Plant Simulation for Warehousing and Logistics

Design, analyze and optimize warehousing and logistics operations

Benefits

- Reduced time for designing warehousing and logistics operations
- Optimal utilization of resources, including personnel, docks, storage and other factors
- Extensive what-if analysis and evaluation of scenarios
- Optimal return on investments in equipment and WMS implementation
- Unmatched accuracy and realism of results
- Set of predefined control rules
- Visualization and animation of operations and their performance
- Powerful tool to communicate design alternatives and their performance

Features

- Simulation of complex production systems and control strategies
- Object-oriented hierarchical models of warehouses, encompassing business, logistics and production processes
- Graphs and charts for analyzing throughput, resources and bottlenecks

Summary

Tecnomatix® Plant Simulation for Warehousing and Logistics software enables you to rapidly create realistic simulation models of dynamic warehousing and logistics operations. Plant Simulation lets you evaluate the characteristics and performance of design alternatives long before they are implemented in real-life processes, thereby enabling you to make smarter decisions, minimizing design rework.

Challenges in warehousing and logistics

In today's global economy, warehousing and logistics involve more than just "shoving boxes." Warehouses now operate in dynamic global supply chains. A highly competitive global marketplace requires rational approaches to designing dynamic warehousing and logistics operations. Speed, efficiency and quality all need to be improved simultaneously, not only at the operational level, but also during design and implementation.

Dynamic simulations of operations have become an indispensable aid for achieving these strategic goals. To address these goals, Tecnomatix Plant Simulation provides a solution that enables you to evaluate the warehouse performance from a comprehensive, "fact-based" perspective.

Source image: DB Schenker.

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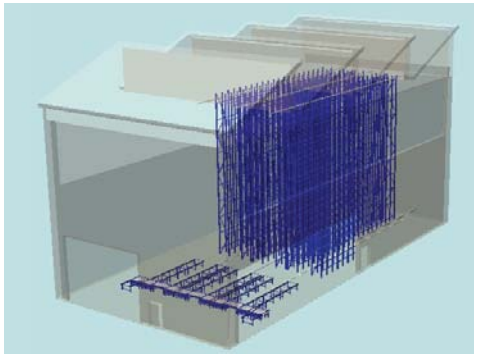
Features *continued*

- Comprehensive analysis tools, including automatic bottleneck analyzer, Sankey diagrams and Gantt charts
- 3D online visualization and animation
- Integrated neural networks and experiment handling
- Automated optimization of system parameters
- Open system architecture supporting multiple interfaces and integration capabilities (ActiveX, C, CAD, MS Excel, Oracle SQL, OPC)

Ready for today's and tomorrow's questions

Traditionally, companies had to make "best guesses" about their warehousing and logistics operations. Now, Plant Simulation leverages material flow simulation to enable you to make "fact-based" decisions about:

- Capacity requirements for personnel, storage and handling equipment
- Site and warehouse layout, including position, length, number and width of aisles and other considerations
- Storage, including ABC storage, zone storage, dedicated storage, random storage and cross-docking
- Order-picking, including batching, optimized routing, sorting and consolidation algorithms
- Effects of automation, including robots, AGVs, AS/RS and carrousels
- Planning and control, including consideration of schedules, order release and other factors
- Inventory management, including ordering policies, cycle counting and other considerations
- Value-added logistics



Speeding up design and implementation

Plant Simulation offers functionality to address all areas that influence the performance of a warehouse. It provides basic capabilities, such as the ability to represent storage racks, layout and lift trucks. It also provides features for facilitating order-picking and value-added logistics.

Plant Simulation objects are capable of reflecting real-world dynamics, such as varying order volumes, downtimes of resources and varying picking times. The simulation's unmatched realism sharply differs from solutions that rely on common spreadsheet-based calculations.

