

Tecnomatix Plant Simulation

Value Stream Mapping Library

Benefits

- Increase productivity of existing production facilities by as much as 20 percent
- Reduce investment in planning for new production by as much as 20 percent
- Reduce inventories and cycle time by as much as 60 percent
- Optimize the system dimensions, including buffer sizes
- Reduce investment risk through early feasibility analysis
- Increase resource utilization
- Improve line planning and allocation

Typical questions for the simulation:

- How can we minimize investment costs?
- Is the required output achieved?
- What happens when quantities change?
- How can stock be reduced?

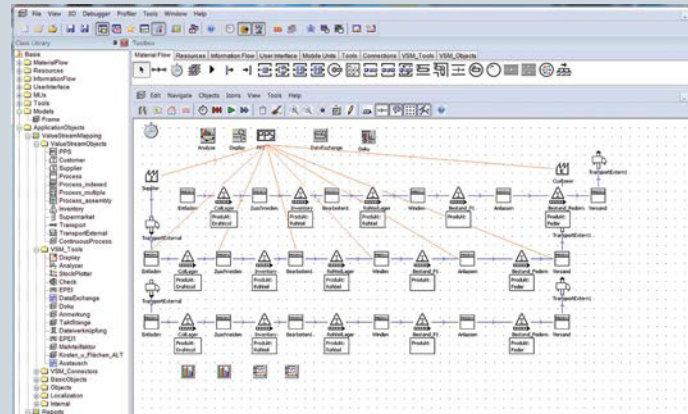
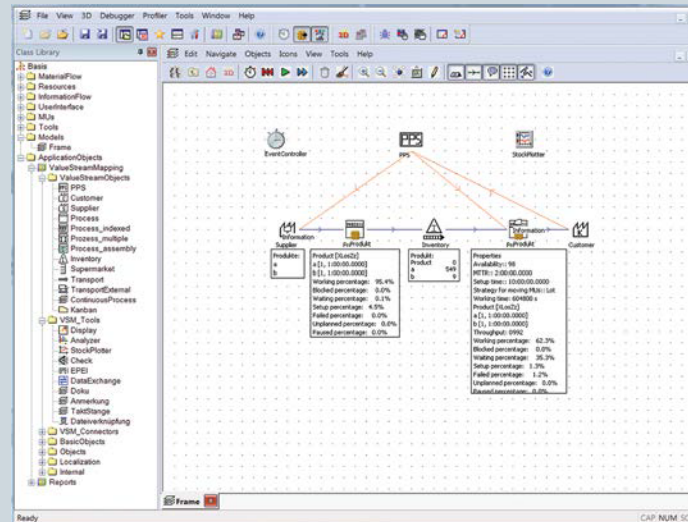
Implementation

The Value Stream Mapping Library is an optional extension for Tecnomatix Plant Simulation.

Summary

The Tecnomatix Plant Simulation Value Stream Mapping Library supports the user, taking into account the dynamic relationships of complex manufacturing sequences, in order to increase the share of value-added production, variability, quality, speed and efficiency for increased production, while reducing inventory and capital commitment, and securing on-time delivery.

Tecnomatix Plant Simulation helps you create models of logistic systems (e.g., production) to explore those systems' characteristics and to optimize their performance. The digital model enables users to run experiments and



