Revista Catarinense da CIÊNCIA CONTÁBIL

ISSN 2237-7662, Florianópolis, SC, v. 22, 1-22, e3373, 2023

DOI: 10.16930/2237-7662202333732

Disponível em http://revista.crcsc.org.br

# *EXPLOITATION* AND *EXPLORATION* INNOVATION: A BIBLIOMETRIC ANALYSIS OF THE SCIENTIFIC PRODUCTION OF THE SCOPUS DATABASE (1995-2022)

**RÚBIA FREHNER POFFO**[1]

*Universidade Regional de Blumenau*

*https://orcid.org/0000-0003-4081-2428*

*rubiafpoffo@gmail.com*

## ABSTRACT

Innovation enables organizations to invest in processes or products that increase their competitive advantage in the market. Thus, this research aims to conduct a bibliometric mapping of scientific production on *Innovation Exploitation* (incremental innovation) and *Innovation Exploration* (radical innovation), focusing on scientific articles published in journals in business, administration, accounting, and economics. However, a bibliometric analysis of the publications indexed in the Scopus database from 1995 to 2022 was performed and operationalized using RStudio's Biblioshiny software. The search was performed by the keywords "*Innovation Exploitation*", "*Innovation Exploration*", and "*Innovation Ambidexterity*", in the fields title, abstract, and keywords. After the filtration processes, the final sample comprised 746 scientific articles. The results of this research present an evolution of the theme over the years. In 1995, innovation was considered the creation or remodeling of products. In contrast, in 2020, innovation was defined as radical or incremental, in which the manager uses innovation as a strategy to increase sales and decreases production costs with the help of technology. Most publications (42.35%) occur after 2017, making clear the importance of the topic in recent years. Between 1995 and 2000, only 22 articles were published, and between 2017 and 2022, there were 408 studies. It was found that the author with the highest number of citations is American, and the country with the highest number of publications is the United States. However, the author with the highest number of publications is Italian, as well as the largest collaboration network, with Italy being the third country with the highest number of publications. Therefore, this study can be a starting point for future research or those interested in the topic.

**Keywords:** Bibliometrics. Innovation *Exploitation.* Innovation *Exploration.*

---

**Edited in Portuguese and English. Original version in Portuguese.**

[1] **Correspondence address:** Rua Antônio da Veiga, 140 | Itoupava Seca | 89030-903 | Blumenau/SC | Brazil.

**Received on** 02/12/2023. **Revised on** 03/29/2023. **Accepted on** 05/26/2023 by Prof. Dr. Rogério João Lunkes (Editor-in-Chief).
**Published on** 06/27/2023.

## 1 INTRODUCTION

The industrial revolution was one of the major milestones of world innovation, beginning in England in the 1970s (Davenport & Bibby, 1999). Steam engines made it possible to produce at scale, leading organizations worldwide to invest in innovation by implementing new manufacturing processes (Warglien, 1995). The production process innovation allowed companies to reduce production time, reaching maximum productive efficiency (Erzurumlu & Smith 2023).

This technological evolution has transformed the world market, increasing competitiveness among organizations (Li et al., 2023). Management accounting has a great responsibility in the search for innovative processes and products (González-Ramos et al., 2023). Innovation encourages companies to invest in control and planning due to the need to remain economically competitive in the market (Van Neerijnen et al., 2022; Duarte Ribeiro et al., 2023).

According to Shen et al. (2023), Raisch et al. (2009), and Warglien (1995), the economic uncertainty caused by the world economy caused organizations to invest in innovations, both in the production process and in how company managers view the market. Benner and Tushman (2003) state that innovation denotes a process of knowledge management that involves identifying and using ideas, tools, and opportunities to create products or improve existing products and services.

Atuahene-Gima (2005) also explains that the search for innovation expands managers' knowledge, generating greater efficiency in the production process. For organizations to survive or even thrive in the market where they operate, investments in the implementation of exploitation innovation and exploration innovation are necessary (Keller & Chen, 2017; Bresciani et al., 2018; Zheng et al., 2023).

Exploitation or incremental innovation requires efficiency and convergent thinking to continuously harness capabilities and creativity to improve product offerings (Bresciani et al., 2018; Zheng et al., 2023). In contrast, the exploration or radical innovation model involves search, variation, and experimentation efforts to generate new recombinations of knowledge (Keller & Chen, 2017; Bresciani et al., 2018; Hiebl & Pielsticker, 2023).

Both forms of innovation involve the combination of knowledge and skills (Sabidussi et al., 2021), employing existing knowledge concisely and varied and dispersed knowledge in several ways (Danneels, 2002; Bedford et al., 2018). In this scenario, organizations describe multiple tensions of innovation, such as conflicts between the internal and external environment of the organization, new-age, determined-emergent, and freedom-responsibility of companies (Kumar et al., 2021; Lissillour & Rodriguez-Escobar, 2023).

Also according to Shafique et al. (2022), these correctly managed conflicts lead companies to homogeneity, finding comfort as they develop mindsets and routines that support one form of innovation, scaling their efforts in their preferred mode to the detriment of the other (Bresciani et al., 2018; Duarte Ribeiro et al., 2023). Considering the importance that innovation represents for organizations, it is important to understand and discuss this theme, and it has been much researched in the last decade.

Therefore, this research aims to bibliographize the theme of *Innovation Exploitation* and *Innovation Exploration* in the *Scopus* database. This research is justified due to the need to better understand this topic in the national and international literary sphere. This research considered the published ones that emphasize the Brazilian and international reality, allowing a comparison between the periods.

Still as a justification, this information is useful to help researchers identify the main authors, countries, and journals most relevant to the studies related to *Innovation Exploitation* and *Innovation Exploration,* and thus obtain a better understanding of the subject, in order to verify what has already been studied in the area and the research gaps to be worked on in future studies. This research explains the concepts and contributes to greater stratification of how ambidextrous

organizations coordinate the development of strategies, innovation *exploitation* and *exploitation* in organizational units.

Thus, this study differs from the previous ones, as it covers the entire period of publications on *Innovation Exploitation* and *Innovation Exploration* of the Scopus platform, encompassing the period from 1995 to 2022 (27 years) and allowing a comparison between the oldest and most recent publications with the evolution of the theme in the scientific research environment. For the search, the words together were considered: "*Innovation Exploitation*", "*Innovation Exploration*", and *"Innovation Ambidexterity*", with only publications in business, administration, accounting, and economics journals. The next stage of this research addresses the theoretical framework.

## 2 THEORETICAL FRAMEWORK

To meet market needs, organizations must constantly seek innovation (Hiebl & Pielsticker, 2023). Tidd and Bessant (2015) indicate that innovation is the creation of something. For Arekrans et al. (2022), innovation is a necessary investment for the organization to acquire greater knowledge, being this technological, organizational, financial, and commercial, which include investments that lead the organization to improve an existing product line or create products (Lennon, 2022).

