Smart Water Strategies – Smart Utilities

SmartWater4Europe

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Water Eco-Security 2015

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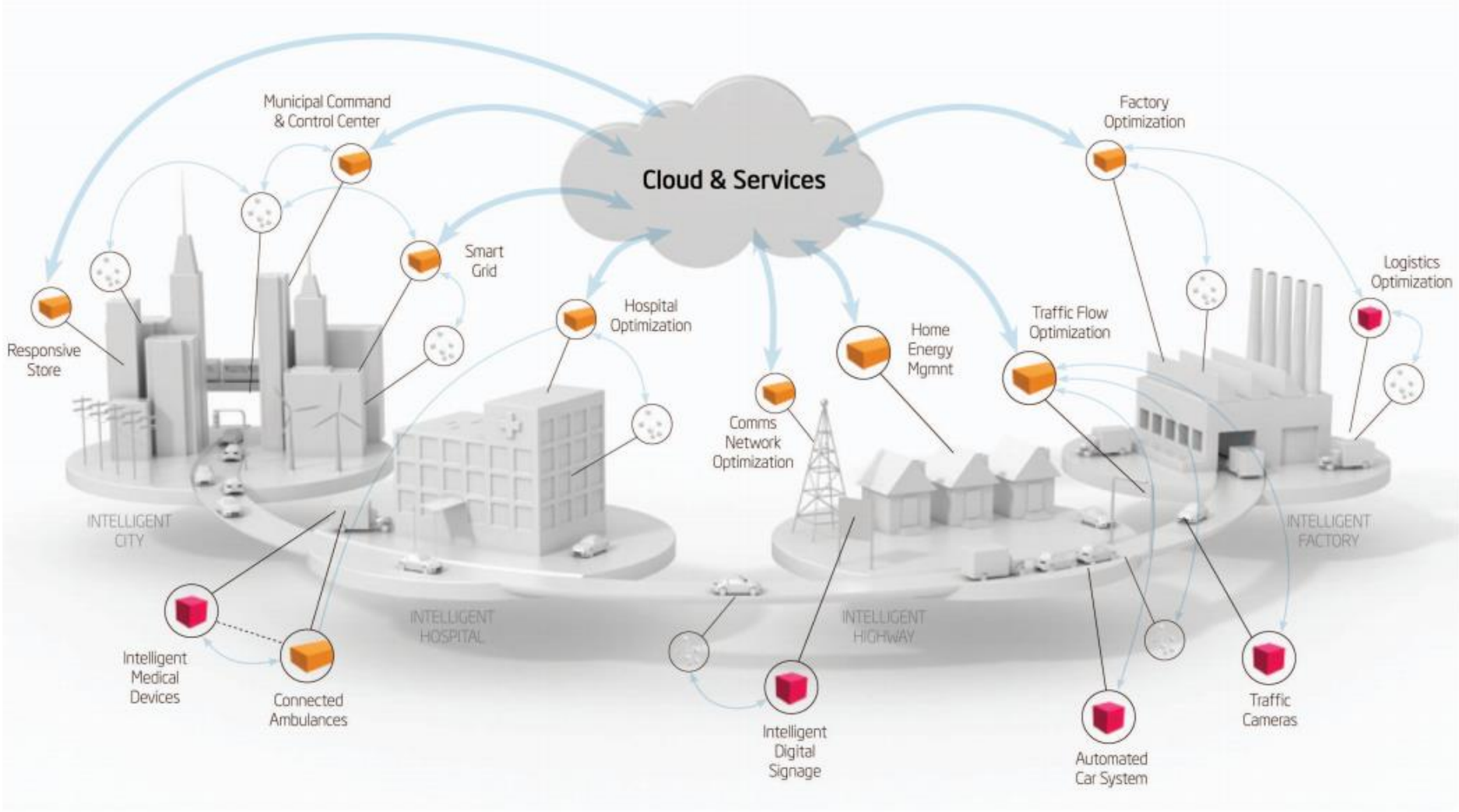
The Internet of Things



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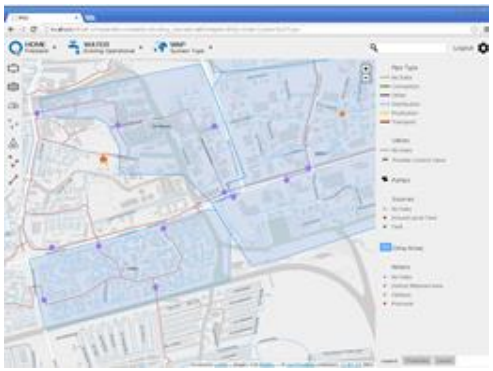
Please hold the line

Please hold the line

Please hold the line……..

