



PROJECT OVERVIEW

LOGISTAR - Enhanced data management techniques for real time logistics planning and scheduling



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About LOGISTAR

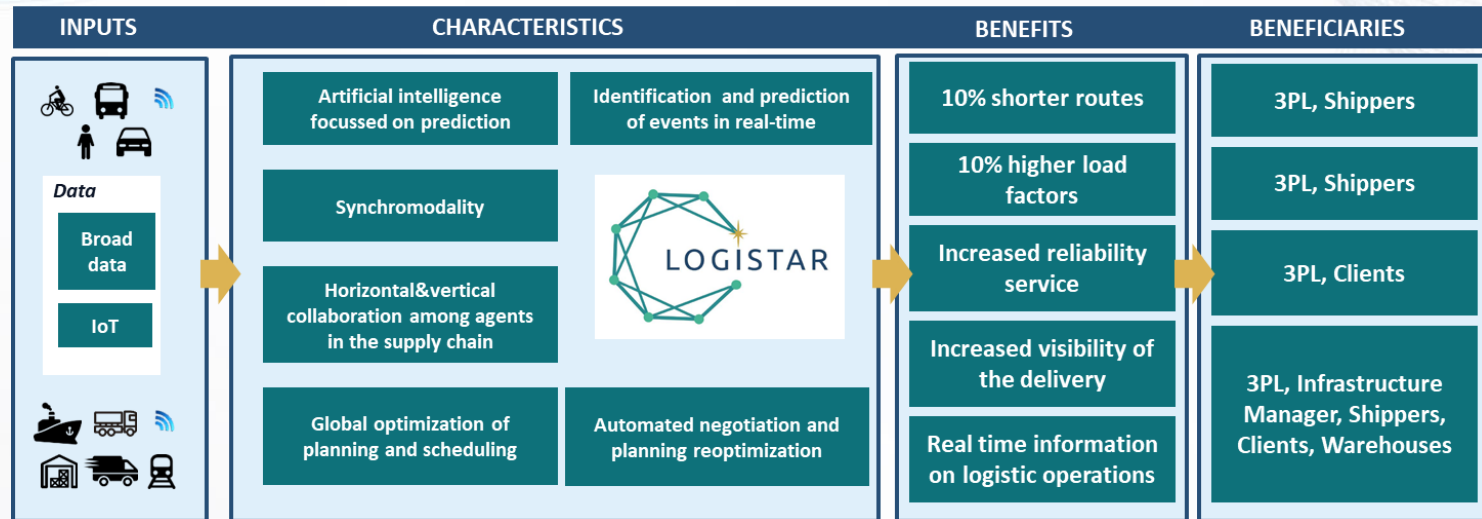
- Executed by a consortium of **15 partners** at EU level, coordinated by the University of Deusto (Spain)
- Overall budget: **4.997.548,75 €**
- Duration: **36 months** (Starting June 2018)
- Project managed by INEA agency - Innovation and Networks Executive Agency (European Commission)
- Project funded by H2020:
 - Work programme: **Smart, green and integrated transport**
 - Call: MG-5.2-2017: **Innovative ICT solutions for future logistics operations**



LOGISTAR overall concept

- LOGISTAR aims to: allow **effective planning and optimizing of transport operations**
 - By taking advantage of **horizontal collaboration** and relying on the increasingly **real time available data** gathered
- A **real-time decision making tool** and a **real-time visualization tool** of freight transport will be developed
 - With the **purpose of delivering information and services** to the various agents involved in the supply chain

LOGISTAR overall concept



- ✓ **Increasing by 10% the load factors of freight vehicles:** optimization techniques
- ✓ **Shortening by 10% the delivery routes** by relying on synchromodality
- ✓ **Increasing the reliability and efficiency of services:** predicting events and incidents.
- ✓ **Facilitating the management of logistic operations:** providing dashboards and showing alerts or recommendations.
- ✓ **Increasing the visibility of the delivery** derived from the use of sensors to monitor the goods shipped and boosting data sharing



