



Review Article

Process-Based Management in Public Administration: A Bibliometric Analysis

Gilbert Roland Alvarado-Arbildo ^{1*}, Hugo Henry Ruiz-Vásquez ¹, Stevs Raygada-Paredes ¹, Víctor Arturo Jesús Castillo-Canani ¹, Beny Pasquel-Flores ¹, David Eduardo Burga-Pérez ¹, Wu Koy Fon Chonn-Chang ¹, David Miguel Melgarejo-Mariño ¹, Edgar David Iturrarán-Sandoval ¹, José Ricardo Young-Gonzales ¹

¹ Universidad Nacional de la Amazonía Peruana, Loreto, Iquitos 16008, Peru.

Abstract

This bibliometric study aimed to analyze the trends and scope of scientific papers on process-based management in public administration worldwide between 2010 and 2024. A methodology based on the Scopus search engine was used to collect the data, which were selected according to specific criteria; thus, 29 documents were obtained. For the analysis, Microsoft Excel was used to produce graphs and tables, and VOSviewer software was used to create co-occurrence maps of countries, authors, and keywords. The results indicated that the United States and Brazil were the most productive countries in this area. Most papers were published as conference papers in areas such as computer science, business management, engineering, and social sciences, while scientific papers were the most cited. It was identified that process-based management has been applied in various sectors, such as healthcare institutions, educational institutions, food companies, and agricultural companies, among others. It was concluded that the reviewed papers highlight the obstacles derived from the organizational and operational complexity in public sector institutions, which limits the implementation of process-based management. This underlines the need for further research, especially for comparisons with private sector organizations.

Keywords:

Process-Based Management;
Public Sector;
Organizational Improvement;
Bibliometric;
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1- Introduction

Process-based management aims to optimize organizational processes in order to increase system performance, achieve greater benefits, improve services, and provide faster responses to any contingency [1]. In the public sector, process-based management has gained prominence in recent years, mainly due to innovation and digital technologies that have significantly improved processes and introduced communication, knowledge, and innovation in all phases of organizational processes [2].

The relevance that process-based management has acquired, especially in the public sector, has generated research focused on different aspects inherent to it, such as risk management [3], knowledge management [4- 6], and performance management [7]. Process-based management has been studied from the perspective of its importance in the optimization of organizational processes and, therefore, in the productivity of all parts of organizations. Particularly in recent years, the focus of process-based management has been on technology as its foundation, with works such as that of Kuziemski and Misuraca highlighting the importance of using artificial intelligence (AI) in process management. This became

* **CONTACT:** gilbert.alvarado@unap.iqitos.edu.pe

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especially important after the global crisis caused by COVID-19, as AI and the regulations generated around it became a state issue due to the collection and use of data, real-time access to information and services, and digital relationships between institutions and citizens [8].

Process-based management is one of the most important management concepts in recent years and has a significant impact on the success of organizations [9]. In organizations, there are processes, and the effectiveness of these processes is reflected in the effectiveness and efficiency of the people who integrate them; therefore, process-based management is related to the review and continuous improvement of processes, making adjustments and changes when results are observed that deviate from the organizational objectives initially planned. Organizations implementing process-based management must recognize that their effectiveness is significantly influenced by the way operations are performed in each process. This means that the individual activities of each process are assigned to a person or work group, regardless of the vertical organizational structure [10].

Process-based management has been defined from a holistic perspective, associating it with the leadership and management of modern organizations and with operational and tactical dimensions [11]. From a broad perspective, process-based management is defined as a special way of perceiving and orienting people to the processes that take place in an organization, which serves as a basis for improving and optimizing it [12]. Furthermore, process-based management is regarded as a managerial activity that optimizes specific components of the organizational structure. This includes aspects related to the monitoring of processes, their connection with organizational strategies, and the establishment of principles and criteria for process control and monitoring [10].

Process-based management is focused on the development of the organization's mission through a model that takes into account the satisfaction of the expectations of all stakeholders (customers, shareholders, suppliers, employees, and society), beyond focusing solely on structural aspects such as the chain of command and the functions of each department. Companies that implement this model generate an organizational change, identify their processes, select the relevant ones, analyze and improve them, and thus achieve a transformation in the organization [13]. Process-based management is mainly a model of continuous improvement of business processes, whose purpose is to achieve organizational effectiveness through the strategic alignment of the operational and tactical levels, based on the professionalization of management [14, 15].

Process-based management brings the strategic levels closer to the operational base, allowing us to know how each area really works and how they interact in a systemic way. This makes it possible to design the process and determine how it adds value to the business. The real value of process-based management lies in standardizing activities and practices by defining how the process works and who is responsible for carrying it out. Shared responsibilities are defined to achieve the expected end result in a coordinated manner, which increases the efficiency and productivity of the processes that generate the organization's services [16].

The use of innovative and emerging technologies, such as AI tools, has revolutionized process-based management. Although barriers to the adoption of technological innovation in the public sector have been identified, it is also evident that when innovation policies are aligned with the organization's mission, opportunities unfold that lead to innovations in the organization's operations [17]. Despite the above, it has been observed that innovation in the public sector has been more limited than in the private sector and that studies in this context have made limited contributions, so the study of innovation in process-based management in public sector organizations in relation to existing sources of innovation should be deepened [18].

Although systematic reviews have been conducted on various topics related to the use and effectiveness of process management in public administration, such as agile business process management [19] and business process models [20], no bibliometric reviews were found to provide an overview of the research trend toward process-based management in public administration. Bibliometrics is defined as a study that describes relevant information about the direction of research in a particular field and helps to show how information is directed and disseminated by authors when communicating information related to a problem [21, 22].

