

AI AND DECISION MAKING PROCESS: EXPLORING RESEARCH AND THEORIES

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Abstract: *The importance of technology to the decision-making process is already high, with artificial intelligence playing an increasing role. Due to the advantages of using AI in the decision-making process, more and more companies are incorporating it. Increased accuracy, faster decision making, improved efficiency, better risk assessment and mitigation, data-driven insights, are some of the valuable benefits for decision makers, but companies must also consider the challenges they must face with AI integration. While the AI-informed decisions are increasing, fully autonomous AI decisions are still an exception. Decision makers using the same AI recommendations may make different decisions, so personal human involvement is still important. The AI's power today is obvious, the companies must strive to have more advanced AI, but at the same time the human decision-maker will be the one to decide which decisions will be made completely by AI and which with the help of AI. More than that, companies must develop strategies for how and when to use AI tools. This study aims to analyze the interest of specialists in investigating topics related to artificial intelligence in decision making. To carry out the study, we investigated the specialized literature from the Scopus database, in the period 2015-2025. The software applications we used were Microsoft Excel and VOSviewer. The major objective of the performed analysis is the research of the scientific productivity of the literature focused on the subject we investigated.*

Keywords: *artificial intelligence; decision making; AI-informed decision; fully autonomous AI decision; benefits; challenges.*

JEL classification: M50; M54.

1. Introduction

Artificial intelligence (AI) represents one of the most important technological revolutions of our century, having a direct impact on the way we live, work and interact. AI has a great capacity to analyze huge volumes of data in a very short time, to take over repetitive or complex tasks, to personalize information and provide solutions for each user. Therefore, AI becomes an engine of competitiveness, helping companies reduce costs, optimize processes and create added value for society. Given the rapid and continuous changes, organizations that adopt artificial intelligence certainly become more adaptable. Demographic changes and the lack of qualified personnel have led global corporations to reevaluate their business practices to achieve efficiency and remain competitive. (Roppelt et al., 2025)

In a constantly changing world, the ability to make informed, balanced and ethical decisions is one of the most important skills of any manager. The success of a business is never accidental, but is the result of good decisions, made in a competitive and often unpredictable environment. Therefore, decision-making is an essential process that influences the future of the entire organization, both in an international corporation and in a small business. As the foundation of economic performance, decisions directly influence the profitability and sustainability of a business. Theoretically, the manager must analyze all the options and choose the optimal option. In practice, it is difficult, if not impossible, for the decision maker to analyze all the options. Moreover, the decision maker is not completely rational. Decisions are affected by cognitive biases, such as: anchoring - the first information received is of great importance, overconfidence bias - exaggerated confidence in one's own knowledge, loss aversion - the fear of losing is stronger than the desire to win. (Kahneman, 2015) In addition, emotions play an essential role in decision-making. They are not simple subjective reactions, but indispensable components of the rational decision-making process. Recognizing and managing emotions leads to more balanced decisions. However, the decision-making processes can be enhanced by Artificial Intelligence. (Punzi et al., 2023). A good decision requires rapid access to a large volume of accurate information and the ability to quickly evaluate multiple scenarios. AI also offers an increased level of objectivity; it can diminish the influence of human bias, supporting a fairer and more rational decision-making process. But human involvement is still important; humans cannot be completely replaced.

The best approach is to establish hybrid systems in which humans and artificial intelligence work synergistically. This way, the strengths of both humans and artificial intelligence will be capitalized. (Akata et al., 2020)

The interaction between artificial intelligence and human decision-makers is becoming stronger, with the number of managers using recommendations generated by artificial intelligence in the decision-making process continuously increasing. Therefore, it is now common for artificial intelligence to assist human experts in a variety of tasks of major importance. (Carter, 2025)

Hybrid decision-making systems (HDMS) consist of human and mechanical agents, which can collaborate in various ways. (Punzi et al., 2023; Cummings, 2014) These cooperations are encountered in the current context in various fields of activity (business, medicine, finance, security). HDMS presents significant advantages, while also involving certain challenges.

From one perspective, the use of hybrid decision-making systems could bring advantages such as:

AI quickly analyzes large volumes of data, and humans add experience, context, and ethical judgment.

AI can detect patterns invisible to humans, and humans can validate the results to avoid algorithmic errors.

AI proposes scenarios, and the decision-maker chooses based on the context, making the system more flexible.

Human involvement increases the degree of acceptance of the decision in organizations.

In sensitive areas such as medicine, the military, and justice, people can stop or adjust automated decisions if necessary; this way critical situations are better managed.

