Tertiary Study on the Use of Artificial Intelligence for Service Delivery: A Bibliometric Analysis of Systematic Literature Reviews

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Abstract

Despite the large number of systematic literature reviews (SLRs) on the use of artificial intelligence (AI) for service delivery, scholars suggest more scientific evidence. However, the direction that these reviews will take depends on the knowledge accumulated in the existing literature. Therefore, the objective of this research is to explore SLRs that have synthesized the use of AI for service delivery. We conducted a tertiary study, which consists of a bibliometric analysis of SLRs. We searched SLRs published over the last ten years in six bibliographic databases. Sixty-six studies meeting the inclusion criteria were processed through a bibliometric analysis in which we combined article metadata with data extracted from the full-text review. The results describe the publication trends of SLRs, their application domains, and the particularities of the private and public sectors. Recommendations for future SLRs on the use of AI for service delivery are proposed.

Keywords: Artificial Intelligence, Bibliometric, Systematic Literature Review, Public sector.

1. Introduction

AI systems are autonomous systems that can operate independently, learn, and identify patterns to make decisions and to reach different conclusions based on the analysis of different situations (Čerka et al., 2017). AI is one of the most prominent IT-based solutions that private and public organizations, as well as scholars and practitioners, are constantly striving to explore, develop, and adopt to respond to their business, strategic, operational, and organizational needs, and to resolve their daily challenges. In recent years, we observed a rapid emergence of AI that can be explained by the dramatically increasing data availability, the advancements in the algorithms coding techniques, and the computational power enhancement (Sousa et al., 2019). The increasing growth of interest in AI has not been accompanied by a wide enough range of scientific research in the field. Indeed, scholars argued that research on AI is still scarce, especially when it comes to services. In this sense, the advance of this technology as well as the applications and results of AI adoption strategies need to be more systematized (Sousa et al., 2019). Several studies have helped fill this research gap by conducting systematic literature reviews (SLRs) of existing evidence on the applications, concepts, implications, and impacts of AI systems to propose future research directions accordingly. The SLRs on the use of AI for service delivery have covered many sectors such as the public sector (Sousa et al., 2019; Wirtz et al., 2021; Zuiderwijk et al., 2021), and several domains like mental health (Choudhury & Asan, 2020), farming (Bao & Xie, 2022), education (Aljarrah et al., 2021), and business management (Cubric, 2020). Examples of use of AI for services include agricultural robotics for soil preparation and monitoring (Hasan et al., 2022), smart assistants that help people manage their daily lives (Islas-Cota et al., 2022), and chatbots that assist customers in finding answers to their questions or their booking or appointment needs (Zhou et al., 2019).

Because of the variety of the studies on the use of AI to provide services and the SLRs that aggregate them, we believe that now is a good time to explore the systematic evidence and build a picture of what has already been done in the field. By knowing the current trends in SLRs, researchers will be able to avoid unnecessarily wasting their research efforts and make informed decisions about the direction of their research. Therefore, this tertiary study proposes to conduct a bibliometric analysis of SLRs that have studied the use of AI in services. Specifically, we aim to explore and analyze the scientific evidence and provide an exploratory landscape of SLRs on publication trends, domains, and sectors. Bibliometric analysis helps to achieve this goal as it allows us to examine the contributions of research constituents (e.g., authors, countries, topics) to the field and the relationships between these constituents (Donthu et al., 2021). Thus, we attempt to answer the following research questions regarding the use of AI in services:

RQ1. What are the main publication trends of the selected SLRs?

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RQ2. What are the application domains that the SLRs addressed?

RQ3. How does the public sector compare to the private sector?

Answering these questions enables us to unpack the evolutionary nuances related to the AI in services and shedding lights on the emerging areas of this field (Donthu et al., 2021). At the best of our knowledge, no study has provided a bibliometric-based overview of SLRs regarding the use of AI to deliver services.

The paper is structured as follows: in the second section, we present the literature review where we expand the scholarly discussion related to the definition and the adoption of AI. In the third section, we describe the methodology that we adopted to conduct the bibliometric analysis. In the fourth section, we present the main findings with respect to the research questions. In the last section, we conclude our work and provide recommendations and future directions.

