# AI Agents | Video Intelligence Platform

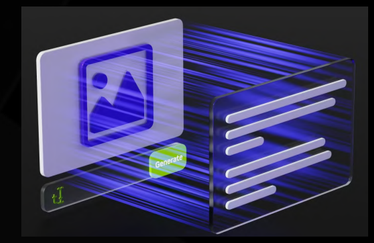



AI PM Case Study

Presenter: Ayan Sircar

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# What will be covered today



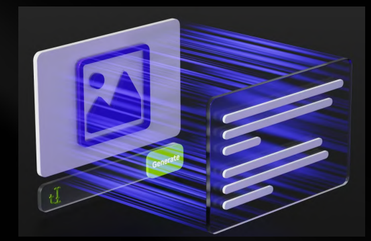
## Topics

1. Vision for cyCity Solution Suite
2. Competitive Landscape and Differentiation
3. Proposed AI Agents to Integrate
4. Job to be Done, Core Solution and Value Proposition
5. Technical Architecture
6. Bonus: 6M Roadmap

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# Vision

*Transform urban surveillance footage into proactive intelligence for safer, smarter cities*



This means turning sight into **Insight**

1/ Enable users to ask questions and get answers from video data, uncover trends and automate enforcement

2/ Combine deep Vision AI with Generative AI enabled by Agentic AI

## Ideal Customer Profile

1. Urban traffic enforcement agencies in Singapore, Indonesia, Malaysia
2. Large-scale urban security monitoring departments
3. Transport & Infrastructure analytics teams
4. Govt operations managers
5. City planning boards
6. Law enforcement leadership and policy units

## What challenges are they facing?

1. Long video review times for incident investigation
2. Difficulty converting vast video data into actionable security patterns
3. Missed trends and anomalies due to fragmented and unstructured data sources
4. Inefficient reporting workflows slowing operational decision-making
5. Lack of clear, data-backed insights for long-term infrastructure and zoning plans
6. Limited access to concise, high-level situational summaries for informed policy action

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# Competitive Landscape and Differentiation

| Platform | Core Features | Agentic AI Capabilities | USP |
|---|---|---|---|
| BriefCam | Post-event forensic video analytics platform: VIDEO SYNOPSIS® tech for rapid review, multicamera search, realtime alerts, and BI dashboards | Partial – Introduced a mobile app with "natural language textual search" chatbot to find people/objects by description. Lacks generative text output (relies on visual synopsis rather than AI-written summaries). | Mature and Proven Investigative Tool – Industry leader in condensing hours of video to minutes (visual synopsis) and filtering search criteria. |
| VAIDIO® BY IRONYUN | Comprehensive AI video analytics suite (30+ detectors). Modular platform deployable on-prem or cloud.<br><br>Recently added GenAI features | Yes – New "agentic intelligence" release uses a CLIP-based engine for natural language video search and alert fine-tuning. Users can refine queries like "person holding a red purse" to pinpoint events. (No known auto text summaries yet, focus is on NL search & detection). | Broad & Scalable Analytics – Large library of out-of-the-box analytics with NL interface added.<br><br>High adaptability (integrates with various systems).<br><br>Accuracy boost by combining proprietary models with CLIP embeddings for better search precision |
| Ambient.ai | AI-powered physical security platform for real-time threat detection (enterprise focus): detects intrusions, tailgating, weapons, fights with context-awareness.<br><br>Integrates with access control and maps. | Limited – No user prompt interface (system uses pretrained "contextual AI" models). | Proactive Contextual Alerts – Known for extremely low falsealarm rates via context (e.g. distinguishing a broom vs. rifle). Real-time automation with HITL verification for critical alerts. |
| AVIGILON a Motorola Solutions Company | Adjacent offering.<br><br>E2E video surveillance offering analytics like motion anomaly detection, license plate recognition, face/appearance search.<br><br>Primarily rulebased configurations. | No – Does not offer generative or NL agent interface. Users search via structured filters or image matches (e.g. upload face to find matches). Analytics are traditional (ML/CNN-based) focusing on predefined events. | Enterprise Reliability – Trusted VMS with hardware integration. "Appearance Search" feature allows finding people across cameras by image. Scalable for city-wide deployments, but analytics are less flexible (limited to trained classes, lacking the open-world understanding of VLMs). |

