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# TiTiMaKe: A Distributed Service Architecture for Security Applications

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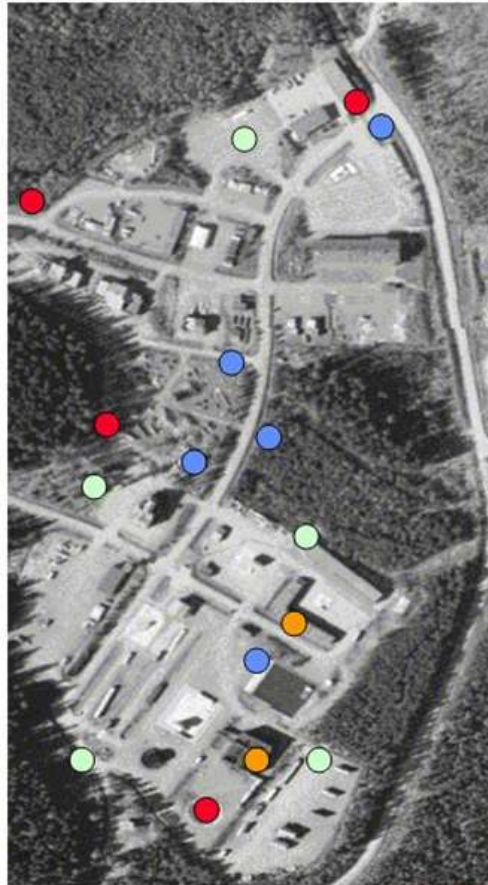
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# Outline

1. ToMoVaKe Sensor Network
2. ToMoVaKe Platform
3. TiTiMaKe Architecture
4. TiTiMaKe Logical Decomposition
5. TiTiMaKe Core Logic
6. Case Study: Unauthorized driving on a private road
7. Case study: Fire at an industrial site with chemicals
8. Conclusion

# 1.1 ToMoVaKe Sensor Network @ Emergency Services College

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## ● Detection of chemical emissions in the air

- weather
- small particles
- gaseous material
- hazardous materials for environment or health

## ● Control access, vehicle identification

- seismic sensors
- acoustic sensors
- cameras

## ● Detection of chemical emission in the water

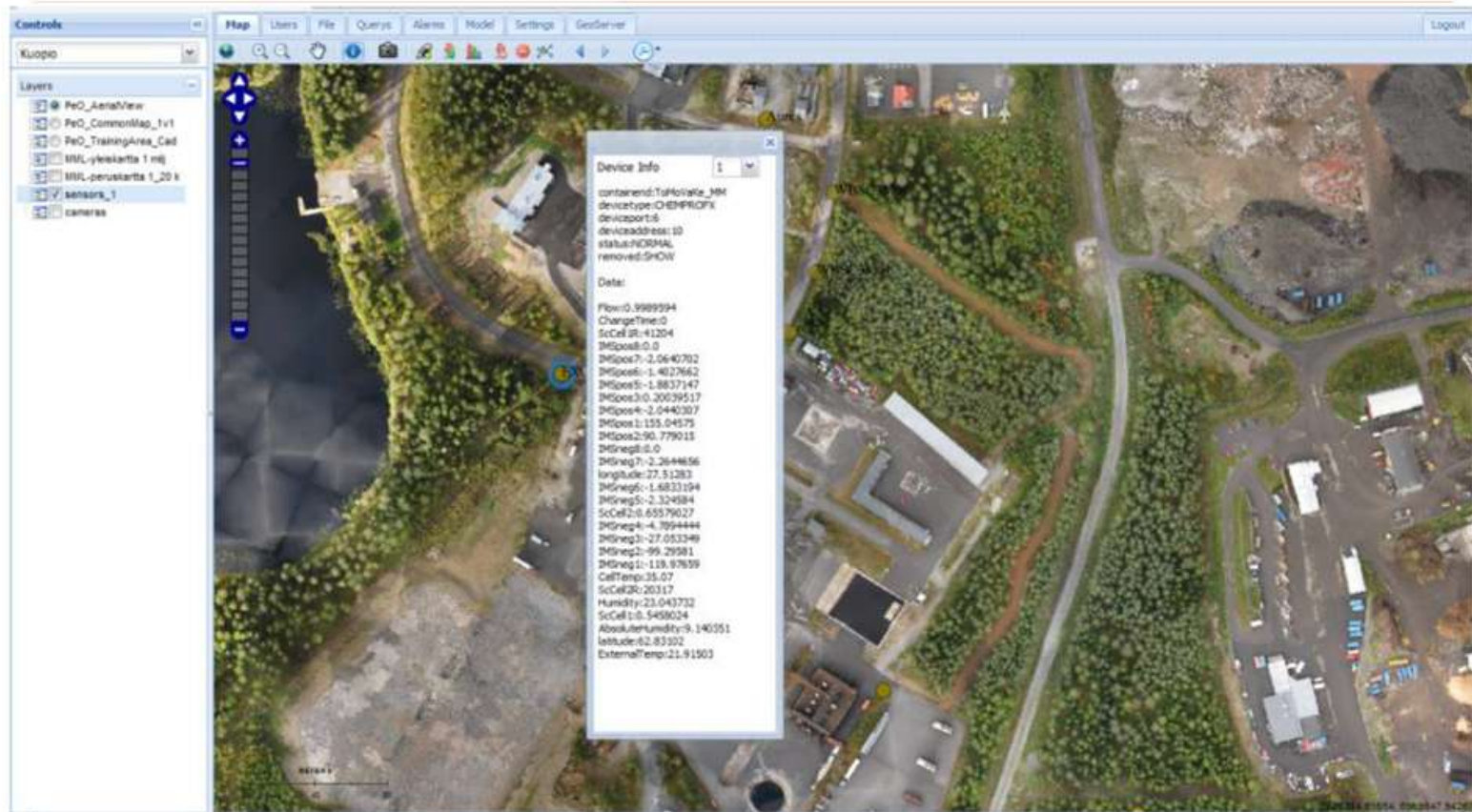
- sewer systems
- ditches
- water systems

