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SMART WATER



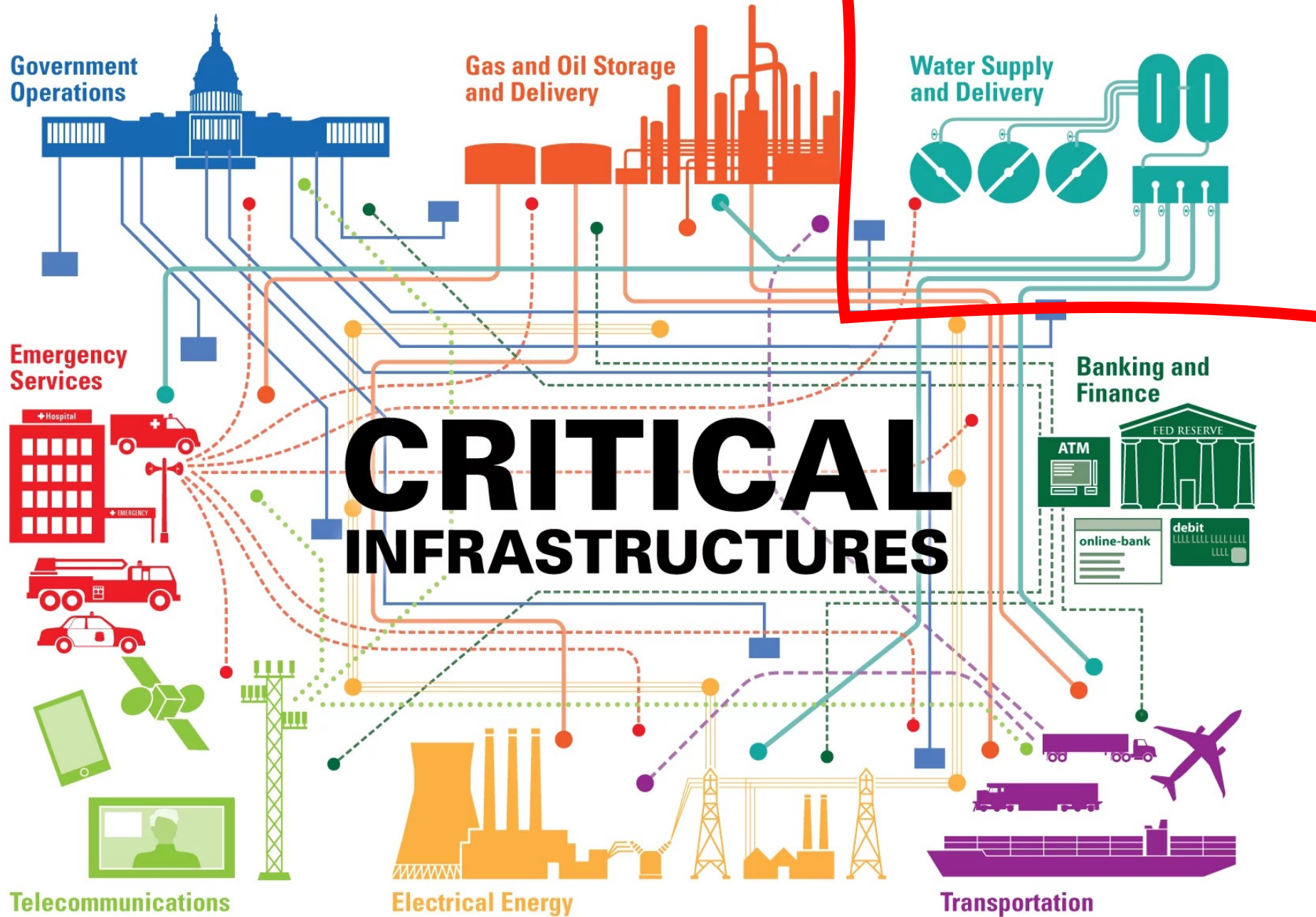
Smart Water Solutions - supporting innovation in the water sector

Patryk Wójtowicz

The background of the slide features a blurred city skyline, likely Kuopio, with various buildings and a prominent tower. Overlaid on this is a complex network of white lines connecting numerous small white dots, creating a digital or smart infrastructure theme. The overall color palette is light blue and white.

