NEWSLETTER #8

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planet

PROGRESS TOWARDS FEDERATED LOGISTICS THROUGH THE INTEGRATION OF TEN-T INTO A GLOBAL TRADE NETWORK

COORDINATION

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Contents

Living Lab 3: major breakthroughs

Living lab 3 at a glance

IoT for Silk Road Route: reliable, transparent and fully connected corridor China-EU

PLANET LL3 is working 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.

Use Cases

UC 1 on monitoring and optimization of container flow along the New Silk Road

Use Case 1 focuses 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.

Implementation of sensor network-mobile base stations and to collect data on container transport conditions and selected logistic units during transport	Use of EPCIS for event data collection and integration with IT systems of business partners and IoT sources	Use of EGTN for: - Volume Flow forecasting - Carbon Footprint Prediction - ETA forecasting
Activity 1 IMPLEMENTATION OF SENSOR NETWORK	**Activity 2** INTEGRATION OF OPERATIONAL DATA IN THE SUPPLY CHAIN	**Activity 3** EGTN FOR ESTIMATION & PREDICTION OF LOGISTIC KPI'S

UC 2 on optimizing e-commerce flows in global supply chains

Use Case 2 addresses 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.

Application of GS1 standards for monitoring e-commerce parcel shipments from China to Poland	Use of EPCIS for event data collection and integration with IT systems of business partners and IoT sources	Use of EGTN for: - Volume Flow forecasting - Carbon Footprint Prediction - ETA forecasting
Activity 1 INFORMATION FLOW STANDARDIZATION IN SUPPLY CHAINS	**Activity 2** INTEGRATION OF OPERATIONAL DATA IN THE SUPPLY CHAIN	**Activity 3** EGTN FOR ESTIMATION & PREDICTION OF LOGISTIC KPI'S

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Living Lab 3 business use cases

The following diagram illustrates the spatial scope of the Living Lab 3. The goal is to monitor the entire rail flow starting from the terminal in China to the Polish terminal Małaszewicze and all the way to the final destination of the Distribution Centers of our business partners Polish Post and Rohlig Suus.

In addition to the implementation of IoT technology, the tools that support data transfer and collection are EPCIS and Vayasens platform and predictions from EGTN, i.e., ETA forecasting, Carbon Footprint prediction Volume Flow forecasting, which will be used to increase the efficiency of transportation processes of the business partners.
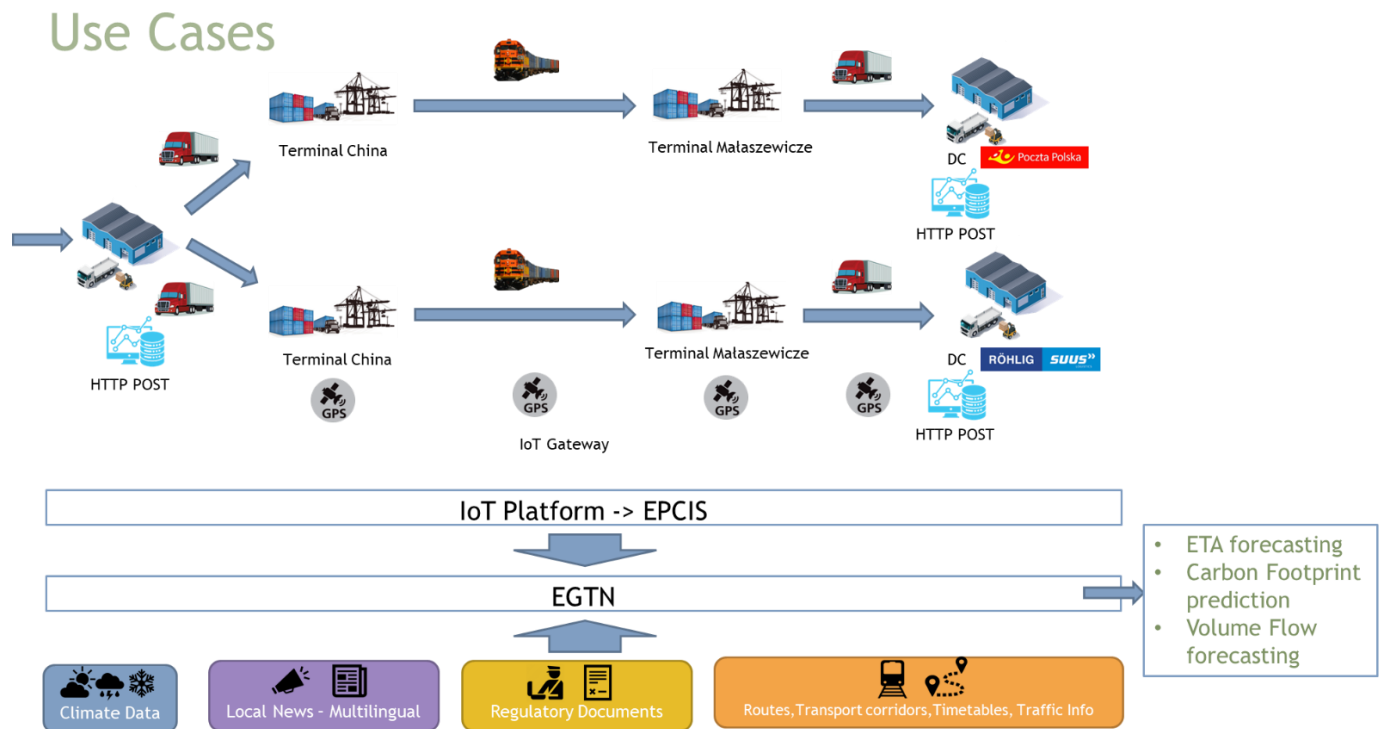
Four phases of the pilot