2. Literature Review

There is a wide scholarly discussion about the definitions of AI, which are encapsulating different dimensions and visions. For instance, Voss (2007) and Russel & Norvig (2016) agree on the cognitive dimension of AI. They defined it as a field made of a set of systems able to autonomously acquire a wide range of specific knowledge and skills to simulate the cognitive attributes of humans such as learning, speaking and problems solving. This set uses self-directed learning to improve its own cognitive ability. Kaplan & Haenlein (2019) focused in their definition on the ability of AI systems to transform data into knowledge by interpreting and learning from external data. Jackson (2019) has taken a high-level view of AI by focusing on the concept of intelligence. He defined AI as the ability of machines to do things that people would say, *"require intelligence."* He argues that machines could be developed and improved to show behavior indicative of intelligence that is comparable and even superior to that of humans. Computer programmers approach AI from a more technical perspective in that they define it as a field of study that relates computation to cognition, with the intention of writing programs that attempt to achieve an intelligent behavior (Barr & Feigenbaum, 2014). According to Krishna et al. (2017), AI is becoming a whole theory of developing systems that are able to perform tasks that normally require human intelligence. Even if these definitions agree about the increasing abilities of machines, applications, and systems to accomplish specific roles and tasks habitually performed by humans in the workplace and the society in general (Dwivedi et al., 2019), it is worth noting that the diversity of definitions can be explained by the evolutionary nature of AI. Indeed, the performance of AI depends increasingly on various related data sources and technologies. For instance, many AI systems can learn from data generated by the Internet of Things (IoT), which provides external data that is exchanged and collected by devices equipped with sensors and software. Moreover, AI makes use of more and more innovative techniques like machine learning, natural language processing, robotics, and voice and image recognition (Miles & Walker, 2006). For this research, we approach AI from the information systems view, considering it as an application domain where systems have the ability to autonomously transform data into knowledge with the objective of supporting decision making and assisting in task execution (Kaplan & Haenlein, 2019).

AI has become an integral component of many organizations' business models and a key strategic element in the plans of several organizations (Dwivedi et al., 2019). Indeed, AI systems are increasingly developed and widely applied, with countless industries and the world exploiting their "newfound" capabilities. Due to their high efficiency and adaptability, these systems are more and more used for providing services in various private sectors, including automotive (Tubaro & Casilli, 2019) and pharmaceutical (Thakur et al., 2020).With the advancement of deep learning algorithms, big data, IoT, and computing power, AI has the potential to transform businesses (Wang et al., 2021). We expect the AI market to add approximately $15 trillion to the global economy by 2030 (Miller & Strinling, 2019). Despite the fact that we tend to believe that AI is essentially applicable to the private sector, it is clear that the public sector is not exempt. Indeed, the public sector is beginning to adopt the AI to improve services and to take advantage of its capacity to transform the service delivery (Fatima et al., 2020), improve the democratic policies (König & Wenzelburger, 2020), and increase the efficiency of public decision-making and monitoring (Raghav Bharadwaj, 2019). AI is also expected to reduce the administrative and operational burden by automatizing the routine tasks (Fatima et al., 2020), helping governments enter into a new era of sophisticated and smart public services (Reis, Santo, & Melão, 2019). Regardless of the application sector (private or public), it is recognized that AI has the potential to act as a "catalyst" in the development of many services (Wang et al., 2021), which has led to a strong research interest in this regard. Several studies on SLRs and literature reviews have been conducted for this purpose. However, given the rapid acceleration of AI adoption and the variety of its application

domains and sectors, further empirical studies and systematic literature reviews are needed to keep pace with this field and contribute to its success.

3. Methodology

To answer the research questions, we conducted a tertiary study, which consists in an exploration of SLRs that aggregated scientific studies on the use of AI to provide services across multiple domains and sectors. To do so, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol (Moher, 2009) to select the SLRs. We used Mendeley Desktop software for reference checking and Covidence software (Babineau, 2014) for peer-blind validation and data extraction. For data analysis, we opted for bibliometric analysis. This rigorous method of scientific data mining and analysis is advocated to unpack the evolving nuances of a specific field and highlight emerging areas. We analyzed not only the metadata of the surveyed articles, but also the aggregated data from the full-text review results. The programming language R was used for this purpose.

