

# JASPIQ

**(Judgment & Smart Prediction  
Intelligence for Urban Crises)**

An AI-powered Decision Engine for Risk  
Assessment, Evacuation, and Crisis Response in  
Smart Cities

**Team:  
HACKSTREETERS**



# MEET THE TEAM



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# Problem Statement

Modern cities face multi-layered crises like floods, blackouts, infrastructure failures, and the spread of misinformation – often happening simultaneously and amplifying each other.



## **ZONE C FOCUSED AS A HIGH-RISK URBAN DISTRICT**

Zone C is characterized by dense population, aging infrastructure, and proximity to water bodies – making it especially vulnerable to floods, power outages, and transportation disruptions during extreme events.



## **GAPS IN TRADITIONAL EMERGENCY RESPONSE SYSTEMS**

Existing systems are often reactive, siloed across departments, and lack integration of real-time data, leading to delayed or misinformed decisions



## **LACK OF TRUSTWORTHY, ACTIONABLE INTELLIGENCE**

Citizens and decision-makers struggle to determine which signals to trust (e.g., false alerts vs. real threats), causing confusion and potentially life-threatening delays in evacuation or response.



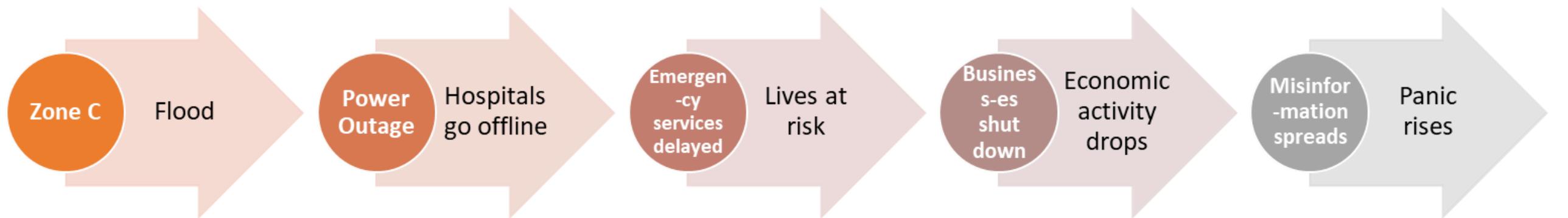
## **NO UNIFIED RISK SCORING OR EVACUATION PLANNING TOOLS**

There is currently no centralized system that aggregates multimodal data (social, sensor, weather, economic) to assess real-time risk and recommend tailored evacuation routes or shelter options.



# THE RIPPLE EFFECT: UNDERSTANDING CRISIS CASCADES IN SMART CITIES

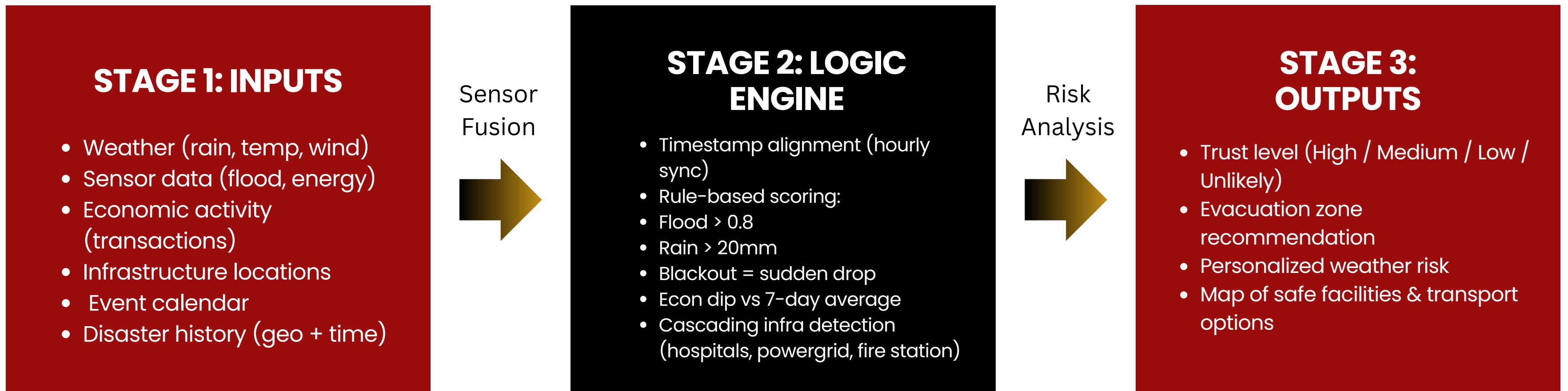
## SCENARIO: MULTI-HAZARD CRISIS IN ZONE C



