Future Challenges of Automation for Intelligent Technical Systems

Roland Bent
Welcome to
PHOENIX CONTACT Electronics
Phoenix Contact GmbH & Co. KG, Blomberg/Bad Pyrmont
Market leader in electrical connection and automation technology
Founded in Essen in 1923
12,000 employees worldwide
Annual turnover 2011: €1,520 million
48 own sales subsidiaries worldwide
30,000 active products
2,000 new products every year
What are the Challenges for the Manufacturing Industry?

- Shortening of the product life cycles
- Reduction of lot sizes
- Increasing diversity of versions
- Price decline and cost pressure
- Varying utilization
- Shortening of the return-on-investment time
- Saving of resources, energy efficiency

- Globalization
- Individualization
- Sustainability
- Economic cycles
Productivity and Cost Cutting

- Increasing the flexibility of systems and machines
- Modular, adjustable automation concepts
- Ideal utilization of the production resources
- Short through-put times
  - From incoming materials to delivery
  - From the order to the machine
- Energy-optimized production

The solution:
Integration of the horizontal value-added processes and the vertical business processes
Horizontal Integration along the Value-Added Chain

- Storage
- Pre-production
- Assembly
- Plastic parts
- Testing
- Packing
- Storage
Vertical Integration along the Business Processes
The Key to Integration is Information Technology

- Communication within the machine or part of the system
  - Decentralized I/O’s
  - Distributed automation
  - Modularization
- Communication along the added value
  - Linking of the process chain
  - Transparency regarding process statuses
- Communication along the business processes
  - From Production up to the Web
Horizontal and Vertical Integration …

ERP

Control level

Enterprise Resource Planning System

Cell computer

Intelligent technical systems

Field level

Field devices

Industry 4.0 is the future – CIM is the past –
Intelligent Technical Systems

Innovative advance towards technical systems with inherent partial intelligence

Mechanical

Mechatronics

Intelligent Technical Systems

- Intelligent networking
- Self-optimizing
- Energy efficient
- Human-machine interaction

Source: OstWestfalenLippe Marketing GmbH
Intelligent Technical Systems

Innovative advance towards technical systems with inherent partial intelligence

... interaction with the environment and automatic adjustment to it (adaptive)
... also manage unexpected situations in a dynamic environment not necessarily considered by the developer (robust)
... anticipation of the effects of future influences and states (proactive),
... consider the specific user behavior (user friendly).

Source: OstWestfalenLippe Marketing GmbH
Cluster Intelligent Technical Systems OWL - It’s OWL

Vigorous industry
machine engineering, electrics/electronics, automobile supplier

Source: OstWestfalenLippe Marketing GmbH
Cluster Intelligent Technical Systems OWL
It’s OWL

High-performance research

Source: OstWestfalenLippe Marketing GmbH
15 Leading Edge Technology Cluster in Germany

- Aviation cluster Hamburg
- it’s OWL
- Efficiency cluster Logistik Ruhr
- Software cluster
- Cluster of individualized CI3 immune intervention
- Biotech cluster Rhein-Neckar BioRN
- Forum Organic Electronics
- MicroTec Southwest
- Electromobility Southwest
- BioEconomy cluster
- Cool Silicon
- Solar valley in central Germany
- Medial Valley EMN
- Munich biotech cluster m4
- MAI Carbon

Source: OstWestfalenLippe Marketing GmbH
It’s OWL - Intelligent Technical Systems

174 cluster partners

- 25 core companies (investment in 34 innovative projects)
- 78 basic companies (participation in transfer projects)
- 24 engineering and consulting companies (multiplicators)
- 17 universities & centers of excellence

Clustervolume: 100 m€
It’s OWL- Intelligent Technical Systems

Phoenix Contact and it’s OWL

- “The it’s OWL leading edge technology cluster will continue to strengthen the outstanding innovative power of the region and make the high-tech location of OWL visible well beyond our own borders.
- We shall invest approx. 3 million Euros to develop an "adaptive" automation technology that allows more flexible design of machines and systems.”
Future Challenges of Automation for Intelligent Technical Systems

Roland Bent