

PORT SOLUTIONS FOR EFFICIENT, EFFECTIVE AND SUSTAINABLE MULTIMODALITY



# MultiRELOAD

## Horizon Europe project

[www.multireload.eu](http://www.multireload.eu)

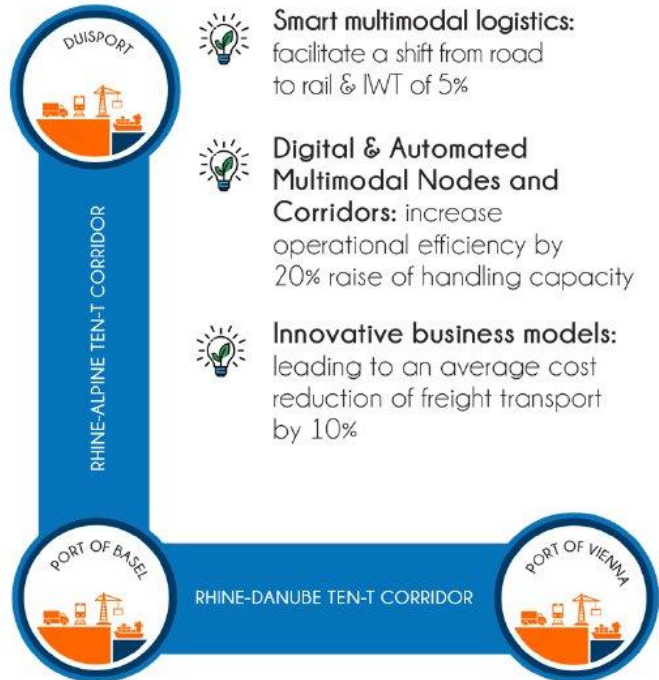
# Consortium



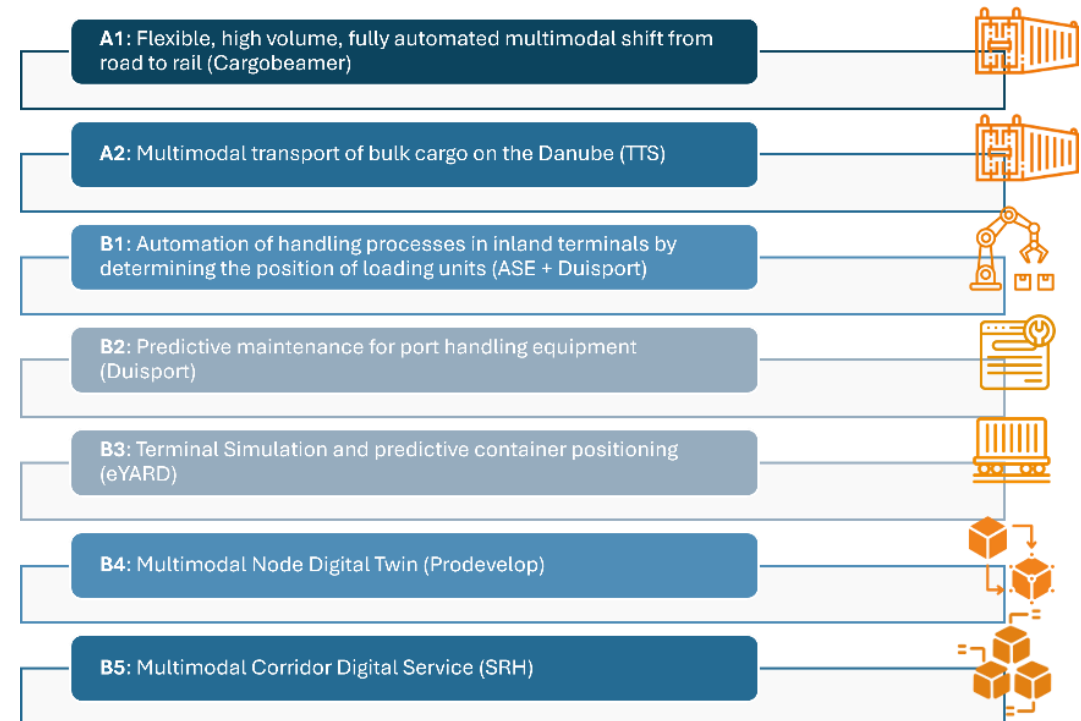
UNIVERSITY  
OF APPLIED SCIENCES  
UPPER AUSTRIA