Growth in APAC AI Video Analytics

23–25% CAGR

Reduction in false alerts with GenAI deployment

~85%

Improved Outcomes with Agentic AI

Q3 2022

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# Why the need for Agentic AI

## Market Gap

While detection and summarisation are solid, there is untapped potential in **Agentic AI** - systems that **orchestrate tasks, multi-step reasoning over outputs, and proactively identify patterns**.

## Opportunity

The Innovation Lab should focus on **designing and integrating Agentic AI layers** that:

- Build **multi-step workflows** on top of existing detection/summarisation
- Trigger **real-time alerts and reports** based on evolving context
- Support **non-technical users** with natural language interaction

## Proposed High-Impact Agents

**Agent #1 – City Analyst** - Natural Language Video Query & Insights Agent

*Enables any stakeholder to **ask complex, ad-hoc questions** of the city's visual data and get **reasoned, context-aware answers**. **Priority** as it helps in Ops efficiency*

**Agent #2 – City Reporter** - Automated Video Summarisation Agent

*Generates **on-the-fly summaries and AI-authored reports** tailored to specific audiences (Ops, Exec, Planners)*

## Strategic Impact

- **Significant Time Savings** – Reduce incident review cycles by up to 70%
- **Higher Detection Rates** – Multi-parameter reasoning detects patterns earlier
- **Democratised Insights** – Anyone can query and get actionable answers at scale

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# Agent #1 - City Analyst - Overview

## Job to be Done

*Enable city operations teams to instantly detect and understand unusual patterns in video data using natural language queries and AI-driven anomaly detection.*

## Core Solution

1. Natural language interface for archived video and metadata search
2. Multi-step reasoning to answer complex queries (time + location + object + behavior)
3. Output with linked video evidence and key timestamps

## Core Functionalities

1. Interpret natural language queries and convert them into structured searches over cyCity's indexed video archives.
2. Retrieve and rank relevant video segments, metadata, and event clusters.
3. Present results with evidence (timestamps, object tags, motion patterns, zone data) and allow export for reporting.

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# Agent #1 - City Analyst - Value Proposition

## For City Planning

1. Infrastructure Planning Input - Identifies recurring traffic bottlenecks, crowding zones, or safety hazards to inform long-term planning.

2. Early Risk Identification - Detects minor anomalies before they evolve into significant operational or safety issues.

3. USP vs Competitors - Competitors may surface anomalies but often without location-temporal context; Cynapse's contextual tagging increases decision usefulness.

## For Operations Teams

1. Proactive Insight Discovery - Flags anomalies and patterns without waiting for manual review, enabling quicker awareness of unusual trends.

2. Reduced Monitoring Burden - Cuts down the need to manually scan multiple hours of footage by surfacing only statistically significant deviations.

3. Scalable Surveillance Analysis - Can handle large-scale deployments without additional manpower.

## For Leadership

1. Evidence-Based Decision Support - Provides a factual, data-backed view of incidents and patterns for resource allocation and strategic planning.

2. Consistency in Detection - Reduces human oversight errors by applying uniform detection logic across all zones.

3. Clear, Action-Oriented Insights - Outputs are prioritised by relevance and impact, enabling leadership to focus on high-value actions.

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# Agent #2 - City Reporter - Overview

## Job to be Done

*Deliver consistent, audience-specific summaries of city incidents and trends, reducing manual report creation from hours to minutes.*

## Core Solution

1. Automated, narrative-style daily/weekly incident summaries
2. Trend detection with visual highlights
3. Configurable for different stakeholder needs (operations vs policy)

## Core Functionalities

1. Aggregate daily/weekly/monthly metadata from cyCity archives.
2. Detect recurring patterns, anomalies, and statistical outliers.
3. Auto-generate narrative summaries with visuals for decision-makers.