From another perspective, HDMS may face some challenges:

Integrating AI into decision-making processes requires advanced technologies and training, which means high costs

There may be conflicting opinions between AI and human decision-makers

Clear rules are needed regarding priority when the opinions of the two agents are different

Human decision makers may have biases that can alter the decision.

There is a possibility that humans will rely too much on AI and thus the balance may be compromised

Considering the level of physical control, the degree of monitoring and the human intervention, (Merat et al., 2018) approach three types of collaboration between humans and artificial intelligence:

Human-in-the-loop

Human-on-the-loop

Human-out-of-the-loop

Human-in-the-loop (HITL) is an interaction model in which the ultimate control belongs to the human; the automated decision cannot be implemented without the explicit approval of a human operator. (Li, Nianyu et al., 2020)

Human-on-the-loop (HOTL) is a supervision model in which humans can intervene if they detect errors or unwanted behaviors; humans exercise control through monitoring, but do not approve every decision.

Human-out-of-the-loop (HOOTL) is a model in which humans are excluded from the decision-making process, and the system operates with full autonomy, without direct supervision or the possibility of human intervention.

The three models of human involvement illustrate a spectrum of interactions between humans and machines, from direct control to full autonomy. The HITL model is more present in areas such as health or justice, where responsibility and ethical implications are essential; the HOTL model are increasingly prevalent in contexts that require efficiency and rapid reactions, but retain human oversight mechanisms, while HOOTL systems are less common for now, raising ethical challenges.

AI brings an undeniable increase of efficiency in decision-making process, but it does not eliminate the need for the human factor. The most viable decision-making model in the near future seems to be the hybrid one, with the human role shifting from actual decision-making to supervision. Responsible integration of AI into society can contribute to the development of more efficient, safer and fairer systems, transforming the way people make decisions and take actions.

2. Research methodology

In our research we investigated the interest of the specialists towards the use of artificial intelligence in the decision-making process, using quantitative analysis of scientific production in this field.

The research objectives:

Finding of the evolution of the interest in the field of research

Finding the journals with the most scientific productivity and impact in the field of research

Finding the most consulted papers in the field of research

Finding the countries with the largest number of published articles in the field of our research

The research conducted is based on a bibliometric analysis of studies related to the use of artificial intelligence in the decision-making process.

“Bibliometric analysis is an increasingly popular and thorough technique for examining and assessing massive amounts of scientific data, which is being used more and more in research.” (Passas, 2024)

“Bibliometric analysis has recently become a popular and rigorous technique used for exploring and analyzing the literature in business and management.” (Öztürk, Kocaman & Kanbach, 2024)

Statistical methods play an important role in the analysis of the field of research. But their relevance depends on the clarity of reporting. According to this, the PRISMA methodology brings rigor, transparency and clarity to the process of conducting and reporting systematic reviews.

“The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework is a widely recognized methodology for conducting and reporting systematic reviews and meta-analyses.” (Teixeira, Ferreira & Ramos, 2025)

By using PRISMA methodology we can improve analysis based on statistical methods. Therefore, this research follows the PRISMA methodology for systematic reviews. Inclusion and exclusion criteria are presented in Table 1.

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
It must explore at least one topic related to artificial intelligence in the decision-making process reflected by the title or the abstract of the paper;	Papers containing the terms “artificial intelligence” and „decision making process” in authors’ keywords section but in reality, the papers main topic was about something else;
Papers released between 2015 and 2025;	Book, book chapter, letter, conference review, editorial, note, short survey;
Journal and Conference Proceedings;	
The papers are written in English	

Scopus is one of the most important bibliographic databases. For this reason, we used it to collect the data necessary for the research. The data were collected in June 2025. For the selection of in the field of interest we used the following search algorithm: TITLE-ABS-KEY (artificial intelligence) AND TITLE-ABS-KEY (decision making process)) and we have obtained 20.452 results.

By filtering the results in the following way: Year: 2015-2025; Source Type: Journal and Conference Proceeding; Document type: Article, Review and Conference Paper; Subject Area: Business, Management and Accounting, Economics, Econometrics and Finance; Language: English we obtained a number of 1.161 results.

In the next step, we excluded the inconclusive journals for the field of interest and we obtained 1107 results. Finally, we analyzed the articles evaluating the title and keywords and retained 1059 papers in the database.

3. Data analysis

In the data analysis process, we used the tools of the Microsoft Excel and VOSviewer applications. The results of the data analyses carried out in accordance with the research objectives are presented below.

Number of articles by year (2015-2025) - evolution of the interest for artificial intelligence in the decision-making process topic (Figure 1).

