INDUSTRY 5.0: OPPORTUNITIES AND SOCIAL CONSEQUENCES

Elsayed Fathy Mohamed Reda Ahmed, Chmykhova O.
National Technical University «Kharkiv Polytechnic Institute», Kharkiv

Industry 5.0 is intended to symbolize a new era in which technology and humanity seamlessly merge, creating a balance between efficiency and human values, aiming to develop strategies for building flexible and efficient manufacturing processes. Industry 5.0 will enable increased operational efficiency, achieve greater manufacturing flexibility, expanded product customization, and quality improvement, reduce production costs and environmental impact, enhance global competitiveness, improve workplace safety, create new high-quality jobs, and accelerate technological innovation. Industry 5.0 is characterized by a human-centric approach, in which technologies, including advanced collaborative robots, serve to enhance the quality of life for workers and citizens. Sustainable development is another pillar, based on a strong commitment to waste reduction and efficient resource utilization.

There are six categories of technologies contributing to Industry 5.0: individualized human-machine integration; biotechnologies and smart materials; digital twins and modeling; data transmission, storage, and analysis technologies; artificial intelligence; technologies for energy efficiency, renewable energy sources, storage, and autonomy. These are the technologies that Industry 5.0 will utilize to address new challenges posed by society and the environment, as well as to become a driving force of prosperity for all stakeholders [1].

Industry 5.0 presents a range of significant opportunities. These include ongoing innovations in products and processes, fostering economic growth, creating new high-quality jobs, more sustainable manufacturing, the ability to offer individualized products on a larger scale, enhancing workplace safety, utilizing advanced technologies for employee training and upskilling, and improving business resilience to better cope with market disruptions and emergencies. And conversely, there are also common concerns, such as the potential loss of jobs. Industry 5.0 may automate some so-called "routine tasks" but at the same time, it will create new jobs that require human-machine interaction. The transition to 5.0 is a transition to an advanced, technology-driven industrial model in which the adoption of digital technologies such as the Internet of Things, artificial intelligence, and robotics enhances the efficiency, resilience, and customization of manufacturing processes. Essentially, it's a step toward a highly digital and future-oriented industry. Industry 5.0 is intended to introduce a new model in which technology and humanity harmoniously blend, creating a balance between efficiency and human values. This is a vision of industry that is directed not only towards productivity but also towards the well-being of people and respect for the environment. Unlike Industry 4.0, which was a true industrial and technological revolution, Industry 5.0 is primarily a new cultural paradigm.

References:

1. Fabio De Felice. Digital Effects, Strategies, and Industry 5.0. Taylor & Francis. 2024.