

İşgüzar, Seda; Fendoğlu, Eda; Şimşek, Ahmed İhsan

Article

Innovative applications in businesses: An evaluation on generative artificial intelligence

Amfiteatru Economic Journal

Provided in Cooperation with:

The Bucharest University of Economic Studies

Suggested Citation: İşgüzar, Seda; Fendoğlu, Eda; Şimşek, Ahmed İhsan (2024) : Innovative applications in businesses: An evaluation on generative artificial intelligence, Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 26, Iss. 66, pp. 511-530,
<https://doi.org/10.24818/EA/2024/66/511>

This Version is available at:

<https://hdl.handle.net/10419/300607>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>

INNOVATIVE APPLICATIONS IN BUSINESSES: AN EVALUATION ON GENERATIVE ARTIFICIAL INTELLIGENCE

Seda İşgüzar¹, Eda Fendoğlu^{2*} and Ahmed İhsan Şimşek³

¹⁾²⁾Malatya Turgut Özal University, Malatya, Turkey

³⁾Fırat University, Elazığ, Turkey

Please cite this article as:

İşgüzar, S., Fendoğlu, E. and Şimşek, A.I., 2024. Innovative Applications in Businesses: An Evaluation on Generative Artificial Intelligence. *Amfiteatru Economic*, 26(66), pp. 511-530.

DOI: <https://doi.org/10.24818/EA/2024/66/511>

Article History

Received: 30 December 2023

Revised: 18 February 2024

Accepted: 26 March 2024

Abstract

The utilisation of Chat Generative Pre-Trained Transformer (ChatGPT) and generative artificial intelligence (GenAI) technologies has started to demonstrate its impact across several domains. The swift shift and widespread implementation of efficient artificial intelligence (AI) present distinct prospects such as optimisation, advancement, enhanced efficiency, boosted sales and marketing, expansion, reduced costs, and heightened profitability. GenAI has the potential to create a competition crisis between technologically advanced enterprises and less developed ones. Additionally, it may give rise to legal, moral, and ethical issues such as copyright infringement and the production of fake and false information. Hence, it is crucial for organisations to ensure that the productivity of AI is maximized in order to maximise its benefits and minimise any potential harm. The aim of this study is to provide suggestions regarding the use and potential of GenAI technologies in the corporate sector and to emphasise the potential research areas of future GenAI. This study contributes to research and practice in business and management and also identifies future research avenues. This study examines the benefits and disadvantages of using GenAI tools in businesses and individual departments, and it highlights the potential risks and dangers. A bibliometric analysis of 198 studies in the discipline of Business & Management from the Scopus database was conducted using the R program's bibliometrix package. The study focuses on descriptive data, annual scientific production, most productive journals, most productive authors and authors dominance factor, most cited publications, and most relevant keywords. The findings show that GenAI is likely to continue with a strong and rapidly rising trend in 2024 and beyond.

* Corresponding author, Eda Fendoğlu – e-mail: eda.fendoglu@ozal.edu.tr



This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. © 2024 The Author(s).

Keywords: ChatGPT, artificial intelligence (AI), generative artificial intelligence (GenAI), OpenAI, business, business management, technology adoption, bibliometric analysis.

JEL Classification: M10, M19, O10, O32, O33

Introduction

“Is it possible for machines to possess the ability to think?” Alan Turing’s inquiry in 1950 serves as the catalyst for the integration of artificial intelligence (AI) into our contemporary society, as it outperforms humans in certain activities. AI is a branch of science and engineering that enables the creation of intelligent machines that mimic human intelligence. The concept of AI was first introduced in a text presented by a group of scientists led by J. McCarthy at a seminar held at Dartmouth College in 1956. With their work and that of subsequent researchers, it emerged as a science (Say, 2018). Since then, despite experiencing periods of both advancement and stagnation, AI has become a technology that not only names an era, but also, in the words of Harari, empowers humanity with the ability to “reshape life” (İşgüzar, 2021). These advancements in technology, particularly in the field of AI, have created a variable and uncertain competitive environment. Businesses are aware of the need to adapt their processes rapidly to changing conditions. Therefore, they are redefining their competitive strategies while simultaneously integrating these technologies into their processes, aiming to make many processes data-driven and automated, from planning and execution to performance measurement.

In the past decade, rapid advancements in AI technologies have significantly impacted businesses’ operations and strategic decision-making processes. Utilised in various fields ranging from financial forecasting to customer relationship management, and from market analysis to inventory management, AI technologies support businesses in their decision-making processes. However, recent developments have raised the question, “Will humanity delegate its creative skills, which it still possesses, to artificial intelligence as well?” This discussion pertains to the rise of GenAI tools, which can generate new content by learning from data.

GenAI, based on deep learning techniques, utilises data-driven learning methods with human-like language abilities to learn from example data and generate new data. Although existing AI technologies provide algorithmic predictions based on data understanding, GenAI goes further by creating unique content such as text, images, videos, and music. The emergence of GenAI has attracted attention from academia to the business world due to its “creativity” ability.

The existence of GenAI tools is undoubtedly based on cumulative knowledge in the field of AI. However, the release of the Generative Pre-Trained Transformer (GPT) by OpenAI in June 2018 marked a significant milestone in the popularity of GenAI technologies. The introduction of ChatGPT, which could be used as a language model, in November 2022 further increased interest in this technology. Trained on a vast dataset including publicly available texts, books, articles, and other written sources, ChatGPT has been successful in producing results similar to human language abilities (Serdaliyev and Zhunissov, 2023; Lyu et al., 2023). Currently, various companies, including Google, have developed and continue to improve GenAI tools in different domains. These technologies are expected to bring about significant transformations in education, communication, healthcare, business, and various aspects of life.

The incorporation of GenAI tools into business and management processes is believed to provide a competitive advantage. Therefore, businesses are focusing on how to benefit from these technologies. These tools have the ability to merge different datasets, analyse, summarise, and generate new content and perspectives, thus inspiring creative thinking. Hence, it is deemed essential for businesses to comprehensively understand how to utilise GenAI technologies and explore their impacts through research.

Seeing the applications and effects of GenAI tools in businesses will take time. Even the extensive literature on AI and business context can provide inconsistent results on the real impacts of these technologies on businesses (Pereira et al., 2023). Therefore, research on GenAI and business is still emerging. For instance, a search on the Web of Science database with the keyword “generative artificial intelligence and business” yields a total of 64 studies. Most of these studies focus on determining whether ChatGPT can produce effective results by generating instant scenarios and demonstrating their benefits. However, these studies only encourage businesses to use ChatGPT for instant problem-solving. Hence, there is a need for studies that can provide insight to managers who wish to integrate GenAI as an innovative technology into their businesses.

This study aims to provide a projection regarding the future of GenAI tools in businesses, based on a bibliometric analysis of data from the academic literature, which is just beginning to conceptualise. The findings are expected to provide holistic knowledge about prominent researchers, countries, institutions, focused topics, and applications in the field of GenAI and business management. This study is structured to address the following research questions:

RQ1: In which research areas and by whom have studies been conducted in the field of GenAI and business?

