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The Impact of Artificial Intelligence on the Stakeholder Theory: A Bibliometric Review Analysis

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Master in Management

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Departments of Strategy, Marketing and Operations

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Resumo

À medida que a Inteligência Artificial começa a florescer nesta nova década, é importante compreender o impacto que tem em vários domínios e teorias bem célebres que foram desenvolvidas durante o século passado, mais precisamente, a Teoria dos *Stakeholders*. Os objetivos do estudo consistem em identificar lacunas na literatura e delinear potenciais vias de investigação futura neste campo em rápido desenvolvimento. Metodologicamente, foi utilizada a plataforma *Elsevier Scopus* para efetuar uma análise exaustiva das publicações académicas e a aplicação *VOSviewer* foi usada para escrutinar as publicações académicas selecionadas. As conclusões importantes apontam para um domínio fragmentado que exige mais investigação integradora para explorar plenamente as relações complexas entre a Inteligência Artificial e a dinâmica das partes interessadas. Além disso, o documento salienta o valor da cooperação multidisciplinar e o impacto da Inteligência Artificial nos objetivos organizacionais, nas relações com aos *stakeholders* e nas ramificações sociais.

Palavras-chave: Inteligência Artificial, Teoria dos *Stakeholders*, *Stakeholders,* Sistemas Inteligentes, Revisão de Literatura Sistemática

Classificação JEL:

C18 - *Methodological Issues*

M14 - *Corporate Culture; Diversity; Social Responsibility*

O32 – *Management of Technological Innovation and R&D*

Abstract

As Artificial Intelligence starts flourishing in this new decade it is important to understand the impact that it has in various subjects and well-known theories that were developed during the last century, more precisely, the Stakeholder Theory. The study's objectives are to pinpoint gaps in the literature and outline potential future research avenues in this rapidly developing field. Methodologically, the Elsevier Scopus platform was used to carry out an extensive screening of academic publications and the VOSviewer application was used to scrutinize the selected academic publications. Important conclusions point to a fragmented field that requires further integrative research to fully explore the complex relationships between AI and stakeholder dynamics. Furthermore, the paper highlights the value of multidisciplinary cooperation and the impact of AI on organisational goals, stakeholder relationships, and social ramifications.

Keywords: Artificial Intelligence, Stakeholder Theory, Stakeholders, Intelligent Systems, Systematic Literature Review

JEL Classification:

C18 - Methodological Issues

M14 - Corporate Culture; Diversity; Social Responsibility

O32 – Management of Technological Innovation and R&D

Table of Contents

Index of Figures

Index of Tables

Index of Acronyms

AGI - Artificial General Intelligence

AI - Artificial Intelligence

BRA - Bibliometric Review Analysis

CSR - Corporate Social Responsibility

DSS - Decision Support Systems

MCDA - Multiple Criteria Decision Analysis

ML - Machine Learning

NLP - Natural Language Processing

PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses

RL - Reinforcement Learning

ST - Stakeholder Theory

SL - Supervised Learning

UL - Unsupervised Learning

1. Introduction

In an era characterized by rapid technological advancement, Artificial Intelligence (AI) has emerged as a revolutionary force transforming the global landscape and will significantly change our economy and society in the near future (Li & Zhang, 2017). In this setting, it becomes essential for understanding the dynamics of our linked world to realize the deep implications of AI on the Stakeholder Theory (ST). Freeman (2010) described the Stakeholder Theory as a cornerstone of corporate ethics and management that offers a framework for assessing the interests of different stakeholders in firms, including staff members, clients, shareholders, and society at large.

The introduction of AI technology has resulted in a paradigm change in the way business's function, develop, and add value. Businesses' stakeholder relationships observe a significant shift as they integrate AI into their operations with increasing frequency. In this scenario, Stakeholder Theory—which focuses on the notion that companies should consider the interests of all important stakeholders—becomes especially significant (Freeman, 2010). Stakeholder dynamics and AI combine to create a complicated web that must be thoroughly investigated.

The convergence of AI and stakeholder theory has the potential to reshape company interactions with the many stakeholders they serve. As artificial intelligence pervades sectors and decision-making processes, it has far-reaching consequences for ethical concerns, corporate governance, and social duties. This research attempts to provide light on the transformational implications of AI, affecting the way businesses operate and, eventually, influencing the society in which we live by diving into the deep interplay between AI and ST. The findings of this study might give important insights into how AI can be used to promote ethical business conduct, social responsibility, and long-term growth in an AI-driven future.

Lack of a systematic knowledge of the structure, definition, and evolution of the literature on AI's effects on stakeholder theory is the research problem. This entails determining the field's primary research, writers, disputes, and fields of interest. The lack of a structured corpus of information restricts the creation of an all-encompassing structure for managing the intricacies of interactions between AI and stakeholders.

This research begins with an introduction to the subject and an overview of the goals of the investigation. It also gives a quick summary of the study's general structure and highlights the significance of investigating the potential and difficulties related to AI adoption in the context of stakeholder theory.

The second chapter will address methodology, explaining the methodical strategy utilised to carry out the bibliometric review and providing clarification on study selection standards, data gathering techniques, and the analytic framework. The research objectives are then presented, followed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology.

The bibliometric analysis, that is, the findings gleaned from Elsevier Scopus and the connections identified by the VOSviewer, is the main topic of the third chapter. A thorough examination of the bibliometric data to identify gaps, patterns, and trends in the literature.

The study findings and debate are covered in detail in the fourth chapter. The chapter provides an in-depth review of the body of research on the relationship between AI and stakeholder theory, identifying and combining important topics, discussions, controversies, significant writers, and original research. To complete this topic, it will be presented a summary of the findings, a critical analysis of their ramifications, and a look at possible directions for further investigation.

In the final chapter it will be presented a summary of the main research findings. A brief synopsis of the main conclusions, their wider relevance, and suggestions for more research are included, concluding with reflections on the broader implications of the study. It will also be presented the Limitations of the study. Potential scope limitations resulting from the topic's enormity, linguistic bias resulting from the study's dependence on English-language sources, and difficulties guaranteeing data availability and quality are some of the study's limitations. These restrictions emphasise the necessity of interpreting results with caution and point to directions for further study targeted at minimising these limits. This chapter also indicates possible topics for more research and offers suggestions for future studies. It also discusses the constraints that were present during the development of the study. This research contributes to a wider knowledge of the subject by identifying the parameters within which the study findings should be understood by admitting their limits.

2. Methodology

2.1. Research Questions

Q1: What does the bibliographic literature say about Artificial Intelligence and Stakeholder Theory between 2018 and 2024

Q2: What Artificial Intelligence systems impacted the Stakeholder Theory from 2018 to 2024

Q3: Can Stakeholder Theory benefit from the progressive advancement of Artificial Intelligence?

2.2. Identification of the Research

The proposed investigation will be developed according to a methodology based on secondary data called Bibliometric Review Analysis (BRA). Bibliometric Review Analysis is a popular and rigorous method for exploring and analysing large amounts of scientific data that has been applied in various fields of business research, allowing it to uncover emerging trends and explore the intellectual structure of a specific area in the existing literature (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021).

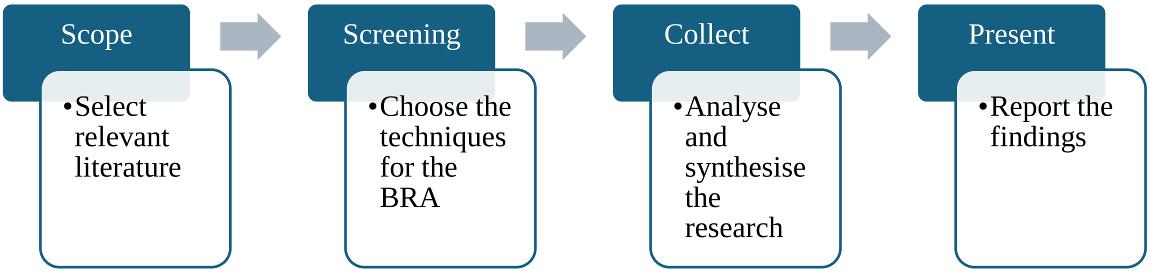
The suggested study will examine previous conventional papers connected to the two topics of research, as well as contemporary management trends (Tranfield et al, 2003). The identification of keywords and research terms derived from the subjects and subsequent debate were used in this research procedure. To further appreciate the goal of this research, it is vital to grasp bibliometric methodologies, which are variations on citation analysis. Citation retrieval can be utilised descriptively (rather than evaluatively), with the goal of highlighting important approaches within a field and tracing its evolution through time according to Van Leeuwen (2004).

When it comes to conducting a bibliometric analysis procedure, according to Donthu, Kumar, Mukherjee, Pandey and Lim (2021), involves four steps: (i) define the aims and scope of the bibliometric study, (ii) choose the techniques for bibliometric analysis, (iii) collect data for bibliometric analysis, (iv) and run the bibliometric analysis and report findings.

A systematic literature review, according to Linnenluecke, Marrone, and Singh (2020), consists of four major steps: (i) selecting relevant literature for inclusion, (ii) cleaning and screening the selected studies for quality and relevance, (iii) analysing and synthesising data from the selected research, and (iv) concisely presenting the findings of the analysis.

After taking into consideration the two methods, the procedure used for this research is a combination of both methods in order to get a more complete research method.

Figure 2.1 - Research Method Scheme



Source: Self-elaborated

2.3. Instruments for Articles Selection

Regarding the specific software that will be used during this research, the articles, papers, and journals will be retrieved via the online platform Elsevier Scopus, with the goal of meeting the previously defined quality requirements for the analysis. Initially, a thorough collection will be carried out in order to get a substantial number of relevant publications. Following that, a review and selection of these papers will be performed based on pre-determined criteria to identify those that offered the most relevance and contribution to the research in question. This method will be used to guarantee that only the most important and high-quality articles make the final cut.