# IN A NUTSHELL...



3 innovations  
areas  
7 demonstrators



## Port solutions for efficient, effective and sustainable multimodality

**MultiRELOAD** focusses on the specific role and challenges of **inland ports as multimodal freight nodes** in reaching Europe's greenhouse gas reduction target, thereby shifting a substantial part of the 75% of inland freight carried today by road in the EU to inland waterways and rail, and by increasing **operational efficiency, safety and reliability of existing infrastructures through digitalization**. MultiRELOAD enhances the **collaboration between different freight nodes in Europe to jointly test innovations and create favorable market conditions for multimodal freight transport solutions**.

PORT SOLUTIONS FOR EFFICIENT, EFFECTIVE AND SUSTAINABLE MULTIMODALITY



# MultiRELOAD

## Digital Twin as Environmental monitoring tool for Ports and water

[www.multireload.eu](http://www.multireload.eu)

José Antonio Clemente  
Smart Tech Lead  
[jclemente@prodevelop.es](mailto:jclemente@prodevelop.es)

# Introduction to Digital Twin

## *What is a Digital Twin?*

A Digital Twin (DT), is a virtual representation of physical system, utilizing data from sensors and other sources to simulate and analyse real-world processes.

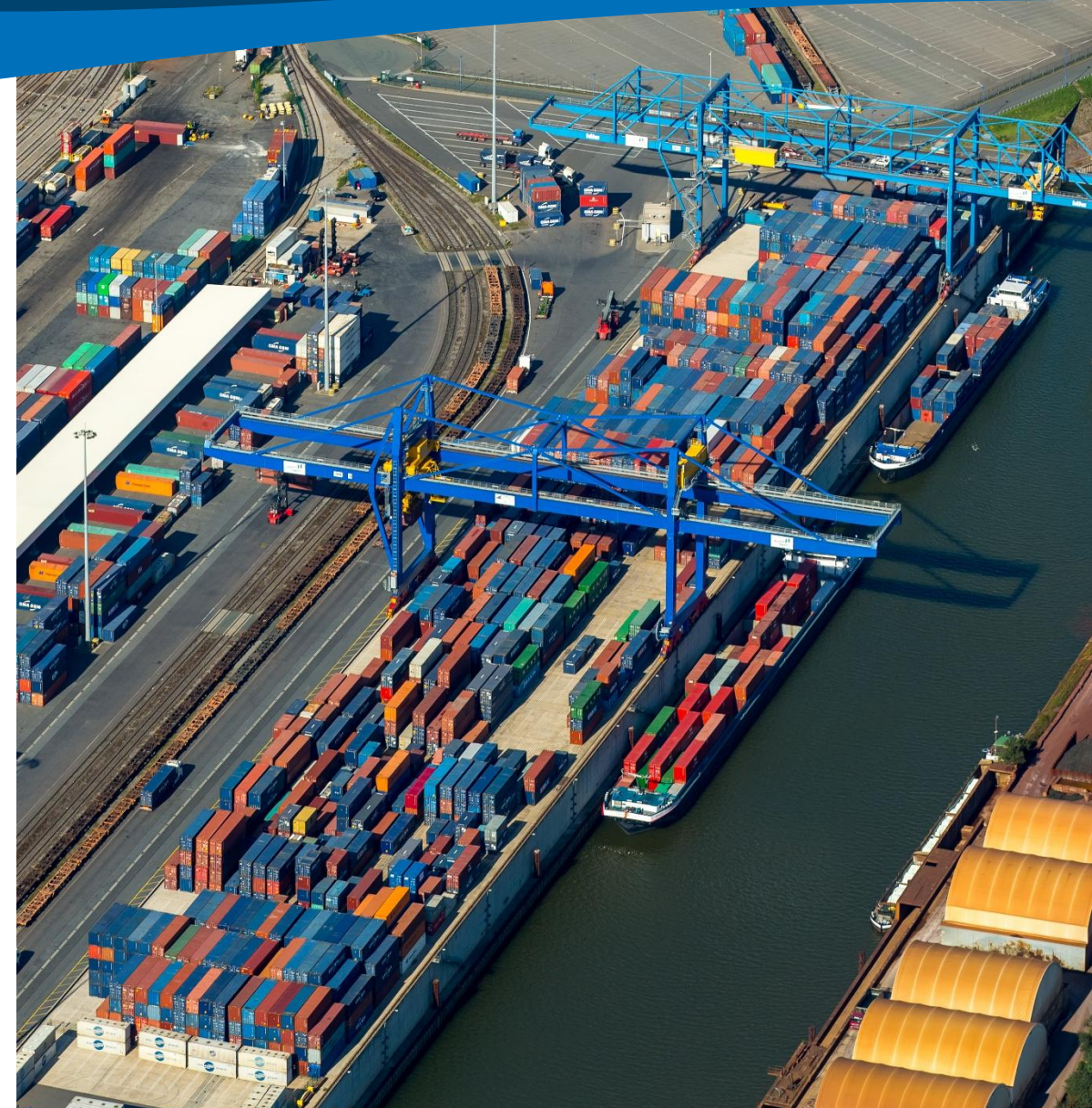
It enables real-time monitoring, predictive analysis and enhanced decision-making by providing an accurate digital model of the facility.

