

Agile Pune 2025 Conference - DYPCOE Project Presentation and Competition Plan

1. Project Title: Dual-Domain Drone-Based Intelligence System for Crowd Management and Law Enforcement Surveillance.

2. Problem and Solution :

A. Crowd Management Domain – MVI–Janrakshak.

Problem:

Religious events and public gatherings such as the Kumbh Mela attract millions of devotees, creating immense challenges in crowd control, safety management, and coordination. Conventional systems like CCTV networks or manual policing are limited by field visibility and response delay.

Solution:

MVI-Janrakshak, an AI-driven aerial crowd management solution, uses drone surveillance and analytics to monitor crowd density, detect congestion or anomalies, bottlenecks at entry and exits and alert ground teams in real time. The system enhances administrative preparedness and public safety while reducing human risk.

B. Law Enforcement Domain – MVI–Rakshak

Problem:

Law enforcement authorities face challenges in area surveillance, Regular Night patrolling coordination, and emergency response particularly during urban security operations.

Solution:

MVI-Rakshak is an AI-based surveillance and patrolling system built for police and emergency units. It deploys autonomous MALE VTOLS equipped with cameras, and AI vision to detect incidents, Track and follow vehicles, or monitor zones efficiently. The system integrates with a command center dashboard for real-time visual intelligence and data analysis.

C. Extended Solution – MVI–TeerthRakshak

To strengthen safety for devotees and tourists, Maha Vaayu Innovations (MVI) is developing **TeerthRakshak**, a mobile application for pilgrims attending large religious events.

Purpose:

To provide early warnings, navigation help, and real-time safety information to pilgrims before and during the event.

Key Features:

- 1. Pre-Notifications:** Alerts about crowd density, route diversions, and weather updates before travel.
- 2. Smart Navigation:** AI-based route guidance towards less crowded access points.
- 3. Emergency Communication:** Syncs with MVI–Rakshak drones for on-ground public announcements and live alerts.
- 4. Lost-and-Found Support:** Allows pilgrims to report or locate missing individuals or belongings.
- 5. Multilingual Support:** Interface in Hindi, Marathi, and English.
- 6. Authority Dashboard:** Enables officials to push real-time updates to all registered users.

Together, **Rakshak**, **Janrakshak**, and **TeerthRakshak** form a unified **RakshaNetra Ecosystem**, combining aerial surveillance, crowd analytics, and digital communication for safe, efficient public management.

Why:

To revolutionize India’s public safety systems through indigenous drone and AI technologies, reducing dependence on manpower and enabling predictive crowd and security management.

What:

An integrated drone-based intelligence network for government and event administrations to ensure safe, monitored, and efficiently controlled large gatherings and public zones.

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Industry Domain – The “Where”

- 1. Crowd Management:** Religious congregations, public festivals, rallies, and political gatherings.
- 2. Law Enforcement:** Police departments, smart city surveillance, traffic monitoring, and emergency response operations, Indian Coast Guard.

Solution Provided – The “How” and Core Technology

1. Autonomous Drone Swarms with real-time video analytics.
2. Edge AI for faster decision-making without cloud latency.
3. Central Command Dashboard integrating both aerial and ground data.
4. AI-based Behavior Analysis for risk detection.
5. Public Address & Communication Integration for alerts and voice messages.
6. Secure Network Architecture with encrypted data transmission.

Core Technology Stack:

Computer Vision, AI/ML (YOLOv8), IoT, Cloud Integration, Edge Computing, and GPS Path Automation.

Impact Seen / Expected

Metric	Conventional Systems	MVI RakshaNetra Ecosystem
Area Coverage	1 km ² per patrol	8–10 km ² per drone
Response Time	20–25 min	< 5 min
Incident Detection Rate	40%	90%+
Manpower Requirement	500+	<100 support staff
Safety Efficiency	Medium	High

Expected Impact: Faster emergency responses, enhanced administrative coordination, reduced manpower strain, and improved citizen safety perception.

Optimal darshan guidance 24/7 help for best time & route to visit, Lost Person Identification - AI Finds the closest match, One tap Distress alert with location using App.

Current Status and Future Viability :

Current Status:

1. Prototype drones built and flight-tested successfully.
2. AI detection and voice broadcast modules functional.
3. Discussions in progress with **SPPU Research Park Foundation** for incubation support and technology validation.

Future Viability:

1. To form industrial collaborations with leading AI, Software, and electronics companies.
2. MVI will act as major project holder, while partner companies contribute in domains such as software development, AI model optimization, manufacturing, and communication systems.
3. Expansion into Smart City and Disaster Management Programs post Kumbh Mela 2027.
4. Providing drone pilots to government to simplify the workflow integration of system.

Business Model

- 1. B2G Model:** System deployment for police, municipal bodies, and government agencies.
- 2. B2B Model:** Partnerships with event management and industrial sectors.

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Revenue Streams:

1. Drone system sales and leasing
2. Annual maintenance and data analytics service contracts
3. Subscription for AI-based surveillance dashboard
4. Licensing of mobile app modules to government agencies

Support System :

Available Support:

1. Prototype development funded through the Research & Development (R&D) funds of D.Y. Patil College of Engineering.
2. Proposal under review for incubation at SPPU Research Park Foundation for extended R&D and commercialization support.
3. Incubation support under the DYPEC Dnyan Sagar Incubation Centre, providing workspace, mentorship, and access to institutional innovation resources.

Required Support:

1. Angel investment funding through the Angel Investors Association Pune for large-scale deployment and team expansion.
2. Industrial partnerships in AI software, drone manufacturing, and communication systems for technology scaling.
3. Institutional and government backing for pilot implementations under public safety and smart city programs.

Risk	Mitigation Strategy
Regulatory compliance for drone flights	Obtain permissions via DGCA and local police authorities.
Data privacy concerns	Implement AES encryption and government cloud hosting.
New Startup is unable to compete In such big tendors	Partnerships with big companies

Recognition and Achievements :

1. Selected for **Agile Pune 2025 Conference**, representing DYPCOE.
3. Selected for **Design Impact Movement – Pune Chapter** by *Titan Company Ltd., TinkerLabs, and Sattva Consulting* under *NEST (National Entrepreneurship Program for Social Transformation)*.
4. Awarded **“Best Startup – Student Category”** by *Hon’ble Shri Ashish Shelar and Shri Chandrakant Dada Patil* (Government of Maharashtra).
5. Secured **2nd Rank** in *Innovera 2025 National Hackathon* (K.K. Institute of Engineering & Research, Nashik).
6. Secured **3rd Rank** in *Elephant Tank* by *Datatech Labs & Just for Entrepreneurs*, with an **investment proposal of ₹8.35 lakhs**.

Team Name : Maha Vaayu Innovations

Team Members :



Aryan Amol Surve
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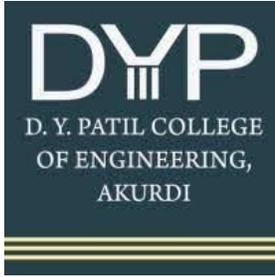


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Disclaimer & Confidentiality Notice:

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