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# Agent #2 - City Reporter - Value Proposition

## For City Planning

1. **Early Visibility into Trends** – Detects recurring issues (e.g., repeated vandalism in the same zone) before they escalate.

2. **Actionable Recommendations (Potential)** – Lays the groundwork for prescriptive insights, such as patrol adjustments in response to patterns.

3. **USP vs. Competitors** – Offers plain-language narratives with visuals, making complex intelligence accessible to non-technical stakeholders—an area where competitors often fall short.

## For Operations Teams

1. **Insight in Minutes vs. Hours** – Eliminates the need for half-day manual report collation by producing summaries in minutes.

2. **Comprehensive Awareness** – Flags all relevant incidents consistently, including smaller events that might otherwise be overlooked until they accumulate.

3. **Scalability** – Handles data from 50 to 5,000+ cameras without proportional increase in human resources, scaling seamlessly with smart city sensor expansion.

## For Leadership

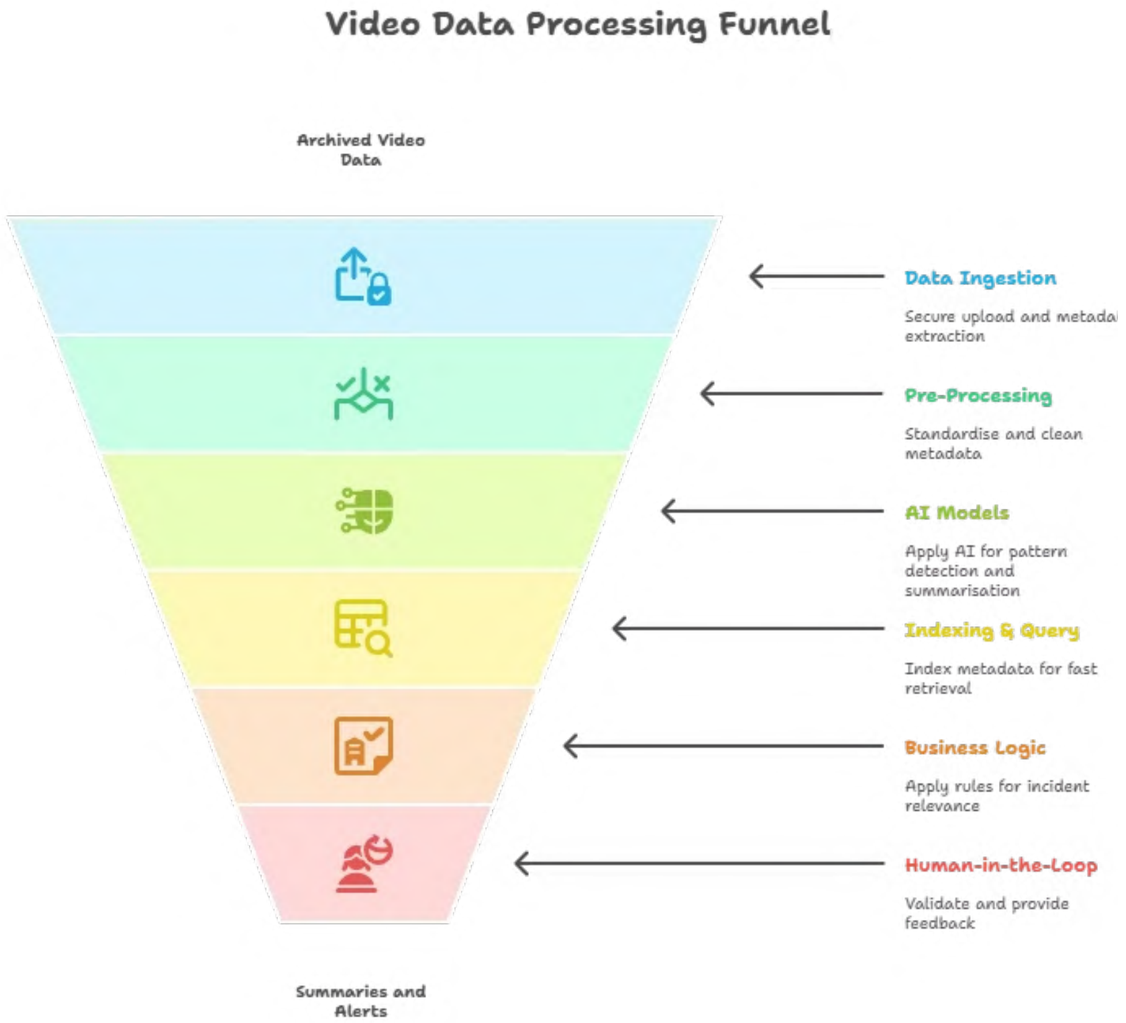
1. **Executive-Ready Reports** – Delivers polished, narrative-driven summaries with visual context, ready for briefings without additional editing.

