

OPEN INNOVATION IN BUSINESS INNOVATION: EFFECT OF THE DESIGN METHODS

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Abstract

A systematic review was carried out on producing and publishing research papers on the study of Open Innovation, Business Innovation and Design Methods used under the PRISMA approach (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The purpose of the analysis proposed in this document was to know the main characteristics of the publications registered in the Scopus and WoS databases during the year and their scope in the study of the proposed variables, achieving the identification of 17 publications. Thanks to this first identification, it was possible to refine the results through the keywords entered in the search button of both platforms, which were Open Innovation, Business Innovation and Design Methods, reaching a total of 10 documents, already excluding duplicates and those that did not meet the analysis criteria. The identified scientific publications were analyzed expecting to know the main characteristics within the execution of research projects related to the study of Business Innovation through the implementation of Open Innovation strategies in the different aspects of the organization, as well as the Design Methods used in the same, in search of the optimization of the processes that lead to the maximization of profits and reduction of production costs that are manifested through waste, bottlenecks, among others.

Keywords: open innovation, business innovation, design methods.

1. INTRODUCTION

Nowadays, companies face a market with an increasing number of competitors, products and services with similar characteristics that can replace those offered at present, so it is a fundamental task in the organization to have factors that represent added value to their brands. However, it has been proven that such added value is given from the very conception of the product or service offered, from its production in the choice of raw materials to marketing campaigns that seek to position them in the mindset of consumers. To this end, strategies such as those designed through Open innovation have been proposed to provide internal and external information flows that feed the decision-making process to the board of directors, seeking to extract high levels of value through the generation of new knowledge based on the data collected both internally from the working staff, and externally with current and potential customers and competitors (Ramírez & García-Peñalvo, 2018). From the above, it can be defined that Open innovation constitutes any innovative process within the organization that allows the influence of perceptions of both the staff in charge of production and the data collected by different external sources to identify the needs of the target audience. This is a new force in Industrial Innovation since it has proven to be closed only to the strategies designed by the board of directors within each company. It does not mean that the needs of consumers have not been taken into account, but the product design was limited solely and exclusively to the staff's opinion. The above has been the subject of research for the

scientific community over the years, as it seeks to know the impact that Open innovation has generated on market behavior. For this reason, it is expected that through this systematic analysis of the literature documented in specialized databases such as Scopus and WoS, it is possible to identify the main contributions that Open Innovation has had in recent years in the construction of design models in different organizations.

2. GENERAL OBJECTIVE

To analyze from a bibliometric and bibliographic perspective, the production of research papers on the variables Open Innovation, Business Innovation and Design Methods published in high-impact journals indexed in Scopus and WoS database from 2017 to 2022.

3. Methodology

The present research is of a qualitative typewhich, according to Hernández et al.(2015), corresponds to studies that obtain information to review and interpret the results obtained in such studies. For this purpose, searching for information was performed in the Scopus and WoS databases employing the words *open innovation*, *business innovation* and *design methods*.

3.1 Research design

The research design proposed for the present research was the Systematic Review which involves a set of guidelines to carry out the analysis of the data collected, framed in a process that began with the coding to the visualization of theories (Strauss & Corbin, 2016). On the other hand, it is stated that the text corresponds to a descriptive narrative in that it is intended to find out how the levels of the variable affect; and systematic because after reviewing the academic material obtained from scientific journals, the theories on knowledge management were analyzed and interpreted (Hernández et al., 2015).

The results of this search are shown in Figure 1, where PRISMA technique is used for the identification of documentary analysis material. It was published during the period between the years 2017 and 2022, limited to publications coming from Latin American institutions, without distinction of an area of knowledge, as well as any publication, namely: Journal Articles, Reviews, and Book Chapters, Book, among others.