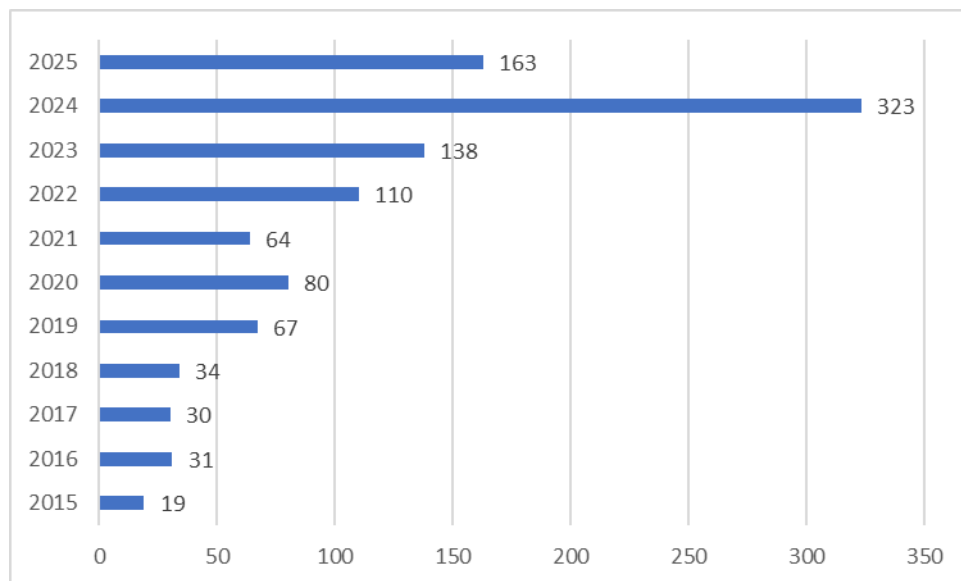


Figure 1: Number of articles by year

Source: own representation

From figure 1, we can see that in the period 2015-2018, the interest in the topic artificial intelligence in the decision making process is still low. Starting with the year 2019, interest starts to grow. Thus, in the year 2019 the number of published articles is double that of the year 2018, and in the year 2023 it is double that of the year 2019. But, a significant increase in the approach to this topic occurs only in the year 2024. Interest is maintained throughout the year 2025. Thus, in the first 6 months of the year, the number of published articles is half of the number of articles published in the year 2024.

Scientific productivity by journal - top 10 journals that contain papers with topic: artificial intelligence in the decision making process (Figure 2).

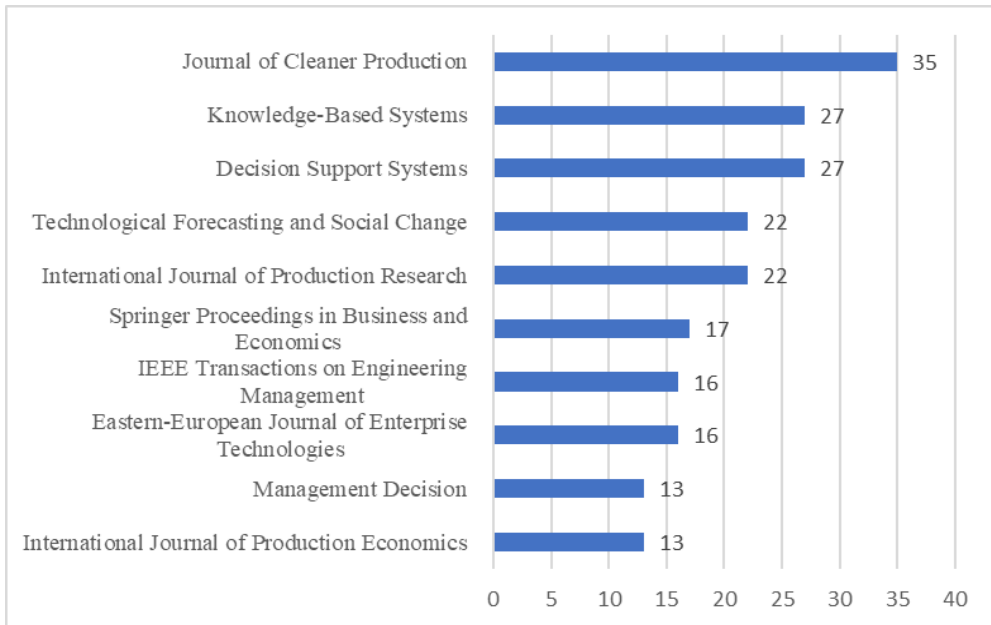


Figure 2: Scientific productivity by journal: number of articles published

Source: own representation

Impact by journal: Total number of citations by journal

In figure 3 we can see the journals, whose articles published in the field of interest, have the largest number of citations. The journals with more than 400 citations were included.