## ● Determination of indoor air

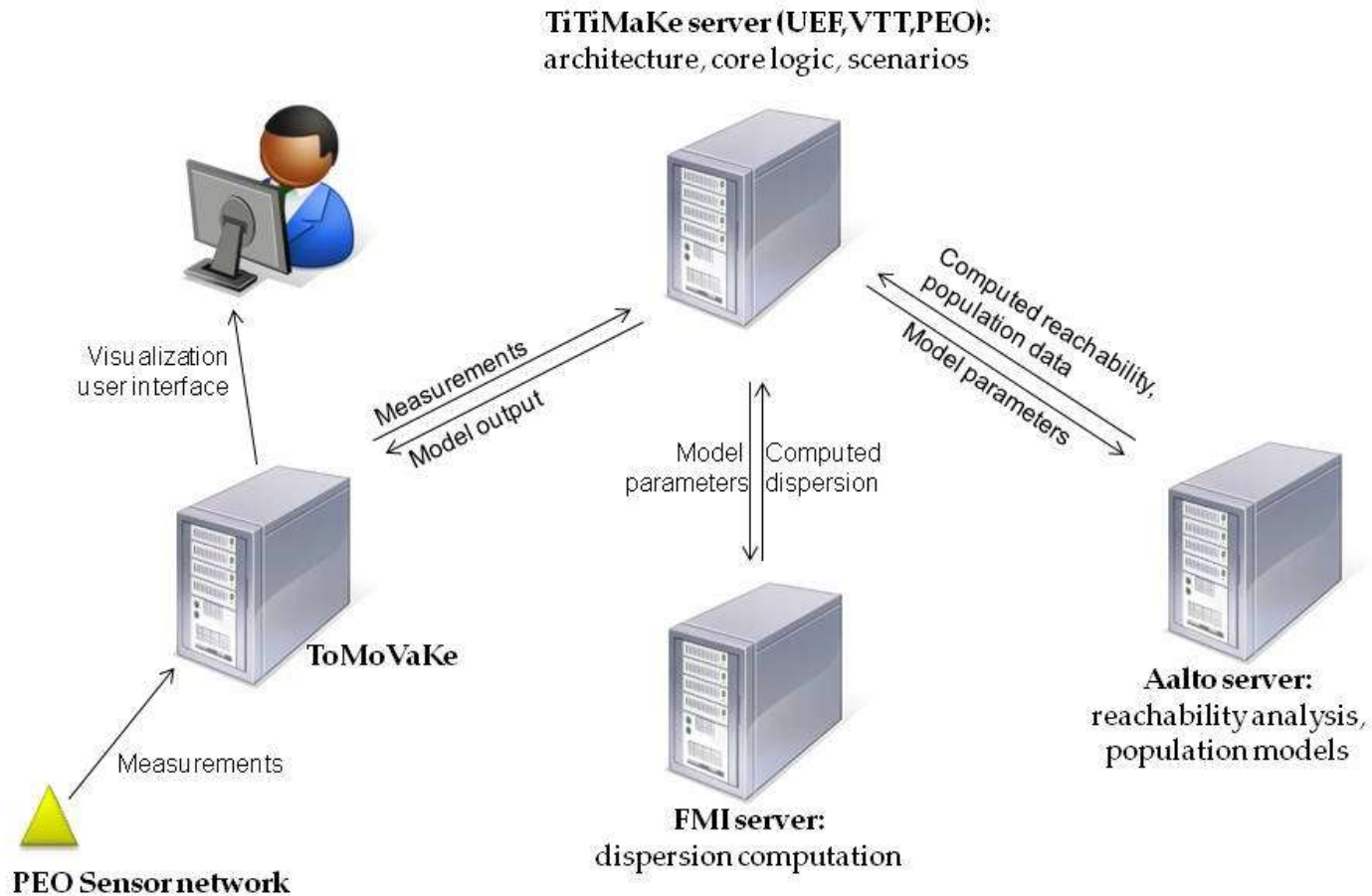
- combustion gas

# 1.1 ToMoVaKe Platform

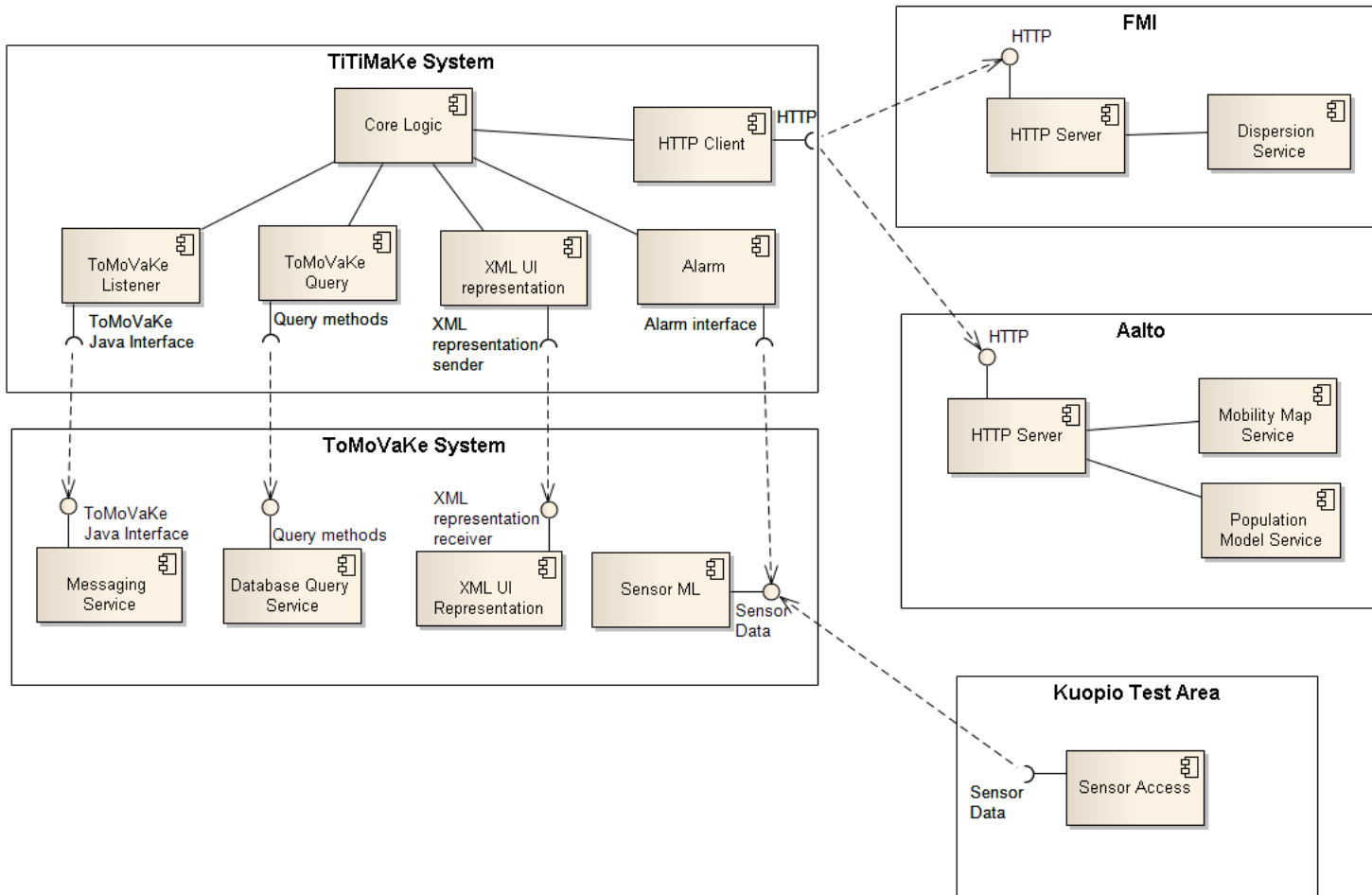
