



Project Profile

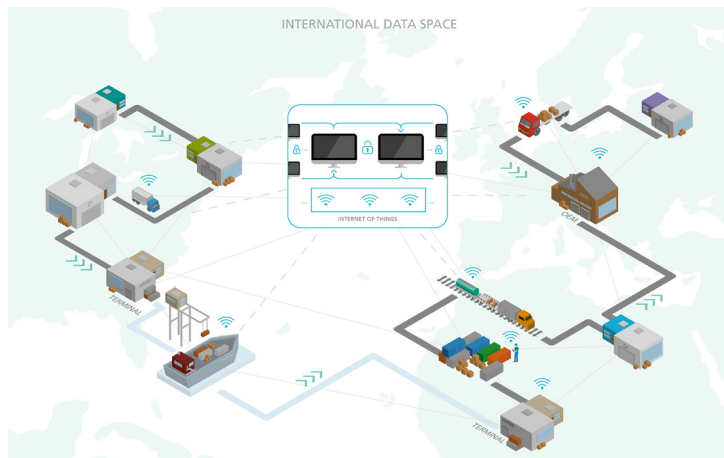
I²PANEMA

Steps towards creating smart port networks

To improve the efficiency and sustainability of ports, the ITEA project I²PANEMA will develop a European reference architecture for Port Internet of Things (IoT) platforms and corresponding SW services in combining heterogeneous data sources into a timely operational overview. This will increase supply chain resilience, benefiting both transport networks and wider society. Proofs of I²PANEMA concepts are planned in selected business verticals including vehicle sequencing, noise reduction and digital logbooks.

ADDRESSING THE CHALLENGE

IoT can revolutionise the combined transport field, embracing the vital role that ports play in today's modal shifts. Given the expected 50% increase in EU cargo by 2030, the growing pressures of urbanisation, sustainability and labour management must be relieved. However, the multitude of operators in the value chain has led to the use of many interfaces and means of communication. Different file formats cause constant software adjustments and data integration issues. The resulting information transfer gaps between partners create a competitive disadvantage and reduce acceptance.



IoT-enabled Port Operations

PROPOSED SOLUTIONS

The ITEA project I²PANEMA (Intelligent, IoT-based Port Artefacts Communication, Administration and Maintenance) envisions smart port networks that work efficiently and sustainably through the integration of existing, heterogeneous IT systems. This will be achieved through an extensible microservice-based system architecture that interconnects different stakeholders with each other. A Data Warehouse component will collect data from sensors and management systems, displaying the analysed results on Interactive Visualisation GUIs. A Situational Awareness Component will create a Common Operational Picture (COP) of the port by executing real-

time situational awareness rules. An Interoperability Layer will fuse data from various sources in a plug-and-play manner. This requires the application of sustainable data security and data protection mechanisms that can be flexibly adapted to meet the individual requirements.

PROJECTED RESULTS AND IMPACT

In 2020, digitalisation is expected to reduce worldwide transportation and logistics costs by USD 61 billion. As European ports have barely scratched the surface of IoT, I²PANEMA will increase this figure enormously. Its architectural approach and exploitation/dissemination plans will allow actors of all sizes to

utilise the framework, ultimately leading to collaborative networks. Alongside the economic benefits of optimisation, a knock-on effect will be felt throughout society: Citizens can enjoy reduced noise, congestion and air pollution around the port, while better water, waste and emissions management improve sustainability. By initiating standardisation activities for selected interoperability components, I²PANEMA envisages to permanently change the nature of combined, multi-modal transport.



Germany

- HPA Hamburg Port Authority
- bayernhafen Gruppe
- catkin
- DeltaPort. Logistik an Niederrhein
- DSW21
- BUNDESVERBAND ÖFFENTLICHER BINNENHÄFEN e.V.
- Fraunhofer
- MATERNA Information & Communications
- NautilusLog
- NXP
- Universität Rostock Traditio et Innovatio

Turkey

- ERSTE
- SRDC SOFTWARE RESEARCH & DEVELOPMENT CONSULTANCY
- TURKCELL TEKNOLOJİ
- VTECH VISION IN TECHNOLOGY

Spain

- Puerto de Gijón Autoridad Portuaria de Gijón
- proDEVELOP Integración de tecnologías

Project start

October 2018

Project leader

Franz-Josef Stewing, Materna

Project website<https://itea3.org/project/i2panema.html>**Project end**

May 2022

Project email

franz-josef.stewing@materna.de

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