The European Robot Initiative for Strengthening the Competitiveness of SMEs in Manufacturing
Introduction

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World Robotics 2008 – First results
World: 1 million industrial robots operating

Estimated worldwide operational stock of industrial robots

* 000 of units

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* preliminary data

Source: IFR Statistical Department
World Robotics 2008 – Europe
Demand of non-automotive is growing

Estimated yearly sales of industrial robots 2001 - 2007
Share of Automotive - Non-automotive Industry in Europe

Source: IFR Statistical Department* preliminary data
Material handling is surging

Estimated yearly supply in Europe of industrial robots 2005 - 2007* by applications

- Handling
- Welding
- Assembly
- Dispensing
- Processing
- Others

* preliminary data

Source: IFR Statistical Department

In 1000 units
Robots in SME Manufacturing?

Why robots?
- Increase productivity
- Improve quality
- Qualified and safe jobs

Haven’t industrial robots become a:
- commodity?
- synonym for flexible automation?
- symbol of high-tech?
Why haven’t robots made it in SMEs?

Cutting and Deburring

Today’s industrial robots lack of:

- Alternative rapid instructions methods to robot pendants
- Intuitive instruction schemes for force/torque-control
- High process forces “when needed”
Today’s industrial robots lack of:
- Intuitive instruction (instruction time versus process time)
- “Plug ‘n Play” retooling
- Safe worker-robot cooperation
Why haven’t robots made it in SMEs?

Machine tending and handling

Today’s industrial robots lack of:
- Mobility for placing and clamping to machines
- Robust object localization
- Multi-purpose grippers
Requirements of Future Robotic Designs

- < once/year
- “offline”
- ~4*robot unit price
- ~5% of installations
- Trained staff

Changeover
Programming
Workcell cost
Sensor equipped
Maintenance

- < once/day
- “on-line”, shop-floor
- ~1*robot unit price
- 100%
- Worker

Photo: KUKA-Roboter GmbH
SMErobot: A Family of New Robots

Three Major Innovations:
1. Robot capable of understanding human-like instructions
2. Safe and productive human-aware space-sharing robot
3. Three-day-deployable integrated robot system

• Integrated approach – Critical Mass
• 17 partners, major European robot manufacturers
• Project runtime March 2005 - May 2009
# The SMErobot Initiative

## Research & Development

1. **The robot capable of understanding human-like instructions**
2. **Safe and productive human-aware space-sharing robot**
3. **Three-day-deployable integrated robot system (install-configure-instruct)**

## Demonstrations (in SMEs)

1. **D1**
   - Intuitive instruction of fettling castings for the foundry
2. **D2**
   - Fast installation, small batch size production change (forgery)
3. **D3**
   - Robot Assistants as Multi-Purpose Tools (example welding)
4. **D4**
   - Automation of manual woodworking processes

### Innovation Related Activities

- Training and education
- Socio-economics (new business models, LCC)
- Standardization
- Exploitation, IPR

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Final Workshop SMErobot
Stuttgart, 7, 8 May 2009