# Event Processing in Asset Management

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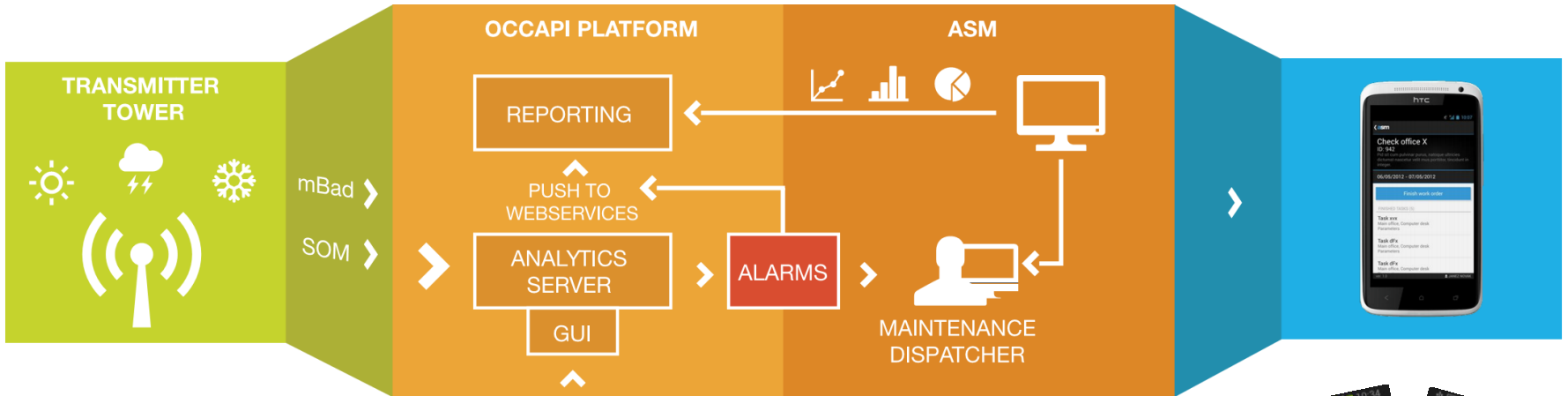ailab.ijs.si       Artificial Intelligence Laboratory

