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Análise bibliométrica de métodos ágeis com inteligência artificial

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BIBLIOMETRIC ANALYSIS OF AGILE METHODS AND ARTIFICIAL INTELLIGENCE

Trabalho de Diplomação apresentado à COMGRAD de Engenharia de Serviços do Departamento Interdisciplinar da Universidade Federal do Rio Grande do Sul, como parte dos requisitos para obtenção do título de Engenheiro de Serviços.

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Este Trabalho de Diplomação foi julgado adequado como pré-requisito para a obtenção do título de ENGENHEIRO DE SERVIÇOS e aprovado em sua forma final pelo Professor Orientador e pela COMGRAD da Universidade Federal do Rio Grande do Sul.

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SUMMARY

BIBLIOMETRIC ANALYSIS OF AGILE METHODS AND ARTIFICIAL INTELLIGENCE

ABSTRACT: *This study conducts a comprehensive bibliometric analysis to evaluate the trends, impact, and global contributions of academic articles focusing on agile methodologies and Artificial Intelligence (AI). For this, it used the Scopus' database of articles, and Bibliometrix, a Rstudio package to visualize data. Utilizing metrics such as "Total Citations" and "TC per Year," the study provides insights into the influence and significance of individual papers in the field. The findings indicate a substantial increase in research production, especially from countries like the United States, Italy, and India, demonstrating a dynamic and evolving international academic landscape. Notably, emerging countries like Pakistan have also become contributors in recent years. The study also identifies a shift in research focus towards AI and agile methodologies, that could be justified with the recent expansion of Industry 4.0 studies. Articles by key authors, such as Meinert E (2020) and Hayat F (2019), have demonstrated considerable impact within a short time frame, highlighting the rapidly evolving nature of the field. This study serves as a resource for researchers, and industry professionals looking to understand the current state and future directions of academic research in agile methodologies and AI.*

KEYWORDS: *AGILE METHOD; ARTIFICIAL INTELLIGENCE; BIBLIOMETRIC ANALYSIS; SIMPEP 2023; SIMPÓSIO DE ENGENHARIA DE PRODUÇÃO.*

1 Introduction

In recent years, the intersection of agile methodologies with artificial intelligence (AI) has been causing profound transformations in the world of business and technology. This phenomenon has been driven by the constant advancement of digital technologies and the growing need to adapt to consumer demands in a highly dynamic and competitive environment (Rocha et al., 2022).

Conventional approaches often prove insufficient for dealing with the complexity and speed of changes that occur in this context. In response, agile methodologies, initially developed in the field of software development, have emerged as an effective way to address this intersection between agility and AI (Gonçalves, 2022).

These agile methodologies have as their fundamental principle flexibility and collaboration, allowing for agile adaptation to constantly evolving needs. They emphasize interaction, active participation of stakeholders, and quick responsiveness to changes, which leads to greater efficiency, productivity, and quality in the integration of AI.

However, despite the growing interest and adoption of these approaches in AI integration, there is still a gap when it comes to a comprehensive and systematic understanding of this interdisciplinary field. Therefore, it is important to conduct a bibliometric analysis, using the Scopus database as a reference, to examine existing academic and professional studies. According to Dervis (2019) this type of analysis allows to identify concepts related to the application of agile methodologies in conjunction with AI.

The bibliometric analysis will enable the Identification of influential authors, prominent institutions, and leading countries in this specific domain. Additionally, it will map the temporal evolution of publications, highlight existing contributions, identify research gaps, and outline possible future directions (Cella, 2017).

Upon completing this study, it is expected to offer a view on the integration of agile methodologies with AI, providing insights for professionals, and academics involved in this intersection of knowledge. It is believed that this analysis will significantly contribute to an understanding of this interaction, driving the advancement of knowledge and improving practices in this theme. This study will be divided into five sections: the first section will present the introduction of the study, following it will be

presented the theoretical frameworks of the study. Next, the method used for the study's execution will be presented. In the fourth section, the results will be presented, and finally, the last section will be dedicated to the conclusions.

2. Theoretical Framework

The application of agile methodologies in AI has been widely discussed and adopted across various sectors. Initially developed for the area of software development, these approaches are increasingly relevant for processes and outcomes in AI projects. Paula (2013) has explored the fundamental principles of agile methodologies, such as incremental delivery, iteration, and collaboration, highlighting their adaptability to changes and efficiency in achieving goals.

The combination of agile methodologies with AI offers a dynamic and adaptable approach. Authors like Leijnen et al. (2020) discuss the benefits of this union, including the ability for quick responsiveness to variable demands, focus on experimentation, continuous learning, and collaboration among multidisciplinary teams. Their research shows the positive impact of agile methodologies on AI, emphasizing improvements in delivery, quality, and stakeholder satisfaction. Flexibility, adaptability, and innovation are some of the advantages of incorporating agile practices.

The literature highlights the challenges and best practices in implementing agile methodologies in AI projects. Leijnen et al. (2020) emphasizes the creation of multidisciplinary and self-managed teams, along with an organizational culture that favors agility. Effective communication and techniques like Kanban and Scrum are seen as crucial for success.

In summary, the literature on agile methodologies in AI addresses the importance, characteristics, challenges, benefits, and impacts of these practices. This literature review will form the basis for the proposed bibliometric analysis, helping to deepen understanding and identify areas that are still underexplored in the field.

Bibliometrics is an area of study that uses quantitative methods to analyze and measure scientific production, its dissemination, and impact. According to Devis (2019), it is a discipline aimed at providing insights into the structure and

development of science, as well as aiding in strategic decision-making related to research.

In 1934, Paul Otlet introduced the term “bibliometric” in “Traité de Documentatión” describing it as a subset of statistical bibliography focused on the measurement and quantification of books. However, according to Vanti (2002), the popularization and widespread adoption of the term are credited to Alan Pritchard in 1969. He defined bibliometrics as studies focused on the quantification of written communication processes. Pritchard played a significant role in replacing the term“statistical bibliography” which had been in use since 1922 when Edward Wyndham Hulme first mentioned it.

Garfield (1979), discussed the advantages and limitations of citation analysis as a tool for assessing the quality and impact of research. Garfield (1979) emphasized that citation analysis can provide valuable information about the recognition and influence of a scientific work, but also warned about potential biases and limitations of this approach.

Bibliometrics analysis continues to evolve, driven by increasing access to large volumes of bibliographic data and the development of new analysis techniques. Bibliometrics plays a crucial role in understanding scientific production, identifying trends, and evaluating the influence and impact of research across various areas of knowledge.

The aim of this study is to conduct a bibliometric analysis focused on the applications of agile methodologies within the field of AI. As the need for rapid adaptation and flexibility grows, agile methods such as Scrum, Kanban, and Lean have gained prominence as effective strategies to accelerate the development and deployment of AI solutions.

3. Method

To obtain a comprehensive understanding of the current state of the art, this study will use bibliometric analysis. Through the review of scientific articles and other relevant publications in the Scopus database, the goal is to identify the most notable academic work that is being produced within the intersection of agile methodologies and the use of artificial intelligence.

The methodology adopted for carrying out this bibliometric analysis consists of three main stages: data collection, bibliometric analysis, and evaluation of results.

In the data collection stage, resources from the Scopus database were used to search for articles related to agile methodologies applied in AI. Relevant keywords were used, and inclusion criteria were established, such as the period of publication and the language of the articles.

After data collection, a bibliometric analysis of the selected articles was conducted. Bibliometric techniques were used to identify and analyze the number of articles published over time, the main reference journals, the most productive authors, the most frequent keywords, and the co-citation relationships among the studies.

This bibliometric analysis of agile methodologies in AI aims to contribute to the understanding of current trends and gaps in the field. It will serve as a foundation for academics and professionals while also guiding future research. The study is particularly relevant for companies aiming to adapt to market demands and optimize their AI strategies.

3.1. DATA COLLECTION

The data collection was conducted using the Scopus database, known for its comprehensiveness and reliability in accessing scientific publications. Keywords “agile method”, “artificial intelligence”" and their variations were used to identify articles related to the theme of this study, searched within article abstracts, title and key-words. The variations used were all the suffixes for “method”, which can be indicated to Scopus search system using an asterisk on the end of the word “method”. In this initial search, a total of 122 documents were found in the Scopus database on September 3, 2023. Table 1 illustrates the variables that were entered into the Scopus database. The table uses the same notation used on Scopus:

Table 1: Variables used to filter articles into Scopus

Variable	**Description**
Keywords	“Agile method*” AND “artificial intelligence”
Document type	Article, Conference paper, Conference review, Review
Language	English

Source: Generated by the author.