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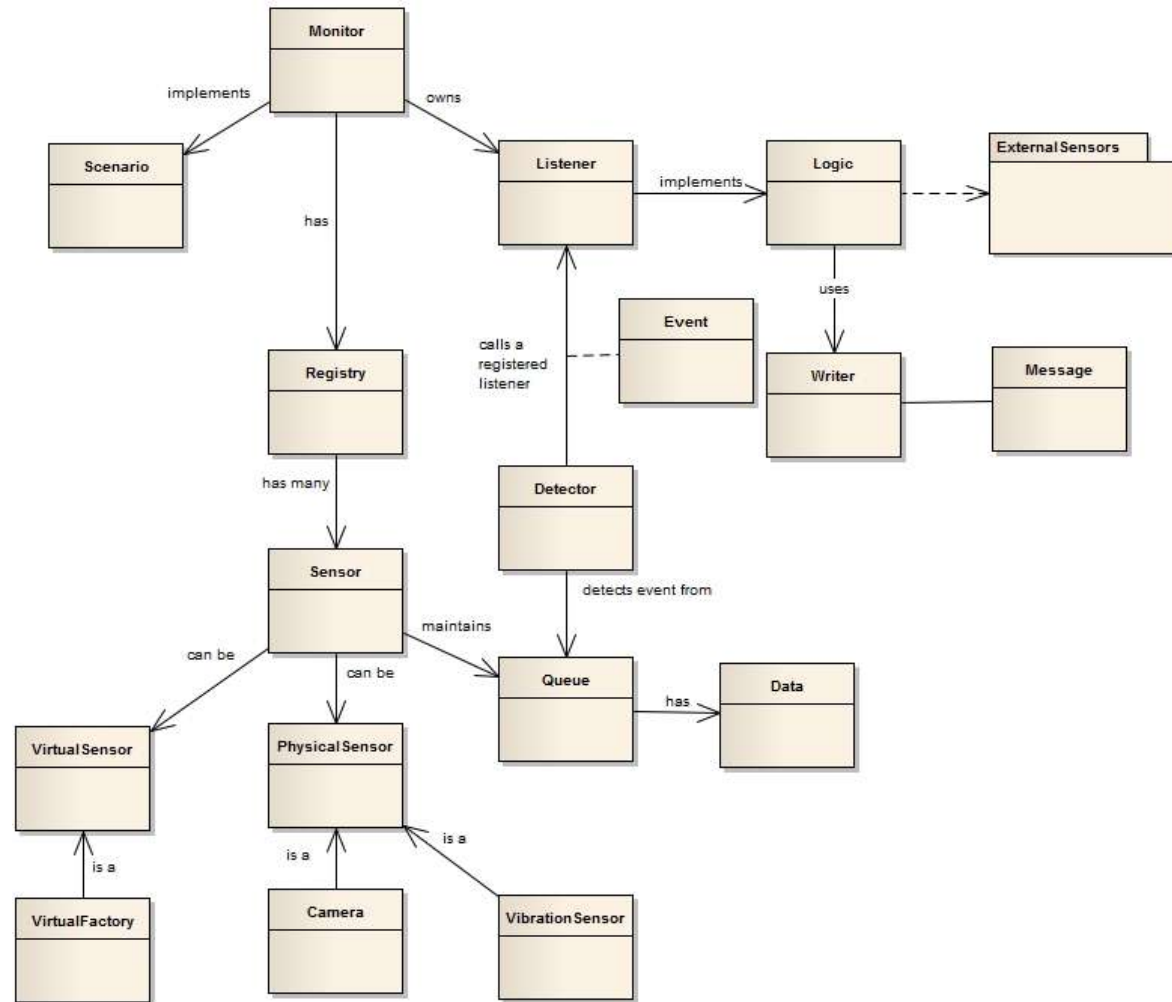
# 3. TiTiMaKe Architecture