Passas [23], defines bibliometrics as the systematic study of scientific literature that makes it possible to identify trends, patterns, and the impact of publications within a given scientific field. Bibliometric review involves the collection of data from relevant databases, data cleaning and refinement, and the application of various bibliometric methods, leading to the generation of relevant and meaningful information for understanding research in the field studied. In this context, only bibliometric studies are available that have analyzed topics such as the principles of process-based models applied to areas such as agriculture. These studies have shown that process-based management is a useful tool for land management in agriculture [24]. On the other hand, another bibliometric study highlighted the academic gaps around process-based management and evidenced deficiencies in the amount of research conducted, pointing out the need for further deepening in the subject [25]. This reaffirms the importance of devoting more efforts to this field of research to achieve a better understanding of process management, not only as a tool for improving business quality but also as an object of study capable of driving significant advances in its application.

This study examines the trend and patterns of research in process-based management research in public administration worldwide over the last 10 years. Scientific publications indexed in the Scopus database were examined and processed using bibliometric techniques in order to study and analyze descriptively the co-occurrence networks between the different bibliometric indicators obtained in order to observe in a broad way how research in process-based management has evolved and developed in different public sector organizations in different countries and under different approaches. This research represents a significant contribution to the knowledge of the research reality in process management, especially in a little-studied field such as the bibliometric trends that define and direct research in this subject.

The study is divided into the following sections: an introduction with a brief compilation of the literature (state of the art) and the justification of the research; the description of the methodology used, with the criteria for selecting the sample of documents for analysis and the steps carried out to process the information; a results section with the main findings summarized in tables and graphs; the discussion of the results obtained; and, finally, the conclusions derived from the results and the discussion carried out.

2- Research Methodology

2-1-Information Collection

The study was based on the collection and analysis of scientific papers published on process-based management in public administration. The information was retrieved from the Scopus database, published by Elsevier, which enjoys great prestige worldwide. This multidisciplinary database contains more than 69 million documents from all fields of knowledge: social sciences, life sciences, basic sciences, and health sciences [26, 27].

The following equation was used as the search criteria. TITLE-ABS-KEY(process-based AND management AND public AND administration) AND PUBYEAR > 2009 AND PUBYEAR < 2025 AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "ar")). The search equation included document inclusion criteria such as the time period (2010-2024), documents published in English, and of the type conference papers and articles. An initial filtering without the inclusion criteria yielded a total of 52 documents, and filtering with the inclusion criteria yielded a total sample of 29 documents (Figure 1).

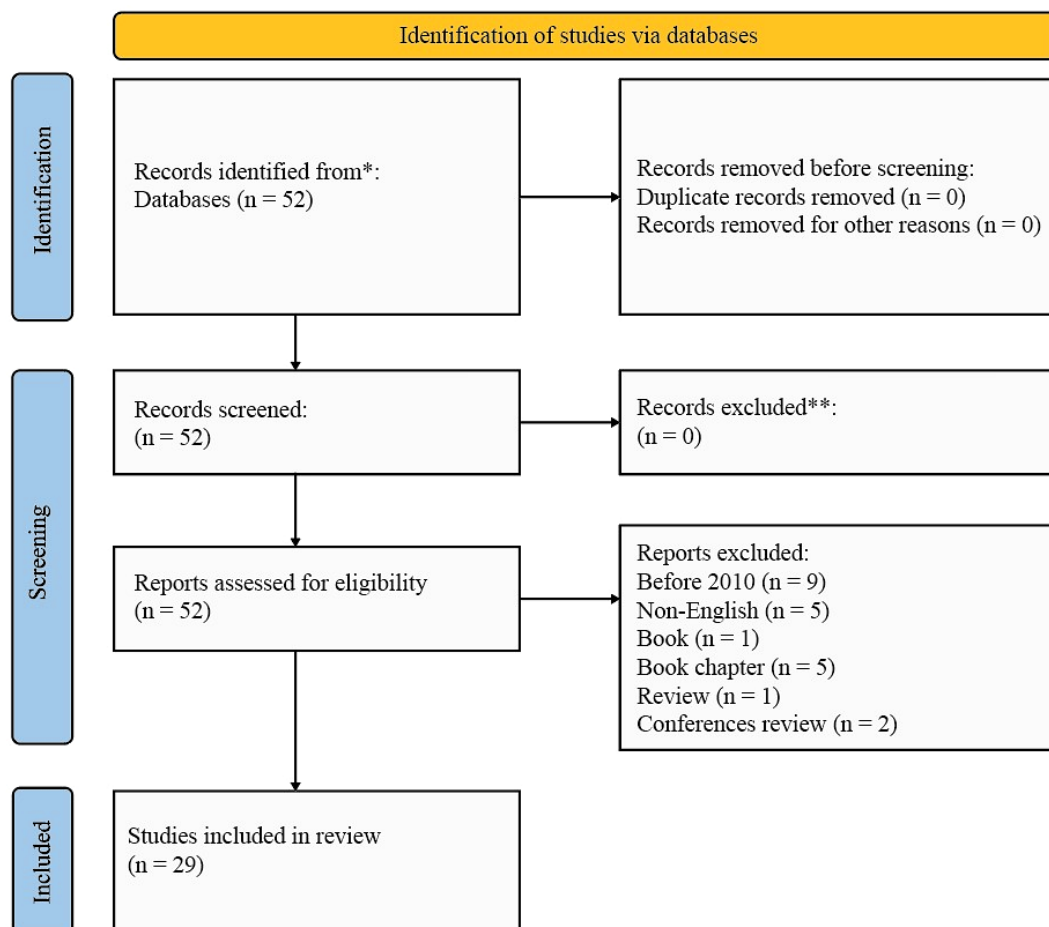


Figure 1. Flowchart of the information collection process according to PRISMA recommendations

2-2-Information Processing

The bibliometric information obtained from the database was exported to a Microsoft Excel spreadsheet file containing data such as article title, year of publication, publication source, authors, country of origin, abstract, and author keywords. As a first step, the graphical option of Microsoft Excel was used to generate bar graphs and pie charts to show the distribution graphs of the documents by year, country, and knowledge sub-area of the document.