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Tecnomatix Plant Simulation

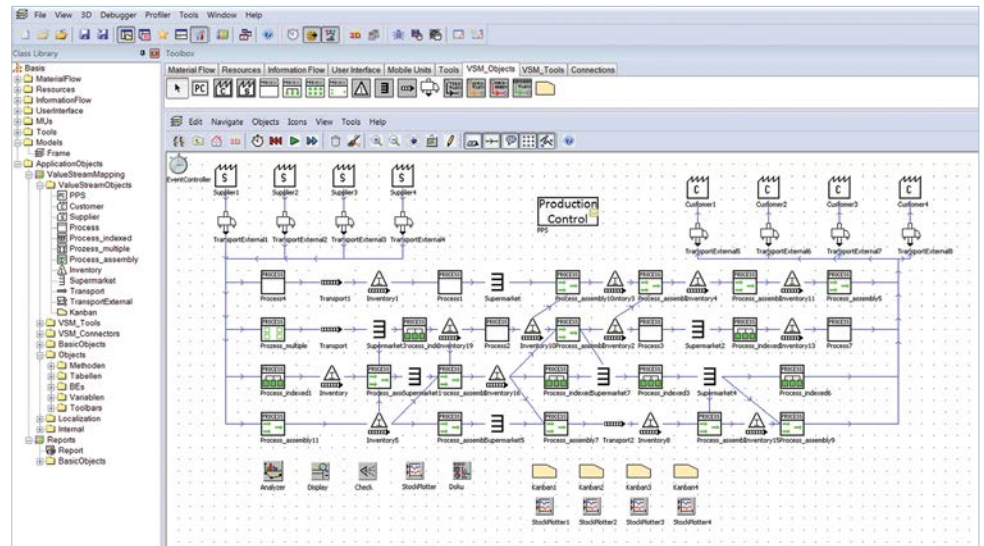
what-if scenarios without disturbing an existing production system or – when used in the planning process – long before the real system is installed. Plant Simulation contains powerful object-oriented architecture and modeling capabilities that enable you to create and maintain even highly complex systems, including advanced control mechanisms. Plant Simulation's user interface follows Microsoft Windows standards, making it easy for you to quickly become productive. Simulation models can be created quickly by using components from application object libraries dedicated to specific business processes. You can extend the library with your own objects through a powerful programming environment for the furthering of simulation capabilities. Tools for automatic optimization, analysis of simulation results and 3D visualization of simulation models are also available. Extensive analysis tools, statistics and charts let users evaluate different manufacturing scenarios and make fast, reliable decisions in the early stages of production planning.

Plant Simulation helps users:

- Detect and eliminate problems that otherwise would require cost- and time-consuming correction measures during production ramp-up
- Minimize the investment cost of production lines without jeopardizing required output
- Optimize the performance of existing production systems by taking measures that have been verified in a simulation environment prior to implementation

Tecnomatix Plant Simulation Value Stream Mapping

Visualization, analysis and improvement of dynamic value chains



- Easily use the software through Microsoft Windows conformity
- Quickly and efficiently model typical scenarios through the use of block libraries
- Chart and graph results
- Perform analysis of throughput, resource utilization and bottlenecks

Plant Simulation allows for the creation of complex production systems and processes in easy to understand computer models. Using Plant Simulation, material flow, resource utilization and supply chains at all levels of corporate planning may be optimized.

What is Value Stream Mapping?

Value stream mapping is an established method for studying the economic value

added in manufacturing and for identifying, reducing and eliminating non-value added processes and operations.

Value Stream Mapping is a modern method of process optimization based on the methods of lean management, as described by the well-known Toyota Production System and as applied by the Siemens Production System.

The goal is to easily and quickly map and better understand the value chain for the purpose of optimizing it.