The organization constantly uses knowledge and technology to develop new products to improve its market performance (Tidd & Bessant, 2015; Lissillour & Rodriguez-Escobar, 2023). Negulescu (2020) states that innovation is the most appropriate way for an organization to have advantages over the market. Through innovation, organizations raise funds that amplify their gains (Erzurumlu & Smith 2023). For Jiménez-Jiménez and Sanz-Valle (2011), innovation is solely responsible for providing the company with greater gains, considering it explores new market opportunities.

The table below presents the innovation definitions over the years, considering the most influential authors in this line of research.

**Table 1**

*Change in the definition of Exploration and Exploitation innovation over the decades*

| | |
|---|---|
| Warglien (1995); Tushman and O'Reilly (1996); Jayanthi and Sinha (1998); Davenport and Bibby (1999) | The process of organizational innovation consists of creating products and processes or reshaping existing products and processes. |
| Danneels, 2002; Benner and Tushman (2003); Atuahene-Gima (2005); Jansen et al. (2006); Cao et al. (2009) | Innovation allows organizations to expand their gains in the market, and some managers opt for more radical behavior, such as developing new products for the market. In contrast, other managers opt for more incremental behavior, such as reshaping existing products. |
| Jiménez-Jiménez and Sanz-Valle (2011); Smith and Lewis (2011); Christensen et al. (2012); Lin et al. (2013); Tidd and Bessant (2015); Keller and Chen (2017); Solís-Molina et al. (2018); Bedford et al. (2018) | Organizational innovation is creating or improving existing processes to expand markets and improve the company's financial performance. The innovation process can be implemented in the organization in an *Exploration* (radical) or *Exploitation* (incremental) way, and the *Exploration* manager requires the organization to leave its comfort zone, exhibiting more aggressive innovative behavior in the market. In contrast, the *Exploitation* manager focuses on improvement and efficiency. |
| Negulescu (2020); Sabidussi et al., (2021); Lennon (2022); Van Neerijnen et al. (2022); Hiebl & Pielsticker (2023); Lee and Hemmert (2023); Shen et al. (2023); Erzurumlu and Smith (2023) | Innovation is a strategy the organization uses to lower production costs by increasing sales. Organizations exhibit *Exploration* (radical) or *Exploitation* (incremental) behavior, presenting more aggressive behavior when the company aims for market growth and more incremental when the company seeks to maintain constant sales. Organizations with both forms of innovation may present management conflicts due to the need for resources for the company's sectors. |

Source: Prepared by the author considering the cited literature (2023).

Innovation can be explored through two perspectives: incremental and radical. According to Tidd and Bessant (2015) and Bedford et al. (2018), incremental innovation (*exploitation*) focuses on changes that produce improvements in the performance of products, services, and processes that already exist in the organization, creating small impacts (Cao et al., 2009; Solís-Molina et al., 2018). While radical innovation (*exploration*) represents the organizational changes that generate a high impact of transformation, addressing a great technological revolution in the organization (Jiménez-Jiménez & Sanz-Valle, 2011; Lin et al., 2013; Bedford et al., 2018). Thus, a completely innovative value proposition is created compared to that available in the market (Christensen, 2012; Tidd & Bessant, 2015; Bedford et al., 2018).

According to Lennon (2022), Hiebl & Pielsticker (2023), and Lee and Hemmert (2023), ambidextrous innovation is also used as a strategy to reduce production costs because the technology provides the company with greater controls and more mechanized processes. Therefore, companies increase sales and profits by decreasing costs (Shen et al., 2023; Erzurumlu & Smith, 2023). Companies that adopt high levels of *exploitation* and *exploration* typically have difficulty understanding and managing the tension between the organization's past and future (Van Neerijnen et al., 2022; Erzurumlu & Smith, 2023).

Recent research indicates that exploitation and exploration innovation models can cause managers to compete for organizational resources in organizational processes. However, at the same time, they have the potential to be complementary (Van Neerijnen et al., 2022; Hiebl & Pielsticker, 2023; Lee and Hemmert, 2023; Shen et al., 2023). The organization's managers incorporate a tension between *exploitation* and *exploration* through incompatible cognitive frameworks that underlie these opposite activities (Sabidussi et al., 2021; Nie et al., 2022). *Exploration,* for example, is associated with experimentation, flexibility, and divergent thinking, while *exploitation* is associated with efficiency, refinement, and focus (Lin et al., 2013; Van Neerijnen et al., 2022).

These incompatibilities hinder managers' ability to overcome these differences and undertake a new shared understanding (Van Neerijnen et al., 2022; Shen et al., 2023). Thus, there is the perception that the *exploitation* and *exploration* frameworks are self-referential and restricted to the view of managers (Lin et al., 2013). However, they are also subject to learning, meaning they can be changed as new information becomes available (Keller & Chen, 2017; Duarte Ribeiro et al., 2023).

Although ambidextrous innovation is generally cited as a means of achieving above-average sustainable performance, the theory indicates that due to trade-offs between *exploitation* and *exploration* at an organizational level, sometimes ambidextrous may be out of reach, or ineffective, making *exploitation* or *exploration* specialization the most advisable course of action (Solís-Molina et al., 2018; Duarte Ribeiro et al., 2023).

In this way, the innovation process allows management to invest in tools and processes that enable the organization to make greater gains, and managers can present *Exploration* or radical innovation behavior, in which the manager has more aggressive behavior in the market, creating organizational processes aiming at future profit. Or, it presents more *Exploitation* (incremental) behavior, aiming to increase profits through the efficiency and improvement of existing products, and the company can present both forms of innovative behavior.

## 3 RESEARCH METHODOLOGY

This research has a methodological procedure called bibliometric, as it examines the articles published on *Innovation Exploitation and Innovation Exploration* in the *Scopus* database. According to Kumar et al. (2021), bibliometric research is developed to demonstrate the evolution of a certain theme in the literature. This research approach is quantitative because it offers the number of publications, authors, and most productive countries, journals, and most influential articles, among others.

This study has a descriptive characteristic because, according to Gil (2021), the descriptive study aims to describe the characteristics of a given population or phenomenon and establish relationships between variables. The search for articles to prepare this bibliometric research took place on January 24, 2023, through the search method developed in the research by Kumar et al. (2021). It consists of four stages, but for this investigation, a small adaptation was prepared to be included in the sample only research published in journals, the first being called data search, followed by academic filtering, source filtering, language filtering, and subject filtering.

In the first stage, which covers the data search, it was decided to use the *Scopus* database for its wide coverage of publications that meet a strict set of indexing requirements (for example, scientific and academic relevance) and for the comprehensiveness of bibliometric information for the publications it indexes.

