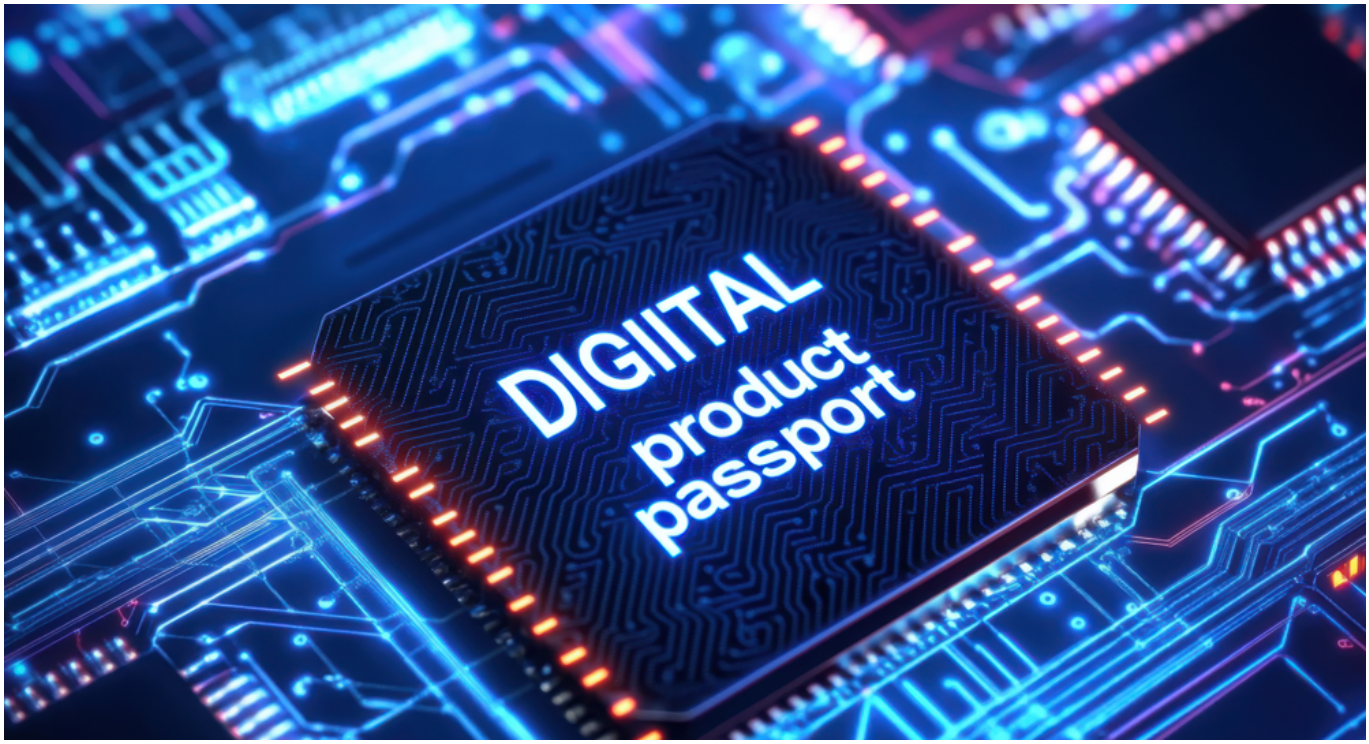
TECH OFFER

Digital Product Passport for Traceability and Compliance



KEY INFORMATION

TECHNOLOGY CATEGORY:
Infocomm - Blockchain & Other Distributed Ledgers

TECHNOLOGY READINESS LEVEL (TRL): TRL7
COUNTRY: SINGAPORE
ID NUMBER: TO175360

OVERVIEW

This technology provides a secure and privacy-preserving digital infrastructure for traceability, regulatory compliance, and sustainability verification across global supply chains. It was developed in response to tightening international regulations, such as those in the European Union, which require companies to disclose detailed product and material data through digital passports.

The solution addresses key challenges in supply chain management, including fragmented data systems, unverifiable sustainability claims, and inefficient audit processes. It enables companies to log, verify, and share trusted data across all tiers of the supply chain.

Applicable to industries such as electronics, batteries, construction materials, and textiles, this technology supports compliance with environmental, social, and governance (ESG) requirements. It transforms compliance into a competitive advantage, enhancing transparency, reducing risk, and enabling access to sustainability-linked market benefits such as green premiums.

The need for such a solution is underscored by growing global regulatory pressure and operational gaps: studies show that over

70% of companies lack visibility beyond Tier 1 suppliers, and the incidence of greenwashing-related penalties has risen sharply in recent years.

The technology owner is seeking R&D collaborations, test-bedding partners, and licensing opportunities to co-develop new use cases and expand industry applications.

TECHNOLOGY FEATURES & SPECIFICATIONS

The solution consists of a web-based software platform and an API (Application Programming Interface) toolkit that enables users to create, publish, and update digital product passports linked to physical products or materials. It is designed for seamless integration with enterprise systems such as ERP (Enterprise Resource Planning) and PLM (Product Lifecycle Management) platforms, supporting global standards including GS1 identifiers, QR codes, and RFID/NFC (Radio Frequency Identification / Near-Field Communication) tags.

Data integrity and transparency are ensured through anchoring on a permissionless blockchain, with a built-in 20-year record-keeping capability to meet long-term regulatory requirements. The system incorporates AI-driven gap detection to flag inconsistencies and offers optional peer-to-peer audits for enhanced data verification.

The overall architecture is built to support privacy, interoperability, and future-proof compliance, particularly with evolving EU sustainability and product traceability regulations.

POTENTIAL APPLICATIONS

This technology can be deployed across industries regulated under the ESPR and Chinese Carbon Product Framework which includes:

- Electric vehicle batteries
- Construction products
- Textiles and apparel
- Consumer electronics
- Packaging materials

It allows companies to meet due diligence requirements, enhance ESG reporting, and access sustainability-linked financing or carbon credit schemes.

MARKET TRENDS & OPPORTUNITIES

With digital product passport regulation becoming mandatory in the EU and likely replicated in other regions, the solution is well-positioned to capture early-adopter markets in Asia and Europe.

An annual volume of 1.5 billion DPPs is expected to be issued in Europe alone.

UNIQUE VALUE PROPOSITION

Unlike generic traceability tools or ESG dashboards, this technology is purpose-built for regulatory-grade data. It **combines digital**

verification, automated compliance, and product-level environmental insights into a single, unified passport that is auditable, updatable, and anchored on blockchain.

It offers manufacturers and brands a scalable, neutral solution to verify sustainability data without revealing sensitive trade information, effectively transforming compliance into a monetisable data asset.