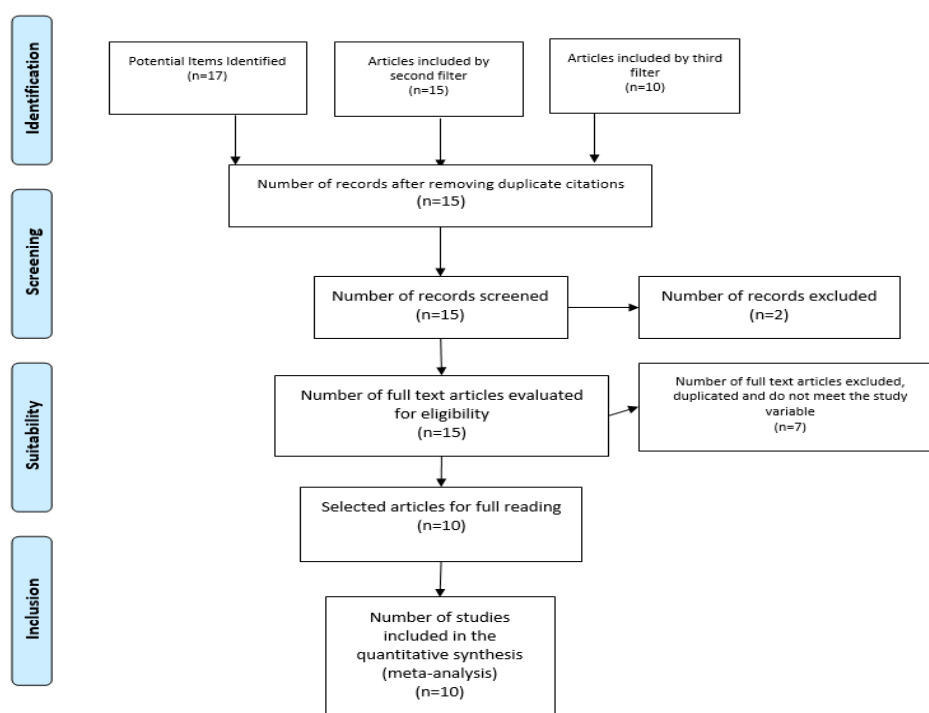


Figure 1. Flowchart of the systematic review conducted under the PRISMA technique.
Source: Own elaboration; Based on the proposal of the Prisma Group (Moher et al., 2009).

4. RESULTS

Table 1 shows the results after applying the search filters related to the methodology proposed for this research after recognizing the relevance of each referenced work.

No.	TITLE OF THE RESEARCH	AUTHOR/YEAR	COUNTRY	TYPE OF STUDY	INDICATION
1	<i>Growing from the South in the seed market: Grupo Don Mario</i>	Marin, A., Stubrin, L. I., & Palacin Roitbarg, R. (2022).	ARGENTINA, UNITED KINGDOM	QUALITATIVE	SCOPUS
2	<i>Digital accreditations in MOOC-based training on sustainability: Factors that influence terminal efficiency.</i>	Ramirez-Montoya, M.-S., Martínez-Pérez, S., Rodríguez-Abitia, G., Lopez-Caudana, E. (2022).	MEXICO, SPAIN, UNITED STATES	QUALITATIVE	SCOPUS
3	<i>Implications of blockchain and transparency for business sustainability: An integrative review.</i>	Giesel, H.D., Nobre, F.S.M. (2021)	BRAZIL	QUALITATIVE	SCOPUS
4	<i>Leveraging Digital Knowledge Ecosystem Framework Implementation Case Study: Aligning Knowledge Management and Innovation Goals for Agricultural Aerial Pest Control</i>	Chaves Gattaz, C., Cruvinel, P.E., Bernardes, R.C. (2016).	BRAZIL	QUALITATIVE	SCOPUS
5	<i>Cooperation in coffee markets: The case of Vietnam and Colombia</i>	Gonzalez-Perez, M.-A., Gutierrez-Viana, S. (2012).	COLOMBIA	QUANTITATIVE	SCOPUS
6	<i>Exogenous Shocks and Business Process Management A Scholars' Perspective on Challenges and Opportunities.</i>	Röglinger, M., Plattfaut, R., Borghoff, V., Kerpedzhiev, G., Becker, J., Beverungen, D., ... & Trkman, P. (2022).	BRAZIL, SLOVENIA, GERMANY, AUSTRIA, SPAIN, GERMANY	QUALITATIVE	WOS

7	<i>Scheduling for a Container Supply Chain to Minimize Costs Using the Meta-Innovation Approach</i>	Husein, I., Suhada, A., Chetthamrongchai, P., Peressypki, A. P., Nurrohkayati, A. S., Hoang Ca, V., ... & M Kavitha, M. (2021).	COLOMBIA	QUALITATIVE	WOS
8	<i>On-Farm Experimentation to transform global agriculture</i>	Lacoste, M., Cook, S., McNee, M., Gale, D., Ingram, J., Bellon-Maurel, V., ... & Hall, A. (2022).	ARGENTINA	QUANTITATIVE/QUALITATIVE	WOS
9	<i>Capping methods for the automatic configuration of optimization algorithms</i>	De Souza, M., Ritt, M., & López-Ibáñez, M. (2022).	BRAZIL	QUALITATIVE	WOS
10	<i>A Progression Model of Software Engineering Goals, Challenges, and Practices in Start-Ups</i>	Klotins, E., Unterkalmsteiner, M., Chatzipetrou, P., Gorschek, T., Prikladnicki, R., Tripathi, N., & Pompermaier, L. B. (2019).	BRAZIL	QUALITATIVE	WOS

Table 1. Flowchart of the systematic review conducted under the PRISMA technique.
Source: Own elaboration; Based on the proposal of the Prisma Group (Moher et al., 2009).

4.1 Co-occurrence of words

Figure 2 shows the relationship between the keywords used to search the study material for the elaboration of the systematic analysis proposed for the present research.