## *Application in Ports*

Ports employ DT to streamline operations, improve efficiency and reduce environmental impact.

DT provides a comprehensive view of environmental data, supporting real-time analytics and predictive tools.

It integrates data from multiple sources, such as sensors and port systems, to monitor and manage operational and environmental factors.



# Classification of Digital Twins

## Classification

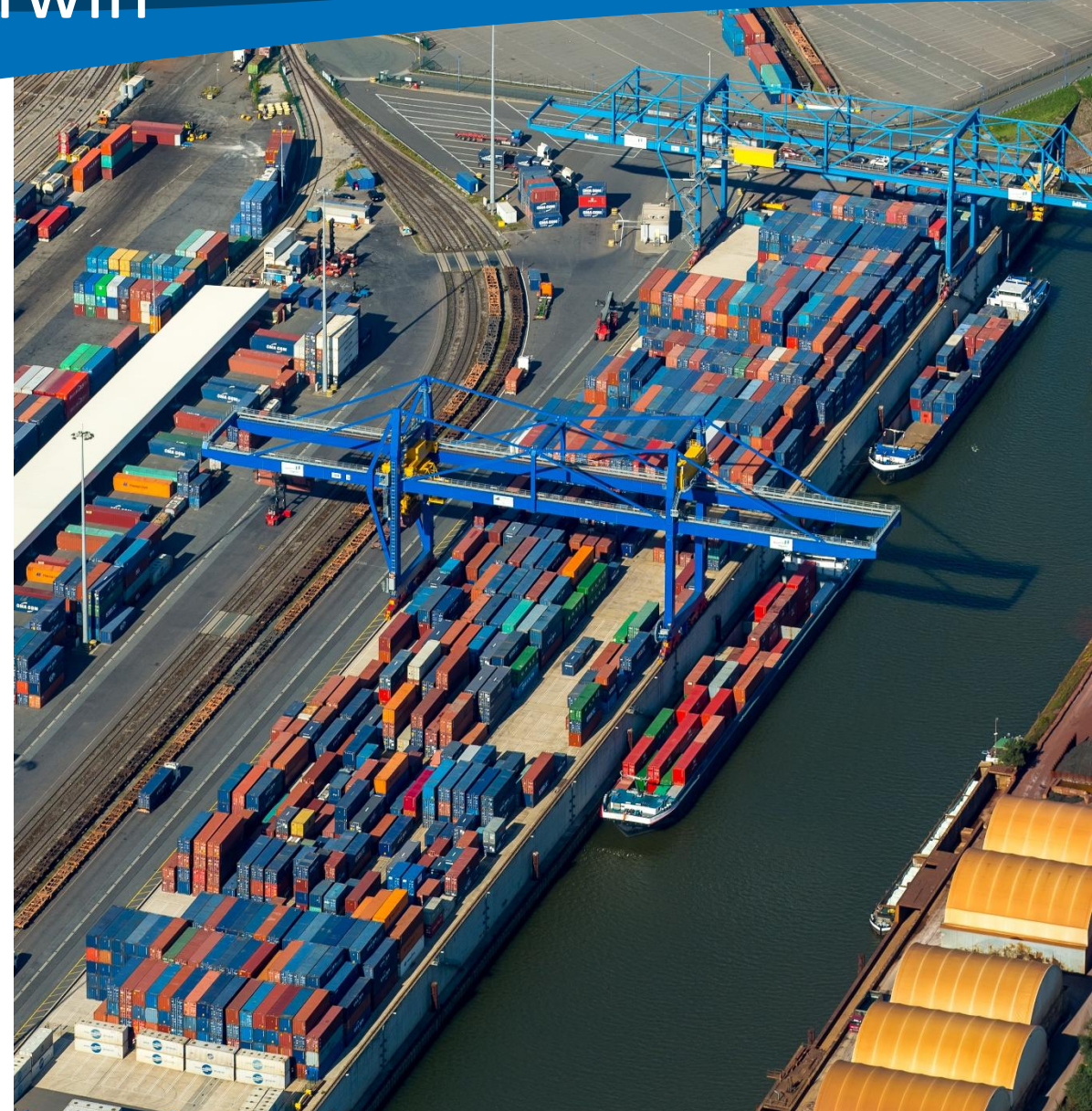
- **Descriptive Digital Twins:**
  - *Overview:* Provide a detailed visual representation of the asset or system.
  - *Included features:*
    - Integration of real-time data.
    - Notifications about system status or relevant changes.
  - *Purpose:* Offer a clear and updated view for basic monitoring and understanding of the system.
- **Operational Digital Twins:**
  - *Overview:* More advanced, capable of suggesting or taking actions based on the data.
  - *Included features:*
    - Predictive capabilities to anticipate issues and optimization opportunities.
    - Prescriptive suggestions and autonomous abilities to intervene in real-time.
  - *Purpose:* Enhance decision-making and optimize system performance through data-driven actions.