The first phase was the time in which the LL team works on the organization of the test course and how this plan will be implemented. In the next step, an innovation and assessment plan for the LL organization was developed. Such preparation was essential so that the entire team working on the test knows the purpose and scope of each task.

The general aim of the 2nd phase was to identify in practical detail, the problems and opportunities of a business partners, collection the needed data and visualization of the AS IS and TO BE maps with the first KPIs simulation. That part is already done.

This next 3rd phase is about responses to the problems and opportunities for the use cases. This involves collaborative (co)- design and evaluation of the options. The main issue with co-design is an iterative loop, i.e., from concept, to sketch, to outline, to detail etc. Each of these needs some form of participation between

technical experts & business partners. We have already done it, and now we are in the process of implementation and testing.

Phase 4 is key to answering whether the final test result is consistent with the Living Lab goal. In this step, the result obtained from both the system simulation and the real test will be validated.

Key Results

So far, the following key achievements and their value to the involved actors as well as the industry have been recognized:

- **Wide usability of Process Analysis & KPIs Simulation based on BPMN for mapping of processes in both UCs**

Due to the need to gain insight into the business processes of individual LL actors as well as physical and documentation flows, 17 Rohlig Suus and 13 Polish Post logistic processes were mapped as part of the pilot preparation phase. This holistic approach allowed us to identify processes where there is potential for improvement through implementation of new technological solutions as well as changes in the organizational area. Additionally, process mapping allows us to see the connections between activities and actors and their potential impact on each other.

The purpose of process mapping was to create an AS IS model of the current situation for business cases along with a target TO BE model for implementation of technological solutions. This allowed us to simulate and evaluate the potential for change of individual KPI's before the actual implementation. So as you can see we have divided that approach into 4 steps: AS IS process mapping, TO BE analysis, simulation of KPIs and comparison of the result.

An open repository of these processes together with simulations of changes will be a reference for the logistics market and can be widely used by industry professionals as best practices.

As part of the ongoing work, LL3 defined 7 KPIs that will allow to assess the impact of implemented solutions on key areas related directly to operations and the business environment. In order to achieve a common understanding of particular KPIs, the project extended their description with a detailed definition.

1) Reduction in CO2 emissions (>20%) – in this case CO2 emission refers to the logistics operating phase that corresponds to the use transport means. From the perspective of the pilot, such an indicator will be expressed indirectly for example as a reduced number of trips due to a reduction in complaints (no need for reshipment).

2) Reduced compliance costs (>10%) - Given the nature of the pilot and the regulatory challenges associated with logistics operations in the New Silk Road area, the main cost to be considered will be the compliance cost of customs processes.

3) Improved end-to-end visibility (>50%) - This transparency is made possible by carefully monitoring each step of the process, capturing all related data, and organizing it in a centralized data management space. It will be possible thanks to EPCIS implementation.

4) Improved customer experience (>15%) - Detailed areas of interest, important from the end customer's point of view, will be defined through a survey conducted among Polish Post and Rohlig Suus clients.

