Industry 4.0 Readiness for SMEs

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Welcome to the questionnaire on the introduction of Industry 4.0 in small- and medium-sized enterprises conducted by Jan Strohschein and Heide Faeskorn-Woyke from Technische Hochschule Köln and Ana María Lara-Palma from Universidad de Burgos. Your responses help us to assess the current status of introduction in small- and medium-sized enterprises and identify needs for further research.

Completing the survey will take you only 15-20 minutes. Your responses to this assessment are anonymous and strictly confidential. Your answers will only be reported in the aggregate and individual responses are not shared.

General questions about your company

The following general questions about the size and structure of your company allow us to form comparison groups for later analysis.

General questions about your company

Q1: In which country is your company located? *

Please choose... ▼

Q2: Please estimate the size of your company's domestic workforce. *

- ( ) less than 10 employees
- ( ) 10 to 49 employees
- ( ) 50 to 249 employees
- ( ) more than 250 employees

General questions about your company

Q3: Please estimate the number of employees working on the I4.0 introduction in the following departments. *

	0 - 5	5 - 10	>10
Leadership / Company Strategy	◯	◯	◯
Manufacturing	◯	◯	◯
IT	◯	◯	◯
HR	◯	◯	◯

Q4: Do you plan to increase the number of employees working on the I4.0 introduction in the following departments. *

	yes	no
Leadership / Company Strategy	◯	◯
Manufacturing	◯	◯
IT	◯	◯
HR	◯	◯

General questions about your company

Q5: Please estimate your 2019 revenues. *

◯ up to 2 million euros

◯ 2 million up to 10 million euros

◯ 10 million up to 50 million euros

◯ Not specified

Industry 4.0 Introduction

Q6-Q13: Do you agree with the following statements regarding the introduction of I4.0 in your company? *

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
"Introducing I4.0 in our company is a good idea."	○	○	○	○	○
"Our company is well prepared to introduce I4.0."	○	○	○	○	○
"Our company adopts the I4.0 strategy of a (bigger) partner."	○	○	○	○	○
"Our company feels the need to introduce I4.0 to stay competitive."	○	○	○	○	○
"Our company feels the need to introduce I4.0 to continue collaboration with (bigger) partners."	○	○	○	○	○
"For our work the usage of I4.0 is important."	○	○	○	○	○
"The benefits of I4.0 introduction are well known to our company and clearly evaluated."	○	○	○	○	○
"The costs of I4.0 introduction are well known to our company and clearly evaluated."	○	○	○	○	○

Strategy and organization

Industry 4.0 is about more than just improving existing products or processes through the use of digital technologies – it actually offers the opportunity to develop entirely new business models. For this reason, its implementation is of great strategic importance.

Strategy and organization

Q14: How would you describe the implementation status of your Industry 4.0 strategy? *

○ No strategy exists

○ Pilot initiatives launched

○ Strategy in development

○ Strategy formulated

○ Strategy in implementation

○ Strategy implemented

Strategy and organization

Q15: Do you use indicators to track the implementation status of your Industry 4.0 strategy? *

○ Yes, we have a system of indicators that we consider appropriate

○ Yes, we have a system of indicators that gives us some orientation

○ No, our approach is not yet that clearly defined

Strategy and organization

Q16: Which technologies do you already use in your company? *

☐ Sensor technology

☐ Mobile end devices

☐ RFID

☐ Realtime location systems

☐ Big data to store and evaluate real-time data

☐ Cloud technologies as scalable IT infrastructure

☐ Embedded IT systems

☐ M2M communications

☐ None of the above

Strategy and organization

Q17.1: In which parts of your company have you invested in the implementation of Industry 4.0 in the past two years, and what are your plans for the future?

-- Investments in the past 2 years -- *

	Large	Medium	Small	None
Research and development	○	○	○	○
Production/manufacturing	○	○	○	○
Purchasing	○	○	○	○
Logistics	○	○	○	○
Sales	○	○	○	○
Services	○	○	○	○
IT	○	○	○	○

Q17.2: In which parts of your company have you invested in the implementation of Industry 4.0 in the past two years, and what are your plans for the future?