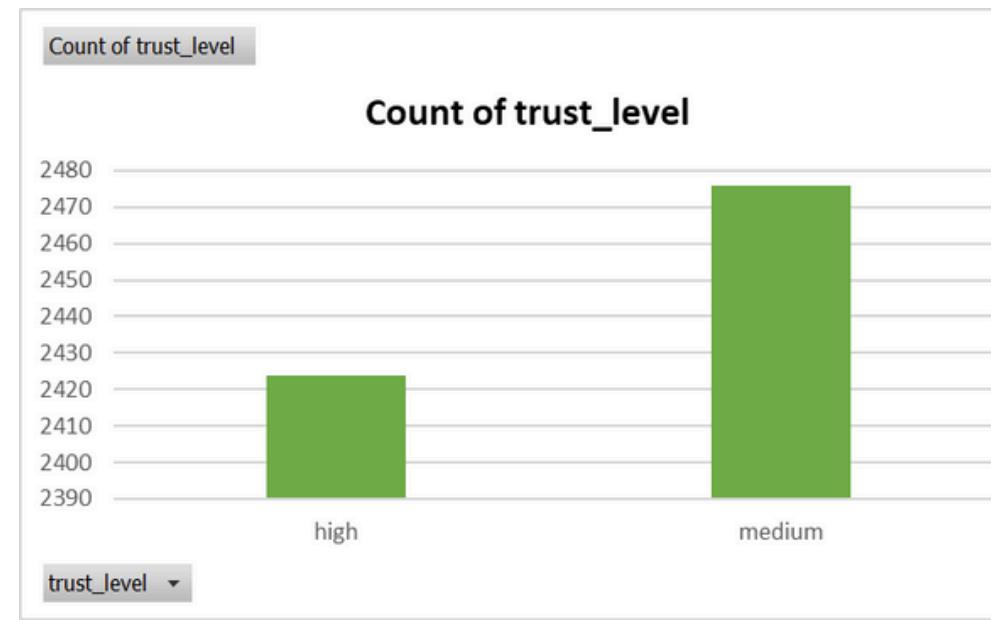
- Crisis doesn't stop at one event – disasters in smart cities trigger chain reactions
- Project focuses on Zone C, a high-risk area with multiple infrastructure dependencies
- Existing systems fail to account for interconnected failures
- This calls for a holistic, AI-driven system that can simulate and respond to ripple effects