3.1. Information sources

We searched for peer-reviewed journal papers and conference proceedings that conducted SLRs. As AI is still an emerging field of research and the SLRs involving AI are in progress, we were not exclusive in terms of the publications' quality. To ensure a coverage of the several disciplines and application domains and sectors, our search targeted the ABI/Inform Global, Business Source Premier, Academic Search Premier, Web of science, International Bibliography of the Social Sciences (IBSS) and Compendex databases (BD). All these databases cover disciplines that are relevant for IS such business management and industry. We keep for the next steps only the SLRs addressing AI from an IS and management perspectives. The timeframe of the review extended along the period between January 1st 2012 and March 31st 2022.

3.2. Search Strategy

We followed a systematic approach to determine the keywords used in the search in the selected databases. The keywords used in the search were initially determined by a preliminary literature review (Borges et al., 2021; Choudhury & Asan, 2020). They were then modified based on feedback from content experts (i.e. the authors of the article) and the librarian at the academic institution where this study took place. We combined the search keywords using Boolean operators (AND/OR) to identify all relevant studies that fit our scope and inclusion criteria. The final search terms used to search databases were "artificial intelligence", "systematic", "review", "review, systematic" and "systematic literature review". Disciplines, keyword combinations and search query wording were tailored to the specifics of each database as illustrated in Table 1. For this study, we selected publications that met the following conditions: (1) the title/key words/abstract included the terms "artificial intelligence" and "systematic literature review"; (2) the publication date was between January 2012 and March 2022; (3) the language was French or English; (4) the articles were published in scientific journals and conference proceedings; and (5) the articles were peer-reviewed.

Table 1. Search queries by database

DB	Disciplines	Search queries
ABI/Inform Global	Business and Management	(ti(artificial intelligence) OR mainsubject(artificial intelligence) OR AB(artificial intelligence)) AND (ti(systematic literature review) OR ti(review, systematic))
Business Source Premier	Business Industry	(TI artificial intelligence OR SU artificial intelligence OR AB artificial intelligence) AND (TI systematic literature review OR SU systematic literature review OR AB systematic literature review OR AB systematic literature review)
Academic Search Premier	Multi-disciplinary	(TI artificial intelligence OR SU artificial intelligence OR AB artificial intelligence) AND (TI systematic literature review OR SU systematic literature review OR AB systematic literature review OR TI review, systematic OR SU review, systematic OR AB review, systematic)
Web of science	Multi-disciplinary	((((TI=(artificial intelligence)) AND (TI=(systematic literature review)) OR AK=(systematic literature review)) OR TI=(review, systematic)) OR AK=(review, systematic))
IBSS	Social sciences	(((ti(artificial intelligence) OR ab(artificial intelligence))) AND (ti(systematic literature review) OR ab(systematic literature review) OR ti(review, systematic) OR ab(review, systematic))
Compendex	Operation management Industry	(((artificial intelligence) AND (systematic literature review) OR (review, systematic)) WN KY)

3.3 Inclusion and exclusion criteria

All articles that did not meet any of these conditions were excluded from the review. Further pruning was done in the abstract screening and full text review stages. We eliminated studies that restricted the context to a particular country as being too restrictive. We also eliminated articles that, despite the presence of the required keywords, did not actually adopt the SLR approach or focused specifically on the services provided through AI. The SLRs that considered the AI from a computer science and/or technical perspective were also not included.

3.4. Data Extraction

The first author (AC) first extracted relevant data from the selected articles. The research team members (HK and MG) then validated them. A data extraction form was designed to aggregate quantitative and qualitative data such as title, publication date, number of citations, countries of authors, abstract, keywords cited and keywords used for SLR, study objectives, and research questions if any. The data extraction form was supplemented with more specific information about application domains and sectors (i.e., public or private or both). All data was obtained from the metadata provided by the databases and from reading the full text of the selected SLRs.

