Google Cloud

PRESENTS

Agentic AI Day

Build the next generation of intelligent agents

Powered by H2S

Team Details

a. **Team name: Praesidio**
b. **Team leader name: Atharv Agarwal**
c. **Problem statement: Improving Safety at Large Public Events**

Brief about the idea

Project Drishti: *The Agentic AI Command Brain for Crowd Safety*

- **Drishti** is a real-time, *agentic AI system* that autonomously manages **large-scale crowd safety** by predicting threats and coordinating multi-modal responses.
- It senses congestion, panic, and medical emergencies before they escalate and acts through **coordinated agents** controlling *drones, responders,* and *alerts.*
- Unifies vision, simulation, forecasting, and response into one **single orchestrated command brain.**
- Built 100% on Google's AI stack: **Gemini**, **Vertex AI**, **Firebase**, **Google Maps**, and **Drone APIs**.
- We're not building a feature. We're building the infrastructure for **AI-powered public safety** across cities, stadiums, and large events.

Opportunities

i) How different is it from any of the other existing ideas?

- While others rely on dashboards and alerts, Drishti makes real-time decisions, takes action, and manages responses without waiting on human input.
- Drishti is the only system that brings together computer vision, forecasting, autonomous drone coordination, and responder dispatch into a single orchestrated platform.
- We deliver intelligence at both ends, a command dashboard for event managers and a safety companion app for the public, keeping everyone informed and connected

ii) How will it be able to solve the problem?

- **Predicts incidents before they occur:** Using real-time forecasting and simulations to anticipate bottlenecks and risks up to 20 minutes before they surface, giving time to prevent rather than react.
- **Reduces response time :** Automatically identifies and dispatches the nearest responders via the fastest and safest route using GPS and Google Maps integration.
- **Eliminates overload on human operators:** Reduces operational fatigue by summarizing hundreds of camera feeds into concise, real-time updates using the Narrator Agent

Opportunities

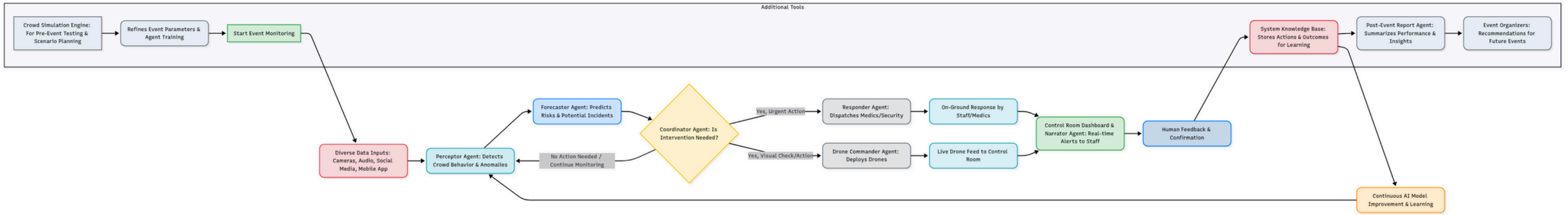
iii) USP of the proposed solution

- **Agentic Autonomy with Decision-Making**
  - Each of Drishti's agents (Perceptor, Forecaster, Coordinator, etc.) operates independently yet collaboratively, enabling real-time, coordinated responses without manual oversight.
- **Simulation-First Planning Model**
  - Organizers can simulate crowd movement before the event begins, revealing flow risks long before people arrive.
- **Multimodal Fusion Intelligence**
  - Processes vision, sound, social media, and app reports simultaneously, creating unmatched awareness of crowd behavior in real time.
- **Public-Side Safety Companion App**
  - Attendees receive personalized alerts, emergency routing, and can report incidents or upload missing person details, creating a live safety feedback loop.
- **Continuous Learning through Feedback**
  - Feedback from each event retrains our system, enabling continuous learning, better decisions, and a compounding advantage over time.

List of features offered by the solution

- **Perception Agent**: Detects crowd density, panic, audio anomalies, fire/smoke using live feeds.
- **Forecast Agent**: Predicts congestion or risk zones using AI simulations and flow modeling.
- **Responder Agent**: Finds and routes nearest medics/security through the fastest, least-crowded paths.
- **Drone Commander Agent**: Deploys autonomous drones for visual tracking of critical zones.
- **Coordinator Agent**: Orchestrates decisions autonomously and learns from human inputs.
- **Narrator Agent**: Summarizes status via natural language, supports multilingual commands.
- **Mobile Companion App**: Provides crowd alerts, SOS button, safety routes, and lost & found tools.
- **Simulation Engine**: Allows pre-event crowd flow testing in 2D/3D environments.
- **Post-Event Reporter**: Auto-generates analytics and risk breakdowns to improve future deployment.

