

# **PROJECT AGNISHAKTI: AI- Powered Fire Safety System**

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# The Problem: A Global Fire Crisis

**180K+**

## Global Fatalities

People die due to fire-related incidents globally every year.

**20**

## India's Crisis

One person dies in a fire every 20 minutes in India (NCRB Report).

**5**

## Alert Latency Target

End-to-end alert latency target is  $\leq 5$  seconds.

Delayed detection and poor alerting systems cause thousands of preventable deaths each year.

## Traditional Systems are Inadequate

- Expensive (₹1,50,000+ per society).
- Hardware-dependent and complex installation.
- High maintenance costs (₹50,000/year).
- High false alarm rates create distrust.



# Primary Objective: Real-Time, Low-Cost Safety

## Core Technology

Build a real-time, low-cost fire & smoke detection system using YOLOv8.

## Hardware Flexibility

Works on existing CCTV/webcams; no extra sensors or sprinklers required.

## Automated Response

Auto-alerts the nearest fire station and owners instantly.

## Incident Visualization

Visualizes incidents and live status on a society map dashboard.

# Functional Objectives: Comprehensive Coverage



## Dual AI Detection

Detect fire and smoke in live video feeds using custom-trained YOLOv8 models.



## Multi-Camera Support

Per-house camera mapping for precise location identification.



## Automated Alerting

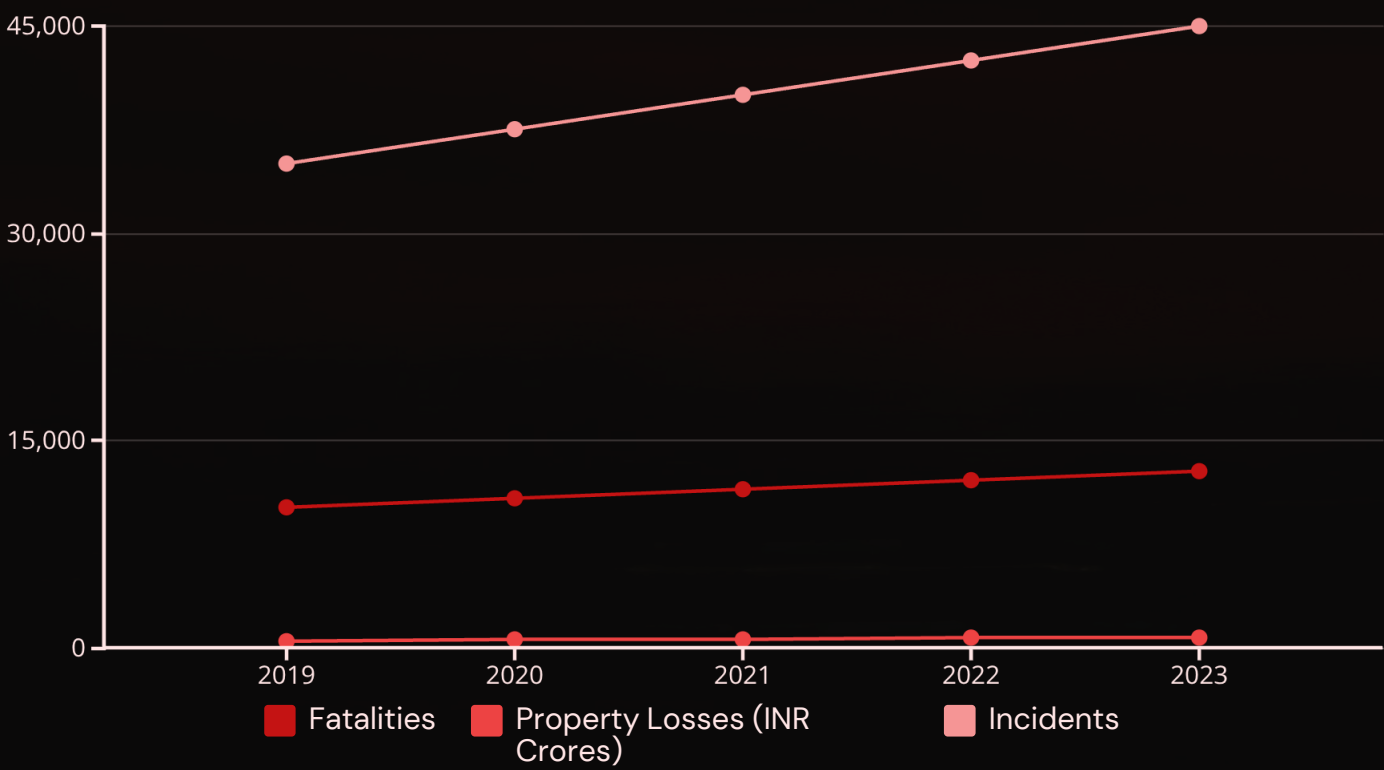
Fetch house ID, email fire station/owner with timestamp, snapshot, and confidence score.