# TURNING CHAOS INTO CLARITY: OUR CRISIS INTELLIGENCE PIPELINE

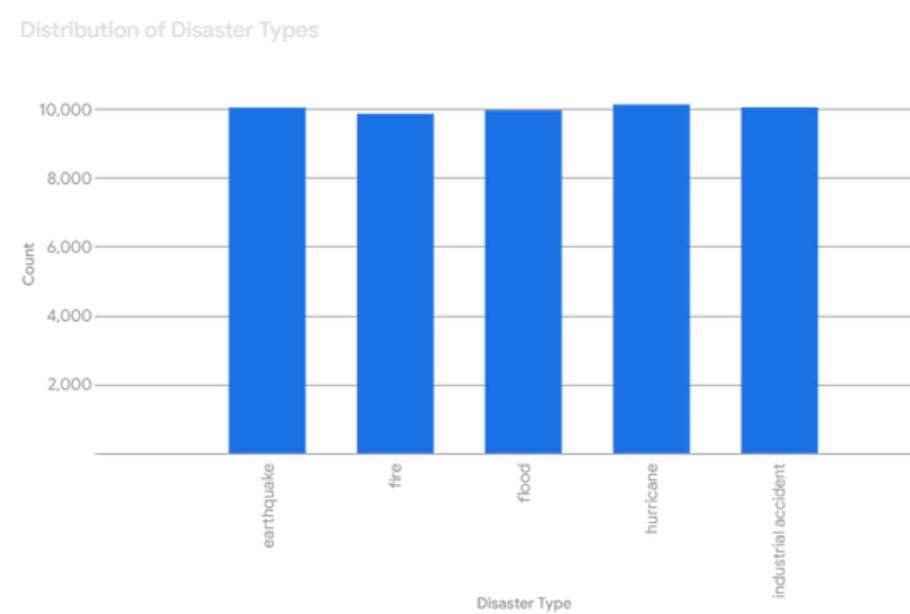
From flood sensors to safe zones, our approach turns raw data into lifesaving decisions – giving smart cities a brain in moments of crisis basically it fuses diverse city data streams through a modular engine that detects risk, identifies cascading failures, and recommends safe, personalized actions.



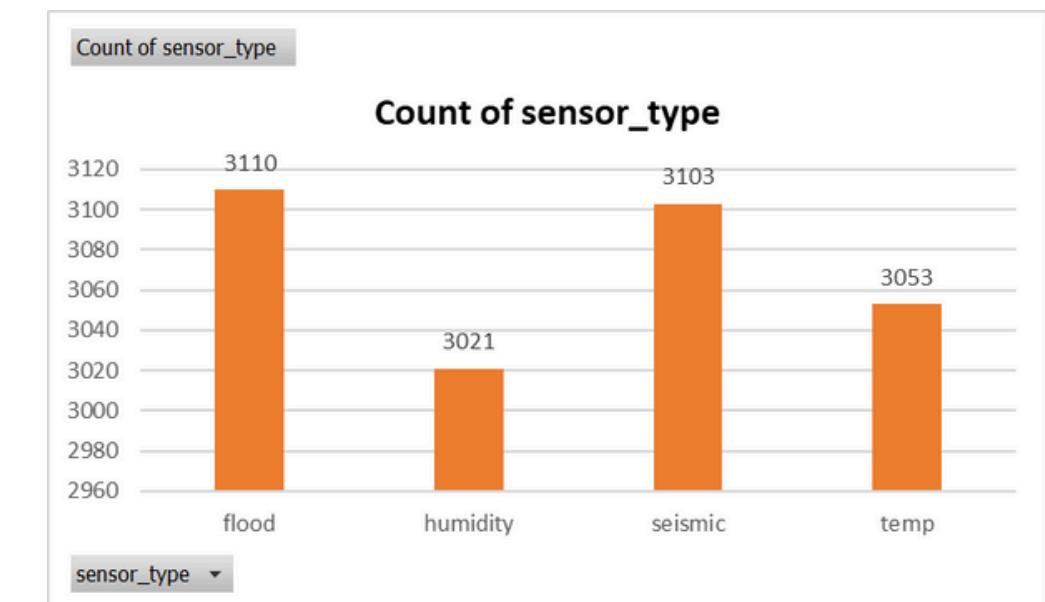
# Exploratory Data Analysis: Understanding City Signals



- Zones have similar total facility counts.
- Hospitals are the most common facility type.
- Shelter counts vary most between zones.

