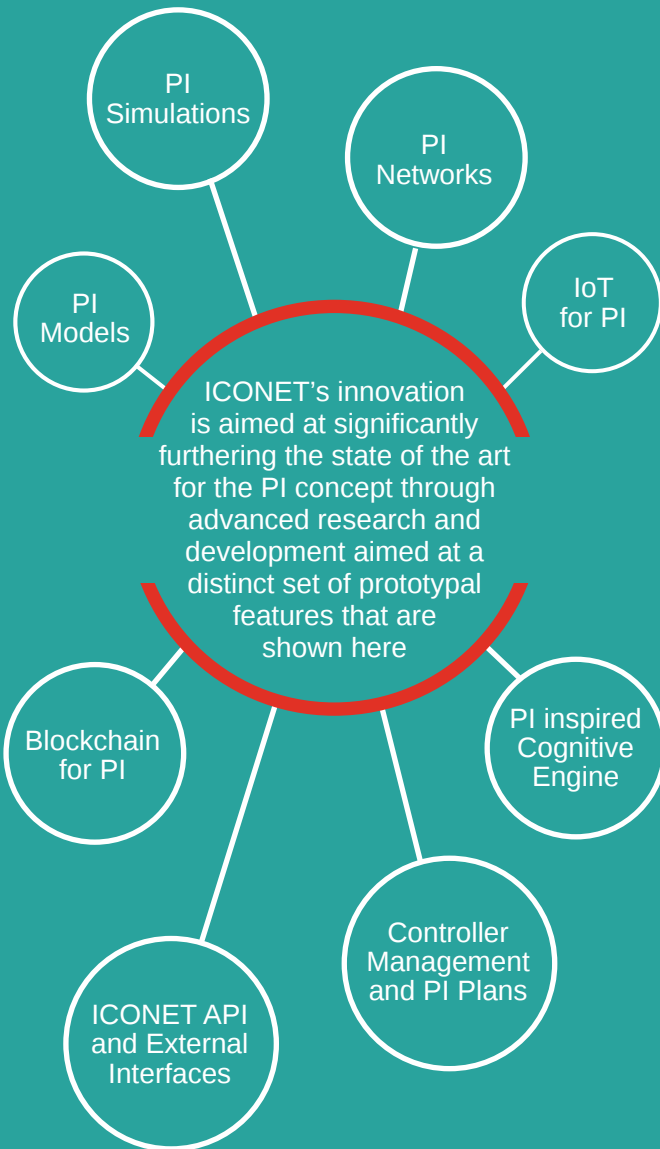


# ICONET Innovation Potential - Unique Value Propositions



## ICONET Partners

inlecom

CLMS

cnit

eBOS Technologies

ELUPEG  
Business Collaboration Delivered

ESC

IBM

e-Ger@Link

UIRR  
INTERNATIONAL UNION  
FOR ROAD-RAIL  
COMBINED TRANSPORT

NGS srl  
New Generation Sensors

P&G

SONAE

STOCKBOOKING®

ITAINNOVA  
INSTITUTO TECNOLÓGICO DE ARAGÓN

Port of Antwerp

VLTN

For more information contact Makis Kouloumbis at [gerasimos.kouloumbis@inlecomsystems.com](mailto:gerasimos.kouloumbis@inlecomsystems.com).



ICONET

### New ICT Infrastructure & Reference Architecture to Support Operations in Future PI Logistics Networks

Physical Internet (PI) is a new paradigm for moving cargo, that employs principles similar to those of the digital Internet, such as protocols, standards for physical and digital interoperability and multi-hop routing.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 769119



# Demonstration and Use

The ICONET PoC will be deployed, tested, refined and extended in four industry-driven **PI Living Labs** each focusing on one of four Key PI Capabilities:

**PI Hub**, which refers to the capabilities of different hub types and the possible connections (topologies) to support optimised PI networks in which PI containers travel according to synchronomodality principles, i.e. making use of the most suitable transport mode at the time, while taking into account the type of cargo, the available transport resources, optimisation criteria and SLAs, thereby setting up an interesting industry-supported use case where PI Hubs, PI Routing, PI Containers, etc., seamlessly mix with new Business Strategies and Models. PI movements between PI nodes include: from terminal to terminal within a PI hub; from terminal in one PI hub to terminal in another PI hub; between PI nodes (warehouses, distribution centres, others) in a PI corridor.

**PI Corridor**, which examines the transformation (modelling) of TEN-T corridors into IoT-enabled PI corridors, to support optimised movement of PI containers between two PI hubs and the broader PI network.

**e-Commerce Fulfilment as a Service**, which explores the impact of the PI on e-commerce fulfilment models, since last-mile transport is an important aspect of the overall PI landscape. Redesigning last-mile distribution centres to fulfil PI hub roles and investigating the role of other forms of mobile or multi-role last-mile hubs fall within this scope.

**Warehousing as a Service**, which investigates the role of the warehouse as a key PI node acting as a dynamic buffer for flow between other PI hubs, so as to increase throughput of hubs, reduce congestion, etc.

# Technical Approach

ICONET has been established to explore and create innovative PI network services that optimise cargo flows against throughput, cost and environmental performance, based on Governance policies and SLAs, constantly and fully aware of network operations and status.

ICONET's Cloud-based PI Platform will serve as an experimental environment that will support the research and development required to further the Physical Internet concept over the course of the project. The requirements gathering work-stream of the project will feed into the PI reference architecture blueprint, which will be used as the basis for initial and subsequent design iterations of the proof of concept (PoC) Platform. With PI Services implemented over the PoC platform, ICONET will enable the thorough study of deployed and simulated Physical Internet Use Cases driven by the requirements of the Living Labs.

By conducting detailed research into the areas of PI node & PI inter-node connectivity, PI nodes intelligent optimisation, network abstractions and encapsulation protocols, routing logic and algorithms, IoT topologies and IoT integration mechanisms, security and privacy, data analytics for real-time PI network optimisation and PI network simulation, ICONET's goal is to make significant inroads in the following areas:

- Deliver the digital backbone for PI. A cloud based connectivity platform on which PI networks can be created based on federated PI nodes
- Support PI connectivity platform as a service on a multitude of cloud infrastructures
- Facilitate inter-cloud inter-networking to create federations of PI nodes/hubs
- Form a digital PI connectivity framework – Bridging and federating previously unconnected logistics networks to allow realisation of the PI concept
- Maximise the impact of the project's solutions by providing a transferrability framework