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5) **Increased volumes (>8%)** - in this case, volumes are defined as the quantities of products, expressed in packages, that can potentially be processed through logistics operations in the supply chain

6) **Reduced operational costs (>10%)** – In this case, we are talking about the cost of logistics operations related to the direct handling of products. Logistics costs that we include are for example:

   o cost of transport activities, for each mode;

   o cost of storage or warehousing activities;

   o cost of marking, identifying, recording, analysis, as well as data transfer and handling;

   o cost of consolidation/deconsolidation activities.

7) **Reduced disruptions of the Supply Chain (>15%)** - A supply chain disruption is any sudden change or crisis - be it local or global - that negatively impacts that process. Since the solutions implemented in the pilot are not able to affect external supply chain disruptions, this KPI is defined as the reduction of the impact caused by Supply Chain disruptions thanks real time information and faster reaction.

All of the above KPIs were measured as part of the AS IS processes, and in the next iteration they will be compared with the results after testing, i.e., after implementing the TO BE model.

- **Increased cooperation between business partners towards sharing of data**

During the implementation of the pilot Polish Post has strengthened cooperation with GS1 China and Chinese Post in order to improve data sharing via EPCIS. The diagram below shows the physical flow with its systemic representation assuming collaboration between business partners using EPCIS subscription and EGTN database feed. It will greatly simplify the flow of real-time data in a standardized way.
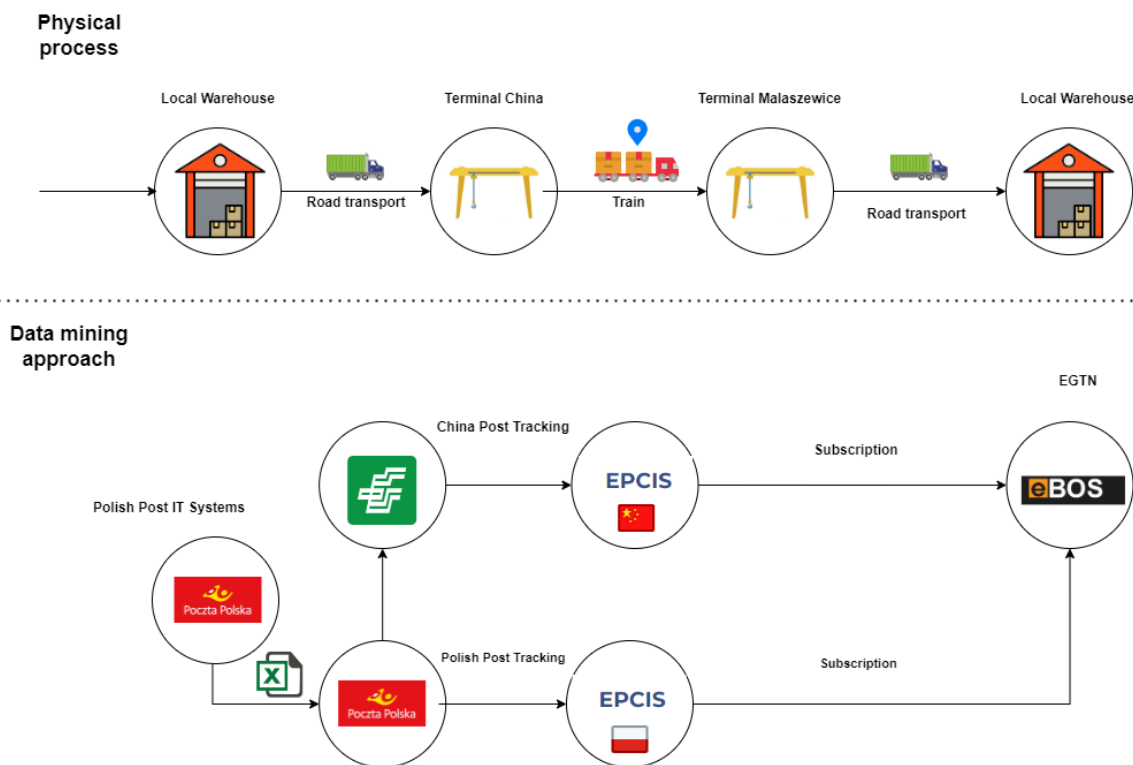
LL3 is currently testing IoT solutions for the use of EPCIS and sharing of data and information with EGTN in real time in order to improve the quality of processes and improve cooperation within supply chain of the

