

# Project Drishti: Agentic AI Usage & Hackathon Progress Report

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## 1. Agentic AI & Google AI Technology Usage

### A. Vertex AI Vision

- **Where Used:**
  - drishti-mvp-functions/analyzeWithVertexVision.js
- **How Used:**
  - Every uploaded frame (from live webcam/mobile) is analyzed for person detection/count using Vertex AI Vision's object localization API.
  - This is the primary perception layer for crowd analysis.

### B. Gemini (LLM, Multimodal)

- **Where Used:**
  - drishti-mvp-functions/analyzeWithGemini.js
  - drishti-mvp-functions/analyzeWithVertexVision.js (calls Gemini after Vertex Vision)
- **How Used:**
  - Each frame (and its person count) is sent to Gemini, which:
    - Assesses crowd density, smoke, fire, medical emergencies, and risk.
    - Recommends incident creation and action.
    - Provides structured, actionable output for the agent to act on.

### C. Agentic Role (Autonomous Action)

- **Where Used:**
  - drishti-mvp-functions/analyzeWithGemini.js
  - drishti-mvp-functions/analyzeWithVertexVision.js
  - drishti-mvp-functions/incidents-api.js, responders-api.js
- **How Used:**
  - The system autonomously:
    - Detects risks/incidents.
    - Creates incidents in Firestore.
    - Assigns responders and updates zone status.
    - Updates the dashboard and triggers alerts.

### D. Firebase Studio & Deployment

- **Where Used:**
  - All backend functions are implemented as Firebase Functions.
  - Firestore is used for real-time data, incident, and zone management.
  - The frontend is integrated with Firebase for real-time updates.

## 2. Feature Coverage vs. Hackathon Objectives

Feature/Objective	Implemented?	% Complete	Details
<b>Predictive Bottleneck Analysis</b>	<b>Partially</b>	~60%	Real-time crowd density and person count via Vertex AI Vision. Prediction logic (e.g., Vertex AI Forecasting for 15–20 min ahead) is not yet implemented, but the data pipeline is ready.
<b>AI-Powered Situational Summaries</b>	<b>Partially</b>	~50%	Gemini can summarize risks per zone, but natural language querying and multi-source fusion (security reports, social media) are not yet fully implemented.
<b>Automate Intelligent Resource Dispatch</b>	<b>Yes</b>	90%	When an incident is detected, the system auto-creates the incident and assigns the nearest available responder. Route optimization (Google Maps) is not yet integrated.
<b>Detect Multimodal Anomalies</b>	<b>Yes</b>	90%	Gemini analyzes for smoke, fire, medical, and crowd surges in each frame.
<b>AI-Powered Lost &amp; Found, Sentiment, Drone Dispatch</b>	<b>Not yet</b>	0%	These are “go beyond” features and are not yet implemented.
<b>Firebase Studio &amp; Deployment</b>	<b>Yes</b>	100%	Project is built on Firebase Functions, Firestore, and deployed as required.

## 3. Agentic AI: Are We Using It?

- **Agentic API/AI Usage:**
  - **Vertex AI Vision:** 100% for perception.
  - **Gemini:** 100% for reasoning, risk, and incident recommendation.
  - **Agentic Automation:** 80–90% of the incident pipeline is autonomous (perception → reasoning → incident creation → responder assignment).
- **Vertex AI Agent Builder:**
  - Not directly used as a conversational agent, but agentic logic is implemented via custom code and Gemini.

## 4. UI & Dashboard Integration

- **Live Camera Feed:**
  - `src/components/CameraCapture.jsx` supports live streaming from webcam/mobile, uploading frames to the backend for analysis.

- **Real-Time Dashboard:**
    - `src/pages/Dashboard.jsx`, `src/components/dashboard/` display live risk, incident, and responder status.
  - **Incident & Responder Management:**
    - `src/components/incident/`, `src/components/incidents/` provide detailed incident and responder views.
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## 5. Overall Progress Estimate

- **Agentic AI Usage:**
    - **85–90%** of the backend pipeline is agentic and autonomous, using Google AI APIs.
  - **Hackathon Objective Completion:**
    - **Core objectives:** ~80% complete (perception, risk, incident, dispatch, dashboard).
    - **Advanced/“Go Beyond” features:** 0–10% (not yet started).
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## 6. Recommendations for Final Push

- **Add Vertex AI Forecasting** for true predictive bottleneck analysis.
  - **Integrate natural language querying** for situational summaries (Gemini chat agent).
  - **Add “go beyond” features** (Lost & Found, sentiment, drone dispatch) for bonus points.
  - **Polish UI** for real-time risk and incident visualization.
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## Summary Table

Area	% Complete	Notes
Agentic AI (Vertex+Gemini)	90%	Fully integrated for perception, reasoning, and action
Predictive Analytics	60%	Real-time, but not yet forecasting
Situational Summaries	50%	Gemini used, but not full NLQ
Automated Dispatch	90%	Incidents and responders auto-assigned
Multimodal Anomaly Detection	90%	Smoke, fire, medical, crowd surge
Go Beyond Features	0%	Not yet started
Firebase Studio/Deployment	100%	Fully deployed

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**You are in a strong position for the hackathon!**  
**Focus on predictive analytics, NLQ, and “go beyond” features for maximum impact.**