After, and to visualize the bibliometric data, it will be used the software developed by Ludo Waltman and Nees Jan van Eck, VOSviewer. VOSviewer it's a software programme that allows academics and researchers to build visual data representations such as co-authorship networks, citation networks, and keyword maps. To give insights into scientific literature and collaborative networks, the approach combines bibliometric analysis with data visualisation (van Eck & Waltman, 2010).

2.4. Articles Screening

For the purpose of determine which publications were chosen and which ones should be eliminated, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) technique was employed. This approach serves as a pillar for guaranteeing rigour and transparency when performing meta-analyses and systematic reviews. PRISMA, which was created in 2009, provides researchers with a systematic framework that includes a detailed checklist and flow diagram. It leads them through every step of the review process, from study discovery to synthesis and reporting of results (Moher et al, 2009).

According to Page et all (2020), to ensure scientific rigour and openness throughout the bibliometric review process, the PRISMA method's essential components are required. PRISMA emphasises the significance of short title and abstract screening above everything else, which makes it easier to find pertinent research quickly. The emphasis is on transparent reporting, which helps researchers to thoroughly record every facet of the review process, such as the protocols for statistical analysis, data extraction techniques, and study selection criteria. It is crucial to have a robust search strategy in place to identify pertinent research across several databases. Having precise and well-defined inclusion and exclusion criteria helps to preserve impartiality and uniformity when choosing studies. Forms for structured data extraction make it easier to gather relevant information from the included research in a methodical manner, and techniques for synthesising data guarantee accurate analysis and interpretation. The last step in strengthening the validity and credibility of the results of the bibliometric review is the assessment of the risk of bias in the included studies, which allows researchers to assess the quality and reliability of the evidence.

2.5 Research Aim

This study tends to elaborate on the relationship between the stakeholder theory and artificial intelligence, more precisely what is the correlation between the constant evolution of the artificial intelligence in the current world and the way that impacts the stakeholder theory and to investigate the general characteristics of international literature that, not only impacts artificial intelligence, but also the stakeholder theory and the relationship between the two.

2.6. Research Problem

Several research challenges emerge in the pursuit of understanding the impact of artificial intelligence on stakeholder theory. Data availability and quality are significant barriers to obtaining thorough information regarding AI deployments. When balancing business goals and public well-being, ethical dilemmas occur. The topic's multidisciplinary character involves the incorporation of insights from other domains. AI's rapid technical improvements require being up to date on the newest discoveries. Addressing diverse stakeholder viewpoints, regulatory complications, and selecting acceptable case studies are all hurdles that must be overcome in this research endeavour.

2.7. Data Criteria

The following criteria have been established on the 3 of March 2024 to help refine the search string:

1. The database used was *Elsevier Scopus*
2. English academic articles, a conference paper, or a book chapter
3. Paper as to be published after 01 January 2018 and before 01 March 2024
4. The research approach was as comprehensive as feasible, although it was limited to the fields of computer science and business analysis
5. Thus, was restricted to the subsequent fields of study: *Computer Science*; *Social Sciences*; *Engineering*; *Economics*; *Business*; *Management*

2.8. Research Objectives

Research objectives were established to provide a clearer structure for the study to address the research questions.

Table 1. Research Objectives and Questions

Key Research Question	What is the current state of research on the challenges and impact of using AI in ST, as reflected in the bibliographic literature?
Research Question	**Research Objective**
Q1: What does the bibliographic literature say about Artificial Intelligence and Stakeholder Theory between 2018 and 2024	R.O.1: To determine the primary obstacles and potential linked AI's application to Stakeholder Theory.
Q2: What Artificial Intelligence systems impacted the Stakeholder Theory from 2018 to 2024	R.O.2: To assess the impact of AI's Systems in the promotion of ethical business conduct, social responsibility, and long-term growth.

Q3: Can Stakeholder Theory benefit from the progressive advancement of Artificial Intelligence?	R.O.3: To identify effective strategies that align with the Stakeholder Theory to overcome the challenges of implementing AI in companies.

Source: Self-elaborated

3. Bibliometric Analysis

3.1. Overall Findings

The arrangement of this chapter is designed to offer a methodical examination of the bibliometric results. Starting by delineating the approach utilised in the gathering and examination of bibliometric information, clarifying the standards and constraints that direct the research. Next, the data is analysed, and conclusions are drawn based on significant patterns and theme groups that the investigation revealed.

In summary, this chapter provides a thorough explanation of the bibliometric investigation, utilising the advanced features of VOSviewer and Elsevier Scopus to reveal the complex web of academic literature.

3.1.1. Global Data Elsevier Scopus

Data was gathered by searching for Stakeholder Theory and Artificial Intelligence in all articles. Elsevier Scopus, a comprehensive database including high-level papers and articles across a range of disciplines universally acknowledged as one of the most relevant indexed research publication databases (Ramos *et al*, 2019), was the search engine that was employed.

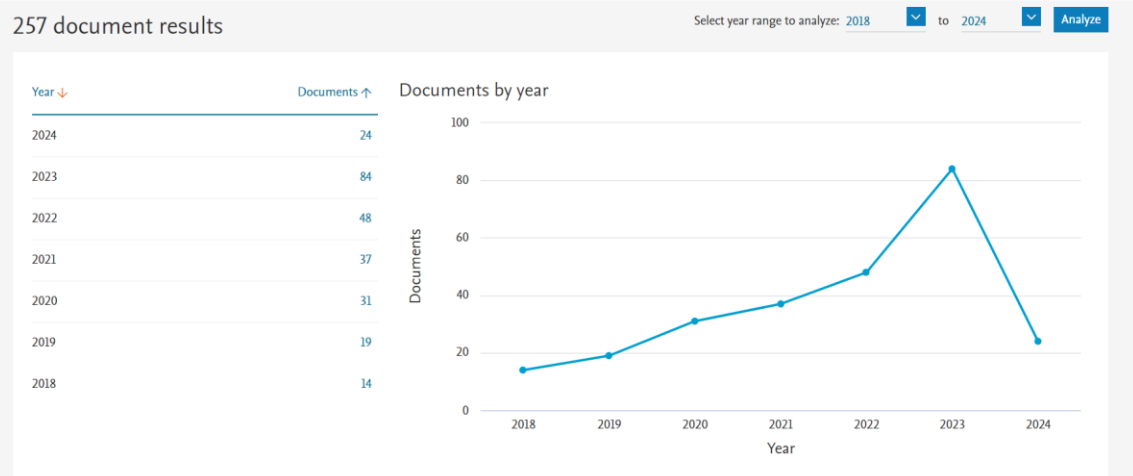
(TITLE-ABS-KEY (stakeholder AND theory*) AND TITLE-ABS-KEY (artificial AND intelligence*)) AND PUBYEAR > 2017 AND PUBYEAR < 2025 AND (LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ENGI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ECON")) AND (LIMIT-TO (LANGUAGE , "English"))

This filter resulted in 257 documents found.

3.1.1.1. Documents per year

Figure 2 shows the total number of publications per year that occurred during the study period of 2018 to 2024. It is evident from this that the traction of these documents has been rising, even though 2024 saw a decline in analysis as indicated by the year-by-year graph. This decline was justified by the fact that the year had not yet concluded at the time of the analysis but considering the percentage of the year that had passed, it is anticipated that the upward trajectory of the line will continue.

Figure 2 – Publications Per Year



Source: Elsevier Scopus Website

3.1.1.2. Top Publishing Sources

The graphic (Figure 3) displays the sources that published the most on the subjects over the analysis period. These sources are primarily in the fields of computer science and environmental sciences, and they come from the ACM International Conference Proceeding Series and Sustainability Switzerland Journal.

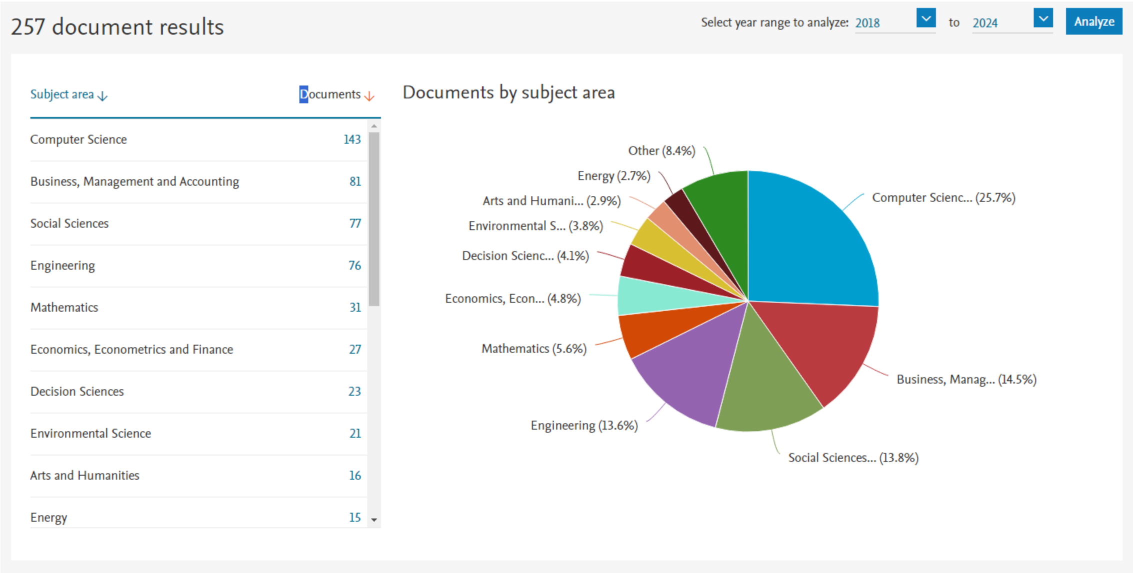
Figure 3 – Top Publishing Sources

Source: Elsevier Scopus Website

3.1.1.3. Total by Subject Area

From the 257 documents retrieved, 25,7% of the documents are from the area of Computer Science, approximately twice as many of the ones from the area of Business, Management and Accounting (14,5%), Engineering (13,6%) and Social Sciences (13,8%).