Rohlig Suus. The diagram below shows how the physical flow is supported by real-time information flow through the use of IoT technology, EPCIS and EGTN.
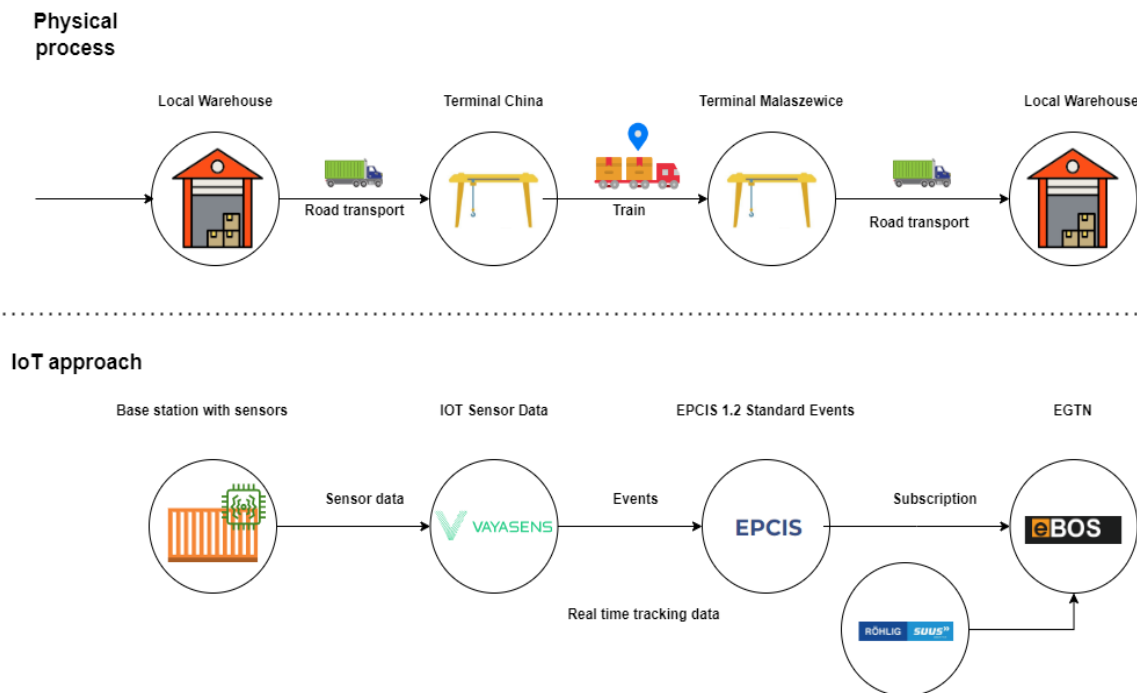
A few words about the sensor data collection platform itself – called Vayasens. When we place the base station and sensors in the container, the data collected by the devices is sent to the server. By logging in to the platform, we can track sensor parameters such as humidity, temperature or acceleration. We also have access to the current position of the selected base station. We can also easily trace historical routes. All the collected data are stored and shared via EPCIS directly to the EGTN platform, so based on that we get a prediction. Shipment alerts can be automatically sent to transport coordinators and customers. Tests are currently underway to verify the correct operation of the components (base station and sensors) and the system during the China-Poland shipment.

Rohlig Suus' challenges that we want to overcome:

o   Rarely sent rail transport statuses in a not automated way (e-mails).
o   Costs and time of keeping cargo at the terminal while searching for a truck.
o   Extending the loading time or transport to a suboptimal cross-dock terminal in Poland.
o   Lack of information about temperature and humidity condition during rail transport.
o   Potential risks of rail transport due to war in Ukraine (new).

What we want to achieve by that is the:

o   Increase the transparency of transports on NSR for logistics operators and their customers.
o   Improve the adjustment of the transport method to the customer's requirements and prevent potential damage to the cargo.
o   Streamline the process of planning the collection of containers and their deconsolidation in terms of operations and the environment.

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Attended events

NOVEMBER 14-17, 2022 – TRA 2022

TRA 2022 took place in Lisbon and brought together experts from around the world to discuss the newest innovations and future of mobility and transport.

PLANET was at the ALICE Booth during this conference and presented the paper *A blockchain-based architecture and smart contracts for an interoperable Physical Internet* at podium 1.4.1 Efficient and Innovative Logistics, Tuesday, 15 November 2022, 15:00-16:30h. This session, presented by Harris Niavis (INLECOM), focused on the solution offered by the EGTN platform, showcasing the value of Blockchain interoperability and smart contracts to the PI,

You can find more information here!