RQ2: What are the connections among the studies conducted in the field of GenAI and business? What types of studies will these connections guide?

RQ3: What are the opportunities indicated in the existing literature for implementing GenAI in businesses?

RQ4: What are the potential threats or challenges associated with the implementation of GenAI in the business sector?

The next section provides a review of the literature on GenAI, followed by a section presenting information on bibliometric analysis, which constitutes the second part of the study. The methodology is outlined in the third section, and the findings are presented in the fourth section. Finally, the last section discusses managerial and practical implications, along with research limitations.

1. Literature review

GenAI has begun to revolutionise, as it has emerged as a new and stimulating solution tool to improve the performance and efficiency of businesses under a number of systematic changes and problems in corporate management and organisation. Table no. 1 summarises the most recent (2023-2024) studies on ChatGPT and GenAI, especially in the business field.

Table no. 1. Literature review

Reference	Business areas	Purpose	Methodology	Outcomes
Amin et al. (2024)	Twitter, Stock Market	To predict stock market trends.	Analysed 500,000 tweets containing ChatGPT-related hashtags. Natural Language Processing techniques, sentiment analysis	More precise market trends forecasts by correlating daily Twitter sentiment and engagement metrics on ChatGPT with end-of-day stock price movements, along with synergies between macroeconomic indicators and company-specific stock data.
Aguinis et al. (2024)	Human resource management (HRM)	To demonstrate that GenAI and ChatGPT can be useful HRM assistants for strategic and operational tasks.	Analysis of texts obtained with ChatGPT prompts and document analysis	When used by a well-trained HRM professional, GenAI and ChatGPT can be an invaluable tool for completing strategic and operational tasks and allocating resources.
Al Naqbi et al. (2024)	Enhancing Work Productivity	To assess GenAI impact on business performance and efficiency.	Bibliometric analysis	GenAI improves productivity and efficiency; serves as a guide for future research.
Gupta and Yang (2024)	Entrepreneurs	To create a comprehensive GenAI Technology Adoption Model for entrepreneurs and other actors.	Task-Oriented AI Adoption (T-AIA) model	New model stands out due to its flexibility, includes different actors in the innovation ecosystem (libraries), is broadly applicable, and can be supported by statistical analysis in the future.
Khan and Umer (2024)	Finance	To examine applications of ChatGPT in finance, and the corresponding ethical challenges.	Literature review	ChatGPT causes a positive disruption in financial decision-making and brings many ethical problems.
Rane et al. (2024)	Intelligent manufacturing	To explore existing knowledge on ChatGPT and Bard integration into smart manufacturing, to create a new paradigm.	Literature review and bibliometric analysis	The major change brought to the industry by ChatGPT will push it to greater efficiency, competitiveness, and applicability in the rapidly developing global market.
Rane (2023a)	Industry 4.0, Industry 5.0 and Society 5.0	To examine the role of ChatGPT and GenAI in Industry 4.0, Industry 5.0 and Society 5.0.	Literature review	Efficient use of AI, in accordance with ethical rules and due attention, is a guiding light towards a future where societies are interconnected and industries develop in harmony.
Korzynski et al. (2023)	Management	To examine GenAI-ChatGPT potential to be a new context for selected theories and concepts.	Opinion piece article	GenAI can impact managerial work at strategic, functional, and administrative levels.
Soni (2023a)	GEN AI with human, technology and market factors in revenue growth	To examine GenAI impact on revenue levels, market dynamics, technological developments, and human variables.	Data from 331 SMEs Ridge, Elastic, and Net regression methods.	Strategic utilisation of human resources and robust technological infrastructure can enhance the benefits of GenAI. Advantages of GenAI may diminish as market competition increases. AI offers an extra benefit in competitive marketplaces.
Chuma and Oliveira (2023)	Decision-making	To examine the use of ChatGPT as a decision-making tool in a commercial context.	Three sets of questions presented to ChatGPT.	ChatGPT provides an overview of the issue in the decision-making process, but does not replace the decision-making expert.
Chen et al. (2023)	Business and finance	To examine advancements of GenAI-	Natural Language Processing, Sentiment Analysis	Sentiment scores from ChatGPT can effectively predict organisations' stock return performance and risk

Reference	Business areas	Purpose	Methodology	Outcomes
		ChatGPT in the business and financial sectors.		management capabilities. Highlights its transformative impact on costs and productivity.
Kanbach et al. (2023)	Healthcare, software engineering, healthcare services	Controversial example of GenAI's impact on businesses.	Qualitative content analysis on 513 examples	Scholarly discussion on AI. Academic studies, business reports, news, and podcasts offer insight on leveraging technologies to enhance existing business models and uncover novel ones.
Soni (2023b)	Digital marketing campaigns	To determine parameters affecting the adoption of productive AI in digital marketing campaigns.	Survey of 411 professionals. Machine learning techniques: Decision Tree, KNN, Random Forest, SVM, Sequential Selection, Probability models	Use of GenAI in digital marketing is driven by efficiency, scalability, and the ability to develop personalised content. Substantial barriers to adoption: complexity, knowledge gaps, and constraints on creativity.
Wamba et al. (2023)	Supply chain	To explore advantages of GenAI, identify risks and strategies for effective use of GenAI in organisations.	Surveys of 315 persons (US and UK). Comparison between companies.	GenAI brings advantages in terms of efficiency and production, but also obstacles and risks in areas such as ethical use, privacy, and human integration.
Rane (2023c)	Human resource management (HRM)	To examine roles and challenges presented by ChatGPT and its counterparts in HRM.	Co-occurrence analysis of keywords in literature	Technologies offer transformative potential, but introduce complexities.
Budwar et al. (2023)	Human resource management (HRM)	To emphasise risks of ChatGPT and more complex AI.	Case study	ChatGPT is valuable in assisting researchers to generate ideas, propose theory, choose research design, determine metrics, choose a data analysis approach, and provide general guidance on conducting ethical research & reporting results.
Rane (2023d)	Multidisciplinary: Retail, finance, manufacturing, accounting, transportation, and construction	To evaluate ChatGPT and other AI contribution in facilitating seamless adoption in various sectors.	Literature review	Cross-domain teams are instrumental in harnessing the transformative potential of AI, thereby driving industries towards a more efficient, sustainable, and technologically advanced future.
Rane (2023b)	Finance and accounting	To examine the changing role of ChatGPT and GenAI.	Literature review	ChatGPT increases customer engagement in finance; it efficiently processes large amounts of data. Automation in accounting streamlines processes, reduces expenses and human errors.
Beerbaum (2023)	Business landscape and accounting	To apply behavioural theory to robotic process automation (RPA) and to address ethical concerns and constraints.	Classification to increase the transparency of XBRL application	Emergence of productive AI will lead to moral problems. Transparency technologies offer answers to mitigate risks.

