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The most commonly used Industry 4.0 technologies in manufacturing: A systematic literature review

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ABSTRACT

Industry 4.0 presents a modern concept in production management that applies digital technologies and enables more efficient and faster production with minimal waste. This paper presents the concept of Industry 4.0, its development over the years, and related technologies for digitalization and automation of production management. A comprehensive systematic literature review based on the scholarly database Scopus was conducted, using VOSviewer software, along with additional analysis of selected articles by the authors of this paper. The main objective of the paper is to define the technologies most applied in production management and their importance and impact on production. Based on these results, the most important and commonly applied technologies in the manufacturing industry are defined: the Internet of Things (IoT), Artificial Intelligence (AI), and Big Data (BD). This paper highlights the advantages, disadvantages, and potential improvements of each technology in manufacturing companies. The intention of this article is to highlight the importance of applying technologies for digitalization and automation, as well as the concept of Industry 4.0, in manufacturing companies through the presentation of the literature review results. This paper is of high importance for manufacturing companies and managers in supporting decision-making regarding the application of technologies for digitalization, automation, and business improvement.

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Keywords:
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Najpogosteje uporabljene tehnologije Industrije 4.0 v proizvodnji: sistematični pregled literature

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POVZETEK

Industrija 4.0 je sodoben koncept vodenja proizvodnje, ki temelji na uporabi digitalnih tehnologij ter omogoča učinkovitejšo in hitrejšo proizvodnjo z minimalnimi izgubami. Prispevek predstavlja koncept Industrije 4.0, njen razvoj skozi čas ter povezane tehnologije za digitalizacijo in avtomatizacijo vodenja proizvodnje. Izveden je bil celovit sistematični pregled literature na podlagi znanstvene podatkovne baze Scopus, pri čemer je bila uporabljena programska oprema VOSviewer, avtorji pa so opravili dodatno analizo izbranih znanstvenih člankov. Glavni cilj prispevka je opredeliti tehnologije, ki se najpogosteje uporabljajo pri vodenju proizvodnje, ter ovrednotiti njihov pomen in vpliv na proizvodne procese. Na podlagi dobljenih rezultatov so kot najpomembnejše in najpogosteje uporabljene tehnologije v predelovalni industriji opredeljeni internet stvari (IoT), umetna inteligenca (AI) in veliki podatki (BD). Prispevek izpostavlja prednosti, slabosti ter možnosti nadaljnjih izboljšav posameznih tehnologij v proizvodnih podjetjih. Namen članka je poudariti pomen uporabe tehnologij za digitalizacijo in avtomatizacijo ter koncepta Industrije 4.0 v proizvodnih podjetjih na podlagi rezultatov sistematičnega pregleda literature. Prispevek je pomemben za proizvodna podjetja in vodstvene kadre, saj podpira odločanje pri uvajanju tehnologij za digitalizacijo, avtomatizacijo in izboljšanje poslovanja.

PODATKI O ČLANKU

Ključne besede:
Industrija 4.0;
Pametna proizvodnja;
Umetna inteligenca;
Internet stvari (IoT);
Veliki podatki;
Digitalizacija;
Uvajanje tehnologij;
Sistematični pregled literature

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