E-ksena
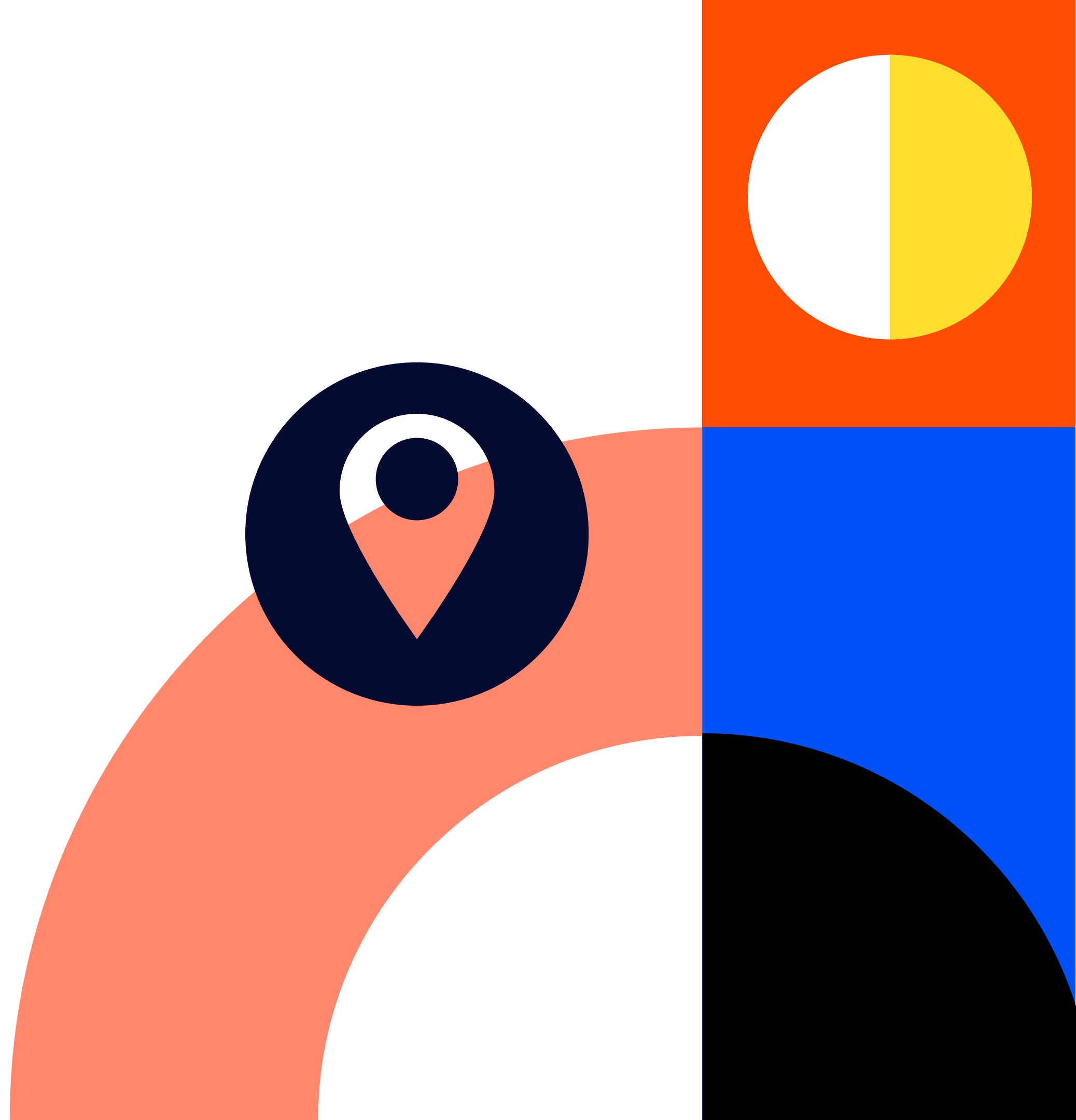
AI-Driven Emergency Scene Recognition

ALT_RUN

ALT_RUN

Peter Arquines

3rd Year College - Bachelor of Science in Computer Science - Specializing in Software and Systems

Lance Benedict Onnagan

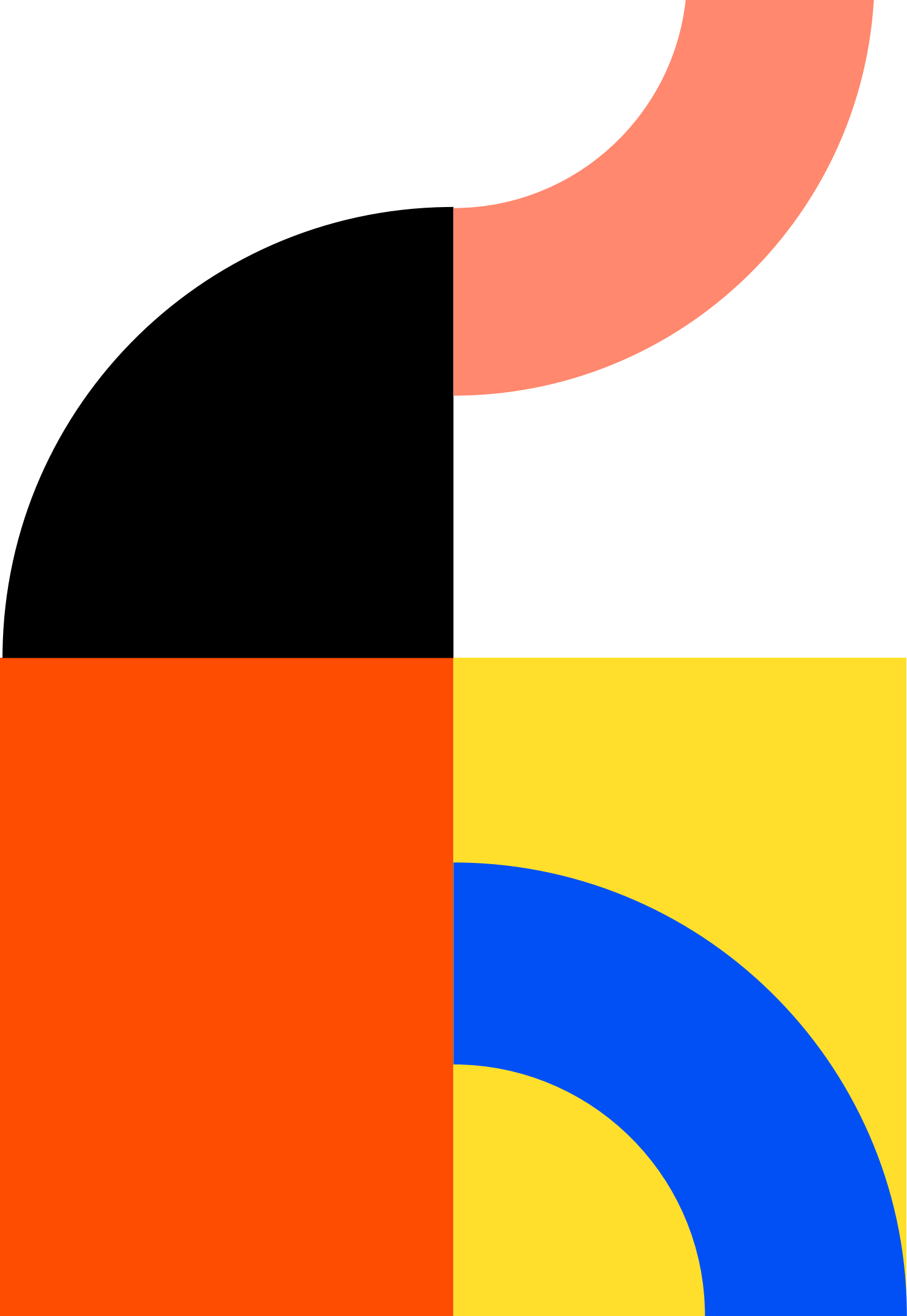3rd Year College - Bachelor of Science in Computer Science - Specializing in Software and Systems

