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THE ROLE OF DESIGN THINKING IN ARTIFICIAL INTELLIGENCE DISRUPTION: A SYSTEMATIC LITERATURE REVIEW

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Abstract
This research aims to explore the role of Artificial Intelligence (AI) and Design Thinking in supporting digital transformation in various sectors, with a focus on innovation, sustainability, and operational efficiency. The study also seeks to analyze the relevance of both approaches in business and academic contexts, particularly in creating creative and human-centered solutions in the era of technological disruption. To achieve these objectives, this study used a systematic literature review method, by analyzing ten accredited and indexed articles in reputable international journals. The results showed that AI acts as a disruptive technology that not only improves efficiency but also accelerates digital transformation. Studies such as the one by Di Vaio et al. (2020), which received 1015 citations, highlighted how AI supports the development of sustainable business models. Additionally, research by Verganti et al. (2020) identified that Design Thinking remains relevant as an adaptive innovation approach, especially in the face of challenges posed by AI. The integration between AI and Design Thinking is also reflected in the study of Pham et al. (2022), which shows how creative approaches can maximize the potential of advanced technologies such as big data. Overall, this study confirms that the combination of AI and Design Thinking offers a comprehensive solution to deal with the complexities of digital transformation across various sectors.

Keywords: Artificial Intelligence, Design Thinking, digital transformation, innovation, HRM

Abstrak
Penelitian ini bertujuan untuk mengeksplorasi peran Artificial Intelligence (AI) dan Design Thinking dalam mendukung transformasi digital di berbagai sektor, dengan fokus pada inovasi, keberlanjutan, dan efisiensi operasional. Studi ini juga berupaya menganalisis relevansi kedua pendekatan tersebut dalam konteks bisnis dan akademik, khususnya dalam menciptakan solusi kreatif dan human-centered di era disrupsi teknologi. Untuk mencapai tujuan tersebut, penelitian ini menggunakan metode systematic literature review, dengan menganalisis sepuluh artikel yang terakreditasi dan terindeks pada jurnal internasional bereputasi. Hasil penelitian menunjukkan bahwa AI berperan sebagai teknologi disruptif yang tidak hanya meningkatkan efisiensi tetapi juga mempercepat transformasi digital. Studi seperti yang dilakukan oleh Di Vaio dkk. (2020), yang mendapatkan 1015 sitasi, menyoroti bagaimana AI mendukung pengembangan model bisnis berkelanjutan. Selain itu, penelitian Verganti dkk. (2020) mengidentifikasi bahwa Design Thinking tetap relevan sebagai pendekatan inovasi yang adaptif, terutama dalam menghadapi tantangan yang ditimbulkan oleh AI. Integrasi antara AI dan Design Thinking juga tercermin dalam studi Pham dkk. (2022), yang menunjukkan bagaimana pendekatan kreatif dapat memaksimalkan potensi teknologi canggih seperti big data. Secara keseluruhan, penelitian ini menegaskan bahwa kombinasi antara AI dan Design Thinking menawarkan solusi komprehensif untuk menghadapi kompleksitas transformasi digital di berbagai sektor.

***Kata Kunci**: Artificial Intelligence, Design Thinking, transformasi digital, inovasi, HRM*

Introduction

In the era of rapid digital transformation, the role of artificial intelligence (AI) is increasingly dominating various industrial sectors. AI not only brings efficiency to business processes, but also changes the landscape of work, human interaction patterns, and innovation strategies. Amidst the disruption caused by AI, a more human-centered approach to technology development is becoming increasingly important. Design Thinking, as a method oriented towards creative and innovative problem solving, offers an approach that can help individuals and organizations adapt to AI disruption. However, research that addresses the relationship between Design Thinking and AI disruption is limited, so a systematic analysis is needed to understand the role of Design Thinking in dealing with the challenges and opportunities posed by AI.

Conceptually, this study uses the Design Thinking theory developed by Brown, which emphasizes empathy-based thinking, collaboration, and iteration in finding innovative solutions (Pande & Bharathi, 2020). In addition, Christensen's technology disruption theory is also used to understand how AI disrupts established business models (Si & Chen, 2020). In this context, the integration of these two theories allows for a deeper exploration of how Design Thinking can be used to manage AI-induced change, whether in the context of business, education, or other sectors. Various previous studies have discussed aspects related to Design Thinking and AI. Setiyani et al. (2022) highlighted the role of Design Thinking in business innovation, while Aman et al. (2020) explained how this approach can be applied in various disciplines. Meanwhile, Rachmadana et al. (2022) discussed the impact of AI on the global workforce and economy, while Masrichah, (2023) highlighted the ethical and technical challenges arising from AI developments. However, there is limited research that specifically addresses how Design Thinking can be used to respond to AI disruption.