Figure 4 – Total by Subject Area

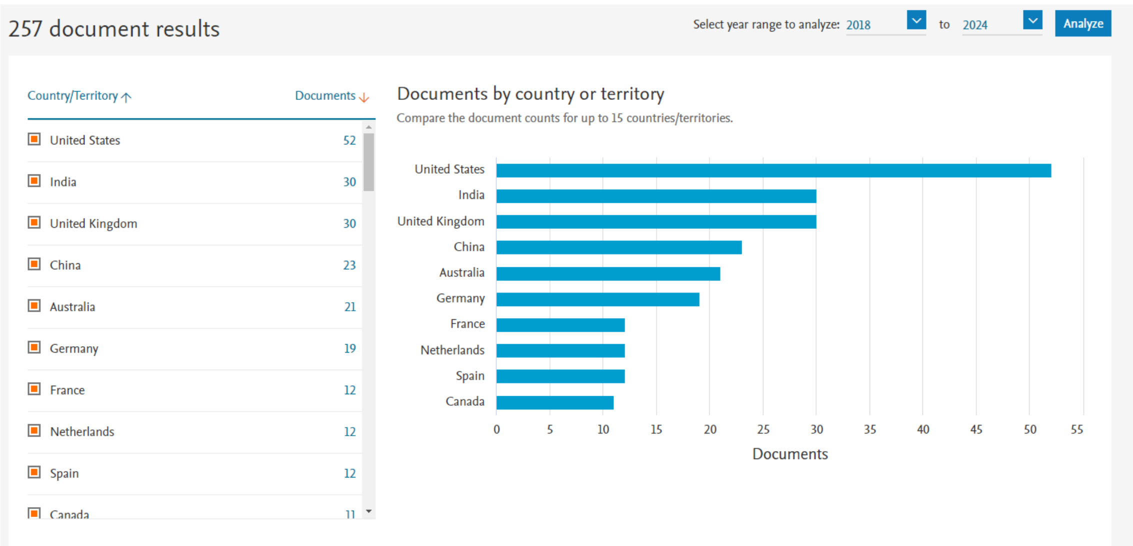


Source: Elsevier Scopus Website

3.1.1.4. Geographics

The majority of the publications are published in countries like the United States, India, United Kingdom, China, Australia and Germany. Nonetheless, the United States has nearly twice as many published sources as the second-place country (India).

Figure 5 – Total Documents per Country

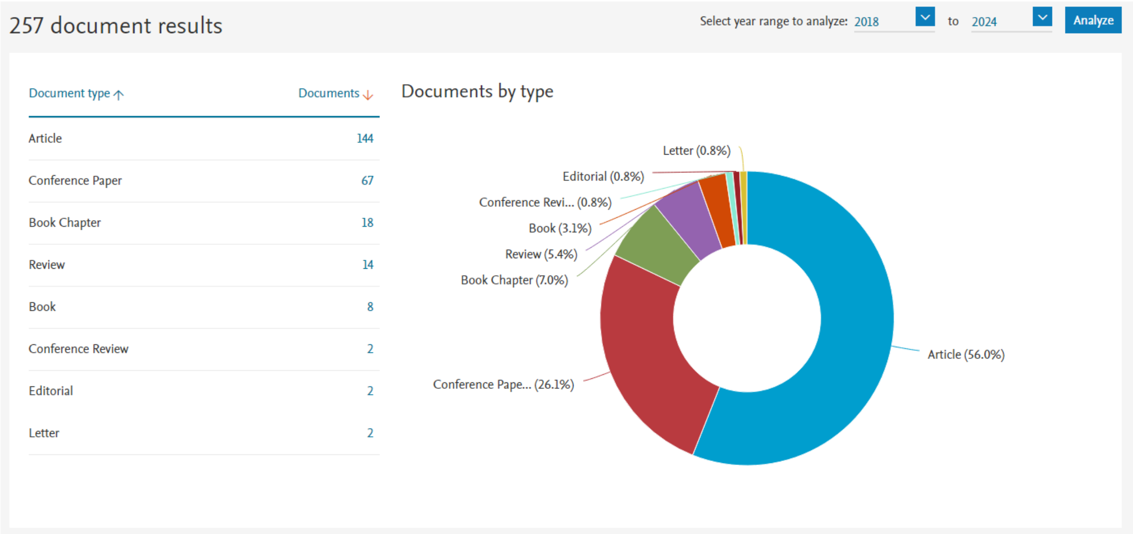


Source: Elsevier Scopus Website

3.1.1.5. Type of Document

As observed in Figure 6, most publications were based on conference papers and articles, which accounted for 56% and 26,1% of the data respectively. This indicates the topic's influence on the scientific community, with 211 out of 257 documents (82,1%) being published on it.

Figure 6 – Types of Publications

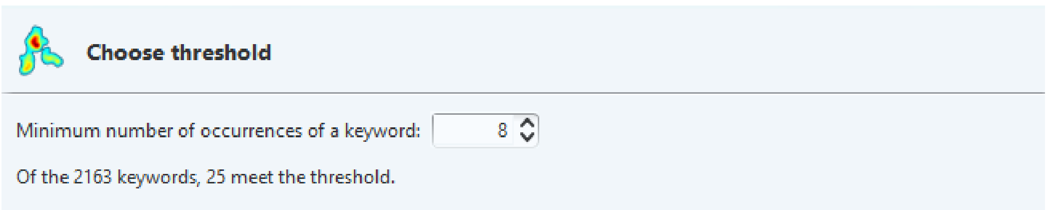


Source: Elsevier Scopus Website

3.1.2. Key Concepts, Structures and Findings

First, by mapping all the keywords that were used on the 257 documents in the Elsevier Scopus search engine's database, a keyword co-occurrence analysis with VOSviewer produced a network visualisation of the top keywords and divided them into several groups. As a result, we can see in Figure 7, that 8 minimum number of occurrences of a keyword were chosen out of the total 2163 keywords in the database.

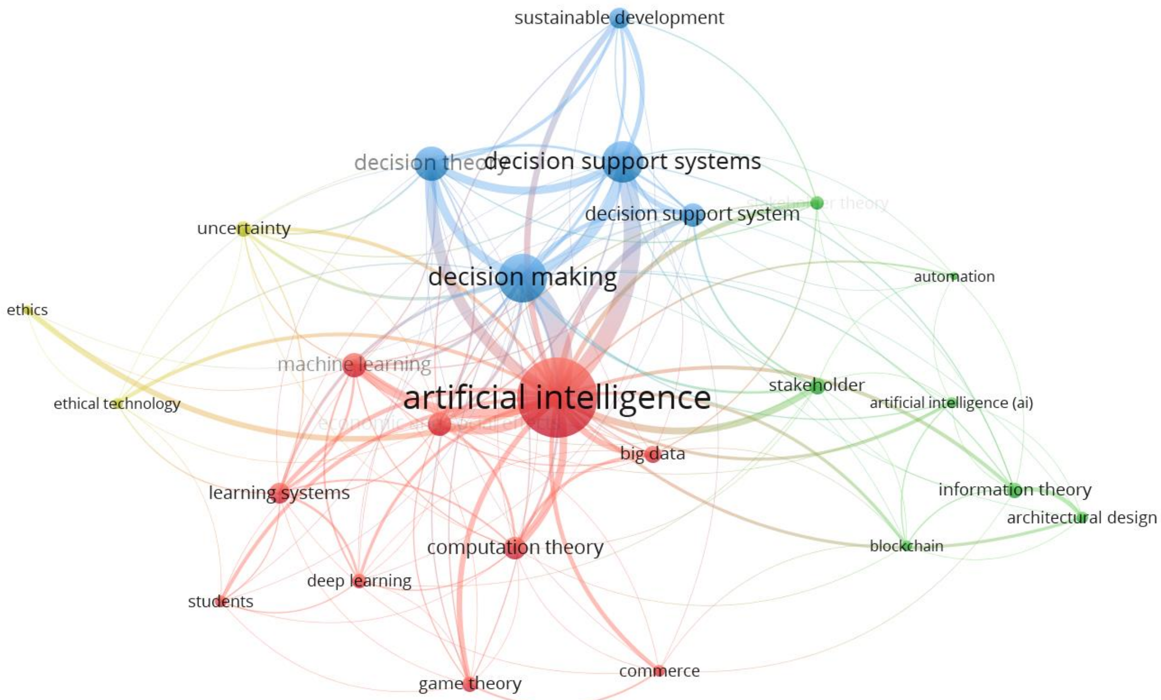
Figure 7 – Keyword Selection



Source: VOSviewer Application

The closer the keywords are in the results, the stronger the relationship between them and the frequency of usage in an article, according to van Eck and Waltman's (2009) interpretation.

Figure 8 – Network Visualization of Keyword and co-occurance



Source: VOSviewer Application

Figure 8 provides a graphical representation illustrating the frequency with which specific terms co-occur across the dataset has been created.

In this illustration, the nodes symbolize distinct keywords, while the connections between them reflect their simultaneous presence within the same documents. The closeness of the nodes indicates the robustness of their relationship, with nodes that are closely grouped denoting keywords that often co-appear, representing a significant thematic bond. Larger nodes signify keywords that are either more prominent or occur with greater frequency, thus emphasizing the principal concepts or subjects that prevail within the literature. This network visualization facilitates the discernment of fundamental themes, unveiling the primary focal points of the research domain, along with identifying potential gaps or emerging subjects that are attracting increasing interest. This analysis allows the identification of four major clusters, as Table 2 illustrates.

