

## **Contemporary Ergonomics: Empowering the Modern Technologies for Smart Operator through the Era of Industrial Revolution 4.0**

**Osama Ali ElSayed Nada**

Asst. Prof. of Industrial Design Department, Faculty of Applied Arts – Benha University

osama.alinada@fapa.bu.edu.eg

### ***Abstract:***

The fourth industrial revolution, or Industry 4.0, has brought about rapid technological growth and development in various manufacturing environments and processes. Manufacturing systems have transformed from manual to automated, and there has been progress in the tools and technologies used in manufacturing. This technological progress has allowed manufacturing processes to be more effective and efficient, as various assistive technologies have been used. In manufacturing processes such as augmented reality, virtual reality... etc, which served as auxiliary factors in the work environments of the Fourth Industrial Revolution, however, the use of these auxiliary technologies led to changes in work systems and human work in addition to the emergence of the concept of operator 4.0, and attention has been paid to Ergonomics, as one of the basic sciences in design, studies the interaction of workers - technology to improve both the efficiency of the system's performance in general and the well-being of these workers in different work environments, and working on their suitability to those environments in terms of physical and psychological social aspects. However, the use of these assistive technologies in environments Work, which has greatly influenced the modification of the status and tasks of workers in manufacturing environments, has led to the need to shift the attention of ergonomics towards focusing on improving the cognitive skills of workers in those environments to process a lot of information. This research aims to present both the concept of operator 4.0 and clarify the functions of workers and their interaction with some of those assistive technologies used in the work environments of the Fourth Industrial Revolution, and the cyber-physical systems in those interactive environments.

### ***Keywords:***

Ergonomics, Industry 4.0, Operator 4.0, Industrial Revolution 4.0 Technologies, Operator 4.0 Capabilities

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