Jesmark David Presbitero

3rd Year College - Bachelor of Science in Computer Science - Specializing in Software and Systems

Paul Brian Sumilhig

3rd Year College - Bachelor of Science in Computer Science - Specializing in Software and Systems

Why E-Ksena?

E-ksena project aims to develop and implement an AI-powered emergency detection and dispatch system that uses short-form video analysis to allocate first responders in real time. Based on the inefficiencies
and delays of traditional emergency hotlines have a negative effect on public safety and well-being.

Charter

The emergency app project was created to transform ordinary citizens into active first informants. Many emergencies—like medical situations, fires, or accidents—go unreported or are delayed due to a lack of fast communication. This app empowers bystanders or victims to quickly send verified incident reports using their phones. Our goal is to build a system that bridges the gap between citizens and responders, making emergency responses faster, more informed, and more coordinated through mobile technology.

Charter

# ↓	SUBJECT	PLANNED	SPENT	AVAILABLE	SPENT (RATIO)	
90	Google Maps API	PHP 1,000	PHP 0	PHP 1,000		0% Total progress
89	Demo & Presentation Materials	PHP 500	PHP 0	PHP 500		0% Total progress
80	SMS and notification service	PHP 1,500	PHP 0	PHP 1,500		0% Total progress
79	Mobile data and internet usage	PHP 1,000	PHP 0	PHP 1,000		0% Total progress
78	Cloud Hosting & Database	PHP 2,000	PHP 0	PHP 2,000		0% Total progress
		PHP 6,000	**PHP 0**	**PHP 6,000**		

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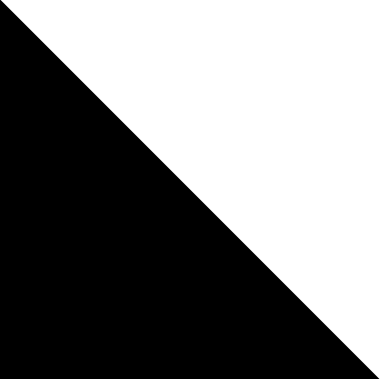
Also available in: CSV

Project Objectives

| Objective	Category	Measure
Implement E-ksena a mobile-to-web emergency response system that reduces emergency response time to 60 seconds or less from video submission to responder notification	Performance	System implementation date and response time in seconds.
Achieve over 95% classification accuracy for emergency types (e.g., fires, violence, medical events)	Quality	AI model classification accuracy percentage
Develop and deploy a mobile application compatible with both Android and iOS platforms.	Technical	Mobile application compatibility across different platforms (Android, iOS).

Project Scope

INCLUDES
- Makati City mid-sized Emergency Response Units:
- Emergency Medical Services (EMS)
- Local Police Outposts and Stations
- Local Bureau of Fire Protection Departments
- Integration of mobile application with a centralized web platform for responders.
- Deployment of AI-based video analysis for classifying incident types.
- GPS, location tracking, and traffic-aware route suggestions.

Project Scope

EXCLUDES

- Limited to only 3 kinds of LGUs (Police Stations, General Hospitals, Fire Stations)
- No multi-language support in initial release (limited to English)
- Wearable devices such as smartwatches, FitBits, and other non-smartphone devices.
- Coverage beyond Makati City during the initial deployment phase.
- Hardware procurement for emergency responders (e.g., radios, body cams).
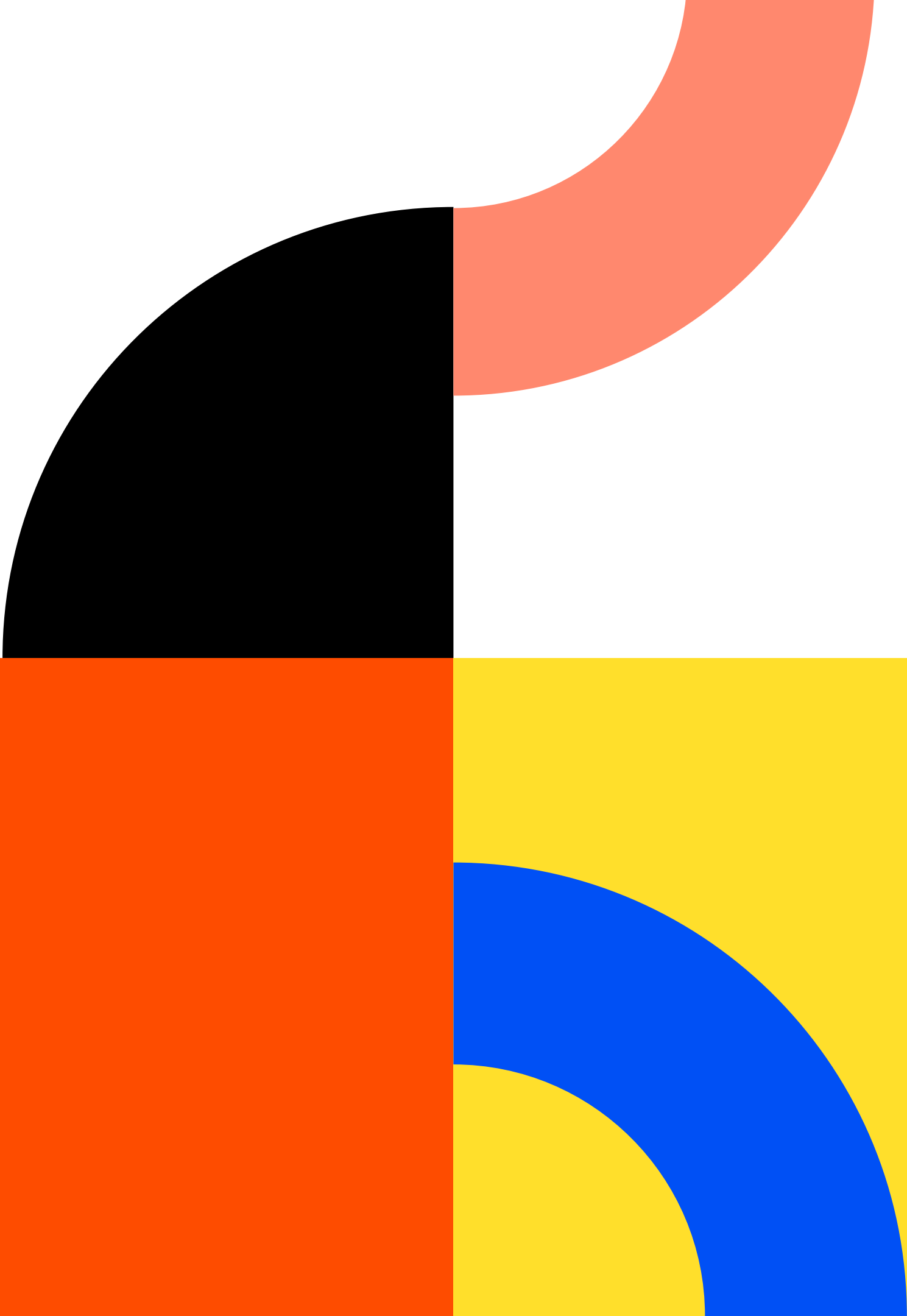
Design Thinking