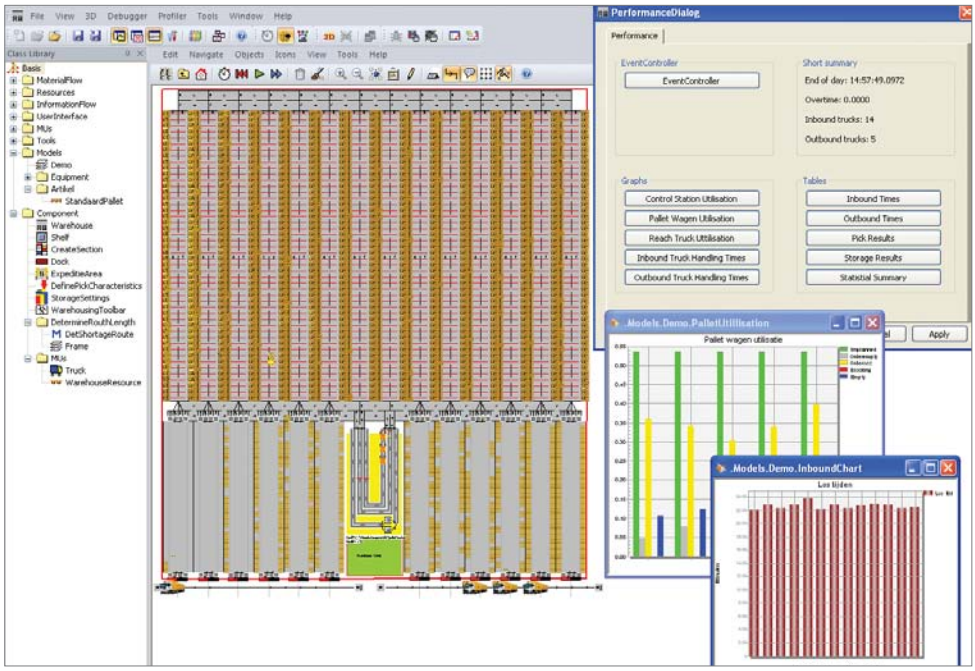
You can easily extend Plant Simulation with custom objects or control strategies. Data interfaces to most common applications support the analysis and re-use of existing data, such as data from an existing warehouse management systems (WMS). Plant Simulation comes with a clever toolset that enables you to run and optimize various operational scenarios and different warehouse designs. Performance metrics are displayed in a transparent manner in standard and customizable reports/ dashboards. Operations are visualized through the use of aesthetically appealing 2D and 3D animations.

Application areas

Conceptual warehouse design

Conceptual design simulations should be easy to use and facilitate effective communications. During this design phase, many options remain open including site and warehouse layout, delivery schedules and operating hours. Unfortunately, historical data often is not available, let alone detailed equipment specifications. However, the extensive capabilities of Plant Simulation support conceptual simulations that facilitate quick warehouse design, process flow animation and the visualization of key performance indicators.

Detailed warehouse design Accuracy and extensive what-if analyses are most important for detailed warehouse design. Conceptual warehouse designs need to be detailed further with more specific data



about equipment and flow of goods. Plant Simulation provides a range of fully configurable equipment types and control policies to support accurate simulations. The solution's automated experimentation capability enables you to analyze and optimize a wide range of scenarios, including completely different layouts.

Optimizing existing operations
Benchmarking a warehouse's operation against a simulation model is an objective way to optimize warehouse performance. Simulation models also can be used for operational planning. Re-use of data and flexibility are the keys to efficient benchmarking. You can easily feed various kinds of data into Plant Simulation, including past orders, inbound and outbound flows, equipment breakdowns and other kinds of information, without regard to their source. Simulations provide accurate benchmarks with clear visualization of the operation and key performance indicators.

Redesigning operations At various intervals, every warehouse operation requires a redesign. For example, redesign usually becomes necessary when new customers have to be served or technological innovations are introduced. Simulation is extremely valuable in these instances. Accurate data is readily available for existing operations. Plant Simulation is the perfect tool to address even the most challenging redesign efforts. You can quickly and accurately build simulation models, as well as communicate alternative designs and results in clear reports and 3D animations.

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