

Statistical Analysis for Process Optimization in Business Administration: A Practical Approach

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Abstract

By means of this document, it was possible to analyze the main characteristics of the volume of scientific production related to the study of the variables Process Optimization and Business Administration. A bibliometric analysis was proposed to analyze details such as Year of Publication, Country of Origin of the publication, Area of Knowledge in which the published research is carried out and the Type of Publication most frequently used by the authors of each document published in high-impact journals indexed in the Scopus database during the period between 2017 and 2022. Among the main findings, it was possible to determine that, for the execution of the different research methodologies, the report of 55 scientific documents related to the study of Process Optimization and Business Administration was achieved. The maximum number of publications made in a year was 17 papers submitted in 2022. The country of origin of the institutions that reported the highest number of records in Scopus was India with 8 documents. The area of knowledge with the greatest influence at the time of executing the research projects that resulted in scientific publications was Computer Science, which contributed great theoretical material in a total of 24 publications. Finally, the type of publication most frequently used to publicize findings from the analysis of the aforementioned variables was the Journal Article, which represented 40% of the total scientific production.

Keywords: *Process optimization, business administration.*

1. Introduction

In optimizing business environments which are constantly changing and highly competitive by the law of supply and demand in the markets, these organizations are increasingly looking to improve their efficiency and their operational plant. One of the key tools that companies have at their disposal is statistical analysis, this analysis allows business environments to execute, collect, analyze and interpret a series of data effectively in order to make decisions optimally and promote the optimization of internal processes in the field of administration.

Professionals in business administration consist of several ranges of activities, among the functions of a manager are financial management, human resources, supply chain management, marketing, and customer relations. Each of the areas mentioned requires an

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innumerable managed process and the constant flow of labor, which must be qualified to carry out jobs, whether complex or challenging for good management. However, by taking advantage of the efficiency of statistical analysis, business organizations can obtain essential information about the different internal processes of companies, identify possible improvements, inefficiencies and ultimately be able to optimize their operations to improve their productivity, improve production costs and obtain greater profitability.

This perspective of business management is not based solely and exclusively on thinking and intuition. On the other hand, professions in this financial area are based on the systematic collection of data from different sources in the organization, such as sales records, worker performance, efficiency results in customer service, among other functions. The techniques of statistical analysis, which originates in descriptive statistics and culminates with advanced predictive models, these functions of statistical analysis, allow companies to extract patterns, trends and relate in an automatic and systematized way of numerous information data, with this knowledge management and decision-makers can make decisions based on data that have a significant impact on the results of the investigation. Business Administration.

The integration of statistical analysis into business administration is numerous, which can play a critical role in reducing production costs, identifying areas with inefficiencies within the production plant, improving customer satisfaction levels, and addressing pain points in customer experiences. This can optimize the allocation of resources allocated to the executive floor and efficiently distribute capital where it is needed most. In addition, this statistical integration allows the business sector to make informed strategic decisions in order to improve its product development, expand new markets and manage business risks. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables Process Optimization and Business Administration, as well. Such as the description of the position of certain authors affiliated with institutions, during the period between 2017 and 2022.

2. Overall Objective

To analyze, from a bibliometric approach, the characteristics in the volume of scientific production related to Process Optimization and Business Administration, registered in Scopus during the period 2017-2022.

3. Methodology

This article is carried out through a research with a mixed orientation that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of Process Optimization and Business Administration.

On the other hand, examples of some research works published in the area of study mentioned above are analyzed from a qualitative perspective, based on a bibliographic approach that allows describing the position of different authors on the proposed topic.

It is important to note that the entire search was carried out through Scopus, managing to establish the parameters referenced in Figure 1.