- **Smart Water** is a part of future Kuopio **Smart City**

- **Smart Water** is a part of every future **Smart City**



SAVONIA

**Environmental
Engineering
expertise areas**



SMARTWATER

Digitalisation in water sector



ZEROEMISSION

Zero emission industry

Global Smart Water Management Market Size Revenue Will Reach USD 31.73 Billion By 2030, at a CAGR of 10.3%: Polaris Market Research

POLARIS
MARKET RESEARCH

NEWS PROVIDED BY
Polaris Market Research →
May 31, 2022, 08:30 ET

NEW YORK, May 31, 2022 /PRNewswire/ -- Polaris Market Research recently published **Management Market Share, Size, Trends, Industry Analysis Report, By Water Meter Service, By End-Use; By Region; Segment Forecast, 2022 - 2030** in its research dat

According to recent research study, the global **smart water management market** : **CAGR of 10.3% growth** and industry revenue is expected to **increase from USD 13 Billion by 2030**.



How small companies can be innovative?

- To innovate companies needs **experts support** + access to the versatile **facilities**, quality **equipment** and **data** repositories + **fast-track to prototype demonstration** (in order to secure RDI support, venture capital)
- Open data culture is fuelling new products and services **driving true cooperation between research organisations and companies based on real-world challenges**

Examples of key Smart Water development areas (2021)



