



***Industrie 4.0 and Made in China 2025 as socio-technological transformation of
production systems***

Workshop organized by

Tongji University and Karlsruhe Institute of Technology (KIT)

18/19 June 2018, KIT

The process of digitalisation of production systems that is labeled in Germany as vision “Industrie 4.0”, in China as “Made in China 2025” is already influencing our lifestyle habits, the way we work, produce, communicate and do business. The ongoing interdependence of economy and society through cyber-physical systems as well as the constant exchange of information by data transfers will evoke a change that primarily is not a pure technological change, but may cause a profound social, or rather a socio-technical change. Here, there is the need of more in-depth research of already existing and evolving social upheaval, on historic discourses and current controversies and debates. For the various stakeholders (producers, contractors, employees, researchers, politicians and citizens) the developments can prove to be chances but also risks. To examine this in a contemporary and historical perspective and to analyse potential consequences in reference to possible structural change is among other things, the task of social and cultural sciences. However, this analysis remains abstract and may even be misinformed if it is not done in exchange and cooperation with developers and engineers. We are in a unique position at both institutions to have a profound experience in interdisciplinary cooperation. This workshop will allow us to focus this cooperation on an emerging issue in public and political discourse and, furthermore, to analyse corresponding debates, visions and contexts in a cultural comparative way – looking at two distinct yet equivalent strategies in Germany and China addressing the governance of digitalization: Industrie 4.0 and Made in China 2025.

Following up on a workshop held by some colleagues of the KIT (from ITZ, ITAS and Germanistik (German studies)) and colleagues from the Tongji University, Shanghai (predominantly from various disciplines, with affiliations at the German and European

Research Centre) in September 2016 on the subject “Social Scientific Perspectives on digitalisation (Industry 4.0/Made in China 2025)”, we will jointly organize an interdisciplinary workshop at the KIT in 2018.

In order to expand the exclusively social scientific perspective of this topic and to position the topic Industry 4.0 as a research area of the integrated and interdisciplinary sciences at the KIT, the event will be organised together by the Institute of Technology Futures (ITZ), Institute of Technology Assessment and Systems Analysis (ITAS), Institute of Production Science (WBK), Institute of Product Engineering (IPEK), Institute for Information Processing Technologies (ITIV) and Institute for Information Management in Engineering (IMI) and will be carried out with the corresponding Chinese partners at Tongji-University.

Concept and goals of the workshop

This workshop focuses on digitalization of industry and resulting effects on production and work environments and, thus, addresses important questions that are posed in the framework of the Science Year 2018 Future of work (BMBF).

The aim of this workshop is to arrive at a true cooperative level of joint research regarding the status of *Industrie 4.0* in Germany and *Made in China 2025* in China as vision in different national, institutional and disciplinary settings. The focus lies, both, on the models and visions as well as on the national strategies for putting this vision in practice and its actual and expected societal impacts. The challenges, we are facing are not only to bridge national cultures and strategies but also to integrate disciplinary knowledge from Engineering Sciences and Social Sciences and Humanities. Public debate around digitalization of production systems show that on the long run we have to face questions of future of work in highly industrialized societies at a global scale. Therefore, we conceptualize this workshop to be interdisciplinary and comparative, allowing for debate and common reflection.

We hope that this format will contribute to advancing the comparative view on *Industrie 4.0* and *Made in China 2025* as concept and vision, enhancing reflexivity regarding actual and possible societal effects as well as making available this knowledge for further cooperation practically, i.e. joint master programs, joint research projects and publications.

Time and location of the conference

18./19. June 2018

Place of event: KIT, South Campus

Contact: Dr. Alexandra Hausstein, Institute of Technology Futures, KIT

alexandra.hausstein@kit.edu

Focus questions for panels

In the workshop, we will jointly discuss following overarching questions:

- 1) How do you describe/define the technological shift of *Industrie 4.0* resp. *Made in China 2025*?
- 2) What are the guiding models and visions directed at future that lie behind this transformation?
- 3) What are actual and possible effects of this transformation and emerging debates, especially how are industries, man-machine interaction and employment structures changing?

Focus Group 1 *Concepts and visions “Industrie 4.0” and “Made in China 2025”*

- Which concepts of technological futures underlay *Industrie 4.0* and *Made in China 2025*?
- What values and attitudes towards technological progress, handling of risks and potential side effects make up the specific contexts in China and Germany?
- How are the visions represented in media and public, and how are they negotiated in national debates?

Focus-Group 2 *Technology-driven changes of “Industrie 4.0” and “Made in China” and its impact on organisational transformation*

- Which technological innovations are enabling *Industrie 4.0* and which *Made in China 2025*?
- How is the work environment changing through reorganization of production systems and work?
- Which new organisational concepts are needed? With regard to institutional settings, i.e. education and qualification?

Focus-Group 3 *New forms of Human - Machine interaction*

- How does *Industrie 4.0* and *Made in China 2025* change monitoring, transfer of tasks, team building between humans and machines?
- Which legal and ethical questions does the restructuring of the human-machine interaction raise?
- How do we deal with self-learning systems?