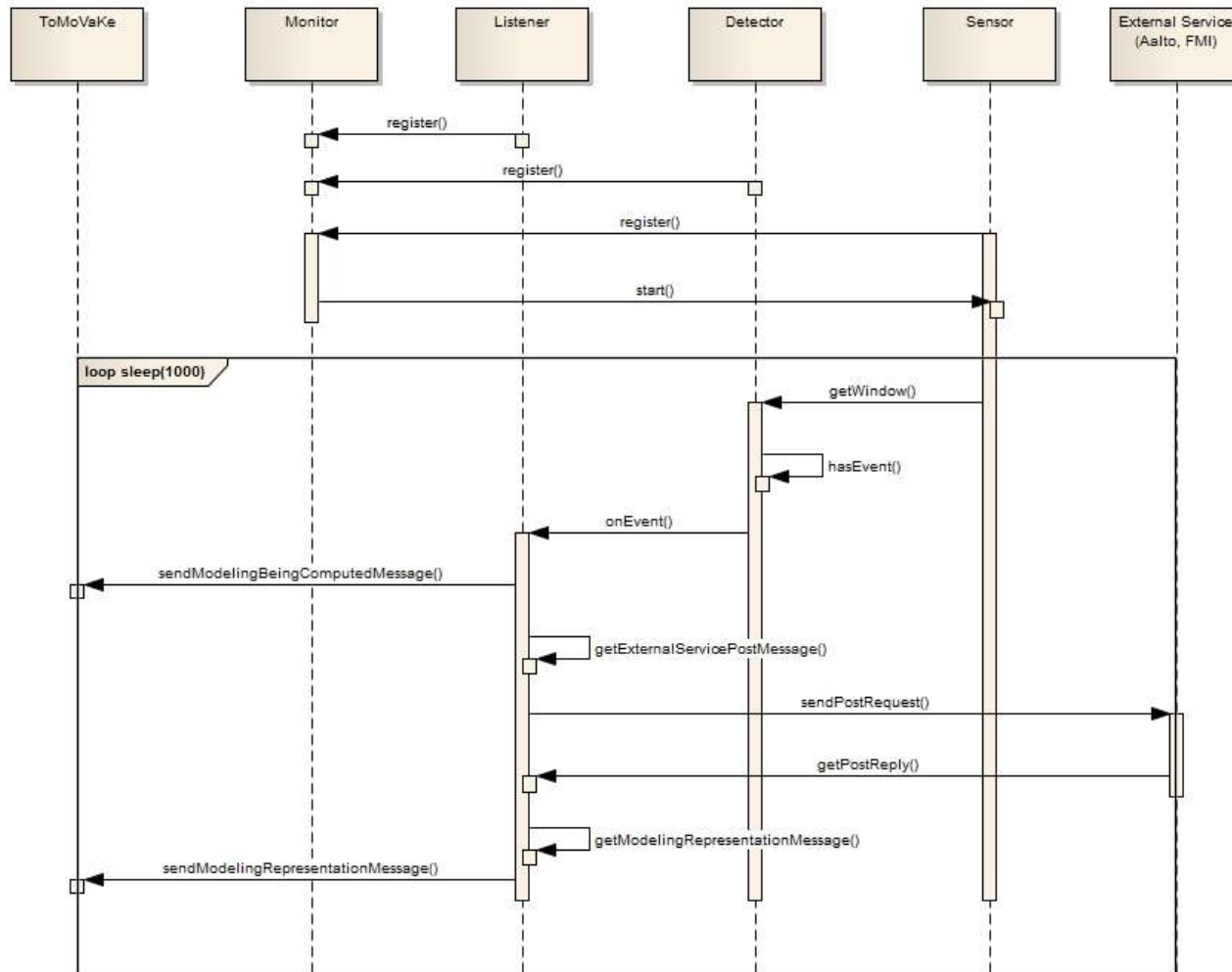
# 4. TiTiMaKe Logical Decomposition



# 5. TiTiMaKe Core Logic (1/2)