Digital Water Metering



Non Revenue Water



Asset Health Inspection



Adaptive Pressure Mgmt



Predictive Intelligent Alarming



Water Quality Management



Flood Abatement



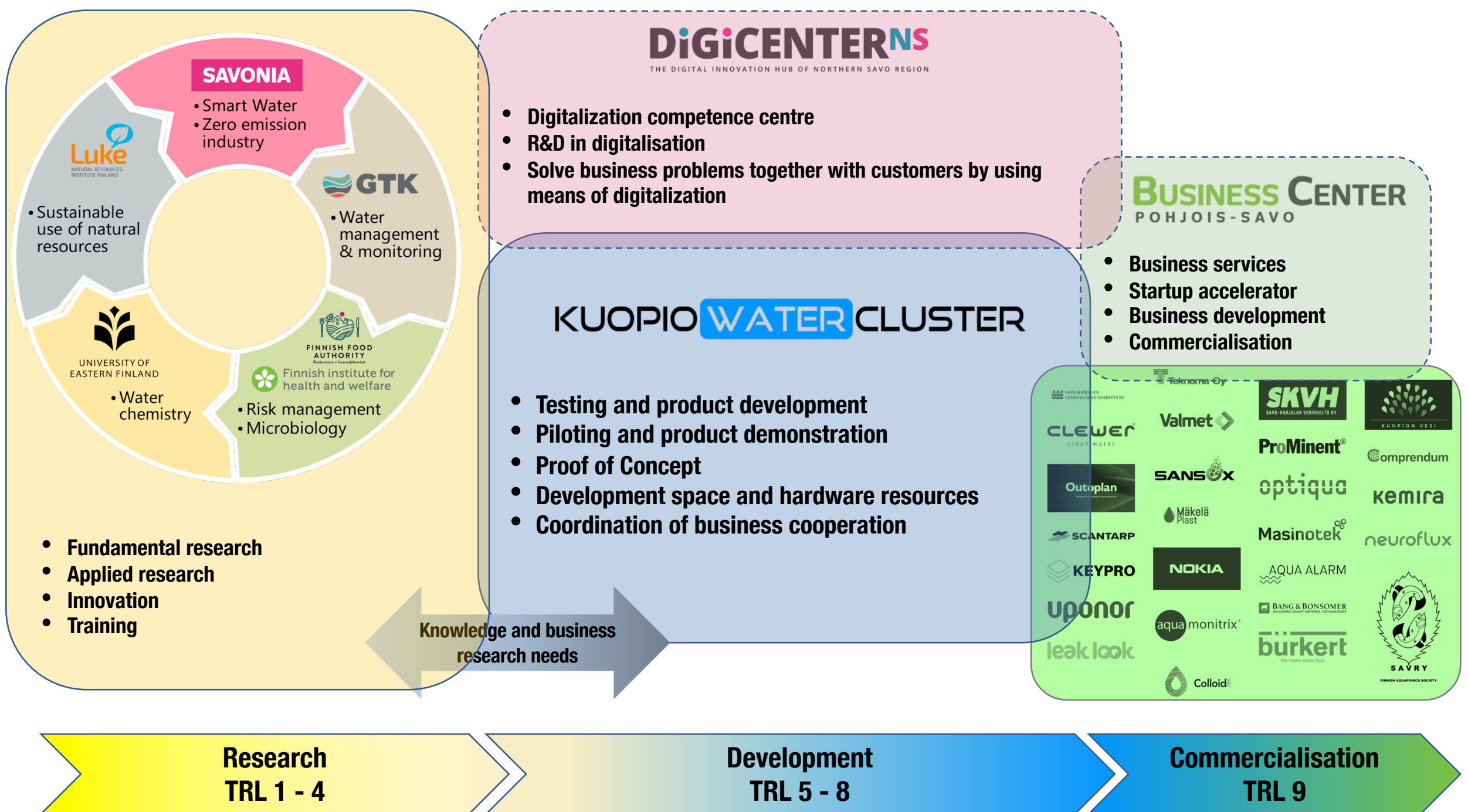
Adaptive Energy Management



Predicting Waste Water Blockages



Field Force Enablement



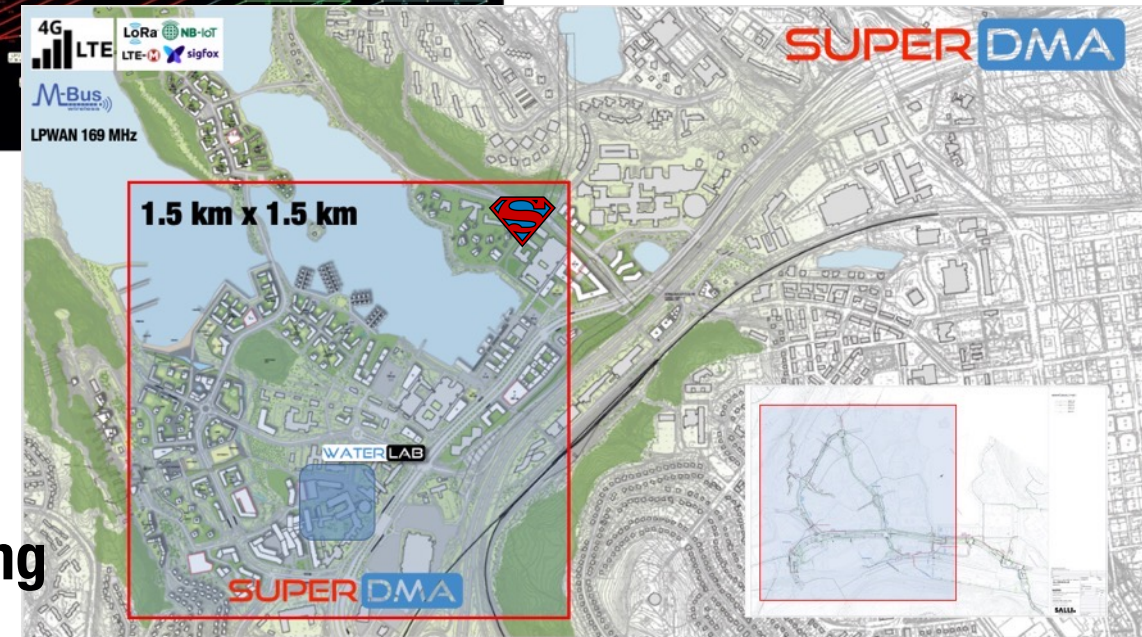
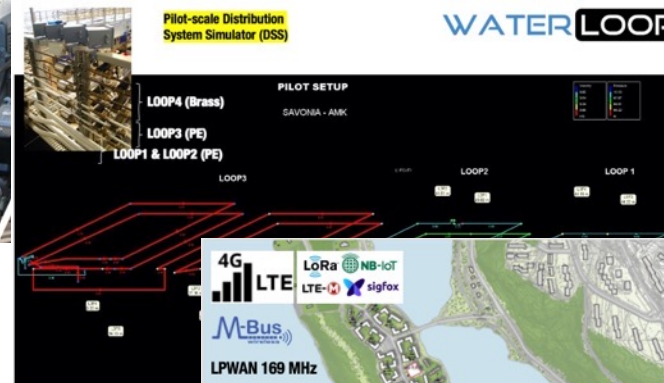
The unique testbed and demonstration sites – combination of lab-, pilot- and full-scale facilities (water + wastewater + stormwater networks)