4 steps:

1. Solve the problem
2. Find out what happened?
3. Who where involved?
4. What can we do to prevent this from happening again?



The European Innovation partnership on Water (EIP)

- Established priority areas related to the challenges in water supply distribution networks, focusing on:
  - resource efficiency
  - smart Water Management
  - decision support systems

- Although the technology components for Smart Water Management are available, the route to application is still uncertain.

The challenge

European water utilities face many problems related to their 3.5 million km's of distribution networks:

- Large parts of water distribution networks have to be rehabilitated requiring investments of € 10 billion/year.
- Prioritization and optimization of investments is needed urgently.
- In many countries, water quality needs improvement in order to reduce health risks and resources for water production and distribution must be used more efficiently.

Old network

Investment Priorization

Water quality

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SmartWater4Europe

- Demonstration of integrated smart water supply solutions at 4 sites across Europe.
- Total Cost: € 12 million.
- EC Contribution: € 5,999,288,00.
- Duration: 4 year.
- Start Date: 1st of January 2014.
- Consortium: 12 innovative SMEs, 3 water utilities, 3 research institutes, 1 company and 2 platform organisations.
- Project Web Site: www.SW4EU.com

Consortium

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Smart Water Grid

Real time

- Sensor data
- (Social) media

Static

- Asset data
- Customer data

Business Intelligence

- **Proactive/Preventive** control & measures
- Information provision

Increased process efficiency

Increased customer satisfaction

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Online Quality Monitoring

Goal: real time WQ control

- **Events…**
  - **due to treatment**
  - **in pipe**
  - **deliberately**
- **Back/forward tracing**
- **Respons strategies!**
  - **derouting**
  - **close**
  - **inform**

Spectro::lyser (S::can)
2x

Eventlab sensor (Optiqua)
45x

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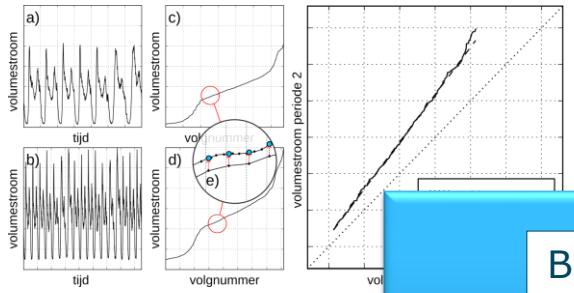
Leak detection



Goal: from reactive to proactive to preventive control

Detect

Build DMA's

PI / IMQS

VLPV method

Leakalgoritm

OPIR/Modelling

Field observations

Human sensor

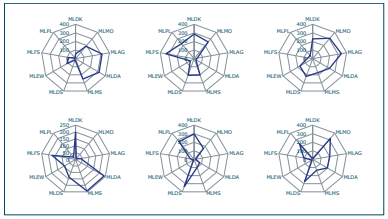
Sensoring

Pattern recognition

Localize

Small leaks

Big leaks



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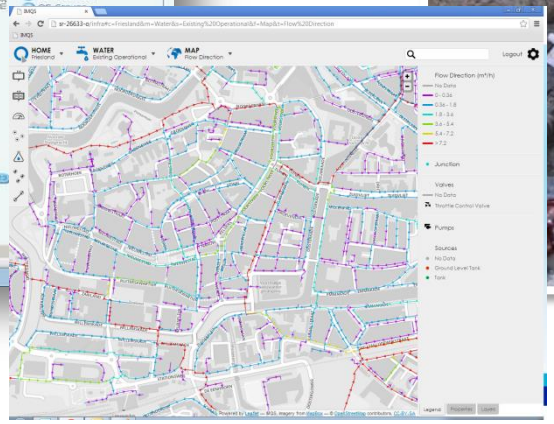
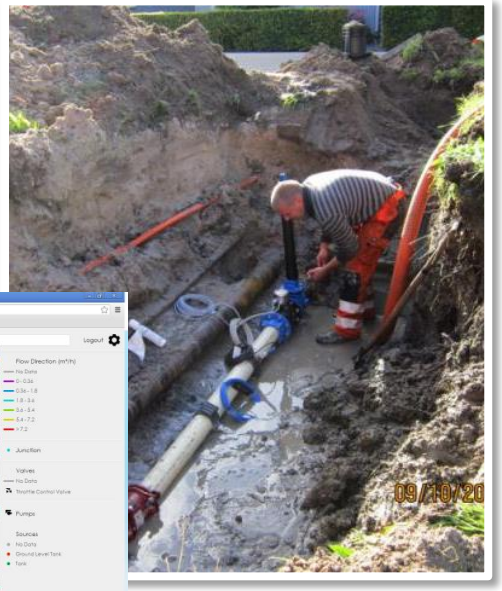
Energy Reduction

