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# Digital Technology Integration for Intelligent Industrial Decision-Making: An Empirical Investigation

**Parul Kashyap[1], Sunny Gaur[2], Ashu Pal[3]**
Assistant Professor, Department of Computer Science & Engineering[1,2,3]
Meerut Institute of Engineering and Technology, Meerut[1,3]
Swami Vivekanand Subharti University, Meerut[2]
parulkashyap956800@gmail.com, gaur.sunny3840@gmail.com, ashu.pal@miet.ac.in

**Abstract:** *The emergence of Industry 4.0, which is characterised by the incorporation of state-of-the-art technology developments into the manufacturing sector, has resulted in significant changes to the global industrial landscape. This thorough essay explores the key ideas, cutting-edge advancements, difficulties, and potential effects of Industry 4.0 with academic clarity and rigour. It highlights how manufacturing practices are greatly impacted by cyberphysical networks, the web, the (IoT), substantial data analysis, (AI), and contemporary robotics. The impact of Industry 4.0 on businesses, employees, consumer satisfaction, society at large, and SMMEs is also examined in the paper. The research thoroughly examines upcoming challenges, including cybersecurity vulnerabilities, data privacy concerns, and the requirement to upskill workers to adapt to shifting demands. The paper concludes with predictions on likely future trends and paths that will guide Industry 4.0's ongoing development, ushering in a new era of innovative thinking and advancement in the manufacturing sector. The quick adoption of digital technologies has drastically changed how decisions are made in contemporary industrial systems. This study uses empirical research to examine how automation, intelligent systems, and data analytics might improve the effectiveness of industrial decision-making. The influence of digital technology adoption on operational performance and resource utilisation is assessed by analysing real-world industrial data. The findings show that decision outcomes are now more accurate, responsive, and sustainable. The results offer useful information to sectors looking to use smart digital solutions for wise and efficient decision-making*

**Keywords**: Integration of Digital Technology; Intelligent Decision-Making; Industrial Systems; Data Analytics; Automation; Smart Manufacturing; Industry 4.0


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