# Outline

- Description of the ASM use-case

- Conceptual Architecture

- Sensor Data Stream

- Event Processing

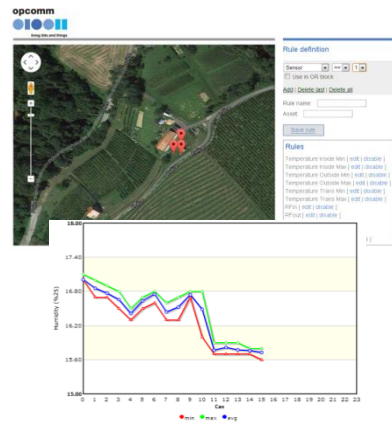- Implementation
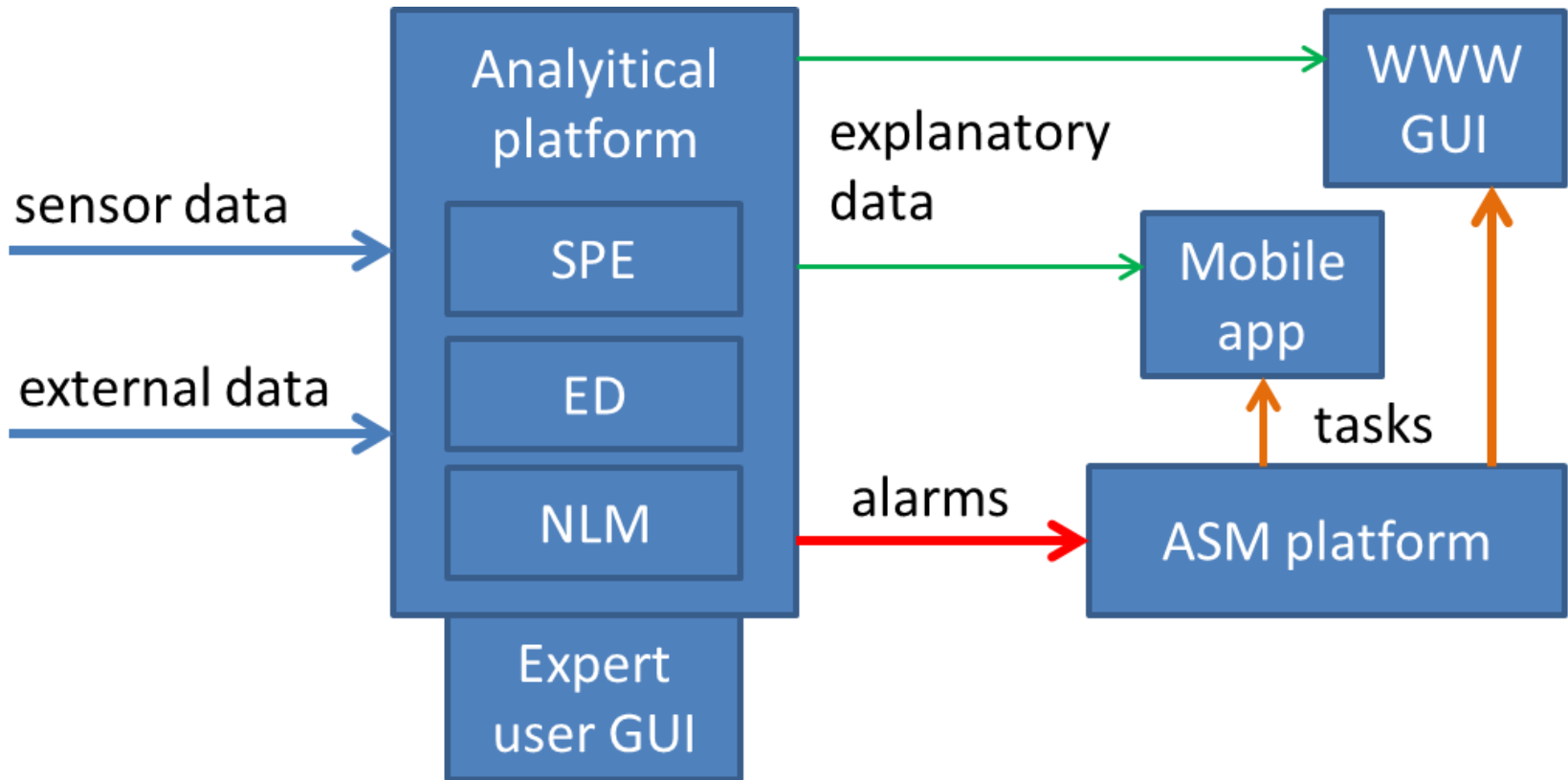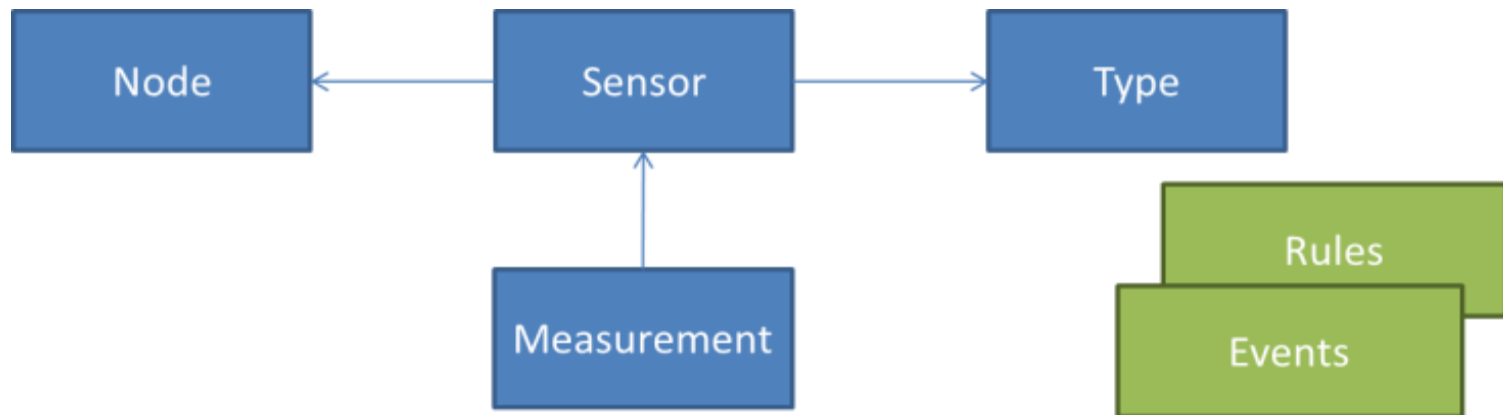
- Conclusions & Future Work

# The Use-case

# Conceptual Architecture

# Handling the Sensor Data Stream

- Dedicated Stream Processing Engine (SPE)
  - vs. DBMS, rule engine

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# Event Processing

**Rule discovery**

- Expert user with sufficient knowledge

- Expert user with support of the measurements (testing hypothesis, refining rules); suggestion

