EasyChair Preprint

№ 13934

AI and Future Work – Bibliometric Research

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July 11, 2024

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Abstract: IT technology and more recently Artificial Intelligence have led to radical changes in the labour market. There are an increasing number of professions that have disappeared or are on the verge of extinction. As new technologies are integrated into organizations, this process of change in the labour market accelerates. According to an analysis by the IMF (International Monetary Fund), in advanced economies, about 60% of jobs can be affected by AI. About half of exposed workplaces can benefit from AI integration, boosting productivity. For the other half, AI applications can execute key tasks currently performed by humans, which could reduce labour demand, leading to lower wages and reduced hiring. In the most extreme cases, some of these jobs may disappear. In this complex landscape, the article aims to analyse the main references on the research area using bibliometric research.

Key words: HR, future of work, AI, bibliometric research

JEL classification: M10

Introduction

The rapid advancement of artificial intelligence (AI) is poised to transform the future of work significantly. AI technologies, encompassing machine learning, natural language processing, and robotics, are reshaping various industries by automating tasks, enhancing productivity, and creating new job roles. This literature review employs bibliometric research to analyse the current state of AI's influence on the future of work, identifying key trends, influential studies, and emerging themes.

Literature review

This review is based on a bibliometric analysis of scientific literature retrieved from databases such as Web of Science and Scopus. The keywords used in the search included "artificial intelligence," "future of work," "automation," "job displacement," and "workplace transformation." The Bibliometrix R package was employed to conduct the analysis, providing insights into publication trends, citation patterns, and collaboration networks (Aria & Cuccurullo, 2017).

The bibliometric analysis indicates a substantial increase in publications on AI and the future of work over the past decade. This rise reflects growing academic and industry interest in understanding and addressing the implications of AI on employment and workplace dynamics. The annual growth rate of publications in this field suggests a heightened awareness of the transformative potential of AI technologies and their socio-economic impacts (Manyika et al., 2017).