After this initial search, inclusion criteria were established to select relevant articles, including the selection of studies written in English and whether the publication was a scientific article. Given that this is a recent topic, no time constraints were placed on the publications. The abstract of each article was read, and evaluated if they had the intention to link agile methodologies and AI or not. Those that were linking the concepts were then selected for this study. As a result of this filtering, the dataset was reduced from 122 to 114 articles, which serve as the corpus of this study and form the basis upon which all subsequent bibliometric analyses will be conducted.

3.2. BIBLIOMETRIC ANALYSIS

The bibliometric analysis was conducted using R Studio software, utilizing the Bibliometrix package, a tool that offers advanced functionalities for the analysis and visualization of bibliometric data. The data collected from the Scopus database were imported into the software, where various bibliometric techniques were applied.

Aria and Cuccurullo (2017) argue that R, being open-source software with robust statistical features, serves as an ideal tool for scientific computing. Additionally, R is not just software but an open-source ecosystem, offering a comprehensive suite of statistical algorithms, mathematical functions, and visualization tools. This makes it well-suited for bibliometric analysis. R is compatible with both Windows and Linux operating systems and features a user-friendly graphical interface through rStudio.

Descriptive analyses were conducted to identify the number of articles published over time, the main reference journals, the most productive authors, and the most frequent keywords in the selected articles. In addition, co-citation analyses were performed to identify the main connections and relationships between the studies analyzed.

3.3. RESULTS' ANALYSIS

The results of the bibliometric analysis were evaluated and interpreted with the aim of identifying trends in the field of agile methodologies in conjunction with the use of AI. This information was used to support the theoretical foundation of the work and provide empirical backing for the discussions and conclusions presented.

Bibliometrics serves as a tool to standardize and optimize the information retrieval process in academic and scientific research. According to Café (2008), it

incorporates a range of statistical and mathematical methods to analyze scientific productivity, covering the evaluation of journals, authors, and even the way information is represented.

This standardization facilitated by bibliometrics helps researchers focus on more relevant and influential sources, contributing to the quality and accuracy of studies. This is accomplished through the mapping of high-impact publications, the identification of influential authors, and understanding research trends in a specific field.

According to Silva et al. (2005), the aim is to use a series of procedures and techniques to analyze text content based on units of analysis, which may include technical terms and keywords, to identify their frequency in the text. Adapting this concept to the context of agile methodology and AI, the research seeks to assess the current state of developments and innovations in agile methods and AI. Within this framework, the measurement of scientific productivity becomes a key element for monitoring and advancing both algorithm development and the implementation of agile practices. This then raises the central question of this study: what is the current state of scientific production in agile methodology and AI?

4. RESULTS

In this chapter, the results of this research on the advancement of scientific publications concerning the topics of artificial intelligence and agile methodology are presented.

4.1 BIBLIOMETRIC ANALYSIS

In this section, the bibliographic portfolio and the results of the analysis of the bibliographic portfolio will be presented.

4.1.1 Bibliographic portfolio

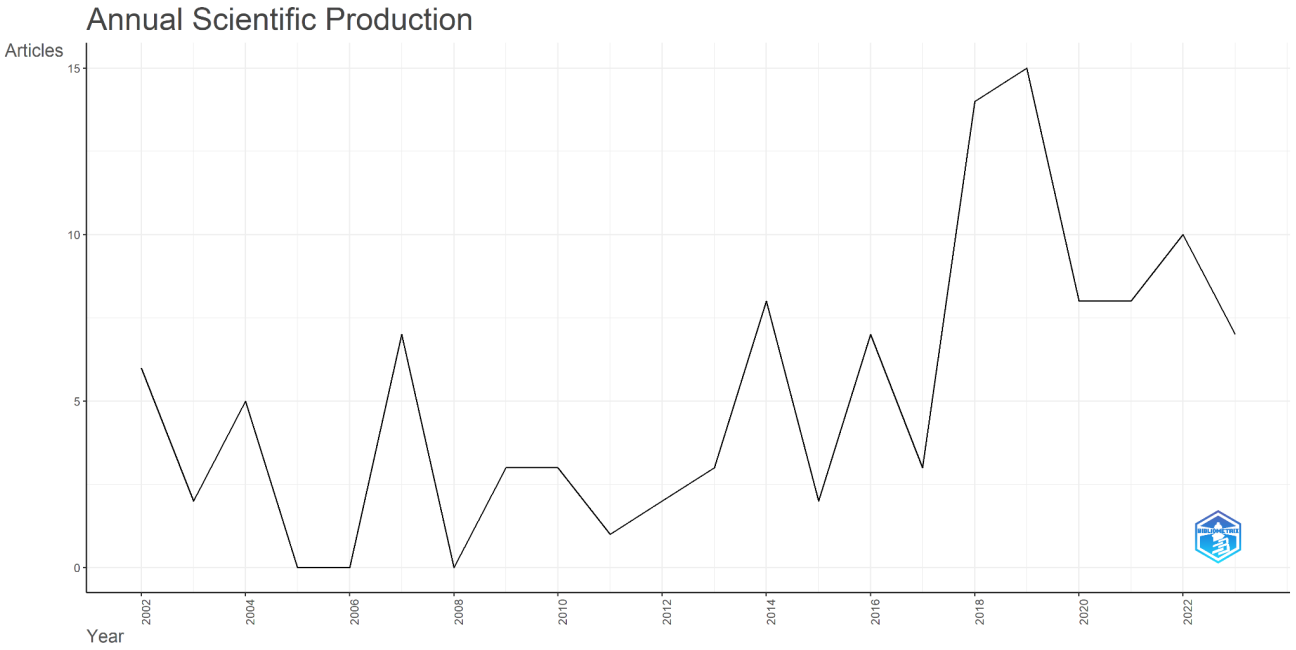
The articles that are the subject of this research were obtained through a search in the Scopus database, as mentioned in the method section. After the subjective evaluation, whether the article was related to the intersection of agile methodologies

with the use of artificial intelligence or not, the result obtained on the filtering was of 114 articles, from the previous 122 articles filtered in total, using exclusively the filters that were present on Scopus.

Colocar quantos artigos resultaram por tipo. Esta seção é de resultados.

4.1.2 Annual Scientific Production

Image 1: Annual Scientific Production from the sample

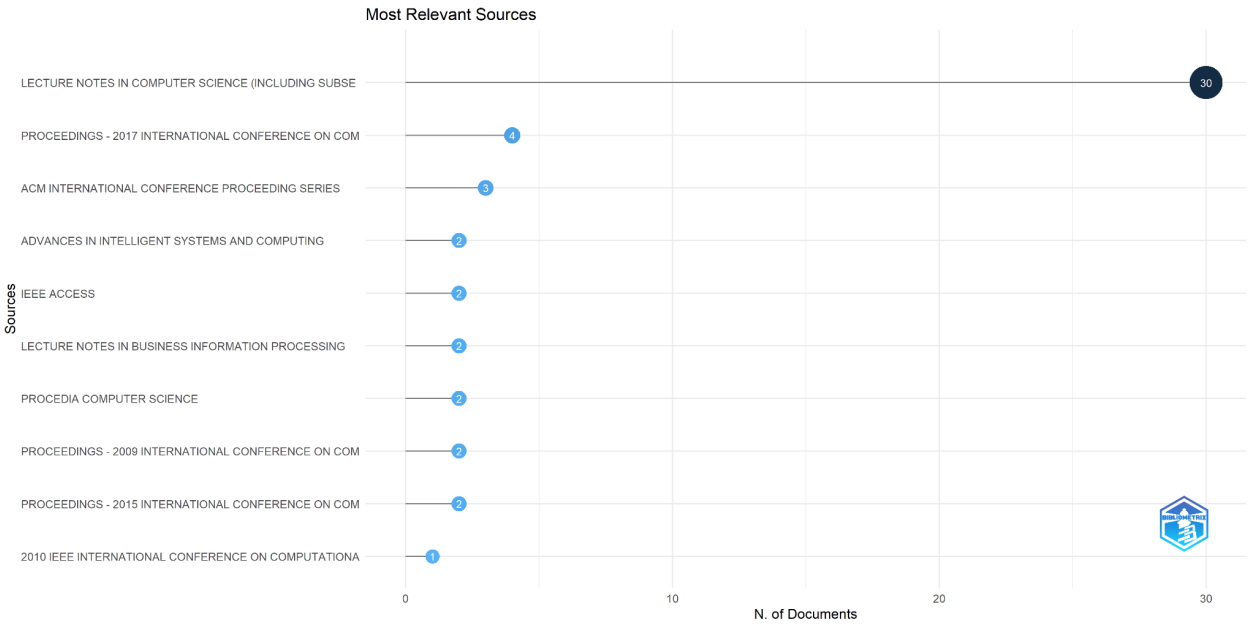


Source: Adapted from Bibliometrix.