What we can offer?

Lab- & pilot-scale development

Scale-up

Demonstration Full-scale testing



Research
TRL 1 - 4

Development
TRL 5 - 8

Commercialisation
TRL 9

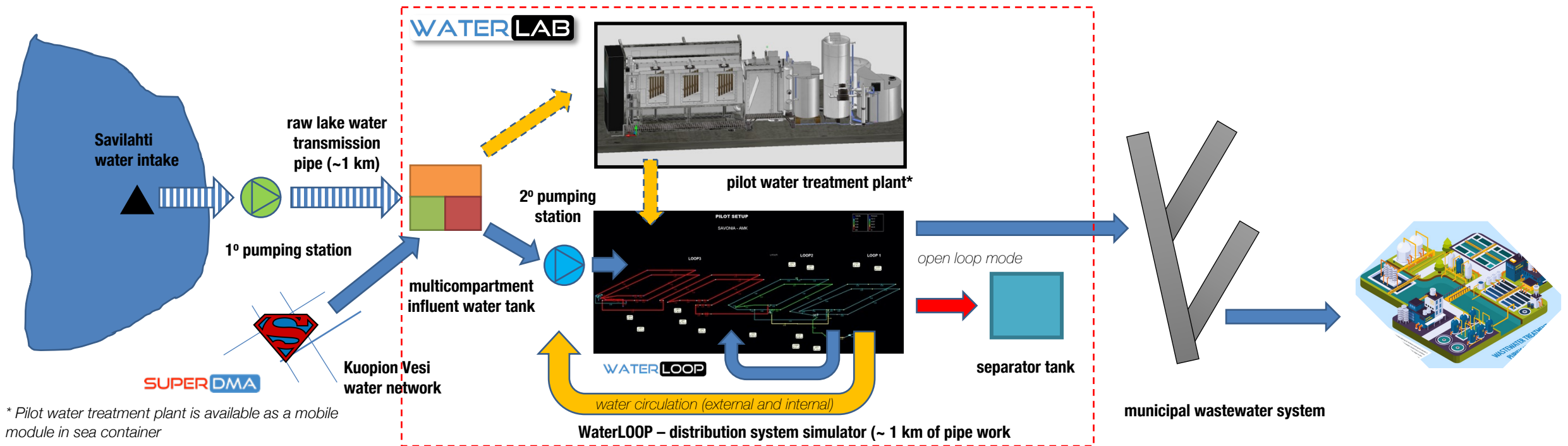


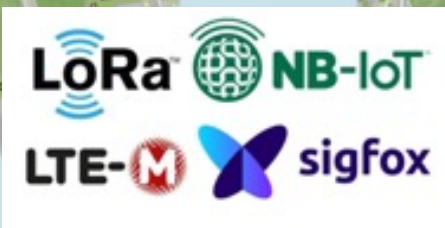
WaterLAB and WaterLOOP

- **WaterLOOP** is comprehensively rigged with telemetry and automation (SCADA)
- The laboratory setup allows for **combining online monitoring with real-time modelling** for the development of tools such as DSS, network awareness and detection of abnormal system operation, testing of new devices or services, water quality studies.
- **Sandboxed physical simulation scenarios-based testing**, including leakage, water hammer, faulty valves, water contamination.
- **Applications range from municipal water systems** (water network, stormwater, wastewater) **to industrial processes** and specific applications.
- **WaterLOOP** applications can be simultaneously **scaled-up** to **SuperDMA**

