Chapter 13
Emerging Tech Analysis of Intellectual Property and Data Ownership in Smart Factories

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ABSTRACT

Integrating emerging technologies in smart factories has ushered in a new manufacturing era. These technologies have transformed how data is generated, stored, and utilised, raising critical questions about intellectual property (IP) and data ownership. This study comprehensively analyses the challenges and implications associated with IP and data ownership within the context of smart factories. By reviewing the existing literature and conducting empirical research, this project aims to shed light on the multifaceted issues surrounding these concepts, offering valuable insights for industry professionals and policymakers.

INTRODUCTION

The Fourth Industrial Revolution brought about significant changes in the manufacturing sector, primarily characterised by the emergence of intelligent factories (Ujakpa et al., 2020). This revolutionary wave has had a profound impact on the industry. Smart factories embody the amalgamation of digital technology, automation, and data-centric operations, revolutionising the manufacturing landscape. Prominent advancements, such as the Internet of Things (IoT), artificial intelligence (AI), and big data analytics, have assumed a central role within contemporary manufacturing hubs (Mondal et al., 2022; Mondal &

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Gupta, 2023; Mukherjee et al., 2021; Singh et al., 2022). These technologies have not only enhanced production processes but they have also brought about an unparalleled data revolution. In light of the upheaval above, novel standards and paradigms have arisen to effectively cater to the industrial sector's distinctive requirements. The conventional methods and production frameworks are being replaced by a dynamic ecosystem of networked gadgets, wherein intelligent machines engage in continuous communication and collaboration (Bhat et al., 2019; Park et al., 2014).

The advent of intelligent factories requires reconsidering the conceptualisation, regulation, and safeguarding of intellectual property (IP) and data ownership (Chu et al., 2020; Custers & Heijne, 2022). The disruptive nature of these technologies has caused manufacturers to reassess fundamental assumptions regarding property rights, leading to a transformation in accepted standards. The continuous influx of data from machines, sensors, and other gadgets presents a growing difficulty in determining the delineations of rights and obligations regarding data ownership and intellectual property. The process of transitioning is not without its complexities. Incorporating artificial intelligence (AI) algorithms that provide novel ideas and the protection of exclusive manufacturing data are among the challenges and intricacies presented by smart factories' intelligent and data-intensive settings. Smart factories driven by data present distinctive issues regarding intellectual property (IP) and data ownership. This work aims to thoroughly examine these issues, identify their consequences, and elucidate possible remedies. In pursuit of this objective, the study combines the knowledge acquired via empirical inquiries with a comprehensive analysis of relevant scholarly sources and practical instances derived from the industrial sector. The study aims to provide decision-makers, professionals, and industry leaders in intelligent manufacturing with practical insights by simplifying the intricate intellectual property and data ownership concepts (Mardani et al., 2015). The intricate dynamics of intelligent manufacturing facilities emphasise the imperative of conducting a more thorough examination of the intricate relationship between technology, data, and intellectual property. The current digital transformation, supported by the Internet of Things (IoT), artificial intelligence (AI), and big data analytics, has sparked a significant change in intelligent manufacturing facilities, commonly called smart factories. These technologies are the foundation for the transition towards intelligent and data-centric manufacturing. The transformation above, albeit highly impactful, has presented many obstacles that manufacturers must effectively negotiate. Smart factories heavily depend on data-driven processes, encompassing various activities such as real-time machinery monitoring and predictive maintenance.

The significant dependence on data streams highlights the pressing need to tackle data ownership and governance concerns. The ownership of data generated by machines and the legal uses thereof are subjects of inquiry. Intellectual property rights (IPRs) Smart factories are data generation sources and innovation centres. Using artificial intelligence, machine learning, and robotics in these establishments has resulted in the development of inventions generated by machines. It necessitates a reassessment of the applicability of intellectual property rights to these innovative inventions. The safeguarding of critical manufacturing data is a significant concern for manufacturers. Protecting proprietary data from breaches or unauthorised access is paramount in a highly networked ecosystem. As we explore the complexities in greater depth, our research aims to furnish a comprehensive guide for manufacturers, policymakers, and industry stakeholders. By simplifying the intricate aspects of intellectual property (IP) and data ownership, our objective is to provide individuals responsible for guiding the direction of intelligent manufacturing with the knowledge necessary to make well-informed choices. Because of how quickly things are changing, our research predicts that useful findings will come to light that will change the course of intelligent manufacturing and make sure that data and intellectual property are handled ap-