3.1 Methodological design

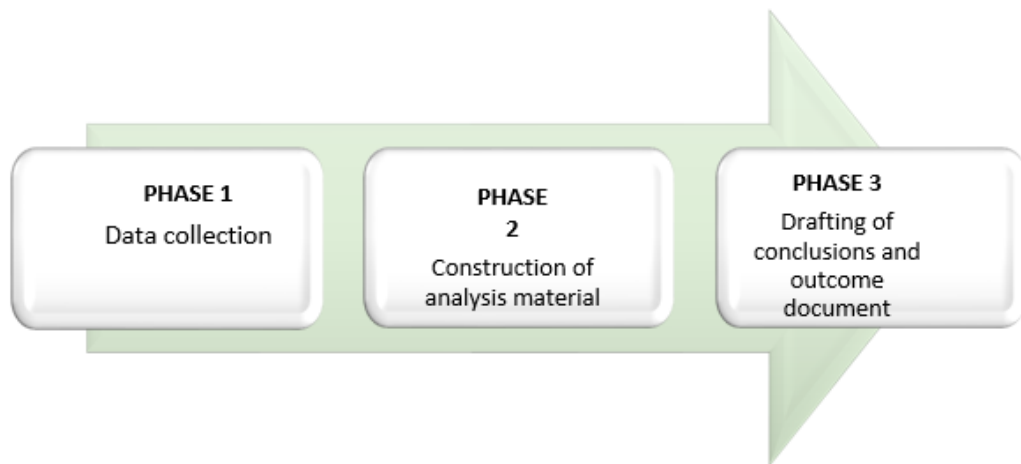


Figure 1. Methodological design

Source: Authors' own creation

3.1.1 Phase 1: Data Collection

Data collection was carried out from the Search tool on the Scopus website, where 55 publications were obtained from the following filters:

TITLE-ABS-

KEY (process AND optimization, AND business AND administration) AND PUBYEAR > 2016 AND PUBYEAR < 2023

Published documents whose study variables are related to the study of the variables Process Optimization and Business Administration.

Works published in journals indexed in Scopus during the period 2017-2022.

Without distinction by country of origin

No distinction in areas of knowledge.

No distinction of type of publication.

3.1.2 Phase 2: Construction of analysis material

The information collected in Scopus during the previous phase is organized and then classified by graphs, figures and tables as follows:

Co-occurrence of Words.

Year of publication.

Country of origin of the publication.

Area of knowledge.

Type of Publication.

3.1.3 Phase 3: Drafting of conclusions and outcome document

In this phase, the results of the previous results are analysed, resulting in the determination of conclusions and, consequently, the obtaining of the final document.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.

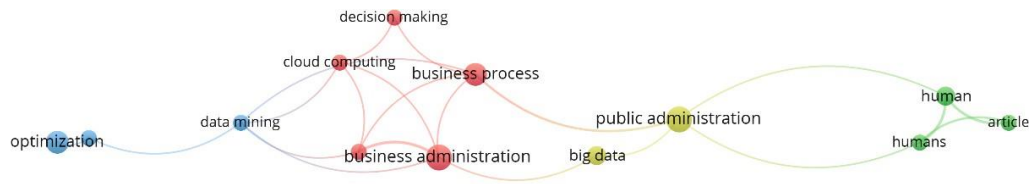


Figure 2. Co-occurrence of words

Source: Authors' own elaboration (2023); based on data exported from Scopus.

Business Administration was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Public Administration is among the most frequently used variables, associated with variables such as Decision Making, Business Process, Big Data, Optimization, Cloud Computing. In this age of big data and advanced analytics tools, statistical analysis is more accessible and powerful than ever. Through this introduction to statistical analysis for business management process optimization, we will explore the fundamental concepts, tools, and techniques that can empower organizations to make data-driven decisions, foster continuous improvement, and thrive in an increasingly competitive marketplace. Whether you're a business leader, analyst, or aspiring data scientist, the insights gained from statistical analysis can be a driving force behind your organization's success.

4.2 Distribution of scientific production by year of publication

Figure 3 shows how scientific production is distributed according to the year of publication.