WATER LOOP - Distribution System Simulator (DSS)

Physical model of water network (fresh water intake \Rightarrow first stage pumping station \Rightarrow raw water transmission line \Rightarrow influent water tank \Rightarrow pilot water treatment plant* \Rightarrow clean water tank \Rightarrow secondary pumping station \Rightarrow main (trunk) system \Rightarrow distribution network \Rightarrow customers/leakages/overflows/ \Rightarrow separator tank or wastewater system)





1.5 km x 1.5 km



WATER LAB

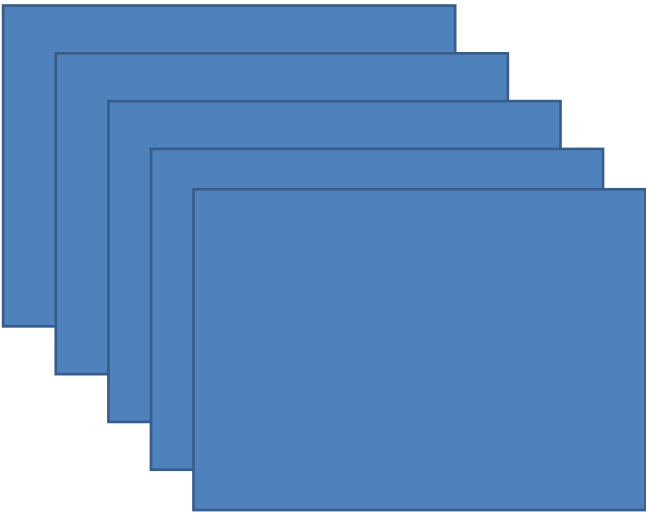


SUPER DMA

Kuopio Smart City -
Savilahti area by 2030:
15 000 students
13 000 jobs
6 000 residents

- **SuperDMA** is located in Kuopio, Finland
- **SuperDMA is a full-scale representative District Metering Area** (in terms of area, number of water consumers, consumers profile, terrain variability etc.) including underground infrastructure (water network, wastewater and stormwater network)
- SuperDMA **allows for rapid scale-up** from WaterLOOP (lab and pilot-scale: **TRL < 6**) and long-term product testing and demonstration in real environment (**TRL > 6**)
- SuperDMA and WaterLOOP are within range of **NB-IoT (LTE B31 450 MHz)** and **mmW 5G NR private test network**