Second, the information was exported to the bibliometric analysis software VOSviewer, which displays visualization maps of the main bibliometric indicators contained in the database. This software can process the data collected from Scopus and create visualization maps of categories such as country of publication, authors and keywords, providing an overview of the content of the information downloaded from the database [28]. The bibliometric categories processed by the VOSviewer software are visualized as co-occurrence maps of authors, countries, affiliations, and keywords, showing how each of the category attributes are related to each other, i.e., the strength of the observed association, for example, between authors within the authorship map [29].

In particular, the keyword co-occurrence analysis carried out with the VOSviewer software made it possible to determine the number of times keywords appeared in the retrieved documents, which is essential for identifying research trends in the subject under study. This analysis is based on the retrieval of all the keywords in each article, in this case those provided by the authors, and on the knowledge of how research on process-based management has been directed during the period under study, which makes it possible to visualize lines of research that may be valuable for future research.

3- Results

The analysis of the documents retrieved from the database showed that the year with the highest production of process-based management documents was 2018, which accounted for 17.24% of the total number of documents published during the study period (Figure 2). The years with the lowest production were 2010, 2019 and 2020, with one document each (3.45%). It is also noteworthy that in the years 2012, 2015 and 2024, no documents were published that met the inclusion criteria of the study. It should be noted that, although the importance of the subject has increased in recent years, the production of documents on process-based management in public administration remained relatively stable during the study period, with a slight increase in the second half of the period of only one document, so that in the first half of the period 48.28% of the documents were published, while in the second half of the period 51.72% were published.

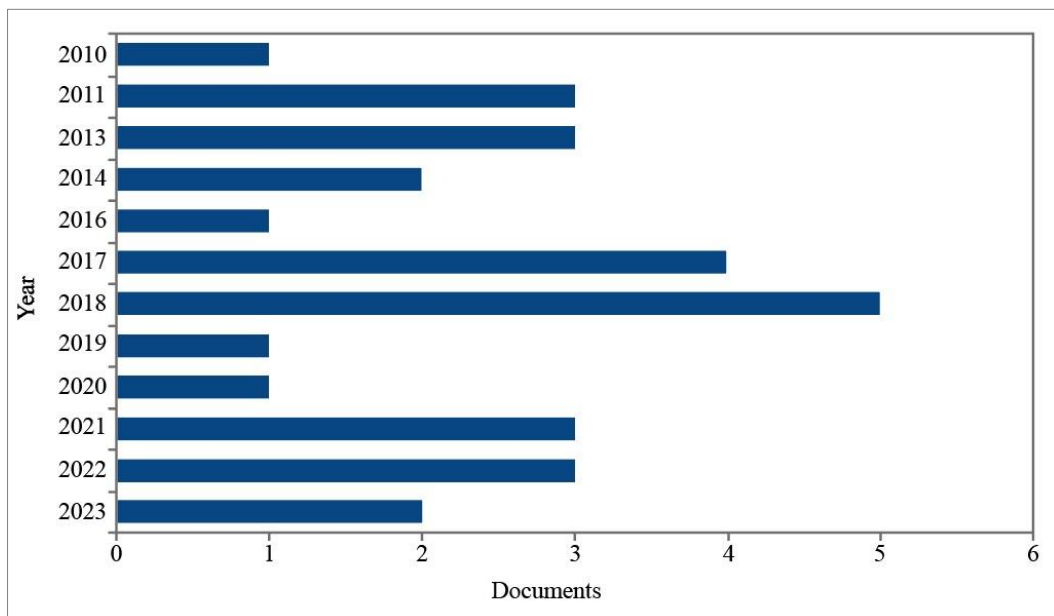


Figure 2. Document production by year

In terms of document production by country, a total of 23 countries were counted. The United States dominated production with 10 appearances as the country of origin of the document (25.00%). Brazil was the second most important country with four occurrences, representing 10.00% (Figure 3). Seven countries accounted for the majority of the documents retrieved (United States, Brazil, Hungary, Portugal, South Korea, Spain, and the United Kingdom), which

together accounted for 60.00% of the documents. The remaining countries identified as authors of documents on process-based management in public administration contributed one document each.

