

Technical Article on Blockchain-based Framework for Secure and Transparent Digital Product Passports in Industrial Supply Chains

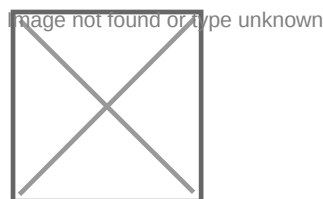
Project:

A Digital value chain Integration Traceability framework for process industries for Circularity and low Emissions by waste reduction and use of secondary raw materials

Process industries are working to find solutions to achieve low emissions and promote circularity through waste reduction and secondary raw materials use. The EU-funded DigInTraCE project will use innovative tracking, sensing and sorting techniques to develop a transparent and interoperable decentralised traceability platform focusing on the pulp and paper and chemicals sectors. The project will also develop dynamically updated DPP schemes supporting certification, quality validation, AI-based decision-making mechanisms for process and life cycle optimisation, and up-cycling, reuse and upgrade technologies for improved secondary raw materials use. DigInTraCE will concentrate on composite wood and furniture, wood and pulp and paper, plastic parts from ICT equipment and the automotive market, and polymers and textiles.

More about DigInTraCE: <https://www.digintrace.eu/>

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Sector:

Chemicals

found or type unknown

Engineering

found or type unknown

Pulp & Paper

Summary:

This technical article presents the DigInTraCE Blockchain Module, a secure and scalable framework for managing Digital Product Passports (DPPs) and traceability data across industrial supply chains. Built on Hyperledger Fabric, the solution combines distributed ledger technology, cloud-native infrastructure, smart contracts, and standardized EPCIS 2.0 traceability to enable trusted collaboration among multiple stakeholders. The article describes the platform architecture, governance mechanisms, secure API integration, identity management, and blockchain-based validation processes that support transparent, interoperable, and auditable product lifecycle information. The proposed framework provides a robust foundation for future Digital Product Passport implementations and circular industrial value chains.

Theme:

[HORIZON-CL4-2022-RESILIENCE-01-01 - Circular and low emission value chains through digitalisation](#)

Keywords:

Computer sciences, information science and bioinformatics, Digital Product Passport

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This article presents the DigInTraCE Blockchain Module, a secure and scalable framework for managing Digital Product Passports (DPPs) and traceability data across industrial supply chains. Built on Hyperledger Fabric, the solution combines distributed ledger technology, cloud-native infrastructure, smart contracts, and standardized EPCIS 2.0 traceability to enable trusted collaboration among multiple stakeholders. The article describes the platform architecture, governance mechanisms, secure API integration, identity management, and blockchain-based validation processes that support transparent, interoperable, and auditable product lifecycle information. The proposed framework provides a robust foundation for future Digital Product Passport implementations and circular industrial value chains.