Table 2. Cluster Division

Artificial Intelligence	Stakeholder
Machine Learning, economic and social effects, big data, learning systems, deep learning, students, game theory, commerce	Stakeholder Theory, automation, artificial intelligence (ai), information theory, architectural design, blockchain
Decision Making	**Ethics**
Decision Theory, decision support systems, decision support systems, sustainable development	Uncertainty, ethical technology

Source: Self-elaborated

The presented table provides a systematic summary of how artificial intelligence, stakeholder theory, decision making, and ethics overlap in the examined publications. Machine learning, big data, and deep learning are just a few of the subjects covered in the broad spectrum of AI topics, which also shows how technology breakthroughs have an impact on society and the economy. These developments are strongly related to Stakeholder Theory, which emphasises the need to think about how AI will affect different stakeholders. Examples of these stakeholders include automation, blockchain, and architectural design. In order to use AI to make strategic, well-informed decisions, the decision-making section emphasises the significance of sustainable development and decision support systems. Meanwhile, the ethics category highlights the necessity for ethical frameworks to direct AI's incorporation into society and draws attention to the rising worries about unpredictability and the moral application of technology. Overall, the table effectively captures how these important areas are interrelated and emphasising the necessity of approaching AI research holistically, striking a balance between technological innovation, ethical issues, and stakeholder implications.

3.2. Data Synthesis

Following the examination of each of the four clusters, the top 35 articles were determined because they examined a range of AI-related subjects, such as sustainability, ethics, and decision-making, and because they provided insightful analysis of important problems and cutting-edge technology. They greatly contribute to both academic research and practical applications by offering useful frameworks and regional views. Their large number of citations attests to their significance and influence in expanding our comprehension of AI's wider ramifications. Lastly, they have terms that had a high degree of correlation with one another. These were the ones included in the table below, which also includes the year, the author, the title, the article's keywords, the main finding and contributions of the study, and the number of times it was cited.

Several distinct keywords are referenced in the chosen articles, including AI, Stakeholder-oriented decision theory, Decision support system, Digital governance and Ethics. In order to make the subject under study easier to grasp, this part will be separated using the most pertinent keywords: AI, Ethics, Decision Making and Stakeholder.

Table 3. Top 35 Articles Selection

Year	Authors	Title	Key Words	Contributions of the study	Main Findings	Cited
2024	Salgado-Criado J.; Mataix-Aldeanueva C.; Nardini S.; López-Pablos C.; Balestrini M.; Rosales-Torres C.S.	How should we govern digital innovation? A venture capital perspective	AI ethics; AI governance; Digital governance; Digital innovation;	Provides insights on governance tactics designed specifically for AI venture capital	Venture capital perspectives highlight the requirement for flexible governance in digital innovation	0
2023	Han H.; Shiwakoti R.K.; Jarvis R.; Mordi C.; Botchie D.	Accounting and auditing with blockchain technology and artificial Intelligence: A literature review	Accounting; AI; Auditing;	Comprehensive review of AI and blockchain integration in auditing	Accounting and auditing accuracy and transparency are greatly increased by blockchain and AI	44
2023	Sienkiewicz-Małyjurek K.	Whether AI adoption challenges matter for public managers? The case of Polish cities	AI; Digital government; Public governance	Highlights the specific AI adoption challenges faced by public managers	The obstacles to AI adoption in public administration are substantial but vary widely by context	3
2023	Bosse D.; Thompson S.; Ekman P.	In consilium apparatus: Artificial intelligence, stakeholder	AI; Firm performance; Stakeholder theory	Demonstrates via stakeholder interaction how AI affects business success	AI improves stakeholder reciprocity, which boosts business performance	3

		reciprocity, and firm performance				
2023	Kamila M.K.; Jasrotia S.S.	Ethical issues in the development of artificial intelligence: recognizing the risks	AI; Ethics; Fairness;	Helps in comprehending the moral pitfalls of AI	Highlights the primary ethical risks associated with AI development, such as issues with bias and justice	2
2023	Dutta D.; Kannan Poyil A.	The machine/human agentic impact on practices in learning and development: a study across MSME, NGO and MNC organizations	AI; Learning and development (L&D); Open systems theory (OST); Technology-in-practice	Gives a cross-sector review of how AI affects education and growth	AI has a major impact on learning and development strategies used by different kinds of organisations	1
2023	Bleher H.; Braun M.	Reflections on Putting AI Ethics into Practice: How Three AI Ethics Approaches Conceptualize Theory and Practice	Aligned ethics; Critical theory; Embedded ethics;	Provides a comparative evaluation of the application of AI ethics	Investigates the implementation of AI ethics in practice using various conceptual frameworks	1
2023	Kitzmann H.; Prause G.	Stakeholder-Oriented Investment Activities for Sustainable Supply Chain Management	AI; Investment appraisal; Stakeholder-oriented decision theory; Sustainable supply chains management	Stakeholder theory connects investment strategies to sustainable supply chain management	Stakeholder-oriented investment is essential to successful supply chain management	1

2023	da Costa R.L.; Gonçalves R.; Montez A.	Artificial Intelligence Applied to Stakeholder Theory	AI; Stakeholder theory; Stakeholders	Investigates how to incorporate AI into frameworks used by stakeholders to make decisions	Stakeholder theory use of AI improves decision-making	0
2022	D'amore G.; Di Vaio A.; Balsalobre-Lorente D.; Boccia F.	Artificial Intelligence in the Water–Energy–Food Model: A Holistic Approach towards Sustainable Development Goals	AI; Business models; Innovation theories; Institutional; Stakeholder; Structured literature review (SLR);	Offers a comprehensive method for incorporating AI into frameworks for sustainability	The Water-Energy-Food model's AI integration promotes sustainable development objectives	32
2022	Mir U.; Kar A.K.; Gupta M.P.	AI-enabled digital identity – inputs for stakeholders and policymakers	AI; Biometrics; Stakeholder theory	Gives policymakers instructions for the governance of digital identities	Digital identities powered by AI present serious ethical and legal issues	10
2022	Viljanen M.; Parviainen H.	AI Applications and Regulation: Mapping the Regulatory Strata	AI development; AI use; AI; Regulation;	Helps to comprehend the complexity of AI regulation	Lays out the complex legal structure needed for applications using AI	5
2022	Winecoff A.A.; Watkins E.A.	Artificial concepts of artificial intelligence: Institutional compliance and resistance in ai startups	AI; Ethical systems;	Investigates how AI business owners deal with institutional constraints	AI startups show differing levels of commitment to ethical norms	5

					and disobedience of them	
2022	Brown J.A.; de Bakker F.G.A.; Bapuji H.; Higgins C.; Rehbein K.; Spicer A.	Building on Its Past: The Future of Business and Society Scholarship	Literature Reviews; Social Issues; Stakeholders	Gives a thorough analysis and recommendations for the field's future	Identifies important topics for further study in the field of business and social scholarship	4
2022	Miller G.J.	Stakeholder roles in artificial intelligence projects	Algorithms; AI; Big data; Project management; Stakeholder theory	Emphasises how crucial stakeholder management is to AI projects	Through their active participation, stakeholders play crucial roles in the success of AI initiatives	2
2021	Du S.; Xie C.	Paradoxes of artificial intelligence in consumer markets: Ethical challenges and opportunities	AI; Corporate social responsibility; Ethical issues;	Investigates the moral implications of AI for consumer marketplaces	Consumer markets with AI provide ethical dilemmas as well as chances for corporate accountability	84
2021	Kwok A.O.J.; Koh S.G.M.	Deepfake: a social construction of technology perspective	AI; destination image; Generative adversarial networks;	Provides information on how deepfakes affect public perceptions	Destination visuals and public impressions are altered using	50

					deepfake technology	
2021	de Almeida P.G.R.; dos Santos C.D.; Farias J.S.	Artificial Intelligence Regulation: a framework for governance	AI; Ethics; Framework; Governance; Regulation	Contributes a systematic framework to the discussion of AI governance	Lays up a paradigm for the ethical regulation of AI	26
2021	Anshari M.; Almunawar M.N.; Masri M.; Hrdy M.	Financial Technology with AI-Enabled and Ethical Challenges	AI; Business ethics; Financial technology;	Explains the moral issues surrounding financial innovations powered by AI	Fintech powered by AI offers prospects as well as moral dilemmas	22
2021	Kirkwood C.; Economou T.; Odbert H.; Pugeault N.	A framework for probabilistic weather forecast post-processing across models and lead times using machine learning	AI; Data integration; Decision theory;	Creates a framework for utilising AI to increase the accuracy of weather forecasts	The accuracy of probabilistic weather forecasts is improved via machine learning	15
2021	Lok K.L.; So A.; Opoku A.; Song H.	Globalized service providers' perspective for facility management outsourcing relationships: Artificial neural networks	Artificial neural networks; Global facilities management	Examines how AI may improve facilities management on a global scale	AI enhances facilities management outsourcing through relationship optimisation	6
2021	Varoglu A.; Gokten S.; Ozdogan B.	Digital Corporate Governance: Inevitable Transformation	AI; Big data analytics; Stakeholder expectations	Analyses how AI could change corporate governance procedures	AI and big data analytics are driving digital revolution in corporate governance	3