2. Bibliometric analysis

Bibliometrics is a quantitative approach used to analyse publications in the scientific literature and the connections among them (Groos and Pritchard, 1969; Herubel, 1999). The primary objective of this approach is to methodically assess scientific papers and uncover the connections among them (Donthu et al., 2021). Additionally, it possesses the capacity to indicate the direction in which a field of study will progress in the next years. Consequently, it is a commonly employed strategy for conducting systematic literature reviews (Aria and Cuccurullo, 2017). The system examines extensive scientific data, including keywords, citations, publication count, and using mathematical and statistical techniques to extract relational information. Conducting bibliometric analyses in this manner enables the investigation of specific subjects, comprehension of trends, and provision of an unbiased viewpoint to researchers (Wang and Su, 2020; Han et al., 2020). In his 1972 work, Crane elucidates the advantages of bibliometric analyses, which can be summarised as follows:

- Exploring novel research methodologies;
- Formulating fresh research proposals;
- Determining the variables associated with a research subject;
- Recognising the interrelationships among countries, academic publications, and researchers;
- Ensuring the integration of concepts and practical implementations.

However, bibliometric analyses do possess certain limitations. Analyses can solely be conducted on studies that have open access. Excluded are studies that are currently in the publication phase or are not accessible. This could impede the provision of a more precise depiction of the present circumstances. Furthermore, in the present day, alterations are transpiring at an exponential pace. Bibliometric data may occasionally provide an inadequate representation in light of swift changes. Although it has limits, bibliometric analysis is nonetheless a crucial tool for comprehending the connections between various scientific studies in the publishing industry, monitoring advancements in a certain topic or field, and influencing future research paths.

3. Methodology and data

This study examines the influence of efficient AI technologies on businesses and was carried out using a five-stage methodology suggested by Ruiz-Real et al. (2018). The procedures involved in this process are as follows: (1) Identifying suitable keywords, (2) Choosing the database to be scanned, (3) Enhancing the search criteria based on the Initial Research findings, (4) Exporting the results, (5) Analysing the data and discussing the findings.

In order to conduct the study, we thoroughly reviewed the pertinent literature and identified the keywords as “generative artificial intelligence & business” and “generative artificial intelligence & business management”, without using quotation marks. Bibliometric studies typically rely on the utilisation of multidisciplinary scientific databases such as Web of Science or Scopus. These databases encompass a wide range of scientific journals, conference proceedings, and other academic resources (Arenas et al., 2018). The initial step of this research involved searching the Web of Science database using the keyword

“generative artificial intelligence & business” without quotation marks. As of December 15, 2023, a cumulative of 45 studies including the period from 2019 to 2023 have been retrieved. A total of 31 articles are associated with the year 2023. There are a total of 32 articles, 11 early access publications, 6 proceeding papers, 4 review articles, 3 editorial materials, and 2 book chapters in these works. Upon examination of the acknowledged papers, it was ascertained that only 14 of them were directly or indirectly relevant to the objective of our study. A search was conducted using the phrase “generative artificial intelligence & business management”, resulting in a total of 14 matches. It was noted that 14 studies from the most recent screening were also included in the 45 studies from the prior screening. Consequently, the second keyword was excluded. Due to insufficient data received from the initial search in the Web of Science database, the required information was gathered from the Scopus database. Some research is inaccessible in their entirety, but their inclusion in the analysis does not have a negative impact on the results. Hence, all papers pertaining to the objective of our study were incorporated into the analysis.

The study employs a combination of bibliometric analysis, which examines the frequencies of data, and network analysis, which uncovers patterns and connections between data (Lewis and Alpi, 2017). Bibliometric studies, which utilise historical data, can unveil the interconnections among various entities, such as journals, scholars, and countries, with the goal of predicting future trends. Various tools, such as Gephi, VOSviewer, and R, are employed to perform these analyses. The choice of program is contingent upon the problem being addressed in the study, as well as the merits and limitations of such program. Certain programs may restrict the flow of data from specific databases. This study assesses the benefits and drawbacks of the instruments utilised for bibliometric studies, and conducted analyses using the R program. Multiple studies demonstrate the widespread use of VOSviewer. This program is mostly used to conduct analyses on co-authorship, bibliographic coupling, and co-citation.

Recently, the field of GenAI has gained significant academic interest. The current literature is insufficient to conduct these citations and coupling analyses. Descriptive statistics are used instead of detailed bibliometric analyses such as co-citation, bibliographic coupling, and co-authorship. Analyses were conducted using the bibliometrix package in the R software. We examined studies in the Scopus database that included the keywords “business” and “generative artificial intelligence” for the analysis. 198 studies on “generative artificial intelligence” were identified in the business field. First, descriptive statistics on these studies are provided. Subsequently, the data on “annual scientific production” was examined, revealing a significant surge in research on “generative artificial intelligence”. The most productive journals and authors in this field were identified. The dominance factors of the authors were analysed to identify the most influential authors in this field. Finally, the bibliometric analysis section was concluded by determining the most used keywords and the most cited studies.

4. Results

4.1. Descriptive statistics

In order to address the initial research inquiry, descriptive statistics encompassing the essential study data are initially provided. These statistics encompass the research quantity, number of writers, annual growth rate, average citations per document, average keywords

per document, and the most productive authors. The R program's bibliometric package was utilised for doing descriptive statistics. Table no. 2 outlines fundamental research information, encompassing authors, and inter-author interactions, along with the total number of studies and the average number of citations per study.

Table no. 2. Descriptive statistics

Main information about data		Authors	
Timespan	2021:2024	Authors	646
Sources (Journals, Books, etc.)	136	Author Appearances	731
Documents	198	Authors' collaboration	
Annual Growth Rate %	135.1	Single-authored docs	35
Document Average Age	-0.0455	Documents per Author	0.307
Average citations per doc	5.364	Co-Authors per Doc	3.69
Document contents			
Keywords Plus (ID)	327		
Author's Keywords (DE)	619		

The study on GenAI in Business & Management was conducted through a Scopus database search. There are a total of 198 studies in the Scopus database as of December 15, 2023, with publication dates ranging from 2021 to 2024. Table no. 2 reveals that a total of 198 papers related to the field of business, spanning from 2021 to 2024, were discovered in the Scopus database using the search terms "generative artificial intelligence and business". Despite its recent emergence in the scientific literature, the concept of GenAI is gaining popularity among experts. Studies in this field suggest that there is an annual average increase of 135.1 percent. The research in this field has an average age of -0.0455. The main factor for this phenomenon is the significant volume of articles that were released in early view and predominantly produced in the year 2024. A total of 1,064 citations have been made to research in this area, with an average of 5,364 citations per study. A total of 619 keywords were employed, along with an additional 327 keywords plus (ID). Keyword Plus (ID) phrases or words are not included in the title of an article, but are commonly found in the titles of the article's references. This enhances the effectiveness of citation reference searches by identifying all articles sharing common citation references using cross-disciplinary searches. A total of 646 writers contributed to these investigations. A total of 35 studies are authored by only one individual. The average number of authors per study was 3.69, with a value of 0.307.

