Digitalisation 2023: Everything is connected

Next to the mega-trend of sustainability, digitalisation also dominated the packaging industry this year. "Digital Technologies" consequently were one of the Hot Topics at this year's interpack. Especially the increasing use of artificial intelligence (AI) creates whole new opportunities in all areas of the industry.

In October 2023, for example, the first AI pilot projects of the Green AI Hub Mittelstand, an initiative by the Federal Ministry for Environment geared towards small and medium sized enterprises, have begun work. Within the project, over the course of six months, AI experts developed sustainable AI applications for at first five small and medium-sized enterprises (SME) and now implemented them right on the spot in cooperation with these companies – **a special feature of this initiative**. Until the end of 2025, up to 20 pilot applications are planned. The solutions developed are made available to further **companies for free as open source solutions**. A packaging company is among those participating in the first pilot phase: The family-owned business 4Packaging from Dissen (Lower Saxony) produces gravure cylinders for printing on packaging. The cylinders are submersed in chemical baths and coated with copper, the properties of which are a central factor for quality. The AI system is to reduce the consumption of resources during the process and avoid faults in printing.

Plastics Europe, the European association of plastics producers, views artificial intelligence and digitalisation as the keys to reduce the ecological footprint in the plastics industry and to contribute to a sustainable transformation in the plastics industry's added value chain. **AI algorithms can accelerate the development of more environmentally friendly materials** with improving properties like shelf-life or the impact on the environment. Precise control of and communication with machines can also help optimise production processes, reducing energy consumption during the processing of plastics. And thanks to AI and digitalisation, the recycling process is also made more efficient. Modern sorting systems

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already use digital marking and AI algorithms to automatically sort waste plastic into different categories.

"The ongoing digitalisation of the plastics industry is opening up a new chapter in innovation and sustainability. Companies making the best use of this technology will be able to reduce their ecological footprint while at the same time bringing competitive products to market. All in all, AI and digitalisation contribute significantly to making the entire circulation process more efficient, to designing better products, and to reducing the consumption of materials as well as waste production. Our goal is to maintain or even increase competitive performance while significantly reducing the impact which the plastics industry has on the environment."
Ingemar Bühler, Managing Director, Plastics Europe

Digitalising the added value chain

Through networking, digitalisation and automation of work processes as well as switching to more sustainable packaging materials and production processes, the world of packaging is currently on its way towards a fundamental redesign, says machine manufacturer Bobst. The company is now equipping all machines delivered newly to market with its cloud-based data and remote service platform Connect, and this way wants to **make it easier for customers to digitally transform their processes**. Customers can access production data and further information for all machines at any time and with any manner of end user device. As a first step, the tool provided mostly control functions for the most important machine data. The newest level of expansion also adds many different options for efficient control and optimisation of production in real-time.

The cloud-based data and remote service platform makes machine processes more transparent and thereby creates the conditions for an

effective production management. Image: Bobst

In cooperation with pilot customers, Bobst is also developing dashboards which visualise production performance as digital twins. For example, factory managers can **use these dashboards to access the "virtual machines" either from their desk or using a mobile device**. They can see their current operation status as well as the most important performance data in real-time, for example which order is being processed for which customer or how many packages from this order have already been produced.

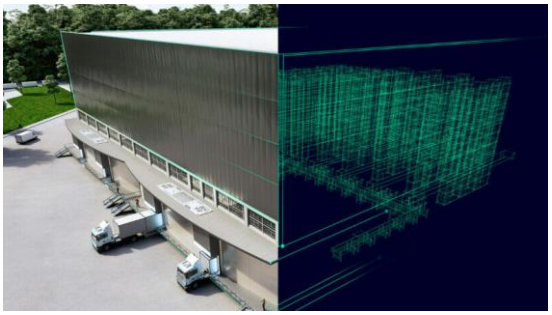
"The digital revolution in the packaging industry forces all companies to embark on new journeys, to question their previous ways of working, to think in holistic and digital processes and to utilise networks and platforms to develop new business models for their customers. The industrial vision by Bobst is based on the four pillars of connection, digitalisation, automation and sustainability and offers this transformation the utmost degree of support."