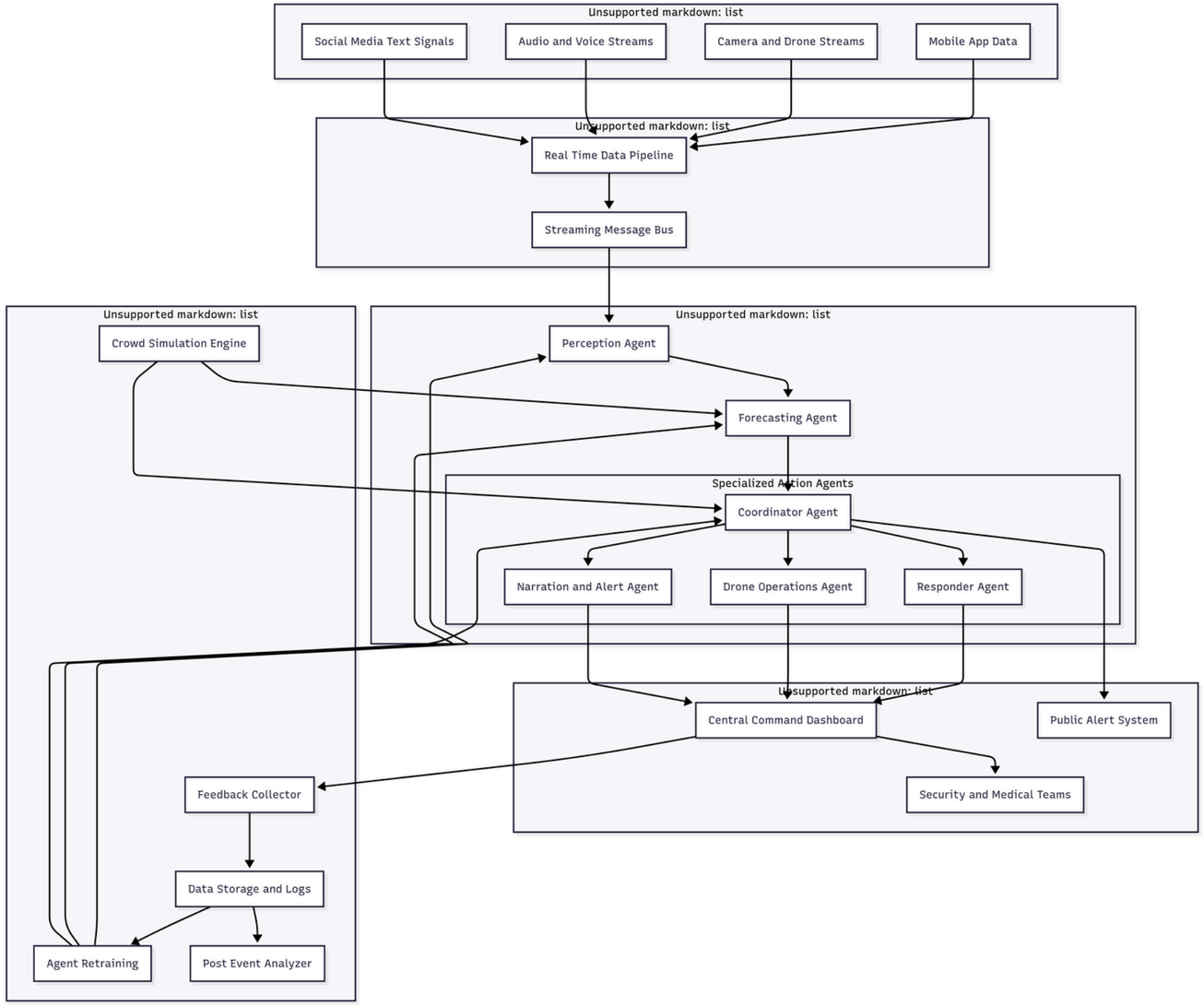
Process flow diagram or use-case diagram



