

Abstract

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Digitizing the food value chain

Digitalization changes all areas of life: The way we stay informed, the way we travel, the way we buy things – and the way we manufacture products; this counts as well for food and nutrition products. The pace of innovation and the ability to disrupt are becoming key success factors in global competition. This increases the pressure on enterprises, no matter the industry – and opens up new business opportunities at the same time. Rapidly changing consumer expectations are placing companies under increasing pressure to turn around ever more customized products within the shortest possible time, and all to an optimum, consistent standard of quality.

Digital technologies, especially "Industry 4.0" solutions will boost industrial upgrading to realize intelligent and flexible manufacturing for mass customization. The food and nutrition industry with its hybrid and highly fragmented value chains is seen as both a future key supplier and adopter of digital operations technologies and Industry 4.0 solutions, such as predictive maintenance, end-to-end product traceability, digitally enabled performance management or self adjusting machines.

Integrating and digitalizing the entire value chain is key to staying competitive in future. Once the value chain has been integrated and digitalized, there will be a perfect digital copy of it available – the Digital Twin¹. Gartner named the Digital Twins as one of the Top Ten Strategic Technology Trends for 2018².

The Digital Twin allows companies to simulate, test and optimize products, production processes and plants in a totally virtual environment. And with this, the entire business can be analyzed and optimized in the virtual world – enabling for instance almost 100 percent of virtual validation and testing of the product under design. All of this eliminates the need for prototypes reduces the amount of time needed for development, improves quality of the final manufactured product and enables faster reiteration in response to customer feedback.

But more important applying Industry 4.0 technologies like the Digital Twin and adjacent technologies to the food and nutrition domain will lead to a significant reduction of resource uses (water, materials, and energy).

¹ Siemens: Mindsphere White Paper, <https://www.plm.automation.siemens.com/global/en/topic/mindsphere-whitepaper/8683>

² Gartner: Top Ten Technology Trends for 2018, <https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2018>