Figure 3: Total number of citations by journal

Source: own representation

In table 2 we can see the first ten journals with the most cited articles in the field of interest.

Table 2: Top 10 journals with the most cited articles.

Journal name	Total number of citations
International Journal of Information Management	2958
Knowledge-Based Systems	1828
Business Horizons	1801
Journal of Cleaner Production	1585
International Journal of Production Research	1565
Technological Forecasting and Social Change	1048
Decision Support Systems	784
International Journal of Production Economics	762
Business Process Management Journal	616
Journal of Business Research	583

Source: own representation

Impact by journal: Average number of citations by year

The articles in the field of interest are published in different years. For this reason, we also calculated the average number of citations per year. In figure 4 we can see the journals, whose articles published in the field of interest, have the largest average number of citations per year. The journals with more 80 average number of citations were included.

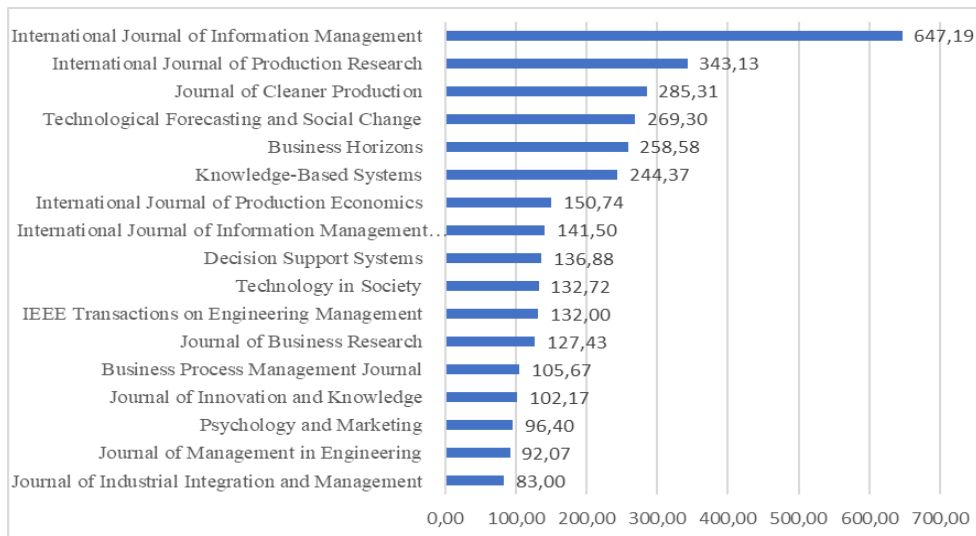


Figure 4: Average number of citations/years

Source: own representation

In table 3 we can see the first ten journals with the highest average number of citations per year for articles in the field of interest.

Table 3: Top 10 journals with the highest average number of citations/years

Journal name	Average number of citations/years
International Journal of Information Management	647,19
International Journal of Production Research	343,13
Journal of Cleaner Production	285,31
Technological Forecasting and Social Change	269,30
Business Horizons	258,58
Knowledge-Based Systems	244,37
International Journal of Production Economics	150,74
International Journal of Information Management Data Insights	141,50
Decision Support Systems	136,88
Technology in Society	132,72

The most cited articles in the field of interest - the articles with great impact.

To measure the impact, we considered the total number of citations per article. In table 4 we can see the articles published in the field of interest, with the highest number of citations. We presented in the table the first five articles in terms of the number of citations obtained.

Table 4: The most cited articles: total number of citations

Title	Authors	Journal	Year of publication	Number of citations
Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy	Dwivedi et al.	International Journal of Information Management	2021	2308
Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making	Jarrahi M.H.	Business Horizons	2018	1251
Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects	Wamba-Taguimdje et al.	Business Process Management Journal	2020	607

Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and artificial intelligence in sales research and practice	Syam & Sharma	Industrial Marketing Management	2018	538
Consensus reaching in social network group decision making: Research paradigms and challenges	Dong et al.	Knowledge-Based Systems	2018	484

Source: own representation

From table 4, we can see that the most cited article was published in International Journal of Information Management, in year 2021. The number of citations is almost double that of the next ranked one and was obtained within an interval of approximately 5 years.

To measure the impact we considered also, the average amount of citations/year per article. Searching our database for the articles with the highest average citations per year (table 5), we find that the first 3 articles are the same as in table 4. The following ranked articles are published three and four years ago.

