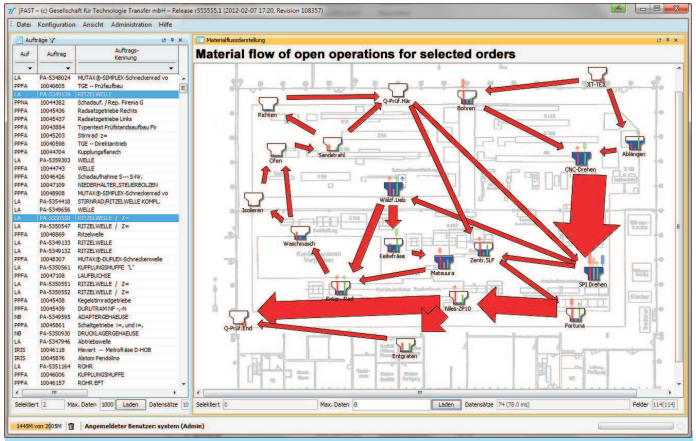
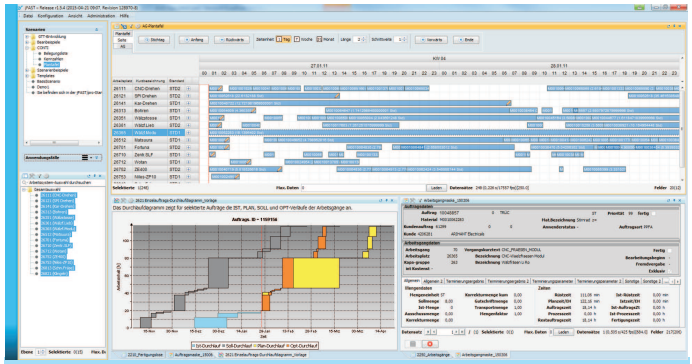


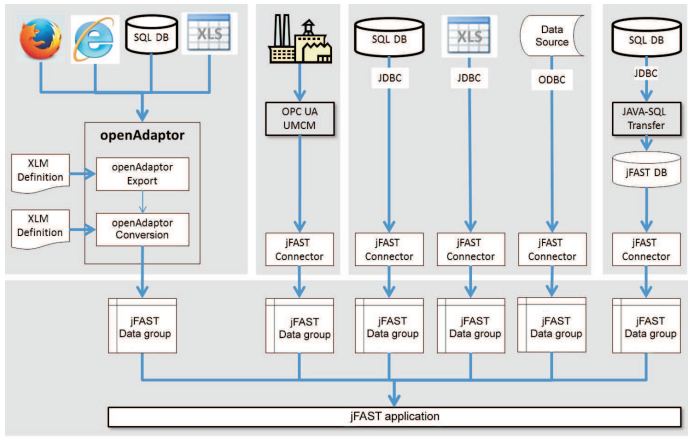
The material flow diagram shows which work centers represent bottlenecks and where capacity adjustments are necessary.

In this example, the pivot function creates an overview of the temporal distribution of the current capacity demand for each work center in a capacity group.

Several analytical building blocks were combined for this sales scenario.



The calendar building block of jFAST can be used as a resource planning board for the capacity planning of work centers, for personnel deployment planning or for the scheduling of operation sequences in work centers.



Gathering data from many different sources and combining them in one consistent user interface is one of the major challenges of Industry 4.0. jFAST meets this requirement with building blocks (modules) that can access data concurrently from various sources by defining data groups. A configurable OPC UA interface for instance allows direct access to all data that an OPC UA source can deliver.

Further information on the FAST methods and tools, on the jFAST software technology and on customer projects are available at www.GTT-online.de.

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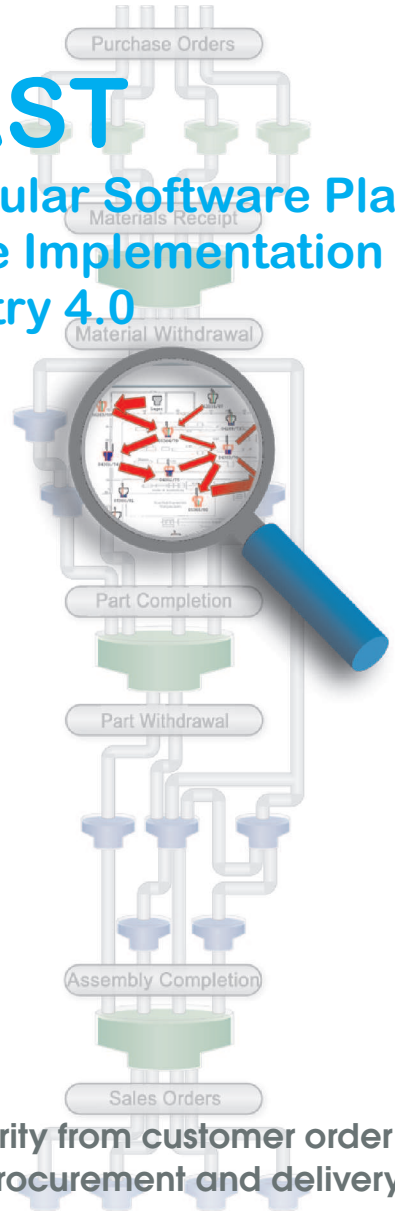
A clear view helps identify your potential for improvement

jFAST

a Modular Software Platform for the Implementation of Industry 4.0



Clarity from customer order to procurement and delivery

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The jFAST Platform Concept

The requirements production sytems have to fulfill are subject to constant change due to the ongoing changes of internal and external conditions.