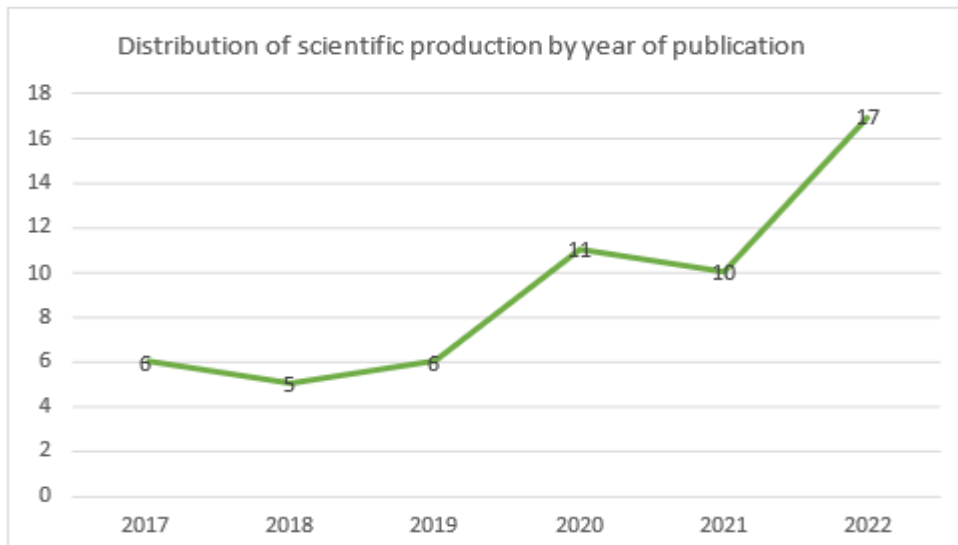


Figure 3. Distribution of scientific production by year of publication.

Source: Authors' own elaboration (2023); based on data exported from Scopus

Among the main characteristics evidenced through the distribution of scientific production by year of publication, the number of publications registered in Scopus was in 2022, reaching a total of 17 documents published in journals indexed on this platform.

This can be explained by articles such as the one titled "Promoting the Circular Economy in Public Sector Organizations: Employee Perspectives on Practices" (Klein, 2022). The main objective of this study is to identify what public employees perceive as appropriate CE practices for their organizations and their critical role in their implementation. Since the adoption of CE practices is influenced by social and material configurations, this research has adopted a case study approach, focusing on the Portuguese Central Public Administration. Semi-structured interviews were conducted with public employees working on CE and sustainability issues, and a complementary analysis of government reports and legislative documents was conducted. The results show that public employees see the existence and potential of EC practices mainly in the area of public procurement, but also in resource efficiency and optimization, dematerialization, and practices related to the R hierarchy, including reduction and reuse. Both technically-oriented practices aimed at achieving traditional resource efficiency and human-centred practices aimed at reducing consumption and sharing resources have been identified.

4.3 Distribution of scientific production by country of origin.

Figure 4 shows how the scientific production is distributed according to the nationality of the authors.



Figure 4. Distribution of scientific production by country of origin.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, registrations from institutions were taken into account, establishing India as the country of this community, with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 8 publications in total. In second place, Russia with 7 scientific papers, and China taking third place presenting to the scientific community, with a total of 6 papers among which is the article titled "Research on the investment strategy of the maritime transport supply chain based on blockchain technology" (Huida, 2022) this article explores the decentralization and investment of blockchain technology in three aspects. First, by constructing the game players, the target function and the sets of investment strategies and describing the rules of calculation, the solutions of the corresponding decision variables are finally obtained. Secondly, the article analyzes the price, quantity, and economic effect of the shipping market using the optimal solutions of different scenarios. Among them, the economic effect includes the marginal and total benefit of shipping companies so that optimal strategies and equilibrium strategies are obtained. And thirdly, a more detailed analysis of the government subsidy, multiple parameters, investment efficiency and social effect is carried out to detect the optimal investment and

operation strategies under different conditions in order to provide a rational operation plan.

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of the elaboration of scientific publications based on the area of knowledge through which the different research methodologies are implemented.