2021	Kushwaha A.K.; Pharswan R.; Kar A.K.	Always Trust the Advice of AI in Difficulties? Perceptions Around AI in Decision Making	Algorithm; AI; Automated decision-making; Farness; Perception	Offers information on variables influencing the level of confidence in AI-driven decision-making processes	Fairness and openness are viewed as having an impact on the public's opinion of AI decision-making	2
2021	Franco E.; Hirama K.; Armenia S.; Skripnikova T.; Betzin S.	A Decision Support System for Managing Technical Debt: Towards a Systemic Perspective	Decision support system; Resource allocation;	Suggests an innovative paradigm for decision support system-based technical debt management	Technical debt in software projects may be efficiently managed via a systemic decision support system	0
2020	Cinelli M.; Kadziński M.; Gonzalez M.; Słowiński R.	How to support the application of multiple criteria decision analysis? Let us start with a comprehensive taxonomy	Decision making; Decision support system;	Creates a thorough taxonomy to facilitate the use of MCDA in decision-making	The implementation of multiple criteria decision analysis (MCDA) is improved by a thorough taxonomy	154
2020	Chatterjee S.; Bhattacharjee K.K.	Adoption of artificial intelligence in higher education: a quantitative analysis using structural equation modelling	AI; Attitude; Behavioural intention; Education;	Provide numerical insights into the elements influencing the	Attitudes and behavioural intentions have a significant impact on the adoption of AI	140

				use of AI in higher education	in higher education	
2020	Chatterjee S.; Ghosh S.K.; Chaudhuri R.; Chaudhuri S.	Adoption of AI-integrated CRM system by Indian industry: from security and privacy perspective	AI; CRM;	Identifies the key elements influencing the adoption of CRM systems with AI integration	Significant obstacles to adoption of AI-integrated CRM include security and privacy issues	60
2020	Mir U.B.; Sharma S.; Kar A.K.; Gupta M.P.	Critical success factors for integrating artificial intelligence and robotics	AI; Autonomous systems; Critical success factors (CSF)	Proposes a framework of essential success criteria for integrating robots and AI successfully	Determines critical success elements for robots and AI integration into corporate operations	45
2020	Modgil S.; Gupta S.; Bhushan B.	Building a living economy through modern information decision support systems and UN sustainable development goals	Modern information decision support systems; Stakeholder theory; sustainability;	Ties decision support tools to the accomplishment of sustainability objectives	Systems for making decisions are crucial for coordinating corporate operations	34
2020	Sollini M.; Bartoli F.; Marciano A.; Zanca R.; Slart R.H.J.A.; Erba P.A.	Artificial intelligence and hybrid imaging: the best match for personalized medicine in oncology	AI; Deep learning; Distributed learning;	Investigates how to use AI and hybrid imaging to provide individualised cancer care	AI and hybrid imaging greatly improve cancer personalised therapy	24
2019	Crittenden W.F.; Biel I.K.; Lovely W.A., III	Embracing Digitalization: Student Learning and New Technologies	AI; Digitalization;	Examines how AI and digitalisation are	AI and digitisation enhance	87

				affecting the educational experiences of students	student engagement and learning results	
2019	Hooker J.; Kim T.W.	Ethical implications of the fourth industrial revolution for business and society	AI ethics; Automation;	Participates in the discussion of the moral ramifications of automation and artificial intelligence in contemporary business	Businesses and society face serious ethical concerns as a result of the Fourth Industrial Revolution	14
2018	Kannan D.	Role of multiple stakeholders and the critical success factor theory for the sustainable supplier selection process	Multi criteria decision making; Stakeholder theory; Sustainable supplier selection;	Delivers a strong framework for choosing sustainable suppliers by utilising MCDA and stakeholder participation	Sustainable supplier selection requires essential success elements and stakeholder participation	243
2018	Wright S.A.; Schultz A.E.	The rising tide of artificial intelligence and business automation: Developing an ethical framework	AI; Automation; Business ethics; Social contracts theory; Stakeholder theory;	Presents a moral framework for handling automation and artificial intelligence in commercial settings	Dealing with the issues posed by artificial intelligence and commercial automation requires an ethical framework	117

2018	Hirsch P.B.	Tie me to the mast: artificial intelligence & reputation risk management	AI; Natural language processing; Predictive analytics;	Clarifies how AI may be used to reduce reputational concerns through sophisticated data analytics	The management of reputation risks in business requires the use of AI techniques such as NLP and predictive analytics	22

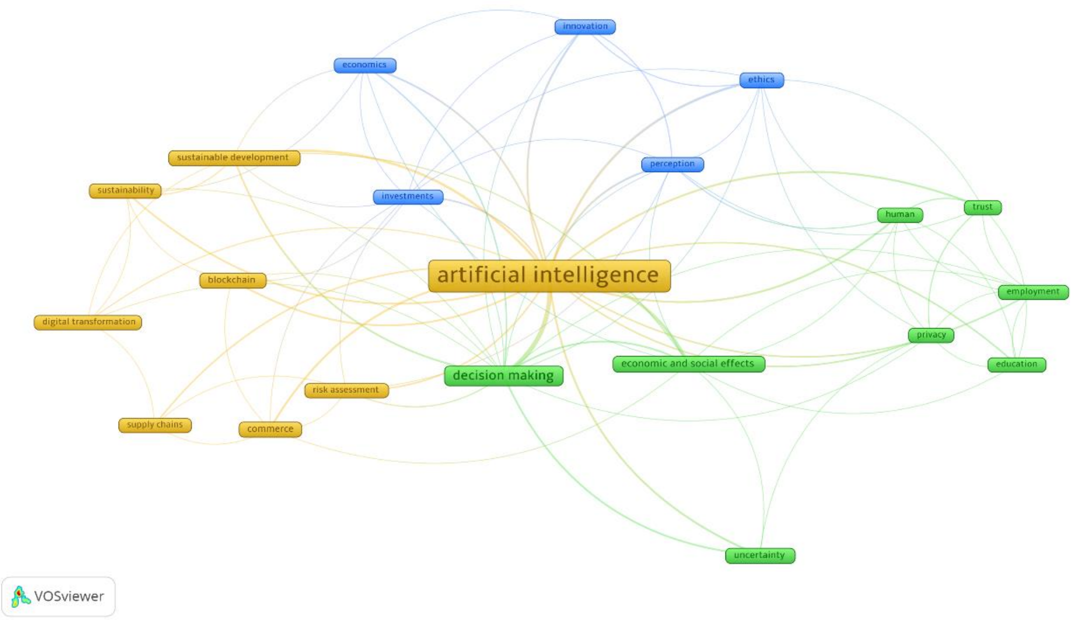
Source: Self-elaborated

3.2.1. First Question of Research

The software VOSviewer has been used to retrieve the data collection methods as shown above. This software programme is a tool for mapping network data and for visualising and interacting with the resulting maps. The main purpose of VOSviewer is to examine bibliometric networks. Depending on the sort of selection, this programme offers numerous analysis types and ongoing methods. Building a network using bibliographic database files, such those from Elsevier Scopus, is the aim of the use. Table 2, which is seen above, was utilised for the data analysis.

Following that, the subsequent steer was chosen: create a map using text data and read information from Elsevier Scopus. The ultimate stage pertains to the outcomes of the chosen terms extraction on the final chosen documents. Consequently, certain terms were eliminated in a pruning examination that ultimately refined the results in a sustainable and strategic manner. This elimination involved the terms “current”, “role”, “author” and “use” as they are ambiguous and unrelated words, allowing us to group the remaining terms to understand the correlation for the analysis.

Figure 9 - Bibliographic Network Graph of the Primary Obstacles

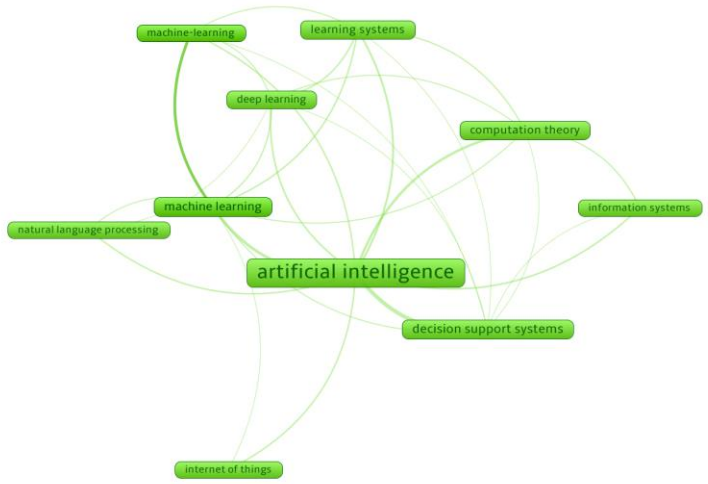


Source: VOSviewer Application

Three distinct clusters can be observed when analysing the primary obstacles of AI´s application in ST. The orange cluster where obstacles like sustainability, digital transformation and risk assessment emerge. The green cluster where decision making, economic and social effects and the trust that the human still don’t have in AI, come into view. And finally, the blue cluster where ethics, innovation and perception are the main reasons for the lack of application of AI in the ST.

3.2.2. Second Question of Research

Figure 10 - Bibliographic Network Graph of the AI Systems that impact ST

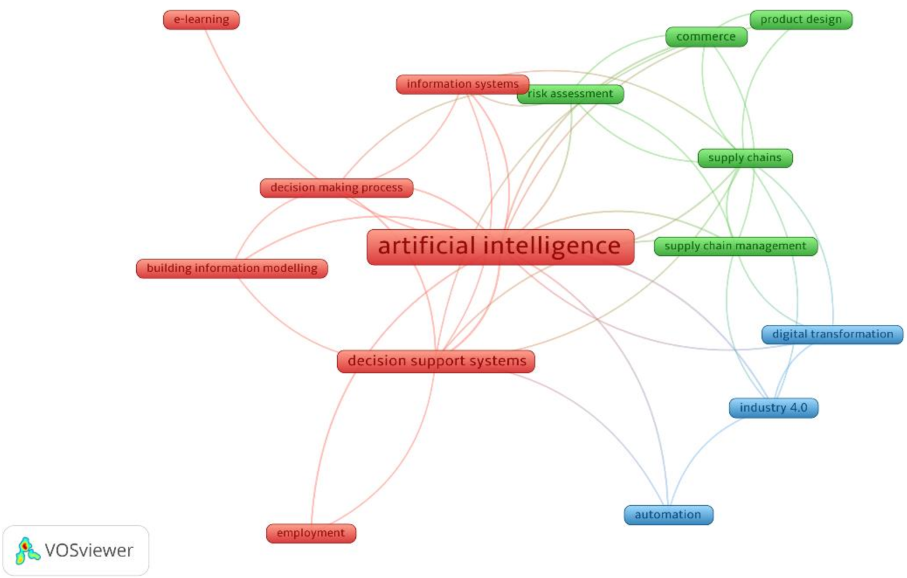


Source: VOSviewer Application

The next phase of the analysis involves identifying the AI systems that have influenced the ST. Upon review of the figure above, it is evident that systems such as machine learning, natural language processing, internet of things, deep learning, and decision support systems have made an impact.