This research is different from previous studies because it combines the perspective of Design Thinking with AI disruption theory in one comprehensive study. If previous studies have mostly discussed Design Thinking as an innovation method in general or highlighted the impact of AI in terms of technology and economy, then this study tries to bridge the two aspects. By conducting a systematic literature review (SLR), this research will identify patterns, trends, and gaps in existing research on this topic. The novelty of this research lies in the holistic analysis that connects two approaches that are often considered separately, namely Design Thinking and AI disruption. Through a systematic approach to reviewing existing literature, this research seeks to provide new insights into how organizations can adopt Design Thinking as a strategy in the face of AI-driven change. This is expected to help policymakers, business leaders, and academics in designing strategies that are more adaptive to technological developments. The urgency of this research is increasing along with the accelerated adoption of AI in various industries. Organizations that are unable to adapt to these changes risk losing their competitiveness. Therefore, understanding how Design Thinking can help organizations navigate AI disruption is an urgent need. Moreover, from an academic perspective, this research also contributes to enriching the literature on the interaction between technology and human-based innovation strategies.

The main objective of this research is to explore the role of Design Thinking in dealing with AI disruption through a systematic literature review approach. Specifically, this research aims to: (1) identify key trends in research related to Design Thinking and AI disruption, (2) analyze how Design Thinking has been used in responding to AI-induced changes, and (3) identify research gaps that still need to be further explored. Thus, this research is expected to provide useful insights for both academics and practitioners in facing AI challenges with a more innovative and human-centered approach.

