Artificial Intelligence and Organizational Stress: Bibliometric Analysis

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Abstract

Artificial intelligence (AI) is an emerging technology. In recent years, organizations are increasingly using or considering the use of AI applications. This brings both considerable benefits and significant challenges for employees and organizations. This article examines the influence of AI on human resources in the organisation, highlighting both positive and negative impacts. The study includes a bibliometric analysis of the literature using Google Scholar scientific publications from 2014 to 2024 on Artificial Intelligence and stress, identifying key areas where AI may be a determinant of stress.

Key words: artificial intelligence, human resources, bibliometric analysis, stress
J.E.L. classification: M15, O15

1. Introduction

Technology has always played a crucial role in the development of societies and in the transformation of business environments. A recent example of technological challenge and innovation is artificial intelligence (AI), which is revolutionizing the concept of business productivity. From automation and machine learning to natural language processing and augmented reality, AI is starting to fundamentally change the way companies create and manage activities. The use of AI has varied purposes, from augmenting human capabilities and automating repetitive tasks to generating predictions and recommendations.

Artificial intelligence (AI), as it is understood in today's organizational context, encompasses a set of technologies designed to replicate human cognitive processes, thus enabling improved problem-solving and task execution capabilities. More specifically, AI can be defined as a suite of interconnected technologies geared towards performing tasks or solving problems that, when driven by humans, require cognitive processes. These include capabilities such as machine learning algorithms for recognizing patterns in large datasets, natural language processing tools for text mining and classification, and decision support frameworks that augment human decision-making abilities. Most studies on AI have focused on its potential benefits, such as optimizing operations, increasing productivity, boosting innovation, and facilitating decision-making processes.

It represents a huge potential for human progress. The technology offers significant opportunities to understand and solve some of the biggest challenges we face. Focusing on ethical AI and integrating it appropriately into the workforce are key approaches to building trust and overcoming current perceptions of this emerging technology. It is important to recognise that technology exists to improve the quality of life of employees, not to create stress and anxiety.

2. Literature review

According to a recent report from Gartner, senior executives view data analytics and artificial intelligence (AI) as key transformational enablers that enable companies to survive crises. Despite the excitement about the potential of AI, there is currently substantial academic discussion about the barriers to its adoption, as well as the skills needed to achieve useful strategic outcomes. AI can bring

significant benefits to companies, but to deploy AI effectively and achieve major impact without undoing all the costs and effort involved, organizations need to define a compelling shared vision when fundamental change is needed. Companies also need to utilize various distinctive technologies, such as AI, to build adaptive transformations and understanding and response capabilities that will drive innovation, improve customer service and experience, and promote superior performance.

According to a study by the American Psychological Association (APA), the use of Artificial Intelligence (AI) and monitoring technologies in the workplace can reduce employee comfort, decrease employee efficiency, and diminish confidence in their professional abilities.

Artificial intelligence anxiety is a new term, introduced by a marketing agency and already popularised on social media, describing the stress and worry generated by the rapid advance of artificial intelligence technology.

Even technology experts have been surprised by the recent rapid growth of new technologies capable of replacing human conversations in multiple languages, creating music and facilitating medical diagnosis. While the potential benefits of artificial intelligence in areas such as healthcare are remarkable, the accelerating pace of change creates considerable uncertainty about the future. This uncertainty can fuel concerns about the impact on individual careers, data privacy, safety and the influence of intelligent robots on human creativity and innovation.

Anxiety about artificial intelligence often stems from this uncertainty, such as concerns about AI's potential to generate fake videos or spread misinformation, contributing to polarised public opinion. Some AI-generated content can also provoke negative emotional reactions among employees. F

These feelings are not new; similar concerns about technological advances, such as 'computer phobia', 'computer anxiety' and 'technology stress', have been around since the 1980s. In many ways, AI anxiety can be compared to the environmental anxiety felt by many young people in the face of climate change. Like environmental degradation, rapid digitisation is the result of human activity, and many employees now feel that both phenomena are developing.

