

Automotive

EBZ SysTec

Integrated plant optimization delivers a significant edge

Product

Tecnomatix

Business challenges

Variety of models
Permanent adaptation of existing production facilities
Shorter product lifecycles
Cost-optimized processes

Keys to success

Networked collaboration
Integrated plant validation
Ensuring component and process quality
Data consistency
Open standards

Results

Optimizing plant validation
Time and cost savings of up to 30 percent for real commissioning
Increased planning process productivity
Standardized processes



EBZ's customers include renowned players in the automotive industry.

EBZ SysTec employs Tecnomatix as corporate standard for optimizing manufacturing facilities, realizing time and cost savings of up to 30 percent for real commissioning

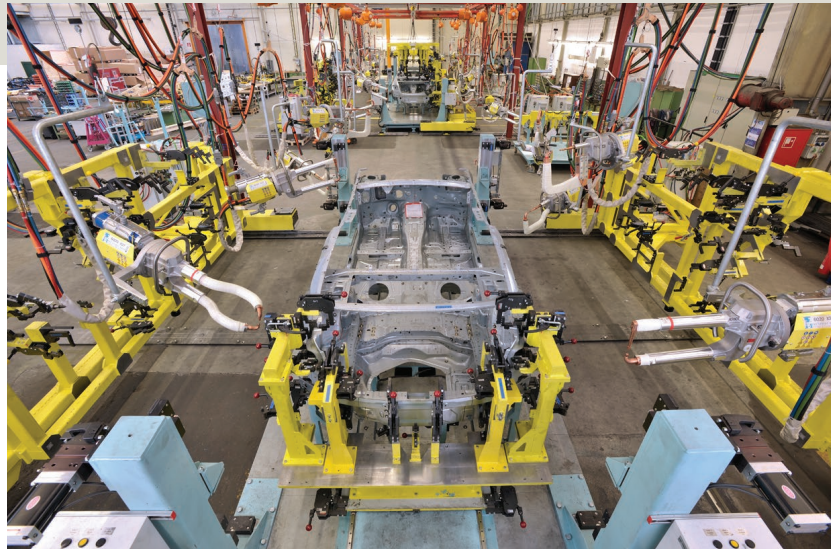
Unprecedented pressures

Automotive suppliers are experiencing unprecedented pressures of competition: changing customer demands, ever shorter product lifecycles, increasing number of product variants, reduced product launch times and increasing pressure in terms of earnings. But quality requirements remain high, making the challenges numerous and varied. It's therefore even more critical

to optimize planning and production processes. To meet these growing requirements, EBZ SysTec GmbH, a leading services provider and manufacturer of production systems and die shapes for vehicle body technology within the automotive industry, opted to use integrated digital software solutions. Using the Tecnomatix® solution Process Simulate Commissioning from Siemens PLM Software, the company can simulate a customer's production cell as an entire, integrated concept and optimize the production process.

Headquartered in Ravensburg, Germany, EBZ SysTec GmbH is an international supplier engaged in the development, design and construction of production facilities

Digital solutions allow production processes to be optimized in advance.



for the automotive industry. The company manages vehicle projects throughout the entire creation process. From planning to design and robot programming through to plant commissioning, EBZ provides its services to OEMs and helps them improve their internal processes and workflows.

The automotive industry in particular is characterized by strong pressures in terms of costs and innovation. For EBZ, one of the key challenges when working with its customers is the increasing variety of models and the constant changes in production conditions. Every change request from the customer means production systems have to be adapted accordingly – modifications that cost time and money. Suppliers are thus facing increasing pressure to significantly cut planning times. There is also less time available for validating and implementing production systems. “Conscious of the pressures on costs, we endeavour to achieve high quality and maximum functional reliability for all stages of performance,” explains Alexander Schmech, managing partner of EBZ SysTec GmbH. “There is neither the time nor the money for error-correction cycles. A validated plant function is therefore a vital prerequisite for cost-optimized processes.”

For some years now, EBZ has used digital solutions to optimize its customers’ production facilities. To date, real

commissioning – a particularly critical and sensitive phase of the engineering process – was rarely incorporated in this process of optimization. However, it is here that last-minute component changes or a low number of prototype parts can, for example, produce unexpected delays, creating havoc for project managers and serious problems for the company. Every design change or rework generates significant extra work, increased costs, a drop in sales and possibly even a reduction in market share if these changes affect the planned production launch.

Separate processes as a source of error

In the past, the departments responsible for engineering, electronics and robot programming generated their respective programs for real commissioning on a separate basis. The people in charge did not meet up until the end of the planning and design phase – around two to three weeks before real commissioning – to consult with each other in the real facility. Previously, control specialists had no access to precise, current engineering design data. Consequently, the level of maturity of the software programs used in the facility for the robots and programmable logic controllers in particular couldn’t be adequately tested. Errors and information gaps weren’t identified until very late. This meant the resulting control concepts and

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Alexander Schmeh
Managing Partner
EBZ SysTec GmbH

programs could only be tested and validated in the real facility, which requires considerably more time.

“To ensure we could successfully meet our customers’ requirements, we needed to be able to plan flexible production facilities with process reliability,” explains Schmeh. “That is why we decided to use integrated software solutions. This opened up the way for digital validation of facilities in terms of virtual commissioning and analyses of different production strategies.”