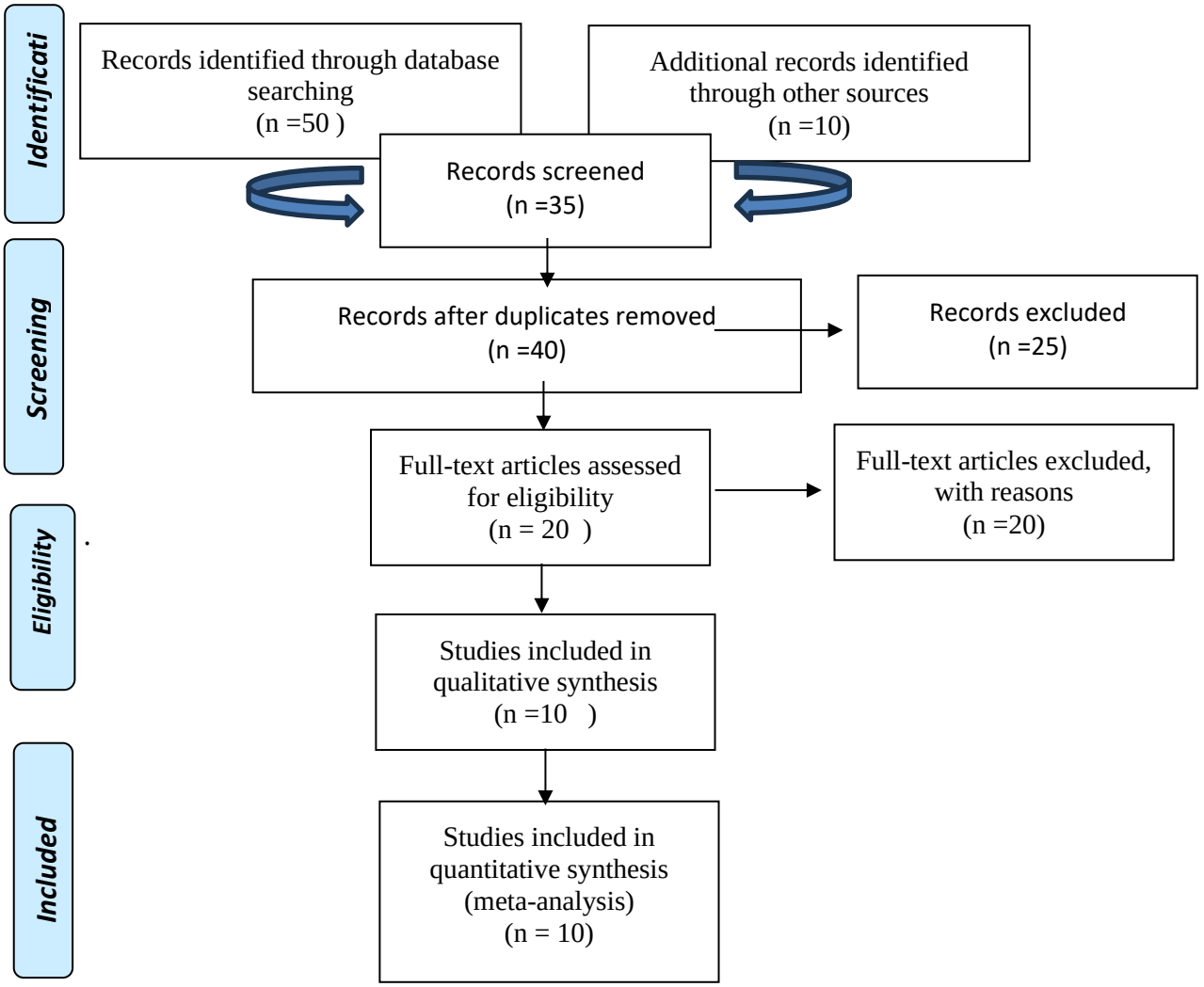
Research Methods

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)

approach is a recommended guideline for conducting systematic literature reviews and meta-analyses (Jaya, 2020). According to Purwanza, (2022), The research method with the PRISMA literature review consists of several systematic and transparent stages. In the initial stage, a clear and focused research question is identified. Next, a search for relevant literature through various electronic databases such as Google Scholar, EBSCO, SCOPUS, Clarivate, and SINTA accredited. The search strategy used a combination of keywords that were appropriate to the topic, population, intervention, and outcomes defined. The article selection process began with examining the title and abstract, followed by a full-text review to determine which studies met the pre-defined inclusion criteria.

At the data extraction stage, key information from each selected study was systematically identified and recorded, such as study characteristics, population, interventions, outcomes, and methodological quality. To assess the risk of bias in the included studies, appropriate methodological quality assessment tools were used, such as the *Cochrane Risk of Bias* or *JBI Critical Appraisal Checklist*. The next stage was data synthesis, where results from studies that met the criteria were summarized and presented qualitatively or quantitatively (meta-analysis) where possible. Interpretation and discussion of the results were conducted considering the strengths, limitations, and implications of the findings for practice and future research. This entire process was documented in detail and presented in narrative, tabular, and/or flowchart form by PRISMA guidelines. This approach ensures that the literature review is comprehensive, transparent, and reproducible by other researchers:

More complete researchers are described in the following diagram:



Results and Discussion

Based on the background and research methods above, the following are the article criteria that researchers use:

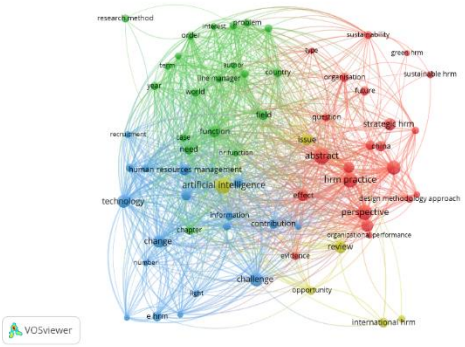
Table 1. Article Criteria

ARTICLE DATA CRITERIA	DESCRIPTION
YEAR OF PUBLICATION	Articles published between 2020 and 2024
ARTICLE SOURCE	Articles indexed in Sinta, proceedings, and international articles obtained through Google Scholar.
RELEVANCE TO THE RESEARCH TOPIC	Articles that are directly related to the role of design thinking in artificial intelligence disruption.