4.1.1. Annual scientific production

Figure no. 1, generated using the R program's bibliometrix package, illustrates the evolution in the number of research publications on the topic of interest. The initial study is a solitary artifact that originates in 2021. There are two studies conducted in 2022. There was a sharp surge in the number of studies in 2023. Approximately 600 writers have made contributions to the research on this particular topic. There was a total number of 1,063 citations of studies in this field. The average number of citations per study was determined to be 5,364. The average age of the research conducted is one year. This illustrates the novelty of this topic and the fact that the majority of studies remain up-to-date.

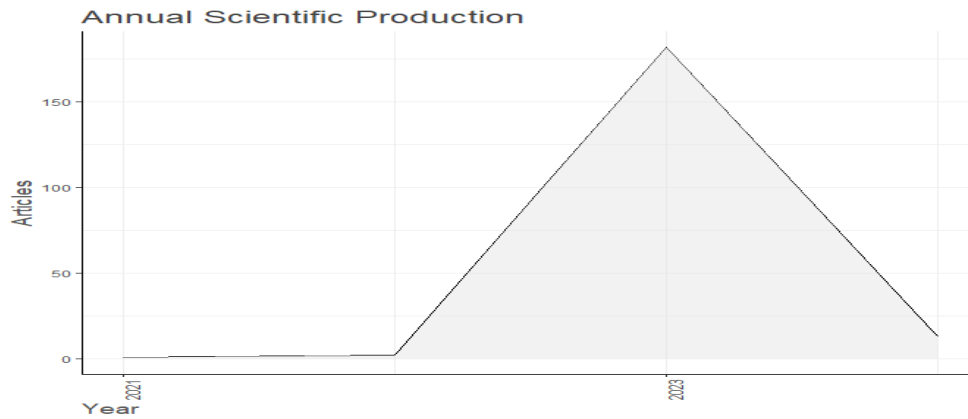


Figure no. 1. Annual scientific production

4.1.2. Most productive journals

Journal productivity is a crucial aspect of bibliometric analysis (Hubert, 1977). The term “productive journal” refers to periodicals that encompass a substantial volume of studies within their respective subject and over various time periods (Oh and Kim, 2020). The Scopus database comprises 198 studies sourced from 136 distinct sources, all of which include the phrases “generative artificial intelligence” and “business”.

Table no. 3 presents a compilation of the top ten journals that publish the highest volume of research on the topic encompassing the phrase “generative artificial intelligence and business”.

Table no. 3. Most productive journals

No.	Sources	No. of articles
1	International Journal of Management Education	8
2	International Journal of Information Management	6
3	Journal of Business Strategy	5
4	Artificial Intelligence for Business Creativity	4
5	Electronic Markets	4
6	Global Business and Organizational Excellence	4
7	IEEE Engineering Management Review	4
8	Issues in Information Systems	4
9	Journal of Retailing and Consumer Services	4
10	Technological Forecasting and Social Change	4

The International Journal of Management Education is the most prolific journal, with a total of 8 published articles. Technological Forecasting and Social Change is the journal that appears at the end of the journal ranking, with a total of 4 studies.

4.1.3. Author's collaboration in the field and most productive authors

The “dominance factor” in the bibliometrix package in R is a metric utilised for bibliometric analyses that determines the most significant papers on a scientific subject through a quantitative evaluation of publications in that field. This component is one of several crucial indicators in bibliometric analysis. It considers the number of citations received by these articles in the field, rather than the author's total number of publications. The dominance factor enables analysts in determining the research that have exerted the greatest influence on a specific topic or subtopic. This measure is helpful in finding prominent or significant research in the literature. Table no. 4 illustrates the dominant factors that contribute to the writers' dominance. Therefore, Ameen N. is the author with the highest dominance factor in the field. The author has conducted a total of three investigations, all of which involved several authors. Cardon P. and Kim J.H. are in the second position. Dwivedi Y.K., the researcher with the greatest number of studies, was rated fourth in terms of dominance factor.

Table no. 4. Authors ranked by dominance factor

Author	Dominance factor	Total no. of articles	Single-authored	Multi-authored	First-authored	Rank by articles	Rank by DF
Ameen, N.	1	3	0	3	3	5	1
Cardon, P.	0.6666667	3	0	3	2	5	2
Kim, J.H.	0.6666667	3	0	3	2	5	2
Dwivedi, Y.K.	0.5	6	0	6	3	1	4
Kshetri, N.	0.5	4	0	4	2	3	4
Pagani, M.	0.5	4	0	4	2	3	4
Lim, W.M.	0.3333333	5	2	3	1	2	7
Kar, A.K.	0.3333333	3	0	3	1	5	7
Kim, J.	0.3333333	3	0	3	1	5	7
Ritala, P.	0.3333333	3	0	3	1	5	7

As shown in Table no. 4, Dwivedi has conducted the highest amount of research compared to other authors in the field. The author has conducted six research on GenAI in the business domain. Lim WM has conducted five studies after Dwivedi. Subsequently, there are four studies by the authors Kshetri and Pagani.

Table no. 5 represents the quantity of studies conducted by writers in the respective field.

Table no. 5. Author's collaboration by study

Number of articles	Number of authors	Frequency
1	583	0.902477
2	48	0.074303
3	11	0.017028
4	2	0.003096
5	1	0.001548
6	1	0.001548

Consequently, there are 15 authors who have published multiple articles in the field (three or more). The analysis also encompasses studies that have been co-authored. Due to the novelty of the discipline, there is a scarcity of studies conducted by writers on this subject. Approximately 90% of the authors have only contributed a single study in this field.

4.1.4. Most cited studies

The study by Dwivedi (2023) is the most frequently referenced, as indicated in Table no. 6. The total number of citations (TC) received by this study was 331. This article examines GenAI, with a specific focus on the consequences of ChatGPT and related technologies. It explores the diverse elements of GenAI, examining the opportunities, problems, and consequences in fields such as psychology, computer science, and AI. The paper examines the capabilities of AI systems from several perspectives and explores broader implications for research, practice, and policy. This complete methodology provides a detailed knowledge of the effects of GenAI, facilitating informed conversations and decisions in academic and practical environments.

Table no. 6. Most cited studies

Paper	TC
Dwivedi et al. (2023), International Journal of Information Management	331
Gill et al. (2022), Internet of Things	177
Lim et al. (2023), International Journal of Management Education	75
Paul et al. (2023), International Journal of Consumer Studies	39
Hassani and Silva (2023), Big Data & Cognitive Computing	37
Iskender (2023), European Journal of Tourism Research	35
Carvalho and Ivanov (2023), Tourism Review	34
Peres et al. (2023), International Journal of Research in Marketing	32
Korzynski et al. (2023), Central European Management Journal	31
Gursoy (2023), Journal of Hospitality Marketing & Management	20

The study conducted by Gill et al. (2022) is placed in the second position, having received a total of 177 citations. It examines the changing field of AI applications, progress, and possible future directions in computing, and how AI is influencing the future of computing, with an emphasis on emerging trends and future directions, especially in autonomic computing and computer science. This research provides useful insights on incorporating AI technologies into computer systems, emphasising the transformative impact of AI on driving innovation and advancement in the IT industry. The study conducted by Lim et al. (2023) has garnered a total of 75 citations, making it the third most referenced study. It provides an original and contradictory perspective on the integration of GenAI and education. From a sociological perspective, the research might explore the effects of GenAI on how people learn and the approaches used in education.