Workshop Agenda

- Language: Deutsch/ Englisch
- Participating Institutes at KIT and Chinese Partners: Institute of Technology Futures (ITZ), Institute of Technology Assessment and Systems Analysis (ITAS), Institute of Production Science (WBK), Institute of Product Engineering (IPEK), Institute for Information Processing Technologies (ITIV) and Institute for Information Management in Engineering (IMI), German Studies and Science Communication

<p>18 June 2018</p> <p>9:00 – 12:30h Introduction and Discussion of topic (Gastdozentenhaus, Dürersaal)</p> <p>9:00h Welcome A. Hausstein Presentation Armin Grunwald: <i>Industrielle Produktion gemeinsam gestalten: Die Integration der Technikwissenschaften, Sozialwissenschaften und Ethik.</i></p> <p>10:00 - 12:30h Workshop</p>		
	Central questions	
<p>Perspective 1 <i>Concepts and visions “Industrie 4.0” and “Made in China 2025”</i></p>	<ul style="list-style-type: none"> • Which concepts of technological futures underlay <i>Industrie 4.0</i> and <i>Made in China 2025</i>? • What values and attitudes towards technological progress, handling of risks and potential side effects make up the specific contexts in China and Germany? • How are the visions represented in media and public, and how are they negotiated in national debates? 	<p>Input: Linda Nierling (ITAS), Zhu Yufang (Tongji)</p> <p>Moderator: Alexandra Hausstein (ITZ)</p>

12:30 Uhr Lunch (Gastdozentenhaus, KIT)		
<p>Perspective 2 14:00 - 16:00</p> <p>Technology-driven changes of <i>Industrie 4.0</i> and <i>Made in China 2025</i> and its impact on organisational transformation</p>	<ul style="list-style-type: none"> • Which technological innovations are enabling <i>Industrie 4.0</i> and which <i>Made in China 2025</i>? • How is the work environment changing through reorganization of production systems and work? • Which new organisational concepts are needed? With regard to institutional settings, i.e. education and qualification? 	<p>Input: Nicole Stricker (wbk) Chen Ming (Tongji)</p> <p>Moderator: Nicole Stricker</p>
<p>Perspective 3 16:30 – 18:30</p> <p><i>New forms of Human - Machine interaction</i></p>	<ul style="list-style-type: none"> • How does <i>Industrie 4.0</i> and <i>Made in China 2025</i> change monitoring, transfer of tasks, team building between humans and machines? • Which legal and ethical questions does the restructuring of the human-machine interaction raise? • How do we deal with self-learning systems? 	<p>Input: Jivka Ovtcharova (IMI) Antonio Moniz (ITAS)</p> <p>Moderator: Philipp Frey (ITAS)</p>
20 Uhr Dinner		
<p>19 June 2018 (Gastdozentenhaus, KIT)</p> <p>9:00 – 10:00h Made in China 2025 (Prof. Chen Ming, Tongji University) Presentation with discussion</p> <p>10:00 – 12:30 Presentation of results and further cooperation (Publication, research)</p> <p>13:00h Lunch</p>		

Participants

Institute of Technology Futures (ITZ)	
Dr. Alexandra Hausstein	Sociologist and Managing Director ITZ
Prof. Dr. Markus Popplow	Professor History of Technology
Institute of Technology Assessment and Systems Analysis (ITAS)	
Philipp Frey	Doctoral Student, Sociology of Digitalisation
Prof. Dr. Armin Grunwald	Professor Philosophy of Technology and Director of ITAS
Dr. Bettina Johanna Krings	Head of research unit and senior researcher, sociologist
Prof. Dr. Antonio Moniz	Professor Sociology of Information Technology
Dr. Linda Nierling	Senior Researcher Environmental Sciences
Institute of German Studies and Science Communication	
Prof. Dr. Andreas Böhn	Professor Media Studies
Dr. Dominik Schrey	Researcher Media Studies
Dr. Szilvia Gellai	Researcher Literary Studies
Institute of Production Science (WBK)	
Sina Helming	Researcher Global Production Strategies
Nicole Stricker	Coordinator Research Topic Industrie 4.0
Prof. Dr. Gisela Lanza (tbc)	Professor and Director Production Systems
Philipp Gönzheimer (tbc)	Researcher in Topic Industrie 4.0
Institute of Product Engineering (IPEK)	
Constantin Mandel	Researcher Model Based Systems Engineering
Dr.-Ing. Matthias Behrendt	Directing Engineer, Validation of technical systems, innovation management
Jonas Reinenmann	Researcher Validation IQ 4.0
Institute for Information Processing Technologies (ITIV)	
Florian Schade	Researcher

Institute for Information Management in Engineering (IMI)	
Prof. Jivka Ovtcharova	Professor and Head of the Institute for Information Management in Engineering
Michael Grethler	SolidLine AG
Klemens Haas	Researcher Information Management
Institut für Deutschland- und Europaforschung Tongji Universität	
Dr. YU Zhouming	Linguistics
Dr. ZHU Yufang	Political Science and History
Prof. CHEN Ming	CDHAW
IZEW Universität Tübingen	
Dr. Mone Spindler	Coordinator INTEGRAM Project