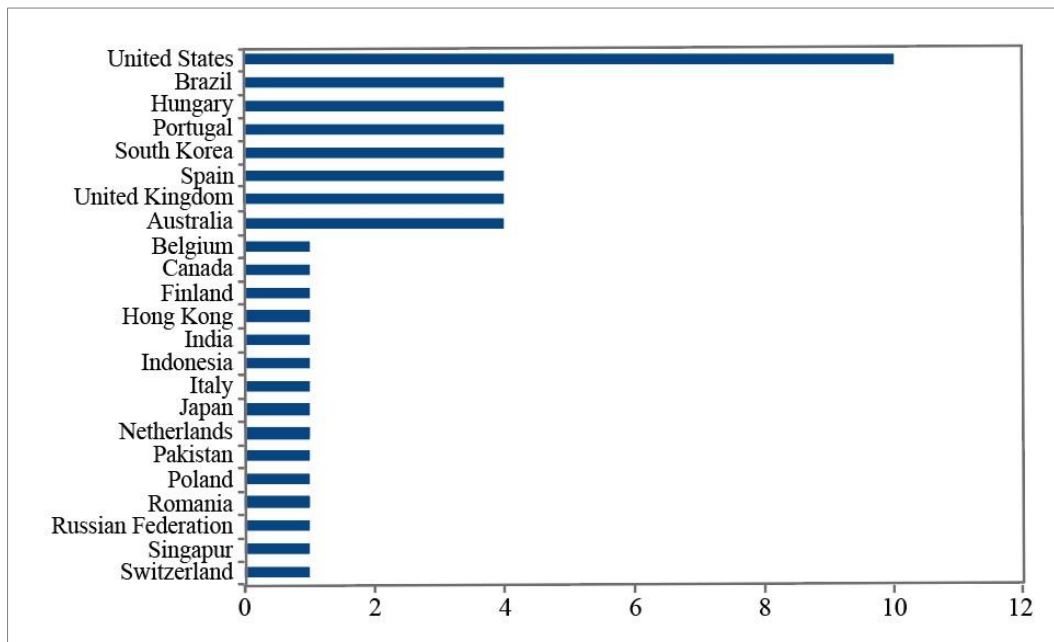


Figure 3. Document production by country

According to the country co-occurrence analysis, which examines the distribution of documents by their interrelationship between countries, it was observed that there are seven countries that are related (Figure 4). The United States presents a co-occurrence network with Spain, South Korea, Singapore, Hong Kong and the United Kingdom, being the main point of connection in the network of countries that have produced research on process-based management in public administration. The Netherlands co-occurs with the United Kingdom but is not part of the main network led by the United States.

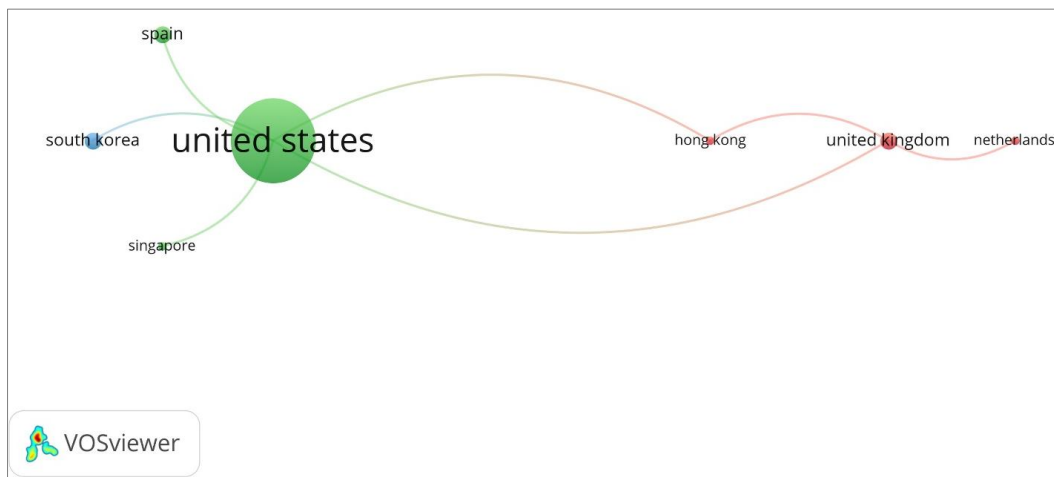


Figure 4. Map of document co-occurrences by country

A total of 116 authors were counted in the retrieved documents. No single author stood out, as all of them appeared in the documents. The analysis by author co-occurrences revealed that 22 authors are related, i.e. they share a network of co-authors and thus collaborate with each other (Figure 5).

According to the type of document published, as defined in the selection criteria, it was found that 15 documents were published as conference papers (51.72%), while the remaining 14 were published as research articles in scientific journals (48.28%). This indicates that the authors have given more importance to scientific conferences to publish the results of their research. Regarding the sub-areas of knowledge to which the retrieved papers belong (Figure 6), the most important were computer science (21.30%), business management (14.90%), engineering (12.80%) and social sciences (12.80%). These four fields accounted for 61.80% of the documents.

