

Unlock Sustainable Solutions

Smart Digital Twins in Reusable Packaging



Executive Summary

In an era where sustainability is paramount, the retail & FMCG industries are seeking innovative solutions to reduce waste and environmental impact. *circolution*, a Frankfurt-based Retail Tech startup, is a provider of reusable packaging solutions for pre-packed retail products, helping food producers shift from single-use to reusable packaging in a convenient and affordable way, and has embraced a **Circular Packaging-as-a-Service** model, pioneering sustainability in the retail industry. Partnering with GoodsTag, they utilize an 'easy to start, ready to scale' approach, enabling enhanced traceability, compliance, and sustainability through their digital platform. This includes leveraging **Digital Twin** technology and **Serialized Items** for tracking and managing reusable packaging systems.

The Challenge

circolution initially faced several challenges in implementing a circular packaging system. By leveraging early IT and tracking challenges, *circolution* has developed a more robust and scalable circular packaging model.

Item-Level Tracking

Implementing sophisticated tracking for reusable containers across retail locations, warehouses, cleaning centers, and distribution hubs throughout their lifecycle was crucial for monitoring usage, cleaning status, and return rates of each packaging item.

Complexity Management

Handling multiple brands and products across various locations, *circolution* needed to coordi-

nate the movement and reuse of containers between different retail sites, warehouses, cleaning facilities and supplier locations.

Reliance on Standards

Ensuring adherence to the **GS1 Digital Link** standard using **GRAI** for reusable containers, crucial for scalability and interoperability within the broader ecosystem of reusable packaging.

System Integration

Seamlessly integrating with diverse retailer and supplier systems to enable smooth data exchange and visibility across the retail supply chain network.

Information Delivery

Providing relevant, real-time data to both B2B and B2C stakeholders, including brands, retailers, and consumers, was necessary to drive transparency and engagement around the reuse and recycling of the packaging.



Nestlé is partnering with circolution to adopt reusable packaging

GoodsTag's Solution

GoodsTag's Smart Product Platform provides a GS1 Digital Link compliant solution, crucial for its scalability and flexibility. Key components include:

Serialized Identity Management with Digital Link GRAI

Facilitates unique tracking of each container, essential for reusable assets.

Digital Twin & Digital Passport

Links physical products with digital profiles, enhancing data accuracy and accessibility.

Lifecycle Tracking

Monitors each packaging item's status, location, and number of usage cycles.

Dashboard for Analytics & Reporting

Delivers insights and trends to optimize packaging processes.

API Integration

Ensures smooth data flow across the supply chain network.

Implementation and Results

circulation has integrated GoodsTag's solution across blending manual processes with digital tools. Key outcomes include:

Enhanced Traceability

Detailed tracking of container movements across the entire supply chain, including the number of cycles, cleaning status, and product history (e.g., cacao, coffee).

Regulatory Compliance and GS1 Digital Link Features

Adheres to evolving packaging standards, leveraging the dual-purpose QR code for both logistical tracking and consumer education.

Sustainability Metrics

Significant reductions in packaging waste through effective reuse and recycling of containers.

Stakeholder Engagement

Improved communication facilitated by providing accessible container-specific information via 2D codes (GS1 Digital Link QR code and Datamatrix code).



GoodsTag's Smart Product Platform supports any kind of any kind of data carrier (e.g. QR code, Datamatrix code, NFC, RFID) and various identifier structures

Future Outlook

circulation harnessed early experiences to refine and tailor GoodsTag's Smart Product platform into a comprehensive solution for their reuse supply chain. By fully leveraging its automation capabilities, *circulation* is eliminating manual processes such as list-based tracking. Future upgrades will focus on expanding system functionality, integrating more granular tracking details – including precise geographical location of high-value containers – and driving further efficiency across the supply chain.



Sustainability impact: Each of *circulation*'s reusable containers saves around 5kg of plastic^[1]

[1] <https://www.foodnavigator.com/Article/2023/02/09/nestle-moves-nesquik-into-reusable-steel-packaging-in-germany-we-want-to-use-less-virgin-plastic-this-is-a-concrete-solution/>

At circulation, we provide reusable packaging solutions for pre-packed retail products and are on a mission to fight single-use packaging waste.

With GoodsTag's support, we've been able to digitise the lifecycle of our reusable system, ensuring transparency and scalability for our circular economy goals.

– Alessandro Marchiaro
Co-Founder & CFO of *circulation* GmbH

Conclusion

This **Circular Packaging-as-a-Service** model demonstrates a significant advancement in sustainable retail packaging solutions. *circulation*, with GoodsTag's support, exemplifies how digital innovation can transform the retail industry, ensuring compliance, enhancing sustainability and preparing for future challenges in the circular economy. Their implementation in the retail environment shows how reusable packaging systems can be successfully scaled across the retail supply chain while meeting the needs of brands, retailers and consumers.

Ready to revolutionize your packaging system?

Request a demo to see how our Smart Digital Product Passports can drive your circular economy initiatives and boost supply chain efficiency.

For inquiries, please scan here:



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