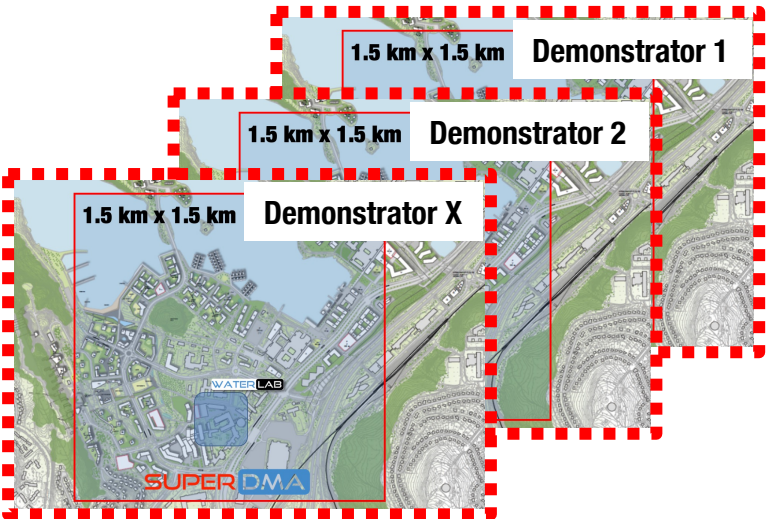
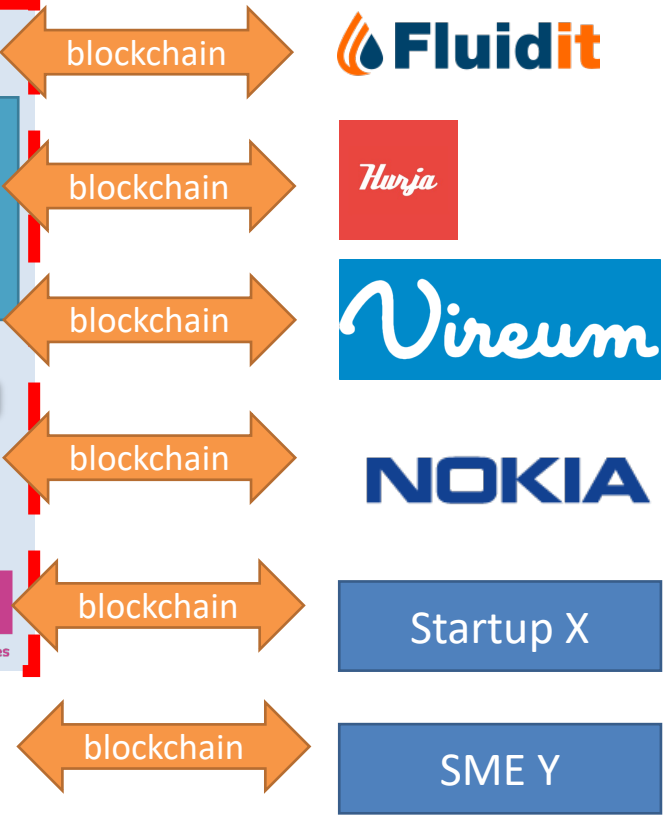
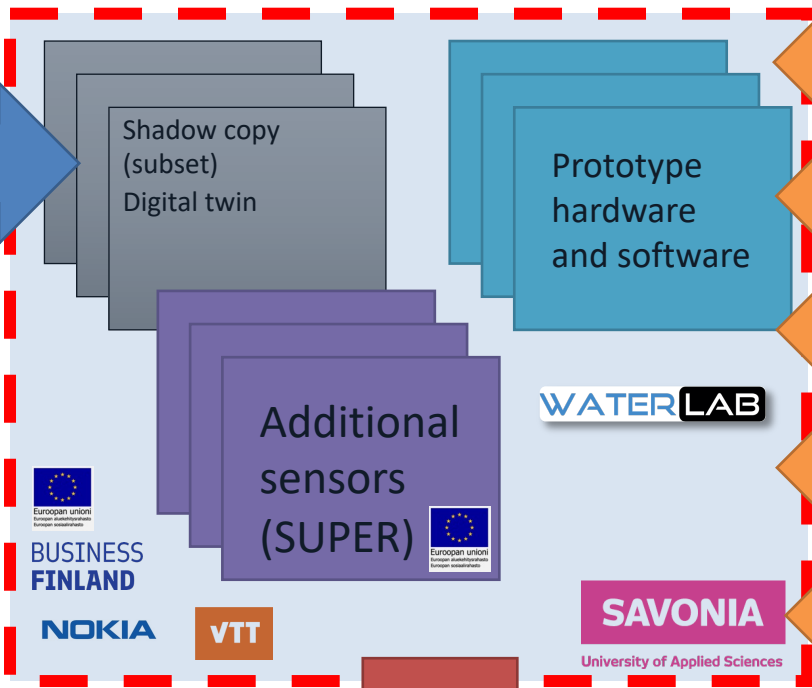
Utility data repositories
(e.g. GIS, SCADA, hydraulic model)



WATERLAB
WATERLOOP
SUPERDMA



Cybersecure enclave **SUPERDMA**



SuperDMA is in range of Savonia private NB-IoT (B3, B20, B31) and 5G NR mmWave (n257 and n258) test network



SWIM

Work packages



Technical Research Centre of Finland



University of Applied Sciences



NOKIA

BUSINESS
FINLAND



WP1
**Project
management**

SG and AB
meetings
Reporting
Ecosystem
management
networking
Dissemination



WP2
**Digital Water
Metering E2E
System**

Identify in-depth
requirements
and evaluation
criteria for
technology
enablers R&D in
the project

Develop globally
competitive
Digital water
meter for water
utilities



WP3
**Smart water
quality
monitoring
solutions**

Objective:
good practices
and existing
solutions for
comprehensive
online water
quality data
management.



