STUDY OF INDUSTRY 4.0 IMPLEMENTATION IN MANUFACTURING COMPANIES

Abstract

Industry 4.0 (I4.0) is evolving because of its potential effects on society, economy, and manufacturing. In response, most of the organizational functions have been digitalized and automated, enhancing speed, dependability, flexibility, and agility while cutting costs. Industrial organizations expect I4.0 to transform supply chains, business models, and operations. Still, most organizations fail to implement I4.0 owing to digital transformation ignorance and direction. Thus understanding I4.0 adoption drivers and how they might help stakeholders achieve sustainable organizational performance (SOP) is very crucial.

In this study, the first exploratory case study demonstrates that I4.0's Key Success Factors (KSFS) are internet infrastructure and technology. Study results reveal that I4.0 adoption requires a reliable internet network, low latency, and seamless connectivity. The second exploratory case study found prominence and receiver Key Performance Indicators (KPIs) favor information security and cost. Also concludes that Technological and social risks impact I4.0 adoption (I4A).

The study further conducted a survey of 225 manufacturing organizations with 280 respondents from different regions of India covering a wide range of manufacturing sectors. Structural Equation modeling is employed shows show that the identified drivers of I4A, Dynamic Capabilities (DC), and Circular Economy Practices (CEP) are positively associated with I4A, DC, and CEP. Additionally, it has been demonstrated that there is a positive association between I4A and SOP, I4A and DC, DC and CEP, and CEP and SOP. Beyond that, the study also arrived at an intriguing conclusion, such as the idea that DC and CEP integration is a key mediating construct that positively mediates the association between I4A and SOP.

The study recommends that I4.0 practitioners and policymakers create internet network infrastructure norms and coordinate technological infrastructure rollout to satisfy roadmap and strategic plan needs for I4A. This research encourages managers, stakeholders, and policymakers to create long-term plans to avoid technological and social risks and ensure I4.0's success and practicality. Configuring the DC and CEP resources and capabilities to meet the SOP target may encourage companies to evaluate their readiness for I4.0. This will help researchers, managers,

and policymakers confront the dynamic nature of business. This study is, therefore, the first of its kind and offers a distinctive contribution to the literature and practitioners.

Keywords: Fourth industrial revolution, Sustainability, Drivers, Dynamic Capabilities, Circular Economy Practices