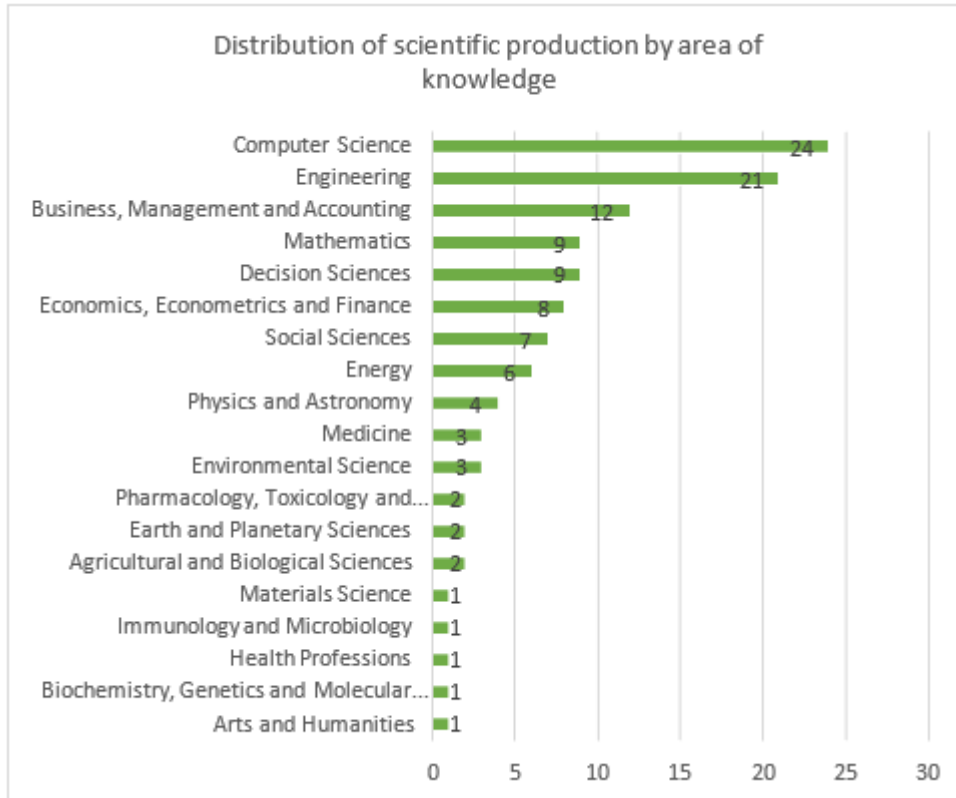


Figure 5. Distribution of scientific production by area of knowledge.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Computer Science was the area of knowledge with the highest number of publications registered in Scopus, with a total of 24 documents that have been based on its variable methodologies: Process Optimization and Business Administration. In second place, Engineering with 21 articles and Business, Management and Accounting in third place with 12. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by the area of Computer Science entitled "ECONOMIC-MATHEMATICAL MODEL OF MAXIMIZATION OF BUSINESS PROFIT IN THE VALUE SYSTEM OF THE

SUSTAINABLE DEVELOPMENT" (Skrynkovskyy, 2022) The purpose of the research is to improve the economic-mathematical model of the maximization of corporate profits in the sustainable development value system. Methodology/approach. The work uses the methods of system analysis, systematization, generalization and specification, the graphical method and the method of comparison (of processes, indicators, etc.), as well as economic and mathematical methods of systems modeling and expert methods. Results. The structural scheme (triple model continues as a conceptual scheme of information technology) of the management of financial and technological processes, innovation risks, which takes into account the impact of innovations on the activity (internal variables, business processes) of the company, constraints (on production, implementation, supply, finance) and conditions of their fulfillment with the optimal amount of production (realization) were improved. as well as a synergistic effect in the

context of the profit maximization, in the "innovation type - development type" system, in the value system of sustainable development

4.5 Publication Type

In the following graph, you will see the distribution of the bibliographic finding according to the type of publication made by each of the authors found in Scopus.