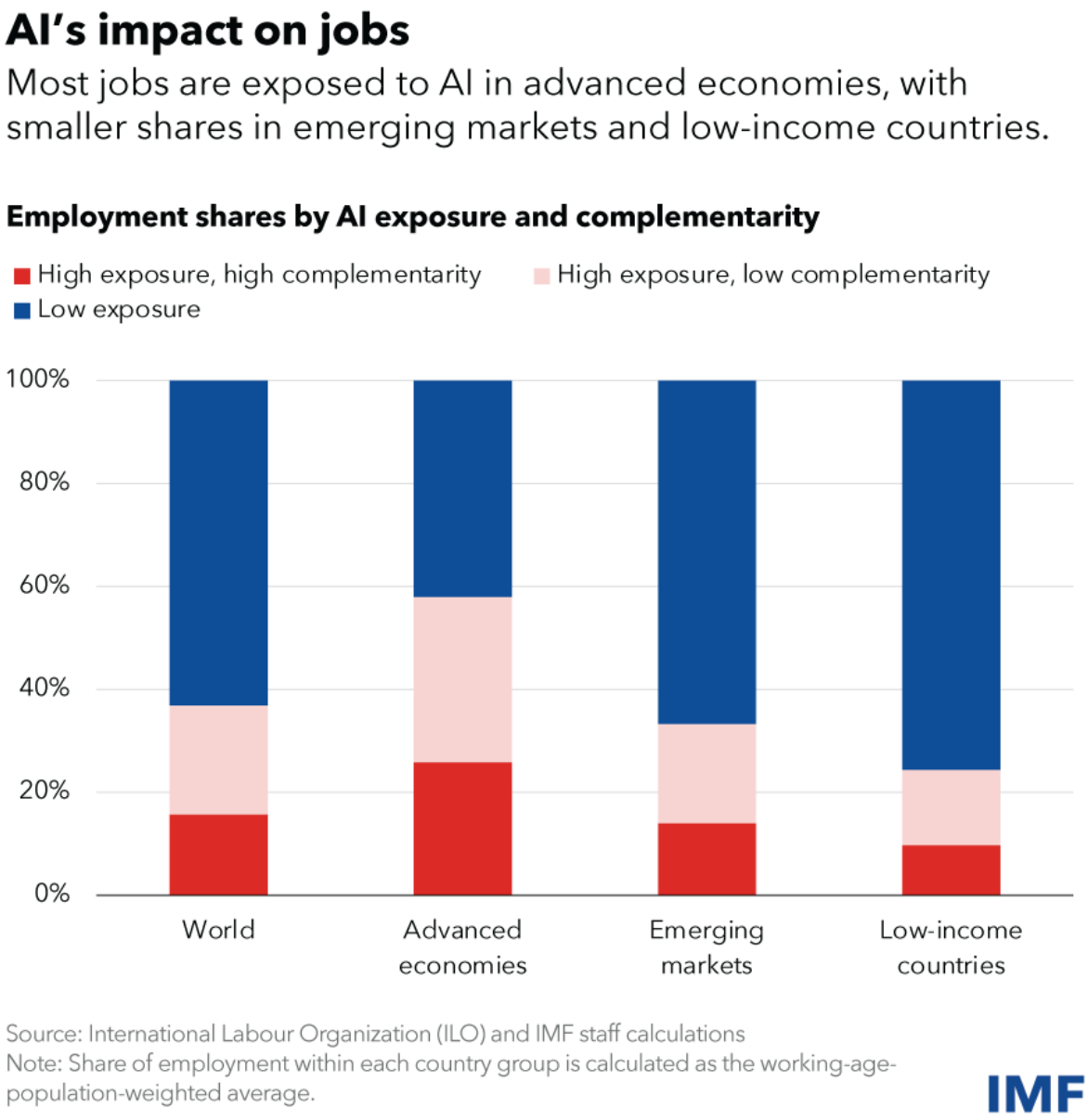

Fig. 1. AI's impact of job
Source: IMF

One of the most extensively researched themes is the potential for AI to automate jobs and the subsequent displacement of workers. Studies have highlighted that while AI can significantly enhance efficiency by automating routine and repetitive tasks, it also poses a risk to certain job categories, particularly those involving low-skilled labour. Frey and Osborne (2017) estimate that approximately 47% of total US employment is at risk of automation.

Conversely, AI is also seen as a driver for new job creation, particularly in sectors requiring advanced technological skills and creativity. The literature emphasizes the need for a workforce equipped with digital literacy and proficiency in AI-related fields. Bessen (2019) argues that AI will lead to the emergence of new professions and industries, necessitating continuous learning and adaptation by the workforce.

Another significant theme is the transformation of workplaces through AI integration, leading to enhanced human-AI collaboration. AI tools are increasingly used to augment human capabilities rather than replace them, fostering a collaborative environment where AI handles data-intensive tasks while humans focus on strategic decision-making and creative problem-solving (Brynjolfsson & McAfee, 2014).

The bibliometric analysis identifies several highly cited studies and influential authors in the field. Key contributions include Brynjolfsson and McAfee's work on the "second machine age," which explores the economic implications of digital technologies and AI (Brynjolfsson & McAfee, 2014). Another seminal work by Frey and Osborne (2017) provides an in-depth analysis of job susceptibility to computerization, significantly influencing subsequent research on AI and employment.

The analysis of collaboration networks reveals a strong interconnection among researchers from diverse disciplines, including computer science, economics, and sociology. These interdisciplinary collaborations are crucial for comprehensively understanding the multifaceted impacts of AI on the future of work. Notable collaborations include partnerships between academic institutions and industry leaders, facilitating the translation of research findings into practical applications and policies (Acemoglu & Restrepo, 2018).

Recent literature increasingly addresses the ethical and social implications of AI in the workplace. Issues such as bias in AI algorithms, privacy concerns, and the need for transparent AI systems are gaining prominence. Researchers advocate for the development of ethical guidelines and policies to ensure that AI deployment in the workplace promotes fairness and inclusivity (Crawford et al., 2019).

The role of policy and governance in managing the transition to an AI-driven workforce is another emerging trend. Governments and organizations are called upon to implement policies that support workforce reskilling, provide social safety nets, and promote equitable access to AI technologies. This trend underscores the importance of proactive measures to mitigate potential negative impacts of AI on employment (Bessen, 2019).