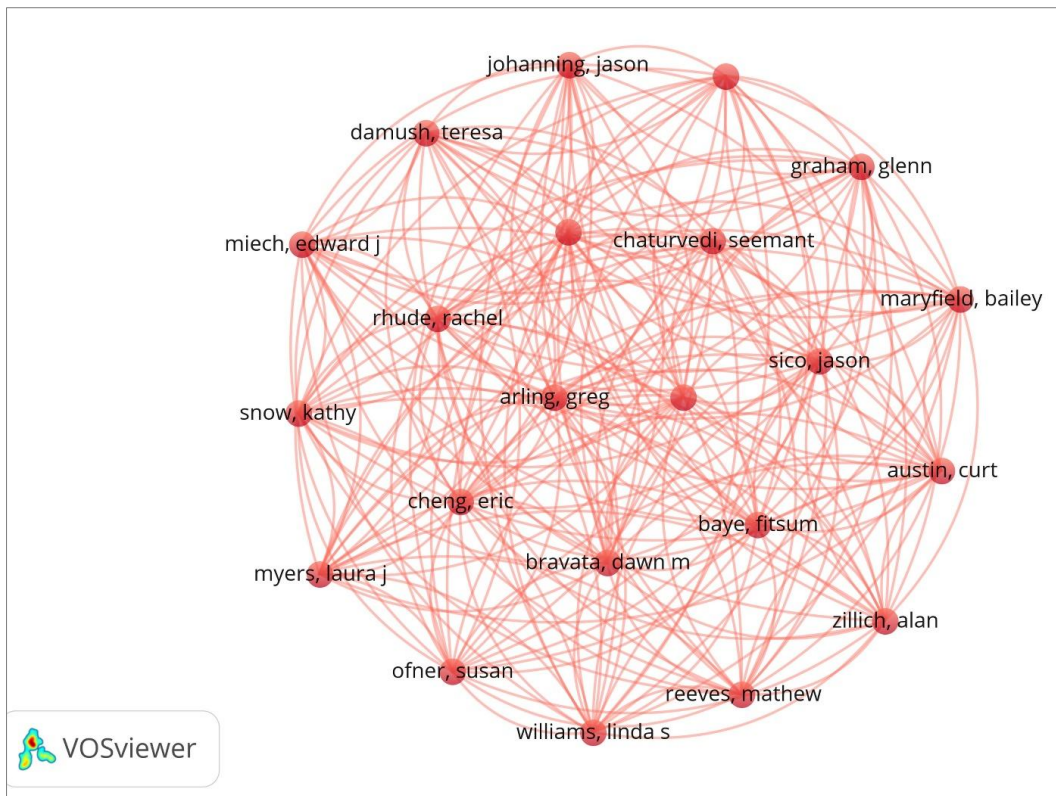


Figure 5. Map of co-occurrences of authors

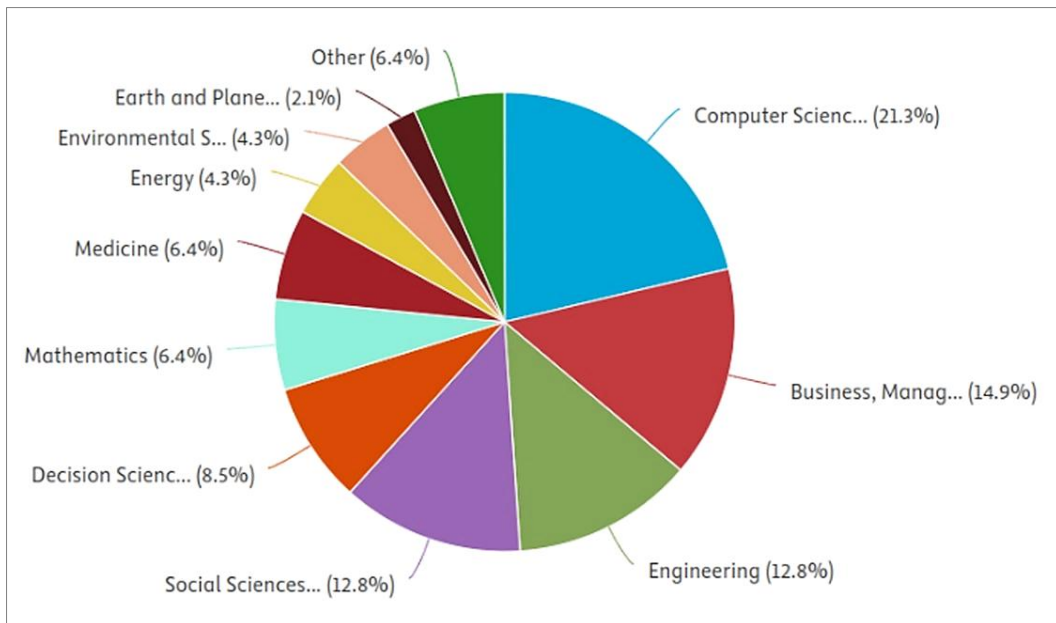


Figure 6. Distribution of documents by sub-area

Regarding the affiliation of the retrieved documents, it was found that there are 84 institutions, among which the Universidade de São Paulo, with three published documents, and the Universitat Politècnica de Catalunya, with two, stand out. The rest of the affiliations corresponded to a single institution (79), which indicates that, in the thematic area studied, there is no institutional affiliation that stands out, but that, on the contrary, the distribution of published documents is quite homogeneous.

An important indicator for evaluating the impact of the retrieved documents is the number of citations they have received. A total of 400 citations were found, distributed by year as shown in Table 1. In terms of citations per document, the most cited year was 2010, as one document was published and cited 87 times. In second place was 2018, with 20.40 citations per document, and in third place was 2017, with 16.75 citations per document.

Table 1. Distribution of citations by document by year

Year	Documents	Cited	Cited/Documents
2010	1	87	87,00
2011	3	8	2,67
2013	3	44	14,67
2014	2	29	14,50
2016	1	11	11,00
2017	4	67	16,75
2018	5	102	20,40
2019	1	4	4,00
2020	1	0	0,00
2021	3	23	7,67
2022	3	13	4,33
2023	2	12	6,00

The citations by document showed that 309 citations were to articles published in scientific journals, for an average of 22.07 citations per document, and 91 citations were to conference articles, for an average of 6.07 citations per document. This shows that although a greater number of conference papers were obtained, papers published in scientific journals have a greater impact.

