



ENHANCING SAFER TRAVEL WITH PREDICTIVE MAINTENANCE IN TRANSPORTATION

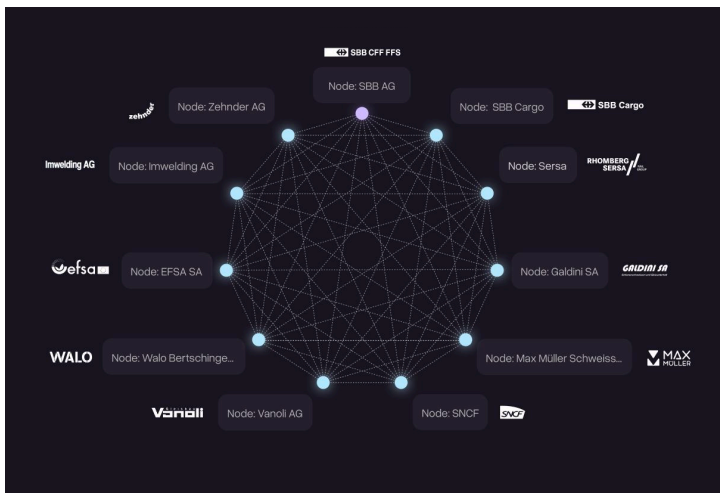
In partnership with OriginTrail and GS1 Switzerland, Swiss Federal Railways (SBB) has taken important steps to make train travel safer and more sustainable. Managing railways requires handling vast amounts of data from multiple operators—often in real time—creating operational complexity and risk. To address this challenge, SBB introduced a specialized EPCIS repository powered by the OriginTrail Decentralized Knowledge Graph (DKG).



Already in production since 2021, this EPCIS repository—actively used by SBB and its partners—has demonstrated clear improvements in safety and sustainability. It enables seamless train tracking across the EU by querying a network of railway GS1 EPCIS repositories, supports advanced analytics for predictive maintenance of train wheels using IoT data, and facilitates the tracking of welding and maintenance events across the Swiss Federal Railways network with input from over 10 welding partners. Additionally, it enables event tracking for Forged Tongues, further enhancing operational reliability.

What sets this solution apart is how **OriginTrail DKG (symbolic AI)** is combined with **Large Language Models (neural AI)** to generate trusted insights and analyses, enabling business decision-making through natural, conversational queries. This is particularly valuable for industries that require high data accuracy, transparency, and trust.

By leveraging GS1 and other global data standards, the solution ensures seamless communication across different systems. While this implementation focuses on railways, the same approach is adaptable to industries such as manufacturing, construction, automotive, and aerospace—demonstrating its versatility and wide-reaching impact.



- 1 Decentralized Knowledge Graph connects complex railway data from multiple operators, enabling predictive maintenance and reducing the risk of critical failures.
- 2 Retrieving data from multiple repositories and generating verifiable AI outputs ensures fast and reliable decision-making.
- 3 Neuro-symbolic AI is leveraged to improve the resilience, transparency, and sustainability of critical infrastructure industries.

AI-ENHANCED RAIL REPOSITORY FOR NEXT-GENERATION TRANSPORTATION SAFETY, POWERED BY ORIGINTRAIL

QUERIES ARE HARD, ASKING QUESTIONS IS EASY.

Effortlessly interact with your data repository using natural language queries - from simple questions to advanced analysis. Run AI agents for automated analysis, such as predictive queries, notifications, and many more.

SYSTEM OVERHAULS ARE DISRUPTIVE AND COSTLY.

Connect effortlessly to existing ERP, WMS, & other IT systems with AI-driven transformation to Knowledge Graphs - no need for system overhauls.

STRONG NETWORKS MAKE STRONG SUPPLY CHAINS.

Seamlessly expand queries across multiple networked repositories & share events with business partners in an interoperable, privacy-preserving way

GLOBAL STANDARDS DRIVE SCALABILITY & INTEROPERABILITY.

GS1 EPCIS 2.0 native, supporting Rail extensions, proven in deployment in European railways, spearheaded with Swiss Railways. Integrate seamlessly with other GS1 and W3C standards (Digital Link, RDF, SPARQL, etc).

TRUST IS THE FOUNDATION OF RELIABLE DECISIONS.

Use Knowledge Graphs (Symbolic AI) for zero hallucinations. Ensure verifiability of all data with blockchain, enhancing trust & compliance.

EXTENSIBILITY FUELS INNOVATION & GROWTH.

Easily extend functionality with agentic add-ons & plugins, driving better insights & new customer offerings.



AI-powered rail repository

See the solution in action:

<https://www.youtube.com/watch?v=B2Bw4sJT1-o>

For more information contact:

jurij.skornik@origin-trail.com