4.1.5. Most relevant keywords

Table no. 7 presents the primary keywords that are of utmost importance in research on GenAI within the business domain.

Table no. 7. Most relevant keywords

No.	Author Keywords (DE)	No. of articles	Keywords-Plus (ID)	No. of articles
1	Artificial intelligence	64	Artificial intelligence	24
2	ChatGPT	56	Generative artificial intelligence	9
3	Generative AI	46	Machine learning	9
4	Ethics	11	ChatGPT	7
5	Generative artificial intelligence	11	Innovation	7
6	Large language models	9	Language model	6

No.	Author Keywords (DE)	No. of articles	Keywords-Plus (ID)	No. of articles
7	Artificial intelligence (AI)	8	Technological development	6
8	Bard	5	Technology adoption	6
9	Machine learning	5	Decision making	5
10	Tourism	5	Chatbots	4

The term AI is predominantly utilised in research on GenAI within the business domain. A total of 64 studies employed AI. ChatGPT is a prominent AI platform that has played a significant role in the integration of GenAI into our daily lives. The authors of 56 studies preferred the ChatGPT term as their preferred keyword. GenAI ranks as the third most favoured keyword, with a total of 46 studies. The author keywords in table no. 7 do not cover key concepts such as innovation, technological advancement, technology adoption, and decision making. However, these topics are included in the keyword plus (ID) assigned by the system through article scanning. This may be related to the authors' personal preferences or their selection of certain terminology. The terms listed in the Keywords-Plus (ID) section are determined by a precise analysis or indexing method. Automatic indexing can encompass a broader spectrum of terms, resulting in the inclusion of distinctive and additional terms in Keywords-Plus (ID).

4.2. Possible opportunities and threats presented by GenAI

The emergence of GenAI has raised the question: "Is GenAI the new way for businesses to achieve sustainable competitive advantage?" However, to answer this question, more time is needed. The literature on GenAI, which is still very new and only beginning to find its place in business applications, is quite limited. Therefore, it is important to present studies that reflect the current situation through literature review and provide insight to business managers. The findings obtained from the scanned literature are presented under this heading.

The ease of use of GenAI tools, along with their ability to provide solutions in almost every field due to being trained on a vast dataset, has led to their presence in every branch of business. Thanks to these tools, "Anyone who can write a query can turn into an employee who can produce with artificial intelligence". - For now - there is no need for a separate workforce specialised in this field. Therefore, GenAI tools are seen as a technology that can enable faster and higher-quality production at lower costs. These tools have encountered an interest that surprises even their creators and have rapidly penetrated into many areas. For example, according to data provided by OpenAI, despite being in existence for only a year, ChatGPT has been adopted by over 80% of Fortune 500 companies. This statistic was obtained through corporate email addresses belonging to individuals who subscribed to ChatGPT. Companies such as Block, Canva, Carlyle, The Estée Lauder Companies, PwC, and Zapier have obtained ChatGPT Enterprise membership and integrated GenAI into their business processes. The studies accessed in the literature focus on which activities of the business this technology can be integrated into, how to benefit from this technology, and the potential risks and advantages. Although it may be difficult to comment on the long-term effects of this technology at the current stage, it is possible to provide a summary of the potential returns and challenges it may create

Opportunities: GenAI, like all other technologies, has the potential to automate routine and time-consuming tasks, process large volumes of data in a short time, and reduce human errors. Therefore, there is evidence that it can contribute to automating business processes

(Rane, 2023b). Additionally, by enabling more efficient use of resources, it can lead to increased productivity by allowing more work to be done in less time and providing faster and more effective responses to changing conditions. This situation may result in a more flexible and adaptable organisational structure (Korzynski et al., 2023; Rane, 2023d; Aguinis et al., 2024; Al Naqbi et al., 2024; Rane et al., 2024). GenAI tools have the ability to summarise multiple text pools quickly and generate new content based on them. This creativity ability, which is the most striking feature of GenAI, can also result in greater innovation. Because innovation begins with a creative idea. The data provided by the GenAI tools have the potential to both solve the relevant problem in an original way and inspire employees. However, what the working authors emphasise in this regard is the effective use of human resources (Soni, 2023a). It is emphasised in the research that GenAI, thanks to its ability to produce personalised outputs, can yield particularly successful results in areas such as digital marketing and customer relationship management (Korzynski et al., 2023; Rane, 2023b; Rane, 2023d; Soni, 2023b). Additionally, it is believed that GenAI tools will have benefits for many activities related to human resources management, such as unbiased decision-making, increasing productivity, and employee satisfaction in areas such as recruitment, employee engagement, and employee training (Rane, 2023c; Aguinis et al., 2024). GenAI supports data-driven decision-making and forecasting processes in businesses (Chuma and Oliveira, 2023; Amin et al., 2024). Dwivedi et al. (2023) addresses similar ideas. GenAI can improve consumer satisfaction and loyalty by responding to requests instantly and personalising interactions. GenAI may automate repetitive jobs, improve procedures, and boost productivity, lowering costs. GenAI improves consumer engagement and revenue by providing individualised recommendations, information, and experiences. Businesses can innovate and create new goods, services, and solutions by using GenAI for ideation and creativity. In addition, Gill et al. (2022) evaluate the topic from a different perspective. According to this study, AI technologies, such as GenAI, have the potential to advance next-generation computing, creating opportunities for autonomic computing and computer science. As a result of all of these, the expected output of GenAI in businesses is to gain a competitive advantage. Research in this regard almost unanimously suggests that GenAI will provide a short-term competitive advantage. However, there are concerns about providing sustainable competitive advantage.

Threats: The GenAI tools, while offering advantages, also raise some concerns. ChatGPT, like any other AI model, does not possess real-time experiences or consciousness - as is the case with no existing AI model. It can only generate data in accordance with the provided inputs. These tools are mostly based on a language model and are trained with large and diverse datasets. Particularly, what has contributed to ChatGPT's success is said to be the AI model based on transformers and Reinforcement Learning Human Feedback (RLHF) (OpenAI, 2023a). This system, which relies on a small amount of human feedback, makes the algorithm's performance dependent on human evaluation. Therefore, individuals providing incorrect evaluations could lead to the system learning incorrectly. Additionally, issues such as intentional manipulation of the system by those providing feedback may arise. In such cases, the reliability of the data generated by the GenAI tools may become questionable. These tools, perceived to have the ability to make unbiased and merit-based decisions, also carry the risk of bias or error. Trust in the accuracy of the data generated by these tools may become questionable when it is unknown how decisions are made in the background, and when the system simply produces results based on entered text. It is unrealistic to expect a system that merely generates results based on entered text, without

knowing how decisions are made in the background, to assume a decision-making role. It is necessary not to fall into the misconception that GenAI tools, including ChatGPT, flawlessly and uniquely fulfil every task. At present, considering these tools as instruments that can provide insight to decision-makers may reduce the margin of error. Furthermore, it is believed that the creativity potential of GenAI tools is quite different from human creativity. According to some researchers, the lack of emotions and intuition, which are characteristics of human creativity, limits the creativity of AI. It is thought that in areas where complexity and knowledge gaps exist, the solutions it provides may not necessarily be an alternative to human solutions (Soni, 2023a; Rane, 2023c). Therefore, for the time being, it is necessary to view these tools as complementary instruments that provide employees with quick and inspiring information, allowing more time to be allocated to more complex tasks.