WP4
**Secure E2E
Communication**

Objective:
Research and
Develop security
measures to
protect E2E
digital water
system



WP5
**Integrated
Smart Water
Operational
Platform**

Objective:
R&D on enabling
technologies for
ICT infrastructure
and concrete
applications for
water sector in
the Smart Water
Platform



WP6
**Piloting and
demonstrations**

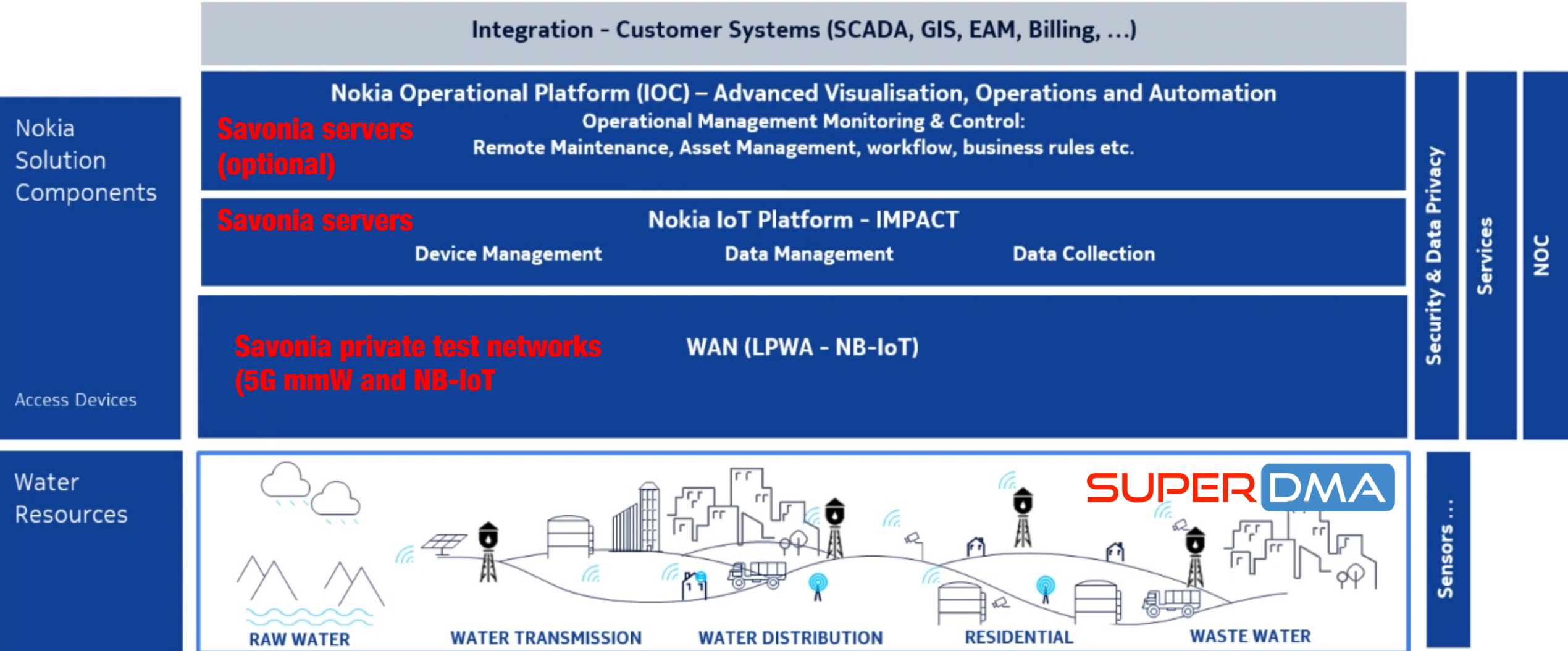
Objective:
Demonstrate
E2E Digital
Water Metering
System and
Nokia smart
water platform
end user benefit



