Chapter 9
How Industry 5.0 Ensures Total Quality Management in Organizations

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ABSTRACT

In the era of Industry 5.0, the convergence of advanced technologies and the reimagining of traditional industrial processes have led to significant transformations in the way organizations operate. The next stage of industrial growth is known as Industry 5.0, where a dynamic and very responsive industrial ecosystem is created via the integration of cyber-physical systems, artificial intelligence, the internet of things, and human cooperation. Industry 5.0, with a focus on human-machine collaboration, acknowledges the value of human abilities, imagination, and decision-making in guaranteeing the quality of goods and services. The goal of total quality management is to improve the effectiveness and caliber of all internal processes, goods, and services inside a company. There has been a change in culture, with all staff members dedicated to client satisfaction and ongoing progress. By providing the frameworks and resources required for enterprises to meet their quality-related goals, Industry 5.0 enhances TQM.

1. INTRODUCTION

1.1 Industry 5.0

A new phase relating to the Industrial Revolution known as "industry 5.0"is characterized by the blend of human skill and creativity with robotics, the internet of things, artificial intelligence, and other cutting-edge technology 3D printing. By utilizing these technologies to enable personalized and flexible production, Industry 5.0 attain a more inclusive and sustainable society development while additionally encouraging economic (Paula Fraga-Lamas, José Varela-Barbeito & Tiago M. Fernández-Caramés (2021)

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Next Generation Auto-Identification and Traceability Technologies for Industry 5.0: A Methodology and Practical Use Case for the Shipbuilding Industry, IEEE). Industry 5.0 attain intelligent manufacturing systems that are human-centered, durable, and able to utilize real-time pervasive networks.

In other words, Industry 5.0's central theme suggests a move from emphasizing economic value to emphasizing societal worth, as well as a transition away from wellbeing instead of welfare. Resilient individualized manufacturing can be thought of having strong production stability that can withstand extremely frequent interruptions in individualized processes (Saeid Nahavandi. (2022*), Industry 5.0—A Human-Centric Solution,* Sustainability). Fifth Industrial Revolution, which computerized production with human intelligence unified and briefed is already underway even though Industry 4.0 doesn't yet reach its maximal potential due to the Internet's rapid growth and dissemination.

Automation, however, is the key. In contrast to the problem in Industry 4.0, the difference in Industry 5.0 will involve human and autonomous. The individual person will include independent and will be conscious of human desire and intention. The individual person they are sure that their robotic coworkers completely understand them and can work cooperatively with them, they will cohabit without anxiety or fear when there are robots at work. It will result in a highly efficient and value-added production process, blooming reliable independence, less waste, and fewer related costs (Pant, P., & Taghipour, A. (2023). Machine Learning and Blockchain for 5G-Enabled IIoT. In Blockchain Applications in Cryptocurrency for Technological Evolution (pp. 196-212). IGI Global). It depicts a person putting together an electro-mechanical device. Using a lens on a gimbal, a robot monitors a task that a human worker starts. The robot's eye is served by this camera. In addition, the robot linked a progression of the corresponding that uses machine learning to take an image, process it, and identify patterns.

Additionally, it observes the user, keeps an eye on the surroundings, and uses deep learning-powered human intention analysis to predict what the user will do next. As Industry 5.0 mainly describe the mix up of the human centric, resilient and sustainability towards the nature as shown in below in Figure 1. The primary lesson from this debate is that the development of the corresponding ideas, methodologies, as well as depends heavily on an accurate knowledge of Industry 5.0. to facilitate the functioning of future business and society more effectively, it is essential into fine-tune the development tracks of Industry 5.0 and from the very beginning (Ashwin Verma, Pronaya Bhattacharya, Nirav madhani, Chandan Trivedi, Bharat Bhushan, Sudeep tanwar, Gulshan Sharma, Pitshou n. Bokoro, and Ravi Sharma (2022) *Blockchain for Industry 5.0: Vision, Opportunities, Key Enablers, and Future Directions*).