Table 5: The most cited articles: average number of citations/years

Title	Authors	Journal	Year of publication	Average nr of citations by year
Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy	Dwivedi et al.	International Journal of Information Management	2021	461,60
Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making	Jarrahi M.H.	Business Horizons	2018	156,38
Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects	Wamba-Taguimdje et al.	Business Process Management Journal	2020	101,17

A systematic literature review of artificial intelligence in the healthcare sector: Benefits, challenges, methodologies, and functionalities	Ali et al.	Journal of Innovation and Knowledge	2023	99,67
Artificial Intelligence Applications for Industry 4.0: A Literature-Based Study	Javaid et al.	Journal of Industrial Integration and Management	2022	83,00

Source: own representation

Number of articles by country

In table 6 we can see the countries with the largest number of published articles in the field of our research.

Table 6: Number of articles by country (2015–2025)

Country	Number of papers	% of total (1059)
United States of America	157	14,83%
China	124	11,71%
India	120	11,33%
United Kingdom	84	7,93%
Germany	72	6,80%
Italy	62	5,85%
Australia	56	5,29%
France	53	5,00%
Spain	47	4,44%
Portugal	34	3,21%
Ukraine	34	3,21%
Canada	31	2,93%
Total	874	82,53%

Together, they represent 82,53% of the total number of articles published in the field of our research. The United States of America is the country with the largest number of published articles (157 papers, 14,83% of the total number of articles in our database), followed by the China (124 articles), India (120 papers), United Kingdom (84 articles) and Germany (72 articles). These five countries represent more than half (52,6%) of the total number of articles included in our database.

In Figure 6 we can see the graphic representation obtained with the VOSviewer application.

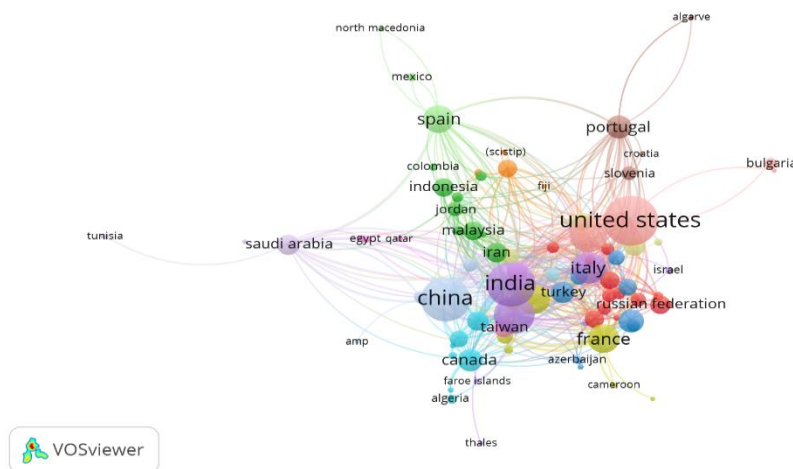


Figure 6: Number of published articles by country
Source: own representation

4. Conclusions

Artificial intelligence is profoundly transforming the way decisions are made, delivering efficiency, accuracy, and the ability to handle complex data at a rapid pace, exceeding the limits of traditional human reasoning. This change also brings important challenges related to ethics, transparency and accountability, especially when the human role in the decision-making process diminishes. However, maintaining a balance between automation and human control remains essential, as technology's role grows. Currently, the “human on the loop” model is predominant, as it allows for general human control over automated processes without limiting their efficiency. Less commonly used, “human in the loop” remains relevant in areas where risks are high or where ethical and contextual validation of decisions is needed. In the long term, however, the trend is clearly oriented towards a gradual transition to “human out of the loop”, where complete autonomy is safer and more efficient. The future of decision-making lies in finding a balance between human reasoning and artificial analysis – a model in which technology does not replace human judgment, but complements and amplifies it, ensuring safer, fairer, and more efficient decisions.

Our research results show that, of the 1059 articles selected in the database, almost 70% were published in the last three and a half years. This fact highlights the increasing interest of specialists for artificial intelligence in the decision making process topic in recent years. A significant increase in the approach to this topic occurs in the year 2024. Interest is maintained and throughout the year 2025.

According to the results of the research carried out, the journals with the largest number of articles on the artificial intelligence in the decision making process topic are: Journal of Cleaner Production, Knowledge-Based Systems, Decision Support Systems. The journals with the most cited articles in the field of interest are: International Journal of Information Management, Knowledge-Based Systems, Business Horizons. Also, he

countries with the largest number of published articles are: United States of America, China, India, United Kingdom and Germany.

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