3.2.3 Third Question of Research

Figure 11- Bibliographic Network Graph of strategies to implement AI in the ST



Source: VOSviewer Application

Upon analysing the methods for implementing AI in the ST, three clear clusters emerge. The red cluster prioritizes decision support systems and information systems. The green cluster concentrates on the product itself, including supply chain management, product design, risk assessment, and commerce strategies. Lastly, the blue cluster emphasizes technology strategies such as digital transformation and automation.

4. Discussion & Findings

Upon the development of the bibliographic map, the 257 articles in the literature data set from the Elsevier Scopus database were ultimately grouped into four themes: (1) Ethics, (2) Decision Making, (3) Artificial Intelligence and (4) Stakeholder Theory. These last two themes show a relationship between them and the study's issue, which is meant to be demonstrated after the discussion presented below.

4.1. Ethics

The conceptualization of "ethics" has undergone a significant evolution across philosophical traditions, reflecting broader changes in moral thought. Writing in the fourth century BCE, Aristotle (2009) defined ethics as the study of moral virtues and the development of a good life, placing special emphasis on character and achieving eudaimonia, or flourishing. By emphasizing the rational determination of moral duties and the universality of moral laws, Immanuel Kant (1997) redefined ethics through a deontological lens in the 18th century, highlighting the importance of reason in ethical deliberation. By the early 20th century, G.E. Moore (1903) introduced a meta-ethical perspective extending the conversation from practical morality to a more abstract examination of ethical ideas by putting the focus of the discussion on the nature of moral goodness and the standards by which ethical decisions are formed. The works of scholars like Martha Nussbaum (2006), who has emphasized the importance of capabilities and human dignity in ethical theory and advocates for a more inclusive and global approach to ethics that transcends traditional boundaries, demonstrate how ethical discourse has become more and more concerned with global justice and interconnectedness in the twenty-first century. The shift from virtue ethics to deontology, meta-ethics, and finally to a focus on human capabilities and global justice highlights the growing complexity and breadth of ethical research, indicating a growing concern with the fundamental principles.

4.1.1. Ethics applied to Management

Ethics in management is deeply intertwined with moral philosophy, serving as the groundwork for discerning appropriate and inappropriate conduct within an organizational framework. A seminal work in this field is Freeman's (1984) text "Strategic Management: A Stakeholder Approach," which introduces the concept of stakeholder theory. This theory asserts that organizations have ethical duties towards all stakeholders, such as employees, customers, suppliers, and the broader community, beyond just shareholders. Stakeholder theory has played a crucial role in expanding the ethical considerations within management by stressing the necessity of balancing the concerns of different parties involved in or impacted by business activities.

Another significant contribution to this area comes from Carroll (1991), who formulated the Pyramid of Corporate Social Responsibility (CSR). Carroll's framework delineates four levels of responsibilities that corporations must attend to: economic, legal, ethical, and philanthropic. According to Carroll, ethical responsibilities transcend mere compliance with laws and regulations, demanding that businesses act in a manner that is morally right, equitable, and just, even when not legally bound to do so. This model has become a cornerstone in the examination of ethics in management, underscoring the multifaceted nature of corporate responsibility.

The development of ethical management practices can be observed through the growing emphasis on corporate social responsibility and sustainability. Porter and Kramer (2006) contend that businesses can gain a competitive edge by incorporating ethical considerations into their strategic planning. Their notion of "shared value" proposes that companies can generate economic value while addressing social and environmental issues simultaneously. This perspective has had a significant impact on reshaping the role of businesses in society, urging companies to see ethical practices as essential to their long-term success rather than a burden or expense.

In conjunction with corporate social responsibility, the notion of ethical culture within organizations has emerged as a key area of investigation. An ethical organizational culture is defined by the promotion and recognition of ethical behaviour, as well as the discouragement and punishment of unethical conduct. According to Kaptein (2008), an ethical culture is distinguished by clarity, consistency, achievability, supportability, transparency, discussability, and sanctionability. These factors contribute to the establishment of an environment where ethical conduct is standard practice, and employees are encouraged to report unethical behaviours.

4.2. Decision Making

4.2.1. Decision Theory

Decision theory is an interdisciplinary field that intersects with various disciplines including economics, psychology, mathematics, and management. It focuses on analysing decisions made under conditions of uncertainty and risk, with the main objective being the identification of optimal choices that maximize expected utility. (von Neumann and Morgenstern, 1944). The foundation of classical decision theory can be traced back to the pioneering work of early economists such as von Neumann and Morgenstern (1944), where they formalized the concept of expected utility. This utility theory was further developed by Savage in "The Foundations of Statistics" (1954), introducing the distinction between risk (where probabilities are known) and uncertainty (where probabilities are unknown).

The premise of rational behaviour in the classical model has been questioned by further studies. According to Simon (1957) concept of limited rationality, people are "rationally" optimum to the extent that their knowledge, cognitive abilities, and temporal limitations allow them to be. Empirical research in behavioural economics, especially that of Kahneman and Tversky (1979), lend credence to this viewpoint. In order to take into consideration actions that deviate from the predicted utility maximisation principle, they developed Prospect Theory. Prospect Theory clarifies how people's decision-making in uncertain situations is inconsistent because they place a higher weight on probable losses than comparable rewards.

4.2.2. Types of Decision Support Systems

Decision Support Systems (DSS) are computerised systems created to assist decision-making in complex and dynamic situations, a response to the complexity of modern decision-making. Gorry and Scott Morton's (1971) divided decision-making activities into structured, semi-structured, and unstructured categories, gave rise to the notion of DSS in the 1960s.

DSS may be broadly classified into four types: knowledge-driven, communication-driven, model-driven, and data-driven systems. Large-scale dataset manipulation and analysis are the main goals of data-driven DSS in order to support decision-making. Online analytical processing tools, statistical analysis, and data mining are frequently used in these systems. One prominent instance is the application of DSS in supply chain management, whereby real-time data analysis plays a pivotal role in optimising logistics, demand forecasts, and inventory levels (Turban, Sharda, & Delen, 2010).

Conversely, model-driven DSS use analytical and mathematical models to simulate various decision-making scenarios. For tasks like risk assessment and portfolio management, these systems are extensively utilised in financial management. For instance, it is commonly known that linear programming models are used in decision-making (Ragsdale, 2014).

Artificial intelligence and machine learning are incorporated into knowledge-driven DSS, sometimes referred to as intelligent DSS, to offer professional guidance and suggestions. These systems work especially well in areas like medical diagnosis and legal case analysis, where specialised knowledge is essential (Power, 2002). Lastly, communication-driven DSS promote shared decision-making processes by facilitating decision-makers' participation. This is frequently accomplished via the use of technologies like groupware or collaborative software.

4.2.3. Decision Supports Systems applied to Management

In order to assist managerial duties at the strategic, tactical, and operational levels, DSS are essential tools that improve decision-making by combining data, models, and analytical tools. According to Shim, Warkentin, and Courtney (2002), these technologies increase organisational efficiency and competitiveness by empowering managers to make well-informed decisions in complicated contexts.

By combining data from several sources and using advanced analytics, DSS enhance long-term planning and resource allocation at the strategic level. As an illustration, Executive Information Systems, a subset of DSS, give senior executives a thorough understanding of the operation of the company, empowering them to track important performance metrics, see patterns, and make choices that create a competitive edge (Watson, Rainer, & Koh, 1991).

At the tactical level, DSS support decision-making in the areas of marketing, finance, human resources, and production. For example, marketing managers utilise DSS to categorise markets, analyse consumer data, and create marketing strategies that are specifically targeted. To ensure the stability and health of their finances, financial managers use DSS for financial analysis, forecasting, and budgeting (Shim, Warkentin, & Courtney, 2002).

Operationally, DSS improve productivity and effectiveness by streamlining procedures including logistics, production scheduling, and inventory management. To save costs and shorten lead times, for instance, supply chain management DSS offers real-time data and predictive analytics (Turban et al., 2010).

4.3. Artificial Intelligence

From early conceptualizations of intelligent machines, the meaning of artificial intelligence has evolved dramatically throughout the decades. AI was first conceptualised in the 1950s, when the field of study was still in its infancy. Alan Turing, a pioneering mathematician and computer scientist, lay the groundwork for AI with his Turing Test work. According to Turing (1950) a machine is deemed intelligent if it could engage in a conversation that is indistinguishable from that of a person.

As the study of artificial intelligence expanded throughout the 1950s and 1960s, researchers like as John McCarthy, M. L. Minsky, H. Simon and A. Newell, according to Pan Y. (2016), contributed to the creation of a new definition of AI. The significance of employing logical rules and symbols to express information and execute reasoning was established (McCarthy, 1960).

There are many diverse perspectives and thoughts about AI. Consensus on the concept of AI is unlikely; hence, several definitions and ideas have been established throughout the years (Duan *et al.,* 2019).

Recently, Hao (2018) asserts that AI may drive machines to learn, rationalise, and behave autonomously, making their own judgements when presented with new circumstances in the same manner that humans do.