# B4 - Multimodal Node Digital Twin

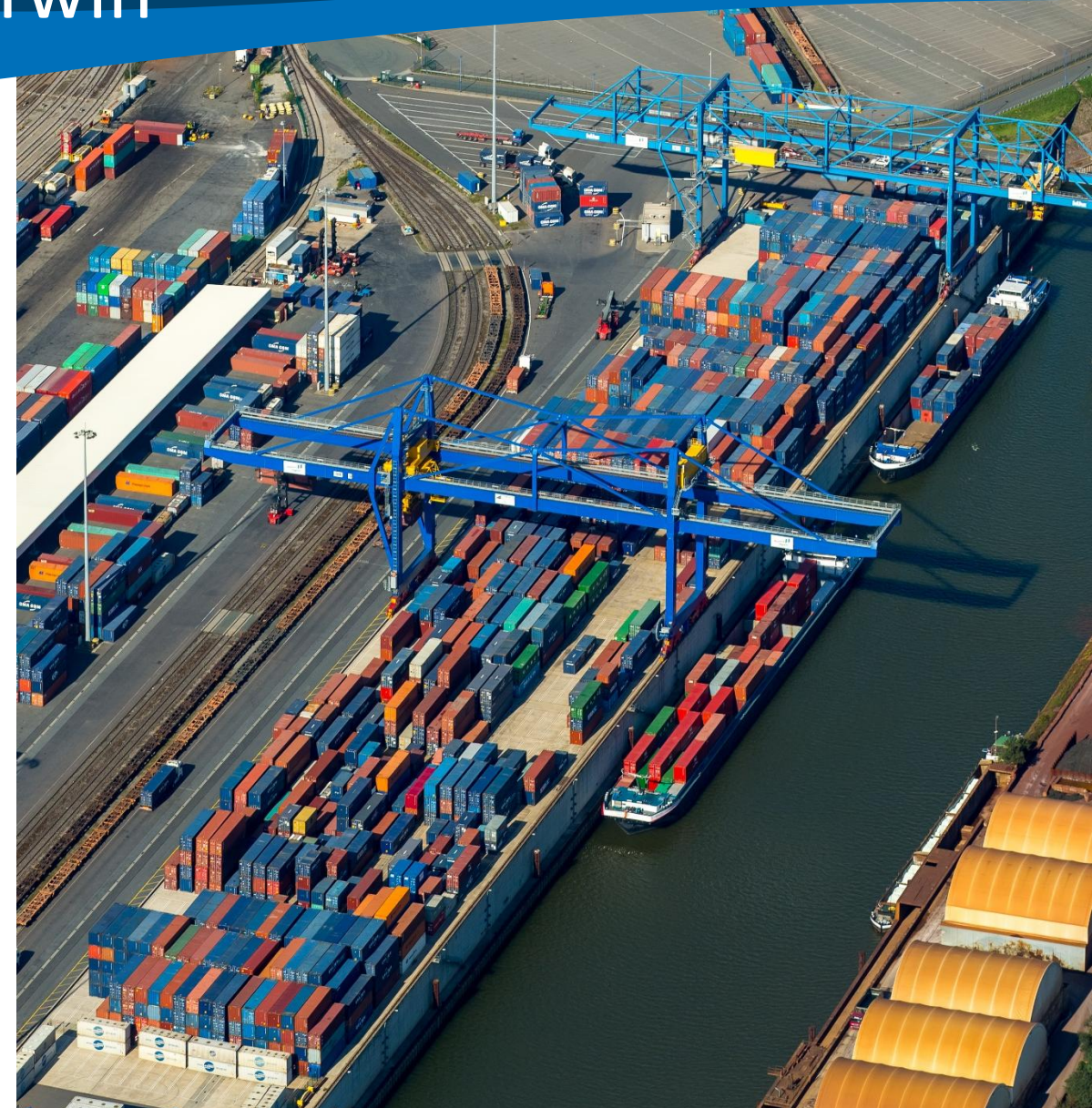
