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Sensors, Low Code and No Code: how Industrial AI revolutionizes Intralogistics

In the upcoming decade of Industry 4.0, AI takes center stage in achieving the next level of long-term autonomy in adaptable and distributed production facilities¹.

Intralogistics is becoming increasingly intertwined with real-time AI-based production control through active digital twins, as demonstrated by SYNAOS and the German Research Center for Artificial Intelligence in the BaSYNAOS project.

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Building on digital twins for all logistics components and processes, an industrial metaverse for production facilities is emerging. This metaverse allows for realistic simulation of planned changes and expansions, along with virtual commissioning in intralogistics. This significantly reduces the manual effort required for integration and commissioning. Dual Reality methods, an evolution of Augmented Reality (AR) and Virtual Reality (VR) technologies, enable synchronous coupling between digital twins and the physical intralogistics environment.

Industrial sensor price drops and AI-powered sensor interpretation based on Deep Learning enable active sensor systems. These sensors dynamically focus on recognition tasks in mobile intralogistics systems. Automation in intralogistics can progress towards mobile robot systems through cost-effective retrofitting of manually operated transport systems (i.e., forklifts) using gradual integration of sensors and intelligent control components.

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Secure “Plug & Produce” based on self-optimizing intralogistics can only be realized through machine learning.

Advancements in AI enable automatic generation of simple apps and API connectors for intralogistics systems when sufficient high-quality training data is available. LLMs are already capable of code generation in various programming languages. As a result, the impact of AI and software development skills shortages, the main obstacles to rapid and widespread implementation of next-generation intralogistics systems, can be somewhat alleviated.

¹Kagermann, Henning and Wahlster, Wolfgang. 2022. „Ten Years of Industrie 4.0“ *Sci 4*, no. 3: 26. <https://doi.org/10.3390/sci4030026>