*Scopus* is suitable for efforts that seek to select a large corpus for review (Paul et al., 2021), and it is a scientific database often recommended for bibliometric reviews (Donthu et al., 2021). *Scopus* has been recognized as a high-quality source for bibliometric data (Ballas et al., 2020) and correlations of its measurements with those available in alternative scientific databases, such as the *Web of Science*, which is extremely high (Archambault et al., 2009). Also according to Paul et al. (2021), *Scopus* is a more comprehensive and high-quality data source for this type of review.

The terms used for the initial selection of this research were "*Innovation Exploitation*" "*Innovation Exploration*", and "*Innovation Ambidexterity*" in the search field by Title, Abstract, and Keywords. The search period was from 1995, the year when the first article on "*Innovation Exploitation*", "*Innovation Exploration*", and "*Innovation Ambidexterity*" was published on the *Scopus* platform, to 2022. The search on the *Scopus* database resulted in 1,512 papers.

The second stage consists of academic filtering, and articles were considered only, not including other types of documents such as books or book chapters. This filtering excluded 483 papers, resulting in 1,029 articles. The third stage, constituted by filtering the source, establishes that only articles published in journals will be used because these are usually submitted to a more rigorous review than articles from other sources.

Therefore, articles from congress proceedings were not considered in the sample, or articles that have not been published in journals. By filtering the source, 47 articles were excluded, which resulted in 982 valid articles for this search. The fourth stage is filtering the language, considering only articles in English because it is impractical to work with translations with large data sets, as in the case of bibliometric reviews. By filtering the language, 56 studies were excluded, resulting in 926 articles.

The last stage consists of filtering the subject due to the research focus. Articles from business, administration, accounting, economics, econometrics, and finance were considered. Filtering by subject excluded 180 articles, resulting in a final sample of 746 scientific articles in English on "*Innovation Exploitation*", "*Innovation Exploration*", and "*Innovation Ambidexterity*", published in journals and referring to the areas of business, administration, accounting, economics, econometrics, and finance.

These filterings are necessary, considering a large number of business studies. The criteria here correspond to the recommendations of Donthu et al. (2021) and Paul et al. (2021). 766 articles were excluded due to academic, journal, language, and subject filtering. The remaining 746 articles follow for bibliometric review, which will be explained in the next section, as shown in Table 2.

**Table 2**
*Bibliometric review search and filtering strategy*

| **First stage - Database search** |
|---|
| Database: *Scopus*<br>Fields: title, abstract, and keyword<br>Keyword: "*Innovation Exploitation*", "*Innovation Exploration*", and "*Innovation Ambidexterity*"<br>Period: 1995 to 2022 |
| **Second stage - Academic filtering** |
| Document type: Articles |
| Research: 1,512<br>Articles: 1,029<br>Excluded: 483 |
| **Third stage - Source Filtering** |
| Source: Journals<br>Articles: 982<br>Excluded: 47 |
| **Fourth stage - Language Filtering** |
| Language: English<br>Articles: 926<br>Excluded: 56 |
| **Fifth stage - Subject Filtering** |
| Articles: Business, administration, accounting, economics, econometrics, and finance<br>Articles: 746<br>Excluded: 180 |

Source: Prepared by the author (2023)

For operationalization purposes, the bibliographic data of the 746 scientific articles resulting from the filtering process were exported in CSV format and later imported into the Biblioshiny software for scientific mapping. Biblioshiny (graphical interface of the Bibliometrix package of RStudio) was used because it is one of the most complete research tools related to bibliometrics, having an intuitive interface, in addition to wide scope of several functionalities, analyses, and graphics (Aria & Cuccurullo, 2017).

Thus, this review conducted a bibliometric analysis of the literature on "*Innovation Exploitation*", "*Innovation Exploration*", or "*Innovation Ambidexterity*". Using 746 articles retained from the Scopus database, a series of analyses based on bibliometrics were performed. Finally, the results are presented through figures taken from the Bibliometrix software.

## 4 BIBLIOMETRIC RESULTS

After presenting the methodological procedures for the collected data, the scientific bibliometric mapping on *Innovation Exploitation* and *Innovation Exploration* is presented: the number of publications, the authors in terms of productivity and collaboration network between authors, the countries in terms of productivity and collaboration network between countries, the most influential journals and articles, the keywords most used by researchers and, finally, the most relevant studies and possibilities for future research.

### 4.1 Database overview

Table 3 shows the general information obtained in the search, considering the 746 studies involving incremental and radical innovation, published between 1995 and 2022.

**Table 3**
*General information about the database*

| **Main information about the data** | |
|---|---|
| Period | 1995 - 2022 |
| Journals | 284 |
| Documents | 746 |
| Mean number of publications per year | 35.52 |
| Mean citations per article | 21.17 |
| Mean citations per year | 29.36 |
| **Document Types** | |
| Articles | 746 |
| **Content of Documents** | |
| Keywords | 721 |
| **Authors** | |
| Authors | 1616 |
| Authors of single authored documents | 64 |
| Authors of multiauthoral documents | 1552 |

Source: Data extracted from Biblioshiny.

Based on the data in Table 1, we perceive the dimensions and limits of the database involving the theme. This review has 284 journals, 39.8% of which are journals on public and business administration, accounting, and tourism sciences, and 60.2% are accounting, management, and innovation journals. The mean number of publications per year is 35.52%, but only 22 studies were developed in the first decade.

The mean number of citations per article is around 21.17, and the mean number of citations per year is 29.36. It can also be seen that most articles were developed together, considering that only 64 articles are single-authored, with 1,616 authors involved in elaborating the 746 studies.

## 4.2 Annual scientific production

Data analysis begins with Figure 2, which demonstrates the research between 1995 and 2022. As shown in the figure, the first research of the *Scopus* database is dated 1995, developed by Massimo Warglien, and published in *Industrial and Corporate Change* with 691 citations in Google Scholar and 289 in the *Scopus* database. The research is single-authored by Warglien (1995), who investigated the hierarchy of organizational processes and radical and incremental innovation in organizations, exploring how the interactions between dynamics used by the organization shape the evolution of companies.

According to the research, the interactions between an organization's systems generate adaptations in the development of organizational activities, which in turn facilitate the work developed by the team (Warglien, 1995). Warglien (1995) describes that researching the organization's hierarchy helps understand managers' behavior given the market uncertainty and the risks involved in implementing innovative processes. Thus, future research should capture the manager behavior considering market uncertainties, especially in countries with economic instability, or even seek to understand family businesses if they present more *exploitation* or *exploration* behavior before the market (Duarte Ribeiro et al., 2023).

