

The background of the slide is a complex network diagram. It consists of numerous small nodes, represented by tiny red and blue dots, interconnected by a dense web of thin, multi-colored lines (red, blue, green, yellow). The connections form a complex, interconnected structure that resembles a social network or a communication network. The overall appearance is that of a large, intricate graph with many clusters and long-range connections.

Integrated Wireless Phone Based Emergency Response System (WIPER - DDDAS)

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Mobile Phone Database

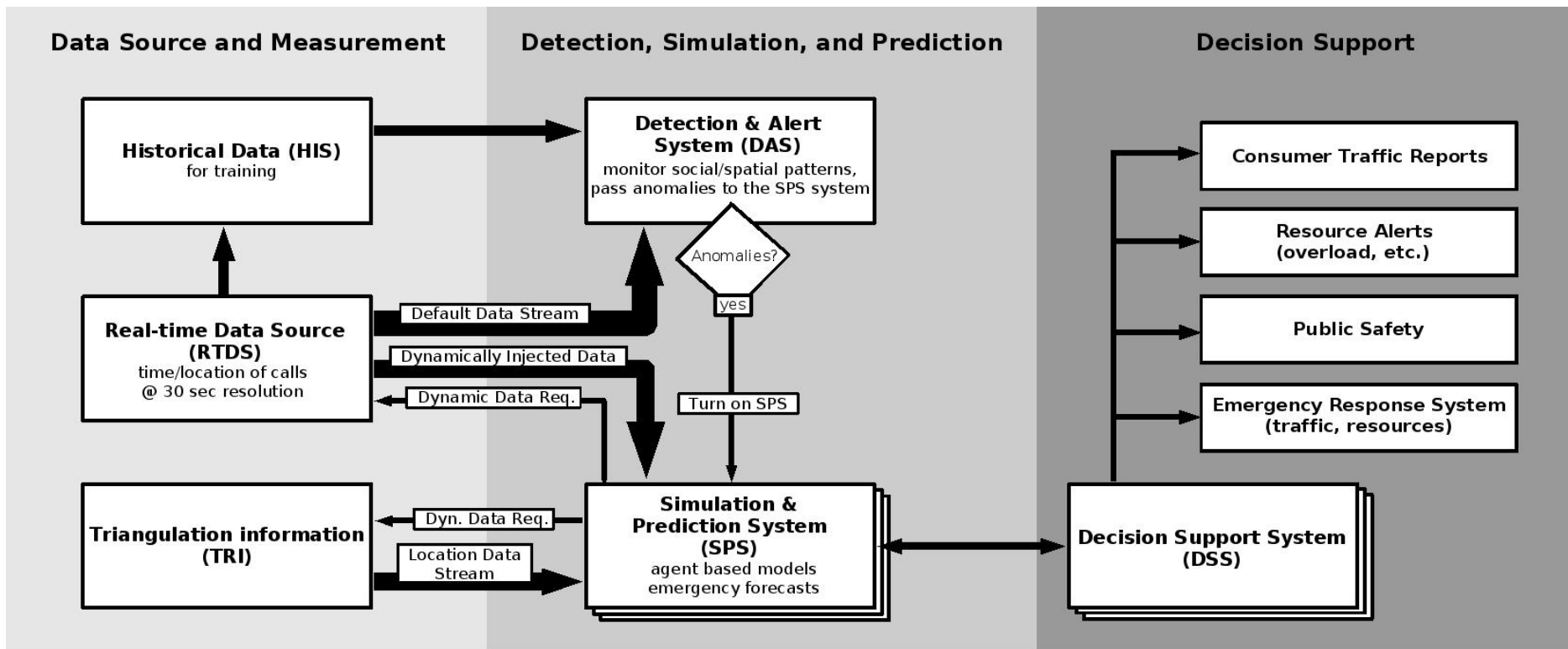
- **Real phone call records**
 - 7 million users
 - 2004 April → today (1.5 years)
 - Who calls whom/Call duration
 - Services (SMS, WAP, images)
 - Time resolved data (1 month)
 - Social data (sex, age, zip, phone)
 - Several **billion** phone call records
- Cell phones are an ad hoc **distributed sensor net**
- Location of all cell phones (that are powered-on) during an emergency can be determined
- Abnormal call patterns during an emergency or incident