NOVEMBER 16-17, 2022 – EUROPEAN FREIGHT AND LOGISTICS LEADERS FORUM

This event is for business leaders and decision-makers in manufacturing, retail, supply, all modes of logistics, ports technology companies including start-ups, insurance, finance, academics, NGOs, policymakers, politicians and experts, all those actively working in or with the international supply chain and logistics. PLANET was presented during this forum by Franco Castagnetti (NEWO), opening a window on PLANET EGTN and the project use cases, including the drivers and the KPIs associated.

You can find more information here!
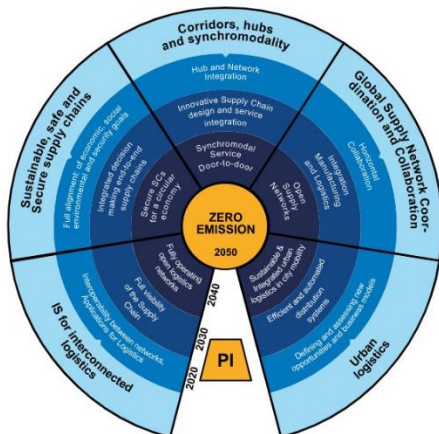
NOVEMBER 30, 2022 – Physical Internet Webinar

ALICE organized together with PLANET, PILL and ePIcenter the online webinar *Physical Internet: synergizing efforts via the ALICE liaison program*.

PLANET's presentation was conducted by Kostas Zavitsas (VLTN) and its available here.

If you missed the webinar, don't worry, a recording of the event is available here!

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News: PLANET's 3rd Advisory Board meeting, past events organised and new publications

NOVEMBER 29, 2022 – PLANET 3rd Advisory Board Meeting

The PLANET 3rd Advisory B Meeting took place on the 29th of November 2022 and concentrated on looking at PLANET's achievements to date.

You can find more information here!

PLANET'S 2ND WORKSHOP TO EXPLORE REGIONAL AND LOCAL IMPLICATIONS FOR THE RALP CORRIDOR PLANNING OF THE EXPANSION OF NEW ROUTES

PLANET celebrated on 2 December its 2nd workshop to discuss the simulations results for the baseline years 2030 and 2050 of emerging trade routes on the Rhine-Alpine (RALP) Corridor. This workshop took place during the 13th edition of the Rhine-Alpine Talks and was attended by 35 people, EGTC members and relevant stakeholders along the RALP Corridor.

You can find more information and download the PLANET presentation here!

PLANET'S SECOND ANNUAL REPORT
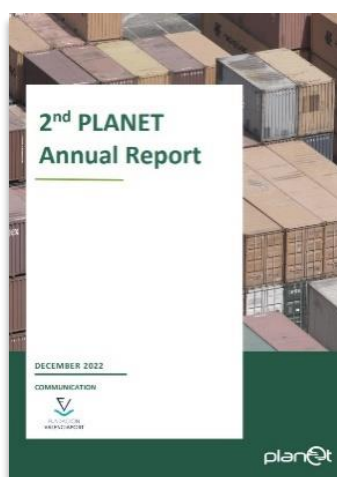
The 2nd PLANET Annual Report presents project's key achievements accomplished by its consortium members over the course of the second year of the project (M13-M24).

The report introduces and highlights the deliverables and other scientific outcomes and achievements of the PLANET project, the interactions among the PLANET's project various tasks and **Work Packages (WPs)** as well as the most significant milestones and **communication and dissemination achievements** ensuring the dissemination of project's results and the engagement of project's stakeholders.

You can read the report here!

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There are the new public deliverables you can find in our website:

DELIVERABLE	WORK PACKAGE (WP)
D1.3 Modelling & Simulation Capability final version	WP1
D2.8 EGTN Transport Data and Knowledge Models final version	WP2
D2.12 Multi-Actor Multi-Criteria Analysis final version	WP2
D2.14 Intelligent PI Nodes and PI Network services final version	WP2
D2.16 Integration and Interoperability of proprietary Blockchain Systems for Seamless Global Trade Workflows final version	WP2
D2.18 EGTN smart contracts and associated PI motivated workflows in the context of SLA management final version	WP2
D4.1 Recommendations for TEN-T interfacing to Global Trade Routes	WP4
D4.2 Policy guide, Briefing sheets and case study on freight transport for policymakers in emerging economies	WP4

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