

The Siemens logo is displayed in a white box in the top right corner of the page. It consists of the word "SIEMENS" in a bold, teal, sans-serif font.

Ingenuity for life

Engineering and Integration
Services

Optimization of production and logistics environments based on simulation and AI

Digital Factory Optimization for AGVs

The optimization of production environments is extremely complex due to various parameters that must be considered (e.g. number and type of AGVs, number of charging stations, production sequence). The physical or planned plant needs to be modeled and simulated in order to predict the optimum for best possible production based on artificial intelligence. By combining simulation and artificial intelligence, Digital Factory Optimization for AGVs unleashes optimization potential in your plant.

Convincing value-adds



Cost reduction through optimized plant logistics and resources

Reduce cost by optimizing production environments (e.g. number and type of AGVs, number of charging stations, production sequence).



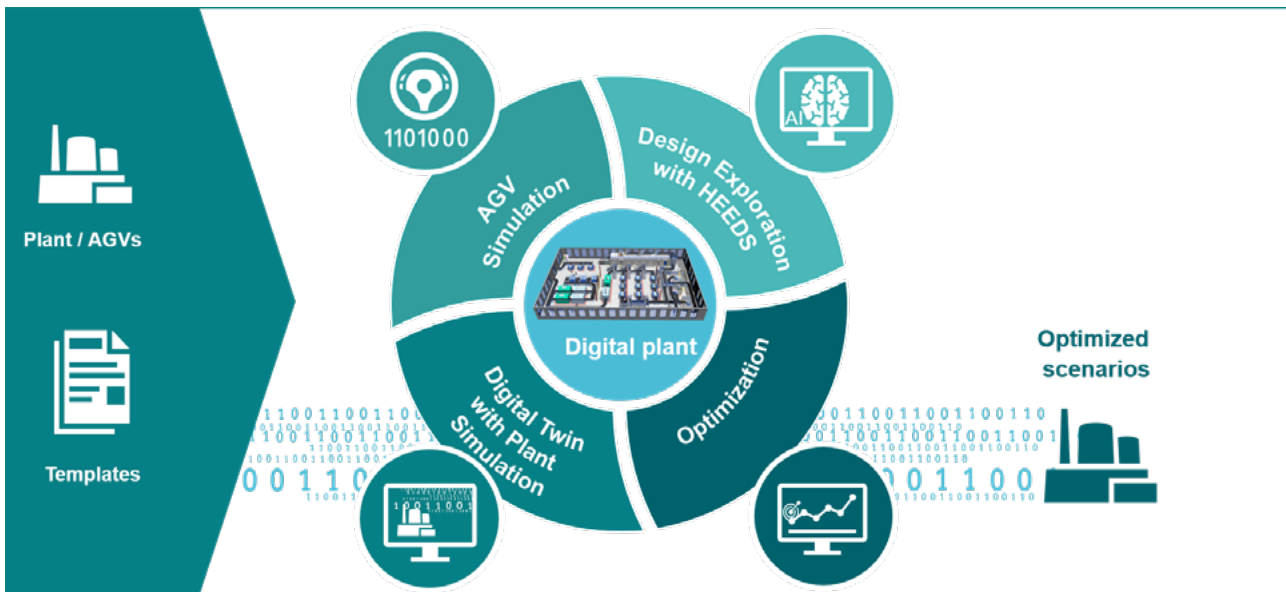
AGV acquisition cost reduction

Reduce AGV acquisition cost by up to 25% by determining the number of AGVs needed.



Throughput increase by planning the best AGV paths

Optimize AGV paths based on simulation model for optimal material flow.



Complex simulation processes for AGVs can be optimized by closed loop simulation based on artificial intelligence

Project steps to optimize production environments:

Digital Factory Optimization for AGVs unleashes optimization potential in your plant by building the Digital Twin of the AGV system and environment. The solution is implemented with four steps. The sequence and number of steps may vary.

- **Digital Twin with Plant Simulation**
Workshop to fully understand your production processes and to pinpoint your challenges as basis for

simulation model development.

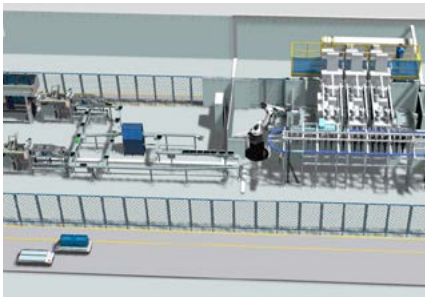
- **AGV simulation**
Using simulation, we test and evaluate different scenarios in the virtual world.
- **Design Exploration with HEEDS**
For finding the optimal solution, multiple parameters have to be considered. To ensure that, the Digital Twin gets connected to analysis algorithms: Leveraging AI

and data analytics, the software tool HEEDS generates and tests thousands of possible scenarios in the virtual world.

- **Optimization**
We set up specific optimization use cases in the software tool HEEDS to identify the best solution – the optimum for best possible production. The optimal parameter set can then be evaluated in the real production environment.

Reference: Airborne production line, Netherlands Production increase enabled by digital twins

At Airborne in the Netherlands, products are produced fully automated. Flexibility of production lines was a bottleneck, but necessary to ensure individualized mass production.



- Customer co-creation workshop in order to pinpoint exact challenges of Airborne. After defining clear use cases, the engineering solution was made and executed.
- The digital manufacturing concept enabled the reconfiguring of the production line to the precise, optimized settings for each product.
- Bottleneck identification and elimination for a strong output increase, first-time-right commissioning, saving CAPEX invest, highly flexible and individualized production planning opportunities.

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