WP2 Consortium Members:

An overview of key contributions and roles

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IBM

ROLE IN WP2

IBM will lead:

- WP2 PLANET Cloud-based Open EGTN Infrastructure, where it is concerned with the design and implementation of the EGTN platform by developing new Physical Internet (PI) inspired Predictive & Optimization based analytical algorithms for route planning and PI node optimization.
- Task T2.3 Predictive and optimisation analytics and its subtasks T2.3.1, T2.3.2, T2.3.3, and T2.3.4.
- Deliverables D2.9 EGTN Support Services based on Big Data analytics models and D2.10 Cloud deployment of EGTN logistics services.

IBM's main contribution by now is the deliverable D2.9.

KEY CONTRIBUTIONS TO PLANET

- IBM has an extensive experience and track record in the areas of data analytics and cloud/edge technology and architecture.
- It also has experience in working in projects related to the Physical Internet paradigm and how to technically enable PI to become a reality and encourage its widespread adoption.

IBM/Red Hat is the world's largest IT company with offices in 174 countries and involvement with clients across all technology domains including Cloud, Edge, Analytics, Software Solutions, IT Infrastructure, Mainframes, Research & Innovation, Trust & Security, Smart IoT, Mobile, Quantum Computing. The industry verticals that these technology domains intersect with includes Facilities Management, Agriculture, Aviation, Automotive, Banking, Environment, Freight and Logistics, Government, Healthcare, Insurance, Manufacturing, Retail, Sport, Telecom and Media and Energy/Utilities. IBM/Redhat has an extensive global portfolio of products and services.

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ROLE IN WP2

INLECOM will lead:

- Task T2.1. Cloud-based Open EGTN ICT Infrastructure Architecture. The objective is to specify, design and prototype an open Cloud-based platform and to create an open-source blueprint that enables organizations.
- Deliverables D2.1 Open EGTN Platform Architecture (v1) and D2.2 (final version). So as the related task and subtasks: T2.1 Cloud-based Open EGTN ICT Infrastructure Architecture, ST2.1.1, ST2.1.2 and ST2.1.3.

OTHER ROLES

INLECOM will be the project coordinator and Project Manager of Project Steering Team.

INLECOM will also lead:

- WP6 Project Management.
- WP7 Deliverables on Ethics.
- Deliverables D6.1 Project management handbook — management plan, D6.3 Initial Data management plan, D6.4 Data set made available and D6.5 Innovation management report and Patent Filings.
- And the subtasks ST1.5.3, ST3.1.2 and ST4.5.3.

INLECOM's main contribution by now are the deliverables D2.1, D6.1a, D6.3, D7.1, D7.2, D7.3, D7.4.

INLECOM is also actively participating in WP5.

KEY CONTRIBUTIONS TO PLANET

- INLECOM provides consultancy services in the strategic use of advanced and emerging ICT technologies to the transport and logistics industries.
- In addition, it intends to define and prototype new services for the implementation of EGTN framework in the broader T&L market.
- INLECOM has formalized the Open EGTN ICT Infrastructure Architecture and is currently developing specialized capabilities for interoperable blockchain solutions for the diverse T&L stakeholder communities of the project.

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INLECOM

INLECOM is a European SME with offices and consultants in Belgium, Greece, UK, Ireland, Spain, and Italy. It has established a unique holistic view of the ICT domain as well as become a leader in Digital Ecosystem Platforms & Technologies, through an extensive research programme including a library of process models, domain entities, ontologies, and client-facing solutions.

It is also a highly successful coordinator of multiple EU research projects, with a team of PMI-Certified Project Managers currently coordinating numerous high profile H2020 projects, in the areas of T&L, IoT, Security, Big Data and Cloud technologies.

ROLE IN WP2

NGS will lead:

- Deliverables D2.3 (v1) and D2.4 (final version) of EGTN IoT Infrastructure. The objective is to use IoT infrastructure for increased automation in T&L operational management with automated localised data capture, processing and event-based transmission including registration of events through EPCIS (GS1 standard); hardware and software for the High-level gateway and battery powered IoT tracker/gateway.
- And the subtask ST2.2.1 EGTN IoT infrastructure.

NGS's main contribution by now is the deliverable D2.3.

KEY CONTRIBUTIONS TO PLANET

- In PLANET, NGS provides the Tracking, Tracing and Monitoring solution enabling the supply chain complete visibility in LL1. NGS enables the logistic units' monitoring during the shipment. The solution is interoperable and, at the Cloud side, allows a seamless integration with third parties solution. It implements the LL1 IoT infrastructure providing data from the field to the EGTN platform.