## Society Map Dashboard

Live status visualization and role-based login (Owner / Admin / Fire-Station).

Fire Incident Trends in India (Recent Years)



The chart illustrates a concerning upward trend in fire-related incidents in India over the past few years. Annual fatalities, property losses (in INR Crores), and the overall frequency of incidents have all shown a steady increase, highlighting the urgent need for enhanced fire safety measures and advanced detection systems to mitigate these growing risks.





# AgniShakti: AI That Sees Fire Before It Spreads



## Dual AI Detection

YOLOv8 models trained for real-time accuracy ( $mAP \geq 0.85$ ).



## Automated Alert System

Instant email to fire station & owners with location and snapshot (<5 sec delivery).



## Live Dashboard

Society map with color-coded status (Green/Yellow/Red) and role-based access.

# AgniShakti's Multi-Layered Intelligence



## Monitoring Layer

Unified dashboard for managing multiple properties and cameras.



## Action Layer

Fire stations and owners receive live updates with image evidence.



## Manual Override Layer

Owners can pause detection with a password-protected button.



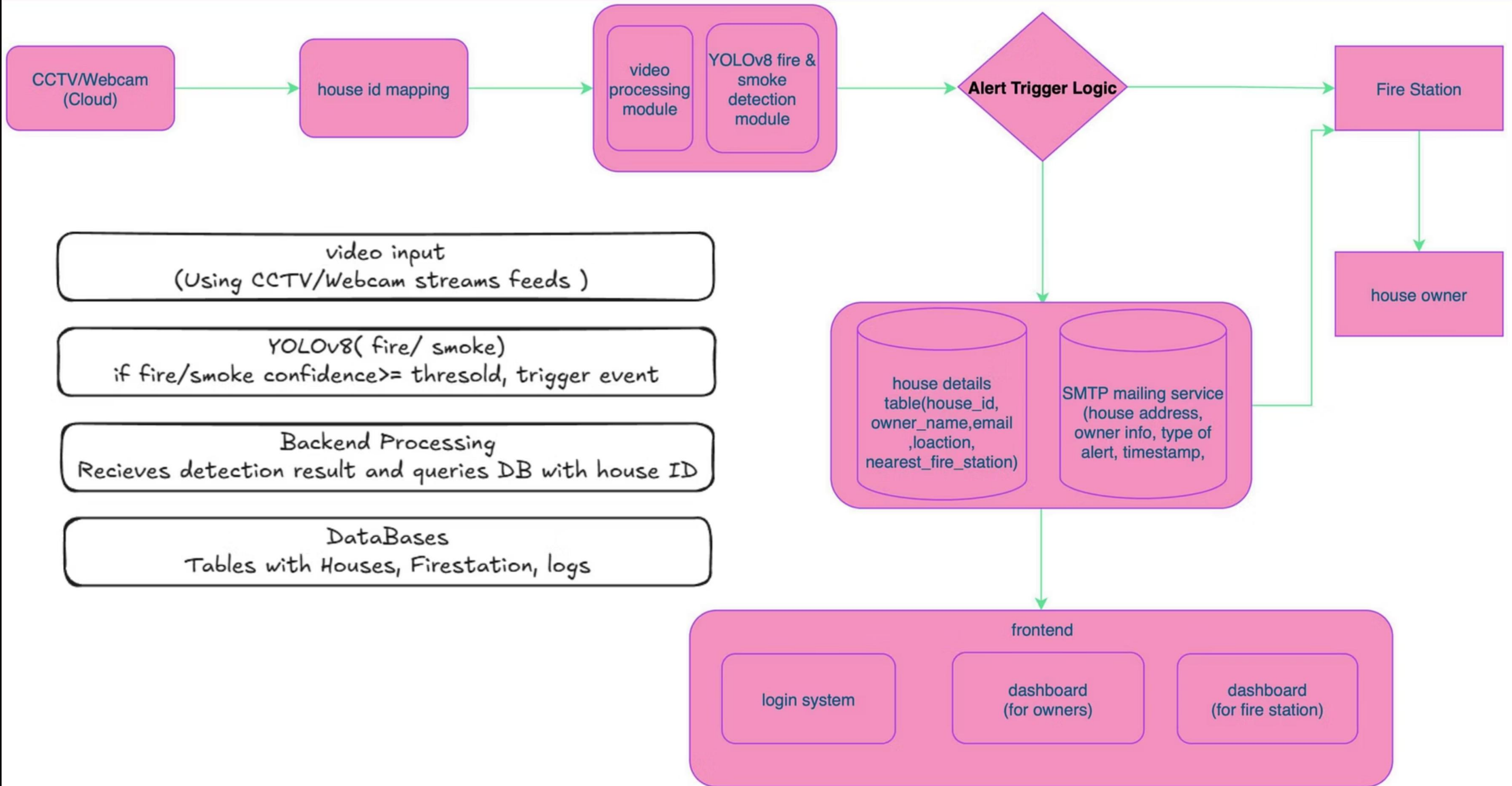
## False Alarm Control Layer

Gemini API validation ensures only real incidents trigger alerts.