2. **Consistency and Objectivity** – Maintains a standard reporting format and criteria, reducing variability and bias in intelligence outputs.

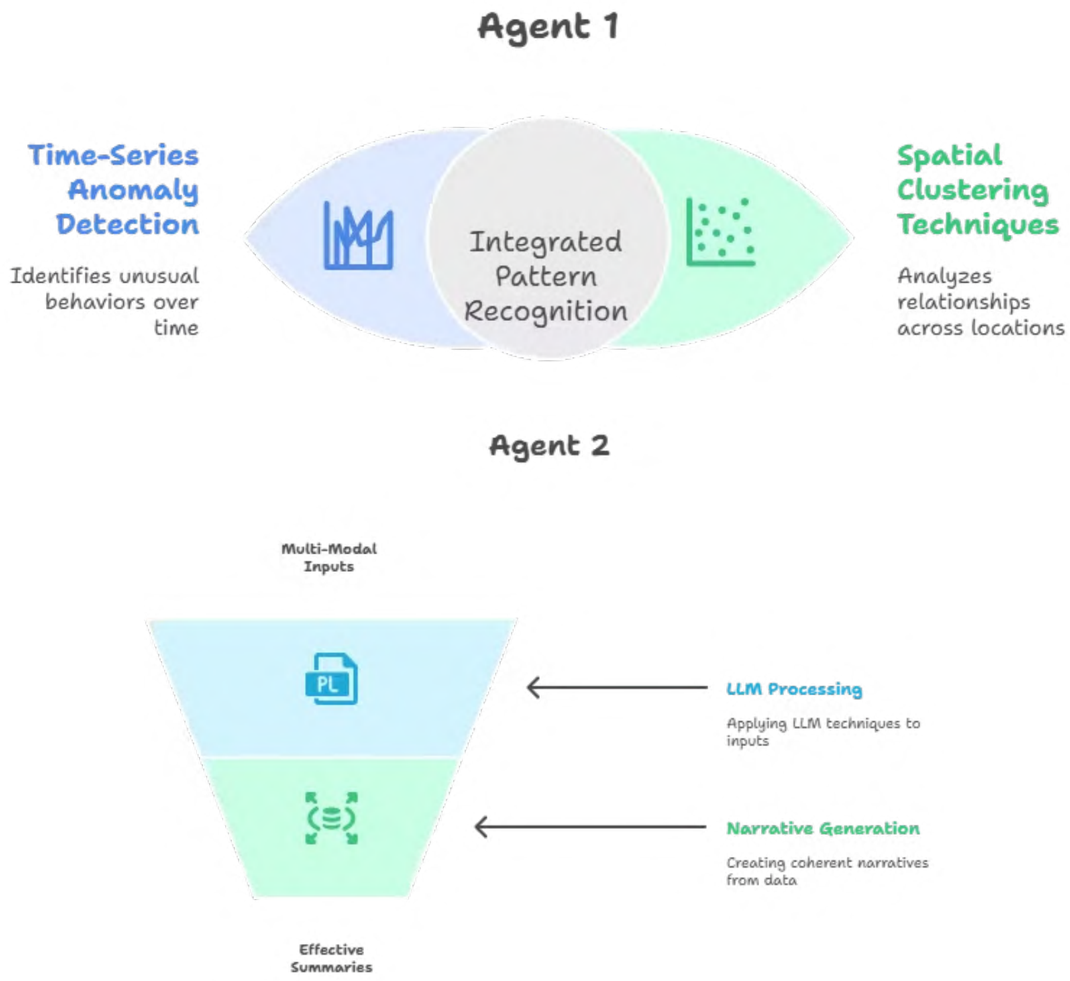
3. **Enhanced Communication** – Can generate tailored versions for different audiences—technical detail for analysts, high-level trends for executives.