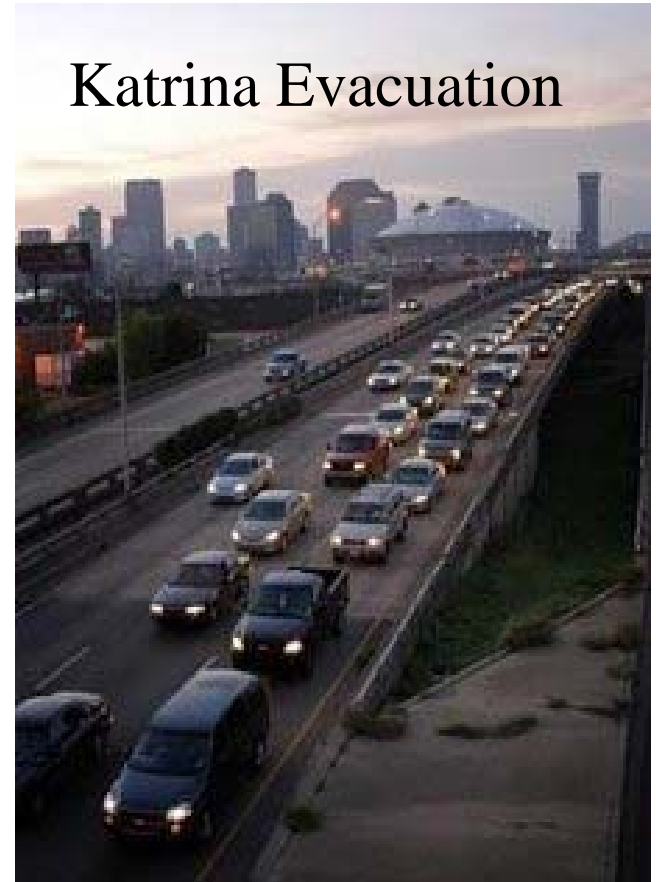
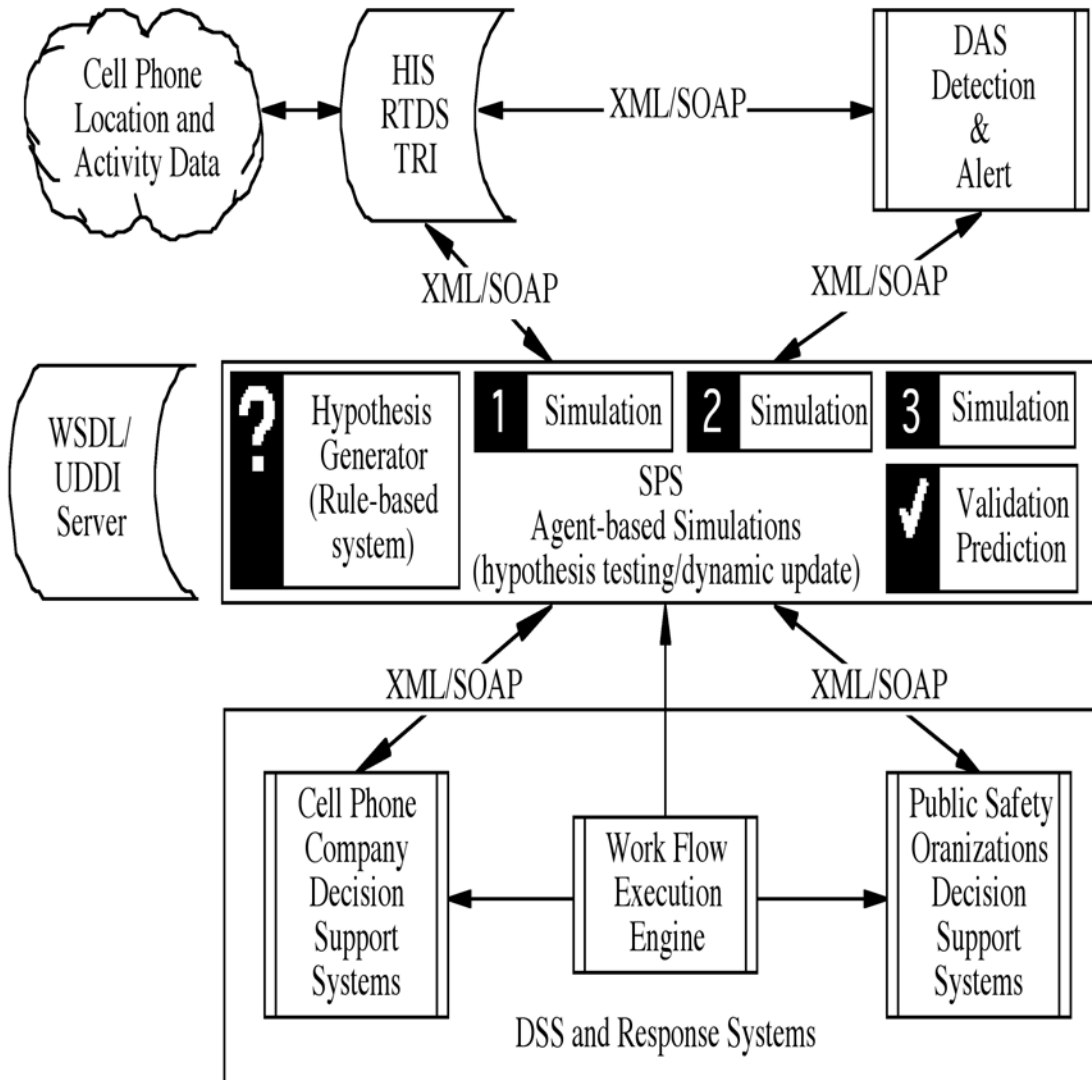
WIPER - DDDAS

Three Layer Architecture

- Data Source and Measurement
- Detection, Simulation, and Prediction
- Decision Support System (DSS)



DDDAS SERVICE ORIENTED ARCHITECTURE



Katrina Evacuation

WIPER - DDAS will

- Detect abnormal patterns in mobile call activity and locations
- Initiate dynamic data driven simulations to predict the evolution of the abnormality
- Initiate higher resolution data collection in localities of interest
- Interface with emergency response Decision Support Systems