The annual variation in the number of scientific publications from year 2002 to year 2023, with years like 2005, 2006, and 2008 having no publications, and years like 2018 and 2019 experiencing peaks of 14 and 15 publications respectively. Despite these fluctuations, there is a general upward trend in the number of publications over the period, indicating increased attention and resources being directed toward the field in question.

4.1.3 Most Relevant Sources

Image 2: Most relevant sources from the sample



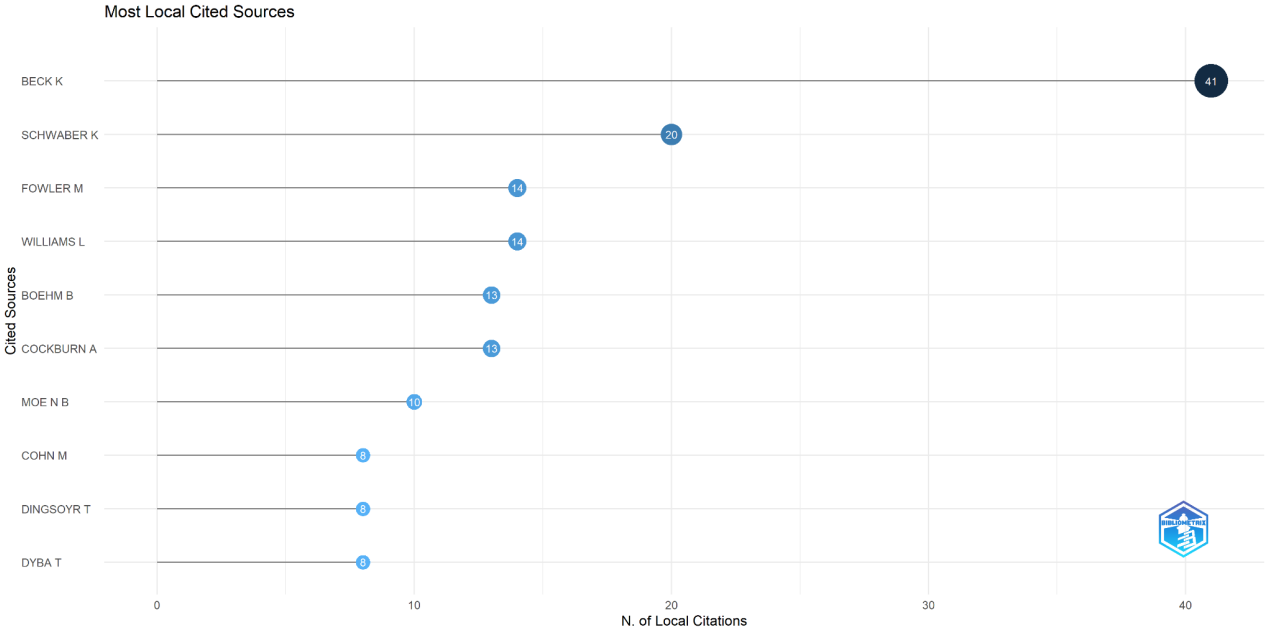
Source: Adapted from Bibliometrix.

The diversity of conferences and journals in the studied field is extensive, ranging from general engineering to specific topics like petroleum engineering and healthcare informatics. "Lecture Notes in Computer Science" stands out with the highest number of publications (30 articles), while other sources have smaller contributions. This source is in the 126 position out of 233 sources, when we compare it with other computer science sources, using the CiteScore methodology, developed by Scopus. The majority of the documents filtered were from the computer science field of study, showing that this interdisciplinary intersection is still focused on its origins.

The variation in the number of articles per source suggests a growing field, but one that has yet to clearly consolidate where the most influential research is being published. This dispersion can be seen as positive due to the plurality of perspectives it represents. The abstraction possible from this area exchange could also be interpreted as a beneficial aspect of having this multidisciplinary production.

4.1.4 Most Local Cited Sources

Image 3: Most relevant sources from the sample



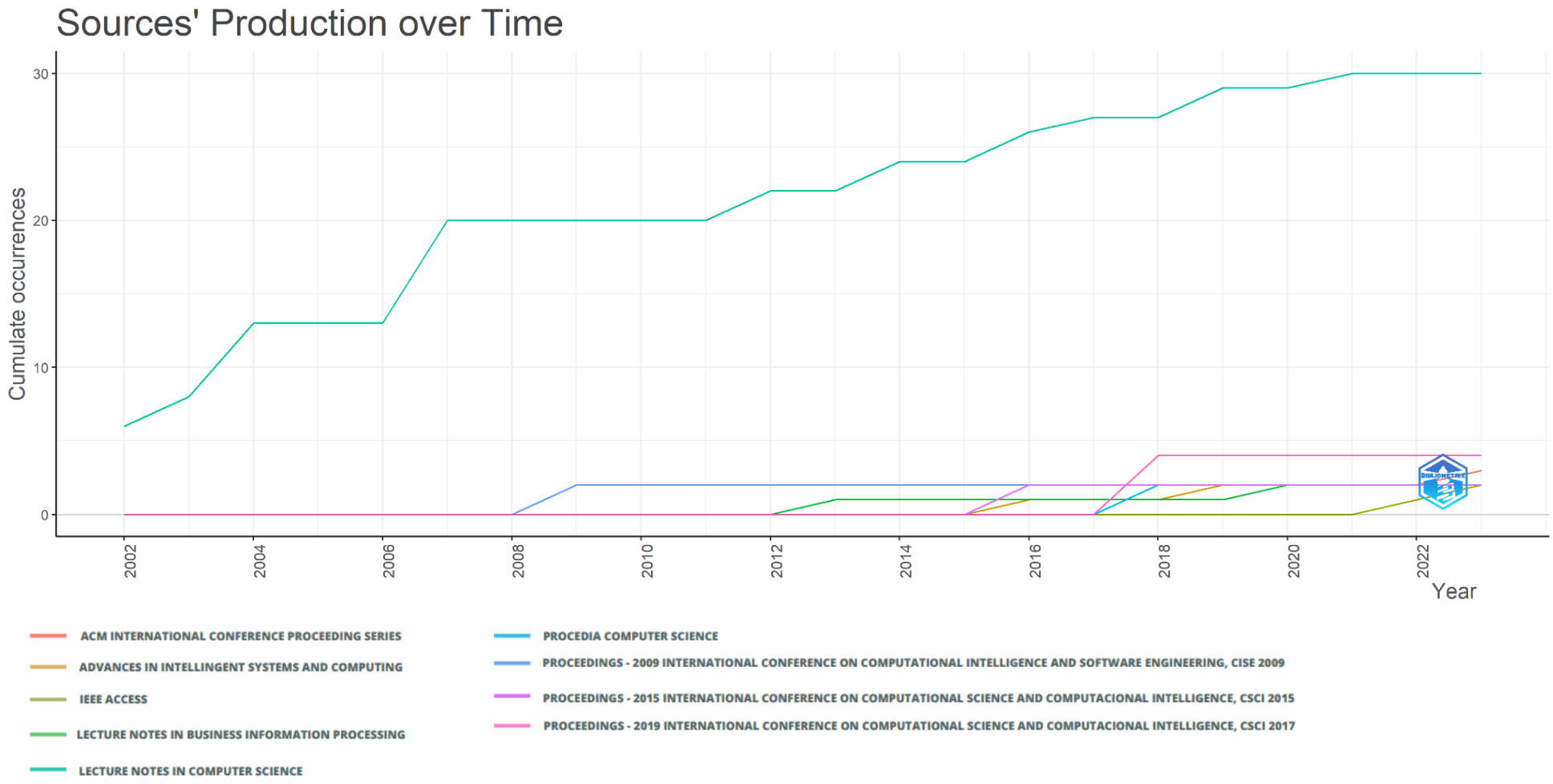
Source: Adapted from Bibliometrix.

