Progress towards Federated Logistics Through The Integration Of TEN-T into A Global Trade Network

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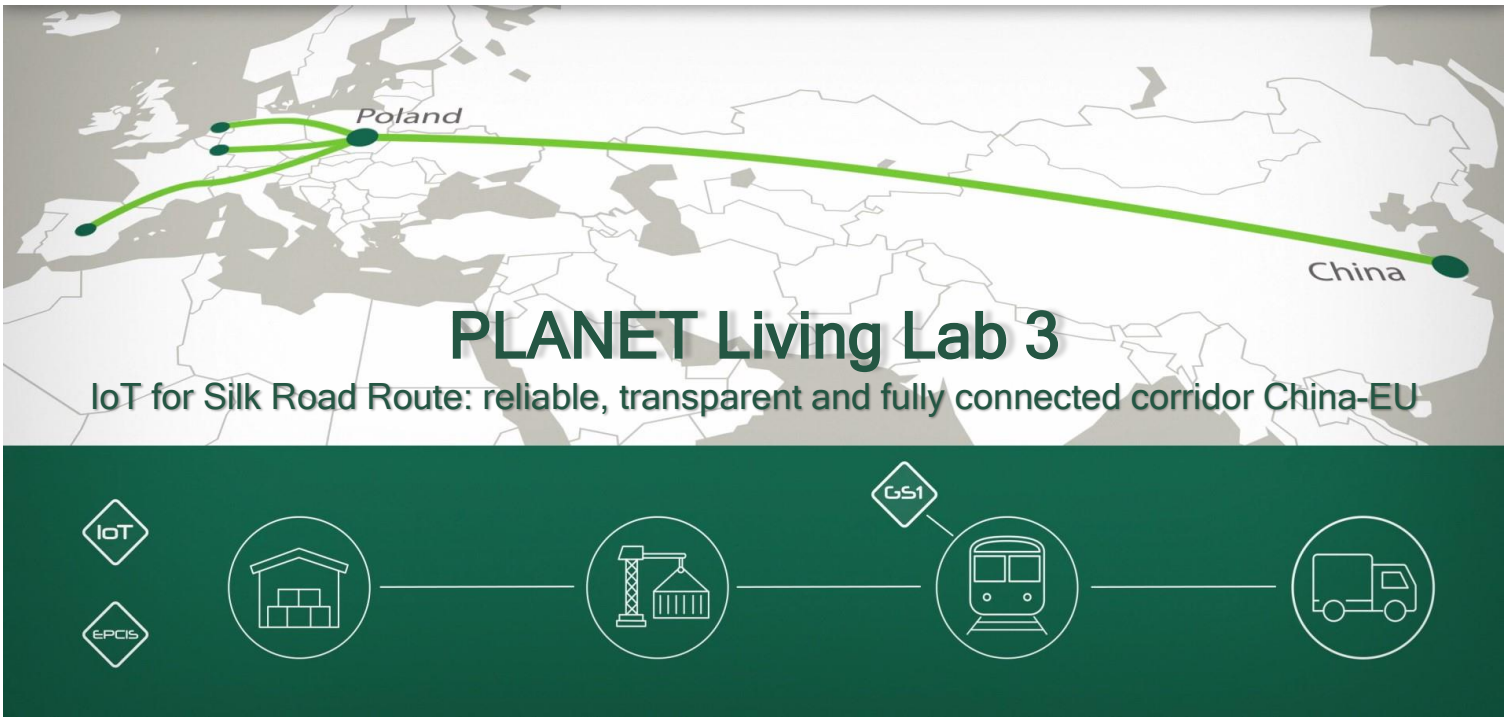

PLANET LL3 focuses on streamlining logistic processes in flows from China to Europe along the Silk Road by implementing Internet of Things (IoT) technologies (based on the Electronic Product Code Information Services, EPCIS, platform) and GS1 standards that facilitate transmission of data between the partners involved in the e-commerce operations.

Objectives & Business benefits of the technologies implemented

Sensor Network

The use of sensor system will help to **control resource parameters in real time** and **identify them while moving in the transport process, providing information on the status and location of goods on an ongoing basis**. As a result, it is expected **clear records of events** affecting the cargo condition (exceeding temperature, humidity, shocks, tampering) and a **clear division of responsibilities for damage**, as well as **shortening the time of transport thanks to faster reaction at individual stages**.

EPCIS platform

EPCIS greatest potential in the New Silk Road is in the **real-time monitoring of rolling stock**, obtaining data on rolling stock and rolling stock components to facilitate preventive maintenance. Thanks to this solution, it will be possible to: track loads in real time, estimate the distance travelled by the vehicle to plan preventive maintenance, as well as the control of vehicle availability. EPCIS Platform will lead to **reduced operational errors** due to the lack of detailed information about the delivery, **lower risk of shipment loss in international supply chain and improved delivery status monitoring** in transit to Client.

