KER 6: New distributed ledger technology for smart contract blockchain interoperability

PLANET KERs are innovative, interdisciplinary knowledge exchange networks designed to foster collaboration and knowledge-sharing between different sectors. By facilitating the sharing of knowledge and experience obtained during the development of **PLANET**, KERs have offered an innovative vision for developing new solutions to complex challenges.

What are the Key Exploitable Results (KERs) in PLANET?

Overview

The new distributed ledger technology service introduces two innovative outputs:

1) The blockchain infrastructure that will interconnect existing blockchain systems and installations from existing T&L and Supply Chain actors. It is a unique solution for **interconnecting different blockchain systems** which up until now has not been implemented in the T&L sector. Existing domain platforms gather all actors under a single blockchain umbrella, which does not provide interoperability with other systems.

2) The prototypes of smart contracts that **facilitate, verify, or enforce a contract or an aspect of an SLA**. Smart contracts can be triggered automatically when predetermined terms and conditions are met by encoding 'if then' rules that depend on other actions that occur in the supply chain and are recorded through the IoT and the connectivity infrastructure in the blockchain. Once the right conditions are satisfied, the smart contract also executes and records its outcome/transaction in the blockchain. This is the first solution that offers a **standardised technology for smart contracts to accommodate a wide range of T&L actors**, together with their business and technical requirements.

Description	The EGTN Platform blockchain interoperability service aims to **connect different blockchain systems/partners and support interorganizational trade workflows**. Smart contracts facilitate automated and paperless negotiations, improving customs control, increasing trust and confidentiality, and ensuring data authenticity/integrity. It serves as a **universal front end, facilitating objectives like sharing of master data** as a single, jointly agreed and undisputed source of reference. It also supports sharing transport events and supports T&L standards such as GS1.
Needs Addressed	Large T&L organizations have invested in independent blockchain applications to support their business needs, resulting in a need for interfaces to multiple proprietary blockchain systems to support seamless global trade. Customs is driving the need to enhance control in the transport process, while the industry aims to increase trust and ensure confidentiality and data authenticity/integrity among different actors.
KER Type	New service
Direct or indirect exploitation/use of KER	Technology development

Business Model

The Business Model section will provide a comprehensive overview of the different aspects of the KER's business operations, including its key partners, resources, value proposition, customer segments, customer relationships and also highlighting the strengths and opportunities that this KER offers to its partners and stakeholders.

Key Partners	Joint exploitation and IPR scheme among Konnecta and Inlecom.
Key Activities	Product development, IP protection, marketing, deliver early version of solution to early adopter to create feedback loop.
Key Resources	Cloud infrastructure, Open Source components (Sofie Interledger), human capital.
Value Proposition	Empower stakeholders across the SC to collaborate and exchange information seamlessly. Offer a solution based on T&L stakeholders' needs and be applied and tested in real conditions, while using feedback to improve it.
Opportunities	Huge market opportunity, solution is ahead of the curve, with a lot of potential if adopted by stakeholders.
Customer Segment	Market segments include communities/companies already having a BC implemented for their "community-internal" needs, interested in interoperating with similar other communities (e.g., A Port Community with linked 3PLs or Carriers, a hinterland carriers community with a physically interconnected group of shipping companies.
Potential USP	PLANET's EGTN blockchain interoperability service employs a unique BC-interoperability technology implemented specifically for the needs of the T&L domain. This also merges IoT Transport events with relevant events fed from different BCs, to further enhance their trust level.

Exploitation Pathway

This KER focused on the short/medium term considered the following activities in the exploitation pathway:

- Continue research & development of solution
- Need to move from a pure Proof of Concept to a solution that accommodates further use cases.
- Gather further requirements to cover more elaborate use cases
- Develop solution based on the previously mentioned

The technology has been successfully tested in PLANET living Labs and the proof of concept is fully working and can be used as basis for further development. The main drawbacks are that further funding will be required and relevant technical resources and experts will be needed. The next chapter shows the need of further test the technology collaborating with the PLANET LL partners, in addition, INLECOM is a key collaboration in order to include the technology in the EGTN platform in the long term.

Finally, the tentative action plan to perform the activities are included from 2023 to 2025. The first year the main activities are software solution development, market research and documentation by project partners. In 2024 security and scalability will be ensure for performing a testing, the marketing of the product will be prepared and in 2025 the production version will be released.

Contact Information

For more information about the new distributed ledger technology for smart contracts blockchain interoperability KER, please contact the members of the KER owner: aristea.zafeiropoulou@konnecta.io and antonis.mygiakis@konnecta.io