Table 1. Elements of bibliometric research

Step	Explanation
1	Extract relevant article from Web of Since
2	Key Words: Artificial Intelligence, Future of Work
3	Import in Bibliometrix, a package for R statistic and R Software

Source: Authors

Methodology & results

The bibliometric analysis also identifies several influential works and researchers contributing to this field, providing a roadmap for future research directions. Trends in citation patterns suggest that collaborative efforts between academia and industry are crucial for advancing practical AI applications in data centers. Moreover, the research emphasizes the necessity for standardized metrics and benchmarking tools to assess the efficacy of AI interventions. As data centers continue to expand globally, driven by the proliferation of cloud computing and big data, the role of AI in mitigating their environmental impact becomes increasingly critical. This bibliometric research not only underscores the current contributions of AI but also paves the way for future innovations aimed at sustainable energy management in data centers.

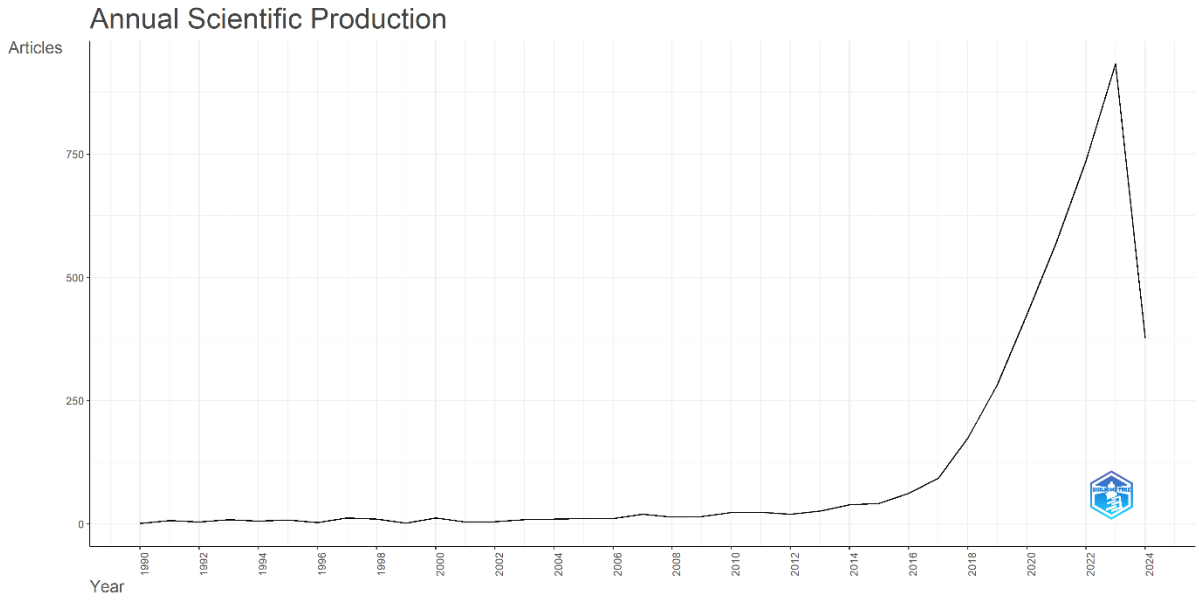

Fig. 2. Annual scientific production of articles.
Source: Authors – Bibliometric analyse

Exclusively open source software was used to perform the bibliometric analysis, namely the R statistical software and the bobliometric analysis package – Bibliometrix.

R is a comprehensive, open-source programming language and software environment designed primarily for statistical computing and graphics. Developed by Ross Ihaka and Robert Gentleman in the early 1990s, R has evolved into one of the most widely used tools for data analysis and visualization (Ihaka & Gentleman, 1996).

Bibliometrix offers a wide range of functionalities that facilitate detailed bibliometric studies. These include citation analysis, co-citation analysis, and keyword co-occurrence analysis, which are crucial for identifying research trends, influential works, and collaboration networks. The package also supports advanced network analysis and provides various visualization techniques to help researchers understand the structure and dynamics of scientific fields (Aria & Cuccurullo, 2017).

The package is designed to handle data from major bibliographic databases such as Web of Science and Scopus. It allows users to import, clean, and preprocess large datasets, making it easier to conduct comprehensive analyses. Bibliometrix provides tools for descriptive analysis of bibliographic data, including the evaluation of publication and citation counts, h-index, and other bibliometric indicators (Aria & Cuccurullo, 2017).