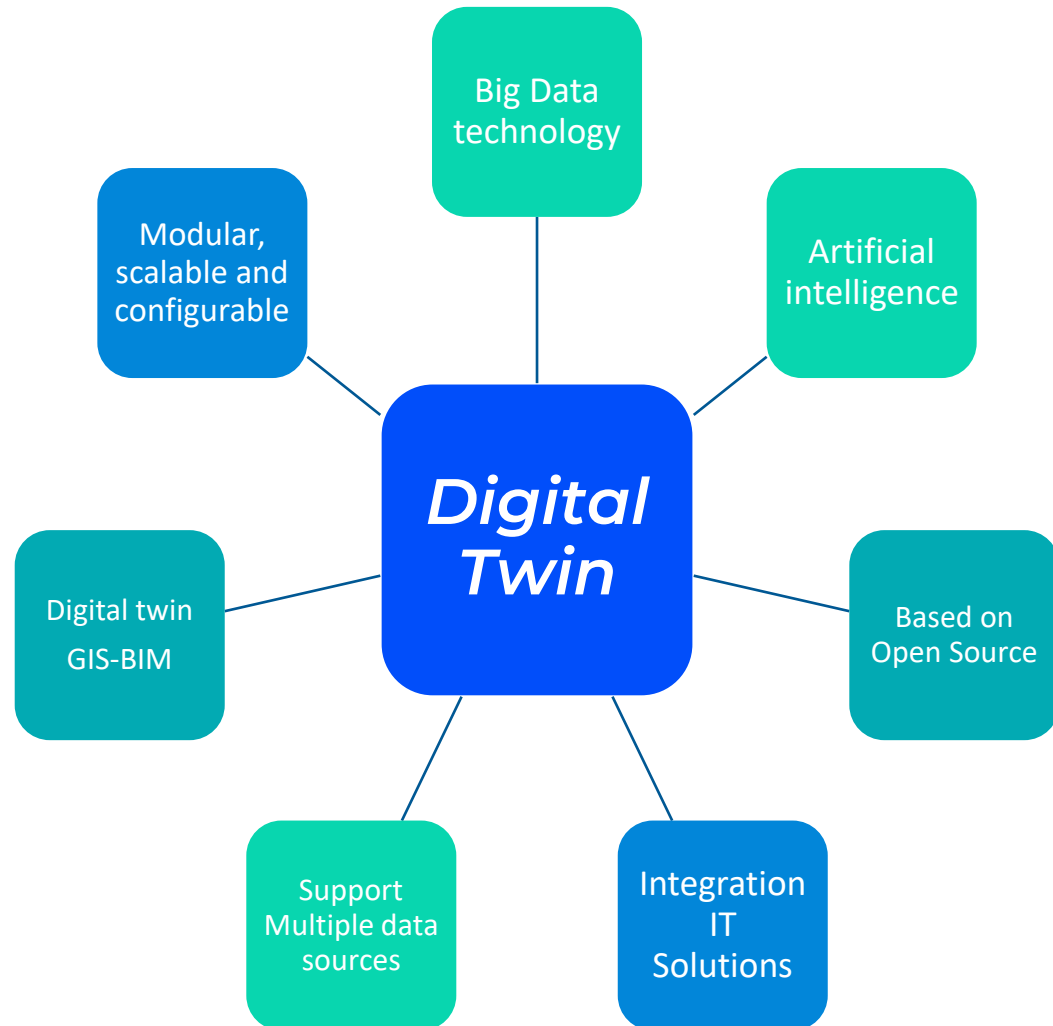
## *What is the ambition?*

