Chapter 21
Operator 4.0 Within the Framework of Industry 4.0

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ABSTRACT

Operator 4.0 is a smart and skilled operator who augments the symbiosis between intelligent machines and operators. Better integration of Operator 4.0 in Industry 4.0 can bring emphasis on human-centric approach, allowing for a paradigm shift towards a human-automation cooperation for inspiring the compulsion of human-in-the-loop. This further enhances the domain knowledge for the improvement of human cyber-physical systems for new generation automated systems. This cooperation of humans and automation makes stability in socio-technical systems with smart automation and human-machine interfacing technologies. This chapter discusses the design principles of Industry 4.0 and Operator 4.0 human-cyber physical systems.

INTRODUCTION

Aa described by Reyes Garcia et al. (2019), the industrial scenario is radically changing due to the technology innovations of the last decades. Industry 4.0, allows collaboration between operators and machines by integrating robotics, automation and data driven technologies into intelligent workspace. This interaction offers significant impact on transforming industrial tasks to accommodate production variability by introducing collaboration between operators and production systems for the development of future workplaces improving safety aspects during the design phase (Martinetti et al., 2017; Martinetti et al. 2019). Integration of operator 4.0 in Industry 4.0 (Figure 1) brought more emphasis on human-centricity, allowing for a paradigm shift towards a human-automation cooperation. This shift emphasis on human cyber-physical systems i.e. more efficient and effective cooperation of system with humans

instead of substituting human skills and abilities. Operator 4.0 work will be qualitatively developed and flexible, and will require new qualifications to understand the digital technology in Industry 4.0. It is important that smart factories should motivate the operators in gaining knowledge of new skills. The Operator 4.0, paradigm shift cannot flourish just by presenting new technologies. Work tasks needs to be redesigned and new approaches to training are desirable to support continuous development of skills.

Figure 1. Integration of operator 4.0 in Industry 4.0
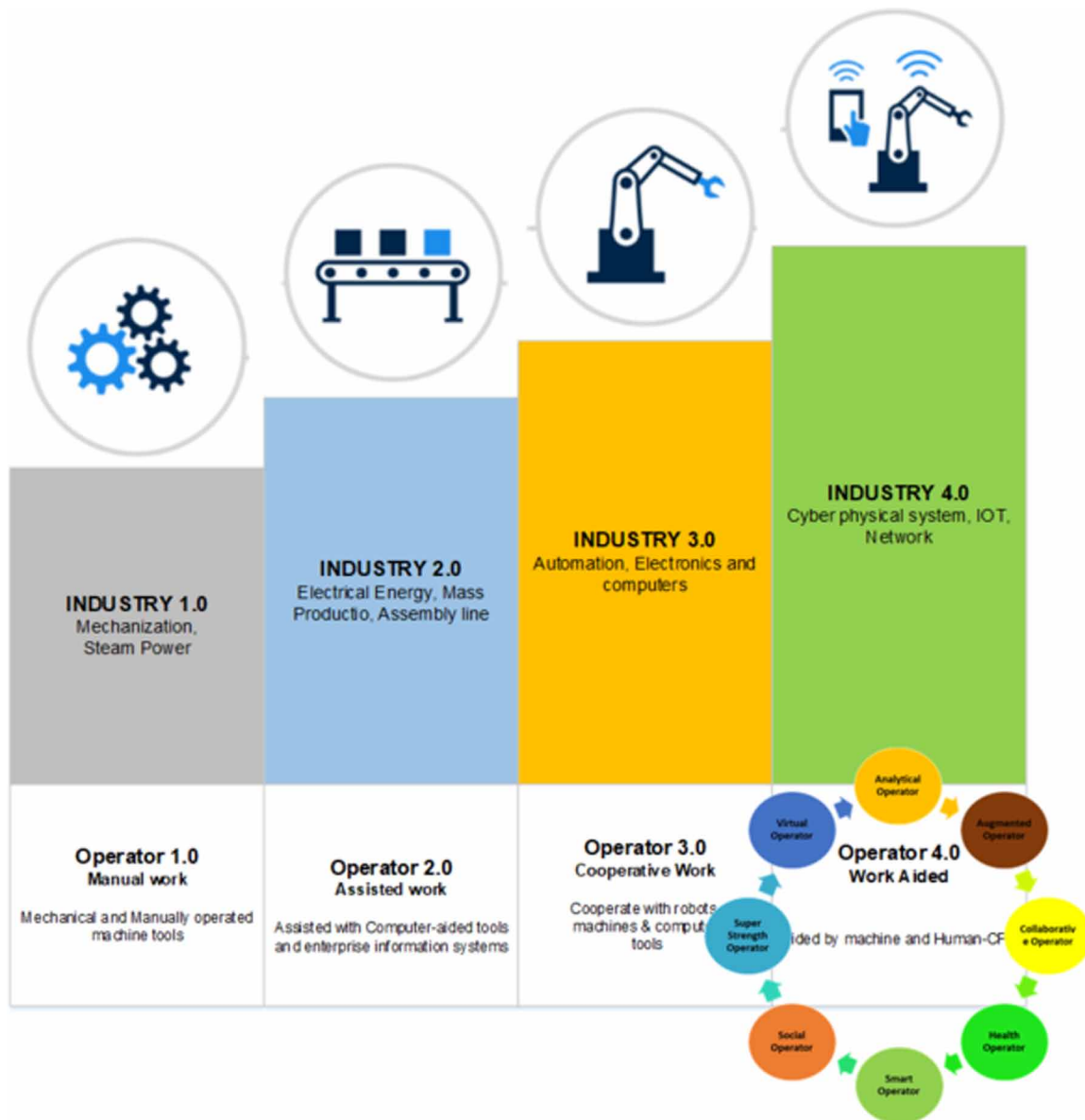
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