper-proof Digital ID** issued at entry points, secured with RSA, Blockchain, and IPFS for safe KYC, trip, and emergency records.
- YatraRaksha app with **offline geo-tracking**, safety scores, geo-fence alerts, panic button, and **ARIMA**-based high-risk zone detection.
- **IoT tracker** (Arduino Nano + GPS + Iridium) for encrypted **SOS signals** in remote or low-connectivity areas.
- **Garuda Dashboard** for police with real-time clusters, heatmaps, Digital IDs, and last known locations.
- Enhanced by **Isolation Forest detection**, seven trust checkpoints, and global compliance for faster, safer response.

## Problem Addressing:

- Tourist safety in remote and high-risk areas remains a challenge, as traditional tracking and policing are often too slow.
- Over 29,000 tourists go missing annually (NCRB, 2023), with response times in remote areas exceeding 3–4 hours, risking lives.
- These safety issues also impact tourism, causing a 15–20% revenue drop in vulnerable zones.

## Innovation /Uniqueness

- **Secure Digital ID** – Trip-only ID with Blockchain, IPFS, RSA for KYC and emergency info.
- **YatraRaksha App** – Multilingual app with offline tracking, alerts, panic button, and AI risk detection
- **IoT & Garuda Network** – Satellite SOS tracker linked to police dashboard with heatmaps and anomaly alerts.

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# TECHNICAL APPROACH

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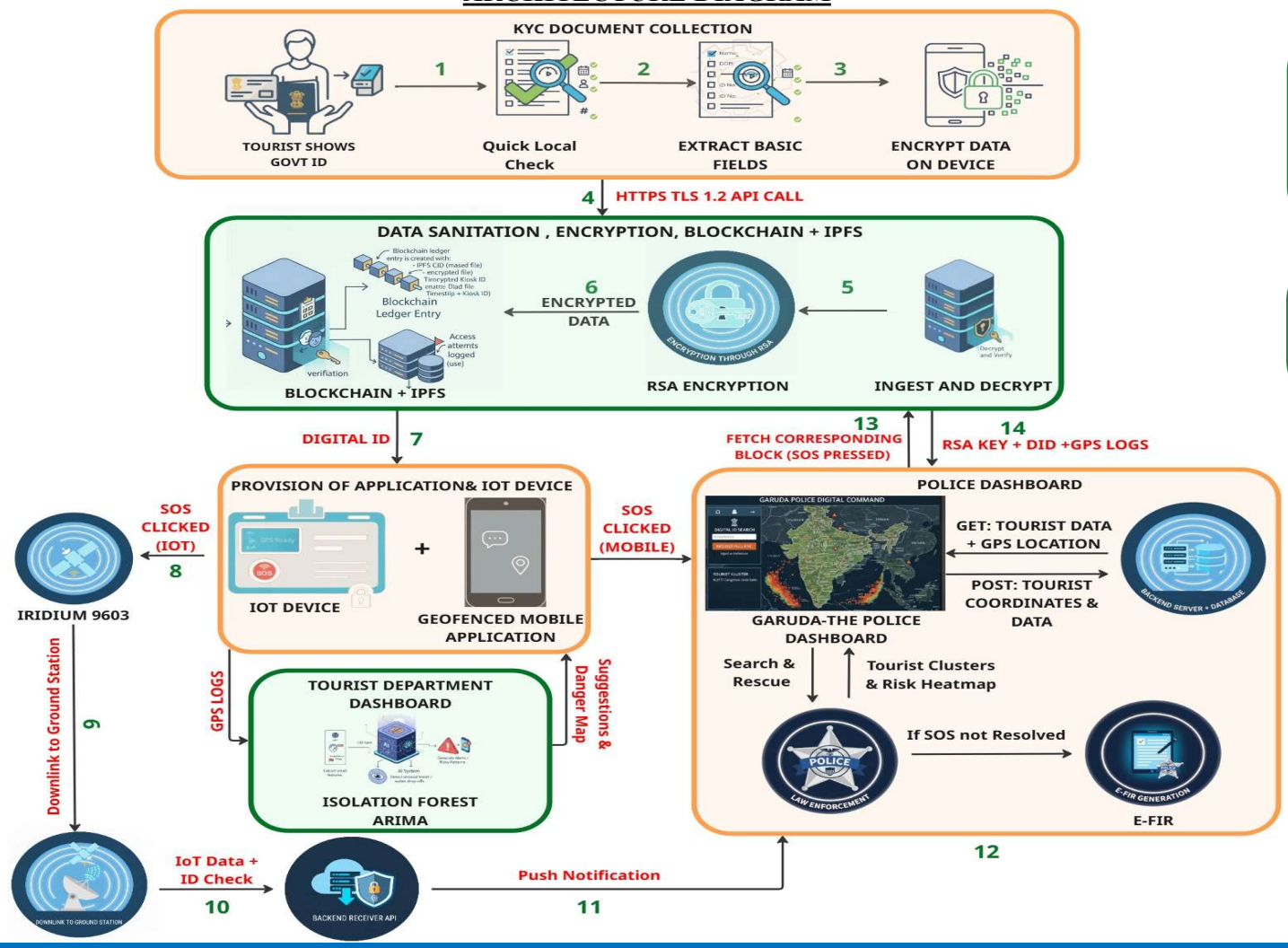
## ARCHITECTURE DIAGRAM