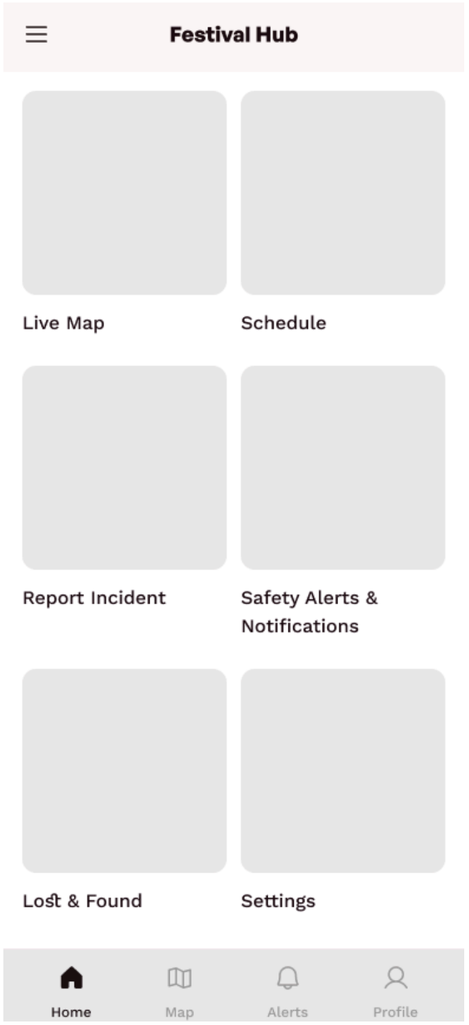
Technologies to be used in the solution

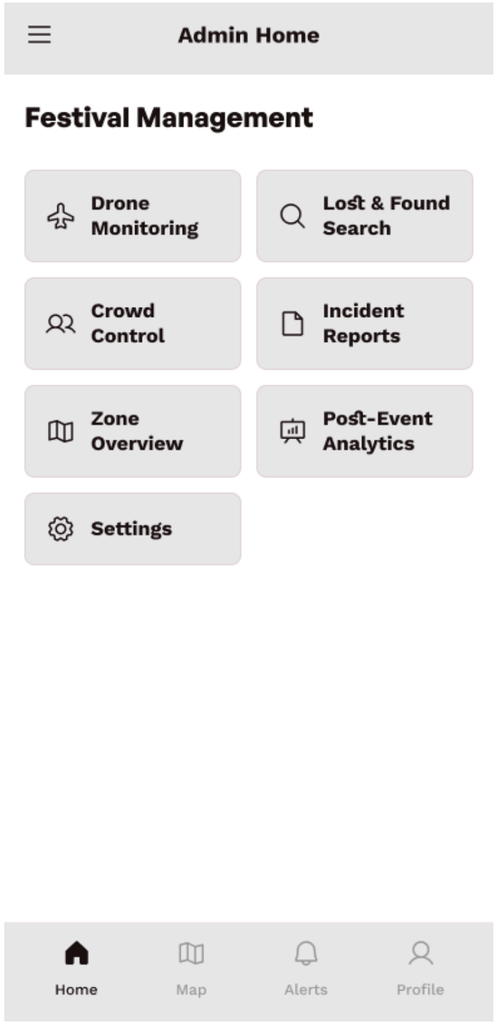
Stack Area	Google-Based Tech
Agent Intelligence	**Vertex AI Agent Builder**, **Gemini 1.5** (multimodal agents with LLM orchestration)
Vision & Detection	**Vertex AI Vision**, **PaLI**, AutoML Vision, Video Intelligence API, Cloud Speech-to-Text for audio signals
Forecasting & Simulation	**Vertex AI Forecasting**, **TensorFlow Agents (RL)**, **Vertex AI Workbench**, simulated environments via **Unity on GCP Compute Engine**
Real-Time Messaging & Ingestion	**Google Pub/Sub**, **Cloud Functions**, **Cloud Composer** for pipeline orchestration
Drone Control & Edge Compute	**Vertex AI Vision Edge**, **Cloud IoT Core**, **Edge TPU**, drone telematics via Cloud Run + Pub/Sub
Dispatch/Location Services	**Firebase Realtime Database / Cloud Firestore**, **Google Maps Routing API**, **Geospatial APIs**
Command Center UI	**Firebase Studio**, **Cloud Firestore**, **Cloud Functions**, **Cloud Build**
Mobile Companion App	**Flutter + Firebase (Auth, Messaging, Hosting)**
Multilingual Vocalisation	**Vertex Text-to-Speech**, **Translation API**, **Dialogflow CX for voice commands**
Learning & Feedback Retraining	Human feedback logged in Firestore → triggers retraining pipelines via **Vertex Pipelines**, **AI Platform**, and **Cloud Scheduler**

