

Chapter 1

Recognizing Skills and Competencies Required Under Industry 4.0's Framework for Achieving Business Digital Transformation

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ABSTRACT

Economic and technological developments that took place the last 30 years have resulted in a new form of industrial revolution, widely known as Industry 4.0 (I4.0). Researchers and professionals worldwide try to foresee and contribute to its development, while the COVID-19 pandemic acted as an accelerator and revealed that changes arising under Industry 4.0 will affect a wide variety of working-life aspects. Among these aspects, skills and competencies needed under I4.0 are expected to change. The current chapter uses the European Skills, Competences, Qualifications, and Occupations (ESCO) database to identify which are the most valuable skills and competencies in the time being, when European businesses are taking part in the so-called digital transformation, part of Industry's 4.0 evolution.

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The most significant skills and competencies will be presented alongside with an analysis on existing research on the relationship between I4.0 and new skills/competencies needed.

INTRODUCTION

Modern business environment seems to be transformed rapidly under COVID-19 era. Digital forms of working and cooperation are used heavily, while more and more industries face the necessity of transforming their traditional operations and product / service development in a more digital and “online – connected – to – customers” manner. Even though the concept of Industry 4.0 gained lot of attention during the last 10 years, only after recent pandemic crisis its implementation seem to touch sectors other than manufacturing as a “current” need – rather than a trend of change in the future.

Existing studies seem to be more oriented to technological factors, while emphasis is put on businesses’ readiness and on maturity models for a successful implementation. Aspects of Industry 4.0 most commonly mentioned (Baur & Wee, 2015) during research are (indicatively): machine flexibility, predictive maintenance, human – robot collaboration, remote monitoring and control, real time supply chain optimization. Statistical process control, digital quality management, data driven design to value and demand prediction, concurrent engineering, virtually guided self-service etc. All these aspects take for granted how human factor will react to changes needed, even though less significant changes (e.g. teleworking, massive use of P.C. and mobile devices in everyday life) took years to be globally implemented and failures occurred in several cases.

Undoubtedly, the forthcoming changes will fully affect the workforce of all sectors, while several studies already report the transformation of the labor – market, moving employers’ interest from low-skills jobs to new ICT-based ones. Moreover, there is a growing interest on new skills development and the necessary training procedure required for existing employees, in order to better fit in teleworking conditions and Industry’s 4.0 technological changes.

Current chapter aim to highlight the challenges emerged under these conditions. Moreover, changes in labor market will be revealed via existing literature and an initiatory analysis of the relationship between “Industry 4.0 and digital skills recognized as significant for its implementation” will be conducted. The analysis will be based on existing literature, while a well – known database will be used to evaluate most significant digital skills required for Industry 4.0, namely:

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