From 1995 to 2005, only 22 studies were developed, comprising 2.94% of the total sample, with emphasis on 2009 (9 articles), and in 1996, 1997, and 2000 no research was published on the subject. A growing number of publications can be observed since 2007, and between 2006 and 2016, 316 articles were developed, representing 42.35% of the total sample. In these 10 years, 2014 stands out with 45 studies and 2016 with 49 published studies.

The most relevant research was developed by Jansen, Van Den Bosch, and Volberda in 2006 and published in *Management Science* entitled *Exploratory Innovation, Exploitative*

*Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators.* It has 4,181 citations in Google Scholar and 2,001 citations in the *Scopus* database. Jansen et al. (2006) sought to understand how environmental aspects, dynamism, and competitiveness, moderate the effectiveness of *exploitation* and *exploration* innovation. This theme could also be researched in family companies, as these companies tend to behave differently due to the family culture in the organization's management.

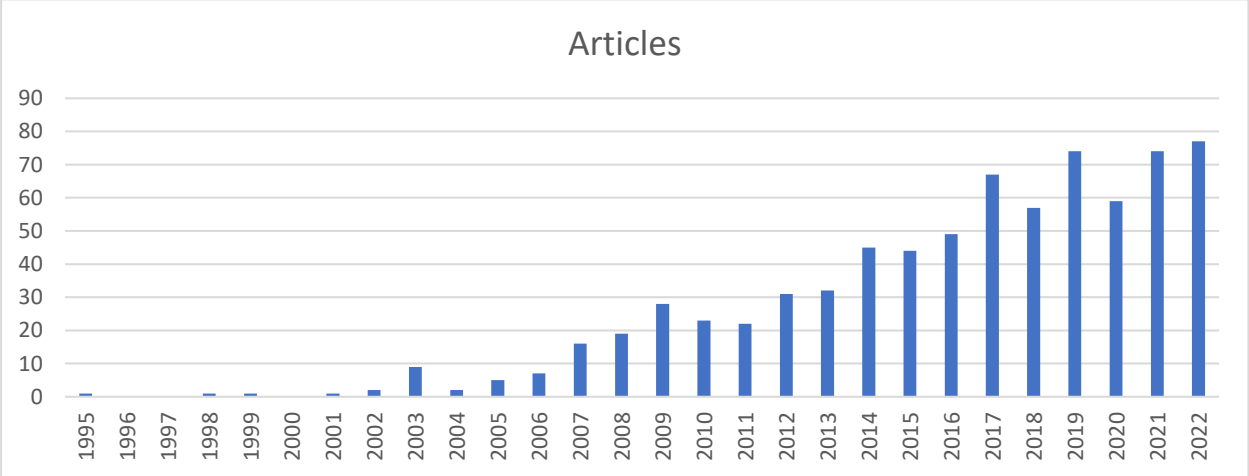
The research was developed in a large European financial services company through the case study. According to Jansen et al. (2006), case studies enable a deep understanding of the innovation theme. Thus, future research through a case study is necessary to understand if *laissez-faire* leadership models, which allow a more dynamic work environment, lead to greater *exploration* innovation by management or if the *survey* model is applied to understand the relationship between these variables.

The research developed between 2007 and 2016 has different lines, considering that until 2010 most research sought to understand innovation in the organizational environment if implementing new processes generates greater organizational profits. Another range of authors investigated the behavior of managers towards organizations with more radical and incremental innovation behavior.

The results also show that of the 22 studies developed between 1995 and 2005, 4 were case studies, 6 were literature reviews, and 11 were quantitative studies elaborated through a *survey* and developed in Europe and the USA. The 316 publications between 2006 and 2016 present case studies, experiments, and research with secondary data, but most were developed with a *survey.* Of these 316 articles, 23 were developed by Brazilians. The others are divided into Europe, North America, and Asia.

**Figure 2**

*Annual scientific production*




Source: Data extracted from Biblioshiny.

The period spanning 2017 to 2022 contains 408 publications. The 6 years represent 54.69% of the sample data, and 77 studies were published in 2022 alone, more than triple the number of publications in the first decade. This growth in publications indicates the importance of the topic for organizations. Bresciani, Ferraris, and Del Giudice developed the most relevant research in 2018, with 226 citations on *Scopus* and 341 citations on Google Scholar. The research is titled "*The management of organizational ambidexterity through alliances in a new context of analysis: internet of Things (IoT) smart city projects"* and was published in *Technological Forecasting and Social Change.*

Bresciani et al. (2018) investigated how the internet affects organizations' approach to innovation and how they create and capture value in daily business activities. The research developed after 2020 presents an approach focused on understanding the behavior of managers in using ambidextrous innovation in companies, expanding the literature with new insights on the subject.

In this period, research concludes that in *exploration* (radical) innovation, the manager presents aggressive, innovative behavior towards the market, requiring the organization to explore new markets. Still, the manager who chooses *exploitation* (incremental) innovation prioritizes greater efficiency of the production line and greater improvement of products. Organizations can implement both innovation models, which can generate conflict between managers who want the organization's resources.

## 4.3 Authors

### *4.3.1 Most productive authors*

Figure 3 shows the twelve most relevant authors with publications involving the theme *Innovation Exploitation*, *Innovation Exploration*, according to the research database. Martini stands out with 8 publications on organizational innovation. Antonella Martini is a professor at the University of Pisa in Italy and has her line of research focused on organizational management and innovation.

**Figure 3**
*Most Productive Authors*


Source: Data extracted from Biblioshiny.

Innovation processes come from synergistic combinations between *exploitation* and *exploration* activities, promoting a synergistic combination of operational effectiveness and strategic flexibility that allows companies to achieve a higher performance than their competitors. Antonella also points out that seeking to understand the behavior of managers is the best way to understand how the implementation of the innovation model happens in the organizational environment. In this case, future research should be based on the theory of self-determination to understand the manager's motivation for the risks involved in the radical innovation model. Lee

and Volberda are in the sequence, both with 6 publications on the subject, and Lee and Volberda also have research involving manager behavior.

The next Table presents the most cited authors, with Tushman with 4,159 citations, almost twice as many as Jansen, who has 2,876 citations, followed by Benner and Volberda with 2,818 and 2,778, respectively. Professor Michael L. Tushman is an organizational theorist, business management consultant, and business administration professor at Harvard *Business School*. His main research in management includes disruptive innovation, organizational environments, and organizational evolution. Tushman has developed a lot of research involving the organization's internal processes. However, his latest research is more focused on the behavior of managers. As a researcher, the professor has 105,643 citations on Google Scholar.