The graph illustrates the list of authors and their citations in a sample of articles, helping to identify the most influential figures in the field. "Beck K" is the most cited with 41 citations, followed by "Schwaber K" with 20. Several other authors are also noteworthy, albeit with fewer citations. While the number of citations is not the only indicator of an author's significance, it suggests that the works of frequently cited authors like "Beck K" and "Schwaber K" are highly relevant in the field. “Beck K” is more known as being the creator of “extreme programming”, a software development methodology that eschews rigid formal specification for a collaborative and iterative design process. “Schwaber K” was one of the Scrum methodology creators.

Additional studies into the works of these authors could provide insights into their specific contributions and individual impact that they have into the intersection of agile methodologies and the use of artificial intelligence. Researchers and professionals may benefit from an exploration of these authors' work as they could offer seminal ideas and frameworks that have shaped the current landscape of agile methodologies within artificial intelligence.

4.1.5 Sources' Production over Time

Image 4: Sources' production over time from the sample



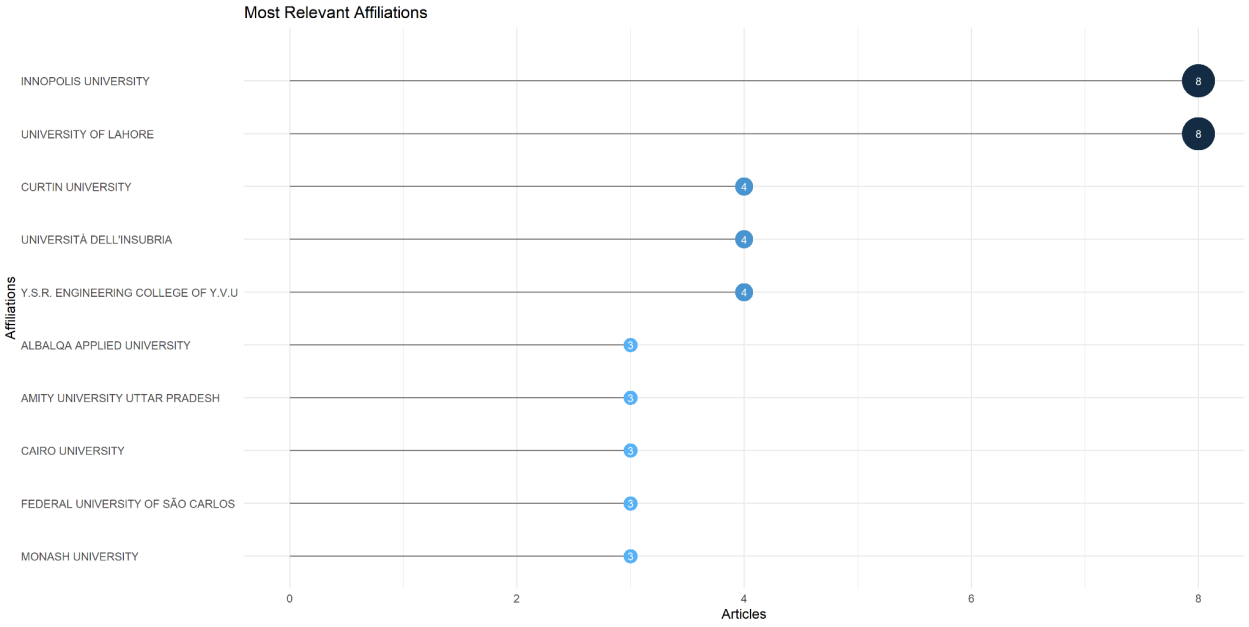
Source: Adapted from Bibliometrix.

The dataset shows the production of articles in journals from year 2002 to year 2023, highlighting the continuous increase in publications in "Lecture Notes in Computer Science," which grew from 6 articles in 2002 to 30 in 2023. New conferences, such as "Proceedings - 2017 International Conference on Computational Science and Computational Intelligence, CSCI 2017," have also emerged, indicating expansion in the field. Furthermore, some journals have increased their publications over time, while others have maintained a steady presence.

The majority of the journals have fewer articles published annually compared to "Lecture Notes in Computer Science," suggesting that it could be a primary publication vehicle, or that the field has many specialized journals with smaller volumes of publication. The overall landscape shows growth and diversification in academic research in computer science and related areas.

4.1.6 Most Relevant Affiliations

Image 5: Most relevant affiliations from the sample



Source: Adapted from Bibliometrix.

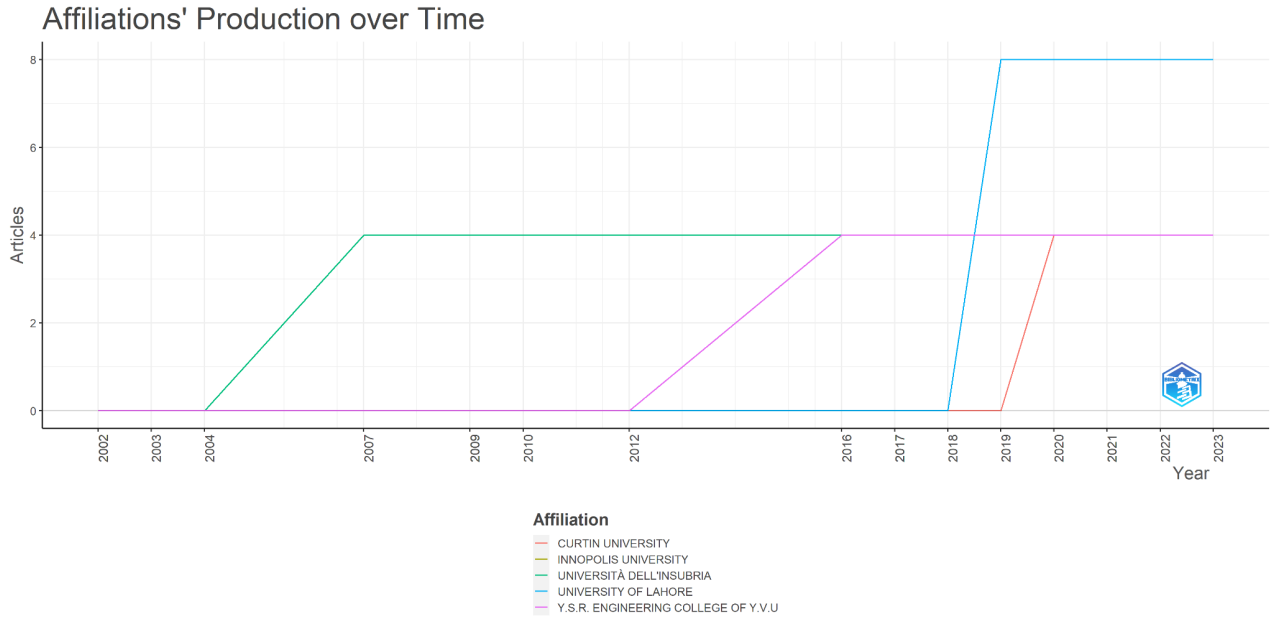
The dataset shows the diversity and global distribution of academic institutions and research centers contributing to a specific area of study, such as technology or computer science. Innopolis University and the University of Lahore lead with 8 articles each, suggesting strong research activity at these institutions. Innopolis University is considered the seventeenth best university in its country, Russia,

according to the ranking system of the Round Ranking website. The University of Lahore is considered the best in its country, Pakistan, using the same evaluation system. Both are ranked 674th and 611th, respectively, on a global rank, according to the same website. The ranking evaluates four dimensions of universities: Teaching, Research, International Diversity, and Financial Sustainability.

There are also several institutions with fewer publications, which could be seen as emerging or growing in the field. The overall picture points to a dynamic and internationally collaborative field of study.