It should also be noted that there are risks associated with sharing, being exposed to, and stealing data shared with GenAI tools. Therefore, it is emphasised that serious security measures should be taken along with the use of these tools.

One of the most emphasised issues regarding GenAI tools is 'ethical concerns'. It is important to know which data the GenAI tools, which learn from others' data and produce outputs based on them, are trained on. There are two possible problems with training data. Firstly, as mentioned above, there is the possibility that the data used for training may be biased. For example, ignoring female candidates when evaluating resumes in the engineering field is a bias issue. Therefore, developers of the relevant system should improve the system by eliminating bias problems and provide transparent policies on this (Budwar et al., 2023). Secondly, using data covered by someone else's copyright during the training of the system may lead to violations of data privacy and copyright issues (Dwiedi et al., 2023). Dwiedi et al. (2023) have also concluded that the use of GenAI in automation could lead to job displacement, forcing employees require reskilling, and potentially causing disruptions.

GenAI tools are believed to bring competitive advantage; however, the following questions arise: What will be the efficiency when everyone has the same tool, i.e., when everyone has the same competitive tool? Additionally, does providing information to GenAI tools with the motivation of quick and easy solutions lead the AI to learn from this information? In this case, does the use of GenAI tools lead a company to be more creative than its competitors? Is information unintentionally leaked to outsiders?

In response to these concerns, OpenAI states that ChatGPT Enterprise does not train on provided business data or conversations and does not learn from users (OpenAI, 2023b). However, the black box problem of AI is still relevant here. Knowing how and why decisions are made is currently not possible (Will Knight, 2017). Although concepts such as Responsible AI, Transparent AI, Explainable AI - XAI have emerged to produce models that can be interpreted and explained while continuing to deliver high performance, relevant circles are still debating. Furthermore, even if GenAI follows accountable policies, in a competitive environment, it may not be a tool that provides a competitive advantage. In this case, human resources or new approaches that can use GenAI tools more creatively gain importance. Therefore, statements suggesting that human touch will be what sets companies apart in an environment where everyone has the same tool are available (Soni, 2023a).

It is also seen that the emphasis of studies on the use of GenAI instead of humans is intense. This emphasis, which stems from concerns such as accuracy, ethics, and security, also takes into account the negative effects it may have on the psychology of employees. The adoption

of AI in freeing individuals from routine and boring tasks is not difficult. However, it is thought that the idea of transferring the creativity, which makes individuals feel unique and valuable, to a machine undermines self-perception. Therefore, during the adoption process of GenAI tools in businesses, issues such as employee resistance and demotivation can be encountered. On the other hand, it is also possible for GenAI tools to be associated with deviant workplace behaviours. It is also possible for the time gained from GenAI to be filled with activities such as coffee breaks and virtual slacking. Additionally, today, ChatGPT can even be listed as an author in academic articles. Therefore, research is needed on whether it leads to problems such as ease of use and diminishing productivity. In the process of adopting GenAI, it is considered necessary to develop adaptation and acceptance models (Gupta and Yang, 2023).

Conclusions

GenAI tools have begun to yield successful results in areas that require uniqueness, such as “productivity, creativity”. Businesses driven by concerns for efficiency and speed show significant interest in GenAI. In order to understand the academic reflections of this situation and examine the current state of GenAI in the business field, literature reviews and bibliometric analyses were conducted. This provides academics and practitioners with a concise research summary. The information obtained from this study aims to support practitioners interested in adopting GenAI solutions in businesses. The analysis was based on a keyword search for “generative artificial intelligence and business” in the Web of Science and Scopus databases, with the assumption that the data obtained from the Scopus database would provide a broader perspective. Therefore, analyses were conducted based on research results obtained from the Scopus database. A search without quotation marks in the Scopus database with the keyword “generative artificial intelligence and business” yielded access to 198 studies. The results of the research are presented in relation to the research questions.

RQ1 - In which research areas, by whom, and in which years were studies conducted on GenAI and business? The studies spanned the years 2021-2024, with the majority conducted in 2023. This is because GenAI attracted attention in November 2022 with the launch of ChatGPT. It was observed that 646 authors contributed to the studies, with the number of single-authored studies being 35. Although GenAI is a subject of computer science, its potential is associated with almost all disciplines. Therefore, it can be said that researchers need collaboration to conduct studies. The findings of the study indicate that GenAI tools are used in various areas of businesses such as marketing, customer relations, accounting, human resources, and production management. The general trend in the studies is to understand GenAI tools and their usage. Attempts have been made to determine how these tools can be utilised for the goals of businesses, what advantages they can bring, or what challenges they may pose. This is thought to reflect the conceptualisation of GenAI as a relatively new concept.

RQ2 - What are the connections between GenAI and business studies? What types of studies will these connections lead to? It was observed that the majority of the studies consisted of literature reviews and case studies searching for solutions through GenAI in a produced scenario. It can be understood that focusing on the forms of work and their advantages and disadvantages is necessary to determine how these tools can be integrated into businesses.

However, these studies only encourage businesses to produce solutions through ChatGPT for instant problems. Therefore, the literature is seen to need more empirical studies that involve methodological diversity. Additionally, future studies should examine sector-specific applications in various business fields such as production, marketing, finance, human resources, and determine their contributions to each sector. Moreover, it is considered important to focus on models and policies that can lead socio-technical regulations and facilitate human- GenAI collaboration, which can pioneer responsible AI applications. Furthermore, attention should be paid to developing policies and regulations that can provide a roadmap for practitioners regarding concerns about adopting GenAI tools and the ethical implications and security issues that may arise during their use.

RQ3 - What are the opportunities identified in the current literature for the implementation of GenAI in businesses? Businesses can use GenAI to increase productivity, improve customer experiences, innovate, organise marketing strategies and advertising campaigns, accelerate decision-making processes, and automate tasks. As a result, they can gain a competitive advantage and differentiate themselves from their competitors.

RQ4 - What are the potential threats or challenges associated with the implementation of GenAI in the business sector? Current challenges to overcome with GenAI include the risk of making mistakes, security issues, bias problems, effects on employee mental health, providing short-term competitive advantages, and creating shortcuts. To benefit from the power of GenAI tools, responsible AI applications must be incorporated, a balance between employees and technology must be maintained, robust and comprehensive security measures must be taken, governance frameworks must be determined, appropriate human resources must be developed, department-specific information management skills must be improved, and data collection and storage policies must be regulated.

The desire of businesses to use GenAI tools is increasing. However, like any technology, the successful adoption of GenAI in businesses and achieving positive outcomes requires the right strategy, resource allocation, policies, and effective change management. The importance of making a range of configurations, from employee training to security measures, should be understood.