Age	: 35
Occupation	: Crash Fire Rescue Specialist
Location	: Plaza, Lubao, Pampanga

Mr. CFRS. Mark John B. Manalansan is a Crash Fire Rescue Specialist (CFRS) at Clark International Airport Emergency Services. He has 4 years of experience as an Airport/Aviation Fire Fighter, 2 years as a Ship Fire Fighter (Sea-Based), and 1 year as a Volunteer Fire Fighter.

Goals

- Brave and caring, faces danger to help others
- Calm under pressure, makes quick decisions
- Team player, works well with others

MARK JOHN B. MANALANSAN

Personal Characteristics

- Brave and caring, the firefighter faces danger to help others. Calm under pressure, they make quick decisions in emergencies. A strong team player, they work well with others to get the job done.

Hobbies

- Community involvement or volunteering
- Physical fitness activities like running, weightlifting

Sources of Information

- Interview

WALLY MIRANDA

Age	33
Occupation	PNP, Alert Team
Location	Sta Cruz, Lubao, Pampanga

Corporal Wally Miranda serves with the PNP Alert Team and has been in service for 3 years. He has experienced a range of emergency scenarios and offered insights into how the police respond to crisis situations.

Goals

- Protect and serve the community
- Maintain law and order
- Improve skills and training
- Ensure public safety

Personal Characteristics

- The police officer is vigilant, responsible, and calm under pressure. A reliable team player, they enjoy fitness and community activities. Disciplined, courageous, and fair, they are committed to protecting and serving others.

Hobbies

- Physical fitness
- Jogging or running
- Volunteering in the community

Sources of Information

- Interview

Age : 33

Occupation : Medical Officer

Location : Makati City Health Office

Daniel Roldan is a Medical Officer of the City Health Office. They ensure every health concerns are treated seriously and with fairness across different agencies.

DANIEL T. ROLDAN

Goals

- Ensure fast and effective emergency
- Maintaining accurate data and communication
- Strengthen coordination across agencies
- Overcome operational challenges

Personal Characteristics

- He's kind, family oriented, helpful to people who are in need, generous and usually calm in times of intense situations.
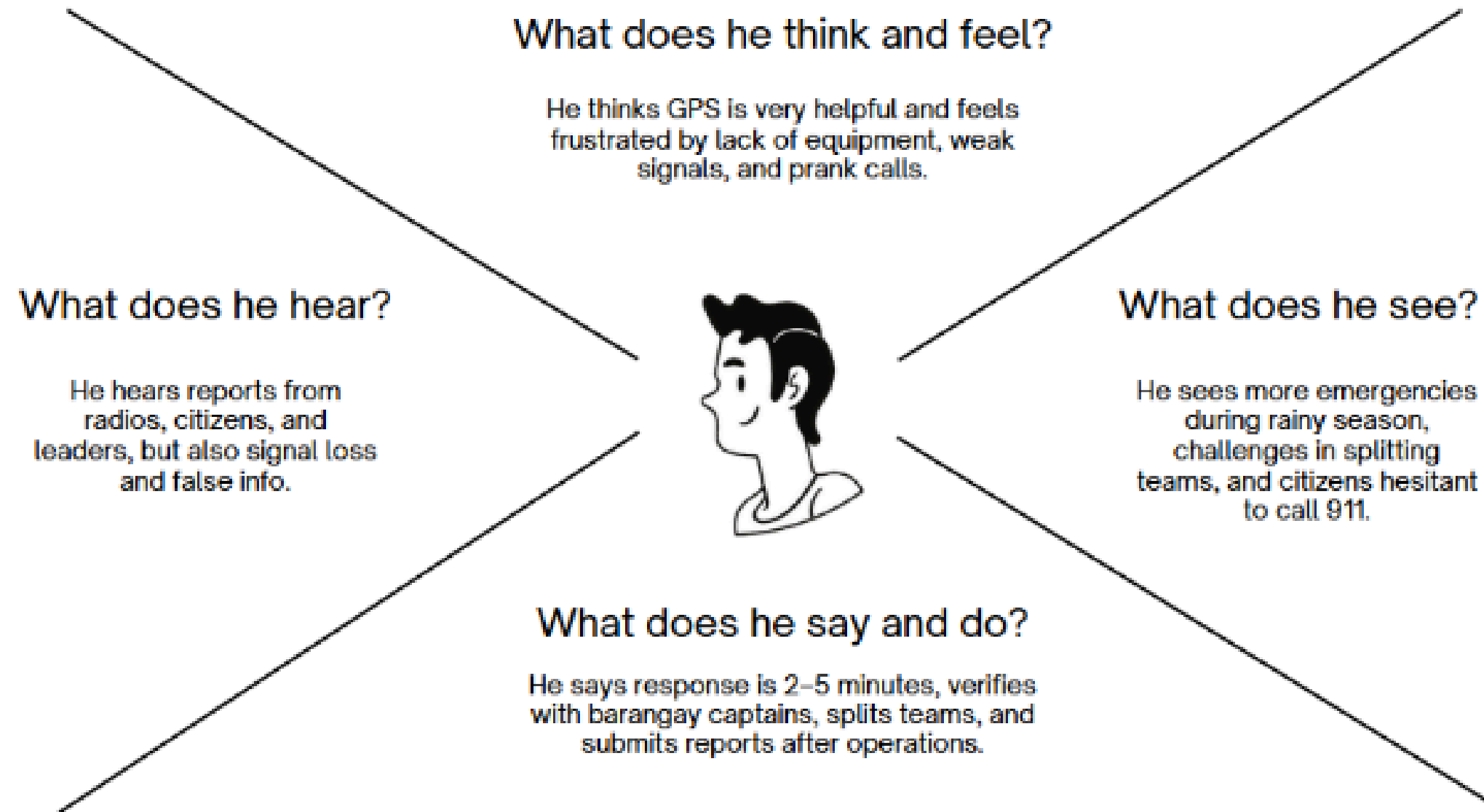
Hobbies

- Exercising (Running)

Sources of Information

- Health reports of other people
- Social Media

Empathize

Corporal Wally Miranda

Empathy Map

What does he think and feel?