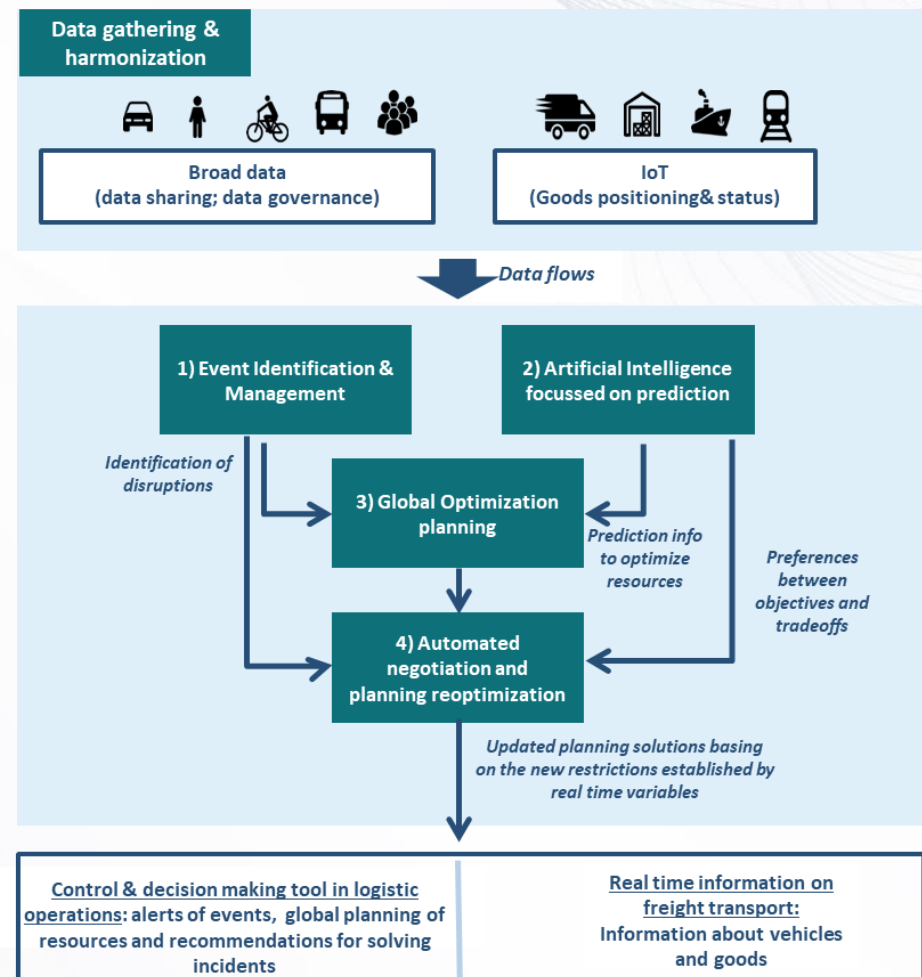
LOGISTAR overall concept

Specific objectives

- Identify **logistic open data sources** and **harmonize** this data together with the other closed sources (i.e. IoT devices)
- **Increase accuracy planning of logistic operations** by applying **artificial intelligence techniques** for timing predictions and learning preferences of logistic chain participants
- **Ensure a seamless flow of the operations** in the supply chain making use of **machine learning techniques** for identifying potential disrupting events and taking relevant actions and needed reconfigurations
- **Make the best use of the available resources** and provide the best possibilities for horizontal collaboration among logistic agents **applying optimization techniques to transshipment planning and scheduling** in hubs and freight transport networks
- **Allow the negotiation among different agents** involved in the supply chain **considering any constraints arisen in real-time** making use of **distributed constraint satisfaction techniques**