Despite providing significant contributions, this research has some limitations. Firstly, the study may not fully cover all the literature. The studies are limited to databases such as Google Scholar, Scopus, and Web of Science. It is also possible that access to studies not indexed in these databases could not be obtained. The subject of the research is highly dynamic and continuously generates new opportunities and challenges. Therefore, the current findings are based on the literature at that time. The findings on the relationship between business management and GenAI were presented collectively rather than separately by branches. For example, distinctions such as its impact on tourism management or production management were not made. Additionally, an empirical experiment with additional datasets that could provide valuable perspectives on the effects, opportunities, and challenges of applying these technologies to real-world problems was not conducted. This study aims to increase the researchers' subjective views, and more comprehensive studies can be conducted.

References

- Amin, M.S., Ayon, E.H., Ghosh, B.P., MD, M.S.C., Bhuiyan, M.S., Jewel, R.M. and Linkon, A.A., 2024. Harmonizing Macro-Financial Factors and Twitter Sentiment Analysis in Forecasting Stock Market Trends. *Journal of Computer Science and Technology Studies*, [e-journal] 6(1), pp. 58-67. <https://doi.org/10.32996/jcsts>.
- Aguinis, H., Beltran, J.R. and Cope, A., 2024. How to use GenAI as a human resource management assistant. *Organizational Dynamics*, [e-journal] art. no. 101029. <https://doi.org/10.1016/j.orgdyn.2024.101029>.
- Al Naqbi, H., Bahroun, Z. and Ahmed, V., 2024. Enhancing Work Productivity through Generative Artificial Intelligence: A Comprehensive Literature Review. *Sustainability*, [e-journal] 16(3), article no. 1166. <https://doi.org/10.3390/su16031166>.
- Arenas, A.D., Valencia, G.E. and Duarte, J.E., 2018. Bibliometric analysis of green energy research from 2011 to 2017. *Indian Journal of Science and Technology*, 11(18), pp. 1-7.
- Aria, M. and Cuccurullo, C., 2017. Bibliometrix: An R-Tool for Comprehensive Science Mapping Analysis. *Journal of Informetrics*, [e-journal] 11(4), pp. 959-975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Beerbaum, D.O., 2023. Generative Artificial Intelligence (GAI) with Chat GPT for Accounting – A business case. [online] Available at: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4385651> [Accessed 8 March 2024].
- Carvalho, I. and Ivanov, S., 2024. ChatGPT for tourism: applications, benefits and risks. *Tourism Review*, [e-journal] 79(2), pp. 290-303. <https://doi.org/10.1108/TR-02-2023-0088>.
- Chen, B., Wu, Z. and Zhao, R., 2023. From fiction to fact: the growing role of GenAI in business and finance. *Journal of Chinese Economic and Business Studies*, [e-journal] 21(4), pp. 471-496. <https://doi.org/10.1080/14765284.2023.2245279>.
- Chuma, E.L. and de Oliveira, G.G., 2023. GenAI for business decision-making: A case of ChatGPT. *Management Science and Business Decisions*, [e-journal] 3(1), pp. 5-11. <https://doi.org/10.52812/msbd.63>.
- Crane, D., 1972. *Invisible Colleges: Diffusion of Knowledge in Scientific Communities*. Chicago: s.n.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. and Lim, W.M., 2021. How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, [e-journal] 133, pp. 285-296. <https://doi.org/10.1016/j.jbusres.2021.04.070>.
- Dwivedi, Y.K., Kshetri, N., Hughes, L., Slade, E.L., Jeyaraj, A., Kar, A.K., Baabdullah, A.M., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M.A., Al-Busaidi, A.S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., Carter, L., Chowdhury, S., Crick, T., Cunningham, S.W., Davies, G.H., Davison, R.M., Dé ab, R., Dennehy, D., Duan, Y., Dubey, R., Dwivedi, R., Edwards, J.S., Flavián, C., Gauld, R., Grover, V., Hu, M.C., Janssen, M., Jones, P., Junglas, I., Khorana, S., Kraus, S., Larsen, K.R., Latreille, P., Laumer, S., Malik, F.T., Mardani, A., Mariani, M., Mithas, S., Mogaji, E., Nord, J.H., O'Connor, S., Okumus, F., Pagani, M., Pandey, N., Papagiannidis, S., Pappas, I.O., Pathak, N., Pries-Heje, J., Raman, R., Rana, N.P., Rehm, S.V., Ribeiro-Navarrete, S., Richter, A., Rowe, F., Sarker, S., Stahl, B.C., Tiwari, M.K., van der Aalst, W., Venkatesh, V., Viglia, G., Wade, M., Walton, P., Wirtz, J. and Wright, R., 2023. "So what if ChatGPT wrote it?" Multidisciplinary perspectives on

- opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, [e-journal] 71, article no. 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>.
- Gill, S.S., Xu, M., Ottaviani, C., Patros, P., Bahsoon, R., Shaghghi, A., Golec, M., Stankovski, V., Wu, H., Abraham, A., Singh, M., Mehta, H., Ghosh, S.K., Baker, T., Parlikad, A.K., Lutfiyya, H., Kanhere, S.S., Sakellariou, R., Dustdar, S., Rana, O. and Uhlig, S., 2022. AI for next generation computing: Emerging trends and future directions. *Internet of Things*, [e-journal] 19, article no. 100514. <https://doi.org/10.1016/j.iot.2022.100514>
- Groos, O.V. and Pritchard, A., 1969. Documentation notes. *Journal of Documentation*, [e-journal] 25(4), pp. 344-349. <https://doi.org/10.1108/eb026482>.
- Gupta, V. and Yang, H., 2023. Generative Artificial Intelligence (AI) Technology Adoption Model for Entrepreneurs: Case of ChatGPT. *Internet Reference Services Quarterly*, [e-journal] pp. 1-20. <https://doi.org/10.1080/10875301.2023.2300114>.
- Gursoy, D., Malodia, S. and Dhir, A., 2022. The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions. *Journal of Hospitality Marketing & Management*, [e-journal] 31(5), pp. 527-534. <https://doi.org/10.1080/19368623.2022.2072504>.
- Han, J., Kang, H.J., Kim, M. and Kwon, G.H., 2020. Mapping the intellectual structure of research on surgery with mixed reality: Bibliometric network analysis (2000-2019). *Journal of Biomedical Informatics*, [e-journal] 109(5), article no. 103516. <https://doi.org/10.1016/j.jbi.2020.103516>.
- Hassani, H. and Silva, E.S., 2023. The role of ChatGPT in data science: How AI-assisted conversational interfaces are revolutionizing the field. *Big Data and Cognitive Computing*, [e-journal] 7(2), article no. 62. <https://doi.org/10.3390/bdcc7020062>.
- Herubel, J.-P.V.M., 1999. Historical Bibliometrics: Its Purpose and Significance to the History of Disciplines. *Libraries & Culture*, 34(4), pp. 380-388.
- Iskender, A., 2023. Holy or unholy? Interview with open AI's ChatGPT. *European Journal of Tourism Research*, [e-journal] 34, article no. 3414. <https://doi.org/10.54055/ejtr.v34i.3169>.
- İşgüzar, S., 2021. Çelik İrade: Güven Bağlamında Yapay Zeka Üzerine Bir Değerlendirme, In: A. Karabulut ed., 2021. *Dijital Yozlaşma ve Etik*. Konya: Literatürk Yayın Evi.
- Kanbach, D.K., Heiduk, L., Blueher, G., Schreiter, M. and Lahmann, A., 2023. The GenAI is out of the bottle: Generative artificial intelligence from a business model innovation perspective. *Review of Managerial Science*, [e-journal] <https://doi.org/10.1007/s11846-023-00696-z>.
- Khan, M.S. and Umer, H., 2024. ChatGPT in finance: Applications, challenges, and solutions. *Heliyon*, [e-journal] 10(2), art. no. e24890. <https://doi.org/10.1016/j.heliyon.2024.e24890>.
- Knight, W., 2017. The Dark Secret at the Heart of AI: No One Really Knows How the Most Advanced Algorithms Do What They Do. That Could Be a Problem. *MIT Technology Review*. [online] Available at: <<https://www.technologyreview.com/2017/04/11/5113/the-dark-secret-at-the-heart-of-ai/>> [Accessed 17 February 2021].