He thinks GPS is very helpful and feels frustrated by lack of equipment, weak signals, and prank calls.

What does he hear?

He hears reports from radios, citizens, and leaders, but also signal loss and false info.

What does he see?

He sees more emergencies during rainy season, challenges in splitting teams, and citizens hesitant to call 911.

What does he say and do?

He says response is 2–5 minutes, verifies with barangay captains, splits teams, and submits reports after operations.

Pain

- Lack of equipment
- Weak signals
- Prank or false calls
- Public fear of using hotlines

Gain

- GPS-enabled apps
- Hotline consolidation
- Stronger coordination
- Better training and tools

Empathize

CFRS. Mark John B. Manalansan

Empathy Map

What does he think and feel?

He feels frustrated by radio traffic and poor coordination. He thinks GPS is key but AI and video are not reliable for reporting.

What does he hear?

He hears crash phone and radio alerts, updates from the tower, and distracting chatter on shared frequencies.

What does he see?

He sees smoke as a landmark, delays from unfamiliar routes, and inefficiencies in the centralized 911 system.

What does he say and do?

He says they respond in 2 minutes, prefers phone reporting, gathers details, dispatches, and keeps communication open with the tower.

Pain

- Radio congestion
- Poor coordination
- Centralized 911 delays
- Vague or unclear locations

Gain

- GPS tracking
- Localized hotlines
- Better coordination
- Route planning tools

Empathize

Daniel T. Roldan

Empathy Map

What does he think and feel?

He's proud of LGU and barangay partnerships; concerned about staff fatigue, fragmented reporting, and infectious disease risks; optimistic about GPS, AI, mobile 911, and mental health integration

What does he hear?

Reports, directives, and feedback from residents, staff, and leadership

What does he see?

Oversees emergency calls, ensures urgent case handling, coordinates stakeholders, participates in reviews, and tracks KPIs like response time and patient outcomes.

What does he say and do?

He emphasizes 10–15 minute emergency response, accurate patient data, and clear incident details. He sees AI and digital tools as useful but worries about accuracy and trust, and believes centralizing hotlines and raising public awareness could improve efficiency

Pain

- Operational strain
- Fragmented reporting
- Technology gaps
- Verification difficulties
- Limited communication
- Infection risks

Gain

- Strong partnerships
- Adequate resources
- KPI focus (response time, patient outcomes, satisfaction)
- Technology potential (GPS, AI, video integration)
- Reform opportunities (mobile 911, mental health services, public awareness)
- Resilient and adaptable team

Define

Location and Reporting Issues

- **Unclear or inaccurate emergency locations cause delays.**
- **Lack of precise GPS guidance for responders.**
- **Difficulty verifying authenticity of reports.**

Communication & Coodination

- **Overloaded radio traffic during emergencies.**
- **Poor coordination between responders and agencies.**
- **Centralized systems slow down response in regions outside Metro Manila.**

Technology and System Limitations

- **Limited equipment and outdated systems affect efficiency.**
- **Signal loss and weak infrastructure disrupt reporting.**
- **Current systems rely too heavily on manual calls.**

- **False alarms or prank calls add strain on responders.**
- **Limited manpower during overlapping emergencies.**
- **Training gaps for digital and AI-powered emergency systems.**