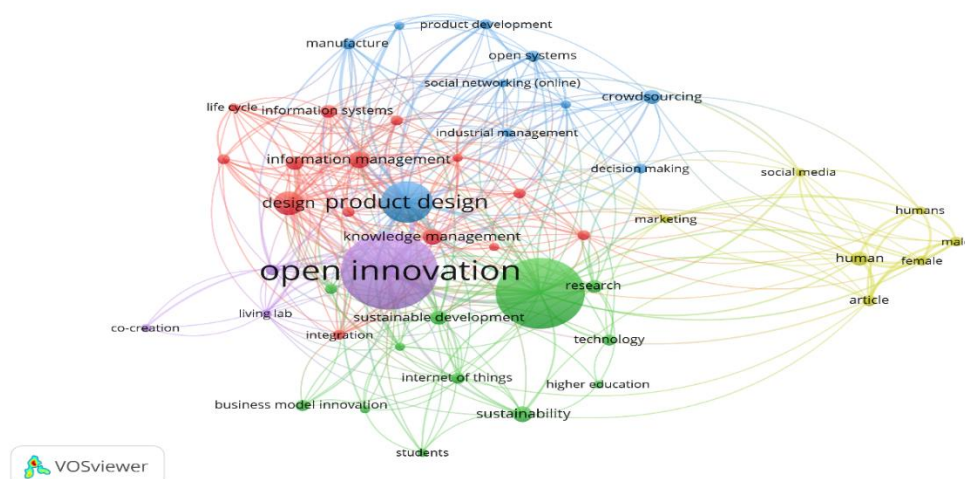


Figure 2. Co-occurrence of keywords.

Source: Own elaboration

The Open Innovation variable was the most used within the research registered in the Scopus database, directly associated with studies focused on Design, Product Design, Co-creation,



Sustainable Development, and Business Model Innovation, among others, which allow confirming the relevance of the publications registered in Table 1. This highlights the interest of the scientific community in the search for innovative strategies that are in line with the Sustainable Development Goals (SDGs) by proposing innovative design models to reduce the environmental impact, which is due to a not-so-recent trend that seeks to increase the added value of companies, trying to reduce damage to the environment, aligned with strategies ranging from the social to the economic and environmental. On the other hand, the variables Open Innovation, Product Development, *Open Systems*, *Collective Collaboration*, and *Decision Making* are part of the construction of the bibliographic material analyzed in this document through the execution of different research methodologies for developing new knowledge about industrial management and innovation in the different processes involved in the production of consumer goods and services.

4.2 Discussion

The purpose of this article was to analyze, from a systematic perspective, the contribution of the authors to the study of Open Innovation, Industrial Innovation and Design Methodsthrough their publications in high-impact journals indexed in Scopus and WoS databases. In this way, it is possible to affirm that the publications indicated in the body of this document have carried out research at different levels whose findings contribute to the generation of new knowledge referring to the variables proposed for the present study.

This is how significant contributions are identified, as contemplated in the article entitled “Cooperation in the coffee markets: The case of Vietnam and Colombia”(Gonzalez-Perez & Gutierrez-Viana, 2012), whose objective was to present a comparative study between the countries Colombia and Vietnam, as two of the leading coffee exporting nations in the world, in terms of their infrastructures, the role of external shocks, the adoption of technology at different stages of production, added value, positioning in national and global markets, internationalization patterns, marketing and branding innovations, regulatory frameworks and policy environments.

Through the execution of this research, the authors were able to determine opportunities for cooperation and competition between these two countries so that the implementation of Open Innovation strategies can be achieved, thus allowing the co-creation of different products with a greater reach in the market not only in Latin America and Asia but globally, thus representing a possibility of growth in this sector of the economy.

In addition to the above, contributions in the implementation of strategies that address Open innovation are highlighted, as perceived in the article entitled “Programming a container supply chain to minimize costs using the meta-innovation approach” (Husein et al., 2021), whose objective was to analyze a shipping line scheduling problem for a container supply chain to minimize vessel loading costs and the cost of holding empty container inventory at the port by considering the port time window and the amount of fuel. This analysis allowed to generate flexible and open strategies within the organization for the investigation of cases supported by the generation of new knowledge that would optimize their processes and thus ensure the added value in their service, so it confirms the effectiveness of solving and optimizing the model through the use of a meta-innovative algorithm, the genetic algorithm. On the other hand, the article “Capping methods for the automatic configuration of optimization algorithms”(De Souza et al., 2022), whose objective was to propose new capping methods for the automatic configuration of optimization algorithms, taking advantage of the benefits of Open Innovation within Industrial Innovation since costs are reduced through feedback in the processes, as shown by one of its main results that states that the proposed methods can save between 5% and 78% of the configuration effort while finding configurations of the same quality.

5. CONCLUSIONS


This review article highlights the importance of knowing the updated state of the literature published in databases such as Scopus or WoS concerning the study of Open innovation and its impact on Industrial Innovation. In this field, the publications are the contribution of researchers to implementing innovative methods for producing goods and services based on Open Innovation

principles, providing information from both internal and external sources to design new and better strategies for a more efficient production and cost reduction for the organization, thus adding value to each product or service offered to the market. Furthermore, the above allows concluding that the scientific community has shown particular interest in the production and distribution lines where specific problems have been identified where the organization is exposed to generate unexpected costs shortening the profit margin so that one of the most effective tools used within the Open innovation is the Feedback. This feature allows forevaluating weaknesses and strengths within the production line, thus allowing the design of strategies to enhance these strengths and eliminate weaknesses in response to the needs of both external and internal customers.

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