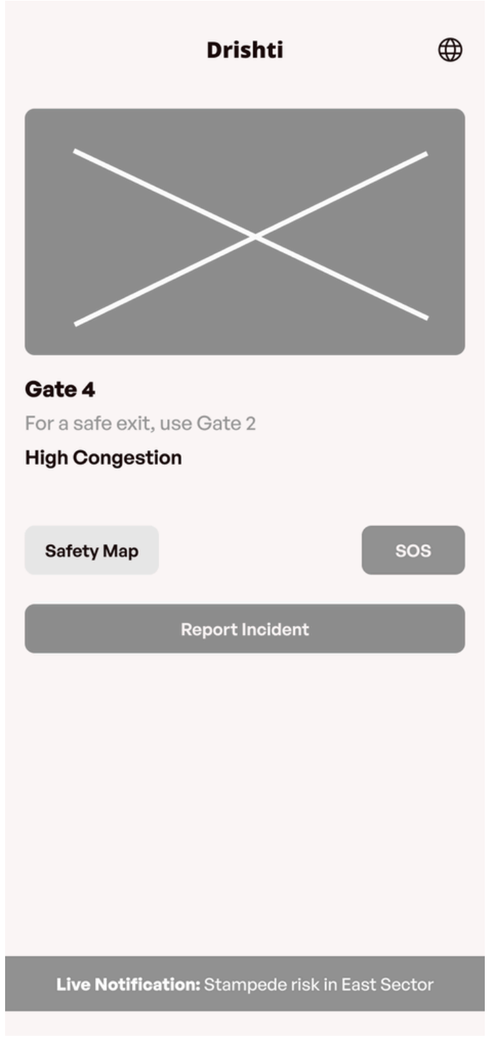
Architecture diagram of the proposed solution



Wireframes/Mock diagrams of the proposed solution (optional)







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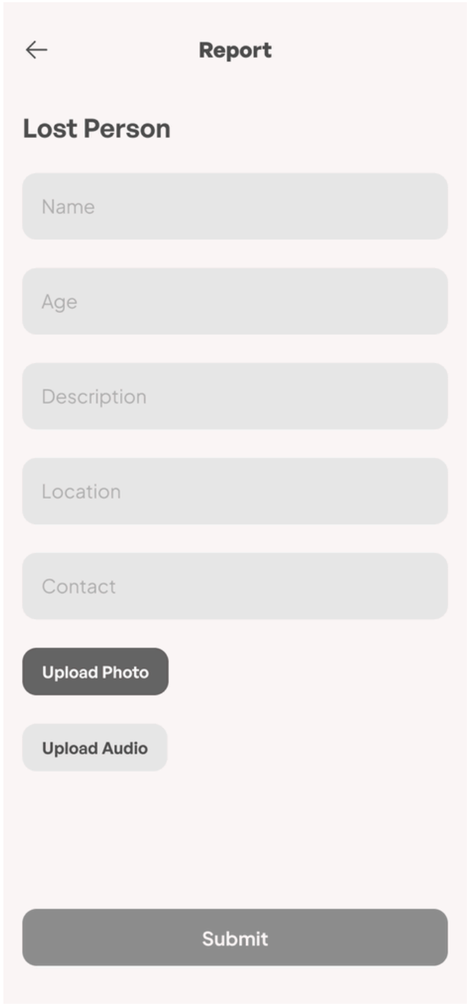

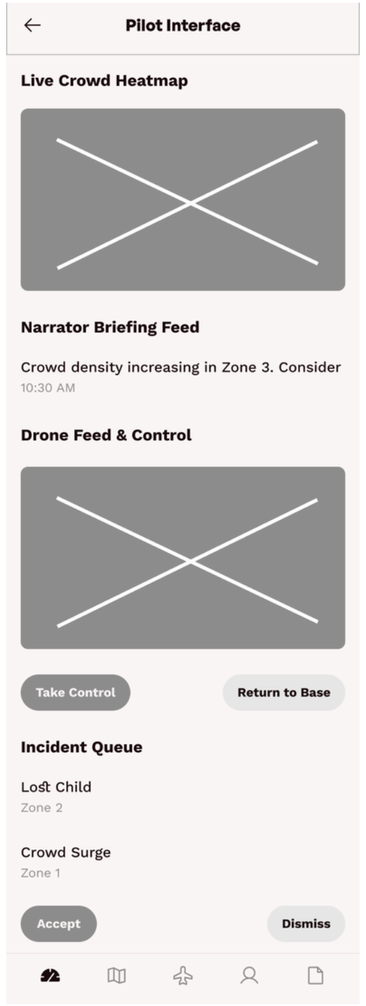

Strategic Differentiation

- **Designed for autonomy from the ground up:** Drishti takes action in real time without waiting for human input, replacing dashboards with decision-making agents.
- **Simulates before it surveils:** Our simulation-first approach stress-tests venues before an event begins, allowing organizers to prevent risks instead of reacting to them.
- **Combines multiple senses into one brain:** Drishti merges vision, sound, social data, and crowd inputs to form a complete picture no single-modality system can match.
- **Built with dual interfaces for public and command control:** We serve both sides of the safety equation, event managers get orchestration, and attendees get live alerts, guidance, and SOS tools.
- **Improves itself after every deployment:** Feedback, incident reports, and response data feed into retraining pipelines, making Drishti smarter, faster, and more reliable with each event.

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Thank you!