Source: Data processing

After determining the criteria for the next article, researchers searched for articles using VOSviewer with the keywords Human resource management (HRM), Design thinking, and Artificial intelligence with the following results:

Figure 1: Network Visualization



Description

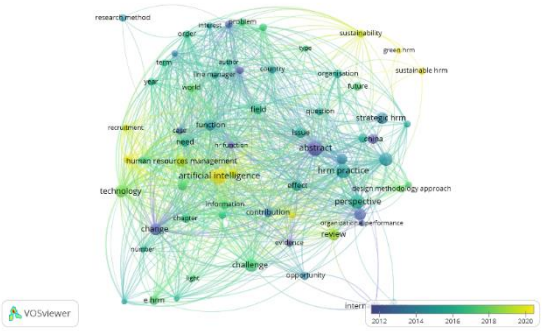
The image shown is a bibliometric map visualization created using VOSviewer software. This visualization shows the relationship between various terms that frequently appear in research related to artificial *intelligence* and human *resource management*, and how these terms are connected in the scientific literature.

In this map, different colors indicate groups or clusters of keywords that are closely related to each other. The green cluster, for example, focuses on research *methods*, research problems, and various concepts related to academic fields and managerial functions. The blue cluster highlights the role of technology and challenges in the application of artificial intelligence, which involves changes in human resource management as well as the application of e-HRM (*electronic human resource management*). The red cluster, on the other hand, relates to *practices*, strategic perspectives in management, and the concept of *sustainability*. The connecting lines in this figure show the relationship between terms that often appear together in the scientific literature. The thicker the line, the stronger the relationship between the two terms, indicating that these concepts are often discussed in the same context.

Overall, this map provides insight into research trends in the fields of artificial intelligence and human resource management. It shows that AI is increasingly playing an important role in HR strategies, both in improving operational efficiency and supporting innovation in organizations. In

addition, this map can also be used as a basis for identifying research gaps and future research opportunities in this field.

Figure 2. Visualization of the Overlay



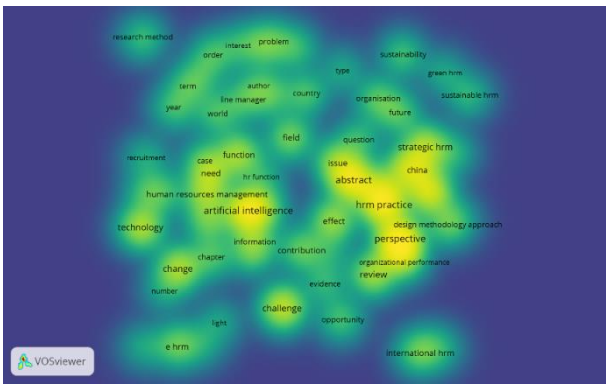
Description

The image shown is a visualization of a bibliometric map created using VOSviewer software. This visualization shows the interconnectedness of terms in research related to artificial *intelligence* and human *resource management*, and how their usage trends have evolved over the years. In this figure, the colors used indicate the temporal distribution of frequently occurring terms in the scientific literature, as indicated by the color scale at the bottom right. The yellow color indicates terms that are more frequently used in recent studies (around 2020), while the blue color indicates terms that appear more frequently in older studies (around 2012). As such, this map provides insight into how certain concepts and topics evolved in the academic literature over a while.

Some of the terms that appear frequently in recent research (marked in yellow) are *sustainable HRM*, *green HRM*, and *strategic HRM*, indicating that research in recent years has focused more on the relationship between artificial intelligence and sustainability in human resource management. Meanwhile, terms such as *artificial intelligence*, *human resource management*, and *technology* appear in various timeframes, indicating that these concepts have been a consistent research topic over the years.

In addition, the connecting lines between the terms indicate a strong relationship between the various concepts, the thicker the line, the stronger the relationship between the two terms. Overall, this map provides insight into the evolution of research in the fields of artificial intelligence and human capital management and helps identify emerging trends in the scientific literature.

Figure 3. Density Visualization



Description

The image shown is a *density* visualization created using VOSviewer software. This visualization shows the density of terms that frequently appear in research related to artificial *intelligence* and human *resource management*. In this figure, the colors used indicate the frequency

with which terms appear in the scientific literature. Yellow indicates the most frequently occurring terms, while green indicates moderately frequent terms but with a lower density. Blue to purple colors indicate areas with less frequent occurrence of terms. As such, this image helps identify terms that are the center of attention in related research.