4.1.7 Affiliations' Production over Time

Image 6: Affiliations' production over time from the sample

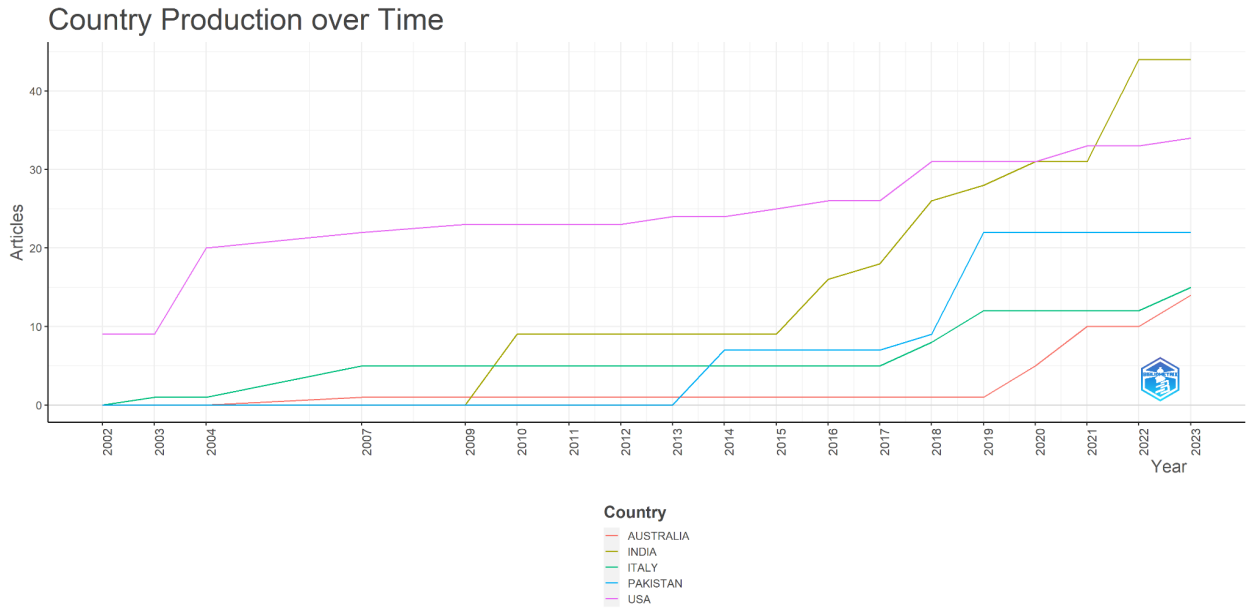


Source: Adapted from Bibliometrix.

The dataset reveals a global diversity of institutions contributing to a specific area of study. Innopolis University and the University of Lahore are the most productive with eight articles each, indicating strong research centers. Other institutions follow with fewer articles but still maintain a presence in the field. The contribution from various institutions around the world, each with a varying number of articles, highlights the dynamic and global nature of the field of study. The dataset also includes many institutions that have contributed minimally, indicating that the field is broad, but the contribution varies in scale.

4.1.8 Country Production over Time

Image 7: Country production over time from the sample



Source: Adapted from Bibliometrix.

The dataset shows varying trajectories in the production of academic articles among countries over time. The United States has been on an upward trajectory since 2002, while Italy, which started from a lower baseline, has seen an increase recently. India, Pakistan, and Australia began producing articles later but have shown growth, indicating an increasing focus on research.

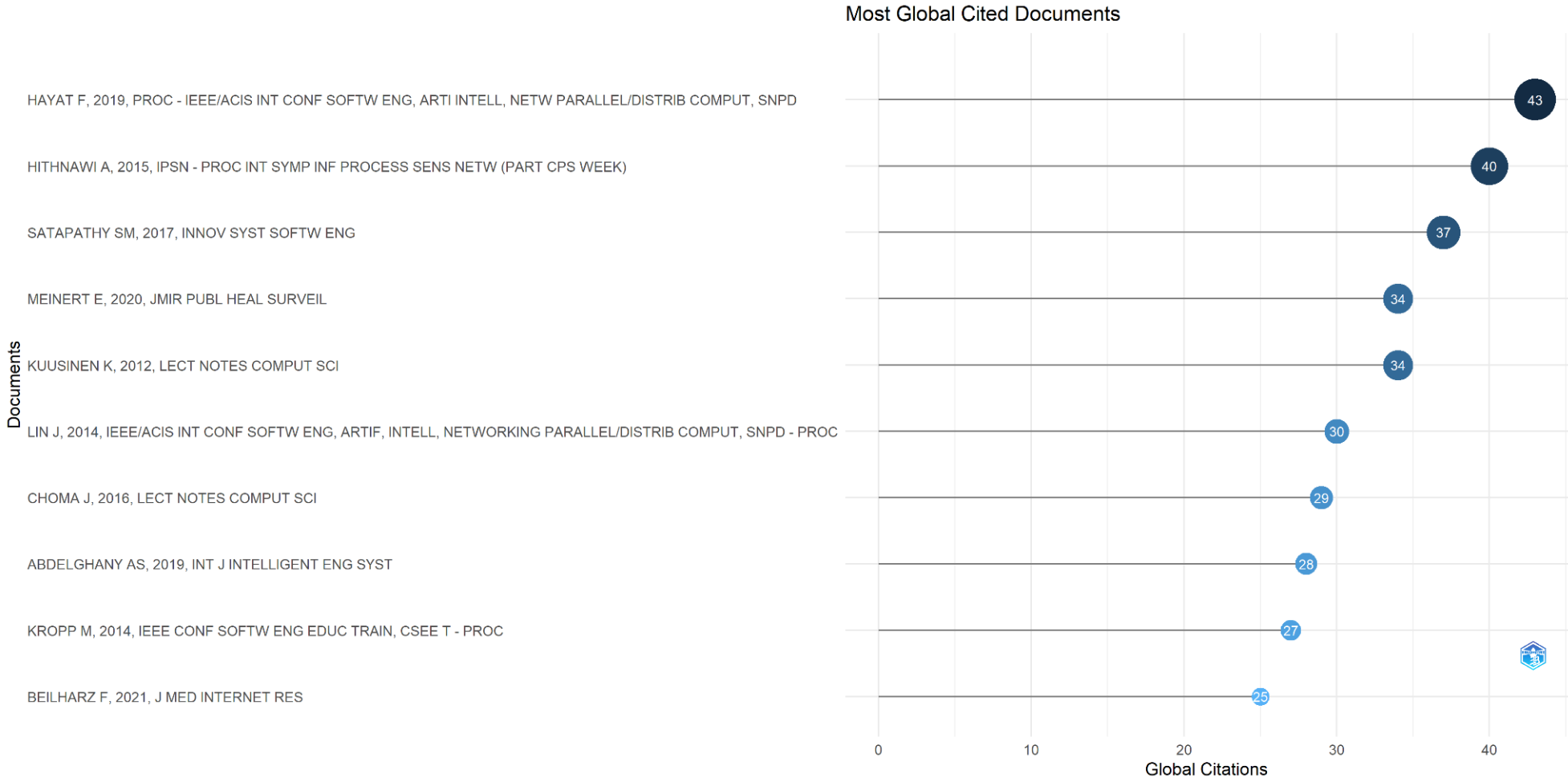
However, countries with high article production like India and the United States show less diversity in collaborations, in contrast to countries like Chile and France, which have a higher "MCP_Ratio," indicating more interdisciplinary or international collaboration. The “MCP_Ratio” refers to the abbreviation of Multiple Country Production, which indicates how many countries were involved in the elaboration of a specific study.

These varying trends and discrepancies in collaboration could be topics for further in-depth investigations, as well as which specific part of the use of agile methodologies is converging with the use of artificial intelligence.

Folletto et al. (2014) indicates that keeping track of the country's production over time can highlight opportunities for international partnerships and the potential for knowledge sharing, which can lead to scientific breakthroughs and innovation.

4.1.9 Most Global Cited Documents

Image 8: Most global cited documents from the sample

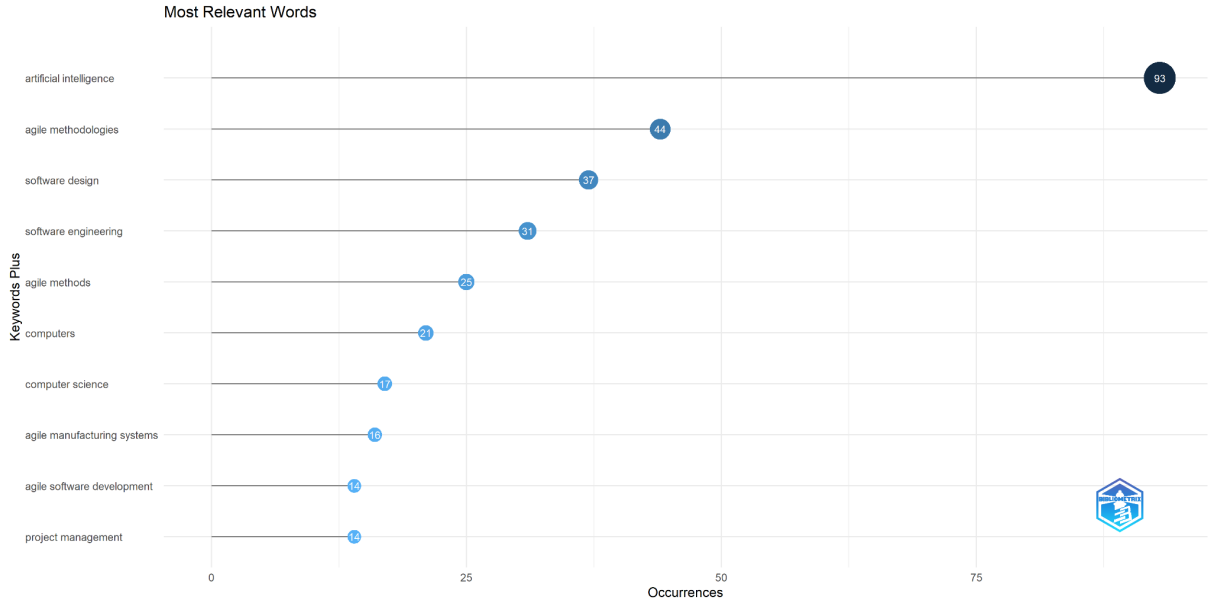


Source: Adapted from Bibliometrix.