In the corporation's view it is therefore necessary that software used in companies can be adapted to changing circumstances within a short time frame with minimum effort, without having to undergo release change cycles of several months. At the same time the software needs to be flexible enough to allow the implementation of task and/or role based user interfaces.

Configuration instead of classic programming

As a result of these requirements GTT has developed the jFAST platform concept which allows the construction of individual software solutions by using generic building blocks following the LEGO principle.The jFAST construction kit provides building blocks (or modules) for analysis, monitoring, planning and scheduling of tasks and resources which - for example - can be used to develop functions available in MES software simply by configuration instead of programming.

Ready for Industry 4.0 with configurable data relations

jFAST includes building blocks (modules) for accessing and importing data from any external data source through ODBC, JDBC, OPC UA or other interfaces.

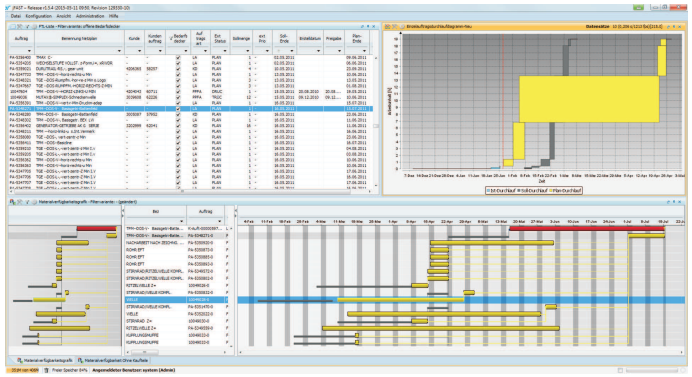
Without traditional programming jFAST can gather a company's entire data, such as machine control data, operative production scheduling and control or accounting data from an ERP system, and can act as an integrating tool to flexibly connect data from various sources and to process this data with analysis and scheduling functions.

On the basis of standard interfaces to common ERP systems, versatile logistic monitoring systems and Manufacturing Execution Systems can be implemented within a very short time, providing full transparency of order processing within a company and between companies.

- *Low development effort (Prototype = productive application)*
- *High reusability by using and providing templates*
- *High standardization by using and providing generic modules*
- *Individual extensibility without release change problems*
- *Defined interfaces for system extensions*
- *Implementation of Groovy für individual adaptations*
- *Concurrent access to various data sources*

jFAST as Monitoring Cockpit for Order Processing

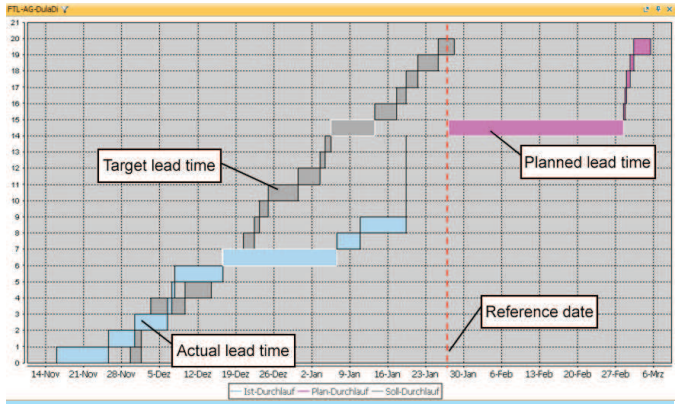
The visualization of logistic processes on company level and between companies is an important component to help improve the logistics performance of companies. With jFAST building blocks (modules) the entire logistic chain from a customer orders to material supply can be displayed as process graphics, allowing a quick and reliable assessment of the present and future delivery situation. By concurrently showing resource requirements and resource availability, availability risks immediately become evident. Due to the high configurability, any number of role oriented views can be created without generating additional data (e.g. in EXCEL spreadsheets).



In the lower half of the scenario the material availability diagram gives an overview of the temporal and quantitative availability of all components that haven't been provided yet for an assembly order. The diagram in the upper right shows the bottleneck work center in the order throughput for the order highlighted in the material availability chart.

The modules interact with a special inter-modular communication method that optionally transfers key values from marked objects in one building block to other building blocks, while automatically loading or activating the respective objects. A single click triggers the recalculation of all dependent building block views. This cascading technique results in a faster response, useful for instance in a schedule meeting, where various resources need to be viewed concurrently.

The process visualization can be created from an order/task perspective or from a resource perspective. In the order operation throughput diagram shown below each operation is displayed as a rectangle. The length of a rectangle corresponds to the lead time, the height is relative to a selected parameter such as resource requirements, the quantity or any other chosen reference value.



In addition to the target throughput (gray) the throughput diagram for a manufacturing order shows the actual throughput (blue) as well as the planned throughput (purple) of the open operations. The graphic shows that the next operation will be delayed due to resource availability constraints.

The work center throughput diagram shows whether a capacity constraint is temporary or permanent.

Bottlenecks and backlogs become evident in the work center throughput diagram for the next three months. The demand/supply budget would be balanced if the cumulated capacity curve (yellow) touched the cumulated target completion curve (dark green) .