According to Wilkins (2019), AI is the study and engineering discipline of computer programming that accomplishes activities that would ordinarily need human intellect and can also be the name given to a programme that is artificially intelligent as a result of its programming.

In compliance with Tyagi (2020), there are 6 different branches of AI: Machine Learning, Neural Networks, Robotics, Expert Systems, Fuzzy Logic Systems and Natural Language Processing (NLP).

4.3.1 Types of Artificial Intelligence

Artificial intelligence is often categorized into two primary types, reflecting different levels of intellectual ability and capacity: Weak AI and Strong AI (Amini et al., 2020; Russel & Norvig, 2020; Li & Zhang, 2017). Weak AI passively duplicates intelligent human activities without perfect comprehension, and it has no intention of imitating the human brain (Li & Zhang, 2017), it has significant limitations, such as the requirement for vast volumes of data and human assistance to fulfil its functions in a feasible manner (Amini et al., 2020). Strong AI is a higher degree of intelligence that strives to emulate human-like cognitive skills (Russel & Norvig, 2020). They highlight general AI ability to comprehend, reason, learn, and adapt across a wide range of activities and domains. The goal of general AI is to mimic the variety and depth of human intellect, allowing AI systems to execute activities, solve issues, and engage in learning experiences in the same way that people do (Russel & Norvig, 2020).

There´s also some researchers who take into consideration a third type of AI, Superintelligent AI. According to Bostrom (2014), he anticipates a future in which AI systems reach not only great levels of performance in limited or particular activities, but also a degree of general cognitive aptitude and problem-solving skills that transcend human capacities.

4.3.2. Intelligent Systems

According to Russell and Norvig (2020), intelligent systems are "agents that receive perceptions of the environment and take actions to affect that environment". In other words, intelligent systems are computer programs that can interact with the environment and make decisions based on their observations. They can learn from their past experiences and improve their performance over time, just as human beings do. They are also designed to mimic human intelligence and capable of performing a wide range of tasks that would otherwise require human intervention. Intelligent systems have revolutionized the field of technology and are widely used in a variety of sectors, including health, finance, education, and transportation.

4.3.2.1. Machine Learning and Neural Networks

One of the most common types of intelligent systems is **Machine Learning** (ML). Machine learning is a branch of artificial intelligence that allows machines to learn from past experiences and improve their performance without being explicitly programmed (Mueller & Massaron, 2018). There are four types of machine learning:

Supervised Learning (SL): Supervised learning is a type of ML algorithm in which the computer learns to map input data to output data based on labelled examples. In SL, the machine receives a set of test data that has been labelled with the desired result, and learns to anticipate the result for future, unlabelled data (Mitchell, 1997). Examples of this typology are:

1. Image Classification: Given a set of images with known labels, a Supervised Learning algorithm can be trained to predict the label of new unlabelled images. For example, a computer vision algorithm can be trained to classify images of animals such as cats, dogs or birds.
2. Spam detection: Given a set of emails with known labels (spam or non-spam), a Supervised Learning algorithm can be trained to predict whether new incoming emails are spam or not.

Unsupervised Learning (UL): Unsupervised learning is a type of ML in which the computer discovers patterns in the input data without the help of labelled samples. In UL, the computer tries to identify patterns and relationships in the data on its own and groups similar data together (Alpaydin, 2010). In terms of specific examples of this typology are:

1. Clustering: Given a set of data, an Unsupervised Learning algorithm can be used to group similar data together. For example, a cluster algorithm can be used to group customers based on their purchasing behaviour.
2. Anomaly detection: Given a set of data, an UL algorithm can be used to identify anomalous data, which does not fit the normal pattern. For example, an anomaly detection algorithm can be used to identify credit card fraud by detecting unusual transactions.

Reinforcement Learning (RL): In the ML system known as reinforcement learning, the computer learns to make decisions based on inputs from the surrounding environment. In RL, the computer itself is given an environment in which it can behave and, by selecting behaviours that produce favourable results, it learns to maximize those that are positive (Sutton and Barto, 2018). Examples of this typology are:

1. Game Playing: RL algorithms have been used to train computers to play complex games such as chess and checkers. The computer learns to make decisions based on the game board and feedback from the outcome of the game.
2. Robotics control: RL algorithms have been used to train robots to robots to perform tasks such as walking and grasping objects. The robot learns to take actions based on feedback from the environment, such as whether it managed to grab an object or not.

Deep Learning - Neural Networks: Deep neural networks are modelled on the structure of the human brain and can learn to recognize complex patterns and relationships in data. Deep learning has been used in a wide variety of applications, including image recognition, speech recognition and natural language processing. (Goodfellow et al., 2016).

4.3.2.2. Expert Systems and Fuzzy Logic Systems

In addition to machine learning systems, there are other types of intelligent systems, such as Expert Systems and Fuzzy Logic Systems. Expert systems are designed to replicate the decision-making skills of a human expert in a specific domain and are used to provide a systematic way of using non-quantitative values (e.g. linguistic values, such as low – medium – high) rather than precise numbers (Unahabhokha, Platts and Hua Tan, 2007). Regarding Fuzzy Logic Systems they came from the mathematical terminology Fuzzy Logic and were first introduced by Lotfi A. Zadeh in the 1960s and are based on the theory of fuzzy sets. Unlike conventional set theory, where an element either belongs or does not belong to a set, this theory posits that an element might partially belong to a set. This allows for an efficient way to work with uncertainties and to condition knowledge in the form of rules towards a quantitative level that can be processed by computers (Carreon-Ortiz *et al,* 2023).

4.3.3. Natural Language Processing (NLP)

Natural Language Processing is a branch of Artificial Intelligence that deals with the creation of algorithms and models that allow computers to comprehend, interpret, and produce human language. NLP strives to bridge the gap between human communication and machine interaction by allowing computers to understand the subtleties of spoken and written language (Jurafsky and Martin, 2021).

Despite its accomplishments, NLP has several limitations. One basic challenge, according to Goldberg (2017), is the uncertainty inherent in language. Words and phrases frequently have several meanings, and context is crucial in deciphering them. Furthermore, anomalies and differences in language, such as slang, regional dialects, or informal speech, pose difficulties for NLP models, which may fail to capture these subtleties consistently.

NLP is altering technology, business, and society in the present and future. Stuart Russell and Peter Norvig (2020) work emphasises the importance of NLP, particularly as it relates to Artificial General Intelligence (AGI). Currently, the effect of NLP may be seen in a variety of applications. NLP is used by search engines like Google to give more contextually relevant search results, and by voice assistants like Siri and Alexa to comprehend and reply to spoken questions.

4.3.4. Robotics

Tyagi (2020) defines robotics as a discipline of artificial intelligence dealing with the design, development, and deployment of robots. Knowledge from numerous domains, such as computer science and engineering, is useful in robotics (Berenguel *et al*., 2018). A robot is a mechanical device that can execute activities with varied degrees of autonomy, ranging from simple, repetitive movements to complicated problem-solving. Robotics is the study of the development of robots that can interact with the physical environment, make decisions, and adapt to changing surroundings (Koditschek, 2021).

Despite significant advances, robotics has numerous limits. The development of dexterous robotic manipulation is a key task. Traditional industrial robots succeed at repetitive tasks but struggle with activities that need fine motor skills and flexibility, on the other hand, they have difficulties of dexterity and it important to make emphasis on the importance of modern sensors and control systems (Brooks, 1991).

4.4. Stakeholder Theory

As the 20th century concluded, firms that had up until then operated in an environment of relative stability and focused on increasing shareholder profits faced a challenging situation. Organisations needed a type of management that considers a new dynamic due to the abundance of government rules, corporate criticism, media assaults, and competitiveness amongst enterprises in a globalised world (Freeman, 2010). In this case, a new management tenet—the stakeholder theory—emerged. Businesses are centred on certain goals that serve as the foundation for stakeholder relationships and corporate cooperation. Based on Freeman (2010), ST suggests that creating value involves working together in partnerships to the mutual advantage of the main company and all of its stakeholders. Value creation and an understanding of the interactions and connections between suppliers, financiers, shareholders, managers, and consumers are crucial components of understanding a business (Freeman, 2010).

The word "stakeholder" was first used in an internal Stanford Research Institute communication in 1963. Its definition was as follows: "any group or individual who can affect or is affected by the achievement of the firm's objectives" (Freeman, 1984). According to Mercier (1999), we can also say that stakeholders are “all of the agents for whom the firm’s development and good health are of prime concern”. Over the years, Freeman (2010) reformulated his definition of stakeholder to “any group or individual who can affect or be affected by the achievement of a firm's purposes”.

As specified by Freeman (1984), organisations have duties and obligations to a variety of stakeholders, according to the management and ethical paradigm known as stakeholder theory. In accordance with this argument, effective business practises must consider the needs and interests of all parties involved, not just shareholders looking to maximise profits. Essentially, it opposes the conventional, profit-focused perspective of business and encourages a more responsible, inclusive method of corporate decision-making.

This viewpoint was expanded upon by researchers such as Donaldson and Preston (1995), who made a distinction between normative, instrumental and descriptive conceptions of stakeholders. The instrumental approach contends that taking into account and protecting stakeholder interests is in the best interests of the business as it promotes stability and long-term success, while the normative approach maintains that organisations have an ethical obligation to do so. In the descriptive approach, which is more comprehensive, the company can be understood as a set of relationships with stakeholders’ relations with interest groups, and the theory is used to describe and sometimes to explain characteristics of corporations.