3.5. Data Analysis

We performed bibliometric analyses to build a picture of the selected SLRs. Bibliometric analyses are considered a relevant approach to analyze and predict research trends (Zhao et al., 2018). They consist in a systematic, transparent, and reproducible review process based on the statistical measurement of scientific activities (Aria & Cuccurullo, 2017). While bibliometric analyses rely solely on metadata provided by databases, we combined these metadata with data we extracted from the full-text review. Indeed, the analyses that we have carried out relate to both structured data, such as the publication date and number of citations, and unstructured data, such as textual data (Lu & Zhang, 2021). We first made a first-order analysis (i.e. descriptive) to dig evolution of publications by year, their frequency of citations, and the distribution of the publications by authors' countries (Santa Soriano et al., 2018). Then, we made a second-order analysis (i.e. categorial) where we coded the reviews with respect to the application domains that they considered (e.g. healthcare, business and management, etc.). We used the thematic analysis approach to identify domains from journal scopes, publication titles, abstracts, keywords and full text (Alhojailan & Ibrahim, 2012). We aggregated the number of publications and the number of citations by the domains of application. Additionally, we determined the citation ratio for each domain to identify emerging domains or those that have received the most attention from researchers when performing SLRs. We also applied an analysis based on research keywords by domain to uncover the main content of articles and evolving search fronts (Santa Soriano et al., 2018). While the analysis of the frequency of occurrence of keywords is one of the most used methods to find the most recurring terms in articles, the co-occurrence of keywords is one of the most effective methods in bibliometric as it helps to better identify “hot spots” in the research areas in question (Zhao et al., 2018). Thus, we applied a co-occurrence analysis to the search keywords that the SLRs’ authors used by choosing a minimum keyword co-occurrence frequency of twice. We used the co-occurrence network to represent the most co-occurring keywords, considering each keyword incidence with the same relevance. Finally, we completed the bibliometric analysis by aggregating the number of publications by sector (ie. private, public, or both) and the domains that prevail in each sector. For all these analyses, we used the R igraph, networkD3 and magrittr packages.

4. Findings

As shown in Table 2, the initial search result yielded 625 records. After filtering them by dates, publication type, and language, 506 were retained. After removing duplicates, 402 items were imported into Covidence software for screening and data extraction. Using Covidence, each step of the PRISMA protocol was performed in a double-blind fashion (duplicate removal, title and abstract screening, full-text screening, and data extraction-see Figure 1).

Table 2. Initial search results

Database	N	Filtering by		
		dates	type	language
ABI/Inform	85	84	82	80
Global Business Source Premier	105	103	102	102
Academic Search Premier	202	200	200	193
IBSS	17	16	16	16
Compendex	151	150	70	70
Total	**625**	**618**	**516**	**506**

First research question: What are the main publication trends of the selected SLRs?

Based on the publication years, we can see from Figure 2 that the first identified SLRs addressing the

use of AI to deliver services are from 2018 with a contribution of two SLRs.