-- Investments the next 5 years -- *

	Large	Medium	Small	None
Research and development	○	○	○	○
Production/manufacturing	○	○	○	○
Purchasing	○	○	○	○
Logistics	○	○	○	○
Sales	○	○	○	○
Services	○	○	○	○
IT	○	○	○	○

Strategy and organization

Q18: In which areas does your company have systematic technology and innovation management? *

☐ IT

☐ Production technology

☐ Product development

☐ Services

☐ Centralized, in integrative management

☐ No systematic technology and innovation management

Industry 4.0 Technology

Industry 4.0 transforms manufacturing through integration of the digital into the physical world. A multitude of emerging new technologies and concepts require evaluation through a company to assess the individual benefits.

Industry 4.0 Technology

Q19: How well do you know the following Industry 4.0 related concepts? *

	no knowledge	little knowledge	good knowledge	very good knowledge
Smart Factory	○	○	○	○
Digital Twin	○	○	○	○
Smart Workpiece	○	○	○	○
Horizontal / Vertical Integration	○	○	○	○
Artificial Intelligence	○	○	○	○
Data-driven Services	○	○	○	○

Q20: Do you plan to implement the following Industry 4.0 related concepts? *

	not planned	planned	implementation ongoing	implementation complete
Smart Factory	◯	◯	◯	◯
Digital Twin	◯	◯	◯	◯
Smart Workpiece	◯	◯	◯	◯
Horizontal / Vertical Integration	◯	◯	◯	◯
Artificial Intelligence	◯	◯	◯	◯
Data-driven Services	◯	◯	◯	◯

Q21: Do you wish for easier access to supporting materials and knowledge about the following Industry 4.0 related concepts? *

	yes	no	undecided
Smart Factory	◯	◯	◯
Digital Twin	◯	◯	◯
Smart Workpiece	◯	◯	◯
Horizontal / Vertical Integration	◯	◯	◯
Artificial Intelligence	◯	◯	◯
Data-driven Services	◯	◯	◯

Employees

Employees help companies realize their digital transformation and are the ones most affected by the changes of the digital workplace. Their direct working environment is altered, requiring them to acquire new skills and qualifications. This makes it more and more critical that companies prepare their employees for these changes through appropriate training and continuing education.

Employees

Q22-Q28: Do you agree with the following statements regarding the effects on employees by introduction of I4.0 in your company? *

	strongly disagree	disagree	undecided	agree	strongly agree
"Using I4.0 would improve our employees job performance."	○	○	○	○	○
"Our employees like the idea of introducing an I4.0 system."	○	○	○	○	○
"The interaction between employees and I4.0 systems will be clear and understandable."	○	○	○	○	○
"Clear interactions between employees and I4.0 systems are important."	○	○	○	○	○
"Learning how to use a I4.0 system will be easy for our employees."	○	○	○	○	○
"Our employees face the new I4.0 challenges with confidence."	○	○	○	○	○

Employees

Q29: How do you assess the skills of your employees when it comes to the future requirements under Industry 4.0? *

	Non-existing	Existent, but inadequate	Adequate	Not relevant
IT infrastructure	○	○	○	○
Automation technology	○	○	○	○
Data analytics	○	○	○	○
Data security / communications security	○	○	○	○
Development or application of assistance systems	○	○	○	○
Collaboration software	○	○	○	○
Non-technical skills such as systems thinking and process understanding	○	○	○	○

Employees

Q30: Are you making efforts to acquire the skills that employees are currently lacking?
Through special training seminars, knowledge transfer systems, coaching, etc. *

○ no training planned

○ training planned

○ training ongoing

○ training completed

Survey completed

Thank you very much for your participation.

Please click "Done" to submit the survey.

You have completed the survey. Thank you very much for your participation.

You can now close the window.