Goal: energy reduction 15 - 20%

- Validation of models with sensors
- Smart use of pumps and reservoirs
- Smart pressure management





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Customer Interaction

Goals:
Customer satisfaction
Peak shaving

Customer engagement

Control

Customer Awareness

Inform

Products & Services

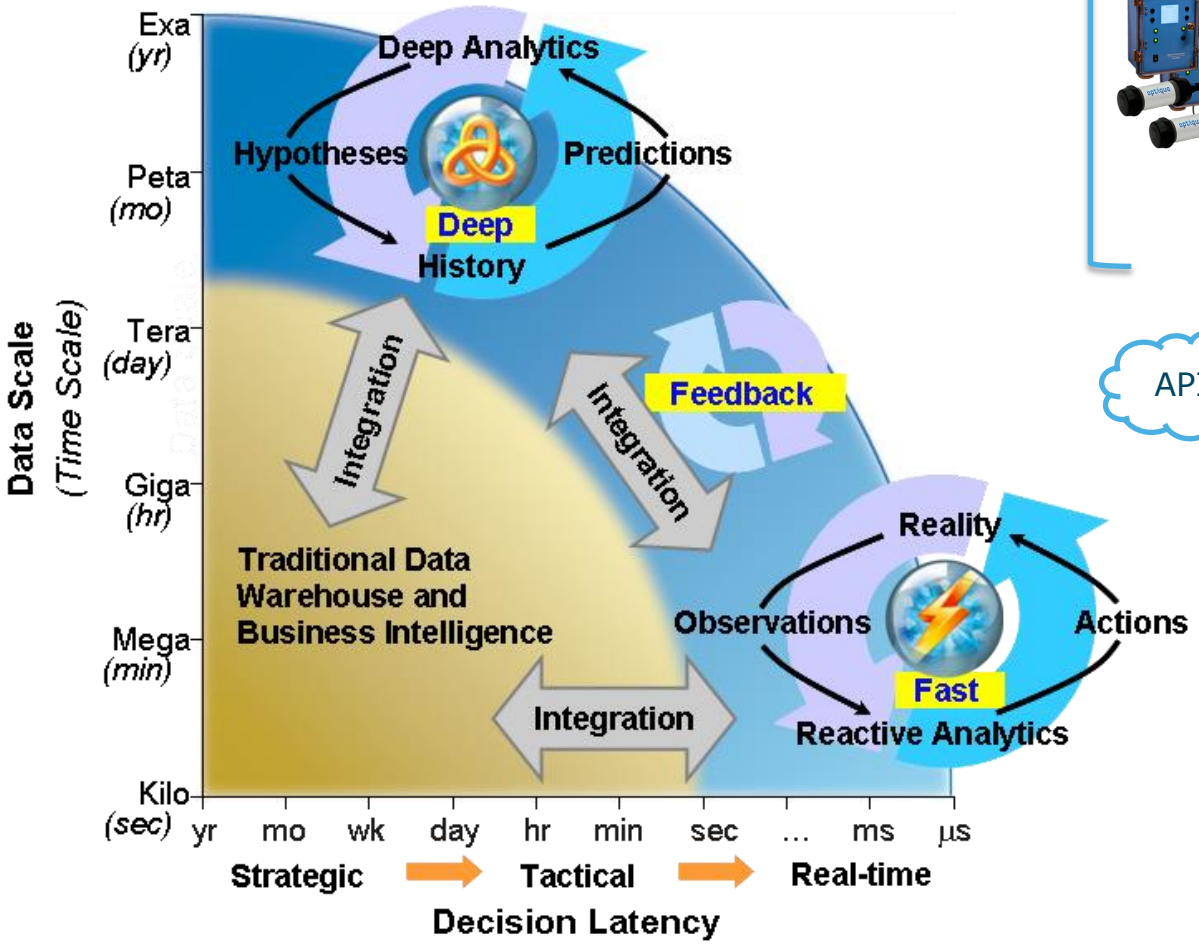
Serious Gaming

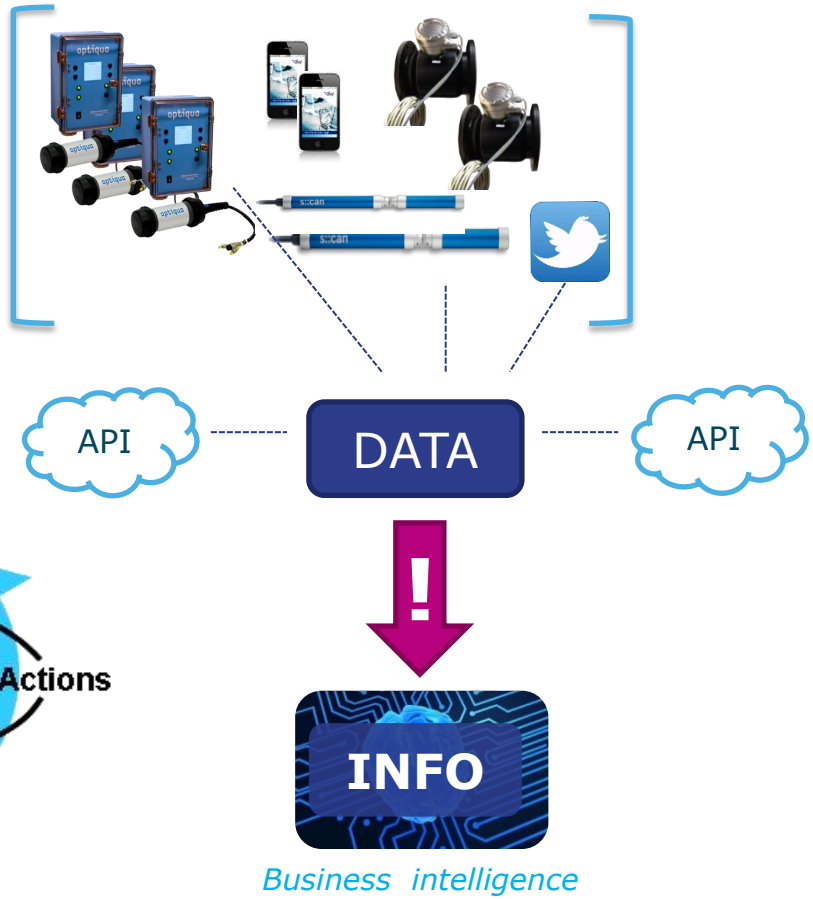
Human Sensor
(PWN – Ignaz Worm PhD)

Water Sevice App

Water Incident Site

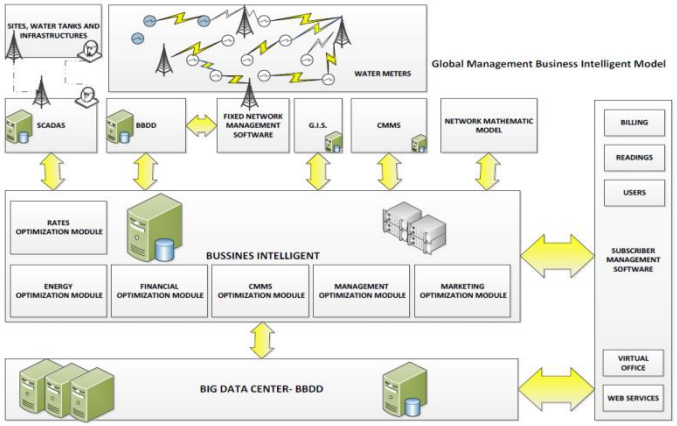
Upmost Challenge: Big Water Data





Project Objectives

- To demonstrate 12 innovative solutions
- To demonstrate 4 integrated solutions
- To establish and guard integration and standardisation aspects
- To establish business cases, deployment and potential market uptake routes



Demo Sites

Site Theme	Netherlands	Spain	United Kingdom	France
Water qualitiy management	1.1 Detection, back-tracing and forward tracing of water quality events by using multiple generic sensors and detailed modelling	1.2 Detection of water quality events in a chlorinated network and optimization of chlorine usage using generic sensors		1.3 detection of water quality anomalies by advanced algorithms using multiple specific sensors
Leakage management	2.1 Detection and localization of leakages by using generic quality, flow sensors, pressure sensors at mains level and detailed modelling	2.2 Detection and localization of leakages by smart meters at household level and heterogeneous data sources	2.3. Detection and localization of leakages by smart meters and determination of leak growing and leak repair effectiveness by self-learning algorithms	2.4 Detection and localization of leakages by using AMR (automatic meter readers) at household level, flow sensors, pressure sensors and algorithms
Energy optimization	3.1 Energy optimization by using district metered areas, pressure and other sensors and detailed modelling		3.2 Energy optimization by pressure sensors, advanced modelling and self-learning algorithms	3.3 Energy optimization by using intelligent distributed controllers
Customer interaction	4.1 Detection of water related events by using social media and provision of information to (vulnerable) customers		4.2 Influencing customer behaviour by supplying water usage information trough web and mobile applications	

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What’s really smart ?

- *A water grid becomes really smart having **sensors in minimal quantities** at strategic points acquiring real-time data combined with **available data*** enabling a **proactive network***

- ** (internal AND external)*