From this visualization, the most prominent terms (marked in yellow) are *abstract*, *HRM practice*, *perspective*, and *artificial intelligence*. This shows that in research on artificial intelligence and human resource management, much attention is paid to HRM practices, perspectives on AI applications, and the role of technology in shaping HR strategy. In addition, terms such as *strategic hrm*, *sustainable hrm*, and *design methodology approach* also appear quite dominantly, indicating that research in this field also highlights sustainability strategies and design approaches in AI-based HRM. Overall, this map provides insights into how artificial intelligence is being integrated with the field of human resource management and the key topics that are being researched. It can assist researchers in identifying key trends and research gaps for further exploration.

Table 2. Sinta-accredited and internationally indexed articles on the role of design thinking in artificial intelligence disruption is accredited by Sinta, and indexed internationally

NO	TITLE	AUTHOR	INDEXED	METHODS	REFERENCED
1	Artificial intelligence and big data analytics for supply chain resilience: a systematic literature review	(Zamani dkk., 2023)	Reputable International	Systematic Literatur Review	171 **Times**
2	Artificial Intelligence as a Disruptive Technology—A Systematic Literature Review	(Păvăloaia & Necula, 2023)	Reputable International	Sistematic Literatur Review	146 **Times**
3	Design Thinking: Critical Analysis and Future Evolution	(Verganti dkk., 2020)	Reputable International	Systematic Literatur Review	113 **Times**
4	The Role of Design Thinking in Big Data Innovations	(Pham dkk., 2022)	Reputable International	Analisa Kualitatif	13 **Times**
5	Types of innovation and artificial intelligence: A systematic quantitative literature review and research agenda	(Mariani dkk., 2023)	Reputable International	Systematic quantitative literature review	182 **Times**
6	Artificial intelligence as an enabler for entrepreneurs: a systematic literature review and an agenda for future research	(Giuggioli & Pellegrini, 2022)	Reputable International	Systematic literature review	222 **Times**

7	Artificial intelligence and business models in the sustainable development goals perspective: A systematic literature review	(Di Vaio dkk., 2020)	Reputable International	SBM literature	1015 **Times**
8	Artificial intelligence in the design of the transitions to sustainable food systems	(Camaréna, 2020)	Reputable International	literature review	124 **Times**
9	Artificial intelligence and the conduct of literature reviews	(Wagner dkk., 2022)	Reputable International	Systematic literature review	205 **Times**
10	Artificial intelligence in marketing: A systematic literature review	(Chintalapati & Pandey, 2022)	Reputable International	Systematic literature review	360 **Times**

Source: Data Processing

Based on the table above, it can be explained that in the era of growing digital transformation, the role of artificial intelligence (AI) and design thinking is becoming increasingly crucial in various sectors. AI has become a disruptive force that is changing the way businesses, industries, and societies operate, while Design Thinking provides innovative, human-centered approaches to deal with these changes. Various studies have been conducted to understand the impact of AI on industries and how creative approaches such as Design Thinking can be used to manage the changes that occur.

One of the relevant studies was conducted by Zamani et al. (2023), who discussed how AI and big data analytics can improve supply chain resilience. Using a systematic literature review method, this study has been referenced 171 times, showing the importance of this topic in academia and industry. The findings of this study highlight how AI can improve the efficiency and resilience of supply chain systems in the face of unexpected disruptions. Similar research was conducted by Păvăloaia and Necula (2023), who explored AI as a disruptive technology in various industrial sectors. Using a systematic literature review method, this study received 146 citations. This study highlights how AI not only changes the way businesses are run but also challenges traditional business models and accelerates digital transformation.

Verganti et al. (2020) in their research entitled *"Design Thinking: Critical Analysis and Future Evolution* ", critically analyzed the concept of Design Thinking and explored its future evolution. With 113 citations, this study provides deep insights into how Design Thinking can continue to evolve as an innovation method, including in the face of challenges posed by AI. In a study conducted by Pham et al. (2022), the role of Design Thinking in big data innovation was examined using a qualitative analysis approach. This is a relatively new study with only 13 citations, but it provides valuable insights into how the integration of creative approaches and advanced technologies can lead to innovative solutions.