LOGISTAR overall concept

- To **leverage the available data**, to process it and **to deliver services**
 - Data** will be retrieved and harmonized
 - Sensors will be **connected to a cloud IoT platform**
- Information used by **smart algorithms to**
 - Predictions**
 - Learning** the preferences of the different participants
 - Optimization** of the planning of operations
 - Automated negotiation** and **re-optimization**
- Real-time dashboards** which will provide an overview to managers of what is happening



Key innovation aspects

- **Artificial Intelligence focused on prediction**
 - Inference based on event detection and probabilistic programming frameworks
- **Global optimization planning**
 - Realistic optimization models based on Robust and Multi-Objective Optimization.
 - Hybrid metaheuristics based on paradigms of parallel computing
- **Automated negotiation and planning re-optimization**
 - Constraint satisfaction problem solving techniques
- **Event Identification Rules**
 - A new application domain for the processing of complex events and their aggregation
- **Service layer – Decision making tool**
 - Increased data gathering, cleansing and structuring
- **Data gathering techniques**
 - ETL tools for Linked Data. Scraping and transforming

CONTROL AND DECISION-MAKING TOOL

Integral visibility and planning of resources

Planning of dynamic routing



Optimized planning of resources

Optimal routes for deliveries

Identification of events

Dynamic planning reconfiguration

Horizontal/vertical collaboration

Synchromodality management

REAL-TIME INFORMATION ON FREIGHT TRANSPORT



KPIs of real time logistics

Position of goods

Operational status

Working conditions

Arrival times

Environmental conditions

LOGISTAR services will be **tested under real operation environment** in three use cases

Collaboration opportunities among FMCG



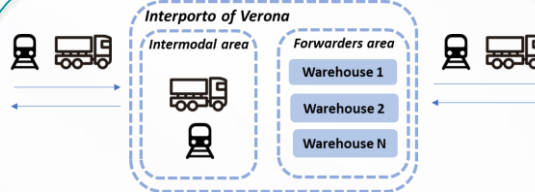
Backhauling and Co-loading

Process of various information coming from the different companies (*schedules, resources, constraints, truck, positions, empty return legs...*) to improve backhauling management

Overall overview of the status of the operations through the real-time dashboards and the real-time information on road transport system.



pladis



Synchromodality

Real time re-planning due to disrupting events: corrective and preventive

Planning of synchromodal routes basing on real time events.

Dynamic assignation of freight transport networks.

Real time status on goods movements: position of vehicles, arrival time of cargo fleets.