Excessive worrying can disrupt activities within the organisation and contribute to health problems, while preventing recognition of the positive effects of evolving artificial intelligence. Employees can benefit from AI's capabilities while at the same time feeling threatened by its demands, thus exacerbating symptoms of stress.

Technostress refers to the stress people experience due to their inability to cope with new technologies. Tarafdar et al. extended the technostress theory to explain how technology can lead to role overload, invasion of privacy, role ambiguity and job insecurity, which are significant stressors in the context of AI adoption. Employees can feel overwhelmed by the demands of continuous learning and the rapid pace of technological change. In the context of workplace stress and physical health, sustained periods of stress not only deplete psychological resources but also, over time, erode physical vitality, leading to pronounced declines in physical health.

3. Research methodology

This article explores the Artificial Intelligence - stress relationship. The integration of Artificial Intelligence into organisational environments can cause stress to human resources through rapid change in work processes and pressure to adapt skills to new technological requirements. Also, concerns about data security and the consequences of automated decisions can contribute to organisational tensions and increased stress. Stress associated with AI can have significant mental health consequences. Anxiety, burnout and other mental health problems can arise as a result of constant pressure and job insecurity.

One of the frequent research methodologies for analyzing an extended topic and tracking its evolution over a period of time (2014-2024) is bibliometric analysis. In this context, such an analysis is carried out based on the publications available on Google Scholar from 2014-2024.

To scan the existing literature, two key concepts were considered: "artificial intelligence" and "stress". The bibliometric analysis was performed using VOSviewer software, version 1.6.15, a free tool used for creating and viewing bibliometric maps. VOSviewer is increasingly popular among business and management researchers for conducting systematic reviews, either as a single tool or in combination with other methods.

The results obtained from WoS (Web of Science) containing complete records were exported to VOSviewer and used as a data source for generating new maps. Text data was used to construct term co-occurrence networks, and bibliographic data served to create keyword co-occurrence networks. The study presented a bibliometric analysis of the scientific literature related to artificial intelligence and stress, identifying the relationships between these two fields.

4. Findings

The Google Scholar search using the terms "Artificial Intelligence" and "stress" identified a total of 1000 publications. These data were imported into VOSviewer to allow the construction of bibliometric maps, thus supporting further analysis. All figures presented in this section were generated using the VO tool

For the entire analyzed time interval (2014–2024), the "text data-based term co-occurrence map" (Figure 1) identified 433 elements, distributed in 40 clusters. These generated 1827 laws and a total power of laws of 2174. Among the most significant elements within these clusters are:

- Cluster 1 (21 items): artificial intelligence, decision tree, engineer, stress level, stress recognition, task;
- Cluster 2 (18 items): artificial intelligence, biomarker, opportunity, stress condition, stress levels, usability;
- Cluster 3 (16 items): abiotic stress management, learning, model plant stress, psychological stress;
- Cluster 4 (25 items): artificial intelligence, big-data analysis, big data integration, data source, work stress;
- Cluster 5 (21 items): artificial intelligence, digital measurement, effort, employee stress, maximum stress, strong stress;
- Cluster 6 (9 items): axial stress, combination, computing power, deep learning algorithm, masonry building, traditional method;
- Cluster 7 (8 items): artificial intelligence method, cardiac activity, healthy subject, help, human daily life activity, physiological stress;
- Cluster 8 (7 items): artificial intelligence robotics utilization, burnout, relationship, wellbeing.
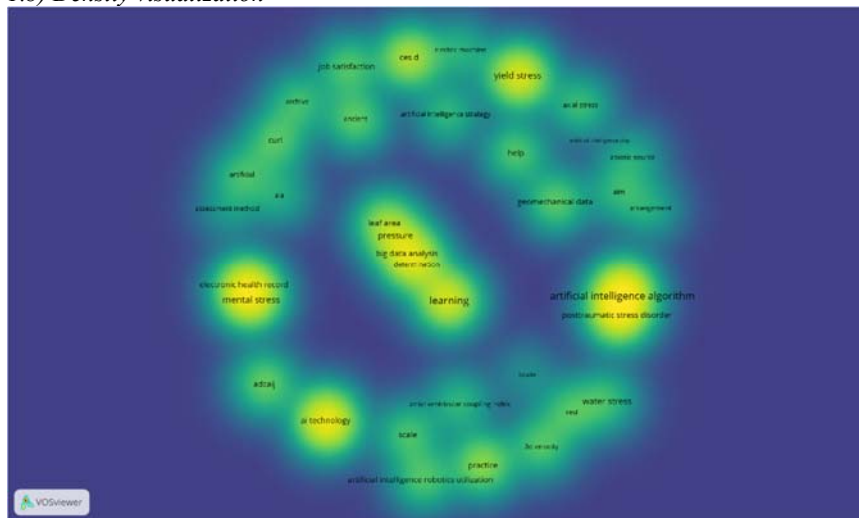
Figure no. 1 Co-occurrence map of terms based on text data (2014- 2024)

