



ATTACC

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AuTOMated Tax Compliance for Cross-border Trading with GRAN-IoT (Generic Radio Access Network-IoT)

This project integrates for the first time 5G, IoT, AI, and blockchain technologies for the automated real-time collection of chargeable customs duties and VAT on imports associated with cross-border transactions. By moving tax and customs compliance upstream, closer to the taxable events, the proposed ATTACC system reduces the administration burden on taxpayers, and streamlines the taxation system thereby increasing its reliability and security.

Main focus

The ATTACC project seeks to reduce frictions in international trade that stem from data duplication and complex administrative processes to deliver an automated cross-border customs compliance capability. This is achieved by tracking goods across the border with GRAN-IoT sensors which are attached to goods, pallets, unit load devices or containers, in a "Russian-Doll hierarchy" and announce landing to customs agencies in the destination country. Landing events notify a Logistics Tracking Service (LTS) which monitors supply chain flows and notifies a

Smart Data Service (SDS) that aggregates tracking information. This information is shared with a Automated Tax Compliance service (ATC) which employs smart contracts to detect taxable events, calculate the right amount of tax and trigger tax payments to enforce compliance and make tax and trade effortless. This project has international significance because of its relation to efforts such as the UK specific Electronic Trade Documents Act and their equivalents in other jurisdictions. and their equivalents in other jurisdictions.

Approach

The ATTACC Project fulfills its objectives through three main subsystems. The first subsystem, LTS delivers accurate, multi-layered tracking by embedding IoT trackers within goods and containers using a "Russian Doll" hierarchy. These trackers continuously announce their location to a GRAN-IoT as goods travel across borders. This subsystem fulfills the physical delivery assurance, ensures precise, real-time monitoring that confirms goods' arrival at their destinations. The second sub-

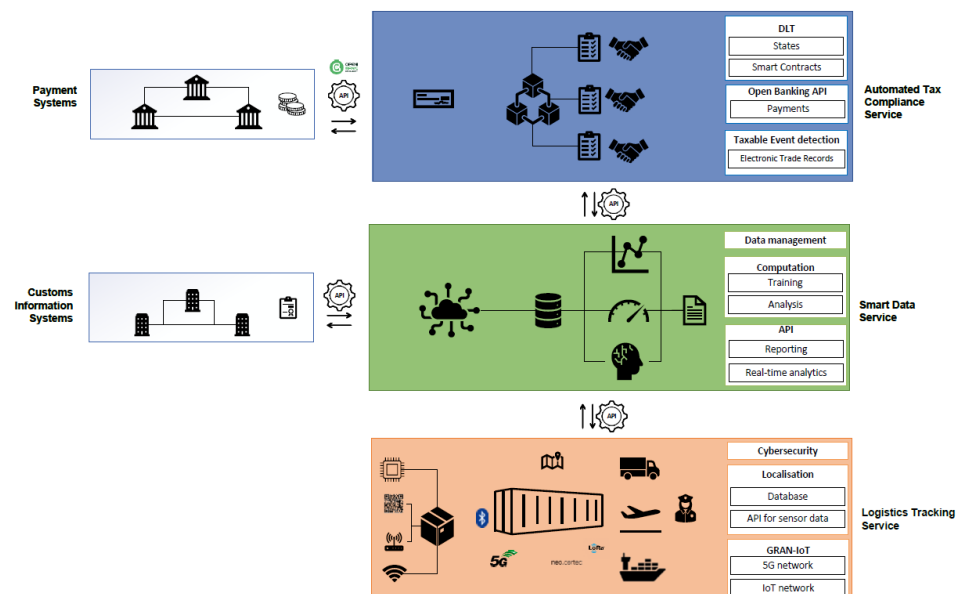


Figure 1: ATTACC system architecture

system, SDS serves as an interoperability layer that consolidates tracking data with customs and tax records. It processes data through an Application Programming Interface (API)-based connection, aligning with the UK's ETDA and United Nations' Single Window requirements. By synchronizing tracking information with trade documentation, SDS ensures data integrity assurance, reduces data duplication and enables streamlined, cross-border compliance. The third subsystem, ATC uses Distributed Ledger Technology (DLT) with smart contracts to detect taxable events and automatically initiate payments. Integrated with Open Banking APIs, the DLT triggers tax payments in real time as goods cross jurisdictional borders, satisfying the financial settlement assurance. This seamless integration of event detection and automated tax payment represents an innovative approach that embeds taxation directly into the natural systems of trade. Together, these subsystems eliminate manual processes, enhance transparency, and support a scalable, technology-driven model for international trade compliance. The ATTACC architecture is illustrated in Figure 1.

Main results

The project will achieve several key results, including

1. Build a GRAN-IoT localisation and logistics tracking system for detecting the position of sensors within port/customs areas.
2. Develop an interoperability ar-

chitecture and API-based connection service for integrating GRAN-IoT generated logistics tracking information with supply-chain provided tax information, called the SDS.

3. Integrate the SDS with a DLT-based automated tax compliance infrastructure capability that detects taxable events and triggers automated tax payments.

4. Deliver a first-time capability for trade information sharing among cross-government and inter-government organisations, in alignment with UK's strategic trade and customs long-term goal, i.e. Border Target Operating Model (BTOM).

5. Implement for the first-time, AI-based anomaly detection prior to tax payment to proactively minimise undesired occurrences such as errors and fraud.

Impact

This first-time integration between 5G-based localisation, DLT-based smart contracts and payment systems results in three cardinal assurances necessary for a realistic technical and administrative solution to eliminate these frictions in international trade i.e. Physical delivery (location) assurance, Data/trade documentation assurance and Financial settlement assurance. Once these three assurances are in position the reliability of a cross-border trading system is enhanced, increasing the probability of achieving the claimed market size of digitalisation benefits of US\$30bn-40bn in new global trade volume alongside

direct saving costs of US\$6.5bn. For the HMRC, ATTACC will increase the innovation capacity of the border industry and UK ports. Further, the proposition for importers/exporters to use GRAN-IoT services becomes affordable and viable as a result of the direct savings and precipitated increase in global trade. Airlines and other carriers would be able to provide IoT Pallet technology as an innovative new system to their customers leading to reduction in their administration overheads and lowering the risk of error.

About CELTIC-NEXT

CELTIC-NEXT is the EUREKA Cluster for next-generation communications enabling the digital society. CELTIC-NEXT stimulates and orchestrates international collaborative projects in the Information and Communications Technology (ICT) domain.

The CELTIC-NEXT programme includes a wide scope of ICT topics based on new high-performance communications networks supporting data-rich applications and advanced services, both in the ICT sector and across all vertical sectors.

CELTIC-NEXT is an industry-driven initiative, involving all the major ICT industry players as well as many SMEs, service providers, and research institutions. The CELTIC-NEXT activities are open to all organisations that share the CELTIC-NEXT vision

of an inclusive digital society and are willing to collaborate to their own benefit, aligned with their national priorities, to advance the development and uptake of advanced ICT solutions.

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