

Let's put the V in smart factory: Empowering employees to shape a safety culture for Industry 4.0

Industry 4.0 is the concept for the smart factory of the future: Digitalization will revolutionize the way in which industrial work is carried out. Advantages of industry 4.0 comprise decreased production costs, increased productivity, fast time to market and increasing innovation cycles (Brettel et al. 2014, Schuh et al. 2014). On the downside, Industry 4.0 will entail new types of risks that are to date difficult to predict (Jaradat et al. 2017).

Business transformation is determined by various modes, processes and structuring elements (Gudergan et al. 2017). Current transformation approaches towards Industry 4.0 focus mainly on technological and organizational aspects. What is still missing are sustainable approaches that solve one of the biggest challenges on the way to an Industry 4.0 for enterprises: To create a corporate culture offering employees an active role in the transformation process, e.g. by handling risks.

This paper presents a study investigating the potential of empowering employees bottom-up in shaping a safety culture for Industry 4.0 for small and medium enterprises. The study combines expert interviews with insights from industrial process modelling methods. In a metalworking company, a partly digitalized production process chain was examined. The focus was on risks in the context of this process chain and how workers would like to be integrated in improving the safety and security of their work. The workers were interviewed how they experience the current work situation, their willingness to contribute to new solutions and their ideas about it.

The results indicate a high reflectiveness as well as a high willingness to contribute to transformation processes. The participants name a broad range of perceived risks. A highly ranked risk area concerns information flows. The participants emphasize the need for means that enhance information flows horizontally (e.g., along the production process) as well as vertically (e.g., between the management and the workers). The general willingness to contribute to a safety culture tailored towards Industry 4.0 seems to be depending on aspects such as trust, model behavior of leaders and pride in one's own work. The participants suggest a broad range of measures to improve both, safety in production processes and information flows.

Literature

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This research and development project is funded by the German Federal Ministry of Education and Research (BMBF) within the "Innovations for Tomorrow's Production, Services, and Work" Program and by the European Social Fund (ESF) (funding number 02L15A002) and implemented by the Project Management Agency Karlsruhe (PTKA). The author is responsible for the content of this publication.