The second most cited author is Justin Jansen, professor of corporate entrepreneurship at the *Rotterdam School of Management*. With several publications in renowned journals, Ph.D. Justin investigates strategic leadership, organizational learning, absorption capacity, organizational ambidextrous innovation, and entrepreneurship. Professor Jansen has been named one of the top 100 professors in the field of entrepreneurship and is considered one of the most knowledgeable individuals in leadership. Professor Jansen is currently the associate editor of the *Journal of Management Studies* and works on the editorial boards of the *Academy of Management Journal, Academy of Management Review*, and *Strategic Management Journal.* The professor is still the scientific director of the Erasmus Centre for Entrepreneurship (ECE), with 17,936 citations on Google Scholar.

**Table 4**

*List of authors with the highest number of citations in the database*

| Most Cited Authors | Frequency |
|---|---|
| Tushman M. L. | 4,159 |
| Jansen J. P. | 2,876 |
| Benner M. J. | 2,818 |
| Volberda H. W. | 2,778 |
| Coelho A. | 2,493 |
| Bresciane S. | 2,172 |
| Messeni Petruzzelli A. | 2,172 |
| Duguid P. | 1,473 |
| Duysters G. | 1,487 |
| Andriopoulos C. | 1,439 |

Source: Data extracted from Biblioshiny.

Next, the third author with the highest number of citations is Maria Benner. Maria is a professor of business administration at the University of Minnesota, with business management based on social cognitive theory as her primary area of research. The researcher also has 11,399 citations on Google Scholar. According to Benner, the management of the organization is shaped by the behavior of the manager. So, future research needs to investigate the relationship between behavior, environment, and people.

### *4.3.2 Collaboration network between authors*

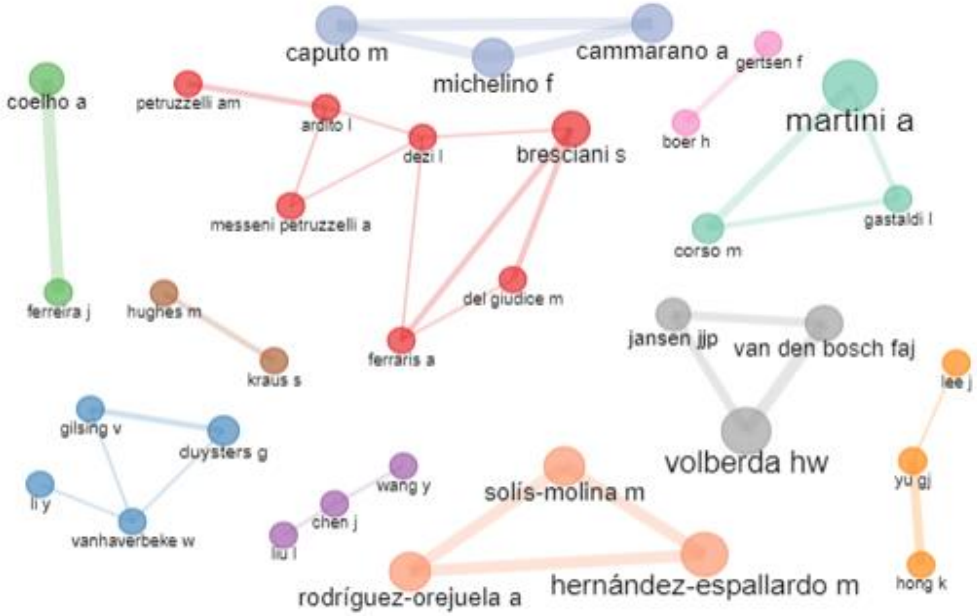
As for the collaboration network between authors, Figure 5 presents the main relationships between the researchers of *Innovation Exploitation*, *Innovation Exploration*, or *Innovation Ambidexterity.* According to the sample of research data, the 3 most important networks are first the Italian researchers Michelino, Caputo, and Cammarano with 6 articles. The most prominent research of the authors has 118 citations and is "*Inbound and Outbound Open Innovation: Organization and Performances",* published in the *Journal of Technology Management & Amp* in 2014.

Michelino et al. (2014) aimed to understand the degree of openness of companies and their characteristics of innovation, R&D organization, and financial performance. At this point, it is possible to notice research elaborated through secondary data, allowing literary advancement that goes beyond the understanding of the organization's management, also considering the company's financial performance. The model Michelino et al. (2014) developed requires information on total R&D costs, total revenues, and total intangibles to capture the innovation index in organizations.

Then, Colombians Solís-Molina, Hernández-Espallardo, and Rodriguez-Orejuela appear with 5 studies. The most prominent article, "Performance implications of organizational ambidexterity versus specialization in exploitation or exploration: The role of absorptive capacity," was published in the *Journal of Business Research* in 2018. With 97 citations, the research sought to understand through the SEM model how the absorption capacity models the effects of ambidextrous innovation and the specialization in *exploitation* or *exploration* in the company performance (Solís-Molina et al., 2018).

With a sample of 281 manufacturing companies, the results indicate that ambidextrous innovation has a greater effect on performance at high levels of absorption capacity. In contrast, *exploitation* or *exploration* specialization is more effective at low levels of absorption capacity (Solís-Molina et al., 2018). And finally, Martini, Corso, and Gastaldi have 3 jointly developed research. The most prominent was "*Continuous innovation: towards a paradoxical, ambidextrous combination of exploration and exploitation",* published in the *International Journal of Technology Management*, with 131 citations in the *Scopus* database.

**Figure 5**
*Collaboration network between authors*




Source: Data extracted from Biblioshiny.

The research by Martini et al. (2012) sought to understand the innovation processes through which the synergistic combinations between *exploration* and *exploitation* activities promote a synergistic combination of operational effectiveness and strategic flexibility, allowing companies to achieve superior performance. Thus, there is the perception that the research developed since 2014 seeks to understand the relationship between innovation and financial performance better, while research developed between 2000 and 2010 focused on the impact of innovation on the profitability of organizations.

Two large groups of researchers are perceived. One group with a behavioral aspect, and another focused on organizational performance, presenting great research quality. However, the authors who seek to understand the manager's behavior considering innovation decisions are the most cited, and the researchers who seek to understand financial performance are the ones who have more publications.