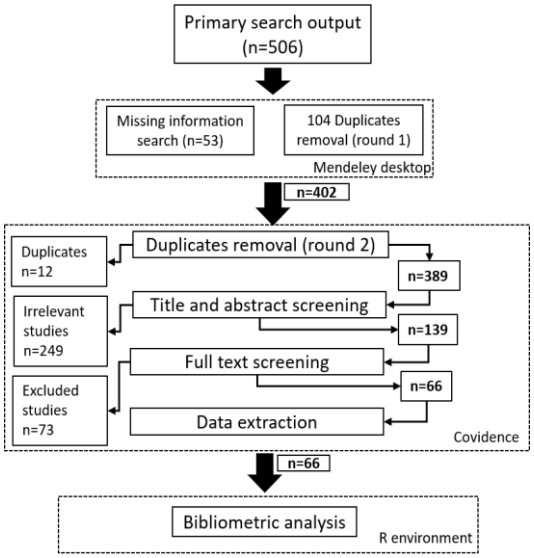

Figure 1. Search and selection results

Since then, the number of reviews has been increasing with 5 SLRs in 2019, 22 in 2020 and 34 in 2021, with the latter year accounting for nearly half of the articles. Because our search extended to March 31, 2022, we found only three SLRs published in 2022 but we expect the number of SLRs to continue growing. The year 2018 marked the first major contribution in terms of SLRs on using AI to deliver services. The relatively recent interest of researchers in conducting SLRs can be explained by the lack, prior to 2018, of a sufficient quantity of empirical studies and scientific productions of enough quality having allowed the accumulation of knowledge on the role played by the AI to provide services in different domains and sectors. However, the evolution of technologies related to AI and the diversity of the domains of its application are among the factors that have allowed the progressive accumulation of this knowledge. The marked and steady increase in the number of SLRs, especially in 2020 and 2021, is witness to this since it indicates that there is a growing number of theoretical and practical studies dealing with AI for services (e.g. Budhwar et al., 2022). Moreover, it is suggested to combine the citation rate with the publication frequency to mainly judge the quality, the importance and the impact of studies and their recognition by the scientific community (Deng & Lin, 2012). We note that the number of citations of an article published in a given year (as shown in Figure 2) is not necessarily occurring at the same year of publication, as it is a cumulative number. Figure 2 indicates that as of the date of this study (2022), the two SLRs published in 2018 had been cited 89 times, an average of 44.5 citations per article. The number of citations for the five SLRs published in 2019 is 152 with an average of 30.4 citations per article. The twenty-two SLRs of the year 2020 recorded a high citation rate, at 878 for an average of 39.9 citations per article. While actually the number of citations for the thirty-four SLRs published in 2021 marks a low compared to the previous year, at 305 citations for an average of 8.97 citations per article, we believe that the citation will keep growing. Finally, the three SLRs published during the first quarter of 2022 were only cited 4 times. We believe it is premature to make an informed judgment on the citation rate for the last two years (2021 and 2022) as the concerned SLRs are considered to be quite recent.

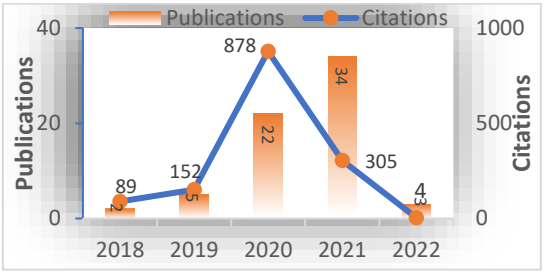

Figure 2. Number of papers and citations by year over the study timeline

Nevertheless, we can deduct from previous years that the citation rate is on the rise and that the average citation per article varies only very slightly. As suggested by Deng & Lin (2012), when the latent information is combined with the publication frequency, it could show a growing and constant recognition and interest of the scientific community for this type of SLRs. We recommend that researchers continue their knowledge synthesis efforts to help consolidate scientific research on the use of AI and its practical application for service delivery.

We can see from Figure 3 that Europe produced the largest number of SLRs on the use of AI for services (i.e., 57%), where the majority of the papers have been published by authors from UK (8), Italy (7), and France (7). The Netherlands and Portugal produced 5 SLRs each, Germany 4, and the rest of the European countries produced 3 or fewer SLRs each. Nineteen percent (19%) of the SLRs were conducted in Asia, where India and the United Arab Emirates produced the majority (4 SLRs each). Authors from Singapore, Malaysia, Israel, and Iran published two SLRs each. China, South Korea, and Turkey produced one SLR each. The Americas account for 16% of SLRs, the majority of which were produced in the United States (8). Brazil had three, Canada had two, and Colombia and Venezuela had one each. Three SLRs were conducted in Australia. Other countries such as New Zealand, Morocco, Egypt, and Ghana had only one SLR each. The response to the first research question provided an overview of the major constituents of

SLRs, demonstrating the scientific community's recognition of research on the use of AI for services and thus providing insight into the groundwork for future research.

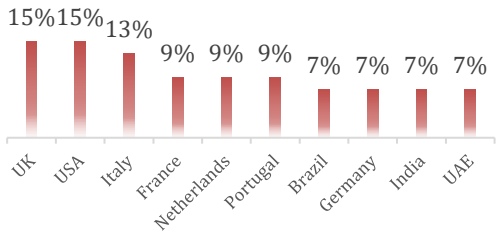

Figure 3. Countries of affiliations of the authors

Second research question: What are the application domains that the SLRs addressed?