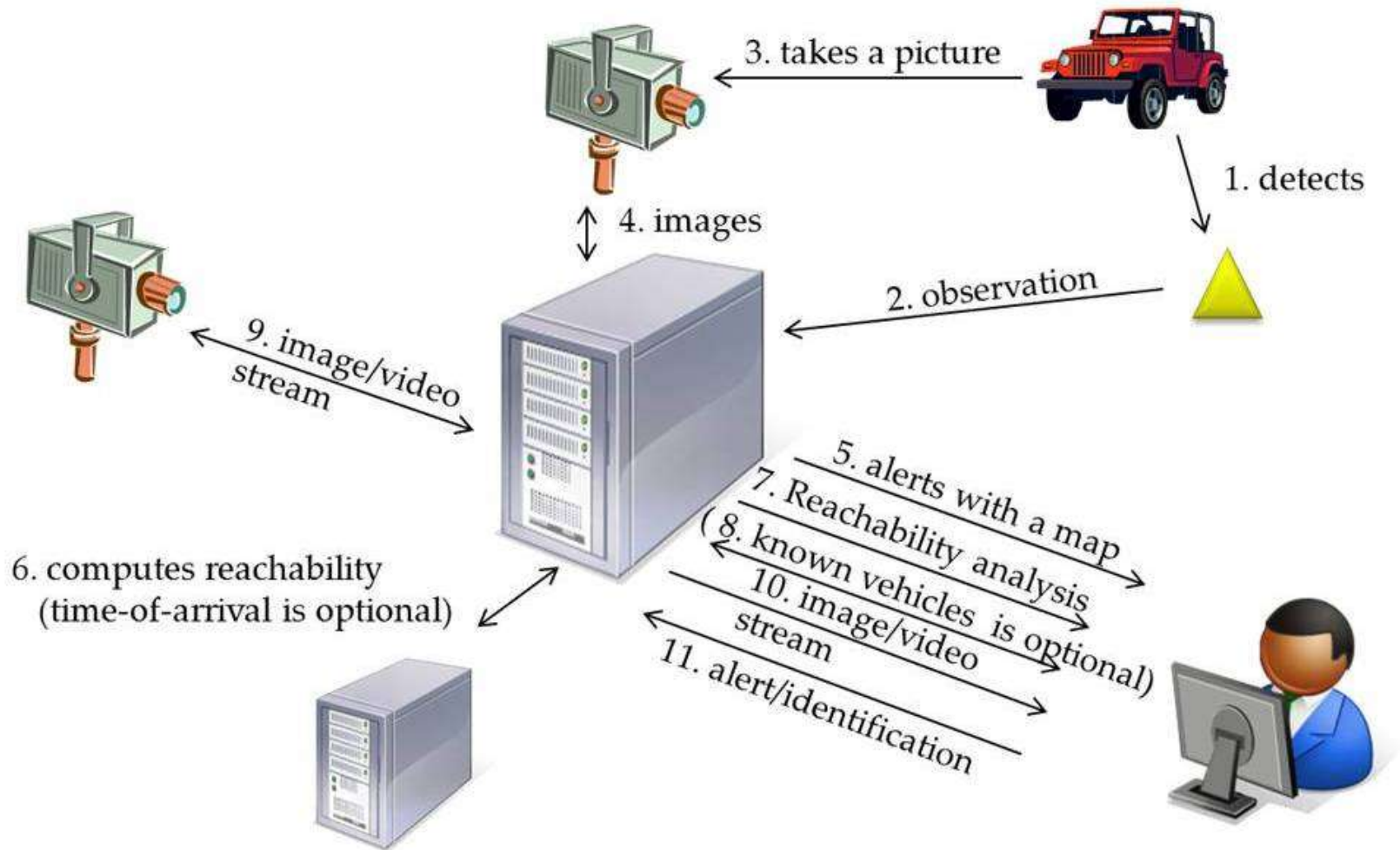


# 5. TiTiMaKe Core Logic (2/2)

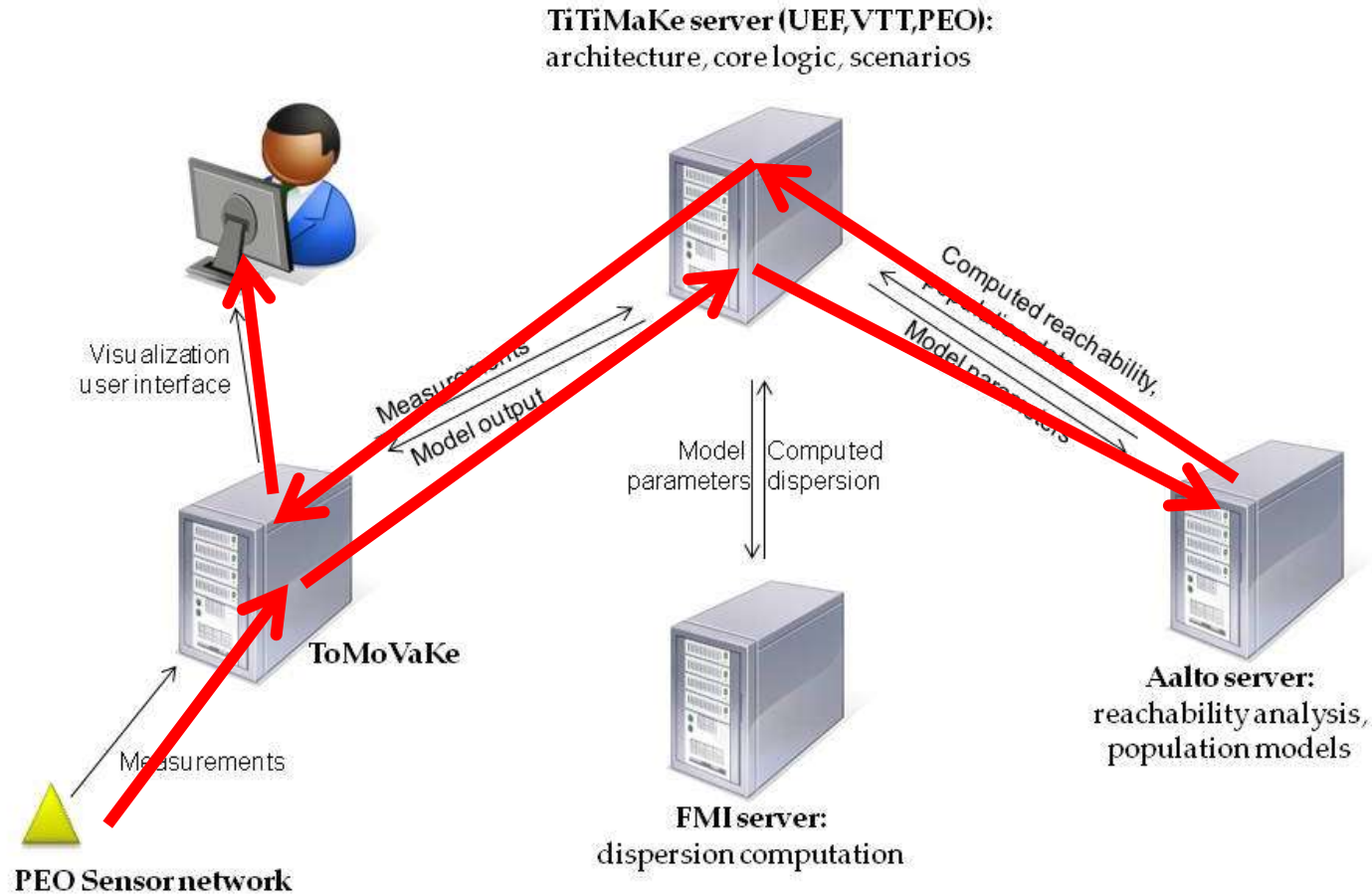




