SME 4.0 > Industry 4.0 for SMEs
Smart Manufacturing and Logistics for SMEs
in an X-to-order and Mass Customization Environment
This project has received funding from the European Union’s Horizon 2020 R&I programme under the Marie Skłodowska-Curie grant agreement No 734713
Industry 4.0 refers to the fourth industrial revolution and technological evolution from embedded systems to cyber-physical systems (CPS) in production. The main objectives of Industry 4.0 can be summarized as:

- the introduction of **intelligent systems in production and logistics**;
- the **development of highly adaptable and modular manufacturing and logistics systems**;
- the **integration of sustainable and advanced manufacturing technologies**;
- the promotion of **automation technology and human-machine interaction**.

In the context of industry 4.0, new ICT and web technologies act as booster or enabler of smart, autonomous and self-learning factories facing the challenges of even more individualized and customized product portfolios.

A great challenge for the future lies in transferring expertise and technologies of Industry 4.0 to small and medium-sized enterprises (SMEs). SMEs represent the backbone of the economy and have an enormous importance in the development programs of the European Union for strengthening the competitiveness of European enterprises.
Despite the high potential of Industry 4.0 in SMEs, the main limitation lies in a lack of concrete models for its implementation and application in small and medium-sized enterprises.

Thus the research project aims at closing and overcoming this gap through the creation of an international and interdisciplinary research network.

**The three main objectives** of the research network are:

1. Identifying the need and enablers for a smart and intelligent SME Factory;
2. Creating adapted concepts and design solutions for production and logistics system in SMEs;
3. Developing sustainable organization and business models.

The applicability of results is ensured through a close collaboration with a European small and medium size enterprise (non-academic partner) from mass customization industry.
A) **Identification of requirements for Industry 4.0 applications and implementation in SME Manufacturing and Logistics:**
- What are actual known concepts and technologies of Industry 4.0?
- What are the main opportunities/risks for the use of these concepts in SMEs?
- How suitable are the different concepts for application in SMEs (assessment of SME suitability)?
- What are SME-specific functional requirements for the adaptation of the most promising concepts and technologies?

B) **Development of SME-specific concepts and strategies for smart and intelligent SME Manufacturing and Logistics:**
- What are possible forms or migration levels for realizing smart and intelligent Manufacturing Systems for X-to-order and Mass Customization Production?
- How can Automation, Advanced Manufacturing Technologies, ICT and CPS improve productivity in SME Manufacturing and Logistics?
- What are suitable models for smart and lean supply chains in SME Logistics?

C) **Development of specific organization and management models for smart SMEs:**
- What are innovative and promising new business models for smart SMEs?
- What are optimal implementation strategies for the introduction of Industry 4.0 in SMEs?
- What are ideal organizational models for smart SMEs or SME networks?
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Focusing on **Small and Medium-sized Enterprises and an X-to-order and/or Mass Customization environment**

**Constraints**
- SME focus
- Mass Customization and X-to-order environment
- Economic, ecological and social Sustainability
- Lean philosophy
- Changeability and flexibility

**Enablers**
- Internet of Things
- Big Data
- Cyber-Physical Systems (CPS)
- Smart Sensors
- Digitalization
- Automation

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**SME 4.0**

**Organization and Management models**

**Leader: TUKE**

- **Business models for smart SMEs**
  - Prof. Vladimir Modrak

- **Organization and network models for smart SMEs**
  - Dr. Guido Orzes

- **Implementation strategies to become SME 4.0**
  - Dr. Slavomir Bednar

Project structure plan

**WP Leaders**
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Knowledge sharing activities

- Regular annual meetings
- Joint workshops and/or joint participation in conferences
- Joint use of laboratories:
  - **UNIBZ**: smart mini-factory Manufacturing/Assembly/Robotics Laboratory
  - **MUL**: LogiLab Logistics/Warehouse Automation Laboratory
  - **TUKE**: Laboratory of RFID in Production Management
  - **MIT**: Park Center for Complexity
  - **WPI**: Engineering labs
  - **SACS**: Manufacturing Technology Lab
  - **CMU**: Excellence Center in Logistics and SCM
- Joint papers
- Participation in trainings during secondment
- Common lecture programs
- Series of lectures
- Project website
- Online meetings
- Involvement of (graduate and under-graduate) students
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Key deliverables

- 1 Website
- 1 Film
- 10 Reports
- 2 Workshops
- 36 Papers
- 2 Books
Project film

Website
www.sme40.eu
Thank you for your kind attention

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