Mariani et al. (2023) in their research entitled *"Types of Innovation and Artificial Intelligence: A Systematic Quantitative Literature Review and Research Agenda* "used a systematic quantitative literature review method. With 182 citations, this study identified various types of AI-driven

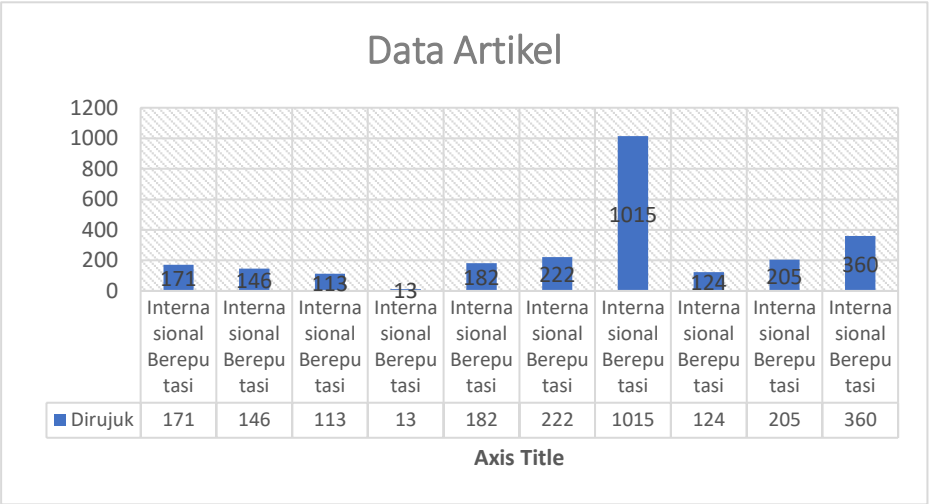
innovation and provided a research agenda for further exploration. In a study conducted by Giuggioli and Pellegrini (2022), AI was studied as an enabler for entrepreneurs. The study used a systematic literature review and received 222 citations. This study highlights how AI can help entrepreneurs grow their businesses, improve operational efficiency, and create new opportunities in the digital business ecosystem. The study conducted by Di Vaio et al. (2020) entitled *"Artificial Intelligence and Business Models in the Sustainable Development Goals Perspective*" discusses how AI plays a role in developing business models that support sustainable development goals. With 1015 citations, this study is one of the most referenced, showing the high relevance of AI in the context of sustainability.

Camaréna (2020) in his research entitled *"Artificial Intelligence in the Design of the Transitions to Sustainable Food Systems*" used a literature review approach to examine how AI can assist in the transition to a more sustainable food system. With 124 citations, this study highlights how AI technology can support innovation in the agriculture and food sectors. Wagner et al.'s (2022) study entitled *"Artificial Intelligence and the Conduct of Literature Reviews*" used the systematic literature review method to explore how AI can be used in the *conduct* of academic literature reviews. With 205 citations, this study shows how AI is not only an object of study but also a tool used in scientific research.

Finally, research conducted by Chintalapati and Pandey (2022) entitled *"Artificial Intelligence in Marketing: A Systematic Literature Review* "has been referenced 360 times. This research discusses how AI is used in modern marketing strategies, showing how AI plays a role in marketing personalization, consumer behavior analysis, and automation of digital marketing strategies. Overall, these studies provide great insight into how AI is affecting various industry sectors and how Design Thinking can be used as an innovative approach to dealing with the changes brought about by AI. From an academic perspective, this research demonstrates the growing trends in AI and innovation studies, as well as identifying research gaps that still need to be further explored.

In the context of business and industry, the findings from these studies provide insights into how companies can utilize AI to improve competitiveness and operational efficiency. Meanwhile, the Design Thinking approach offers a more human-centered strategy for managing change due to AI disruption. Thus, the systematic study of the relationship between AI and Design Thinking is becoming increasingly relevant, not only for academics but also for practitioners in various fields.

Figure 1. List of Cited Articles



Data source: Processing results

Based on the diagram above, the most widely used articles are articles with reputable international indexes with the highest number of 1015 citations. From the table and diagram, it can

be concluded that articles with the theme of Artificial intelligence and business models are widely cited.

Picture. Diagram of Accredited and Indexed Articles

Data source: Processing results

The diagram above shows the distribution of internationally accredited and indexed articles in specific categories. From the diagram, it can be seen that of the total ten articles analyzed, ten articles are accredited and indexed in reputable international journals. This shows that the majority of the research conducted has high-quality standards and is recognized by the international academic community.