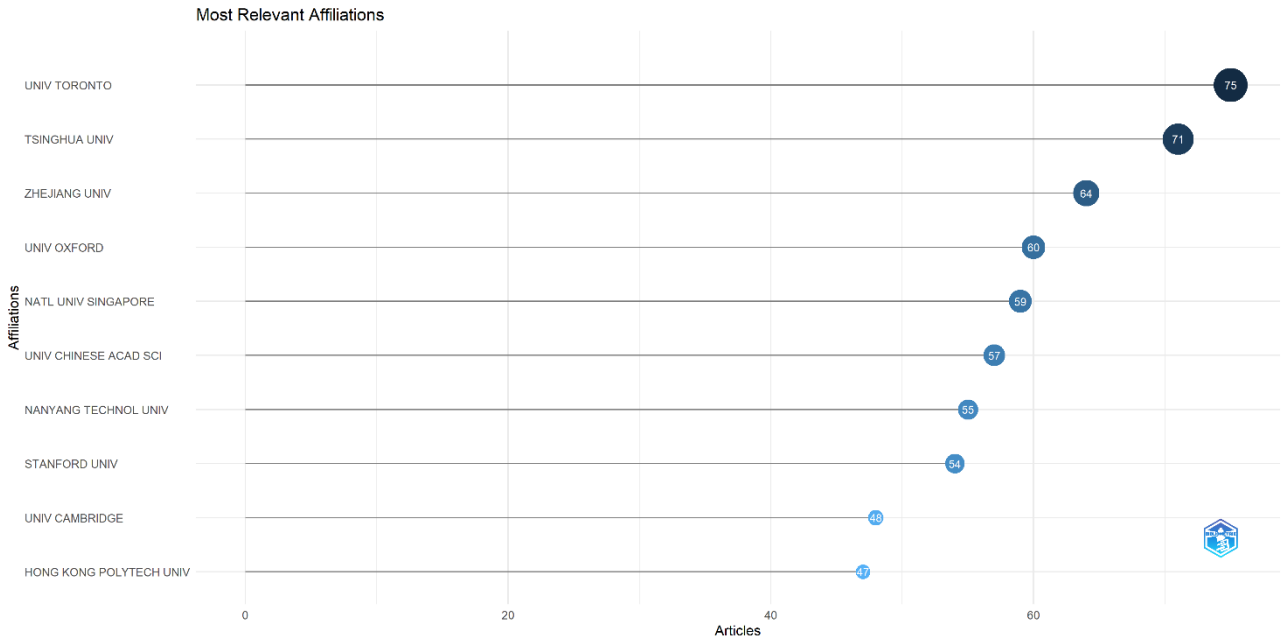

Fig. 3. Most relevant affiliations.
Source: Authors – Bibliometric analyse

One of the key strengths of Bibliometrix is its robust visualization capabilities. It can generate various types of plots and maps, such as conceptual structure maps, thematic evolution maps, and collaboration networks. These visualizations are instrumental in revealing patterns and trends in research activity, helping scholars to identify key areas of focus and potential gaps in the literature (Aria & Cuccurullo, 2017).

Bibliometrix is widely used across various fields for conducting bibliometric analyses. In medical research, for example, it has been employed to analyze trends in cardiovascular disease studies, revealing the most influential papers and emerging research topics (Donthu et al., 2021). In environmental science, it has been used to map the development of research on climate change, identifying key contributors and collaborative networks (Li et al., 2020).

According to the bibliometric analysis, it is a relatively recent topic but with large number of article (more than 5000 articles on the Web of Science in the past five years). From fig. 2 it can be seen that practically the production of articles has registered an exponential evolution since 2018. Also, the most prolific universities for this field are the University of Toronto, followed by two universities in China.

Conclusions

The bibliometric analysis highlights the dynamic and evolving nature of research on AI and the future of work. While AI presents opportunities for enhancing productivity and creating new job roles, it also poses challenges related to job displacement and ethical concerns. Continued interdisciplinary research and collaboration are essential to navigate these complexities and harness the benefits of AI while mitigating its risks. The findings underscore the need for policies and strategies that support workforce adaptation and ensure that the future of work is inclusive and equitable.

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