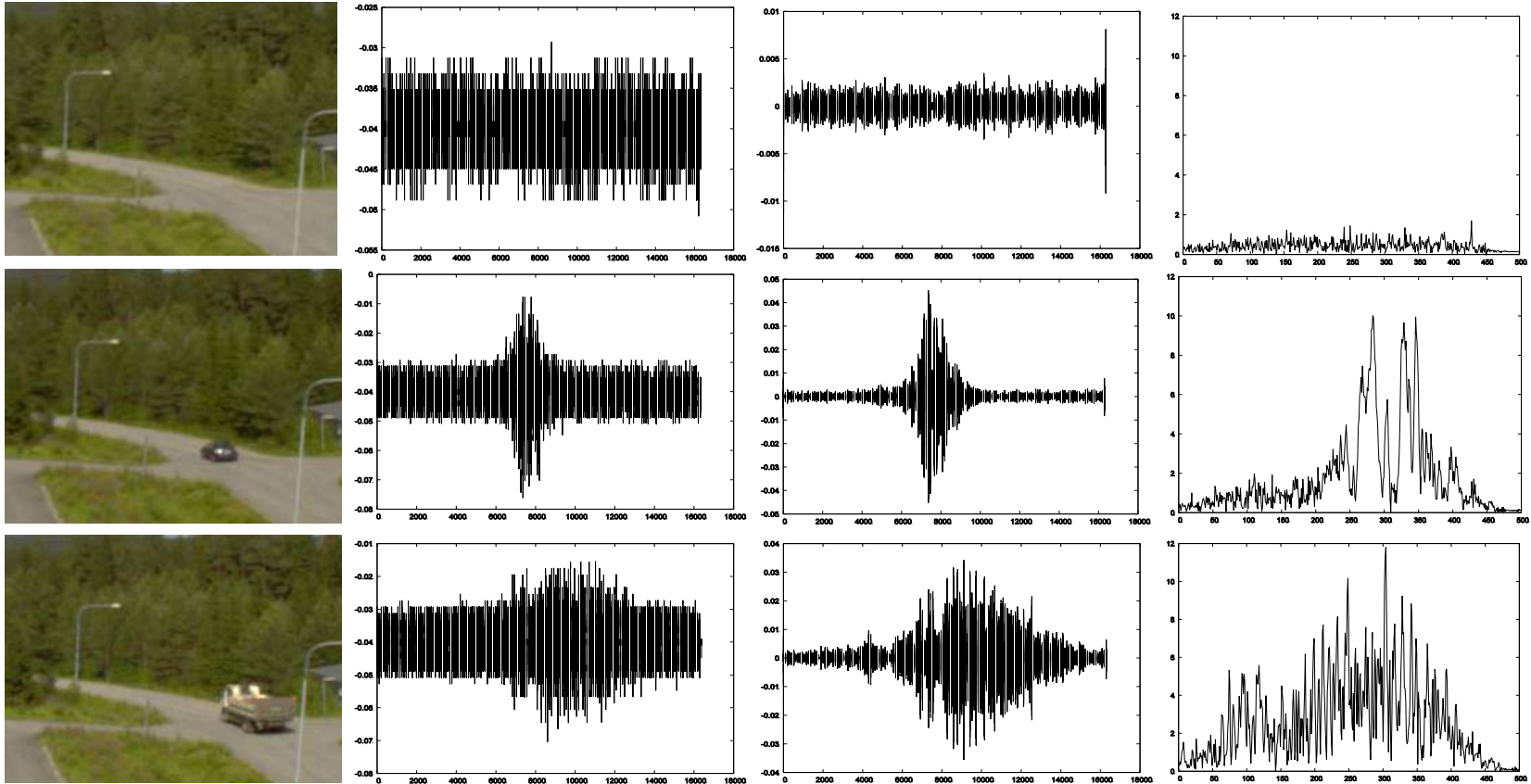
## 6. Unauthorized vehicle on a private road (1/4)