The dataset on the most-cited articles reveals thematic diversity and impact within the academic community, with citation counts ranging from 25 to 43. Metrics such as "TC per Year" highlight that articles by Hayat F (2019) and Hithnawi A. (2015) have had significant impact in comparison to other works in their fields. Both of those works were from the computer science field, with Hayat F.'s study being mostly related to the use of Agile Methodology (Scrum) on Software Project Management, and Hithnawi A.'s study talking more about hardware specifications and programming, with the use of AI models.

4.1.10 Most Relevant Keywords

Image 9: Most relevant words from the sample

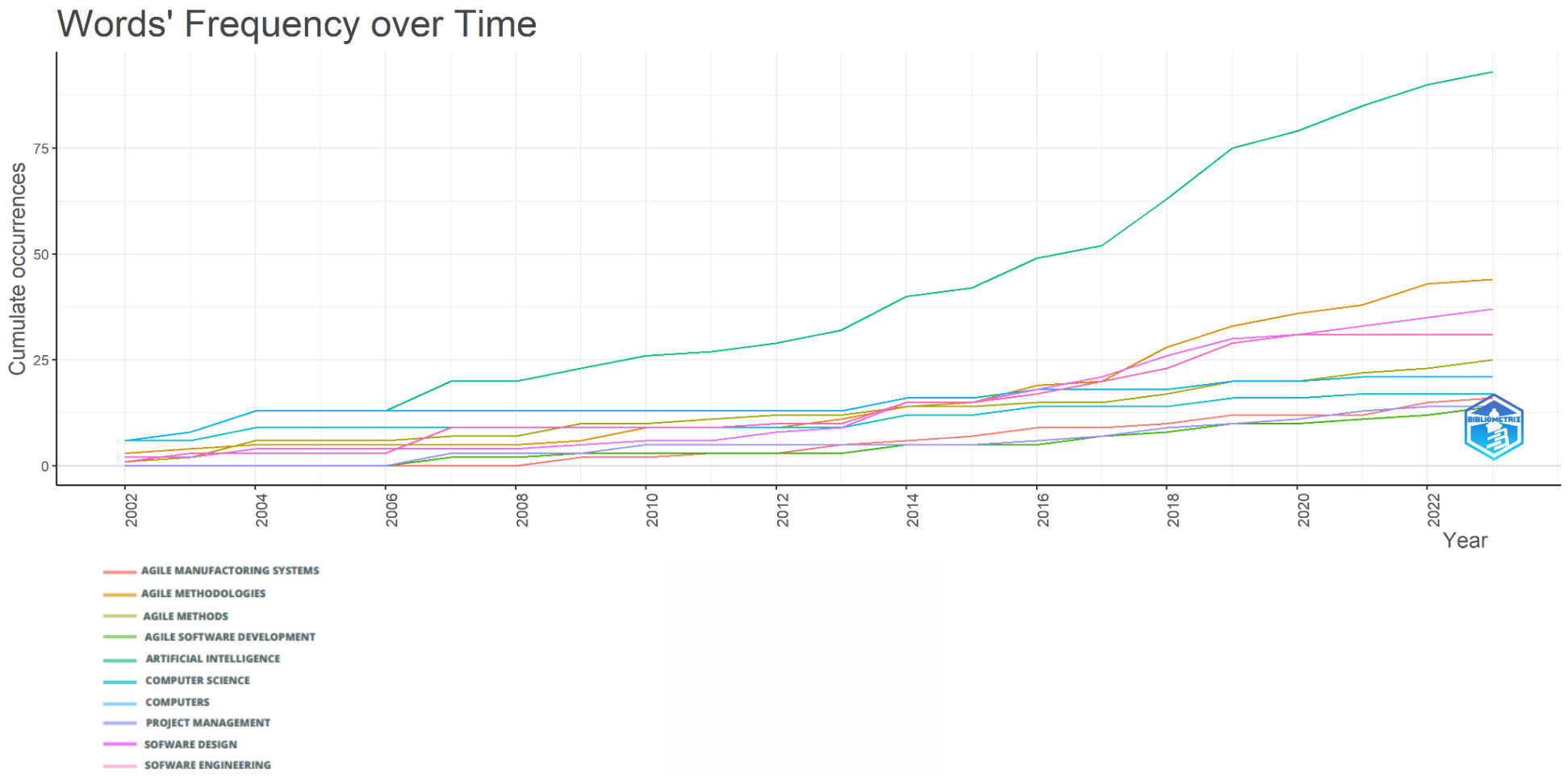


Source: Adapted from Bibliometrix.

The graph illustrates that "artificial intelligence" is the most prevalent theme, with 93 occurrences. Other strong themes include "agile" and its variants, as well as terms related to software design and computer science. Less frequent terms include "scrum," "extreme programming," and emerging technologies like "big data" and "internet of things." Additionally, there is a presence of terms related to education, showing a focus on both technological development and pedagogy. The dataset illustrates a diverse research landscape, particularly in areas like software engineering, artificial intelligence, and education.

4.1.11 Key-Words' Frequency over Time

Image 10: Words' frequency over time from the sample



Source: Adapted from Bibliometrix.

The mention of the term "Artificial Intelligence" has increased from 6 in 2002 to 93 in 2023, indicating its growing importance in research and development. "Agile Methodologies" have also seen an increase, though more moderate, from 3 mentions in 2002 to 44 in 2023. Terms like "Software Design" and "Software Engineering" have grown gradually, while mentions of "Computers" and "Computer Science" have remained stable, suggesting a focus on sub-domains like AI. "Project Management" and specific terms related to agile have also shown steady growth. In summary, there is a growing focus on artificial intelligence and agile methodologies, but the importance of computer science and software engineering remains stable, according to the study's perspective.

Based on the data generated, there is a substantial increase in the production of academic articles over the past few decades in countries like the United States, Italy, and India. The growth in countries such as Pakistan is particularly interesting, as they have started to contribute more significantly to article production in recent years. This data shows a dynamic international landscape in terms of academic research, with some countries displaying robust research infrastructure and others entering the scene more recently.

The advanced level of academic articles been produced recently could also be justified by the expansion of Industry 4.0 studies been published, specially the ones linking both agile methodologies and artificial intelligence to the core necessities of this new concept, like a study published in 2016, by Professor Andrew Ng, from Stanford University, stating that artificial intelligence (AI) is the new electricity (Lynch, 2017).

Regarding the impact of these articles, metrics like "Total Citations" and "TC per Year" offer valuable insights into the influence of individual articles. More recent papers from authors like Meinert E (2020) and Hayat F (2019) stand out, indicating that they have had an impact in a short period of time.

Furthermore, according to Folletto et al. (2014), keeping track of a subject’s bibliometric data, such as a country’s production over time, can highlight opportunities for international partnerships and the potential for knowledge sharing, which can lead to scientific breakthroughs and innovation.

5. Conclusions

The elaborated study has relevance in today's rapidly evolving technological landscape. The data reveals growth in publications, particularly in emerging domains like AI, indicating a shift in research focus and priorities. The study also identifies key contributors, both in terms of authors and countries, thus providing insights into the global and collaborative nature of this research field, as stated by (Gonçalves, 2022).

The analyzed data indicates a rise in academic publications from countries like the U.S., Italy, and India, with recent contributions from countries like Pakistan. This growth is part of a dynamic international research landscape, further propelled by the expansion of Industry 4.0 studies that link agile methodologies and artificial intelligence. Impact metrics such as "Total Citations" and "TC per Year" highlight that more recent articles, specifically those by Meinert E (2020) and Hayat F (2019), have had a considerable influence in a relatively short span of time.