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# High Level Architecture




# Core AI Models




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# Agent #1 - City Analyst - 6M Themes

| Month | Theme | Milestone | Effort | Impact | Notes |
|---|---|---|---|---|---|
| M1 | Data ingestion & metadata indexing pipeline setup | Build small-scale prototype with archived video metadata + location/time tagging. | High 🔴 | High 🔴 | Ensures structured inputs for anomaly models. |
| M2 | Dino & time-series anomaly detection model integration | Validate anomaly queries on sample dataset (few zones, 1 week). | High 🔴 | High 🔴 | Directly impacts accuracy of anomaly detection. |
| M3 | API integrations (internal Cynapse + external geospatial) | Connect to APIs and enrich with other data points. | Medium 🟡 | Medium 🟡 | Adds contextual mapping, useful for visual validation. |
| M4 | Pattern mining & anomaly scoring pipeline build | Deploy pipeline. | High 🔴 | High 🔴 | Core logic to detect and rank anomalies. |
| M5 | ICP-specific business rules & alert templates | Customise anomaly thresholds per ICP (e.g., crowd >100 in parks), create auto-alert formats. | Medium 🟡 | High 🔴 | Improves relevance of alerts to each ICP. |
| M6 | HITL feedback loop + continuous model fine-tuning | Launch HITL review screen for anomaly validation; feed confirmed cases into retraining loop. | Medium 🟡 | High 🔴 | Directly improves model precision & recall over time. |

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# Agent #1 - City Analyst - Tech Components

## Data Inputs

Ingest archived video metadata (objects, incidents, location, timestamps) and enrich with external datasets (weather, event schedules).

## Metadata Indexing

Classify incidents and apply time–location tagging, optimised for “pattern over time” and “anomaly vs baseline” queries.

## Models

Apply Dino for visual embedding similarity and time-series anomaly detection models for baseline deviation scoring.

## APIs

Integrate with internal Cynapse video intelligence API for metadata retrieval and external geospatial APIs for mapping coordinates.

## LLM Query Structuring

Convert natural language requests (“Find unusual traffic patterns in Zone B”) into structured, multi-filter metadata queries.

## Pipelines

Build pattern mining and anomaly scoring/prioritisation pipelines with real-time scoring against historical baselines.

## Business Rules

Define ICP-specific thresholds (e.g., crowd count > 100 in park zones) and create incident explanation templates.

## HITL + Improvement

Deploy operator validation screens, track evaluation metrics (precision, recall, F1 score), and fine-tune with feedback loops.

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# Agent #2 - City Reporter - 6M Themes

| Month | Theme | Effort | Impact | Notes |
|---|---|---|---|---|
| M1 | **Data aggregation & indexing for fast retrieval** – Build aggregation pipeline from Cynapse analytics API. Index incidents by type, time, severity, and relevance tags. | High 🔴 | High 🔴 | Foundation for accurate summarisation queries. |
| M2 | **Qwen2.5-VL integration + RAG setup** – Integrate Qwen2.5-VL for multi-modal summarisation; set up RAG for richer narratives. | High 🔴 | High 🔴 | Enables high-quality, context-rich summaries. |
| M3 | **API integration (Cynapse analytics + template rendering)** – Connect analytics API + report rendering API for multi-format exports. | Medium 🟡 | Medium 🟡 | Allows automated report creation at scale. |
| M4 | **Pipeline creation for aggregation → narrative → export** – Implement full data-to-report pipeline including trend commentary. | High 🔴 | High 🔴 | Enables end-to-end automated reporting. |
| M5 | **Audience-specific business rules & templates** – Tailor summaries for operations, leadership, and planners with event caps and trend commentary. | Medium 🟡 | High 🔴 | Tailors output to operations, executives, planners. |
| M6 | **HITL review process + narrative refinement loop** – Add pre-publish analyst review; refine narrative style and event coverage with feedback loops. | Medium 🟡 | High 🔴 | Improves clarity, coverage, and trust in summaries. |