In order to identify and evaluate stakeholders, several typologies were created. Some writers, like Freeman et al. (2007) and Clarkson (1995), divide stakeholders into primary and secondary categories. These authors define primary stakeholders as those groups that are essential to the company's sustainability and without which it could not continue. According to Clarkson (1995), these groups include suppliers, government agencies, shareholders, customers, and workers. Freeman et al. (2007) classifies as primary financiers (banks, shareholders, among others), the community, suppliers, consumers and employees; and understands the press, the government, and advocacy groups as secondary consumer rights. When Freeman (1984) began the development of his stakeholder theory, he was differentiating between primary and secondary stakeholders through contractual ties, for example, interest groups with official contracts with the firm would be its primary stakeholders; other parties who impacted or were impacted by the business but did not have formal contracts with it would be its secondary stakeholders. Later, however, Freeman et al. (2007) state that even in the absence of a formal contract, the community should always be regarded as the primary stakeholder in any activity. This is due to the fact that if the community's interests are not served, activist groups may seek their rights from the appropriate authorities or organize boycotts of the company. In other words, from a more holistic perspective, the company "assumes" an informal social contract with the community when it settles in a given area.

Long-term ties with particular stakeholders support a company's wealth (Freeman, 1984). Every stakeholder will have an impact on the business climate, provide resources, shape the organization, and profit from its expansion, effectiveness, and influence—whether favorable or unfavorable (Donaldson & Preston, 1995). Therefore, building strong relationships with external and internal stakeholders is essential and vital (Freudenreich et al., 2019).

4.5. Artificial Intelligence applied to the Stakeholder Theory

In today's business and ethical conversations, the confluence AI and ST has gained prominence. Numerous scholarly studies elucidate the far-reaching consequences of artificial intelligence on stakeholder interactions and management. Johnson and Smith (2020) investigate how ST and AI are progressing. They investigated how innovations powered by AI are changing the face of stakeholder interaction across a range of sectors. The authors contend that AI may improve organisational transparency, decision-making, and stakeholder communication, all of which will build ties between organisations and their stakeholders.

In other research, the influence of AI on stakeholder theory and its ethical implications are explored in depth by Brown and Jones (2019). They contend that when AI technologies are incorporated into business processes more deeply, organisations ethical obligations to their stakeholders change. In the framework of stakeholder theory, Brown and Jones emphasise how crucial it is to address concerns like algorithmic bias, data privacy, and the social ramifications of AI-driven judgements.

Regarding the transformative potential of AI in stakeholder engagement, Smith and Patel (2018) argue about how AI technology may help businesses better identify and address stakeholder issues, resulting in more flexible and ethical business practises. The authors emphasise that enhanced company performance and reputation may be attained through AI-driven stakeholder interaction.

Together, these research pieces highlight the intricate connection between Stakeholder Theory and AI. They provide light on how integrating AI might improve ethical concerns, increase stakeholder involvement, and encourage more responsive corporate practises. To ensure that the impact on stakeholders is beneficial and consistent with morally and responsibly conducted business, they also emphasise the significance of tackling the ethical issues and possible hazards related to AI.

4.6. Findings about the Analysis

The field of AI and ST knowledge is structured by conducting a thorough bibliometric examination of 257 articles retrieved from the Elsevier Scopus database. These articles are classified into four main categories: Ethics, Decision Making, Stakeholder Theory and Artificial Intelligence. The classification is determined by different bibliometric criteria including publication year, source, subject area, location, document type, and main concepts. This methodical process enables a comprehensive comprehension of the research environment in these areas and emphasizes the changing patterns and relationships between AI and stakeholder management.

The key themes and discussions in the literature focus on the conceptualization and utilization of AI in stakeholder management. A major point of contention revolves around the ethical considerations of AI, specifically in relation to privacy and the ethical handling of data. Another important issue is the degree to which AI can independently make decisions that are in line with stakeholder interests and ethical principles. The primary areas of study encompass the advancement and utilization of AI technologies in diverse organizational settings, the incorporation of AI with ST to improve decision-making processes, and the examination of AI's influence on stakeholder connections. Scholars are particularly intrigued by how AI can enhance stakeholder engagement, forecast stakeholder requirements, and offer customized interactions.

The bibliometric analysis has identified several key authors who have made significant contributions to the fields of AI and Stakeholder Theory. Notable figures include Alan Turing, John McCarthy, as well as more recent scholars such as Pan Y. and Wilkins, who have offered foundational and contemporary insights into AI. Prominent journals that publish research in these domains include the ACM International Conference Proceeding Series and the Journal of Business Ethics. These publications play a vital role in disseminating state-of-the-art research and fostering academic discussions. In terms of geographical distribution, the research is primarily concentrated in North America and Europe, with the United States, the United Kingdom, and Germany leading the way. Nevertheless, there is a growing body of research originating from Asia, particularly China and India, which reflects the global interest and expanding research endeavours in these fields.

The dataset contains significant publications that have influenced the understanding of AI and its application to ST. Key works include Turing's foundational research on machine intelligence and McCarthy's early contributions to the field of AI. Moreover, the analysis emphasizes highly cited articles that focus on practical AI applications in organizations and the theoretical integration of AI with ST. These articles are important references for current research and discussions. Common keywords in the literature are "artificial intelligence," "machine learning," "stakeholder theory," "neural networks," "expert systems," "machine learning," "natural language processing," and "robotics." These terms represent the central concepts and technologies in the field.

In summary, the bibliometric analysis offers a detailed overview of the organization of knowledge at the intersection of AI and Stakeholder Theory. It identifies key issues, authors, journals, and geographic locations, as well as main publications, citations, and keywords. This mapping of the research landscape provides valuable insights for scholars and practitioners interested in further exploring and contributing to these interconnected fields

Conclusion

Final Considerations

The purpose of this research was to investigate how AI and ST overlap and what ways AI may improve stakeholder management. The study found that by offering enhanced data analysis, predictive insights, and customised engagement tactics, AI considerably increases the efficacy and efficiency of stakeholder management. The key findings of this research reveal several important aspects.

A strong foundation for addressing the requirements and interests of all stakeholders is provided by the combination of AI with ST. AI makes data-driven decision-making and personalised interaction possible, which leads to more efficient stakeholder management. AI applications may forecast stakeholder demands, improve stakeholder management procedures, and deliver real-time insights, all of which improve the dynamic interactions that exist between organisations and their stakeholders.

This research makes significant theoretical and practical contributions. It provides a fresh viewpoint on how AI might be used to improve stakeholder management, theoretically bridging the gap between AI and ST. It improves our knowledge of AI's function in organisational settings, especially regarding handling intricate stakeholder interactions. In terms of application, the investigation offers an an exploratory study with a significant sample size of 257 document and a literature review based on the top 35 articles.

In conclusion, this study adds to the current knowledge base by emphasizing the combined potential of AI and ST. Using AI, companies can improve their stakeholder management, leading to increased efficiency, effectiveness, and responsiveness, which in turn benefits both the organization and its stakeholders. The findings of this research open opportunities for further investigation and advancement in the field of AI and stakeholder management.

Limitations

This study has certain inherent limitations that should be acknowledged and carefully considered to fully examine the influence of AI on Stakeholder Theory. First, the topic's broad scope presents difficulties by nature because it covers a wide range of literature from many fields. Even with the best of intentions, it is possible to ignore some niches or new advancements due to the underlying complications. Moreover, the effectiveness of the bibliometric study is highly dependent on the integrity and accessibility of data sources, which may jeopardise the validity of conclusions because of biases present in databases by nature and differences in indexing techniques. Furthermore, the study's linguistic bias stems from its dependence on English-language articles, which may have an influence on the analysis's representativeness and exclude important findings from non-English sources. Additionally, time restrictions require a defined deadline for the inclusion of literature, which might unintentionally leave out more current works that present fresh viewpoints or even older paperwork's who present other theories. Methodological presumptions, particularly those related to authoring practices and citation measures, have the potential to inject biases into the research, and interpretation difficulties highlight the subjectivity that is inherent in bibliometric analyses. Lastly, although the study attempts to provide light on the wider picture of AI's influence on Stakeholder Theory, idiosyncratic characteristics and contextual subtleties may restrict the findings' applicability to certain sectors or organisational environments. It is beneficial to the research endeavour's credibility and robustness to acknowledge and clearly address these limits. It also helps to identify future research routes that aim to further academic discourse in the subject and mitigate these restraints.

Suggestions for future research

This research investigation of AI's influence on stakeholder theory has yielded important discoveries and indicated areas that merit further academic study. However, given the complexity of stakeholder dynamics and the quickly changing field of AI technology, extensive and continuous study is required.

The creation of extensive ethical AI frameworks that are specifically in line with Stakeholder Theory is one of the most urgent research demands. Even though ethical AI is becoming more popular, most of the work that has already been done is largely focused on technology and has nothing to do with the larger socio-economic ecosystems. Future studies should examine the systematic integration of ethical principles—such as accountability, transparency, and fairness—into AI-driven decision-making processes that impact a variety of stakeholder groups. This might involve doing empirical research to evaluate these models in various industries as well as developing new theoretical models that connect ethical AI with stakeholder involvement.

Artificial Intelligence technologies have the potential to drastically change the conventional approaches of prioritising and identifying stakeholders. Subsequent studies ought to investigate how AI-powered analytics might affect how companies categorise and rank their stakeholders. In particular, studies can investigate how machine learning algorithms might be used to identify newly formed stakeholder groups or changes in the importance of those groups that would not be immediately apparent using more traditional techniques. In order to provide more equal stakeholder participation, research might also evaluate the potential biases brought by AI in this setting and create strategies to counteract these biases.

While the present corpus of research offers glimpses into how AI affects stakeholder dynamics, longitudinal studies that monitor these effects over an extended period of time are required. Future studies might look at the long-term effects of AI technology adoption on stakeholder relationships and organisational results. These studies may offer important new perspectives on the viability of AI-driven stakeholder initiatives and how they affect stakeholder confidence, company reputation, CSR in general.

Future research might lead to significant advancements in both academic knowledge and practical application at the nexus of AI and Stakeholder Theory. In an AI-driven environment, researchers may help create more moral, practical, and long-lasting stakeholder management strategies by following the above-mentioned study areas.

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