Optimal-LOADS

Digitising logistics with trustable data spaces

The ITEA project Optimal-LOADS (Optimal Logistics Operation & Analysis Data Space) will optimise and digitise Maritime and Hinterland logistics in the multi-modal supply chain and create trust among data providers and users by developing data spaces that ensure data sovereignty and interoperability in multi-stakeholder environments.

Addressing the challenge

Crises like COVID-19 and the Ukraine war have highlighted the logistics industry's need to improve supply chain resilience and optimise processes to remain globally competitive. Digitisation and data-driven analysis algorithms offer a promising means to achieve this, but the full potential remains untapped due to data owners' reluctance to provide their data for such purposes. Concerns include a loss of data control and a perceived lack of fairness in business models. Establishing trust among data providers and users is crucial, as is ensuring data sovereignty and smooth interoperability in multi-stakeholder environments.
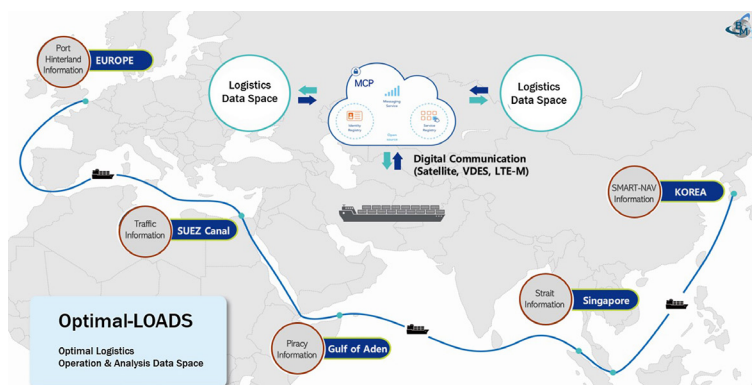
Proposed solutions

The Gaia-X/IDS initiatives were established to create data spaces that address such challenges in industrial sectors, while the MCP (Maritime Connectivity Platform) was created to define a framework for trustworthy and reliable communication in the maritime sector. Optimal-LOADS will therefore integrate the two platforms by populating the Gaia-X/IDS reference architecture with real software components and will create a Maritime and Hinterland data space, aiming to pioneer Gaia-X/IDS-based data economy infrastructure services. MCP will provide decentral standardised authentication and a framework for decentralised trust relations. The resulting Optimal-LOADS platform will be a distributed, decentralised Maritime and Hinterland data space that guarantees

stakeholders' and service providers' specifications for service participation, as well as compliance with data privacy regulations and restrictions set by data or service owners. Services to be offered via the platform must meet framework standards and specifications, follow a specific schema, and allow access only to registered instances to ensure conformity and authorised use. By introducing suitable AI-based data economy provisions to optimise and further digitise