Ideate
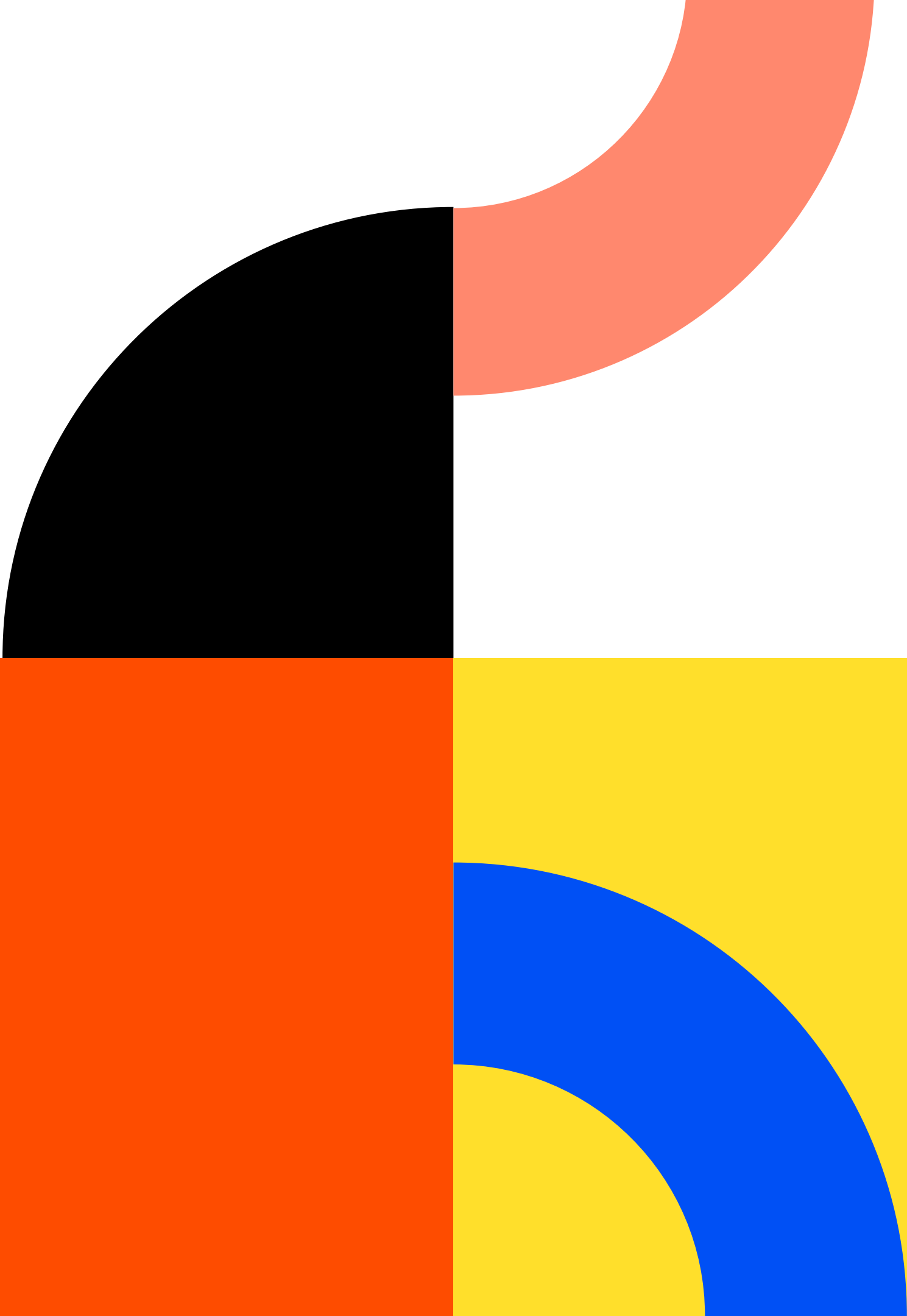
Storyboard

SCENARIO 1: Citizen Log in
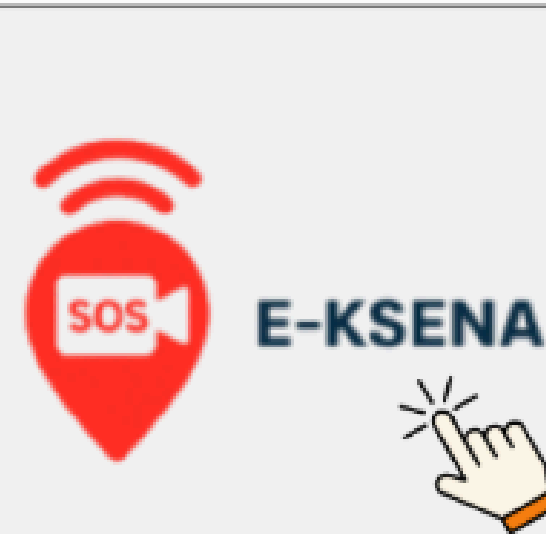
Citizen clicks on the app
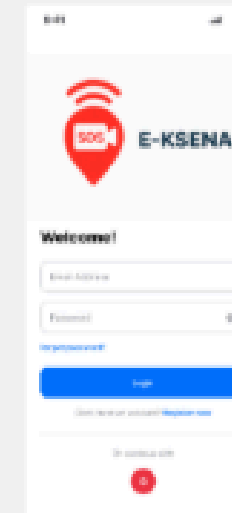
Citizen will be directed to the log in

Citizen will enter the needed credentials
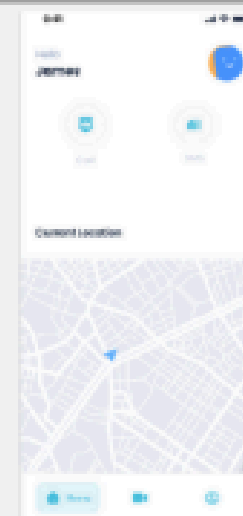
It directs to the home section of the app
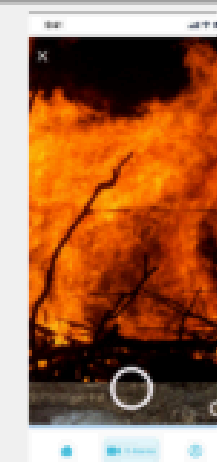
The citizen can now use the full app
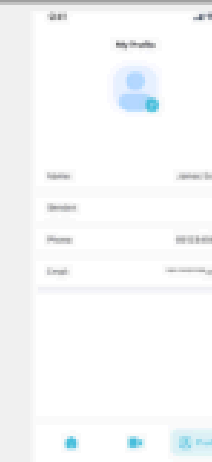
In profile, the info of the citizen is there

SCENARIO 2: Citizen Report
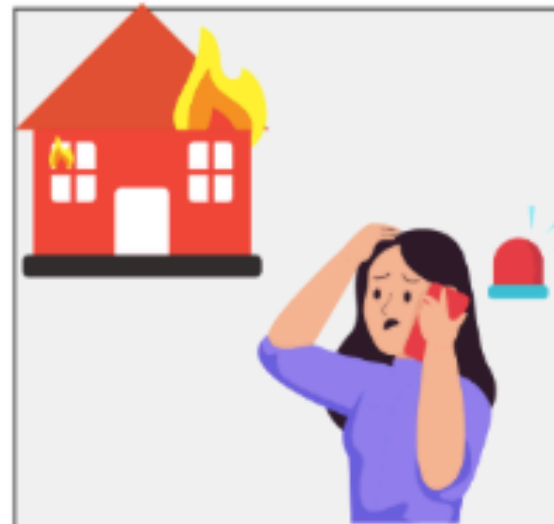
Citizen finds an incident

Citizen goes to the E-ksena section to take a video

Analyzing Report

After the video is sent, the AI analyzes the incident then contacts the nearest and appropriate LGU
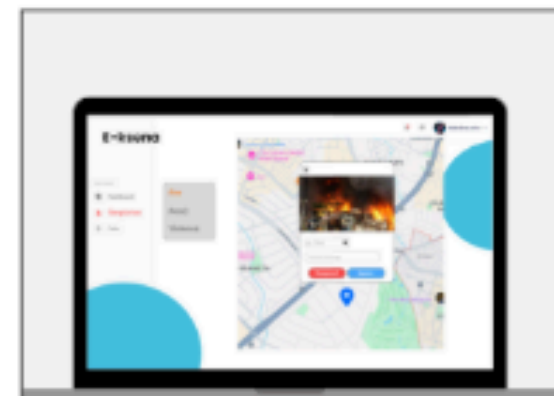
The dispatcher will receive a notification and the location

The dispatcher gives the info to the responder

The responder will go to the scene

SCENARIO 3: User Communication

The first responder needs to get more information from the citizen reporter

The responder uses sms service communication feature to contact the citizen

They can initiate a text chat or a voice call

The citizen can provide real-time updates on the situation

The responder can coordinate with other team members or dispatchers

This secure communication ensures quick and accurate information exchange

SCENARIO 4: User Dispatcher Log in

The dispatcher opens the E-ksena web application
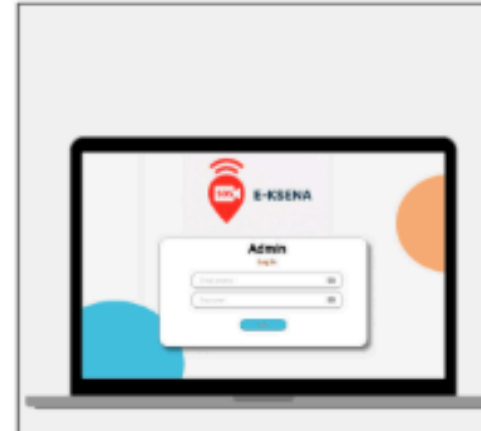
They are directed to the login screen for administrators/dispatchers