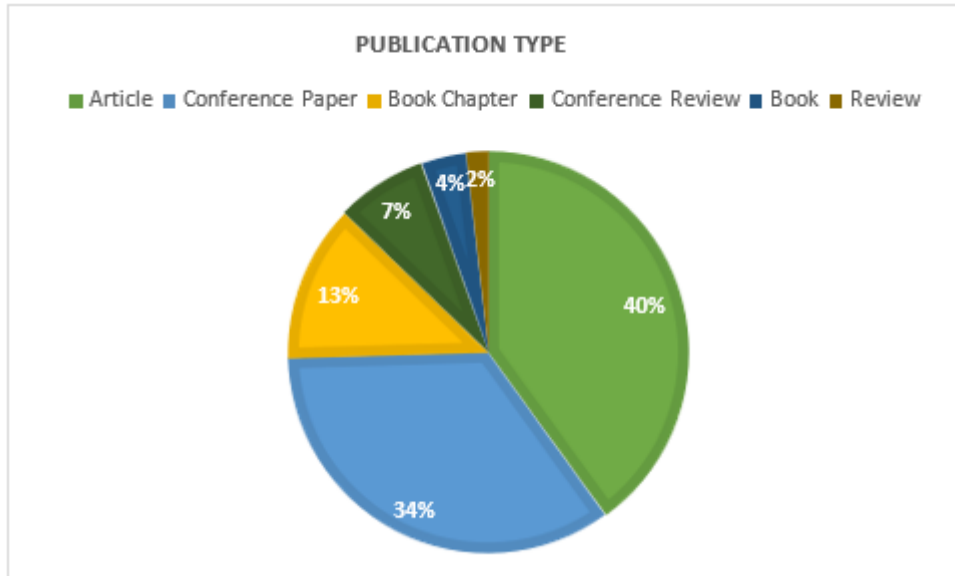


Figure 6. Type of publication.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was the one entitled Journal Articles with 40% of the total production identified for analysis, followed by Session Paper with 34%. Chapter of the book are part of this classification, representing 13% of the research papers published during the period 2017-2022, in journals indexed in Scopus. In this last category, the one entitled "Human resources and business management at Ingelectros Peru S. A. in Los Olivos-Peru" (Martin Albino, 2022) stands out. The purpose of this study is to determine the relationship between human resources and business management in the company Ingelectros Perú S.A. in Los Olivos-Peru. The methodology is quantitative, basic, non-experimental, cross-sectional and correlational. For the study, surveys were carried out with 100 workers of the company Ingelectros Perú S.A., validating the instruments through expert judgment. The results show a positive impact of human resources on business management, which is reflected in the remuneration of people. This research provides interesting theories for the construction of emerging human resources studies. It is concluded that, in the advancement of an organizational culture that favors organizational objectives, the company's human resources support the processes of productivity optimization.

5. Conclusions

Through the bibliometric analysis carried out in this research work, it was possible to establish that India was the country with the highest number of published records for the variables Process Optimization and Business Administration, Higher Education. with a total of 8 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Computer Science, were used more frequently in the implementation of statistical analysis for the optimization of resources in business administrative processes, the integration of this method has directly

provided knowledge and recommendations that provide significant improvements in efficiency and effectiveness in the operations sector. Through careful management of collecting, storing relevant data, we have been able to identify key areas for improvement and formulate data-driven strategies to achieve more optimal results. One of the relevant functions in statistical analysis in business management is to identify inefficiencies in internal and external management processes. These obstacles can be quantified and prioritized, allowing the organization to improve resources and improve the operational effort of the most critical problems. By doing so. Reduce delays, reduce errors, and improve the overall flow of the process. However, optimizing business management processes based on statistical analysis has the potential to play important roles in cost savings. By optimizing productive operations and reducing redundant tasks and optimizing resource allocation, we can reduce operating costs while maintaining or even improving the quality of services provided. It is important to emphasize that statistical analysis is a constant process where the knowledge imparted must be reviewed and periodically integrated into the decision-making processes of business organizations. The constant monitoring of these statistical functions makes it possible to implement commercial and operational strategies of great impact, which would be crucial to guarantee the efforts in business operations and with these improve the commercial conditions that are in constant change.

Finally, statistical analysis of business management processes offers a data-driven approach to improving efficiency, reducing costs, and improving overall performance. By leveraging these insights and implementing recommended strategies, the organization can position itself for sustainable growth and success in an increasingly competitive business environment.

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