Artificial Intelligence, Robotics and Logistics Employment

Supply chain management is impacted profoundly by digitalization in the forms of artificial intelligence (AI) and robotics applications (Klumpp & Zijm, 2019; Bell & Griffis, 2011). Research is scarce regarding the impacts on logistics employment – but obviously, logistics is facing the most severe change since industrialization as digital applications are affecting every industry and all supply chains. Various studies investigate the substitutability of jobs by computers, robotics and machines (e.g. Autor, 2015). Starting from the question whether or not advances in robotics and information technology increase US unemployment, the seminal work of Frey and Osborne (2013) analyzed to what extent occupations are susceptible to computerization. They found that 47% of jobs are potentially at risk, concerning also jobs in transportation. However, automating human work must be worthwhile and sustainable. So far, concrete empirical investigations analyzing changes of employment in supply chains using AI and robotics are still missing. There is also a lack of theoretical foundations to explain current developments in this regard. In particular, the following levels of analysis are of interest in order to reveal effects for logistics employment:

- At the *individual level*, perceptions, beliefs, and attitudes towards AI and robotics are decisive for adoption processes (Schraeder et al., 2006; Rogers, 2003; Venkatesh & Davis, 2000). Moreover, frameworks such as Self-Determination Theory (Ryan & Deci, 2000) and the Job Demands Resource Model (Bakker & Demerouti, 2007) help to understand the impact of changes on motivation and well-being of workers. This is also connected to the relevant question of workplace safety as relevant field in transportation and logistics (Choo & Grabowski, 2018). Equally important is the concept of self-efficacy (Bandura, 1997), whether workers feel competent in using new technologies or learning how to use them and are able to use their intuition when making decisions (Carter et al., 2017). This also relates to worker perception regarding autonomy and control in digitalized work contexts as two sides of one coin (Stohl et al., 2016; Mazmanian et al., 2013).
- At the *group level*, size and structure as well as cohesion and social norms in teams are expected to change in the course of implementing AI and robotics into work organization since workers have the opportunity on the one hand to check their own performance and compare it with that of their colleagues (Collins et al., 2016). This can for example serve as an incentive to improve performance and promote competition among the workforce. On the other hand, there is a higher transparency of performance so that superiors can monitor the activities of individual workers and intervene in work processes (Langfred, 2000).
- At the *organizational level*, structure, work design and goal setting alter in the course of digitalization (Wilkesmann & Wilkesmann, 2018; Lam, 2005). From a transaction cost perspective (Williamson, 1975) it can be explained that organizational structures are changing as a result of the increasing digital transparency, and the engagement of external workers. Above all, issues of efficiency and social sustainability in the light of the Second Machine Age (Brynjolfsson & McAfee, 2014) or Industry 4.0 concept developments (Marsh, 2012; Rifkin, 2014) as well as the potentials of AI and robotics for organizational performance need to be further investigated – so far, the discussion focuses on the opportunities for saving personnel costs and staff reduction (Lovergine & Pellero, 2018).
- In a fourth *cross-level* perspective, work design questions and Human-Computer-Interaction (HCI) are located. The use of AI and robotics can fundamentally change the collaboration of humans with machines since humans will refrain more and more from operational tasks and have to migrate their capabilities and attention towards supervisory tasks. This will affect individual, group and organizational decisions and processes (Lee et al., 2015; Cummings & Bruni, 2009).

The phenomenon of changing work settings due to the advent of AI and robotics in white- as well as blue-collar jobs is influencing all areas of logistics work, from employment relationships, work organization, job demands and competencies required to autonomy and control as well as efficiency questions. Therefore, research shall focus on implications, explanations and possible concepts in order to mend the downsides and exploit the upsides of this groundbreaking development for logistics employment. With this STF, we aim to shed light on the implementation of AI and robotics and the resulting questions for logistics employment from different disciplinary perspectives, and encourage research from a range of disciplines investigating fields of logistics employment in digital work settings and applying various research methods.

GUEST EDITORIAL TEAM
MATTHIAS KLUMPP AND CAROLINE RUINER

JOURNAL OF BUSINESS LOGISTICS

CALL FOR PAPERS: SPECIAL TOPIC FORUM

Artificial Intelligence, Robotics and Logistics Employment

Items for contributions include – but are not restricted to – the following topics:

- Digitalization and resulting job losses or gains
- Changing work organization and job design
- Impact of digitalized work for motivation, work engagement, job satisfaction
- Effects of implementing new technologies for teams and leadership
- Efficiency and social sustainability of AI and robotics in organizations
- Design and effects of Human-Computer-Interaction

The submission deadline is October 31, 2019. Please submit full papers via https://mc.manuscriptcentral.com/jbl (indicating this STF). Papers submitted must follow the Journal of Business Logistics guidelines and will undergo a double-blind review. Questions regarding this STF can be directed towards the guest editorial team Matthias Klumpp (matthias.klumpp@uni-goettingen.de) and Caroline Ruiner (ruiner@uni-trier.de).

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