Schedule

• Welcome and introduction of the participants of the CEO Round Table
  Gudrun Litzenberger, IFR General Secretary

• Presentation of the latest figures on the global robot market
  Joe Gemma, IFR President

• Discussion: “Automation and the Future of US Manufacturing”

• Get together and personal interviews with international robot experts
International Federation of Robotics
Representing the global robotics industry

• Robotics turnover 2015: $35 billion
• More than 50 members:
  • National robot associations
  • R&D institutes
  • Robot suppliers
  • Integrators
• Sponsor of the annual International Symposium on Robotics (ISR)
• Co-sponsor of the IERA Award
• Primary resource for world-wide data on use of robotics – IFR Statistical Department
Speakers on the Panel – Robot Users

Jon Battles
Director WW Engineering
Advanced Technologies
Amazon, USA

Mark Franks
Director Global Automation and North
America Vehicle Launch
General Motors, USA

Craig Hertig
Director of Engineering
Engineered Machined Products, USA
Expert

Professor Howie Choset
CTO
Advanced Robotics Manufacturing Institute, USA

Robot Supplier

Per Vegard Nerseth
Group Senior Vice President
ABB, Switzerland

Robot Integrator

Michael P. Jacobs
President
Applied Manufacturing Technologies AMT, USA
Presentation of WR data

Joe Gemma
IFR President
President and CEO
KUKA Robotics Corp., USA

Timothy Ward
Journalist and co-owner of Intermedia Communications, USA

Moderator
USA: new peak in 2016
About 31,500 industrial robots installed, 15% more than 2015

Estimated annual supply of industrial robots in the United States 2008-2016*

*preliminary results

Source: IFR Statistical Department
Driver of the growth in 2016: Automotive
About 17,600 industrial robots installed, 43% more than 2015

Estimated annual supply of industrial robots
In the United States - main industries 2014 - 2016*

- **AUTOMOTIVE**
  - 2016: 12,273 units
  - 2015: 13,611 units
  - 2014: 17,600 units

- **ELECTRICAL/ELECTRONICS**
  - 2016: 5,100 units
  - 2015: 4,270 units
  - 2014: 6,038 units

- **METAL**
  - 2016: 1,900 units
  - 2015: 2,065 units
  - 2014: 2,384 units

- **PLASTIC AND CHEMICAL PRODUCTS**
  - 2016: 1,100 units
  - 2015: 1,932 units
  - 2014: 2,065 units

- **FOOD**
  - 2016: 1,043 units
  - 2015: 1,094 units
  - 2014: 1,300 units

*preliminary results

Source: IFR Statistical Department
Automotive industry USA: increase of robots and jobs

+9% CAGR
Stock of industrial robots
2010-2016

+6% CAGR
Employees
2010-2016

Automotive industry USA:
Estimated operational stock of industrial robots and number of employees

<table>
<thead>
<tr>
<th>Year</th>
<th>Robot stock</th>
<th>Employees</th>
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<tbody>
<tr>
<td>2010</td>
<td>679</td>
<td>75</td>
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<tr>
<td>2011</td>
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<td>2012</td>
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<td>910</td>
<td>111</td>
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<tr>
<td>2016</td>
<td>940</td>
<td>127</td>
</tr>
</tbody>
</table>

*preliminary results
Source: US Bureau of Labour Statistics and IFR Statistical Department
China: new peak in 2016
Almost 90,000 industrial robots installed, 31% more than in 2015

Estimated annual supply of industrial robots in China 2008-2016*

*preliminary results

Source: IFR Statistical Department
World: new peak in 2016
About 290,000 industrial robots installed, 14% more than in 2015

Estimated annual worldwide supply of industrial robots
2008-2016* and 2017-2018**

* preliminary results

Source: IFR Statistical Department
Continued need to optimize manufacturing

• Increasing demand for consumer goods
• Decreasing life cycles
• Mass customization
• Competitive prices
• New Materials
• High quality
• Sustainability
Automation is driving productivity growth

• The Boston Consulting Group argues that wider adoption of robots will boost output per worker by up to 30 percent over the medium term.

• An OECD study found companies that employ technology innovations effectively are up to 10 times more productive than those that do not.
Robots complement labour

• The future will be robots and humans working together

• Robots substitute labour but not jobs - Less than 10% of jobs are fully automatable (McKinsey 2017)

• 50% increase in productivity with no job losses at Paradigm Electronics, Canada
  
  • by promoting machine operators to robot programmers and
  
  • using robots for polishing loud speakers, but with humans conducting final polish and quality check
Advanced Robotics
Key enablers of Smart Manufacturing

• Learning robots
• Connected robots – robots in the cloud
• Collaborative robots
• Mobile robots
• Easy-to-use robots
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