Regarding the application domains that the reviewers considered in their SRs, we identified seventeen (17) domains (See Appendix 1). Among them, we found that the five highest application domains are respectively (as presented in Figure 4): healthcare (i.e. 25 papers), which includes dentistry (Bernauer et al., 2021), orthopedics (Ren & Yi, 2022), and disease prediction and treatment (Wesdorp et al., 2021); business management (i.e. 13 papers) which includes human resource management (Budhwar et al., 2022), and administration and governance (Wirtz et al., 2021); industry and manufacturing (i.e. 8 papers) which includes supply chain (Naz et al., 2022), manufacturing and engineering (Acerbi et al., 2021), and mining (Jung & Choi, 2021); banking and finance (i.e. 6 papers) which includes financial forecasting (Duarte & Barboza, 2020), and banking and corporates threats prevention (Gruenbichler, 2021); and sustainability (i.e. 6 papers) which includes the sustainable development goals (Manzoor et al., 2021), the urban development (Yigitcanlar et al., 2020), and the sustainable/circular manufacturing (Acerbi et al., 2021). Other application domains that have three to five publications each are disaster management, education, smart cities, social and community-based services and marketing. Application domains with only one publication are defense, tourism, farming and nutrition. It is worth noting that some reviews addressed more than one application domain. For example, José Sousa et al. (2021) reviewed the potential of AI in health higher education, which means that the review covers both healthcare and education domains. As we mentioned before, healthcare is the application domain most studied by the selected SLRs. This could be explained by the fact that healthcare is one of the main domains where AI finds great potential for application (Sharma et al., 2020). Good examples of such applications are surgery and intensive care (Bellini et al., 2020). As a result, the available scientific output that covers the adoption of AI in healthcare sectors is abundant. When considering the number of citations, we observe that articles with more than 100 citations are SLRs on the use of AI in emerging application domains such as sustainability (di Vaio et al., 2020), smart cities (Yigitcanlar et al., 2020), and business management (Borges et al., 2021). By calculating the citation index (i.e. number of citations divided by the number of publications) for each of these emerging domains, we have found that sustainability, business management and smart cities have the highest citation index (i.e. respectively 60, 40.53, and 33.75). For sustainability, the number of related SLRs decreased overtime, but the number of citations is significant (i.e. 360). For business management, which includes mainly SLRs addressing the organizational and administrative services, there is a growing body of publications that counted two in 2019 and attained six in 2021, with 527 citations.

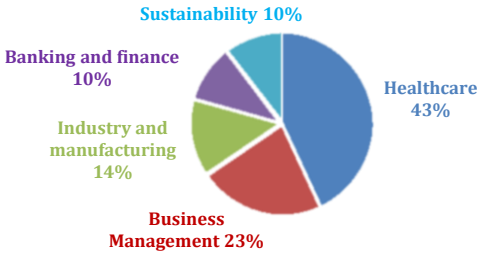

Figure 4. The top five application domains

The SLRs with the highest citation number in this application domain addressed the use of AI in the public administration and in human resource management. For smart cities, which includes four reviews and 135 citations, the first and the only review have been published in 2020 and then this number was tripled in 2021. From the citation count and the citation index, we could infer that there is a growing interest from the scientific community for systematic reviews that cover these emerging domains especially with the growing number of the available materials and outlets related to these domains which could demonstrate the growing scholarly interest in them.

In addition, we performed a co-occurrence analysis to explore the existing or future relationships among topics in a research field by focusing on the written content of the publication itself (Donthu et al., 2021). Digging into the co-occurrence of the search keywords that the authors used in the SLRs of the five highest application domains, we identified two generic clusters: 1) application contexts which refer to specific topics for each application domain; and 2) the specific AI technics, tools, and algorithms that the authors considered in their queries and reviews. AI is a broad term and a vast field and its techniques may vary from one application domain or context to another.