Jean-Pascal Bobst, CEO Bobst

A logistics centre's digital twin

In internal logistics, too, complete automation and digitalisation are seen as a decisive advantage over the competition. In this context, Siemens covers many aspects of warehousing with its solutions, including incoming goods, transport, storage, commissioning, packaging and shipping. This year, the company introduced the **holistic digital twin of its own distribution centre** in Nuremberg, which services 25,000 customers world-wide with 12,000 orders each day, 22,000 ordered items, 27 shelf-operation devices and three kilometres of automated conveyor belts. This real example shows **how simulation scenarios can for example optimise shift planning** to reach maximum productivity. Digital twins also help to identify bottle necks and peak loads in order to optimise material flow. The **seamless interaction between real and digital world**

increases productivity and flexibility of the systems, permanently reduces costs and energy consumption and therefore also the carbon footprint.



Siemens has developed the digital twin of an existing logistics centre. Image: Siemens

AI-based autonomous commissioning done by robots

A new addition to the Siemens internal logistics portfolio is the Simatic Robot Pick AI, an image processing software for robot solutions **based on machine learning**. The 3D image processing software allows robots to grip any article as they perform commissioning tasks in the warehouse, regardless of the article's shape or size. **A pre-trained deep-learning algorithm controls this ability** in order to identify those 3D positions that are best suited for taking out and to provide these to the robot's executive function. The application is designed to already run at the computing power of a tablet-like IPC with calculation times of less than 1.5 seconds, reaching system pick rates of more than 1,000 picks per hour. AI-controlled commissioning robots will in the future be able to work on a **high variance of objects with different shapes, sizes and types of packaging**, both promptly and in dynamically changing situations. This ameliorates the effects that a lack of workers has while at the same time increasing the business efficiency of storage.

Simatic Robot Pick AI is an image processing software for robot solutions based on machine learning. Image: Siemens

Digitalisation improves recycling processes

The growing digitalisation also plays an important part in the recycling industry. For example, the start-up Recyda has developed a **software-as-service solution for the digital management and evaluation of packaging data**. The software makes it easier for international companies to digitally manage packaging in order to reach required goals in the area of circular economy. One core part is the digital assessment of the recyclability of packaging according to international requirements. With the help of this all-in-one solution, companies can efficiently compare packaging solutions and make the best choice for each set of requirements. The software allows detailed evaluations of, for example, the prevalent recycling infrastructure, the applicable license fees and the resulting options for eco-modulation or with regard to plastics tax.

"We are very familiar with the current challenges to the packaging industry and the numerous difficulties which companies have to face right how. Using this knowledge, we developed a software solution that offers focused support for implementing the requirements towards packaging solutions for different markets, and to significantly optimise reportings."
Christian Knobloch, Co-Founder and Co-CEO of Recyda

The team of Recyda founders, Vivian Loftin, Anne Zießow and Christian Knobloch at a recycling plant. Image: Recyda

Digital disposal network

When it comes to waste disposal, today work is often done using simple means of data management and without any digital networking between partners. This is supposed to change through the cooperation between

Interzero and Resourcify. Customers of Interzero are being offered the digital waste management service of the Resourcify **platform for waste management and recycling**. The new joint service is called “Zero Waste Manager”. Recycling partners from the network receive their orders through the platform and then report their performance data back to it. By analysing the data on the platform, customers can clearly see **where waste can be reduced, recycling quotas increases and the circle of valuable resources closed**. Among the first customers is burger restaurant chain Five Guys. All 35 restaurants in Germany are by now using the platform for waste management.

“With the ‘Zero Waste Manager’ we at Five Guys have been given a reliable digital platform that uses systematic data recordings and digital connections to allow us to organise waste removal logistics and recycling of our transport packaging waste in particular in an efficient and transparent manner. This way we are constantly monitoring our waste streams, waste materials and containers, and can prove that our handling saves resources in a way that satisfies an audit.”
Pia Dörner, Project Manager at Five Guys

Digital technologies were the focus of many other companies at interpack 2023, too. An overview is available in the exhibitor and product database at www.interpack.com. The next interpack will take place in Düsseldorf from 7 to 13 May 2026.

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Title image

“Zero Waste Manager” lets customers see where waste can be reduced and recycling quotas increased. Image: Interzero

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