NGS

NGS srl
New Generation Sensors

NGS is an Italian SME company established in 2015 as a spin-off of Scuola Superiore Sant'Anna. NGS has strong expertise in the development of advanced Internet of Things systems for Industry 4.0 domain:

1. Smart factory, with the goal of democratising predictive maintenance.

2. Smart Logistics, with the goal of enabling the complete visibility of the supply chain, Tracking, Tracing and Monitoring of the goods with improved granularity, and providing information to all the shareholders involved in the shipment.

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ROLE IN WP2

KNT will lead:

- Task T2.5 EGTN Distributed Ledgers and Smart Contracts. The objective of this task is to use distributed ledger technology (a main component of blockchain) to simplify, standardize and streamline interorganizational workflows such as the clearance of goods in border crossing points.
- ST2.5.1 Interfaces to multiple Proprietary Blockchain Systems for Seamless Global Trade and ST5.2.2 EGTN Smart Contracts.
- Deliverables D2.15 (v1) and D2.16 (final version) Integration and Interoperability of proprietary Blockchain Systems for Seamless Global Trade Workflows v1, so as D2.17 (v1) and D2.18 (final version) EGTN smart contracts and associated PI motivated workflows in the context of SLA management.

KNT's main contribution by now are the deliverables D2.15 and D2.17.

OTHER ROLES

KNT will also lead the

- T4.3 Open Source Libraries and Transferability Framework.
- ST4.3.2 Electronic Visualisation Library.
- Deliverable D4.3 Electronic Visualisation Library of outputs from WP1-WP2 and WP3.

KEY CONTRIBUTIONS TO PLANET

- KNT is focusing on intelligent connectivity solutions and therefore PLANET research and development will strengthen the company's capabilities.
- KNT intends to deliver an open sourced EGTN support library of components which will be tested and used in the LLs.

KONNECTA

Konnecta (KNT) is an Irish-based IT Consultancy and Solutions SME specializing in Connected Intelligence Application Systems and providing solutions for Connectivity and Data integration, Artificial Intelligence, Digital Trust and Digital Wellness.

KNT leverages a team of highly skilled software engineers, 80% of them devoted to research and development activities. Konnecta possesses a number of software development tools and in-house developed productivity tools, as well as cloud infrastructure with well-known cloud providers (AWS) with AI and serverless functions capabilities.

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ROLE IN WP2

SIRMA will lead:

- Task T2.2 EGTN IoT and Connectivity Infrastructure Components. The objective is to identify, collect and integrate T&L data and models that will be used for creating the new T&L services. Building this knowledge graph means transforming internal and external data sources and integrating them into a single graph by building connections and enriching them with metadata.
- Deliverables D2.5 (v1) and D2.6 (final version) of EGTN Connectivity infrastructure, so as D2.7 (v1) and D2.8 (final version) of EGTN Transport Data and Knowledge Models.
- ST2.2.2 Cloud-based Connectivity and Collaboration infrastructure components.
- ST2.2.3 EGTN Transport Data and Knowledge Models as a Service.

KEY CONTRIBUTIONS TO PLANET

- By taking part in this important project, SIRMA's goal is to provide the solutions to support the creation of a well-connected and sustainable European global transport and logistics network.

SIRMA AI

Sirma AI (trading as ONTOTEXT) is a provider of semantic technology which can be applied to artificial intelligence, big data management and text analytics for better content management, knowledge discovery, semantic search, enabling businesses to build linked data through intricate models for representing information.

By transforming the way organizations identify meaning across diverse datasets and massive amounts of unstructured information, we help them see a much bigger picture.

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ROLE IN WP2

VLTN will lead:

- Task T2.4 Group multi criteria DSS for transport and PI Networks. This task is connected with the following deliverables while developing Multi-user and multi-criteria models to allow stakeholders analyse and assess the effect of new T&L developments, so as intelligent PI Nodes and PI Network services to optimise the efficiency of the whole transport system whilst reducing emissions.
- Deliverable D2.11 (v1) and D2.12 (final version) of Multi-Actor Multi Criteria Analysis DSS (MAMCA), so as D2.13 (v1) and D2.14 (final version) of Intelligent PI Nodes and PI Network services. Through these deliverables, VLTN development and application of analytics solutions, including the introduction of node auctions and the implementation of MAMCA methodology. Based decision support systems are being developed for maritime and inland logistics operations for LLs optimization.
- ST2.4.1 Multi-Actor Multi-Criteria Analysis DSS: Multi-Criteria Analysis (MCA) and ST2.4.2 Intelligent PI Nodes and PI Network services.