According to the source from which the documents were retrieved, 28 sources were obtained. Only the journal Lecture Notes in Computer Science stands out with two published papers, and 27 journals and conferences published one paper. On the other hand, as shown in Table 2, Public Administration Review had the highest number of citations per paper (87.00 cited/documents), followed by the journals Journal of Cleaner Production (81 cited/documents), Circulation: Cardiovascular Quality and Outcomes (33 cited/documents) and Resources, Conservation and Recycling (27 cited/documents).

Table 2. Distribution of citations by document by source

Source	Cited/documents
14th International Conference on Electronics, Computers and Artificial Intelligence, ECAI 2022	0
Advanced Materials Research	13
Advances in Intelligent Systems and Computing	1
CEUR Workshop Proceedings	0
Circulation: Cardiovascular Quality and Outcomes	33
Clinical Orthopaedics and Related Research	19
Communications in Computer and Information Science	8
Construction Research Congress 2018: Sustainable Design and Construction and Education	2
ICEIS 2011 - Proceedings of the 13th International Conference on Enterprise Information Systems	0
Information (Japan)	0
Information and Computer Security	18
International Review of Administrative Sciences	11
Journal of Cleaner Production	81
Journal of Energy and Natural Resources Law	7
Journal of Islamic Accounting and Business Research	21
Journal of Neuroscience Nursing	2
Lecture Notes in Computer Science	10
Management and Production Engineering Review	4
Perspectives on Public Management and Governance	10
Procedia Computer Science	0
Proceedings - 2013 IEEE International Conference on Business Informatics	21
Proceedings of the 13th International Symposium on Open Collaboration	7
Public Administration Review	87
Public Management Review	3
Public Policy and Administration	5
Resources, Conservation and Recycling	27
Society of Petroleum Engineers - Offshore Europe Oil and Gas Conference and Exhibition 2011	0
Proceedings of the 27th Annual Conference of the International Association for Management of Technology	0

According to the co-occurrence of keywords, 121 words and phrases were obtained that define the lines of research of the documents retrieved on process-based management in public administration (Figure 7). The three most common phrases were: public administration, public sector and strategic management. Other key words highlighted were BPM (Business Process Management), energy justice, construction processes, data homogenization and computer systems.

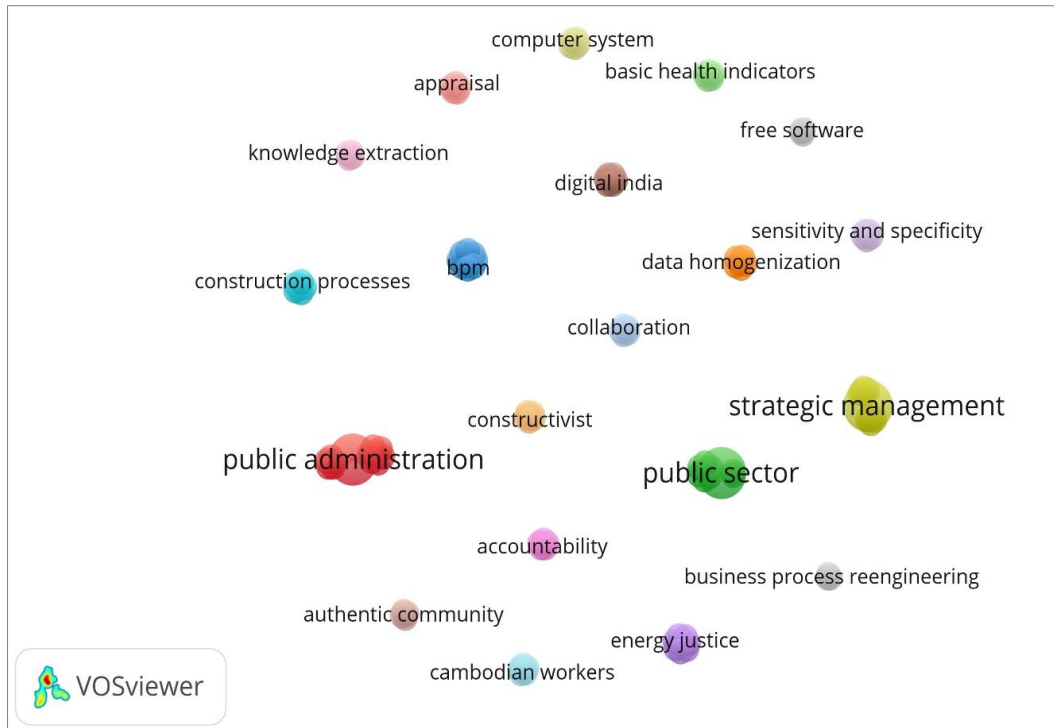


Figure 7. Keywords co-occurrence map

The analysis of the keyword co-occurrence network showed that public administration had the highest number of interactions with other keywords, appearing together with 12 of them (Figure 8). In the area of process-based management, the studies conducted on public administration were related to two groups of concepts: on the one hand, a group related to process management itself, with concepts such as decision support, artificial intelligence, group intelligence and computer modeling. The other group was represented by technological models such as information systems architecture, autodiscovery, technology architecture and continuous update.