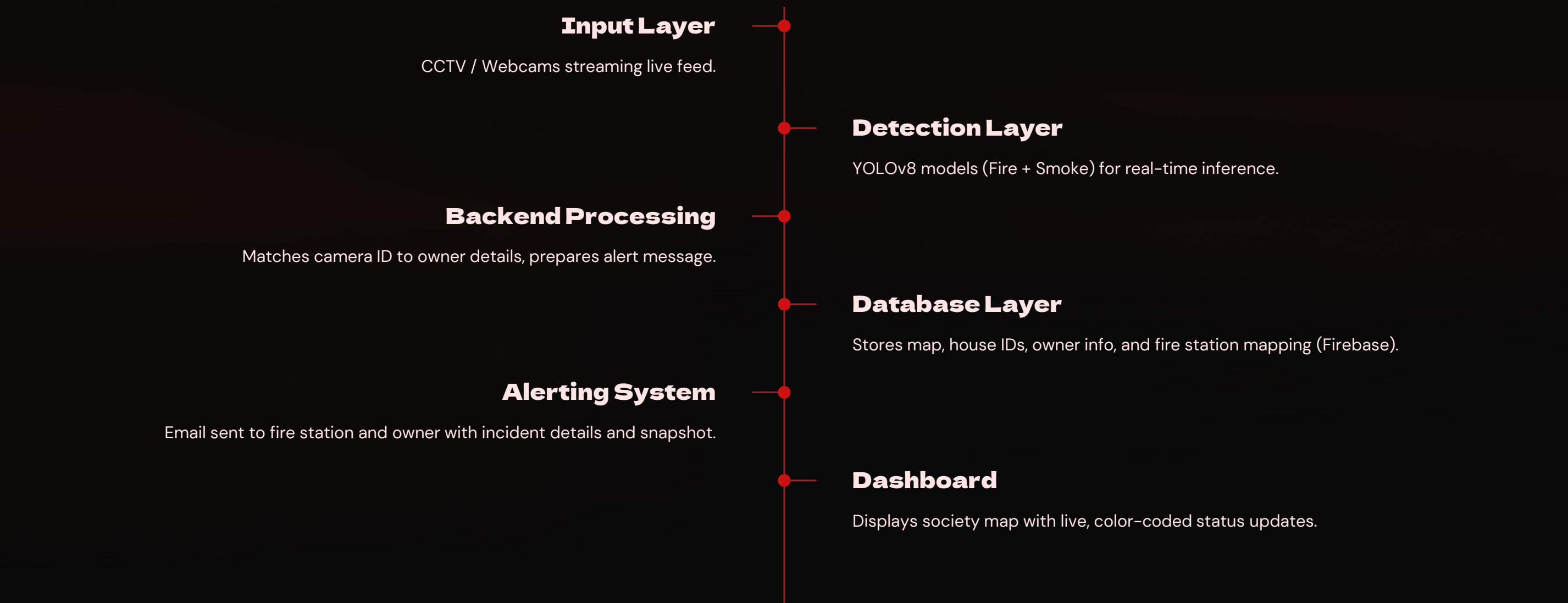


## AI Detection Layer

YOLOv8s model trained for fire and smoke separately.



# System Architecture and Core Models



YOLOv8s (Target)	0.90	30	22MB
YOLOv5	0.85	25	28MB
Faster R-CNN	0.88	12	108MB



# Technology Stack and Tools



## Programming & Frameworks

Python, YOLOv8 (Ultralytics), OpenCV, Flask/FastAPI for backend APIs.



## Frontend & Visualization

ReactJS / HTML-CSS-JS for the dashboard and society map interface.



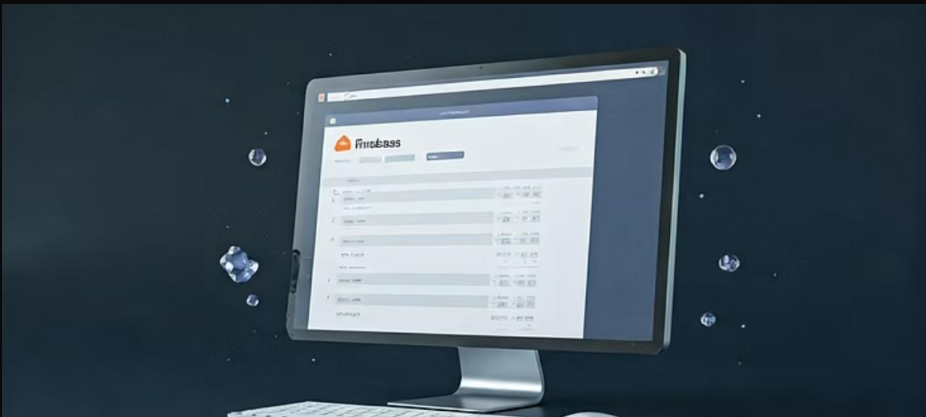
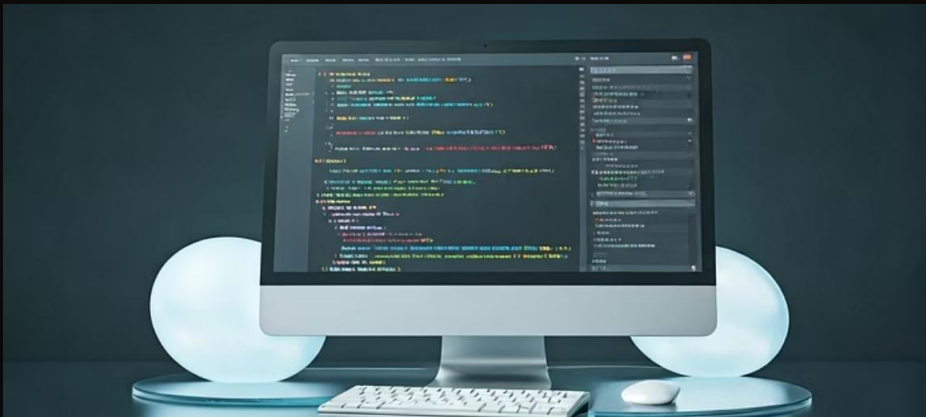
## Database & Storage