At the end of 2008, after carefully analyzing the leading software suppliers, EBZ opted for the Tecnomatix solution Process Simulate Commissioning from Siemens PLM Software. EBZ thus extended its service portfolio to include virtual commissioning. EBZ is successfully using other solutions from the Tecnomatix portfolio, including robotics and automation planning for concept development as well as simulation validation and offline programming. “The decision to use Siemens PLM Software was also based on our long-standing successful collaboration,” notes Schmeh.

Virtual commissioning – a new milestone in the engineering process

Using Process Simulate Commissioning, EBZ can now simulate the entire production cell in a virtual environment, meaning plant commissioning can be tested and analyzed during the early development phase.

A virtual 3D model of the plant is linked to real plant control and these are simulated together with the robot programs. With integrated simulation of the production facility now possible, control, robot programs and the entire engineering operation can be tested and optimized by the respective managers and programmers. The programs communicate with each other the same as in the real world, using events. Either a virtual or external programmable logic controller from a real environment can be connected. The programmable logic controller is connected to the simulation software via an OLE for Process Control (OPC) connection. Process Simulate Commissioning is a flexible, open solution and can be used in conjunction with any popular programmable logic controller during virtual commissioning. “This allows us to meet different

customer-specific requirements to optimum effect," explains Stefan König, head of Robot Engineering at EBZ SysTec GmbH.

High maturity of plant programs

This virtual commissioning process eliminates problems that can otherwise only be discovered in the production facility. Possible logical errors can be identified and rectified long before the plant is constructed and before real commissioning. Programmable logic controller and robot programs that have undergone virtual commissioning are incorporated in the real production facility with a very high level of maturity. So time-critical production processes can be reliably put into operation. Programmable logic controller program changes are also implemented and validated in the virtual model without any risk to the real facility.

Close collaboration between design and control engineering

Process Simulate Commissioning gives the relevant technical departments at EBZ an integrated engineering concept that allows parallel and networked collaboration. Engineers from the Engineering Design, Robot Programming and Control and

Automation departments thus have a common communication platform allowing them to exchange information and coordinate their work processes more closely. Standard definitions, signal reconciliations and other issues are discussed jointly and then tested accordingly. "Early collaboration between Engineering Design, Electronics and Robot Programming means time-critical conversion phases can be implemented on time," explains Schmeh. "This gives us time benefits of up to 30 percent compared with the traditional process."

The Siemens tools can also be used for training operating staff. Before they commence their work, plant managers can prepare for real operation and identify potential sources of errors. The tools can also be used as a basis for joint communication between the technical departments when collaborating with customers. For example, customers can now receive a clear picture of the plant concept's feasibility and a real estimate of the cycle time.

Consistent data model

"Consistency from planning to virtual commissioning is one of the key benefits of the



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Solutions/Services

Tecnomatix

www.siemens.com/tecnomatix

Customer's primary business

With over 800 employees worldwide, EBZ SysTec GmbH is one of the world's leading service providers and producers of production systems and die shapes for vehicle body technology within the automotive industry. EBZ supports its customers in all markets globally through local presence and site-specific know-how. Its companies participate in vehicle projects throughout the entire product creation process – from initial concept planning, design and simulation to manufacture of production facilities and die shapes. One of EBZ's core specialities is the digital creation process up to the construction of a virtual body-in-white in which the EBZ Group is one of the biggest service providers with a revenue of €140 million. www.ebz-gmbh.de/en/

Customer location

Ravensburg
Germany

Tecnomatix solution," says König. Starting from concept definition and planning through to simulation validation and off-line programming with Process Simulate and Process Simulate Commissioning enables every plant to be commissioned virtually using the real logical program controller and robot programs. The consistency of the software means the technical departments can immediately incorporate component cycles and point or process changes into virtual commissioning.

König points out, "A simulated, validated function chain can reduce both our own workload and also our customer's workload on site. This is because after creating the basic functions, attention quickly focuses on optimizing a component's product quality, which also means the provision of prototype parts can essentially be avoided."

The up- and downloadability of the programmable logic controller and robot programs means the current statuses of the virtual commissioning can be incorporated into and fed back from the real facility at any time. This avoids any conversion expense in the various project phases. Changes implemented in the real facility can thus be incorporated and displayed in the virtual commissioning environment.

Virtual commissioning as a corporate benchmark

"Our aim for the future is that production release will only be issued once the process flows, cycle times and process scenarios have been validated by virtual commissioning," says König. "This will enable us to commission the customer's facility with validated engineering and high-quality software, which in turn will reduce commissioning times and generate corresponding cost savings."

The virtual commissioning process was used for two major projects of renowned automotive manufacturers in the first half of 2009. With such proven successes, EBZ decided to make virtual commissioning a fixed standard in its engineering chain. Each future customer project will undergo a virtual commissioning process. "Just as it is now an accepted fact that robots are programmed offline, so we need to view engineering as an integrated process," says Schmech. "With the Tecnomatix solution from Siemens PLM Software, we can now offer our customers an integrated plant optimization concept."

Siemens Industry Software

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