The dispatcher enters their unique credentials

Upon successful login, they are directed to the dispatcher dashboard
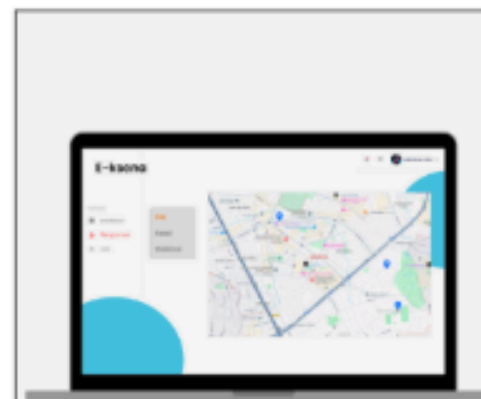
They can now access all dispatcher-specific features and live data
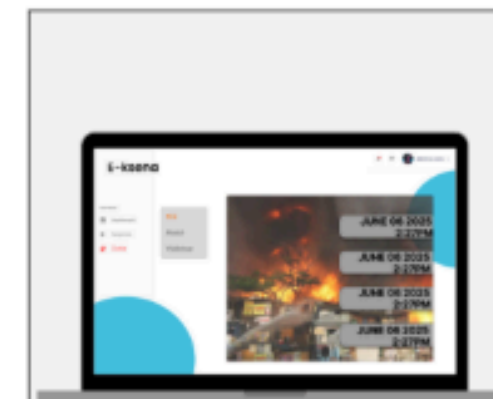
The admin can also see the dates of the incidents

SCENARIO 5: Dispatcher Responds

The dispatcher's dashboard shows a new incident report from a citizen

The dispatcher views the video and location data analyzed by the AI

They assess the incident and determine the appropriate first responders to dispatch

The dispatcher sends a dispatch notification to the selected responders

The notification contains all relevant incident details

The dispatcher monitors the responder's live location on the map as they proceed to the scene

SCENARIO 6: Report Stats

The admin/dispatcher goes into the main menu

They navigate to the dashboard section
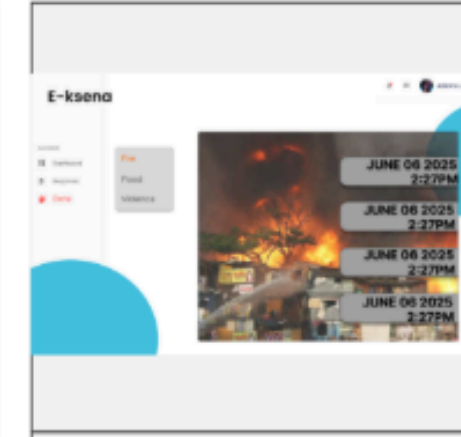
They can select a specific date range or filter for different types of incidents

The system generates charts and graphs showing statistics like response times and incident hotspots

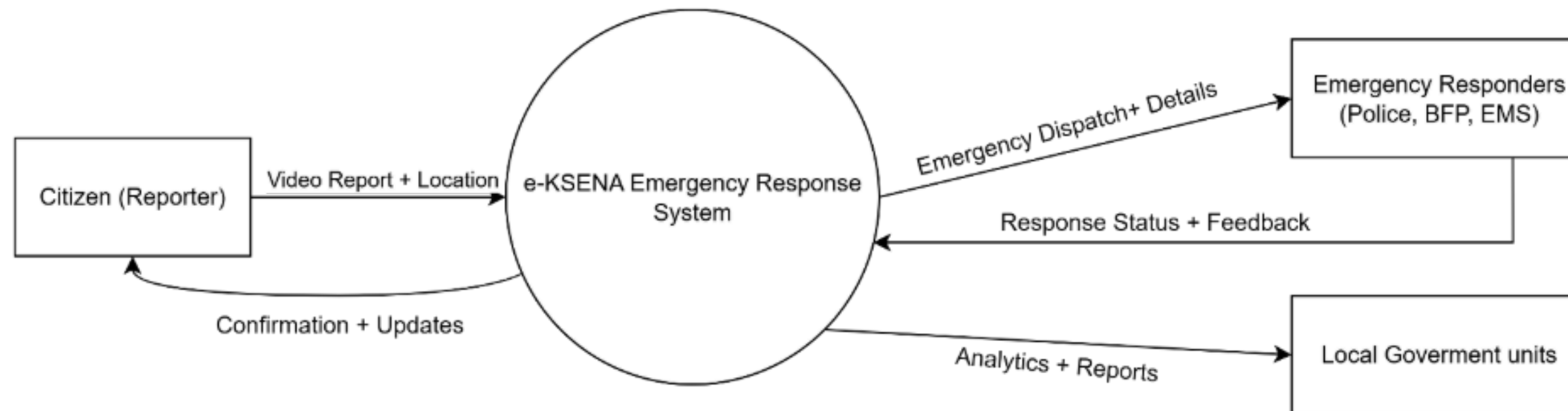The administrator can export these reports in various formats for official use