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# Agent #2 - City Reporter - Tech Components

## Data Inputs

Use structured metadata from Cynapse analytics (incident type, severity, location, time) plus historical summaries for format reference.

## Metadata Indexing

Tag by incident type, time range, and relevance for fast retrieval.

## Models

Deploy Qwen2.5-VL for multi-modal summarisation, with optional RAG for enriched context.

## APIs

Connect to Cynapse analytics API for data pulls and a template rendering API for report formatting.

## LLM Query Structuring

Translate plain-language requests (“Summarise last week’s safety events for Zone A”) into structured queries.

## Pipelines

Create aggregation → narrative generation → visual embedding → export pipelines.

## Business Rules

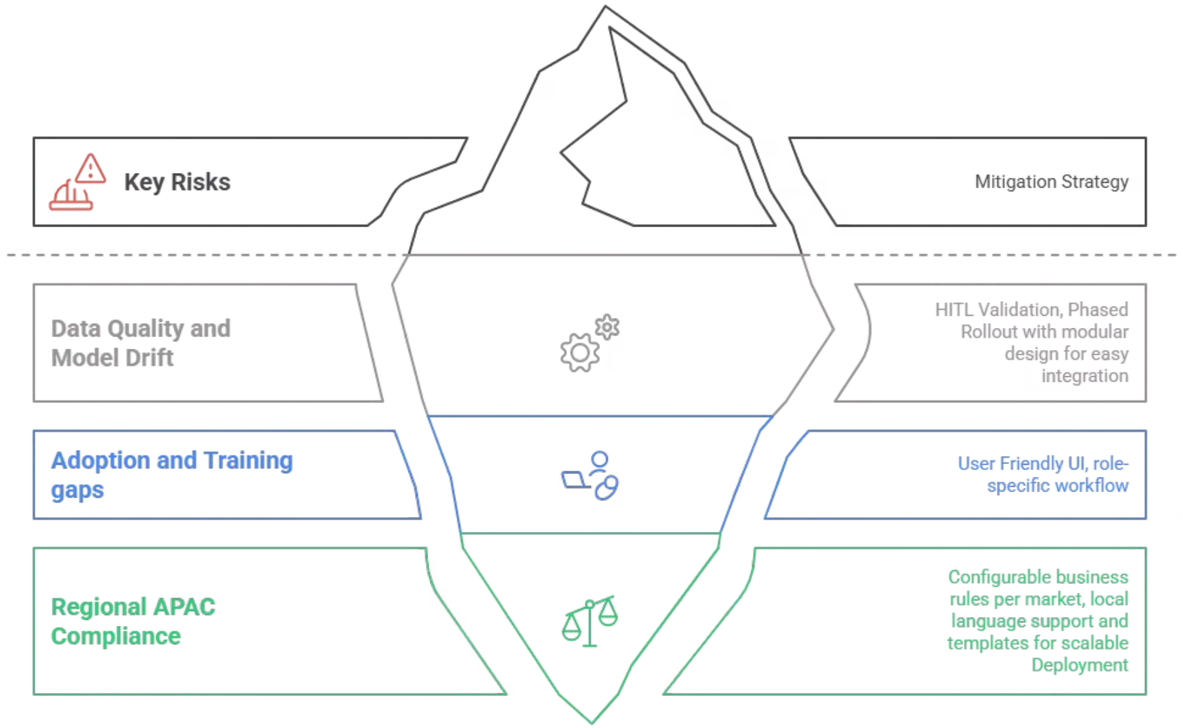
Set caps on key events, define trend inclusion, create audience-specific templates (ops, execs, planners).