Internet of Things

IoT devices will be used for developing **effective routing optimization** that is based on accurate real-time information rather than static and for **increasing visibility of goods along the Silk Road**, providing high flexibility of asset tracking.

GS1 Standards

GS1 standards will **streamline logistics operations throughout the entire supply chain** through the usage of a unique and uniform data recorded by all participants of the GS1 system. As a result, it is expected to achieve **cost and operation times optimization, transparency and supply chain correctness and distribution time reduction**.

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Use case 1 Monitoring and optimization of container flow along the New Silk Road

Overview

The firs use case will focus on **providing access to real time information on cargo coming from China to Poland** along the entire supply chain of the **Rohlig Suus** through application of **IoT** and **EPCIS** to **monitor process events** and **support operational optimization**.

Overall activities and 'AS IS' - 'TO BE' comparison

	AS IS	TO BE
ACTIVITY 1 IMPLEMENTATION OF SENSOR NETWORK Implementation of sensor network - mobile base stations and to collect data on container transport conditions and selected logistic units during transport	• Limited access to real-time container location information. • Lack of information about the condition of the shipment such as temperature, shock, container opening, humidity. • Difficult process to prepare for shipment pickup at the terminal due to lack of complete ETA (Estimated Time of Arrival) information.	• Shortening the time of transport thanks to faster reaction at individual stages. • Providing information on the status and location of goods on an ongoing basis. • Reduction of operational errors due to the lack of detailed information about the delivery.
ACTIVITY 2 INTEGRATION OF OPERATIONAL DATA IN THE SUPPLY CHAIN Use of EPCIS for event data collection and integration with IT systems of business partners and IoT sources	• Multiple sources, systems from which shipment and transportation data is collected. • Lack of a standardized event database.	• Clear records of events affecting the cargo condition (exceeding temperature, humidity, shocks, tampering) and a clear division of responsibilities for damages. • Confirmed and documented conditions and risks of rail transport.
ACTIVITY 3 USE OF EGTN FOR ESTIMATION AND PREDICTION OF SELECTED LOGISTIC KPI'S Use of EGTN for: → Volume Flow forecasting → Carbon Footprint Prediction → ETA forecasting	• Difficult to schedule activities at the cross-dock terminal due to late information about shipments. • The need for precise determination of CO_2 emissions at each stage of the transport process.	• Possibility of planning further activities after transport (e.g., production) with an accurate Volume Flow and ETA. • Ability to monitor CO_2 emissions during the entire transport process, for different modes of transport, both rail and road.

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Use case 2 Optimization of e-commerce flows in global supply chains

Overview

The second use case will address the standardization of information flows and digitalization of interactions between actors within the Polish Post network and the monitoring shipments on the New Silk Road, including rail transport, in terms of e-commerce parcel distribution from China to EU.

Overall activities and 'AS IS' - 'TO BE' comparison

	AS IS	TO BE
ACTIVITY 1 INFORMATION FLOW STANDARDIZATION IN SUPPLY CHAINS Application of GS1 standards for monitoring e-commerce parcel shipments from China to Poland	Necessity of a uniform and standardized identification of the shipments handled within a common IT system and the exchange of information and electronic documents throughout the supply chain.	• Transparency and supply chain correctness. • Improvement of delivery status monitoring in transit to client. • Possibility of monitoring of additional data, which cause in higher delivery service quality. • Safety increase of loadings / shipments. • Lower risk of shipment loss in international supply chain.
ACTIVITY 2 INTEGRATION OF OPERATIONAL DATA IN THE SUPPLY CHAIN Use of EPCIS for event data collection and integration with IT systems of business partners	• Multiple sources, systems from which shipment and transportation data is collected. • Need of creation of a digital connection between actors in the transport network, enabling standardized data flow and access to information about cargoes coming from China to Poland in the whole supply chain in real time.	• Improvement of information flow between various partners involved in the organization of distribution processes on the New Silk Road. • Reduction of operational errors caused by lack of detailed information about delivery. • Cost optimization. • Operational times optimization. • Distribution time reduction.
ACTIVITY 3 USE OF EGTN FOR ESTIMATION AND PREDICTION OF SELECTED LOGISTIC KPI'S Use of EGTN for: → Volume Flow forecasting → Carbon Footprint Prediction → ETA forecasting	• Limited access to information on ETAs and volumes per distribution direction. • Lack of analysis of CO2 emissions at different stages of the transport process of shipments from China.	• Facilitated planning of operations at the transhipment terminal thanks to ETA and volume prediction. • Improvement of competitiveness of business partners on the market – higher quality of services, faster performance in terms of delivery times. • Increase of reloading operations' effectiveness.

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