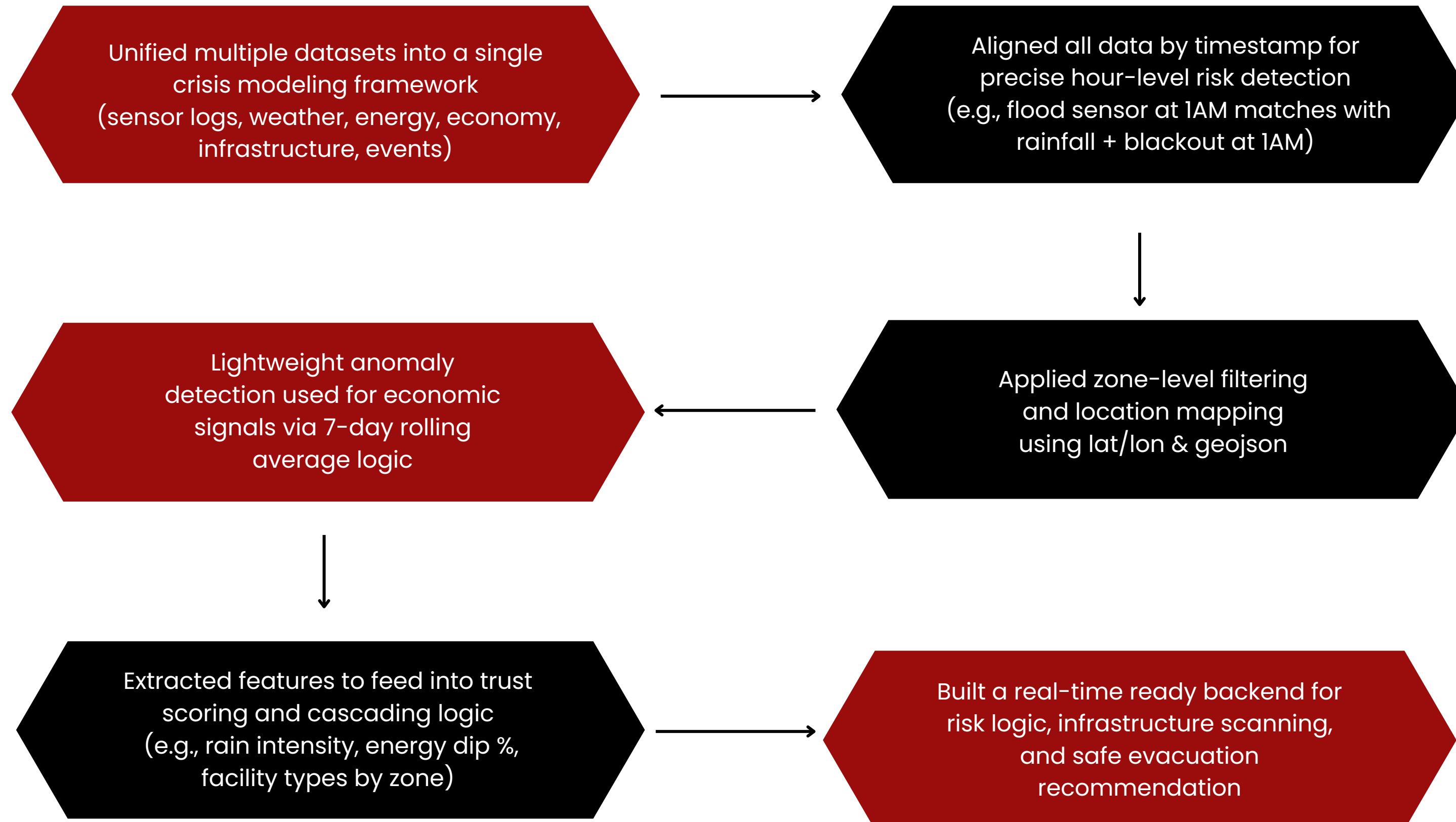


- Sensors show similar temperature trends.
- Sensor 2 records consistently lower temperatures.
- Temperature differences increase over time.



