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The Future of Manufacturing

The Information Technology & Innovation Foundation

Engineering 2.0: Rekindling American Ingenuity



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How Our World is Changing



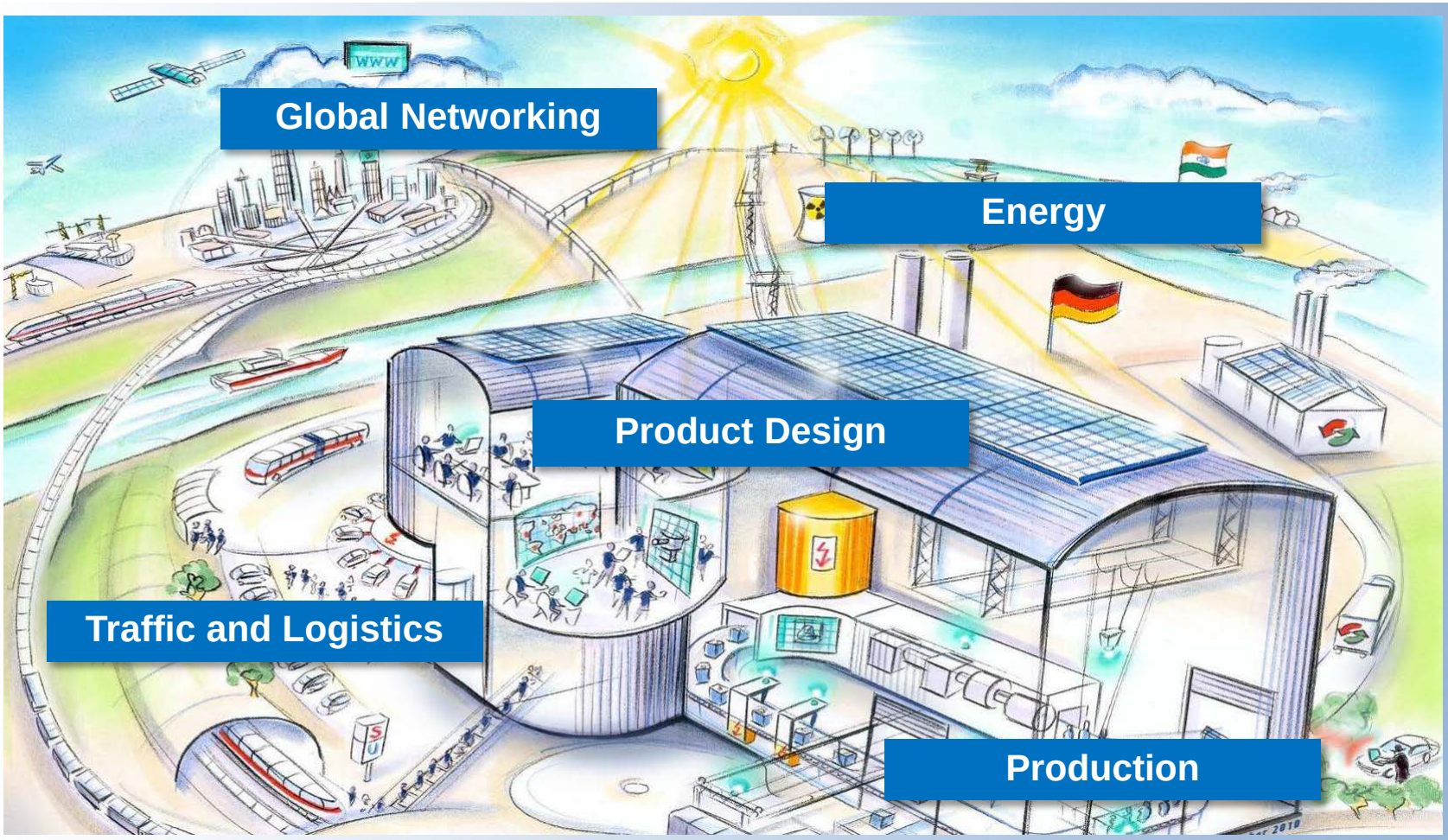
- Climate Change
- Urbanization
- Demographic Change
- Globalization

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A Picture Says More Than 1,000 Words

Picture of the future



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Our markets are changing …



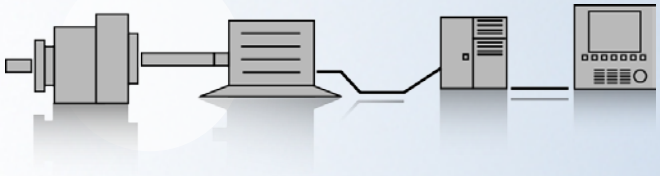
Increase efficiency	Reduce time to market	Enhance flexibility
Energy and resource efficiency are decisive cost factors	The merger of real and virtual production – interlinking automation and drive technology with industry software shortens time to market	Need for higher flexibility drives increasing importance of industrial IT and industry software.