Ahlers - European Distribution Center



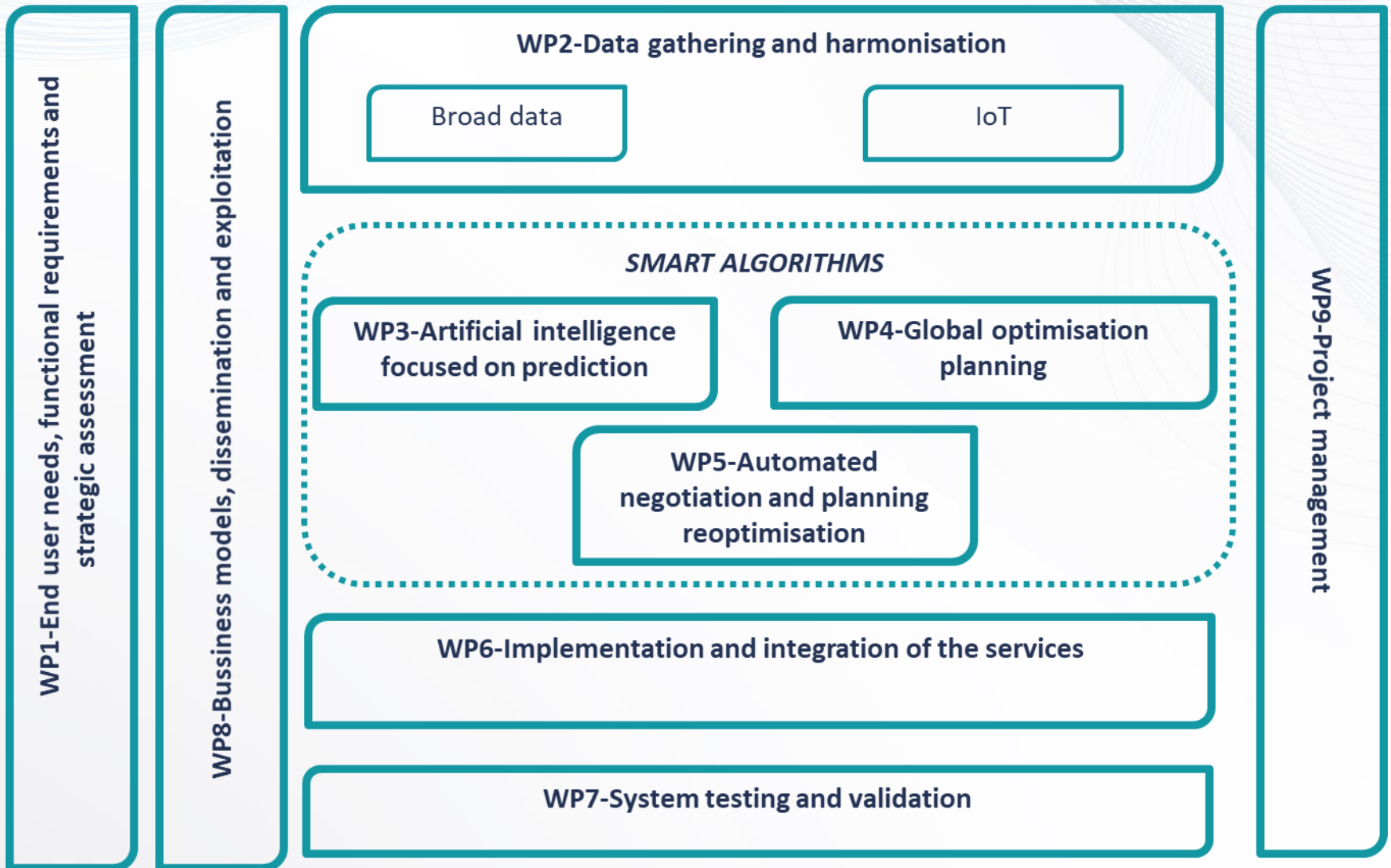
Real time logistics in Chemical Industries

Real time planning of resources looking for transport synergy and bundling opportunities.

















Real-time alerts and recommendations to take action, facilitating the decision-making process.



Work packages structure



Partners and roles

 Deusto <small>Universidade de Deusto Deutsches Universitätskollaboratorium University of Deusto</small> 	Project Coordinator Global optimization planning techniques	 dbh <small>dbh Logistics IT AG</small>	Implementation and integration of services
 Insight UCC <small>University College Cork, Ireland Coláiste na hOllscoile Corcaigh</small>	Artificial Intelligence techniques focused on prediction	 GENEGIS GI <small>Geographical Intelligence</small>	Geo-special oriented software solutions
 CSIC <small>CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS IIA Institut d'Investigació en Intel·ligència Artificial</small>	Automated negotiation algorithms	 ahlers	Testing and validation – Real time logistics in chemical industries use case
 DUNAV <small>NET</small>	Cloud IoT data	 ZAILOG	Testing and validation – Synchromodality use case Dissemination activities
 SEMANTIC <small>WEB COMPANY</small>	Data gathering and harmonization	 Nestlé	Testing and validation – Backhauling and co-loading use case
 SOLUTIONS	End-users engagement	 pladis	Testing and validation – Backhauling and co-loading use case
 MDS Transmodal™	New and emerging business models assessment	 CODOGNOTTO	Testing and validation – Synchromodality use case
 software <small>AG</small>	Predictive analysis and processing of real-time data		



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