Firebase for storing house IDs, owner details, fire station mapping, and alert logs.



## Alert & Communication

SMTP for automatic email alerts. Future scope: Twilio for SMS/WhatsApp.



# Competitive Advantage and Cost Analysis

## Why AgniShakti Wins

Initial Cost	Very High (₹2.8L+)	Low (₹2K)
Alert Speed	30-60 sec	<30 sec
Visual Verification	No	Yes (Snapshot)
False Positives	High	Low (AI-filtered)

## 5-Year Total Cost Comparison



### AgniShakti

Low initial investment and minimal annual operating costs.




### Traditional System

High initial setup, maintenance, and sensor replacement costs.

# Market Size Analysis

## 1. Current Fire Safety & Smart Surveillance Market (2024–2025)

Segment	Global Market Size (2025 est.)	CAGR	India Market Size (2025 est.)	Notes
Fire Safety Equipment (detectors, alarms, sensors)	\$73–75 Billion	~6.5%	₹38,000 Cr (~\$4.5B)	Dominated by Honeywell, Siemens, Bosch, etc. Hardware-heavy.
AI-based Video Surveillance / Analytics	\$14–16 Billion	~20–22%	₹9,000 Cr (~\$1.1B)	Fastest-growing segment due to CCTV proliferation.
Smart Building Safety Systems (IoT + AI)	\$25–28 Billion	~15%	₹6,500 Cr (~\$800M)	Emerging segment blending software + automation.

 **Combined Addressable Market (India)** for AgniShakti’s kind of hybrid model (AI + existing CCTV) sits around ₹4,000–5,000 Cr as of 2025.

## Summary: Market Size Comparison


Metric	2025 Estimate	2030–33 Projection	CAGR
Global Smart Fire Safety Market	~\$75B	~\$130B	~7.2%
India Smart Fire + AI Safety Market	~\$4.5B (₹38,000 Cr)	~\$10B (₹85,000–90,000 Cr)	~9.5%
AI-based Fire Detection (Software niche)	~\$1.5B globally	~\$5–7B globally	~25%
AgniShakti Addressable Slice	~\$100–150M globally	~\$1B+	30–35% potential CAGR



# Phase 1: Foundation & Beachhead Market (Months 0-12)


Our initial strategy focuses on securing a strong foothold in residential apartments and gated communities within Indian cities. This segment offers a strategic entry point for rapid growth and market validation.

## Why This Beachhead Market?




### Ideal Audience

Residential apartments and gated communities prioritize safety, have high-value assets, and a collective willingness to invest in advanced security solutions.



### Concentrated Demand

Multiple units within a single complex allow for efficient sales, bulk installations, and streamlined service management, reducing acquisition costs.



### Existing Infrastructure

Many of these communities already possess basic security setups, making integration or upgrading to AgniShakti a logical and easier transition.

## Solving Critical Pain Points

### False Alarms & Slow Response

Traditional systems suffer from frequent false alarms and delayed response times, undermining trust and effectiveness.

### Lack of Visual Verification

Without immediate visual proof, security teams struggle to assess threats accurately, leading to inefficient resource deployment.

### High Costs & Maintenance

Existing solutions often come with prohibitive initial costs, complex maintenance, and frequent sensor replacements.