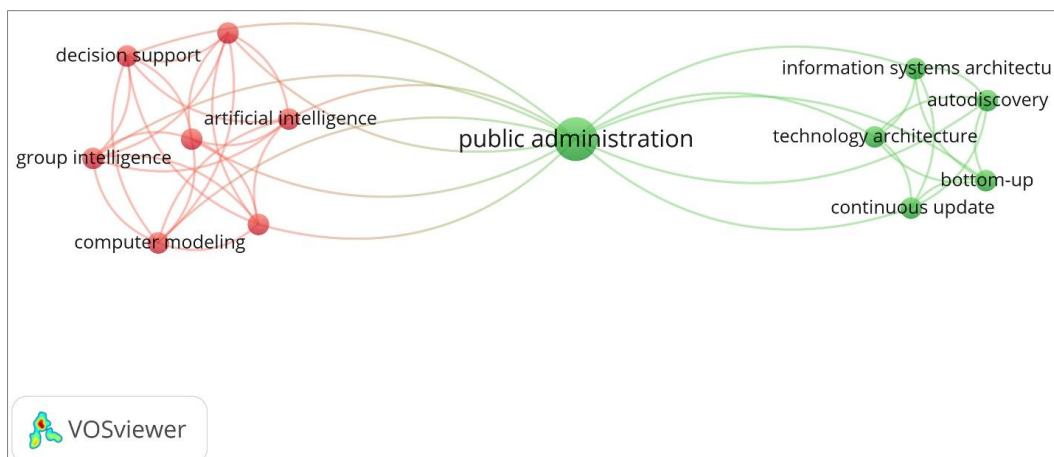


Figure 8. Keywords co-occurrence network map

4- Discussion

In recent years, there has been a growing interest in organizational and business management models that enable significant and continuous improvement and optimization of processes, including the process-based management model. These models have been applied to different industries and organizations with results that have demonstrated their effectiveness in improving, redesigning or replacing processes and making them more efficient [30]. Nevertheless, a

low production of scientific papers has been observed between 2010 and 2024 in public sector organizations where the process-based management model has been applied, which may be due to the peculiarities of this sector, since the implementation of process-based management activities is subject to a higher degree of complexity than in private sector organizations, due to the specific rules that apply to the public sector [31]. Organizational schemes in public sector organizations often involve systems and processes that can be time-consuming and are generally less efficient than those in the private sector. This may explain the paucity of relevant research in this area, as most public sector organizations have difficulty in applying the process-based management model, which has a negative impact on their consideration as a subject of study.

In the same context, Papadopoulos et al. [32] mention that despite the fact that public administration organizations have focused on following the example of private organizations in implementing the process management model to maximize the efficiency of their business activities in an environment of constant change, it has not been an easy task because in the public sector, administrations face service overlaps due to the limited ability to share knowledge related to business processes, which leads to bad practices that generate costs, delays and errors in the performance of activities. This observation is also consistent with the fact that more studies in this area have not been promoted and published within public sector organizations, since poor administrative practices can also have a negative impact on the development of research.

During the study period, it became evident that research on project-based management applied to the public sector had been directed to different organizations, such as the construction industry, which applied process-based management models in collaboration with public and private companies, and the results of which had increased efficiency in the construction of buildings of social interest [33]. This management model was also found to be a tool capable of influencing decision-making in construction projects and quantifying the impact of work throughout the construction process [34]. The public health sector has also been studied, with the generation of mental health indicators based on process management, where the usefulness of the model in the development of indicators was demonstrated [35]. In addition, there was a study in which the management model contributed to the improvement and sustainability of the clinical services department of a public hospital, making it more competitive [36].

Most of the papers retrieved were general studies aimed at improving the public sector and public administration in areas such as transforming information security [37, 38], identifying learning and knowledge needs [39, 40], and optimizing technological architectures [41]. Studies have also been found on management strategies and methodologies in the public sector and public administration [42-47], transportation systems management [48], the use of digital tools in process-based management [49-53], and environmental process management [54, 55]. This shows that process-based management models have been applied to different areas, with studies conducted in different organizations, all of which demonstrate the effectiveness of the management model. As observed by other authors, process-based management has become a model that has improved production processes in different industries and operations, such as in tourism organizations [56], in addition to the incorporation of technologies such as ChatGPT and the Internet of Things [57, 58], which is consistent with what was observed in the documents retrieved for this study.

The countries with the highest production in this area of study were led by the United States, which is consistent with the fact that this country is the largest producer of scientific papers in the world and that process management has become an important area of study in various industries over the years, with an emphasis after the pandemic of COVID-19, which caused structural and productive problems in various companies, such as construction [59, 60]. Similarly, the policies implemented in this country to continuously improve, promote environmental sustainability and reduce greenhouse gas emissions have driven the development of research on process-based management in areas such as agribusiness [61]. Consistent with the previous result, Gonçalves et al [62], in a bibliometric analysis of scientific production in process-based management applied to forestry studies, reported that the United States is the top producer in this area of knowledge. Another country that stood out in terms of production was Brazil, which is the Latin American country with the highest scientific production, so it is not surprising that it was ranked as the second largest producer of documents on process-based management in public administration. As pointed out by Klein et al [63], research is being carried out in Brazil to identify the factors that influence the application of process-based management, focusing on two values: the user and the standardization of processes, continuous improvement and the identification of activities that do not generate value and negatively affect the effectiveness of processes. In this country, process-based management in public institutions has been the subject of study due to its importance in public administration. Its implementation was formalized through a constitutional amendment approved in 1998.

It is important to highlight the contribution of European countries to the research on process-based management in public administration, especially Hungary, Portugal, Spain and the United Kingdom. In specific areas, such as agriculture, studies have been observed in which process-based management models have been successfully applied and have been effective in simulating the production of various agricultural crops [64]. Also in agriculture, process-based models have demonstrated their applicability in the simulation of birch and spruce sprouting in different European countries [65]. These studies confirm the importance given to this topic in Europe during the study period, which is

consistent with what has been observed. In Asia, South Korea stands out, which is consistent with research that has highlighted the importance of process-based management in studies related to agricultural activities [66] and shipbuilding [67]. In the case of Europe, policies aimed at reducing environmental impact and the emission of greenhouse gases have encouraged the use of more sustainable management methodologies in the utility. This has boosted research on process-based management, especially in the conservation of coastal areas and marine ecosystems [68]. For its part, in Asian countries, the need to mitigate the negative environmental impact of industrial activity and to improve the cost-benefit ratio of the implementation of this methodology has encouraged both its application and the development of research in this field [69].