- Korzynski, P., Mazurek, G., Altmann, A., Ejdy, J., Kazlauskaitė, R., Paliszkievicz, J., Wach, K. and Ziemba, E., 2023. Generative artificial intelligence as a new context for management theories: Analysis of ChatGPT. *Central European Management Journal*, [e-journal] 31(1), pp. 3-13. <https://doi.org/10.1108/CEMJ-02-2023-0091>.
- Lewis, S. and Alpi, K.M., 2017. The integration of bibliometrics and network analysis. *Journal of the Medical Library Association*, [e-journal] 105(4), pp. 385-389. doi:10.5195/jmla.2017.
- Lim, W.M., Gunasekara, A., Pallant, J.L., Pallant, J.I. and Pechenkina, E., 2023. GenAI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. *The International Journal of Management Education*, [e-journal] 21(2), article no. 100790. <https://doi.org/10.1016/j.ijme.2023.100790>.
- Lyu, Q., Tan, J., Zapadka, M.E., Ponnatapura, J., Niu, C., Myers, K.J., Wang, G. and Whitlow, C.T., 2023. Translating radiology reports into plain language using ChatGPT and GPT-4 with prompt learning: Promising results, limitations, and potential. *Visual Computing for Industry, Biomedicine, and Art*, 6, [e-journal] article no. 9. <https://doi.org/10.48550/arxiv.2303.09038>.
- OpenAI, 2023a. *Learning from human preferences*. [online] Available at: <<https://openai.com/research/learning-from-human-preferences>> [Accessed 30 December 2023].
- OpenAI, 2023b. *Introducing ChatGPT enterprise*. [online] Available at: <<https://openai.com/blog/introducing-chatgpt-enterprise>> [Accessed 30 December 2023].
- Paul, J., Ueno, A. and Dennis, C., 2023. ChatGPT and consumers: Benefits, pitfalls and future research agenda. *International Journal of Consumer Studies*, [e-journal] 47(4), pp. 1213-1225. <https://doi.org/10.1111/ijcs.12928>.
- Pereira, V., Hadjielias, E., Christofi, M. and Vrontis, D., 2023. A systematic literature review on the impact of artificial intelligence on workplace outcomes: A multi-process perspective. *Human Resource Management Review*, 33(1), article no. 100857.
- Peres, R., Schreier, M., Schweidel, D. and Sorescu, A., 2023. On ChatGPT and beyond: How generative artificial intelligence may affect research, teaching, and practice. *International Journal of Research in Marketing*, [e-journal] 40(2), pp. 269-275. <https://doi.org/10.1016/j.ijresmar.2023.03.001>.
- Rane, N., Choudhary, S. and Rane, J., 2024. *Intelligent Manufacturing through Generative Artificial Intelligence, Such as ChatGPT or Bard*. [online] Available at: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4681747> [Accessed 8 March 2024].
- Rane, N., 2023a. *ChatGPT and Similar Generative Artificial Intelligence (AI) for Smart Industry: Role, Challenges and Opportunities for Industry 4.0, Industry 5.0 and Society 5.0*. [online] Available at: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4603234> [Accessed 8 March 2024].
- Rane, N., 2023b. Role and Challenges of ChatGPT and Similar Generative Artificial Intelligence in Finance and Accounting. [online] Available at: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4603206> [Accessed 8 March 2024].
- Rane, N., 2023c. Role and Challenges of ChatGPT and Similar Generative Artificial Intelligence in Human Resource Management. [online] Available at:

- <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4603230> [Accessed 8 March 2024].
- Rane, N., 2023d. *Multidisciplinary collaboration: key players in successful implementation of ChatGPT and similar generative artificial intelligence in manufacturing, finance, retail, transportation, and construction industry*. Preprint. [online] Available at: <<https://osf.io/preprints/osf/npm3d>> [Accessed 8 March 2024].
- Ruiz-Real, J.L., Uribe-Toril, J., Valenciano, J.D.P. and Gázquez-Abad, J.C., 2018. Worldwide Research on Circular Economy and Environment: A Bibliometric Analysis. *International Journal of Environmental Research and Public Health*, [e-journal] 15(12), article no. 2699. <https://doi.org/10.3390/ijerph15122699>.
- Say, C., 2018. *50 Soruda Yapay Zekâ*. İstanbul: Bilim ve Gelecek Kitaplığı
- Serdaliyev, Y. and Zhunissoy, N., 2023. Applications of «CHATGPT»: Where It Can Be Used and What Can We Solve with ChatGPT. *Q a İsaq'ı Atyndağy Halyqaralyq Qazaq-Türk Ýniversitetiniñ Habarlary (Fızıka Matematika Informatika Seruasy)*, [e-journal] 24(1), pp. 129-138. <https://doi.org/10.47526/2023-1/2524-0080.12>.
- Soni, V., 2023a. Impact of GenAI on Small and Medium Enterprises' Revenue Growth: The Moderating Role of Human, Technological, and Market Factors. *Reviews of Contemporary Business Analytics*, 6(1), pp. 133-153.
- Soni, V., 2023b. Adopting GenAI in Digital Marketing Campaigns: An Empirical Study of Drivers and Barriers. *Sage Science Review of Applied Machine Learning*, 6(8), pp. 1-15.
- Wamba, S. F., Queiroz, M. M., Jabbour, C.J.C. and Shi, C.V., 2023. Are both GenAI and ChatGPT game changers for 21st-Century operations and supply chain excellence? *International Journal of Production Economics*, [e-journal] 265, article no. 109015. <https://doi.org/10.1016/j.ijpe.2023.109015>.
- Wang, Q. and Su, M., 2020. Integrating blockchain technology into the energy sector - From theory of blockchain to research and application of energy blockchain. *Computer Science Review*, [e-journal] 37, article no. 100275. <https://doi.org/10.1016/j.cosrev.2020.100275>.