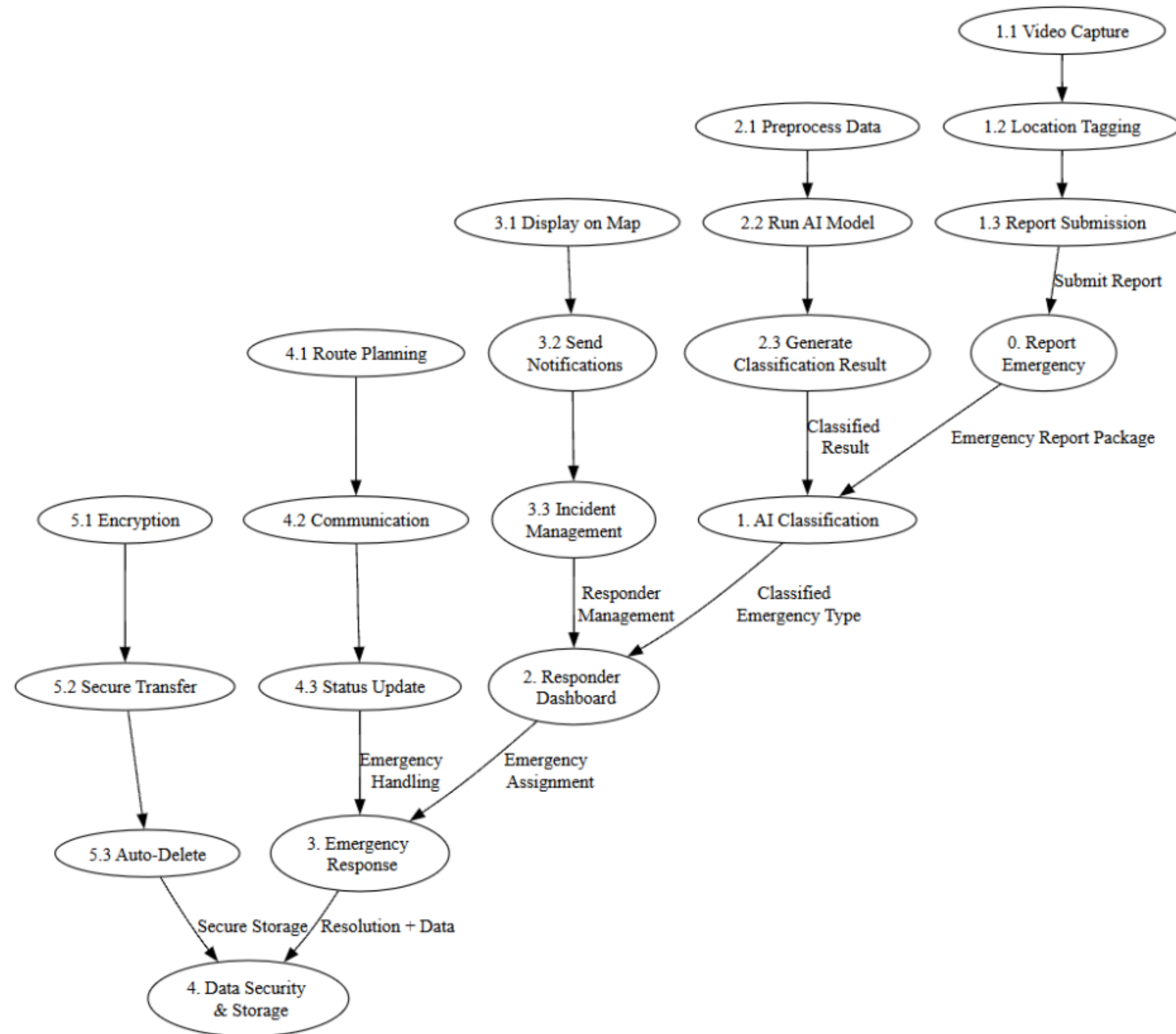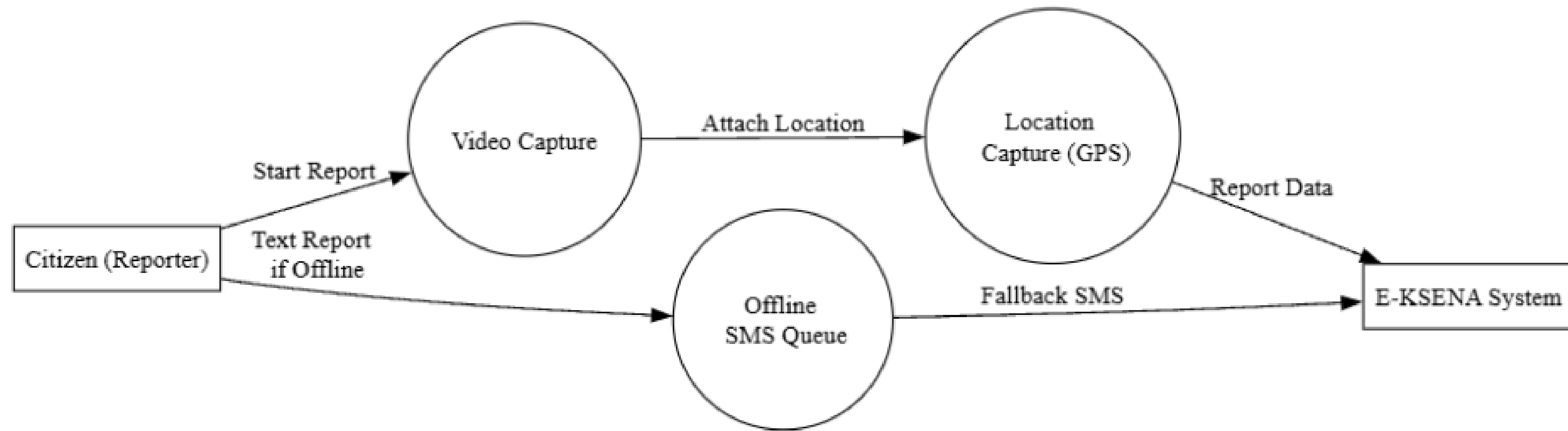This data helps them make informed decisions for future resource allocation and planning
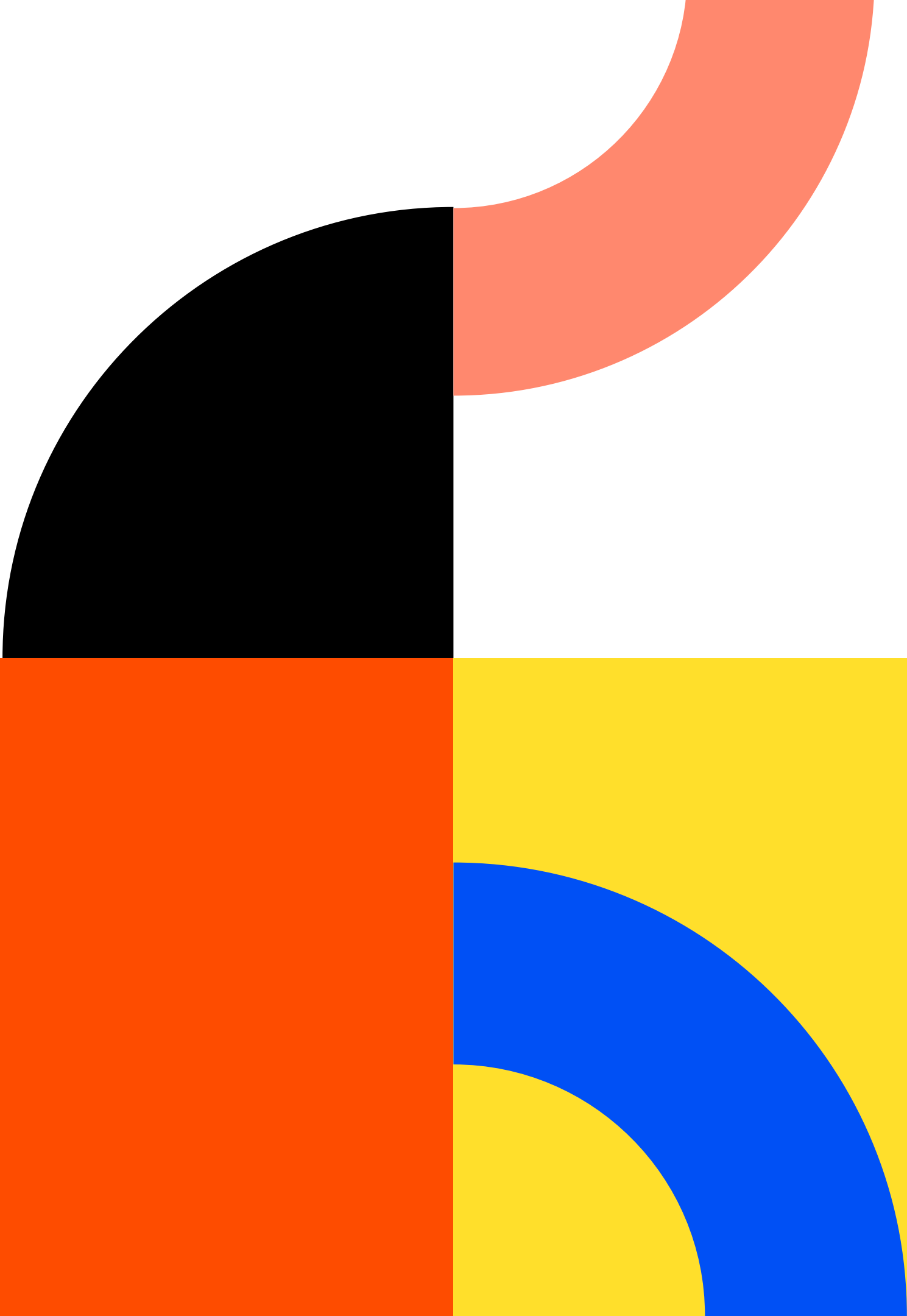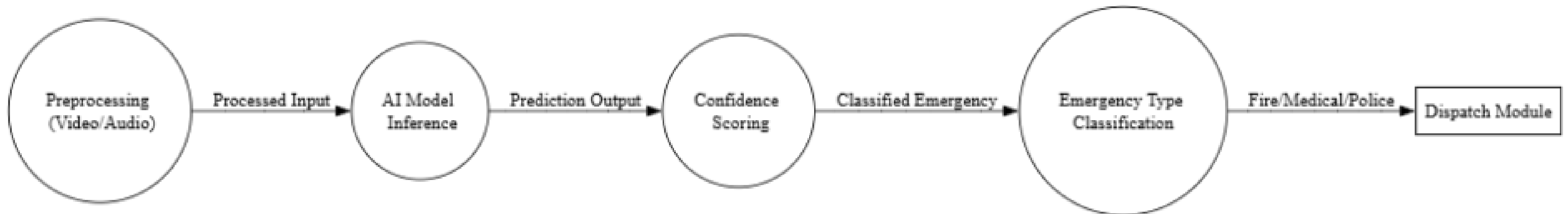
Dataflow Diagram