## 4.4 Countries

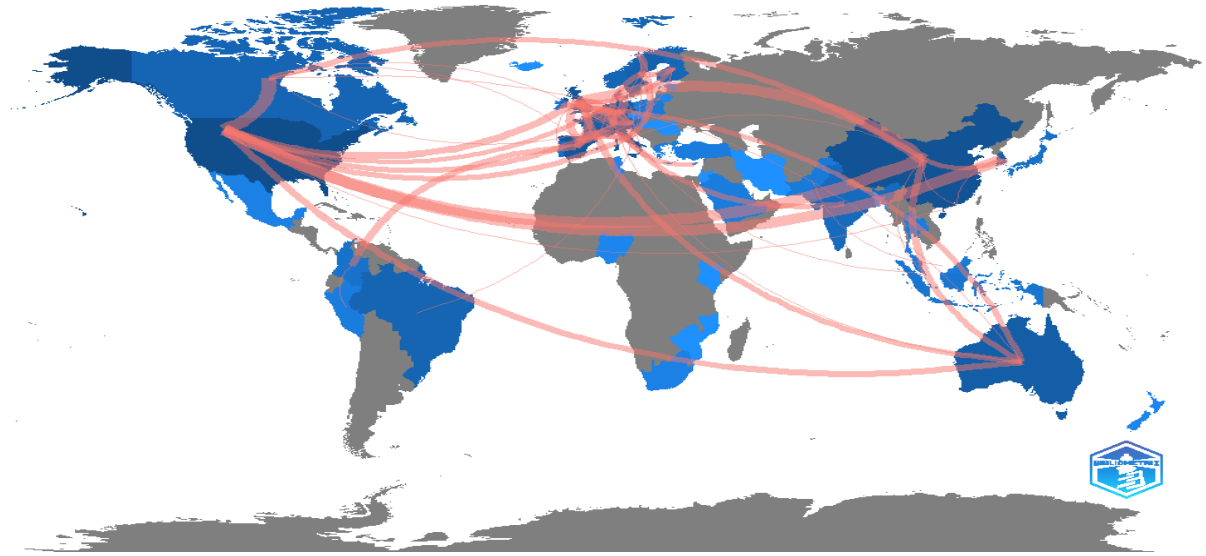
### *4.4.1 Cross-country collaboration network*

Figure 7 presents the world scientific production on the theme of *Innovation Exploitation* and *Innovation Exploration*; as the tone becomes darker, the index of publications on this topic increases. Nevertheless, one can see the theme is quite widespread and has significant relevance in the United States of America, Brazil, countries of Oceania, and some countries of Europe, with these being considered the countries that developed the largest number of research on radical and incremental innovation.

According to Figure 7, more studies can be observed in some countries. Considering the number of publications between countries, the United States of America has the highest number of publications, with 259 published, followed by China with 221, Italy with 193, Spain with 165, and the United Kingdom with 115 publications.

Thus, it can be seen that the countries with the most publications have the most developed economy, and the United States of America is among the 10 most developed countries in the world. They are also countries with high investments in education for developing new technologies, especially in the health area. The United States has developed a technology capable of restoring cellular functions to pig hearts within an hour of their death.

**Figure 7**
*Cross-country collaboration network*



Source: Data extracted from Biblioshiny.

The countries with the most publications together were the United States of America and China with 13 publications, the United States of America and Korea with 11 articles, and China, the United Kingdom, Italy, and Canada with 10 jointly developed research. Still, one can notice the absence of scientific research involving innovation in most countries in Africa, Russia, and South American countries. This may indicate a low interest in researchers from these regions.

### 4.5 Most influential scientific journals

The journals with the largest publications on *Innovation Exploitation*, *Innovation Exploration*, or *Innovation Ambidexterity* in business, administration, accounting, economics, econometrics, and finance are below. The most prominent journals are the *Journal of Business Research,* with 25 publications, followed by the *International Journal of Technology Management,* with 23 publications, and *Technological Forecasting and Social Change,* with 21 publications.

The *Journal of Business Research* publishes research with theoretical and practical applications developed from business research of real situations of organizations, with publications from various areas of business activity, and with a main focus focused on various decisions, processes, and business activities. The journal covers theoretical and empirical advances in accountant behavior, finance, organizational theory and behavior, marketing, risk, insurance, and international business, which are evaluated regularly.

The second journal with the highest number of publications is the *International Journal of Technology Management,* whose mission is to publish original and innovative literature in technology management and innovation, emphasizing relevant topics globally, and standing out in Latin America and the Caribbean. The journal aims to analyze the impact of global technological change on society and disseminate the best management practices of companies and organizations. And the third journal with the highest number of citations is the *International Journal of Technology Management.*

*Technological Forecasting and Social Change* stands out for publishing research in which the methodology and practice of technological forecasting in organizations generate future studies as planning tools interrelate to technological, social, and environmental factors.

Table 4 shows the journals with greater relevance for their number of citations, especially *Organization Science*, which has more than twice as many citations as other journals - 6,104 citations. The *Strategic Management Journal* and *Academy of Management Review* have 2,964 and 2,818 citations, respectively.

Three of the most cited articles in this research were published in *Organization Science.* They are: "*Knowledge and Organization: A Social-Practice Perspective",* by Brown & Duguid (2001), with 2,172 citations, "*Organizational Ambidexterity: Balancing Exploitation and Exploitation for Sustained Performance",* by Raisch et al. (2009), with 1,316 citations, and "*Exploitation-Exploitation Tensions and Organizational Ambidexterity: Managing Innovation Paradoxes"* (Andriopoulos & Lewis, 2009), with 1,227 citations.

**Table 5**
*Most relevant journals by the number of citations*

| Journal | Frequency |
|---|---|
| *Organization Science* | 6,104 |
| *Strategic Management Journal* | 2,964 |
| *Academy of Management Review* | 2,818 |
| *Research Policy* | 2,647 |
| *Management Science* | 2,149 |
| *Technovation* | 2,069 |
| *Journal of Business Research* | 1,701 |
| *Journal of Management Studies* | 1,596 |
| *Journal of Product Innovation Management* | 1,355 |
| *Leadership Quarterly* | 1,047 |

Source: Data extracted from Biblioshiny.

The *Strategic Management Journal* seeks to publish articles that help answer important questions about strategic management and innovation, empirical or theoretical, replicating

