

## **Industry 4.0 Adoption in Manufacturing Industries in SME sector: Opportunities and Challenges**

**Rashmi Prava Das**

Computer Science and Engineering  
CV Raman Global University  
Bhubaneswar, India  
[rashmidas3@gmail.com](mailto:rashmidas3@gmail.com)

**Kamalakanta Muduli**

Associate Professor in Mechanical Engineering  
Papua New Guinea University of Technology  
[kamalakantam@gmail.com](mailto:kamalakantam@gmail.com)

**Sardar M.N. Islam**

Professor of Artificial Intelligence  
Victoria University  
Sydney, Australia  
[sardar.islam@vu.edu.au](mailto:sardar.islam@vu.edu.au)

### **Abstract**

Recent problems and projected future challenges require an increased integration of digital technologies and smart manufacturing methods in addressing issues. In this regard, industry 4.0, which combines information collection, storage, and analysis, has enabled intermachine communication, flexibility, and operational efficiency at a reduced cost. Although this technology comes with increasing opportunities in various sectors, there are still some limitations to its full adoption. Therefore, this paper focuses on the present manufacturing technologies associated with industry 4.0 to highlight the opportunities they present, challenges encountered in their implementation and the readiness of industries and small-scale businesses towards its adoption. Unfortunately, no paper or research work has discussed and reviewed these issues of Industry 4.0 and the associated technologies in an integrated way. Therefore, this paper makes an original contribution to the literature on Industry 4.0.

**Keywords:** AI, Big data, Industry 4.0, IoT, Manufacturing system