


# Chapter 4

## Artificial Intelligence Applied to Project Management in the Industry 4.0 Concept: An Overview of the Bibliometric Analysis Using the Scopus Database

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### ABSTRACT

*Industry 4.0 transformation depends on a set of key technologies that apply across the entire industrial value chain, from the physical shop floor level to the virtual and informational levels. Furthermore, there is a growing awareness of the complementarity of skills between humans and machines and the opportunity to promote human-centric solutions, which is one of the core principles of the emerging Industry 5.0. In this sense, the purpose of this chapter is based on an overview of the use of artificial intelligence in project management in the 4.0 approach. The scope of the study is a bibliographical analysis using the Scopus database in the concepts as artificial intelligence (AI), project management (PM) and Industry 4.0 to identify better AI techniques and their interfaces in PM within the 4.0 concept.*

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## **1. INTRODUCTION**

The 4th Industrial Revolution, also known as Industry 4.0, is a powerful impetus brought about by the widespread adoption of innovative technologies. In this new scenario, machines replace human beings in certain tasks, or even create new tasks with greater efficiency. The consequences of the Fourth Industrial Revolution are profound, affecting both society and organizations, and driving changes of great magnitude (Cabeças & Da Silva, 2020).

According to Cakmakci (2019), Industry 4.0 brings the maturation of all innovations in digital technology. These innovations encompass advances on the internet, artificial intelligence (AI) and robotics, advanced sensor technology, cloud computing that accelerates the transfer and use of data, digital fabrication (3D printing), new services and marketing models, smartphones and algorithms for navigation tools, delivery services and autonomous transport. In the same vein, Cabeças and Da Silva (2020) point out that robots, artificial intelligence, Internet of Things (IoT), Big Data, quantum computing and quantum communications are the engines of this transformation.

Rana and Rathore (2023) declare that industrial revolutions have always influenced other sectors since the first industrial revolution. “Industry 4.0, in particular, has impacted the ecosystem of industries, where the focus is on the development of cyber-physical systems. The goal of Industry 4.0 is to build “smart” machines that can predict and make intelligent decisions. Industry 4.0 applications are seen in various sectors such as health, agriculture, wood, food and education. It has driven not only these sectors, but also new concepts such as Smart Materials, Agriculture 4.0, Health 4.0, Intelligent Operators 4.0, and many others that have emerged in literature.

The furniture sector also points out that the implementation of Industry 4.0 promotes agile transformations, resulting in an increase in operational efficiency between 30% and 50%. This is accompanied by the reduction of communication flows, errors and repetitive tasks, directly contributing to the achievement of sustainable production (Cervený; et al., 2022).

In the evolutionary scope of Industry 4.0, where machine learning and machine-to-machine technology play powerful roles in the preservation and replication of knowledge, the adoption of AI-based hybrid systems emerges as a key element to drive organizational innovation and make the most of intellectual capital (Manuti & Monachino, 2020).

AI emerges as one of the main megatrends in the context of the Fourth Industrial Revolution. It is worth noting that these technologies offer the promise of business sustainability and enhancement of product and process quality. However, the constantly changing market demands, the complexity of involved technologies, and legitimate

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