

Chapter 6

Industry 4.0: The New Industrial Revolution

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ABSTRACT

Industry 4.0 can be considered the 21st century's industrial revolution and will soon be the new form of manufacturing delight. The definitive customer would experience manufacturing requests determined by artificial intelligence, machine learning, and automated technologies linked with data science support for gauging customer necessities. Phenomenally, Industry 4.0 is rapidly changing the firm's management and organizational systems, and competencies, as well as making its environment much more explored, even if more complexed than in the past. This new industrial revolution would possess systems with transformative technologies for managing interconnected systems between its physical assets and computational capabilities. Such enterprises would require skilled workforce to improve and operate advanced manufacturing tools and systems, and investigate the machine data, clients, and global capitals, resulting in an escalating need for trained employees proficient in cross-functional capacities and with competencies to cope new processes and IT systems.

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INTRODUCTION

Unlike the previous three industrial revolutions (18th, 19th, and 20th Centuries), the 4th will be more decentralized, automated, and controlled interdependently (Qin, Liu, & Grosvenor, 2016). In the first industrial revolution, the factory achieved production primarily through machines powered by water and steam and heavy manpower. In the second, operations became slightly more complexed through machines powered by electricity supported by mass production and division of labour. The third industrial revolution ushered in the use of electronics and information technology, adding more complexity to the production process in making it more automated (Brettel, Friederichsen, Keller, & Rosenberg, 2014; Wolfgang, 2016). Undoubtedly, these three industrial revolutions would have impacted their countries' economies. For example, through their relative contribution from the manufacturing sector, especially in European countries where the GDP accounts for 17% and creates about 32million jobs (Qin, Liu, & Grosvenor, 2016). Other such evidence can be seen in industrial landscape of factories and activities in the physical environments as well as improvement in living standards (Calvert & Simandan, 2010; United Nations Industrial Development Organisation, 2015).

Introduced by Germany at the Hannover Fair in 2011, the world's leading trade show for industrial technology (Qin, Liu, & Grosvenor, 2016), Industry 4.0 can be seen as an amalgamation of tangible outputs from integrated information technology systemic processes with mostly interdisciplinary engineering facilitations coordinating into a seamless connect (Sniderman, Mahto, & Cotteleer, 2016). Consequently, the future of the industrial revolution would demand more mobile technology. Vision 2020 in ICT will be the base for Industry 4.0, especially producers of 5G mobile networks seen as the locomotive for Industry 4.0 (Jurčić & Gotovac, 2016) and other modern mobile technologies such as Li-Fi technology. According to IOTUK (2016), Li-Fi is "a new technology with speeds that surpass Wi-Fi hundreds of times over by utilizing light instead of radio waves (Transferring data using fluorescent lights" para 1). Of course, existing modern mobile telecom operators, or more so their key managers, will have to have a "shift in mindset" before they start playing one of the most important roles in this new business order. Subsequently, the integrating processes will include sensor networks (IoT/IIoT), computing and sharing data and finally, a collaborating community. Regarding integrating processes mentioned above, it is good to note that in many literature the terms Internet of Things and Industrial Internet of Things replaced Internet of Everything (IoE). Briefly, Internet of Everything (IoE) was introduced by Cisco for bringing together people, processes, data and things to make networked connections more relevant and valuable than ever before – turning information into actions that create new capabilities, richer

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