Demonstrator **Multimodal Node Digital Twin**, aims the development of a Digital Twin platform of a port (Logistic multimodal hub), as a central visualisation and control point for data and notifications/alarms from diverse data sources and port services. The main functionalities are:

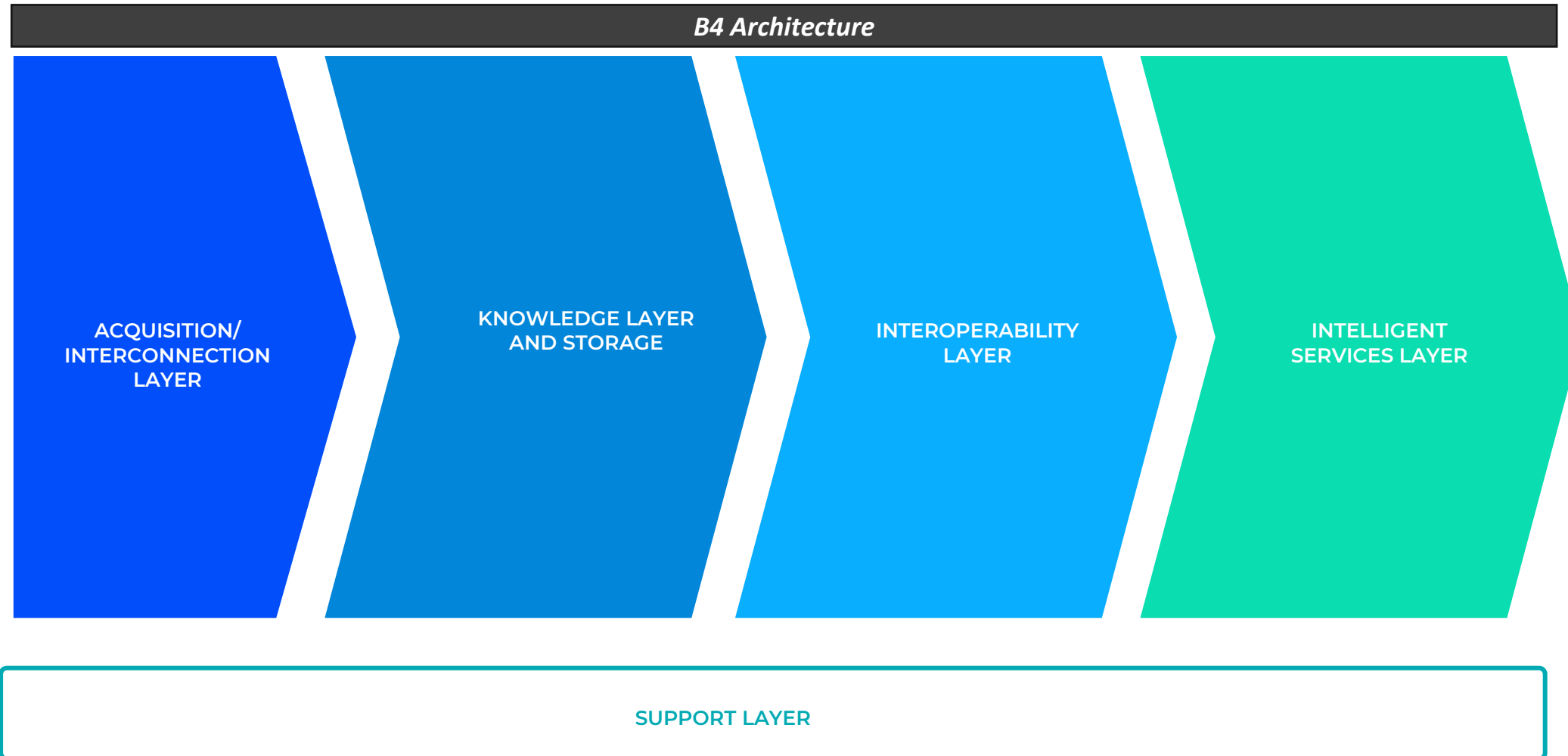
- Comprehensive and centralized port management tool. Central data repository. Able to collect data from a variety of sources (sensors, port information systems) and services.
- Digital representation (map and tabular view), of the port situation in real time and historically .
- Application of Big Data analytics “AI” (Simulations and prediction), to improve decision-making.
- Automates the collection, monitoring and analysis of information.
- Totally modular, scalable solution based on Big Data technologies.