Therefore, being specific in search keywords may reflect deeper analysis and better quality of systematic literature reviews in these terms. The co-occurrence networks are shown in Appendix 2. For the healthcare domain, the application context covers patient participation in the healthcare service monitoring, the digitalization of the healthcare services and industry, the surgical procedures, and the user dialogue systems. The specific technics, tools, and algorithms that we identified are data mining (i.e. for decision support), dialogue systems, natural language processing, and deep learning, which encompasses neural networks (NN). For the business management domain, the main application contexts are human resource management and public administration. The specific technics being researched are fuzzy logic (FL) algorithms, genetic algorithms and computer vision technologies. For the industry and manufacturing domain, the digitalization of the industry, the sustainable supply chain, and the circular manufacturing constitute the main application contexts while the specific techniques being researched are clustering, decision trees, bayesian networks (BN), support vector machines (SVM), linear regression, and genetic algorithms. For the banking and finance domain, the main context applications are bank opportunities and threats, market share, credit risks and scoring, business failure and insolvency, and financial distress. The technics that we observed for the banking and finance are with the other application domains are FL, SVM, and NN. For the domain of sustainability, we have identified urban development, sustainable development, waste management, circular economy, and sustainable engineering as application contexts specific to this domain. We also identified other application contexts that are common with other domains such as sustainable supply chain, smart cities, and circular manufacturing. The application-specific AI technics include computational learning, logistic regression, and genetic clustering. The other technics that have been retrieved for the sustainability domain are common with the other application domains, such as SVM, NN, FL, and linear regression. By answering the second research question, we were able to identify the sectors and application domains that have raised the most interest by researchers to date. We also provided insight into emerging trends and areas where future research can build on to develop innovative research ideas regarding the use of AI for services.

Third research question: How does the public sector compare to the private sector?

To answer the third research question, we aggregated the number of publications by sector (i.e. private, public or both) and the domains that prevail in each sector. As can be seen in Figure 5, more than half of the SLRs refer to the private sector (i.e. 48). The SLRs that cover public sector are nineteen (19) and seventeen (17) SLRs cover both public and private sector. Although the public sector is less predominant than the private sector in the selected SLRs, it should be noted that the number of SLRs dealing with the public sector is in relative growth, going from two reviews in 2019 to five reviews in 2021.

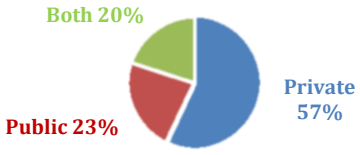

Figure 5. Distribution of sectors

These results suggest that there is still room for research on the use of AI in the public sector. Future research can focus on the implications of using AI for public governance by adopting diverse methodologies, and empirical and multidisciplinary research approaches. It is also recommended to focus more on specific forms of AI rather than AI in general (Zuiderwijk et al., 2021).

Figure 6 shows that business and management is the most common domain in the public sector (39% of the SLRs of the public sector) with six papers. This finding is consistent with the observation of a growing trend of scholarly interest in studying the use of AI for public administration and governance, which is one of the subdomains of administration and governance (Sharma et al., 2020). The domain of social and community-based services is in the second place with 27% of the SLRs of the public sector (4 papers) and the healthcare is in the third place with 20% of the SLRs (3 papers). The observation that we can make is that the domains considered "essential" to the public sector, such as healthcare and education, do not hold an important place for this sector (i.e. 20% and 7% of the SLRs). Furthermore, we have not identified any SLR that covers the domain of transport. These results are possibly explained by the lack of empirical studies in these respective domains which would have made it possible to carry out SLRs of good quality. This indicates that there is still room for the application and study of the adoption of AI by these domains.

Regarding the private sector, Figure 7 shows that 49% of the SLRs (17 papers) were made in the domain of healthcare, 21% in the domain of industry and manufacturing (7 papers), and 12% in the domain of banking and finance (4 papers). The fact that healthcare is a domain that occupies an important place in the private sector can be explained by the countries of origin of the SLRs, most of which have a private health system. However, we are surprised to

find that the domains of industry and manufacturing as well as the domain of banking and finance cover 12% and 21% of private sector SLRs. Other application domains could be more explored in terms of studies in general and reviews of scientific evidence in particular so that research in these fields can find a favorable and easily accessible field of study. For SLRs that dealt with both the public and private sectors, we noticed that they mainly focused on the private sector with less consideration for the public. As private value had a greater effect on overall value creation than public value (Wang et al., 2021), we suggest that to enable the public sector to realize the full potential of AI capabilities, more scientific evidence could be obtained to shed light on the reasons for the gap between the public and private sectors in terms of AI adoption with a view to reduce it.