Concerning research themes, there is an increase in focus on areas like artificial intelligence and agile methodologies. This is observed not just in article counts but also in the frequency of keywords used in these articles. "Artificial Intelligence" dominates the field, while terms like "Agile Methodologies" also show growth, reflecting changes in the technology field and research priorities.

Lastly, the data suggest that although there is a stable core around topics like computer science and software engineering, there is a clear inclination towards emerging sub-domains. The importance of project management and agile manufacturing systems is also highlighted, indicating that these areas are gaining recognition.

In summary, we are seeing a rapidly evolving academic world, with shifts in research focus, increasing diversification of contributing countries, and a rise in the influence of articles in specific areas.

This study contributes to the academic literature by enabling researchers to identify current research trends, map collaborative networks and identify the main authors/affiliations in this intersection of agile methods and artificial intelligence. Through the examination of publication patterns, author collaborations, and citation metrics, bibliometrics empowers scholars to make informed decisions about their research focus and forge valuable collaborations.

While Scopus is one of the most comprehensive academic databases available, it does not include every journal, conference proceeding, or research outlet. As a result, this study could potentially miss valuable insights and data. For future studies, it would be valuable to explore the underlying factors driving the geographic and thematic trends observed in the dataset. Additionally, an evaluation of the quality and real-world application of research, beyond citation metrics, could offer a more comprehensive view of a paper's impact. Furthermore, the study of tools, concepts, practices, challenges, benefits, impacts between the intersection of both areas could lead to a deepen understanding of how this combination is evolving.

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SILVA, C., GOBBI, B., SIMAO, A. **O uso da análise de conteúdo como uma ferramenta para a pesquisa qualitativa: descrição e aplicação do método**. Organizações Rurais e Agroindustriais, Lavras, MG, 2005.

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Appendix I: Article corpus for the bibliometric analysis

Authors	Title	Year
Hayat F.; Rehman A.U.; Arif K.S.; Wahab K.; Abbas M.	The Influence of Agile Methodology (Scrum) on Software Project Management	2019
Hithnawi A.; Shafagh H.; Duquennoy S.	TIIM: Technology-independent interference mitigation for low-power Wireless Networks	2015
Satapathy S.M.; Rath S.K.	Empirical assessment of machine learning models for agile software development effort estimation using story points	2017
Meinert E.; Milne-Ives M.; Surodina S.; Lam C.	Agile Requirements Engineering and Software Planning for a Digital Health Platform to Engage the Effects of Isolation Caused by Social Distancing: Case Study	2020
Kuusinen K.; Mikkonen T.; Pakarinen S.	Agile user experience development in a large software organization: Good expertise but limited impact	2012
Lin J.; Yu H.; Shen Z.; Miao C.	Using goal net to model user stories in agile software development	2014
Choma J.; Zaina L.A.M.; Beraldo D.	UserX story: Incorporating UX aspects into user stories elaboration	2016
Abdelghany A.S.; Darwish N.R.; Hefni H.A.	An agile methodology for ontology development	2019
Kropp M.; Meier A.; Mateescu M.; Zahn C.	Teaching and learning agile collaboration	2014
Beilharz F.; Sukunesan S.; Rossell S.L.; Kulkarni J.; Sharp G.	Development of a positive body image chatbot (KIT) with young people and parents/carers: Qualitative focus group study	2021
Kussmaul C.; Jack R.; Sponsler B.	Outsourcing and offshoring with agility: A case study	2004
Qumer A.	Defining an integrated agile governance for large agile software development environments	2007

Hazzan O.; Tomayko J.	Human aspects of software engineering: The case of extreme programming	2004
Schleier-Smith J.	An architecture for agile machine learning in real-time applications	2015
Biesialska K.; Franch X.; Muntés-Mulero V.	Big Data analytics in Agile software development: A systematic mapping study	2021
Crawford B.; De La Barra C.L.	Enhancing creativity in agile software teams	2007
Tessem B.	Experiences in learning XP practices: A qualitative study	2003
Reifer D.J.	How to get the most out of extreme programming/agile methods	2002
Costa N.; Santos N.; Ferreira N.; Machado R.J.	Delivering user stories for implementing logical software architectures by multiple scrum teams	2014
Dragicevic S.; Celar S.; Novak L.	Use of method for elicitation, documentation, and validation of software user requirements (MEDoV) in agile software development projects	2014
Štolc M.; Polášek I.	A visual based framework for the model refactoring techniques	2010
Mora A.; Zaharias P.; González C.; Arnedo-Moreno J.	FRAGGLE: A framework for agile gamification of learning experiences	2016
Lynggaard P.	Using Machine Learning for Adaptive Interference Suppression in Wireless Sensor Networks	2018
van Manen H.; van Vliet H.	Organization-wide agile expansion requires an organization-wide agile mindset	2014
Bagdasaryan I.; Stupina A.; Zhanna S.; Titiberiya R.; Vaitekunene E.	Training of it-personnel in the interior of “Digital economy”	2019
Mazzara M.; Naumchev A.; Safina L.; Sillitti A.; Urysov K.	Teaching devops in corporate environments: An experience report	2019
Sibona C.; Pourreza S.; Hill S.	Origami: An active learning exercise for scrum project management	2018
Abrahamsson P.	Agile software development of mobile information systems	2007
De Oliveira Fassbinder A.G.; Fassbinder M.; Barbosa E.F.; Magoulas G.D.	Massive open online courses in software engineering education	2017
Concha M.; Visconti M.; Astudillo H.	Agile commitments: Enhancing business risk management in agile development projects	2007
Elshamy A.; Elssamadisy A.	Applying agile to large projects: New agile software development practices for large projects	2007

Govil N.; Sharma A.	Validation of agile methodology as ideal software development process using Fuzzy-TOPSIS method	2022
Tessarolo F.; Nollo G.; Conotter V.; Onorati G.; Konstantinidis E.I.; Petsani D.; Bamidis P.D.	User-centered co-design and AGILE methodology for developing ambient assisting technologies: Study plan and methodological framework of the CAPTAIN project	2019
Sharma S.; Kumar D.	Agile Release Planning Using Natural Language Processing Algorithm	2019
Goswami R.; Jasuja M.; Dhir S.	Impact of different estimation approaches in traditional and agile development	2016
Pieroni A.; Scarpato N.; Scorza M.	Affective agile design a proposal for a new software development model	2018
Jadhav P.P.; Joshi S.D.	ACADF: Ant Colony Unified with Adaptive Dragonfly Algorithm Enabled with Fitness Function for Model Transformation	2020
Favaro J.	Value based management and agile methods	2003
Nawrocki J.R.; Jasinski M.; Walter B.; Wojciechowski A.	Combining extreme programming with ISO 9000	2002
Pinto J.; Ribeiro P.	Characterization of an Agile Coordination Office for IST companies	2018
Hamdani M.; Butt W.H.	Success and Failure Factors in Agile Development	2018
Vlaanderen K.; Van Stijn P.; Brinkkemper S.; Van De Weerd I.	Growing into agility: Process implementation paths for scrum	2012
Yong Y.; Zhou B.	Evaluating extreme programming effect through system dynamics modeling	2009
Patton J.	Designing requirements: Incorporating usage-centered design into an agile SW development process	2002
Juanatas I.C.; Fajardo R.R.; Manansala E.T.; Pasilan A.A.; Tabor J.R.; Balmeo H.D.A.	Sentiment Analysis Platform of Customer Product Reviews	2019
Matthies C.; Hesse G.	Towards using data to inform decisions in agile software development: Views of available data	2019
Baskaran V.; Singh S.; Reddy V.; Mohandas S.	Digital assurance for oil and gas 4.0: Role, implementation and case studies	2019