Level 0 DFD

Level 1 DFD

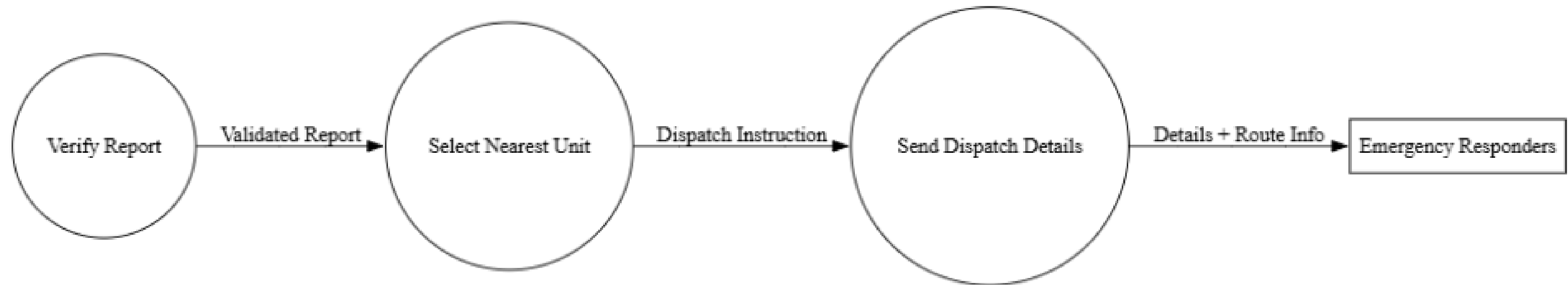# Level 2 DFD
User Reporting

Level 2 DFD
AI Incident Classification

Level 2 DFD
Dispatch Management

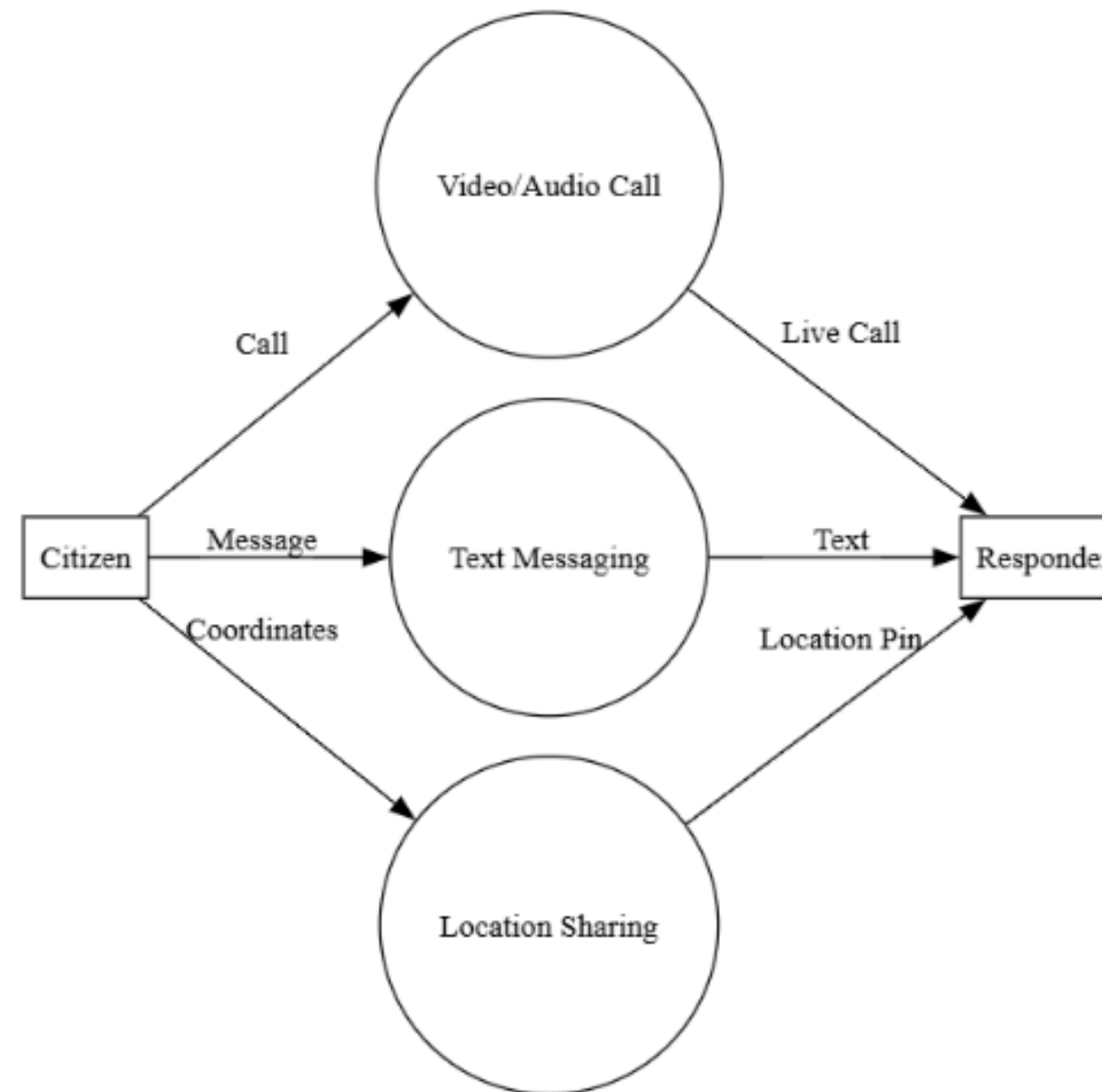# Level 2 DFD
Responder Communication

Level 2 DFD
Analytics Monitoring