## Proven ROI with AgniShakti

✔ AgniShakti delivers significant returns by drastically reducing false positives (AI-filtered), ensuring ultra-fast alerts (<5 seconds), providing critical visual verification, and offering a dramatically lower 5-year total cost of ownership compared to traditional systems.

## Scaling Plan: Months 0-12

01	02
<b>Pilot Deployments</b> Initial deployments in select communities to gather feedback, showcase efficacy, and build strong case studies.	<b>Channel Partnerships</b> Collaborate with security integrators, property management firms, and residential associations for broader market reach.
03	04
<b>Direct Sales Team</b> Establish a dedicated sales force focused on engaging with key decision-makers within large residential complexes.	<b>Referral Programs</b> Incentivize existing clients and community members to advocate for AgniShakti, leveraging word-of-mouth for organic growth.





# Phase 2: Vertical Expansion & Product Diversification (Months 12-24)





Building on our initial success, Phase 2 targets Small and Medium Businesses (SMBs) and high-risk verticals, leveraging AgniShakti's core strengths for broader market penetration.

## Why Expand to These Verticals?

<b>Higher Willingness to Pay</b> These sectors often have dedicated budgets for advanced security solutions due to high-value assets, critical infrastructure, or sensitive data.	<b>Regulatory Compliance</b> Industries like healthcare, education, and finance face strict compliance mandates, making robust security a non-negotiable requirement.	<b>New Use Cases &amp; Integrations</b> Diversification unlocks new applications beyond residential, such as access control, asset tracking, and specialized environmental monitoring.
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## Targeting High-Risk Verticals

 <b>Hospitality</b> Ensuring guest safety, property protection, and monitoring public areas in hotels, resorts, and convention centers.	 <b>Warehouses &amp; Logistics</b> Preventing theft, securing inventory, and monitoring large perimeters in storage facilities and distribution hubs.
 <b>Educational Institutions</b> Enhancing campus safety for students and staff, securing valuable equipment, and managing access to facilities.	 <b>Retail Malls</b> Deterring shoplifting, managing crowd flow, and providing rapid response capabilities in commercial complexes.

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## Enhancing AgniShakti: Product Development

<b>Advanced Alert Systems</b> Integration of real-time SMS and WhatsApp alerts for immediate incident notifications, improving response times.	<b>AgniShakti Pro Features</b> Developing specialized features such as advanced analytics, customizable reporting, and third-party system integrations tailored for enterprise clients.
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# Phase 3: Geographic & Platform Scaling (Months 24-36)

In Phase 3, we shift our focus to global markets and critical public infrastructure, aiming for exponential growth by leveraging our proven technology and expanding our "Safety-as-a-Service" platform.

## Why Target Global & Public Sectors?

### Massive Total Addressable Market (TAM)

Global security spending on smart solutions for public and commercial spaces represents a multi-billion dollar opportunity.

### First-Mover Advantage

Entering emerging markets and specialized public sectors early allows us to establish dominance and build strong relationships.

### Significant Public Sector Impact

Contributing to national safety and security initiatives, fostering trust, and establishing AgniShakti as a critical national asset.

## Public Sector Engagement & Tenders

We will actively pursue government tenders for critical infrastructure and public buildings, tailoring our solutions to meet specific national security and safety mandates.

### Government Buildings

Securing administrative offices, parliamentary buildings, and other high-security government facilities with integrated threat detection.

### Public Transportation Hubs

Implementing safety solutions in airports, railway stations, and bus terminals to enhance passenger security and operational resilience.

## Platform Innovation: Safety-as-a-Service (SaaS)

Evolving AgniShakti into a comprehensive SaaS platform offering multi-hazard detection and proactive risk management for enterprise and public sector clients.



### Cloud-Native Architecture

Scalable, secure, and easily deployable platform for seamless integration and remote management across diverse environments.