## Tech Stack

### AI MODEL

- **Danger Detection :** Isolation Forest
- **Danger Zone Prediction :** ARIMA

### IOT DEVICE

- NEO6M+IRIDUM 9603
- Arduino Neo

### FRONT END LAYER

- REACT
- FLUTTER
- TAILWIND CSS

### BACK END LAYER

- Ganache / Truffle
- Ethereum Blockchain
- IPFS

(WEB3)

- SQLite
- Python (FastAPI)
- RSA Encryption
- JWT Authentication
- ISOLATION FOREST & ARIMA
- Docker
- Cloud Deployment

### LINKS FOR REFERENCE

GIT : SOURCE CODE

YOUTUBE : VIDEO

DASHBOARD PREVIEW : GARUDA-PORTAL

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# FEASIBILITY AND VIABILITY

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***Feasability***

- **Technical Feasibility** → Built with low-cost, proven tech (Flutter, FastAPI, IoT, cloud) and supports offline SOS via SMS fallback.
- **Operational Feasibility** → Easy-to-use mobile app and dashboards integrate smoothly into existing tourism and police workflows.
- **Economic Feasibility** → Affordable components and open-source stack keep costs low while boosting tourism revenue and job creation.

***Potential Challenges and Risk:***

- **Tourist Safety**→Ensuring the real-time safety of tourists in remote or high-risk areas
- **Secure IDs**→ Issuing tamper-proof digital identities valid for the duration of the visit
- **Connectivity**→Operating effectively in low or no connectivity areas without data networks
- **Data Privacy**→ Protecting tourists' personal and location data from unauthorized access

***Strategies to overcome risks:***

- **Proactive Monitoring** → AI, geo-fencing, and IoT enable real-time alerts with SOS support.
- **Blockchain Platform** → Time-bound, verifiable tourist IDs secured on blockchain.
- **Offline Support** → IoT devices with GPS and SOS work even without network.
- **Encrypted Data** → End-to-end encryption with compliance to data protection laws.