1.a) Network visualization
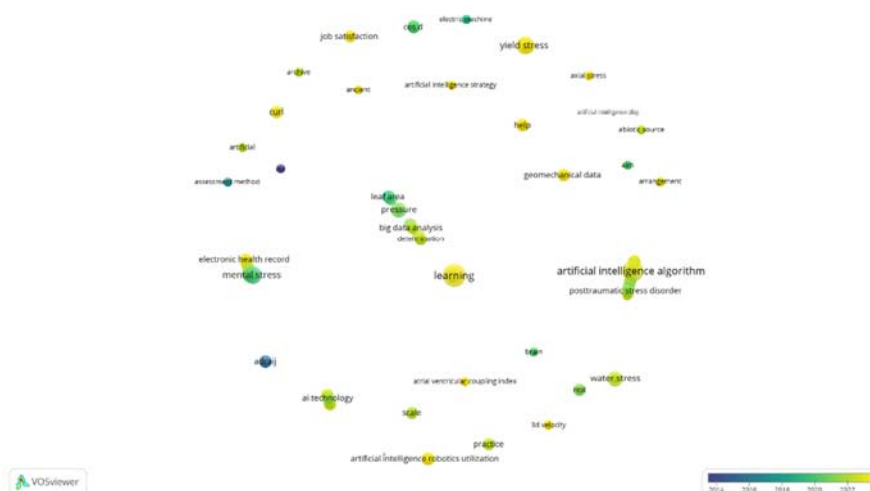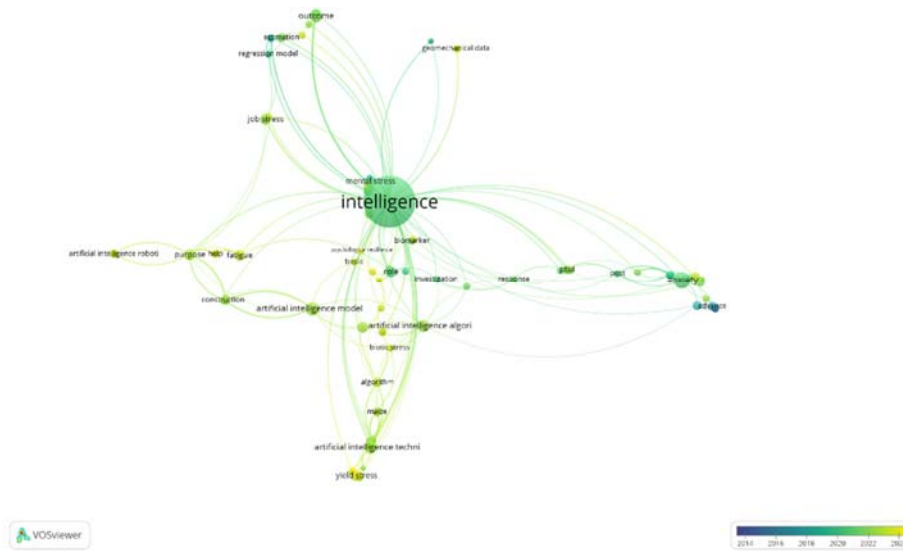
1.b) Density visualization

Source: Developed by the authors

The term co-occurrence map is a useful tool in text analysis that visualizes the relationships and frequencies of co-occurrences of specific terms. Making such a map between the terms 'stress' and 'artificial intelligence (AI)' provides valuable insights into the interactions and mutual influences between these concepts. Each dot represents a term, and the intensity of the colour (green to yellow) indicates the frequency of occurrence and connections with other terms. The key term and connection 1 is represented by the AI algorithm and is connected with the term post-traumatic stress disorder.