VLTN's main contribution by now are the deliverables D2.11 and D2.13.

KEY CONTRIBUTIONS TO PLANET

- VLTN offers its expertise in development and implementation of decision support tools based on operations research and machine learning.

VLTN

VLTN is a Belgium based IT Consultancy and Solutions SME, dedicated to research and development of innovative solutions that harness the Cloud to simulate, digitalize and transform business processes and data. The main areas are security, so as the transport and logistics industries. It focuses on developing customized analytics solutions for the supply chain and logistics industry utilizing expertise in operations research and machine learning.

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ROLE IN WP2

EBOS will lead:

- Task 2.6 Unified interface to EGTN Data and support Services.
- Deliverables D2.19 (v1) and D2.20 (final version) of Unified HMIs implementation and technical documentation. Through this deliverables, eBOS will develop a unified interface to EGTN data and support services with the main goal to deliver a unified interface to communicate with all of PLANET's Cloud-based Open EGTN Infrastructure components via suitable interfaces.
- And the subtasks ST2.6.1, ST2.6.2 and ST2.6.3.

OTHER ROLES

EBOS is also actively participating in WP5.

KEY CONTRIBUTIONS TO PLANET

- EBOS will offer its extensive experience in intelligent front-end dashboards as well as insights to the Logistics' business domain and participation in a number of relevant projects will ensure a successful participation towards achieving project objectives.

EBOS

eBOS Technologies Ltd is an SME software powerhouse established in 2003 based in Cyprus. Always at the forefront of technological advancements, we are committed to innovation and heavily investing in beyond the state-of-the-art technologies. Throughout our long experience, our Research & Development division is focused on research in multiple domains and pilots eBOS' successful engagement in cutting-edge research projects funded by the European Commission and implemented in collaboration with large international research teams and industrial leaders.

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WP2 Deliverables submitted

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D2.1 Open EGTN Platform Architecture v1

The Cloud-based Open EGTN Infrastructure Architecture deliverable reports on the creation of an open-source blueprint that aims to empower organisations to build upon and implement T&L design tools, collaborative logistics and new eCommerce models underpinned by data-driven supply chain insights. The deliverable aims to inform any stakeholder or consortium of stakeholders involved or interested in the design of innovative, crossorganisational EU-Global T&L networks.

The deliverable includes a detailed specification of the platform based on stakeholder needs analysis and it is inspired by other logistics collaboration platforms from previous Horizon 2020 projects (e.g. SELIS and ICONET). The design and architecture of the platform are presented in a separate chapter aiming to point out the stateof-the-art technical solutions behind the blueprint.

The EGTN Platform endeavours to become a powerful platform due to the unique combination of technologies and models it entails. Data Ingestion is handled by versatile mechanisms responsible for importing heterogeneous data from various external sources in batch and/or in real time in a secure manner. A Decision Support System (DSS) allows the users to make important T&L and PI decisions, such as corridor route optimisations, warehouse time reductions etc. The DSS provides data intelligence and is based on different Machine Learning (ML) models, as well as simulation mechanisms. The results of these models and simulations are the basis for the decision-making process. Intelligent forecasting is used with the ultimate purpose of achieving the PI roadmap, while the use of smart contracts facilitates automated and paperless negotiations. Blockchain interoperability aims to overcome the silos of the different Blockchain systems/partners, and, finally, user-accessible dashboards within the Human Machine Interface offer a visual frontend to allstakeholders. Most of the underlying technical solutions used throughout the implementation of the EGTN Platform are industry standard, production proven and open source.

The combination of these technical advancements plays an instrumental role in uniquely positioning the EGTN Platform in terms of technical enablement of the Physical Internet (PI) paradigm. In that context, the EGTN Platform empowers T&L stakeholders by offering them a means to access tools and PI services for routing, node optimisation, shipping, and encapsulation, and so on, as well to collaborate with other T&L actors across borders and organisations in a self-determined and secure way.