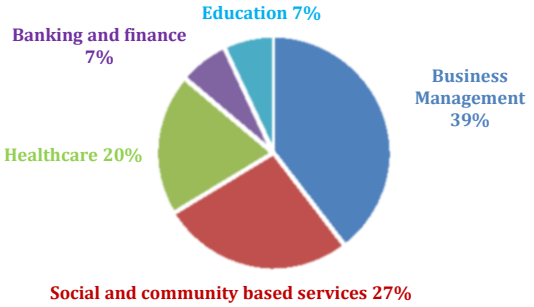

Figure 6. The top five application domains for the public sector

The answer to the third research question leads to the conclusion that it is appropriate to strengthen scientific research that considers the actual and potential adoption and use of AI not only for the public sector in general, but also for specific application areas within that sector, including essential services such as health care, transportation, and education.

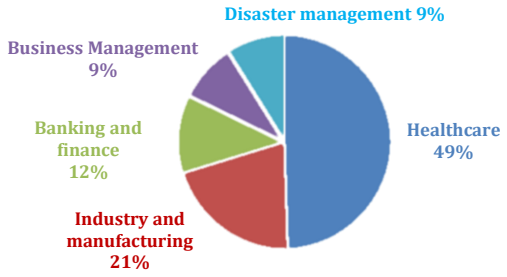

Figure 7. The top five application domains for the private sector

Future research directions could focus on the benefits and challenges of AI adoption in each of these application areas. This bibliometric analysis is a preliminary phase of a more comprehensive review of SLRs that address AI adoption in service delivery. It allowed us to set the context in terms of frequency of SLRs, the extent to which they are being considered by the scientific community, the application domains they cover, and the research trends for each application domain.

5. Conclusion

We conducted a tertiary study, which is a bibliometric overview of SLRs dating from 2012 to 2022 that we extracted from six bibliographic databases. Our goal was to draw a portrait of the scientific evidence collected in SLRs that deals with the use of AI in service delivery. This profile covered publication trends, application areas and application sectors (i.e. private, public or both). By following the PRISMA protocol, we retained 66 relevant SLRs that met the inclusion criteria. A bibliometric analysis of the article metadata and unstructured data obtained from the full text review allowed us to conclude that the heyday of SLRs began in 2018 and that citation indices reflect the steady evolution of SLRs in the field. The distribution of the countries of origin of the authors of the SLRs gives an overview of the regions of the world most interested in systematic reviews of the literature in this field. We have also determined the fields of application on which the SLRs have concentrated, of which healthcare and business management are the most prevalent, as well as the emerging sectors according to the citation indices. The co-occurrence analysis of the search keywords of the SLRs of the five highest application domains allowed us to identify two generic clusters: application contexts and AI techniques and algorithms. The private sector features prominently in SLRs, indicating that there are still many research opportunities for the private sector to seize.

This research has three essential contributions. First, to our knowledge, we have not identified any tertiary study that has developed a bibliometric analysis of SLRs in the area of using AI to deliver services in general. Our study is the first to have drawn up a global portrait of what has already been done in terms of literature reviews. This portrait could provide interesting indications for making informed decisions for future SLRs. Then, we combined the metadata of the articles which are provided by the databases with the unstructured data extracted from the full text review. We also believe that we have ensured fairly exhaustive coverage of scientific publications by carrying out the bibliographic search in six databases instead of two or three as is customary. These methodological contributions offered greater possibilities for analysis and a richness to the results obtained. We believe that in the light of our results, we have relevant evidence and outlets that could allow

researchers to quickly identify the most relevant studies on the use of AI for services. This represents a body of knowledge on which they can build for future research in the field.

As this is a bibliometric overview with an exploratory scope, our work has limitations that future research may address. Indeed, bibliometric studies can only offer a short-term forecast of the research field. Scholars should avoid making over-ambitious assertions about the research field and its impact in the long run (Donthu et al., 2021). To mitigate these limitations, a more in-depth content analysis, focusing for example on AI-specific techniques and methods, deserves to be considered as future research. Based on the evidence collected, comparative future studies can be conducted to dig the implication of the AI adoption with attention to the application domains and the sectors. Considering the growing interest of governments in adopting and developing AI strategies, it is worth to mention that more evidence on AI adoption in the public sector is needed. This study has also laid the foundations to the full text review and the quality assessment of the 66 SLRs in order to meet all the guidelines of a systematic review. In view of these concrete recommendations, we believe that future research will still have promising prospects given that AI is an emerging field that is gradually but surely maturing thanks to the intensive application of its technology for different uses.

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