- Building a predicition model from the list of measurements/known events

**Event detection**

- Able to evaluate high number of rules on a huge amount of data
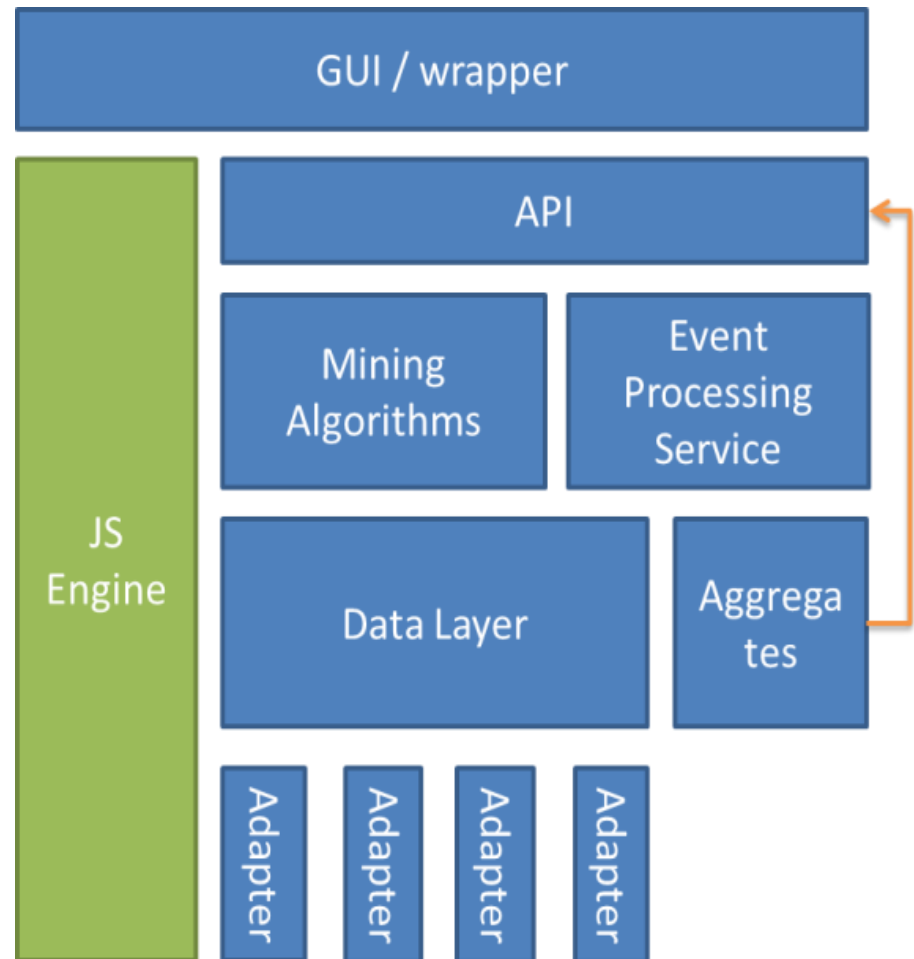
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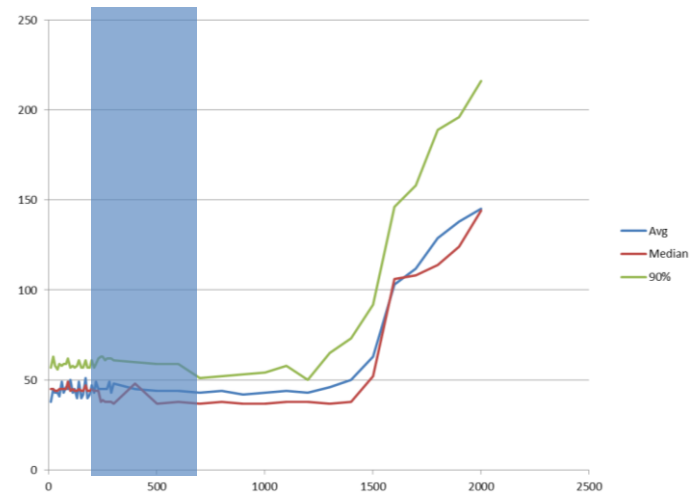
- Question of priority

- Exports

# Implementation

- EnStreaM
  - QMiner
    - C++
    - Integrated data layer (JSON definitions)
    - Integrated V8 JS engine
  - Event Processing Service

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# Rules and performance

- Expert users in the scenario only demanded simple rules
    - if temperature inside the station is lower than 5°C or higher than 40°C
    - if the temperature inside the emitting cell is lower than 5°C or higher than 35°C
    - if the voltage on all 5V devices is lower than 4V or higher than 6V
    - if the value on the WLTS device is not equal to 1186



JSON encoded rule:
{"Phenomena":"air_temperature", "Value":{"$gt":", 40.0"}}

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# User interfaces

# Conclusions & Future Work

- Conceptual architecture for analytical module for stream processing in Asset Management
- Example of implementation
- Evaluation
- Future work:
  - extension to other bussiness cases (data stream processing, CEP, NL generation)
  - predictive capabilities (SVM, decision trees on streams) with fusion of external data sources
  - event triggers in NL
  - Combining expert rules with automatically generated rules

# Questions?

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