Based on the requirements set out from the partners in Work Package 1, as well as the workshops organised by the Living Labs and by WP2, this document provides an architectural blueprint for a cloud-based platform, which is versatile enough to accommodate different sizes of T&L/PI actors. Detailed deployment strategies and cloud provider considerations are also covered, aiming to ensure that the platform can be easily adopted by any interested T&L party. Finally, the platform was developed in such a way that it can ensure secure, and seamless integration of logistics services, and it is based on an explicit governance model for onboarding of users, data, and services.

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D2.7 EGTN Transport Data and Knowledge Models v1

This deliverable presentsthe work done towards developing a harmonized semantic model for a global transport data knowledge graph to be delivered in the EGTN Connectivity Infrastructure. It consists primarily of an inventory of relevant data types. For each data type of interest, there is an exploration of relevant ontologies and analysis of likely data sources focusing on aspects such as data availability, accessibility, format consistency, coverage, reusability and quality. Where relevant, there is a comparative analysis of the alternative data sources, a consideration of their respective advantages and shortcomings and a recommendation for which one would be most useful to the EGTN Cloud Infrastructure as a whole and best meets the needs of identified partner business cases.

The final section is related to the presentation of the initial version of the harmonized data model to be used in the EGTN Connectivity Infrastructure. While it is fully expected that this model will be greatly expanded and improved by the inclusion of additional data sources over time, it sets a groundwork for the minimum contents expected to be available in the Connectivity knowledge graph.

The primary innovation achieved in this subtask lies in the development and expansion of this harmonized data model. It defines the process of transforming individual partner and external data sources into a single knowledge graph that enables exploration and analysis of the data on all levels of interest to the project. On the micro level it defines the representation of individual data points such as a vehicle's current location or the offloading of a container from a ship. On the meso level it enables the inferring and storing of answers to specific partner data needsfor analysis, decision-making and visualization. On a macro level it represents global transport corridors in a deeply enriched state that integrates a variety of informational aspects. Most importantly, it provides seamless querying of data between these levels of abstraction.

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D2.9 EGTN Support Services based on Big Data analytics models

This deliverable describes the preliminary results of experimentation on AI based predictive models, using data made available in the project, to forecast the in-flow of pallets and containers to warehouses. The presented outputs reaffirm the feasibility of building forecasting models for the relevant considered applications and set the basis for using machine learning based AI models for potential future implementations across use cases, for which further time-series data resources will be utilized for validation.

The report also includes additional descriptions regarding ongoing collaborative tasks currently taking place for sharing and utilising expert domain knowledge to better understand the nuances of the available data. This is to enable the predictive models as services and determine their role in the Living Labs and within the currently ongoing development of the respective use cases. These data and predictive-model related tasks are the basis of the analytics-driven cognitive decision support systems that are focused on automating applications ,such as the blockchain-driven smart contracts for payments. The data analytics research conducted to date is also reported which covers both predictive and prescriptive models that enable accurate and responsive information workflows. The models and future services addressed in this report are described in the context of the Living Labs (LLs) current requirements and characteristics for future applications to be enabled, such as the re-routing optimization service.

In addition, the contextual descriptions are presented for the scenarios and use-cases for the analytics' models and future services being developed as part of applications of the corridor route optimisation, supplier collaboration and warehousing management. IBM will conduct further research and implementation developments to update the current identified requirements across all the deployments customised for the European Global Transportation Network (EGTN) stakeholders. The PLANET project employs 3 EU-global realworld corridor LLs that include sea and rail for intercontinental connection to establish the experimentation environment for designing and exploiting the future PI-oriented Integrated Green EU-Global T&L Network that is to be advanced within the project.

The collaborative efforts taken between IBM and the Living Labs project partners are solid and represented in the current descriptions of the use cases. These use cases form part of the basis for further development of models to complete and deploy the required services. The relationship between WP1 and WP2 is pointed out in the report since it describes how models could (to maximise their combined functionalities) interact with each other, and with other services part of the EGTN platform.

These new Physical Internet (PI) inspired EGTN services are designed to optimise the usage of available resources, increase operational efficacies, and encourage collaborations across regions and supply chains. The services developed are envisaged to be part of a set of configurable computing resources and components that can be rapidly provisioned, managed and deployed in line with versatile cloud capabilities inspired design principles.

The research outputs and developments obtained regarding forecasting pallets and containers are preliminary but indicate the feasibility of the approach for using data driven solutions. These and other predictive models required will evolve towards other implementations and deployments to be reported in the next iteration of this deliverable, D2.10.