### Multi-Hazard Detection

Expanding detection capabilities beyond fire to include gas leaks, chemical spills, structural integrity issues, and other environmental threats.




### Predictive Analytics & Reporting

Leveraging AI to provide real-time insights, predict potential incidents, and generate comprehensive compliance reports for stakeholders.


# Phase 4: The Ecosystem & Enterprise Play (Month 36+)

In Phase 4, AgniShakti transitions into a mature ecosystem player, forging deep relationships with enterprise clients and insurance giants. This phase leverages our established technology to deliver unparalleled value through strategic integrations and predictive capabilities, expanding our reach and impact exponentially.


## Why This Strategic Focus?

**Largest Contract Values**

Enterprise an revenued insurance sectors offer high-value, long-term contracts, ensuring sustainable growth and market leadership.

**Strategic Partnerships**

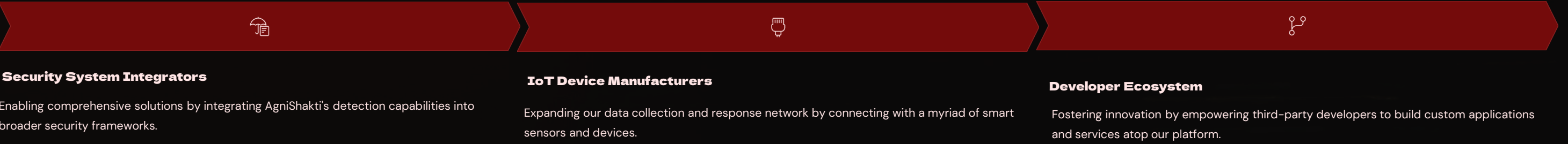
Collaborations unlock new distribution channels, enhance our solution's versatility, and solidify AgniShakti's position in critical infrastructure protection.

**Data-Driven Insights**

Access to vast datasets from these sectors refines our AI, enabling more accurate predictions and proactive safety measures.

### Unlocking Integration with an API-First Approach

Our robust API-first strategy allows for seamless integration with existing systems, creating a powerful, interconnected safety ecosystem.



### Synergistic Insurance Alliances

Partnering with insurance companies to offer mutual benefits, from risk reduction to innovative policy structures.

**Premium Discounts**

Clients implementing AgniShakti solutions qualify for reduced insurance premiums due to demonstrably lower risk profiles.

**Enhanced Risk Assessment**

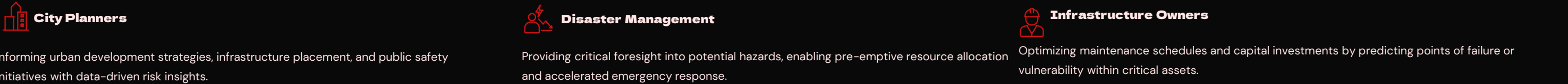
AgniShakti's real-time data and predictive analytics provide insurers with unprecedented insights into asset vulnerability.

**Claims Reduction**

Proactive incident prevention and rapid response capabilities significantly reduce the frequency and severity of insured events.

### Driving Smarter Decisions with Predictive Analytics

Beyond immediate threat detection, AgniShakti's AI-driven predictive analytics become an invaluable tool for long-term planning and resilience.





# AgniShakti's Phased Growth Strategy

## Phase 1: Foundation & Beachhead Market (Months 0-12)

Target: Residential apartments in cities

Revenue Projection: ₹50L-1Cr from 100-200 residential societies.

Key Activities: Pilot deployments, establishing initial channel partnerships. Focus on proving core technology and market fit.

## Phase 2: Vertical Expansion (Months 12-24)

Target: SMBs and high-risk verticals (hospitality, warehouses, education, retail)

Revenue Projection: ₹5-10Cr from SMB and vertical expansion.

Key Activities: Launching AgniShakti Pro with advanced features tailored to specific industry needs, expanding sales channels.