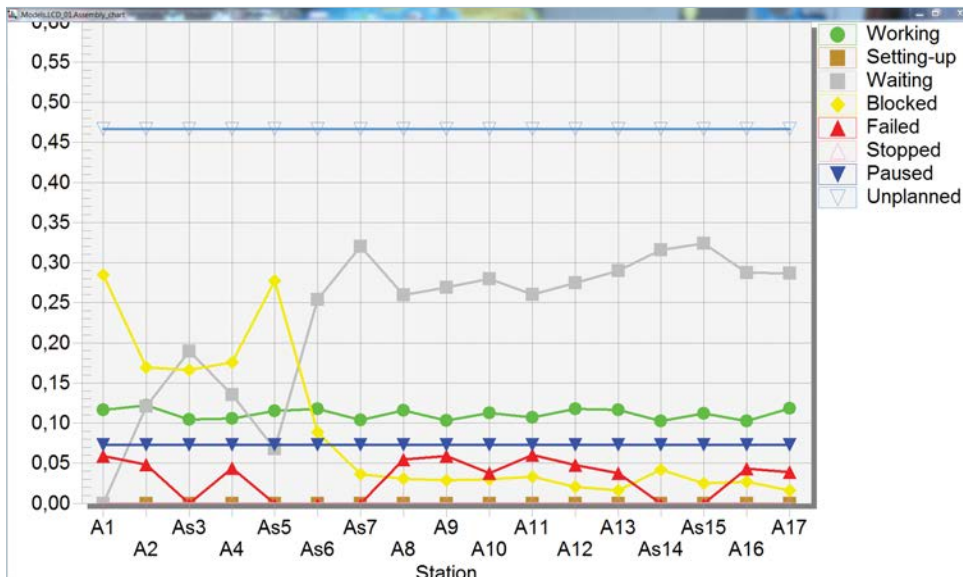
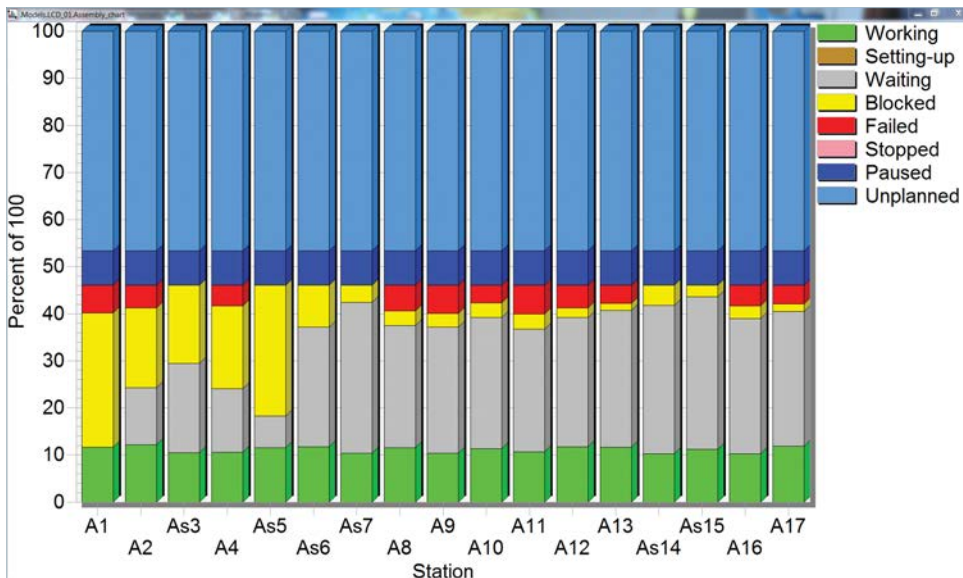
Objectives and benefits

The traditional goals of the Value Stream Mapping process are:

- Increase awareness of production variability
- Increase production quality
- Increase production rate
- Increase production efficiency

The aim is to optimize production resources, the layout of the controls and the lot sizes to guarantee a steady flow of production without buffer stock build-up while simultaneously maintaining quality of order receipt and delivery.

Source: *Value Stream Mapping – The Road to Lean Manufacturing*
Erlach, Klaus; Springer-Verlag, 2010



Tecnomatix Plant Simulation is part of the Manufacturing Engineering Software solution offering from Siemens PLM Software.

Coordinated software components enable you to plan the complete production of a plant by way of a computer model to visualize and simulate the processes in production lines, warehouses and workshops, so as to quickly, easily and safely achieve the required findings and results.

The extensive portfolio allows for an optimized manufacturing process design lifecycle, including planning, factory layout design, and manufacturing processes and factory simulation, enabling the seamless connection with higher-level planning systems.

Approach

Traditionally, the depiction of production is done by way of manual, graphical sketching of the value stream using symbols on a sheet of paper showing the conditions, such as material flow, information flow, inventories, value-added and non-value added activities. Based on customer demand, inventory and cycle times, analysis of the current state of production is performed as a team. Revision and improvement of the value stream is then derived from this current value stream mapping of the production process.

Value stream mapping is a standardized method based on generally accepted symbols.

Why perform value stream mapping in Plant Simulation?