## HITL + Improvement

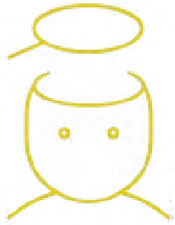
Enable pre-publish analyst review, measure relevance/coverage, and refine narrative quality via feedback loops.

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# Risks and Mitigation Strategy




# Success Metrics



## City Analyst

Review time decreases, detection precision/recall increases, and the number of actionable alerts.



## City Reporter

Report creation time decreases, usage frequency increases, and stakeholder satisfaction improves.



## Leading Indicators

Track engagement and queries as leading indicators of success.

**Accuracy & Recall** – % of meaningful anomalies correctly identified vs. false positives

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# Example: User Story Demo

***As a city safety analyst, I want to see if there were any unusual crowd or traffic events in Zone C last week, so that I can investigate patterns early and recommend preventive measures.***



## Acceptance Criteria

- Search past incidents by type, time, and location.
- Detect anomalies when activity deviates from historical baselines.
- Cross-reference anomalies with external datasets (weather, events).
- Provide plain-language, context-rich alerts with visual markers.
- Allow operator validation (approve/reject) to improve model accuracy.

## Expected Outcome

*Faster identification of emerging risks, improved operational response times, and consistent, evidence-based reporting that enhances safety and decision-making efficiency.*

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# High Level Roadmap

## Foundational Capabilities

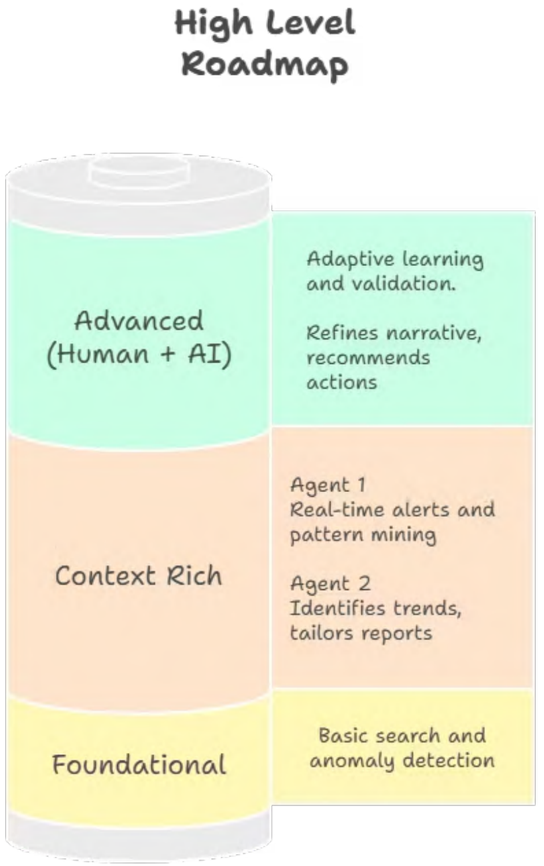
1. **Searchable incident archive:** filter by type, time, and location for fast retrieval.
2. **Anomaly pattern detection:** identify unusual activity (e.g., crowd surges, traffic anomalies) in specific zones.
3. **Context enrichment:** cross-reference incidents with external datasets like weather and event schedules.
4. **Automated summarisation:** aggregate incident data into consistent, bias-free reports.
5. **Indexed retrieval:** search summaries by incident type, severity, or time range.

## Advanced Pattern Recognition

6. **Real-time anomaly alerts:** deliver context-rich explanations and prioritise based on severity and ICP rules.
7. **Hotspot & trend detection:** mine patterns over days/weeks to reveal emerging issues and early warnings.
8. **Multi-modal reporting:** combine narrative text with visual highlights; tailor formats for ops, leadership, and planners.