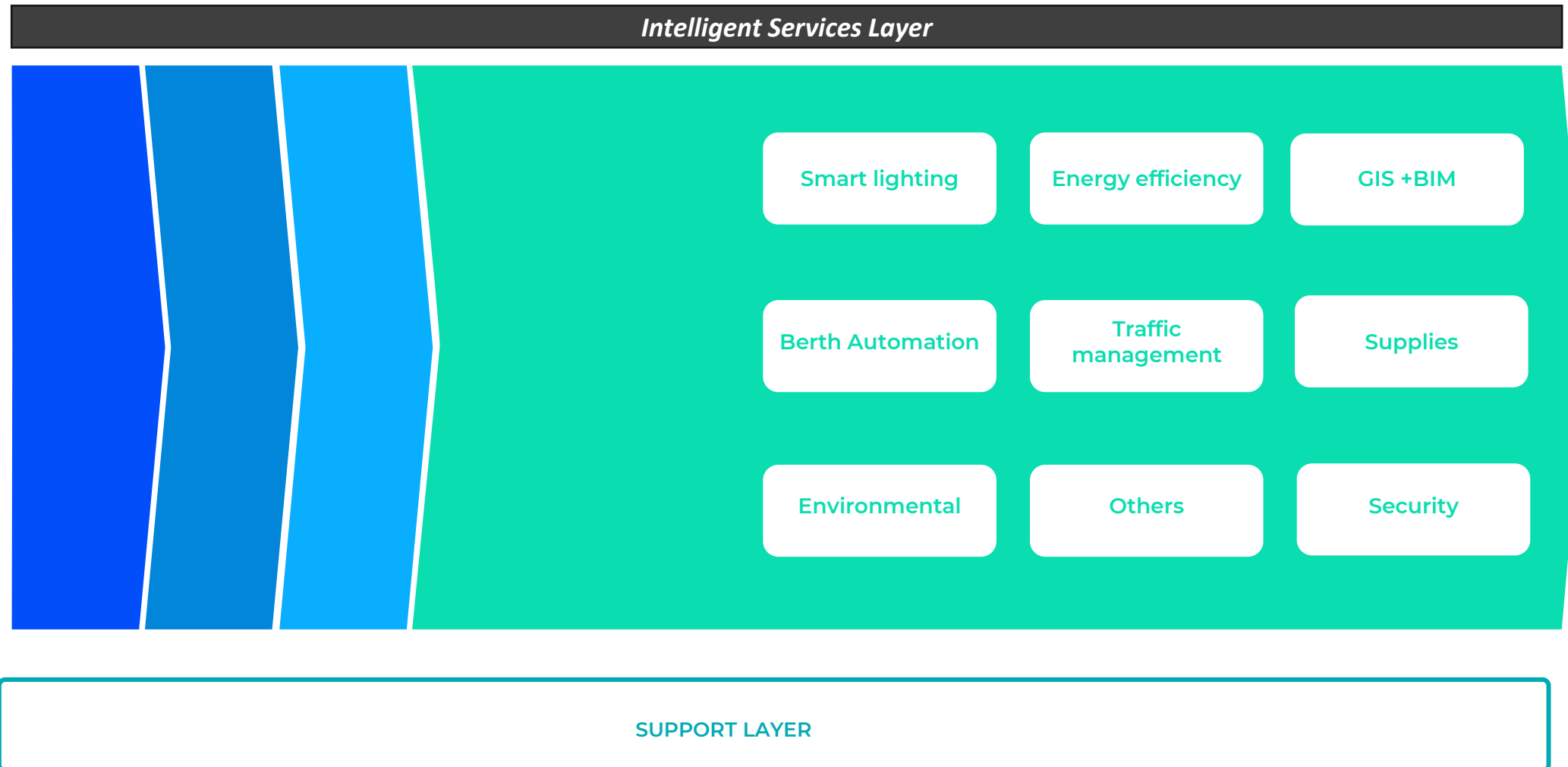
# B4 - Multimodal Node Digital Twin



# B4 - Multimodal Node Digital Twin



# B4 - Multimodal Node Digital Twin





# MultiRELOAD

PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

## Thank you for your attention!

### CONTACTS

José Antonio Clemente

[jclemente@prodevelop.es](mailto:jclemente@prodevelop.es)

Jan-Christoph Mass

[Jan-Christoph.Maass@Duisport.de](mailto:Jan-Christoph.Maass@Duisport.de)

[www.multireload.eu](http://www.multireload.eu)



**Funded by  
the European Union**

The project receives funding under the Horizon Europe Call "Safe, Resilient Transport and Smart Mobility services for passengers and goods" | Call ID: HORIZON-CL5-2021-D6-01, Grant ID: 101069796