

Flexible, multi-mOdal & Robust FREIGHt Transport

Concept

FOR-FREIGHT aims to maximize the utilization of multimodal freight transport capacity and reduce the average cost of freight transport through the development of novel solutions and their integration with legacy logistics systems.

USE CASE 1

Blockchain & Digital Twins to support Decision Making Process in multimodal transport combined with a Subway-Based Network for sustainable last-mile distribution (Spain).

USE CASE 2

Port-to-Airport multimodal freight transport: End-to-end optimization with DSS and real-time monitoring & control capabilities (Greece).

USE CASE 3

Riverport to warehouse hub via railway network - Galati Port (Romania).

Objectives



Involved Technologies

1 Big Data

Development of a (Big) Data database for handling all the necessary non & real-time data of warehouse's status, arrivals predictions, truck/vessel/cargo location & conditions.

2 AI

Decision Support Systems (DSS) on use of resources and end-to-end multimodal transport planning optimization. Provide real-time door-to-door tracking, forecast of optimal routing and Estimated Time of Arrival, resource utilization and End-to-End (E2E) multimodal transport planning, minimizing the cost function computed based on the defined KPI aspects (resource utilization, time, cost, and Greenhouse Gases emissions).

3 Robotics

Build an automated/teleoperated semi-autonomous robotic manipulator for cargo/load picking-up and placing activities.

4 Cloud Technology

Back-end Apps and APIs facilitating AI-based decision making, data processing & optimization.

5 4G/5G/Wi-Fi

E2E communication & interconnection of the diverse systems participating in the overall operations (customs clearance, air flight booking, etc.)

6 IoT

Monitoring of roller cages in real-time, providing detailed information on:

- Moment when the van/truck leaves DHL warehouse loaded with the roller cages towards MDM Depot.
- Arrival of van/truck with roller cages at MDM Depot.
- Moment when roller cages are loaded into the MDM trains.
- Arrival of the roller cages at the final destination.

7 Digital Twins

Support flexible and dynamic E2E transport planning.

Simulating optimal situations based on real time data for support DSS to improve truck planning & staying at port/terminal and reduce traffic congestion.

Operational simulations could be exploited for supporting decision-making processes.

8 Blockchain (BC)

Supply Chain governance based on BC for time reduction in the administrative and operational processes, provided by a Hyperledger Fabric blockchain platform.

Enhance transparency, traceability, security, and fragmentation of the logistic processes and transactions between actors.

Consortium

Project Coordinator: Dr. Georgia Ayfantopoulou