The geographical distribution of literary works, presented in figure 2, shows that a significant proportion of the publications are made in China.

Figure no. 2. Production of articles by authors
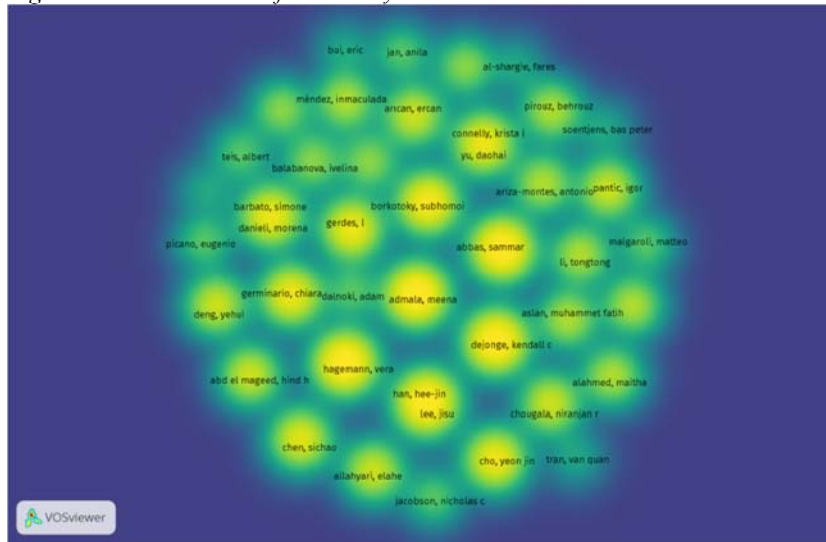
Source: Developed by the authors

Figure 2 shows the relationships between authors who have collaborated or been mentioned together in research papers on the topics of 'stress' and 'artificial intelligence (AI)'. Areas with more intense colours (yellow) indicate the centre of frequent collaboration between authors. These areas suggest groups of researchers who frequently collaborate and have a significant impact in the field studied (e.g. Sammar Abbas and Kendall de Jong are highlighted as the centre of collaborative networks, suggesting a leading role in research on stress and Artificial Intelligence). Artificial Intelligence (AI), one of the most transformative technologies of the 21st century, influences multiple aspects of daily life and professional activities. While AI promises efficiency, accuracy and innovation, its impact on mental health and stress is a growing concern. This can also be seen from the bibliometric analysis conducted.

5. Conclusions and forecasts

In the analysis performed, we grouped the keywords and used them to identify the relevant articles, obtaining the following results: Artificial Intelligence brings innovation and efficiency in various fields, but its impact on employee stress and mental health cannot be ignored. It is essential that organizations manage these impacts through appropriate policies, retraining programs and psychological support, thus ensuring a balanced and healthy work environment for employees. Recognising and addressing these issues can contribute to a smoother transition to a digitised economy and a harmonious integration of AI technology into working life. Continued research into the relationship between Artificial Intelligence and organisational stress will bring significant benefits in the future. They will not only help to gain a deeper understanding of the impact of technology on employee mental health, but will also provide practical solutions to create healthier and more productive work environments.

Research should highlight that Artificial Intelligence relies on collaboration with humans to improve the workforce, not replace it. However, it is important to talk about the benefits of AI and to develop strategies to develop AI towards benefits for society. The advancement of digital technologies involving wearable devices, smartphone apps and machine learning and AI offers a unique opportunity to accelerate the field of stress research and use AI for evidence-based care. These complementary approaches could provide the tools to identify a multidimensional longitudinal measure of employee stress response in an organizational setting..

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