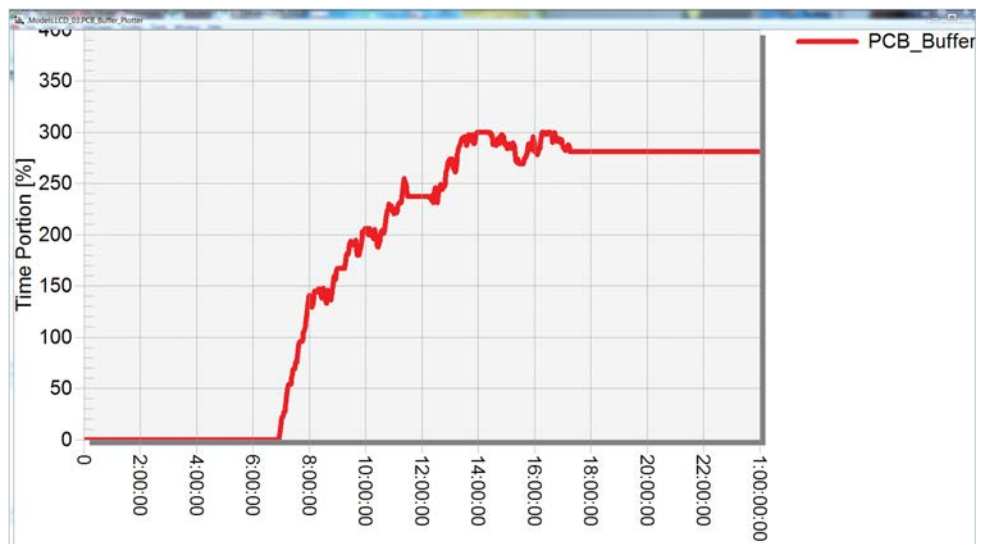
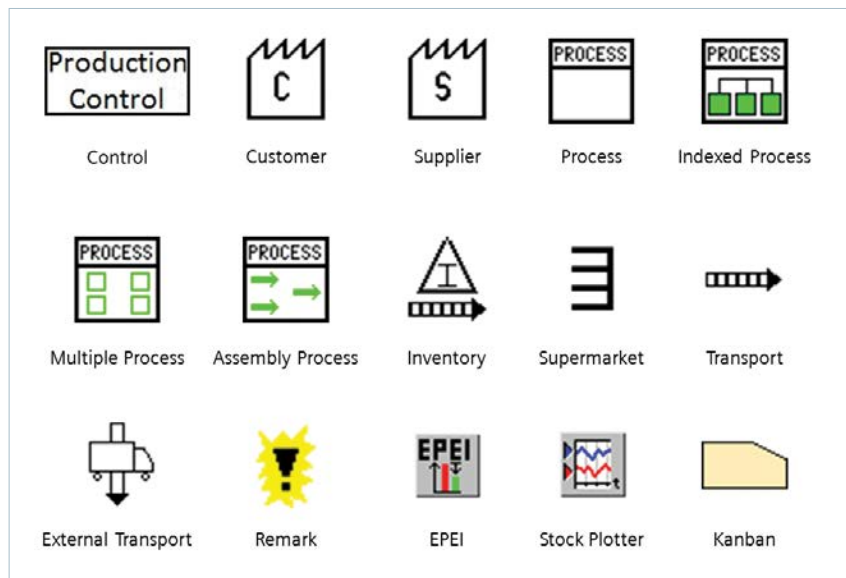
- Reduction of cost for data collection by reducing the number of objects describing the processes through pre-defined logic blocks
- Reduction in analysis effort through automated modules

Through computer simulation, users can examine the dynamic effects of the value stream, which remain hidden in the static, paper-based mapping of the value chain.

The traditional, static value stream analysis is extended to include the critical time element for stock availability.

Thus, you can depict dynamic fluctuations of the daily production due to lot sizes, setup procedures, product variations, or other disturbances.

The dynamic material flow simulation in Tecnomatix Plant Simulation permits the reduction of the number of products in production and thus the capital investment required for robust production, ensuring that natural fluctuations in production do not impair the ability to deliver.



Predefined core objects:

- Process
- Supplier
- Customer
- Stock
- Supermarket
- Internal and external transport
- Predefined controls for mapping of:
 - Kanban processes
 - Heijunka Box
 - Compensation box

Predefined objects for analysis and evaluation of:

- Throughput time
- Loading/unloading or waiting time
- Value-added time
- Analysis of the process utilization
- Availability of resources (time sensitive)

Value Stream Mapping Library in Plant Simulation

Predefined symbols based on the general standard:

- Quick and easy to learn
- Predefined dialogs with configurable user objects
- Control logics
- Analysis objects

Application

The Plant Simulation Value Stream Mapping Library allows users to quickly and easily map and improve their supply chains with real, dynamic behavior.

The Plant Simulation Value Stream Mapping Library was developed for use by industry practitioners in collaboration with industry practitioners, in order to provide the necessary objects.



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