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D2.11 Multi-Actor Multi-Criteria Analysis DSS v1

This deliverable focuses on the implementation of MAMCA (Multi Actor Multi Criteria Analysis) methodology for the development of the TEN-T network and its integration to global corridors. The approach adopted considers both infrastructural and technological advances, including the ones developed in PLANET's Living Labs. The report explores the innovative application of MAMCA in the context of the Physical Internet with the aim of identifying a fair investment roadmap with benefits distributed evenly across T&L stakeholders.

A literature review of the MAMCA methodology is undertaken, examining the main components of the methodology, extending back to predecessor methods, such as the Multi Criteria Analysis, and analysing implementations extending beyond national borders following the scope of PLANET project. The MAMCA steps and applications are also discussed as the methodology has multiple variations and applicability into various contexts.

The MAMCA is considered in the context of the strategic evolution of the TEN-T, contemplating the uncertainty of future scenarios based on PLANETs Positions Papers within its Analytic Hierarchy Process. Technological and infrastructural alternatives associated to the Physical Internet are assessed, and utilized for the identification of preliminary stakeholders, and relevant to the PI context stakeholder criteria. The DSS tool requirements for completing and automating the MAMCA application are also examined.

The modelling requirements for the strategic development of TEN-T are analysed in terms of network representation, as establishing a link between technological advances and network performance evaluation in terms of the stakeholder metrics is essential for meaningful MAMCA application. An inventory of suitable evaluation models based on PLANET partners capabilities is populated for quantifying network performance. The operationalisation of the quantitative and qualitative criteria is analysed considering network performance model outputs.

An additional application of MAMCA focusing on operational collaboration is discussed for the PI services being developed for PLANET Living Labs. The collaborations that arise between containership and the port operators, as well as between warehouse and last mile distribution operators are analysed. In this case the MAMCA enables the identification of mutually beneficial solutions, as well as the consideration of feasible collaboration criteria.

D2.11's purpose is the preliminary development of the building blocks for the successful implementation of the MAMCA methodology in the context of the TEN-T. The parameters for the steps of the MAMCA methodology are analysed and adapted for the context of PLANET outputs and LLs. Alternative development scenarios and stakeholders are also discussed, and evaluation criteria are identified. Finally, focusing on the modelling side, network performance evaluation models are presented, to reflect on the evaluation criteria, while considering technological and infrastructural investments.

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D2.13 Intelligent PI Nodes and PI Network services v1

This deliverable focuses on developing algorithms, that utilise the advantages of the PI, and enable smart decision making at both network and node levels. The deliverable describes models and methods for integrating automated operations for transport and logistics planning and collaboration, in alignment with the Physical Internet principles. After introducing in brief the inefficiencies of current logistics practices, the technological features of the Physical Internet and the benefits it provides are discussed. The report builds on Physical Internet integrated data structure, network representation and workflow protocols developed in SELIS and ICONET EU research projects. Drawing inspiration from PLANETs Living Labs, three generic contexts are defined for DSS tools development capturing:

- Vertical integration of global corridor services to PI Hub clusters and their hinterland
- PI Hubs and warehouse resource management and as-a-service functionality
- Last mile delivery dynamic collaboration

The vertical integration of seaborne services to port clusters and their hinterland, represents the integration of global trade corridors to TEN-T operations. For enabling intelligent decision making in this context, a model structure that incorporates, data requirements informed through connectivity infrastructures and predictive services, as well as an optimization based DSS are proposed. The PI Hub Choice model optimizes sea and land side collaboration, through the identification of efficient options for routing containers to their destination considering hinterland services. The tool integrates with AIS data provided by T2.2 and predictive services provided by T2.3 to analyse the routing options available for containers to reach their destination optimally. A Case Study is presented focusing on COSCO operations in Spain, and various port congestion scenarios are considered, indicating that a robust routing approach is beneficial both to liner shipping service operators and hinterland operators, while port congestion is alleviated.

When considering collaboration for last mile delivery logistics, the high uncertainty of the urban environment that arises from road traffic, limited parking availability, and handover uncertainty, are found to cause significant delays and inefficiencies to last mile operators and cities. To address this challenge, delivery status updates are circulated and stored in the cloud, from one or more operators, that are then analysed to identify collaboration options between vans or operators. The tool builds on a stochastic traffic simulation, and:

- identifies suitable help candidates from the vans operating nearby
- once the optimal help van is identified, reshuffles the parcels to assist the later running van,
- identifies a meeting point for exchanging the parcels, and
- reroutes both vans through the meeting point, and all the delivery locations.