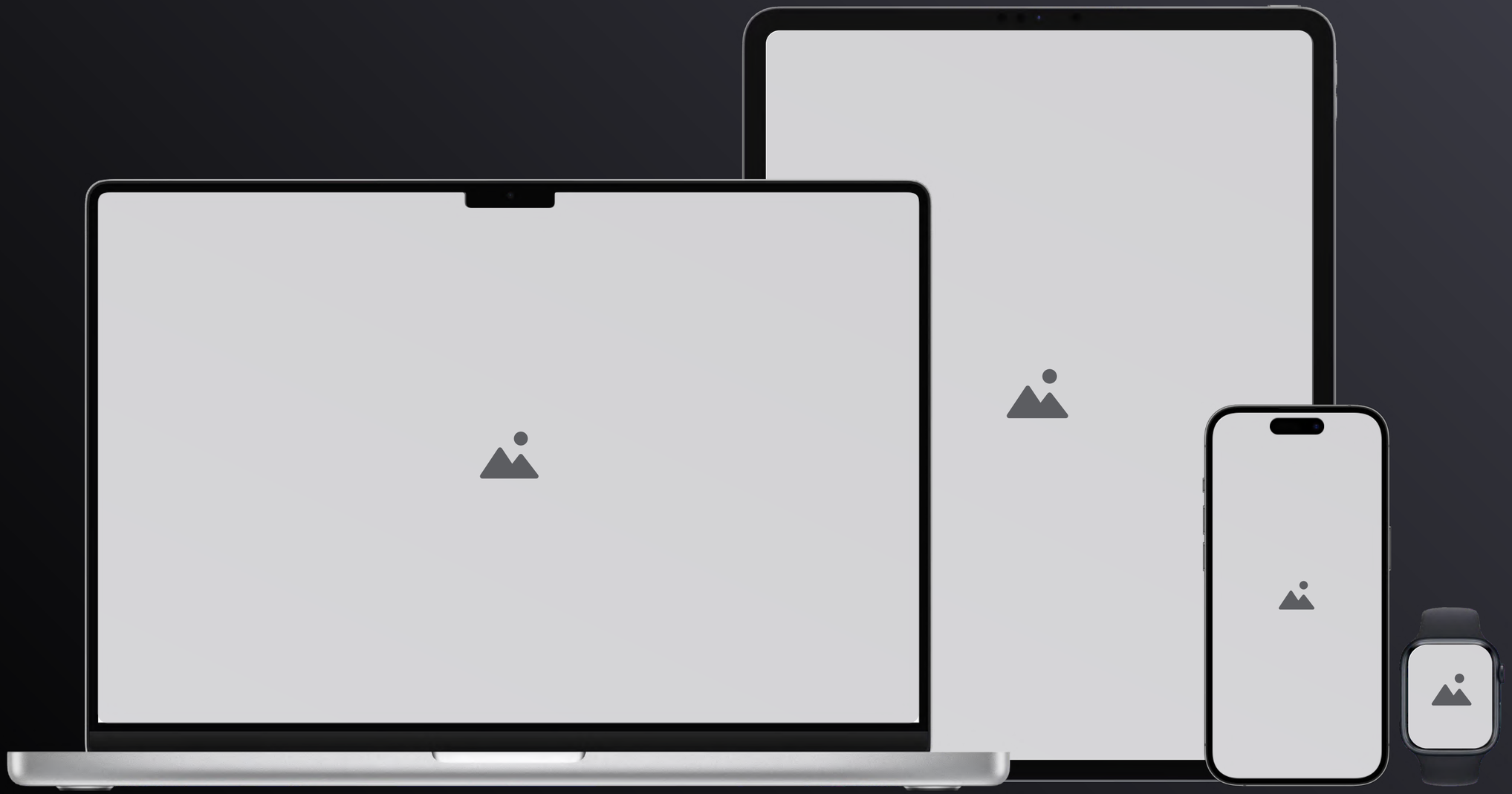
## Human + AI Collaboration

9. **HITL anomaly validation:** operators confirm/reject anomalies; feedback continuously improves model accuracy.
10. **Narrative refinement loop:** analyst pre-publish review, style adjustments, and potential prescriptive recommendations (e.g., “Increase patrols in Zone C”).




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