

Chapter 3

Skilling the Workforce for Industry 4.0

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ABSTRACT

The changes occurring worldwide through the fourth industrial revolution demand a broader range of competencies than just obtaining technical and digital expertise. Human agency is the only thing that allows technologies to be used in a sensible, wise, ethical, and sustainable manner. Aligning human reasoning with machine intelligence is crucial because this kind of employment requires cognitive processing that is difficult for machines to perform. Industry 4.0 is changing the workforce and expanding access to new knowledge and skills, which is having a significant impact on the manufacturing processes is carried out. As per the estimates by World Economic Forum, the adoption of new technology will necessitate reskilling for 50% of all employees by 2025. Twenty-three percent of the skills that employers will need in 2025 will be technology-related, even if they aren't currently considered essential. In this research, the authors focus on understanding the reskilling and up skilling of the workforce to make them future-ready for Industry 4.0 and beyond through detailed literature review.

INTRODUCTION

The term “industry 4.0” refers to the change in manufacturing. According to Encyclopaedia Britannica, the first Industrial Revolution was characterised by “Mechanisation,” or the shift from manual labour to mechanical manufacturing that relied on steam and water power. However, the Second Revolution

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employed electric power to facilitate production and was founded on the Division of Labour. The third industrial revolution followed, employing robotics, electronics, and information technology to automate manufacturing. The fourth Industrial Revolution, which makes use of IT, electronics, and cyber-physical systems, is currently in progress. The first industrial revolution mechanises production using steam, the second uses electricity, the third uses electronics and information technology, and the fourth uses technology to perform tasks that humans performed previously.

Industry 4.0, also known as the fourth industrial revolution, refers to an intelligent and interconnected production system made possible by new technologies, particularly the increased use of automation and data exchange (UNIDO, 2017). Although the sources of the technologies used by Industry 4.0 vary, concepts like artificial intelligence, big data, and the Internet of Things are frequently regarded as being a part of this movement (UNCTAD, 2019; UNCTAD, 2021). The development of smart production systems, also known as smart factories or smart production, is the outcome of utilising these technologies in the process manufacturing. Utilising sensors and equipment connected to artificial intelligence-powered digital networks, smart production keeps an eye on output (UNIDO, 2020).

The structure of economic processes and national economies is undergoing significant changes due to technological advancements, leading to shorter profession lifecycles and social transformations. These changes necessitate a more adaptable workforce and labour market, with educational institutions playing a crucial role in preparing students for future work requirements (Solving future skills challenges. Universities UK, 2018). The transition to Industry 4.0 aims to increase labour productivity, enhance product quality and quantity, and drive economic growth at various levels. In the short term, it is expected to create imbalances in the global economy, resulting in increased inequality among workers and higher global unemployment rates (Karpenko et.al, 2021) as most processes will become automated or obsolete, presenting future specialists with new challenges that demand creative thinking, collaboration with both humans and artificial intelligence, and a readiness to adapt to changing professions or industries.

Industry 4.0 features include real-time connectivity, communication, and interactions between people, machines, and products (Ozkan-Ozen et al., 2020). It creates a personalised, digitalized smart manufacturing model with great flexibility to quickly meet customer demands. Organisations are forced to hire new workers with the skills required for the new job requirements due to the necessity of new job demands. Furthermore, the companies need to improve the credentials of their existing workforce. According to Boyatzis (1982) and Abraham et al. (2001), the skills and competencies enable workers to carry out their duties in an efficient manner and encompass the essential demands and conduct for achieving superior job. Human resource departments are in charge of creating development plans, suggesting career maps, creating new organisational structures, drawing in and hiring new staff, creating competitive compensation packages, creating performance and reward systems, improving internal communication, and overseeing all local, national, and international human resources operations in businesses, according to HRM literature (Boselie and Paauwe, 2005). Directors of human resources policies need to be fully aware of the skills that organisations currently possess and would like to acquire in this context. Consequently, in order to achieve strategies and goals, new skills must be highlighted in the success profiles of new organisational tasks (Kececioglu and Yilmaz, 2014). To effectively embrace the Industry 4.0 paradigm, human resources managers should rework job requirements, suggest new standards for recruitment, and provide training to staff members on how to adjust to the new demands.

Recent major world events, like the coronavirus pandemic and the conflict in Ukraine, have highlighted how vulnerable economies and organisations are. As a result, it is imperative that these changes be promptly adapted to, and people become accustomed to, what has been dubbed the “new normal”

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