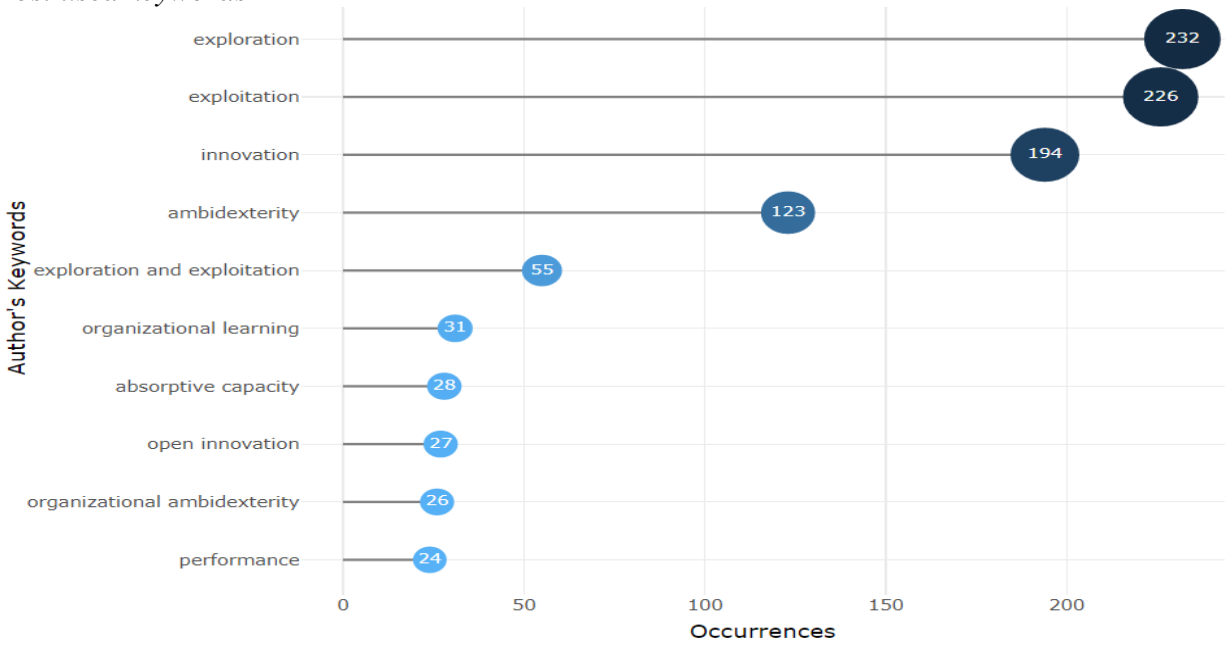
previous studies, exploring interesting phenomena, synthesizing existing research, and evaluating the many methodologies used in the organizational environment. In contrast, the *Academy of Management Review* journal publishes theoretical insights that seek to enhance the understanding of management in the organizational environment.

### 4.6 Keyword Analysis

Figure 8 shows the keywords most used by the authors of the sample research, with *Exploration* at 232 and *Exploitation* at 226 being the most used, followed by *Innovation* at 194 and Ambidexterity at 123.

**Figure 8**

*Most used keywords*




Source: Data extracted from Biblioshiny.

A total of 721 keywords were used in the articles that are part of the sample of this study. Thus, it can be stated that the words used for the search are consistent with the keywords most used by the authors in developing their searches.

### 4.7 More relevant studies and possibilities for future research

Table 5 presents the 10 most relevant articles in the sample of this research, containing in the table: the title of the article, author, journal, and number of citations according to the *Scopus* database. The research by Benner and Tushman (2003) entitled "*Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited"* has the highest number of citations, being: 2,624 citations in the *Scopus* database and 6,125 citations in Google Scholar. The authors addressed a contingent view of the influence of process management on innovation and adaptation of organizational processes (Benner & Tushman, 2003).

According to Benner and Tushman (2003), managing processes and activities benefits organizations in stable contexts, except for innovation, as it generates organizational change. The capacity for dynamism is rooted in *exploitation* and *exploration* activities. The authors also state that process management activities should be based on ambidextrous innovations (Benner & Tushman, 2003).

To deepen knowledge, future research may seek to understand the relationships between the organizational system and individuals' behavior, creativity, and motivation with innovation and process management (Benner & Tushman, 2003). Another proposal would be to understand how cognitive conflict relates to innovation *exploitation* and *exploration*, and whether new processes improve company performance (Bedford et al., 2018).

It is also important to understand the *Dark Triad* and innovation if the manager with narcissistic or Machiavellian behavior tends to develop processes of *exploitation* (improve existing processes) or *exploration* (new processes) innovation (Duarte Ribeiro et al., 2023). Examining additional accounting and control practices attributes may be essential to achieve innovation ambidexterity in the most diverse areas and economic scenarios (Van Neerijnen et al., 2022). The performance measurement system (PMS) can also be used to develop future research related to radical and incremental innovation (Bedford et al., 2018).

The second research with the highest number of citations was developed by Brown and Duguid (2001), which has 2,172 citations in the *Scopus* database. The research investigates knowledge and organization from a social practice perspective. According to the authors, the theory receives a lot of attention, but organizations do not apply this theory in practical procedures within the company (Brown & Duguid (2001). The practice creates epistemic differences between communities within a company, and the company's advantage over the market lies in dynamics to coordinate the knowledge produced by these communities, despite such differences (Brown & Duguid (2001).

In making this argument, the authors state that systemic innovation analyses should be extended to encompass all companies in a knowledge economy (Brown & Duguid (2001). This extension will require a transformation of the coordination of conventional ideas and the trade-off between exploration and exploitation (Brown & Duguid (2001).

The third most influential research is "*Exploratory Innovation, Exploitative Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators",* developed by Jansen, Van Den Bosch, and Volberda in 2006. Through a case study, the authors explored the difference between innovation models and examined the implications for the formal use of *exploitation* and *exploration* innovation. In other words, the centralization and formalization of innovation models (Jansen et al., 2006).

The main results indicate that centralization negatively affects *exploration* innovation, while formalization positively influences *exploitation* innovation (Jansen et al., 2006). The focus of the research developed by Jansen, Van Den Bosch, and Volberda was on financial companies, so future studies must be prepared with a wide variety of organizations and sectors not related to services to have the perception of how the managers of organizations interpret the difference between the types of management (Jansen et al., 2006).

**Table 6**
*Most influential articles by the number of citations*

| Article title | Author | Journal | Citations |
|---|---|---|---|
| *Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited* | Benner & Tushman (2003) | *The Academy of Management Review* | 2,624 |
| *Knowledge and Organization: A Social-Practice Perspective* | Brown & Duguid (2001) | *Organization Science* | 2,172 |
| *Exploratory Innovation, Exploitative Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators* | Jansen et al. (2006) | *Management Science* | 2,001 |
| *The dynamics of product innovation and the competencies of companies.* | Danneels (2002). | *Strategic Management Journal* | 1,430 |

| | | | |
|---|---|---|---|
| *Open innovation in SMEs: Trends, motives and management challenges* | Van de Vrande et al. (2009) | *Technovation* | 1,377 |
| *Organizational Ambidexterity: Balancing Exploitation and Exploitation for Sustained Performance.* | Raisch et al. (2009). | *Organization Science* | 1,316 |
| *Exploitation-Exploitation Tensions and Organizational Ambidexterity: Managing Innovation Paradoxes* | Andriopoulos & Lewis (2009) | *Organization Science* | 1,227 |
| *Resolving the Capability Paradox Rigidity in New Product Innovation* | Atuahene-Gima (2005) | *Journal of Marketing* | 1,035 |
| *Scientific Procedures and Rationales for Systematic Literature Reviews* | Nooteboom et al. (2007) | *Research Policy* | 883 |
| *Technological capacity, strategic flexibility and product innovation* | Zhou & Wu (2009) | *Strategic Management Magazine* | 737 |

Source: Prepared by the author from Biblioshiny.