Most of the retrieved documents were published as articles in scientific congresses, although with a small difference compared to the documents published as original articles in scientific journals. However, articles published in scientific journals received the most citations, indicating that for researchers who have published on process-based management in public administration and related fields, scientific articles are the most appropriate source of relevant and reliable information. The higher number of citations received by papers published in scientific journals is due to the fact that for the scientific community they are the main means of disseminating scientific and technical work and knowledge, which makes them one of the most important means of evaluating researchers, academics and institutions [70]. For this reason, the result of citations received by scientific articles published in journals is in line with what is expected in this case.

In the case of scientific congresses and conferences, their importance in the dissemination of science is evident, especially in fields such as engineering and health sciences, for which they are important not only for the publication of research results but also for the creation of research networks [71, 72]. However, it has been found that papers published as conference papers are less frequently cited than papers published in scientific journals, which may be due to the fact that they are considered gray literature, i.e. papers that disclose research information that is available in media other than journals published by commercial or open access publishers, but indexed in scientific databases [73]. Nevertheless, it is evident that research in process-based management has been widely disseminated in congress and conference papers in the form of articles, which has contributed to knowledge in the field.

Both the thematic area of the published papers and the co-occurrence of keywords showed that computer science accounted for a larger share of the papers, with a greater number of keywords corresponding to the use of technology in process-based management in public administration. Previous studies have also highlighted this result, as special importance has been given to innovation in business models in both public and private administration, leading to a diversification of business models, with process-based management as a prominent model [74]. A trend towards reforms in public administration with more efficient management models has also been highlighted, with process-based management playing a leading role [75]. Despite the above, research directed at public sector organizations is still scarce, so a more exhaustive review of published papers is needed to define the determinants of scientific production in this area.

Kuipers et al. [76] indicate that the main factors that condition the low propensity to change in public sector management are the lack of detail on processes and outcomes, as well as the gap between management theories. Therefore, public administration management should focus on its intrinsic complexity and build bridges between theoretical principles and practice through empirical and comparative studies that define how management models, such as those based on processes, can help improve the services offered by the public sector. Brancalion & Lima [16] emphasize that process management models can help the public sector to improve efficiency, reduce waste, add value to the organization, increase revenue and achieve significant savings, which would have a positive impact on the service user, i.e., improve quality.

5- Conclusions

The research conducted for the period 2010-2024 revealed that the trend in the study and application of process-based management in public administration has remained relatively stable over the years, despite the fact that published documents demonstrate the potential of this method of organizational management to improve and optimize processes. It was observed that the limitations in the research on the application of process-based management in public administration are due to the complexity of its operation and deficiencies in its operational flexibility.

It was observed that among the countries where research on process-based management has been conducted, the American continent stands out due to the significant contributions of the United States and Brazil, although Europe also made a significant contribution, with Hungary, Portugal, Spain, and the United Kingdom as its leading exponents. In the Asian region, there were contributions from South Korea, Hong Kong, India, Indonesia and Singapore, but with little individual participation. It was noted that, despite the importance of the issue, it has not been given due prominence in the public sector, regardless of regional scope.

It was observed that process-based management is applied in different business and organizational contexts, such as healthcare institutions, educational institutions, food production companies, agricultural companies, among others. The

thematic sub-areas with the highest participation in the research on process-based management were computer science, business management, engineering and social sciences, all areas related to business management, with computer science being the most prominent due to the use of technology and innovation in organizational management processes, where process-based management stands out as a relevant model.

Although the importance of process-based management for improving public sector organizations has been demonstrated, important issues remain to be addressed. Obstacles related to the organizational and operational complexity of public sector organizations are a common theme in the research reviewed, so any management model that is applied must address this particularity. In this sense, process-based management is presented as an applicable model that can achieve significant results. Further research from a comparative bibliometric approach between public and private sector organizations is needed to have a broader view of the applicability of process-based management.

6- Declarations

6-1-Author Contributions

Conceptualization, G.R.A.A., H.H.R.V., S.R.P., V.A.J.C.C., and B.P.F.; methodology, G.R.A.A. and H.H.R.V.; software, D.E.B.P., W.K.F.C.C., and D.M.M.M.; validation, E.D.I.S. and J.R.Y.G.; formal analysis, G.R.A.A., S.R.P., and V.A.J.C.C.; investigation, B.P.F., D.E.B.P., W.K.F.C.C., and D.M.M.M.; resources, G.R.A.A., E.D.I.S., and J.R.Y.G.; data curation, G.R.A.A., S.R.P., and B.P.F.; writing—original draft preparation, G.R.A.A., H.H.R.V., S.R.P., V.A.J.C.C., and B.P.F.; writing—review and editing, D.E.B.P., W.K.F.C.C., D.M.M.M., E.D.I.S., and J.R.Y.G.; visualization, D.E.B.P. and W.K.F.C.C.; supervision, D.M.M.M., E.D.I.S., and J.R.Y.G.; project administration, G.R.A.A.; funding acquisition, S.R.P. All authors have read and agreed to the published version of the manuscript.

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6-5-Informed Consent Statement

Not applicable.

6-6-Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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