# 6. Unauthorized vehicle on a private road (2/4)



# 6. Unauthorized vehicle on a private road (3/4)

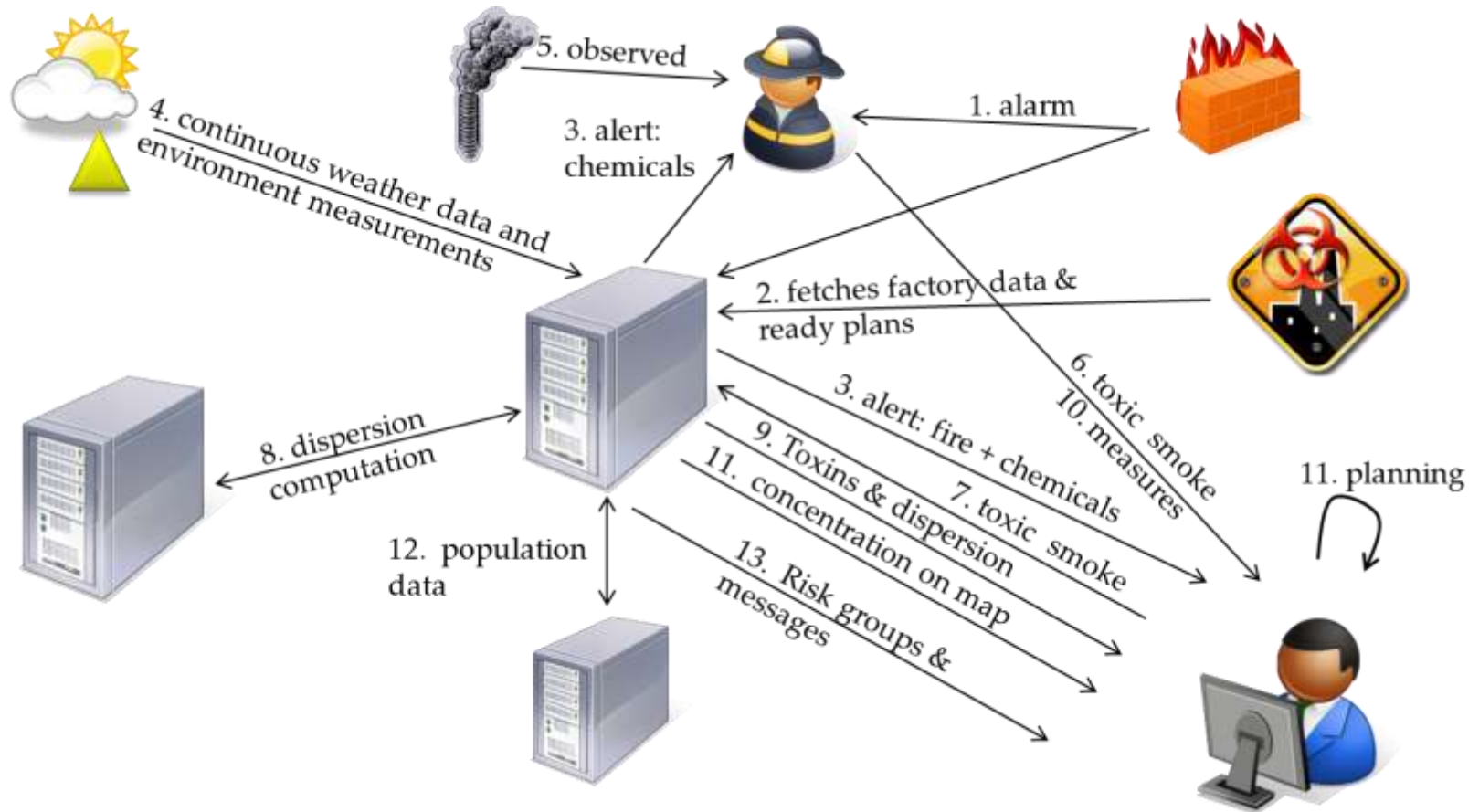


## 6. Unauthorized vehicle on a private road (4/4)

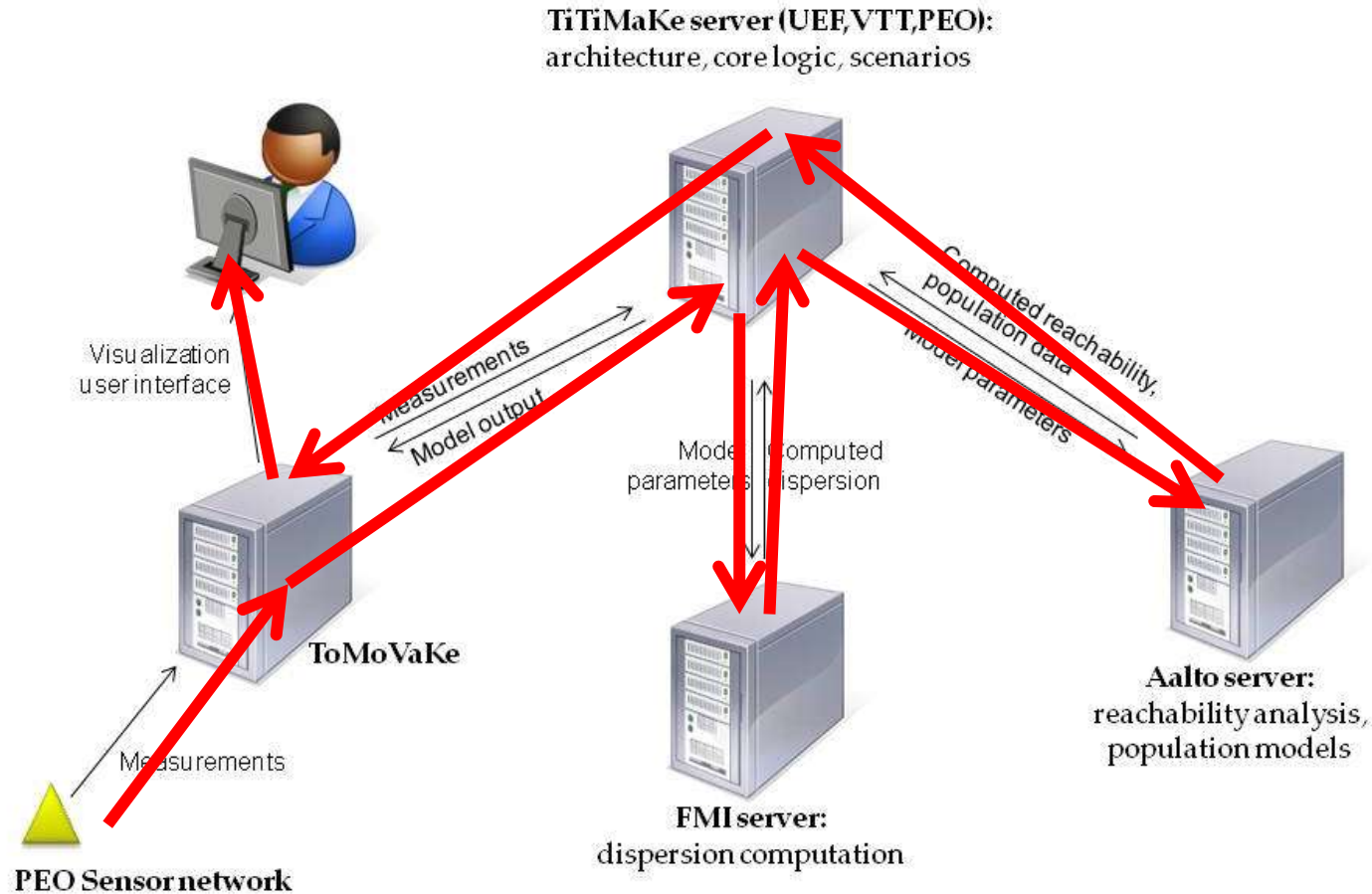


Event detected on Wed Oct 12 10:20:16 EEST 2011 with vehicle type Van-like

# 7. Fire with Chemicals in a Factory (1/3)



# 7. Fire with Chemicals in a Factory (2/3)



## 7. Fire with Chemicals in a Factory (3/3)



Fire alarm notification on Mon Sep 26 09:23:21 EEST 2011 from Factory XBCF

Total population affected: 14

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## 8. Conclusion

- Distributed service network (and architecture) for safety and security applications
- Support for scenario based application development
- Extensible core logic with design patterns
- Emerged issues for future work
  - Resilience; distributed network is highly sensitive to defects!
  - Data quality; resolution and accuracy of GIS data!
  - Central supervisory logic; could it be distributed, too?
  - Linking external services; use of mediators?
  - Personalization; web interface vs. mobile devices!
  - Trustworthiness; what do results mean and how long are they valid?





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