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# IMPACT AND BENEFITS

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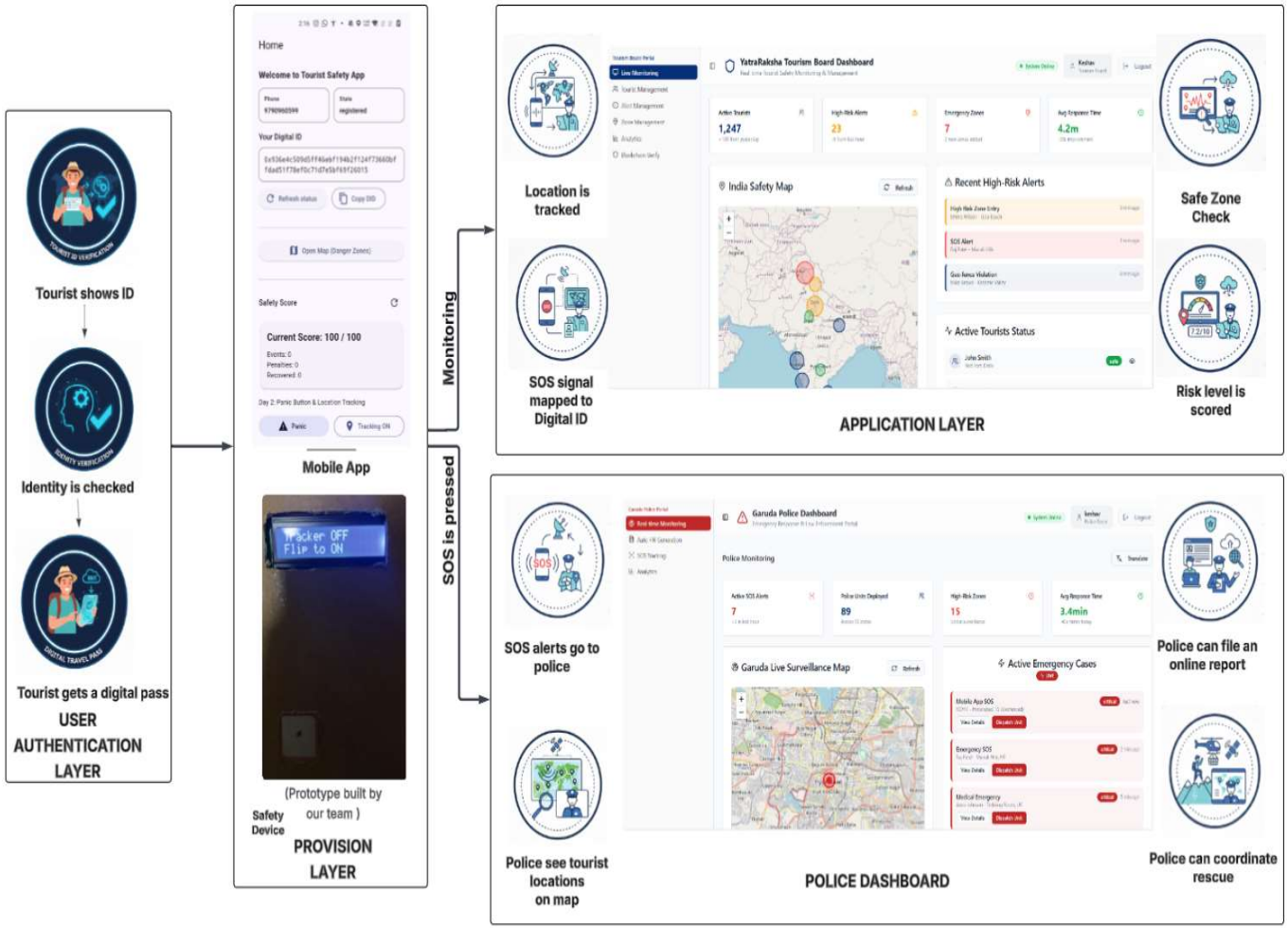
## *Benefits of the Solution:*

- **Social** → Ensures tourist safety with real-time alerts, multilingual access, and offline SOS in remote areas.
- **Economic** → Builds visitor confidence, boosts tourism revenue, and creates jobs in safety-tech sectors.
- **Governance** → Provides tamper-proof records, automated E-FIRs, and faster, accountable emergency response.

## *Impacts on the target audience:*

- **Tourists:** Safer, stress-free travel with real-time alerts and SOS support.
- **Authorities:** AI anomaly detection with automated E-FIR generation.
- **Tourism Industry:** Stronger trust, reputation, and higher tourist inflow.

## Process Diagram



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# RESEARCH AND REFERENCES

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- **Offline GPS Tracking System** - Describes a GPS-GSM based tracking system that works in areas with no internet connectivity. https://ijirt.org/publishedpaper/IJIRT151751_PAPER.pdf
- **Android based map location tracking system without internet** - Proposes an Android-based offline location tracking method using GPS and .mbtiles mapping. https://ijariie.com/AdminUploadPdf/ANDROID_BASED_MAP_LOCATION_TRACKING_SYSTEM_WITHOUT_USING_INTERNET_ijariie2968.pdf
- **Geofencing Technology in the Modern World** - A comprehensive study on the evolution of geofencing from basic GPS systems to advanced hybrid models integrating AI and IoT. https://ijirt.org/publishedpaper/IJIRT174832_PAPER.pdf
- **Real Time Response (RTR)** - A smart tracking approach - The article introduces Real Time Response (RTR) as a smart system to improve destination resilience in tourism. https://eprints.bournemouth.ac.uk/36546/7/Real%20Time%20Response%20%20RTR%20%28002%29.pdf