TITLE PAGE

- **Problem Statement ID –** SIH25165
- **Problem Statement Title-** Temple & Pilgrimage Crowd Management (Somnath, Dwarka, Ambaji, Pavagadh)
- **Theme-** Heritage & Culture
- **PS Category- Software/Hardware-** Software
- **Team ID-**
- **Team Name (Registered on portal)-** The Marauders

The Marauders

DivAura

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Why our solution is unique ?

Currently,
- manual monitoring
- local police deployment
- traditional queue systems

Futuristic,
- Promises a safe and comfortable devotee experience.
- Integrates AI, IoT, and virtual queuing into one system.

Virtual Queue & Smart Ticketing

>Multilingual web application for smooth devotee experience
>IoT-based QR code scanning for entry & parking management

AI Prediction & Monitoring

>Forecast crowd size and waiting time
>Real-time crowd mapping with fall/stampede risk alerts

Safety & Assistance

>Sensors (CO_2, heat) for monitoring environment
>SOS buttons for timely help
>Dedicated support for elders & differently abled

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TECHNICAL APPROACH

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Hardware

- QR code scanner
- Camera
- IR sensor
- CO2 sensor
- heat Sensor
- Smart Barricade
- SOS Buttons
- GPS sensor

Microcontroller Board

Frontend

Webpages

>>HTML and embedded CSS

USER

- Home
- Login
- Sign up
- Booking
- My Booking
- Parking Analytics & Reports

ADMIN

- Dashboard
- Sensor Monitoring Page
- Crowd Prediction & Analytics Page
- Booking Management Page
- Alerts & Safety Management Page
- Smart Barrier Control Page

JSON

Fetch()

BACKEND

flask

Api EndPoints

>> PYTHON

- Sign in and Login
- Crowd prediction
- Bookings and View Bookings
- Booking Details

Database

(Somnath_temple _Data)

>>SQLITE

Tables

- User
- Booking
- Persons
- Parking Slots

AI MODEL

PYTHON + GOOGLE COLLAB

(Supervised ML Regression Model to Predict feature Crowd)

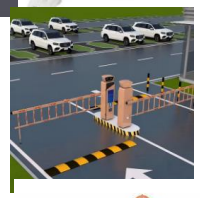
Dataset

- Date related features
- Festival related
- Weather based
- Lag features

Data Processing → Model training → Evaluation

- Calculation of crowd size using Heatmaps.
- Fall detection using YOLO models





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FEASIBILITY AND VIABILITY

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FEASIBILITY:

Technical: Can implement using web technologies, AI-based crowd prediction ,IoT devices such as QR scanners, CO_2/heat sensors, and SOS buttons.

Operational: Can efficiently manage temple crowds through virtual queueing, provide assistance to elders and differently-abled devotees, and ensure safety while facilitating smooth parking.

Resource: The project is achievable within the available time and hardware resources.

CHALLENGES:

- Ensuring user adoption among rural devotees.
- Maintaining crowd safety, including fall detection and emergency response in dense gatherings.
- Providing adequate on-ground support for devotees during emergencies.
- The AI-based crowd prediction model may provide inaccurate results.

MITIGATION STRATEGIES

- Implement multilingual tutorials and orientation programs to promote user adoption.
- Use redundant sensors and robust AI algorithms to improve fall detection and emergency prediction.
- Deploy trained staff or volunteers to assist devotees and ensure prompt intervension in emergencies.
- Regularly validate and update prediction model , include real-time monitoring to handle inaccuracies

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IMPACT AND BENEFITS

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Impact & Benefits of Smart Pilgrimage Crowd Management

1. Social Impact

1.Safer, stress-free darshan for **all devotee**

2.Assistance for **elderly & differently-abled and** Faster **emergency response**

2. Economic Value

1.Reduced manual monitoring → **cost & time savings**

2.Optimized staff, traffic & parking → **better resource use**

3. Scalability

1.Expandable to **all major pilgrimage sites**

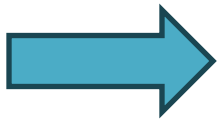
2.Centralized **AI & IoT system** for authorities

4. Emotional Message

From **crowd chaos → smooth, safe, spiritual experience**

Infographic Idea

Long queues, overcrowding, struggling elderly, delayed help, traffic jams



Virtual queues, smooth flow, assisted access, SOS alerts, smart parking

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RESEARCH AND REFERENCES

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1. Recent Trends in Crowd Management Using Deep Learning Techniques
2. An Intelligent IoT Approach for Analyzing and Managing Crowds
3. Implementation of Anti-Stampede System to Control Crowd Using Image Processing
4. IoT-Based Framework for Crowd Managesment
5. Deep Learning in Smart Video Surveillance for Crowd Management: A Systematic Review