

## Chapter 55

# Identification of Challenges and Opportunities for Work 4.0 Competences Developing in Slovakia

**Helena Fidlerová**

 <https://orcid.org/0000-0002-3426-5803>

*Slovak University of Technology, Slovakia*

**Martina Porubčinová**

*Slovak Academy of Sciences, Slovakia*

**Martin Fero**

*Slovak University of Technology in Bratislava, Slovakia*

**Ivana Novotná**

*Slovak University of Technology in Bratislava, Slovakia*

### ABSTRACT

*Industry 4.0 and its effect on processes and people becomes reality with all organizational and technological complex implications for the future. States around the world including Slovakia face the challenge of defining strategy on how to convert the challenges of Industry 4.0 into competitive advantage. This chapter focuses on Work 4.0 competences development, analyzed in the level of enrichment of the human capital content as well as in the level of labor market polarization. The aim of this chapter is to present opportunities and threats in competence development regarding the concept of Intelligent Industry and discuss sustainable solutions in the context of National Action Plan of Intelligent Industry of Slovak Republic, looking for win-win strategy. The authors analyze differences in competences achieved via education system in Slovakia and expectations of industry. Special attention is given the situation in Slovakia, country-oriented on automotive and with strong cooperation with Germany as innovation leader in European countries, to find strategy within this no zero game.*

DOI: 10.4018/978-1-7998-8548-1.ch055

## **INTRODUCTION**

Industry 4.0 has attention in manufacturing process all over world, with special focus on technology solution, big data in real time, augmented reality, predictive maintenance as well as Internet of Things.

Main objective of this chapter is as follows: Insight into sustainable strategy focusing not only on digitalization, automation, collaboration with robots and augmented reality from technological point of view, but also on the human as the central point of this revolution.

Authors consider as important not to exclude humans from the production world issue to identify desired Work 4.0 key competences and to invest in boosting those competences of employees, considering their individual skills and knowledge.

The chapter focuses on the development of new job requirements in the field of demand for Work 4.0 competences. The development of demand and supply of Work 4.0 competences is analyzed in both levels as follows: a) in the level of enrichment of the human capital content and b) in the context of the trend of labor market polarization. This means challenge for all countries, but the situation could be different according to political, economic, social, technical and other aspects. This chapter provides closer look on the specific situation in Slovakia. According to OECD Survey (2018), Slovakia has the biggest risk of automation and risk of significant change regarding jobs in comparison with 30 analyzed countries. One of assumed reasons is not enough diversification thus the industry in Slovakia is oriented mainly to automotive industry.

Subsequently an analysis is conducted in the chapter, which comprises the final observations and results of quantitative research-based survey focused on non-formal learning through participation on EU Youth in Action projects in Slovakia. This special study has been developed to explore the learning processes of actors involved in above mentioned projects: how do participants of projects learn and which settings (comparison of school, work, internship etc.), educational approaches, methodologies and methods contribute to the development of their key competences. The findings clearly indicate that participation in non-formal learning (e.g. via Youth in Action projects) contributes to the development of the key competences and skills required by the concept of Intelligent Industry. Special attention is given to competences that respondents would like to learn for future. As the latest, most important challenge in the field of desired Work 4.0 requirements is taking into consideration the need to monitor the impact of changes on the future work requirements that shape Industry 4.0 as the current worldwide innovation.

## **BACKGROUND**

The innovative process of technological change, which is technologically based on the Internet, has formed the basis for Industry 4.0 concept as a new stage of the production process (Lukac, 2015). The concept of “Industry 4.0” was recognized in Germany to refer to the development of “cyber-physical systems” (CPS) and dynamic data processes that use massive amounts of data to drive smart machines (Strange & Zucchella, 2017).

The fourth industrial revolution, as a change within the entire value chain across the product life-cycle in company including a new level of digitalization, automatic data exchange and automation, demands a has significant paradigm shift in management of manufacturing and organization processes (Maslarić, Nikoličić, & Mirčetić, 2016; Saniuk & Saniuk, 2017; Schuh, Gartzen, Rodenhauser, & Marks, 2015; Wolf, Kleindienst, Ramsauer, Zierler, & Winter, n.d.). This cycle is geared to increasingly individualised

21 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/identification-of-challenges-and-opportunities-for-work-40-competences-developing-in-slovakia/276865](http://www.igi-global.com/chapter/identification-of-challenges-and-opportunities-for-work-40-competences-developing-in-slovakia/276865)

## Related Content

---

### Industry 4.0 in Cultural Industry: A Review on Digital Visualization for VR and AR Applications

Antonios Kargas and Dimitrios Varoutas (2021). *Research Anthology on Cross-Industry Challenges of Industry 4.0* (pp. 1379-1396).

[www.irma-international.org/chapter/industry-40-in-cultural-industry/276880](http://www.irma-international.org/chapter/industry-40-in-cultural-industry/276880)

### Opportunities, Challenges, and Solutions for Industry 4.0

Hee Song Ng (2021). *Research Anthology on Cross-Industry Challenges of Industry 4.0* (pp. 1-20).

[www.irma-international.org/chapter/opportunities-challenges-and-solutions-for-industry-40/276808](http://www.irma-international.org/chapter/opportunities-challenges-and-solutions-for-industry-40/276808)

### Application of Hybrid Firefly Algorithm-Tabu Search Technique to Minimize the Makespan in Job Shop Scheduling problem

Manoj Govind Kharat, Siddhant Sanjeev Khadke, Rakesh D. Raut, Sachin S. Kamble, Sheetal Jaisingh Kamble and Mukesh Govind Kharat (2016). *International Journal of Applied Industrial Engineering* (pp. 1-21).

[www.irma-international.org/article/application-of-hybrid-firefly-algorithm-tabu-search-technique-to-minimize-the-makespan-in-job-shop-scheduling-problem/168603](http://www.irma-international.org/article/application-of-hybrid-firefly-algorithm-tabu-search-technique-to-minimize-the-makespan-in-job-shop-scheduling-problem/168603)

### Maximizing Clicks in Email Marketing Campaigns for a Retail Company

Patrick Mackintosh, Luke Brantley, Alexander Hansen, Jacob Lindell, Jesse Pietz, Joseph H. Wilck, Taylor Leonard and Gerardo O. Gonzalez (2017). *International Journal of Applied Industrial Engineering* (pp. 33-46).

[www.irma-international.org/article/maximizing-clicks-in-email-marketing-campaigns-for-a-retail-company/182722](http://www.irma-international.org/article/maximizing-clicks-in-email-marketing-campaigns-for-a-retail-company/182722)

### Sustainable Performance of Tunisian SMEs in Industry 4.0

Abdullah Abdulaziz Alhumaidan and Noor Hazlina Ahmad (2021). *Research Anthology on Cross-Industry Challenges of Industry 4.0* (pp. 1077-1088).

[www.irma-international.org/chapter/sustainable-performance-of-tunisian-smes-in-industry-40/276864](http://www.irma-international.org/chapter/sustainable-performance-of-tunisian-smes-in-industry-40/276864)