… and we are well prepared to make our customers more competitive

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Innovative drive systems save up to 70% on energy

Drive technology accounts for about two-thirds of industrial energy consumption





Efficiency in the drive train starts with the motor

Up to 70% lower energy consumption with variable-speed drive systems

Interworking of all components

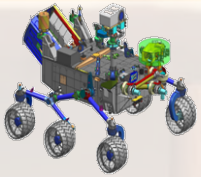


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PLM software accelerates design modifications

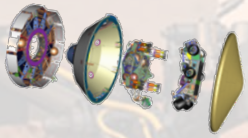
NX CAD



NX CAE & NX CAM



Teamcenter



Mars Rover

Complete 3D digital product design

Integrated simulation, analysis and manufacturing

Full lifecycle data management

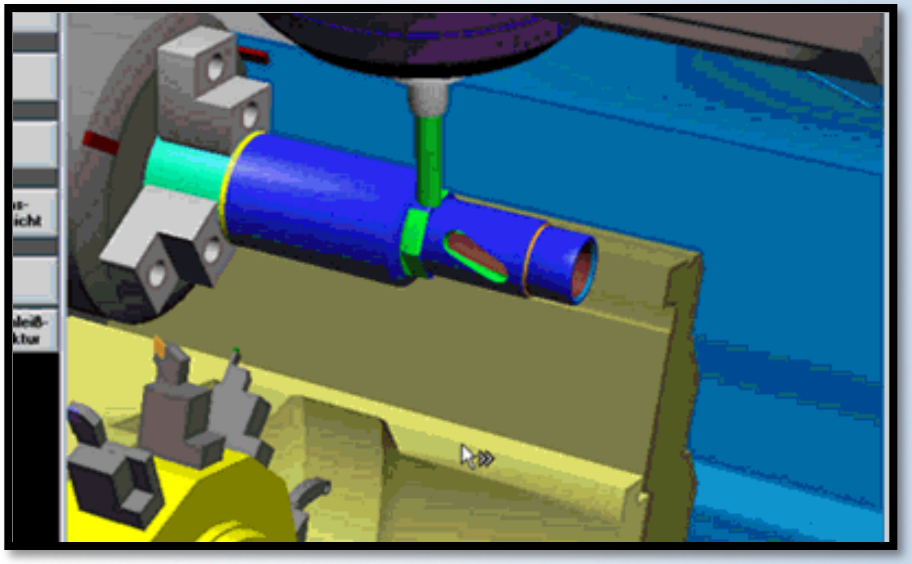
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"Virtual Machines" increase productivity and flexibility by simulating the production process

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- Digital "twin"
- Simulated machining of a workpiece
- Evaluation of production times



10% increase in productivity in running operations

Up to 80% time savings in setting up the real machine

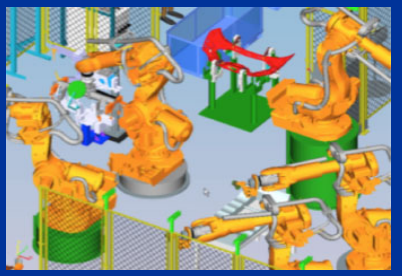
< 1% realtime deviation in Virtual Machine compared to the original



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Innovative software systems open up new perspectives for production technology

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Yesterday	Today	Tomorrow	The future
			
Local automation technology	Communication-aided automation	Optimization of the entire production process with innovative software systems	Self-optimization of cyber-physical systems, based on analysis of virtual models of options

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Human beings remain essential …



Step 1
Humans conceptualize and design the product

Step 2
Humans determine the production rules and parameters

Step 3
CPS simulates and compares production options on the basis of instructions

Step 4
CPS proposes compliant "optimal" production paths

Step 5
Selection of optimal production path and implementation of production

… as creative planners, controllers and decision-makers

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Thank you!



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