Kamthan P.; Shahmir N.	Effective user stories are affective	2017
Althar R.R.; Samanta D.; Kaur M.; Singh D.; Lee H.	Automated Risk Management based Software Security Vulnerabilities Management	2022
Villacís C.; Fuertes W.; Santillán M.; Aules H.; Tacuri A.; Zambrano M.; Salguero E.	On the development of strategic games based on a Semiotic analysis: A case study of an optimized Tic-Tac-Toe	2016
Najdawi A.; Shaheen A.	Which project management methodology is better for ai-transformation and innovation projects?	2021
Singla K.; Bose J.; Naik C.	Analysis of Software Engineering for Agile Machine Learning Projects	2018
Knabke T.; Olbrich S.	Towards agile BI: applying in-memory technology to data warehouse architectures	2011
Dou W.; Hong K.; Zhang X.	A framework of distributed pair programming system	2009
Singh R.; Kumar D.; Sagar B.B.	On The Development Of Agile Software Methodology Using Two Way Assessment	2018
Shankarmani R.; Mantha S.S.; Babu V.; Mehta D.; Khatri K.; Kaushil P.	A decision support system utilizing a semantic agent	2010
Nepomuceno V.S.; Fontana M.E.	Decision support system to project software management	2013
Proaño C.; Villacís C.; Proaño V.; Fuertes W.; Almache M.; Zambrano M.; Galárraga F.	Serious 3D Game over a Cluster Computing for Situated Learning of Traffic Signals	2019
Djoudi L.A.; Monza A.; Anand I.M.; Rome M.	Using knowledge base and DSS to fill the gaps in agile methodologies for managing project life cycles	2016
Akbar R.; Safdar S.; Hassan M.F.; Abdullah A.	Software development process tailoring for small and medium sized companies	2014
Gharaibeh N.; Abu-Soud S.M.; Bdour W.; Gharaibeh I.	Agile development methodologies: Are they suitable for developing decision support systems	2009
Jabeen J.; Motla Y.H.; Abbasi M.A.; Batool D.-E.-B.;	Incorporating artificial intelligence technique into DSDM	2014

Butt R.; Nazir S.; Anwer S.A.		
Janakova M.	Software development with regards to simulations: Are interaction features needed for a better description of actual reality?	2014
Ponce E.K.; Cruz M.F.; Andrade-Arenas L.	Machine Learning Applied to Prevention and Mental Health Care in Peru	2022
Reddaiah B.; Pradeep Kumar Reddy R.; Nagaraju C.; Harsha Sree V.	A novel approach to adopt scrum by an enterprise	2016
Fireteanu V.-V.	Agile Methodology Advantages when delivering Internet of Things projects	2020
Balan C.; Dija S.; Vidyadharan D.S.	The need to adopt agile methodology in the development of Cyber Forensics Tools	2010
Almeida F.; Adão D.; Martins C.	Decision support system for assigning members to agile teams	2019
Barrera F.E.C.; García M.A.; González H.G.P.; Pérez F.E.M.	Agile Evaluation of the Complexity of User Stories Using the Bloom's Taxonomy	2018
Isong B.; Ifeoma O.; Gasela N.	On the integration of agile practices into teaching: An approach to overcoming teaching and learning challenges of programming	2016
Borrego G.; Salazar-Lugo G.; Parra M.; Palacio R.	Slack's knowledge classification mechanism for architectural knowledge condensation	2019
Seya K.; Kobayashi N.; Shirasaka S.	Effectiveness of Story-based Visual and Agile Teaching Method for Non-technical Adult Learners Who Want to Understand Artificial Intelligence	2019
Marroquin Gavelan J.P.; Peralta Mezones P.P.; Rodriguez C.	NEKO: Proposal of the first super-Agile methodology to improve work efficiency	2022
Kupi M.; McBride K.	Agile Development for Digital Government Services: Challenges and Success Factors	2021
Niculescu V.; Sterca A.; Bufnea D.	Agile and cyclic learning in teaching parallel and distributed computing	2020
Terán C.; Torres J.; Flores P.	Productivity Model for Software Development Factories under an Agile Methodological Approach	2018
Isomöttönen V.; Korhonen V.; Kärkkäinen T.	Power of recognition: A conceptual framework for agile capstone project in academic environment	2007
Akour M.A.; Das A.	Developing a virtual smart total learning environment for future teaching-learning system	2020

Masyagin S.; Nurgalieva M.; Succi G.	Kent Beck or Pablo Picasso? Speculations of the Relationships Between Artists in Software and Painting	2019
Nurbojatmiko; Budiardjo E.K.; Wibowo W.C.	SLR on identification & classification of non-functional requirements attributes, and its representation in functional requirements	2018
Srivastava P.; Srivastava N.; Agarwal R.; Singh P.	Estimation in Agile Software Development Using Artificial Intelligence	2022
Awotar M.; Sungkur R.K.	Optimization of Software Testing	2018
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Cadei L.; Rossi G.; Lancia L.; Loffreno D.; Corneo A.; Milana D.; Montini M.; Purlalli E.; Fier P.; Carducci F.; Nizzolo R.	Digital Lighthouse: A Scalable Model for Digital Transformation in Oil & Gas	2022
Papatheocharous E.; Nyfjord J.; Papageorgiou E.	Fuzzy cognitive maps as decision support tools for investigating critical agile adoption factors	2013
Calderón-Martínez O.L.; Rojas A.E.; Mejía-Moncayo C.	A scrum implementation plan by phases and oriented by team members: A case study	2020
	ITMS 2021 - 2021 62nd International Scientific Conference on Information Technology and Management Science of Riga Technical University, Proceedings	2021
Rodríguez Sánchez E.; Vázquez Santacruz E.F.; Cervantes Maceda H.	Effort and Cost Estimation Using Decision Tree Techniques and Story Points in Agile Software Development	2023
De Barros V.A.M.; Paiva H.M.; Hayashi V.T.	Using PBL and Agile to Teach Artificial Intelligence to Undergraduate Computing Students	2023
Volmering L.; Lee R.; Matsuo T.	Developing Cloud Computing Applications Using Agile Principles	2018
Mulla N.; Jayakumar N.	Study on software test case generation techniques and future scope in agile	2018
Grigera J.; Espada J.P.; Rossi G.	AI in User Interface Design and Evaluation	2023
Buniel G.; Dela	I-Detect: An Internet of Things Voice-Activated Home Automation with	2021

Cerna M.	Smoke and Fire Detection and Mitigation System	
Barata S.F.P.G.; Ferreira F.A.F.; Carayannis E.G.; Ferreira J.J.M.	Determinants of E-Commerce, Artificial Intelligence, and Agile Methods in Small- and Medium-Sized Enterprises	2023
Hoda R.; Dam H.; Tantithamthavorn C.; Thongtanunam P.; Storey M.-A.	Augmented Agile: Human-Centered AI-Assisted Software Management	2023
Lescano N.L.; Yamao E.	Project based learning approach for cloud application development course using agile methodologies	2022
Meyer M.L.B.	TSAI-Test Selection using Artificial Intelligence for the Support of Continuous Integration	2021
Sundram D.R.; Lew K.L.; May C.C.M.	Proposal of a Decision Support System and Model to Mitigate Scope Variability for New Product Development	2022
Almanaseer A.M.; Alzyadat W.; Muhairat M.; Al-Showarah S.; Alhroob A.	A proposed model for eliminating nonfunctional requirements in Agile Methods using natural language processes	2022
Lourens M.; Raman R.; Vanitha P.; Singh R.; Manoharan G.; Tiwari M.	Agile Technology and Artificial Intelligent Systems in Business Development	2022
Solomon A.; Crawford Z.	Transitioning from Legacy Air Traffic Management to Airspace Management through Secure, Cloud-Native Automation Solutions	2021
Choi J.	Exploring the possibility of modeling a genetic counseling guideline using agile methodology	2013
	CANDO-EPE 2020 - Proceedings, IEEE 3rd International Conference and Workshop in Obuda on Electrical and Power Engineering	2020
Manfredi G.; Erra U.; Gilio G.	A Mixed Reality Approach for Innovative Pair Programming Education with a Conversational AI Virtual Avatar	2023
Ahmed M.; Malik B.H.; Tahir R.M.; Perveen S.; Alvi R.I.; Rehmat A.; Ain Q.T.; Asghar M.	Estimation of risks in scrum using agile software development	2019
Hansen S.; Suryadibrata A.; Hansun S.	INFRASTRUCTURE PROJECT SELECTION AUTOMATION USING NON-STRUCTURAL FUZZY DECISION SUPPORT SYSTEM II	2023
Penter K.; Perrin B.; Wreford J.; Pervan G.	Designing a Sourcing Ecosystem for Strategic Innovation Through “Big Data” Applications	2020
Guamán D.; Pérez J.; Díaz J.	Towards a (semi)-automatic reference process to support the reverse engineering and reconstruction of software architectures	2018

Caristi J.; Maurer F.; Rettig M.	From the student's perspective	2002
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McBreen P.; Astels D.; Gregory J.; Steinberg D.H.; Crispin L.; Highsmith J.; Mart R.C.	Is XP still relevant?	2004
Thomas D.; Manzo J.; Kitiyakara N.; Stay R.; Dagnino A.	Agile experiences	2002