The algorithm is applied in a case study, in central Madrid, Spain utilizing a dataset provided by CItylogin. Further real-time traffic data and delay prediction services integration is anticipated for a real-world application and model calibration.

In terms of the warehouse cargo and resources management context, operations are analysed and two value adding models are described. The models, after integration with predicted inflow/ outflow data for each warehouse enable the better planning of warehouse human and infrastructure resources. They also contribute towards enabling the as-a-service operation of warehouses as Hubs in a PI enabled context.The intelligent planning tools proposed for all three contexts, utilize T2.2 connectivity infrastructures, and T2.3 predictive services to populate the integrated data structure and undertake efficient decisions. The outputs of the planning and Decision Support tools are illustrated quantitatively. In the case of last mile logistics collaboration, the benefits extend beyond the operator specific business benefits to city congestion and air quality improvements. Furthermore, the roadmap for the further development of the tools is discussed, that includes the integration with real-data sets where available and the testing of algorithm performance in real-world conditions.

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D2.15 Integration and Interoperability of proprietary Blockchain Systems for Seamless Global Trade Workflows v1

This deliverable reports on the integration and interoperability of proprietary Blockchain systems that have the potential empower organisations across the entire T&L supply chain to collaborate seamlessly. The report aims to inform any stakeholder or consortium of stakeholders involved or interested in the design of innovative, cross-organisational EU-Global T&L networks, but also any stakeholders interested in the deployment of Blockchain interoperability solutions in T&L or any other field where the use of smart contracts can be applied.

The report presents the design, architecture, interfaces, and initial implementation of the Blockchain 'front end' which will be part of the open cloud based EGTN platform, that aims at unifying multiple back end blockchain systems. The types of data to be exchanged between different Blockchain systems, both static (master) and transactional, are also presented.

The design of the EGTN Blockchain component was primarily influenced by the requirements and business scenarios that were developed during close and frequent interactions with the partners from the Living Labs. The methodology employed involves a thorough investigation of the current state-of-the-art in the emerging topic of Blockchain interoperability and a mapping of the different technological solutions against the PLANET Blockchain requirements.

The EGTN Blockchain component, that is currently under development, aims to highlight the benefits of Blockchain to the Physical Internet (PI) paradigm. These include better tracking of data across T&L networks, safer contract execution through smart contracts and increased security protection through encryption. To add to the above, Blockchain interoperability is a great enabler for the PI, as it offers the ability for existing disparate blockchain systems to interoperate and share data regarding shipping manifests, smart contracts, customs declarations, transport events and so on. In that regard, the nature and ethos of how Blockchain technologies operate can bring huge benefits to cross-organisational T&L networks that wish to take a step closer to the Physical Internet.

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D2.17 EGTN smart contracts and associated PI motivated workflows in the context of SLA management v1

This deliverable presents the design and structure of the Blockchain-enabled smart contracts which are called to facilitate, verify, or enforce the negotiation or performance of a contract or an aspect of the SLA. Smart contracts are employed in the context of Blockchain interoperability, which aims at unifying multiple proprietary Blockchain systems of different T&L stakeholders. In this manner, actors across the entire T&L supply chain shall be able to collaborate and exchange information seamlessly.

The report aims to inform any stakeholder or consortium of stakeholders involved or interested in the design of innovative, cross-organisational EU-Global T&L networks, but also any stakeholders interested in the deployment of Blockchain interoperability solutions in T&L or any other field where the use of smart contracts can be applied by replacing existing paper-based contracts.

The EGTN smart contracts focus on the contract structure and associated PI motivated workflows in the context of SLA management. Blockchain-enabled smart contracts are exploited as computer programs stored in the EGTN Blockchain. Consequently, they can be triggered to execute automatically when predetermined terms and conditions are met by encoding “if-then” rules that depend on other actions that occur across the supply chain and are recorded in the distributed ledger through the IoT and the connectivity infrastructure. Correspondingly, when the right conditions are satisfied, the smart contract also executes and records its outcome in the EGTN Blockchain component.

The EGTN smart contracts, which are presented in this report, aspire to highlight the value smart contracts and Blockchain technologies bring to the T&L sector and especially to the PI paradigm. Smart contracts guarantee a trustworthy, seamless, and distributed process of contract negotiation and execution that significantly reduces time, administrative overheads, and costs which are currently typically spent on manual interorganisational processes. In this manner, the T&L sector can employ distributed and community driven approaches, instead of centralised, proprietary technological solutions.

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