DISCUSSION

The Role of Artificial Intelligence and Design Thinking in Digital Transformation

In the growing era of digital transformation, artificial intelligence (AI) has become a disruptive force affecting various aspects of business, industry, and society. At the same time, innovative approaches like Design Thinking offer human-centered strategies to manage the changes brought about by AI. The combination of AI and Design Thinking provides a great opportunity to create creative solutions, accelerate digital transformation, and improve efficiency in various sectors.

Research conducted by Zamani et al. (2023) made a significant contribution to understanding the role of AI in improving supply chain resilience through the use of big data analytics. Using a systematic literature review method, this study successfully demonstrated how AI can strengthen the resilience of supply chain systems in the face of unexpected disruptions. The 171 citations are an indicator of the importance of this research, both in academia and industry. The findings are relevant, especially in an increasingly complex global context, where supply chain resilience is a top priority.

Meanwhile, Păvăloaia and Necula (2023) explored the role of AI as a disruptive technology in various sectors. With 146 citations, this study highlights how AI not only changes traditional business models but also accelerates digital transformation. The systematic literature review approach used by the researchers provides a comprehensive perspective on how companies can utilize AI to create new business models that are more adaptive and sustainable. In the context of innovation, the study by Verganti et al. (2020) provides a critical analysis of the concept of Design Thinking, which has become a key innovation method in various fields. The study explores the future evolution of Design Thinking, especially in the face of challenges posed by AI. With 113 citations, this study is an important reference for academics and practitioners who want to understand how this innovative approach can continue to evolve as technology advances.

The study by Pham et al. (2022) also adds a new dimension by highlighting the integration between Design Thinking and big data innovation. Although the citation count of this study is still relatively low (13 times), its contribution cannot be ignored. This study provides insights into how a human-focused approach can be used to maximize the potential of big data in creating innovative solutions relevant to market needs.

Artificial Intelligence as a Driver of Innovation and Sustainability

Mariani et al. (2023) in their study showed how AI drives different types of innovations in various sectors. The study used a systematic quantitative literature review method and has been referenced 182 times. The findings provide an in-depth understanding of how AI acts as a catalyst for innovation while identifying research areas that require further exploration. The relevance of this research is high, especially in an era where companies are constantly looking for ways to compete through advanced technology. Giuggioli and Pellegrini (2022) highlighted the role of AI as an enabler for entrepreneurs. The study has been referenced 222 times, showing that AI not only helps improve operational efficiency but also opens up new opportunities in the digital business ecosystem. From an entrepreneurial perspective, AI becomes an important tool for identifying market opportunities, managing risks, and developing more innovative business strategies.

In a highly influential study, Di Vaio et al. (2020) explored how AI supports the development of business models that align with the Sustainable Development Goals. With a remarkable 1015 citations, this study provides strong evidence that AI has an important role to play in supporting global sustainability. This research provides insight into how technology can be used to create a greater positive impact, both socially and environmentally. Camaréna's (2020) research also addresses the topic of sustainability through a study on the role of AI in the transition to a more sustainable food system. With 124 citations, this study shows how AI can support innovation in the agriculture and food sector, which is a key element in achieving global food security. The findings are relevant in the context of global challenges such as climate change and population increase.

AI as a Tool to Support Research and Innovation

Research by Wagner et al. (2022) provides a new perspective on how AI can be used in the conduct of academic literature reviews. With 205 citations, this study proves that AI is not only an object of study but also a tool that supports the research process. This study opens up new opportunities to improve efficiency and accuracy in academic research. In the context of marketing, Chintalapati and Pandey (2022) explored the use of AI in modern marketing strategies. With 360 citations, this study highlights how AI can be used for marketing personalization, consumer behavior analysis, and automation of digital marketing strategies. This research becomes relevant in an era where data is becoming a key resource for companies to improve competitiveness.

Conclusion

Taken together, these studies provide a comprehensive overview of how AI and Design Thinking contribute to digital transformation in various sectors. From an academic perspective, this research shows that AI has become a major focus in the study of innovation, sustainability, and operational efficiency. The Design Thinking approach, on the other hand, offers human-centered strategies to manage the changes brought about by AI. In the context of business and industry, these findings provide important insights into how companies can leverage AI to improve efficiency, competitiveness, and sustainability. Meanwhile, Design Thinking provides a more adaptive and human-centered approach to dealing with complex challenges. Thus, the combination of AI and Design Thinking is becoming increasingly relevant, not only for academics but also for practitioners who want to utilize technology to create a sustainable positive impact.

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