logistics processes, the project also intends to promote international software standards for the sovereign exchange of data between stakeholders.
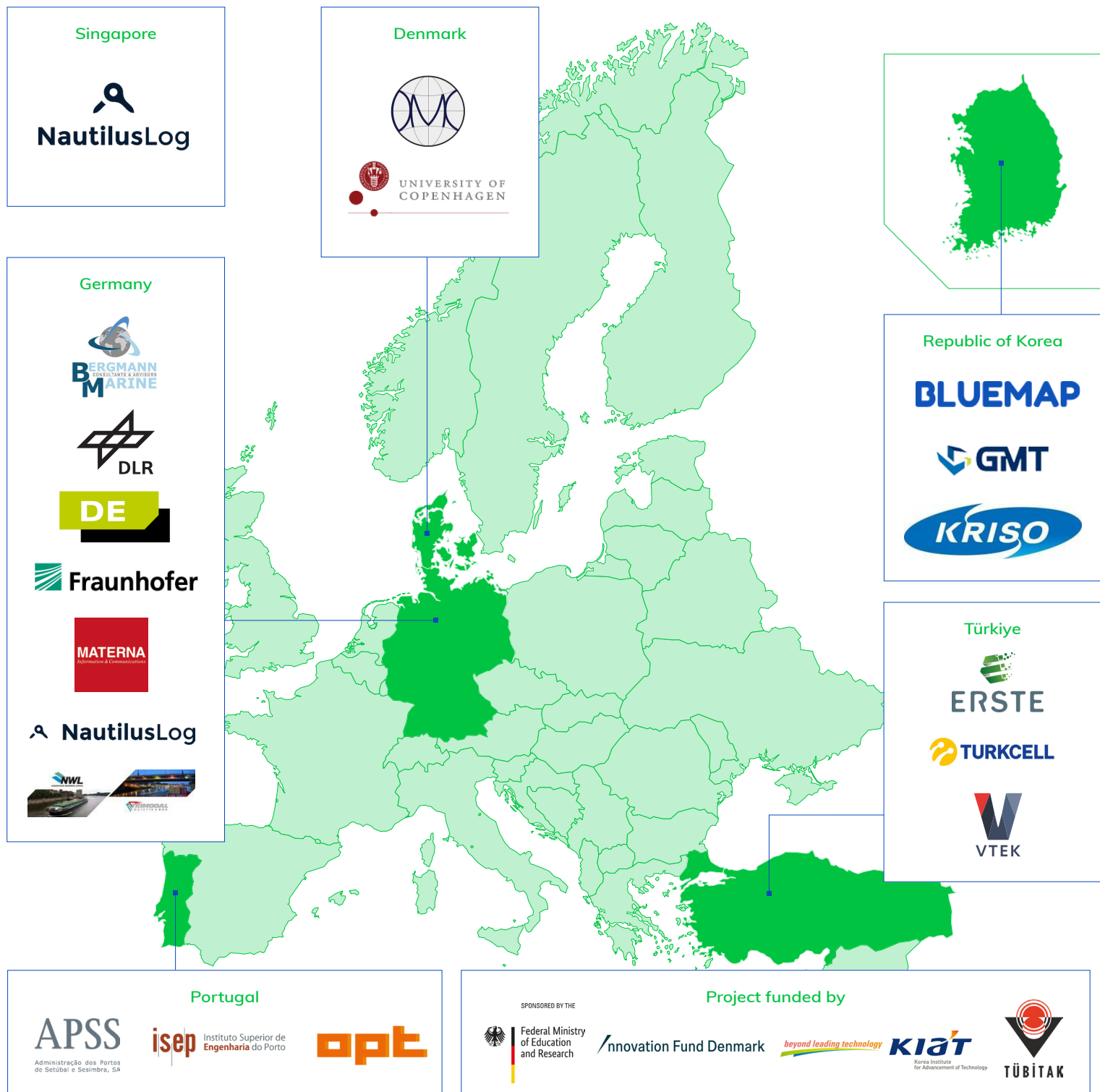
Projected results and impact

Through these factors combined, Optimal-LOADS can enhance the efficiency of multi-modal logistics, the valorisation of data, and the leveraging of emerging business models in the data economy. This will be demonstrated in a cross-country/continent demonstrator with three use-cases:

1. logistics and hinterland processes, considering the distribution optimisation of incoming goods to further transport modes;
2. port operation, providing standardised, real-time updates on port activities; and
3. sustainable route planning, analysing contextual information to reduce waiting times at ports.

These solutions are expected to bring major benefits to Maritime and Hinterland end-users, including a 20-30 hour decrease in waiting times, a 20% reduction in fuel cost, a 10% increase in capacity utilisation and a 10% reduction in congestion-based port accidents. As for the consortium, the technology providers will gain access to the new

market of business and industry experts and will facilitate solutions to AI and data analytics problems, thereby improving the sales and market position of the software developers (such as through AI-as-a-Service). In the longer run, Optimal-LOADS anticipates a significant contribution to the competitiveness and sustainability of the European logistics supply chain so that it can continue to perform its key function for national economies in the face of global challenges.

‹ Optimal-LOADS will optimise and digitise Maritime and Hinterland logistics.

Project partners

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