## Phase 3: Geographic & Platform Scaling (Months 24-36)

Target: Global markets, public infrastructure

Revenue Projection: ₹25-50Cr from global markets and public sector contracts.

Key Activities: Deploying Safety-as-a-Service (SaaS) platform, international expansion, securing contracts for large-scale public infrastructure projects.

## Phase 4: Ecosystem & Enterprise Play (Month 36+)

Target: Enterprise clients, insurance companies

Revenue Projection: ₹100Cr+ from enterprise clients and insurance partnerships.

Key Activities: Implementing an API-first strategy for seamless integration, developing advanced predictive analytics, forming deep strategic alliances with enterprise and insurance giants.

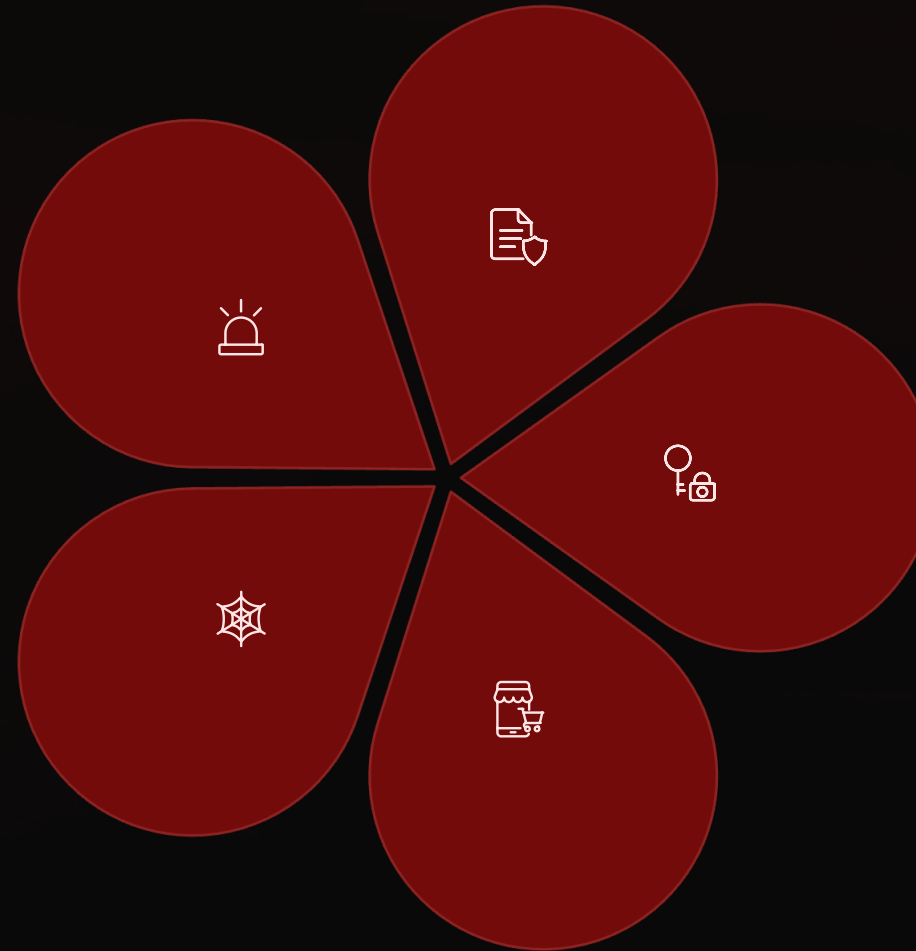
# Impact and Future Scope

## Lives Saved

Reduces fire casualties by 40-50% and response time by 58%.

## Scalability

Global potential—wherever there's a camera, there's potential protection.



## Property Protection

Early detection prevents 60% of property damage, reducing average loss significantly.

## Accessibility

Makes advanced safety accessible to middle-income housing with no hardware barriers.

## Future Scope

Mobile app, SMS/WhatsApp alerts, gas leak detection, and multi-hazard monitoring.

# THANK YOU!