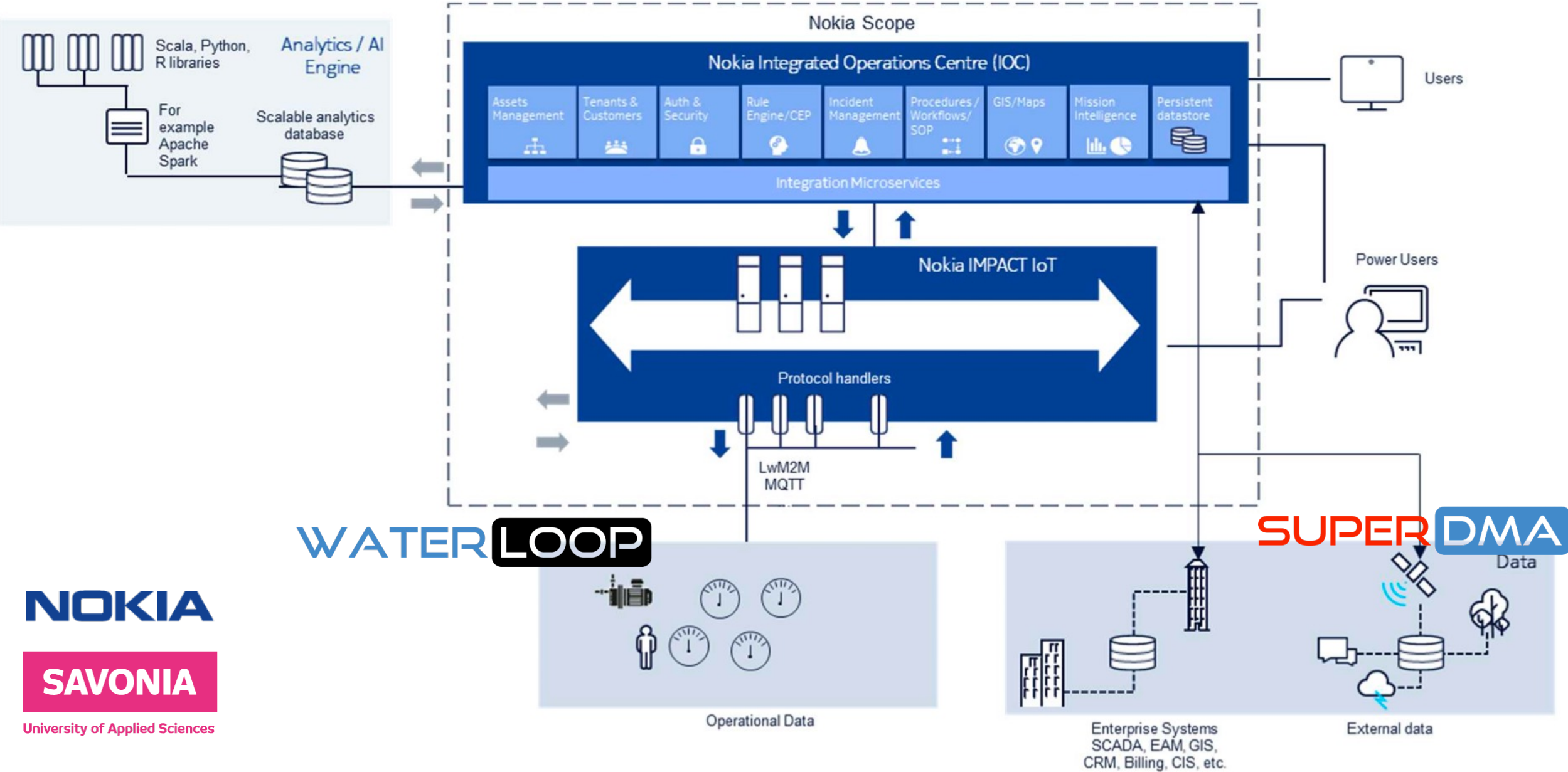
WP7
**Business
development,
exploitation**
Objective:
Deployment
Export promotion

Smart Water High Level Architecture

External resources (client specific)



Savonia test and demonstration architecture (powered by Nokia)



NOKIA

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