- Hurricanes are most frequent.
- Frequency is similar across types.
- Fires are slightly less frequent.

# CRISIS MODELING FRAMEWORK



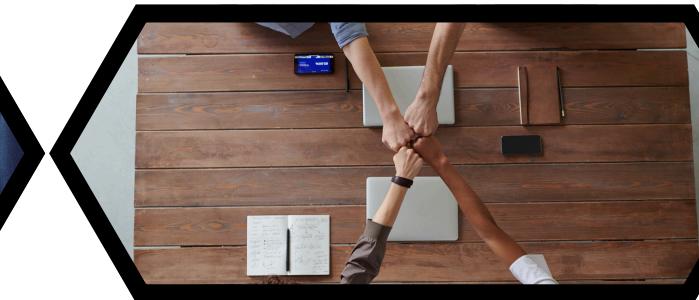
# RISK ENGINE & TRUST SCORE

- Built an interpretable, rule-based logic model to assess risk
- Trust score computed using 4 critical signals:
  - Flood sensor reading > 0.8
  - Rainfall > 20mm (heavy rain threshold)
  - Energy consumption drop > 40% = blackout
  - Economic anomaly: transaction volume < 70% of 7-day rolling avg
- Scoring system:
  - High risk: 3–4 triggers
  - Medium: 2 triggers
  - Low: 1 trigger
  - Unlikely: 0 triggers
- System acts as the “brain” – processes diverse signals and converts them into real-time trust scores for crisis decision-making.
- Interpretable logic-based model supports explainable, transparent decision-making – no black-box ML



# PERSONALIZED CRISIS RESPONSE: WEATHER-AWARE & LOCATION-SMART EVACUATION SYSTEM

Real-time weather meets real-world routing – guiding every citizen with data-backed safety



## WEATHER-AWARE RISK LOGIC

- Pulls hourly weather at user's selected time
- Flags risks like extreme rainfall, wind > 80km/h, or temp extremes
- Enhances trust score context even without sensor triggers

## GEO-PERSONALIZATION USING

- Zone + lat/lon from user selection
- Filters infrastructure and facilities within evacuation zones
- Calculates geodesic distance to nearest hospitals/shelters

## COMBINES TIMESTAMP + ZONE + WEATHER TO DELIVER

- Personalized risk summary
- Recommended safe zone (e.g., Zone D)
- Active transport options (filtered by departure time + status)

## MAP-BASED INTERFACE SHOWS:

- You are here marker
- Nearest 3 safe facilities
- Evacuation-ready routes

# STREAMLIT IN ACTION: FROM CRISIS INPUT TO SAFE OUTPUT



Click ME  
please!!!

- Interactive dashboard built using Streamlit and Folium
- Users select date and high-risk time to trigger real-time crisis assessment
- Outputs generated within seconds:
  - Trust Score
  - Economic anomaly status
  - Weather-related risk alerts
  - Cascading infrastructure risks
  - Personalized zone recommendation
  - Safe facility suggestions and active transport options
- Live map rendering shows user's current location and nearest safe zones
- Entire pipeline updates dynamically based on user input, enabling real-time situational intelligence

# BEYOND THE PILOT: REAL-WORLD IMPACT & WHAT'S NEXT

## IMPACT SO FAR

- Reduced crisis response time with real-time, data-driven decisioning
- Enabled interpretable risk scoring trusted by officials
- Acted as a “city brain” — integrating sensor, weather, economic, and infrastructure data
- Delivered personalized evacuation paths based on real risk and facility access

## FUTURE SCOPE

- Integrate live social/media alerts (e.g., tweets, real-time incident feeds)
- Scale from Zone C to full city deployment (multi-zone logic ready)
- Add a feedback loop from citizens and field agents for continuous learning
- Connect with emergency dispatch systems and city control APIs for faster deployment

# THANK YOU FOR YOUR ATTENTION

We transformed fragmented city data into an intelligent, real-time crisis response engine – and this is just the beginning.