Seeking to understand how organizational backgrounds affect *exploitation* and *exploration* innovation over time is also an interesting line of research (Jansen et al., 2006). Future research can examine the impact of the relational dimension of social networks, considering that relational immersion or the strength of social relationships between unit members can increase the exchange of knowledge, which can affect the ability of units to seek radical and incremental innovations (Bedford et al., 2018).

Product innovation has been recognized as the main means of corporate renewal (Benner & Tushman, 2003). Therefore, it is crucial to understand whether product innovation can also be considered a mechanism of organizational renewal in the Brazilian reality. Andriopoulos and Lewis (2009) emphasize that investigating the tensions involving radical and incremental innovation in innovation companies (startups) can lead to a greater understanding of how management addresses the conflict between innovation models in practice.

Erwin Danneels' research, titled "*The dynamics of product innovation and the competencies of companies,"* is the fourth-highest citation study, with 1,430 citations in the *Scopus* database and 3,663 citations in Google Scholar. The research was prepared in 2002 by the case study method with five technology companies (Danneels, 2002). The single-authored article makes a theoretical analysis of how product innovation contributes to company renewal through its dynamic and reciprocal relationship with the company's competencies (Danneels, 2002).

The research results indicate that product innovation drives organizational renewal, both exploitation and exploration of organizations, but more research is needed to prove these results in other scenarios (Danneels, 2002). Future research could examine the organizational and structural mechanisms that facilitate the storage and transfer of knowledge acquired through product development (Danneels, 2002). Another gap would be in understanding the motivation of employees for innovation, not only for products but also for organizational processes (Danneels, 2002).

It would also be important to examine how environmental aspects, that is, dynamism and competitiveness, moderate the effectiveness of radical and incremental innovation (Keller & Chen, 2017), as well as seek to understand how the organizational culture of the organization's managers influences innovation satisfaction and organizational resilience (Bresciani et al., 2018). Other research directions can be dedicated to case studies to deepen the different trajectories for ambidextrous innovation in specific industries and understand how strategies can be related to company culture (Michelino et al., 2014).

Future studies should develop more refined reports that may affect the ambidextrous relationship and performance in the most varied economic scenarios (Raisch et al., 2009). Considering trends in higher education contexts, relationships between universities, and social and

political demands of higher education, it would be interesting to investigate how universities understand the concept and apply ambidextrous innovation (Peris-Ortiz et al., 2023). Or differentiate between regional, national, and global rankings of common indicators for innovation *exploitation* and *exploration* in universities (Peris-Ortiz et al., 2023).

The fourth most crucial research involving the radical and incremental innovation theme of the *Scopus* database was written by Van de Vrande, Jong, Vanhaverbeke, and Rochemont in 2009. Named "*Open innovation in SMEs: Trends, motives and management challenges",* the article explores whether open innovation practices, widely used by large companies, can also be used by small businesses (Van de Vrande et al., 2009). Considering 605 innovative small businesses in the Netherlands, the research also focuses on the reasons and challenges perceived when they adopt open innovation practices (Van de Vrande et al., 2009).

In the research, open innovation is measured with eight innovation practices that reflect the exploration and use of technology in small businesses (Van de Vrande et al., 2009). The researchers found that responding SMEs engage in many open innovation practices and have increasingly adopted practices over the past 7 years (Van de Vrande et al., 2009). Also, the results indicate no major differences between the manufacturing and service industries, but medium-sized companies are, on average, more strongly involved in open innovation than their smaller counterparts (Van de Vrande et al., 2009).

Small businesses seek open innovation, mainly for market-related reasons, such as meeting customer demands or accompanying competitors (Van de Vrande et al., 2009). Considering the fourth study, future research should focus on the requirements of open innovation in differences in culture, structure, and decision-making between partners of different sizes and from different sectors, and it is possible to understand how small businesses implement their innovation practices in Brazil because according to the Brazilian Institute of Geography and Statistics (IBGE, 2021), about 75% of Brazilian companies are small organizations.

Thus, many studies need to be developed to understand better radical and incremental innovation in the Brazilian organizational background.

## 5 FINAL REMARKS

This research was elaborated through the bibliometric survey of scientific production on *Innovation Exploitation*, *Innovation Exploration*, or *Innovation Ambidexterity* with the aid of RStudio's Biblioshiny software. For the analysis, articles written in English were considered, published in journals in business, administration, accounting, and economics, indexed on the *Scopus* platform between 1995 and 2022 (27 years), containing 746 articles.

It is possible to observe an evolution of the theme over the years. Between 1995 and 2005, only 22 studies were published, while between 2006 and 2016, there were 316, and in the period covering 2017 to 2022, 408 studies were published, representing 42.35% of the total sample. However, from 1995 to 2000, innovation was seen only as creating and remodeling products and processes. In the decade from 2000 to 2010, studies showed a greater distinction between *exploitation* and *exploration* innovation, with a greater focus on organizational profit. From 2010 to 2020, there is a broader definition of the subject, with research aimed at understanding financial performance and with lines of behavioral research.

As of 2020, researchers seek a greater understanding of the subject by investigating organizations that use both types of innovation, with a greater focus on manager behavior and conflicts over organizational resources. The vast majority of research is still developed by the quantitative data methodology. As for the most productive authors, there is the author of 8 articles, Antonella Martini, a professor at the University of Pisa in Italy. However, Italy is the third country with the highest number of publications. Professor Tushman, who has the highest number of citations - 4,159, is a professor of business administration at Harvard *Business School,* considered

the best university in the world. Professor Michael L. Tushman is an American born in Boston in 1947; and his undergraduate degree is in electrical engineering, his master's and doctorate in management.

Collaboration networks are also important for evolving topics and research in accounting innovation. The most important collaboration network is the professors and researchers Michelino, Caputo, and Cammarano, with 6 articles. Both are Italian, and Italy is considered the third country with more research focused on innovation, with research developed through the survey model and focused on understanding innovation and the organization's financial performance. According to the literature, the research developed between 2010 and 2020 sought to understand organizational innovation and financial performance.

The country with the highest number of publications on the subject is the United States of America, with 259 publications, followed by China with 221, and Italy with 193. The collaboration network with the most publications and the researcher with the most articles developed on this topic is Italian. The following are Spain, with 165 publications, and the United Kingdom, with 115 publications. The journal with the highest number of publications on *exploitation* and *exploration* innovation is the *Journal of Business Research,* with 25 articles published. *Still,* the journal with the highest number of citations is *Organization Science,* with 6,104 citations, according to the *Scopus* database.

However, this research presents theoretical and practical contributions, and the analysis results help those interested in the topic prepare for future research involving radical and incremental innovation. This research can also help managers understand the subject and implement innovative practices in organizations, allowing companies to perform better than their competitors.

Future research can be elaborated as case studies, surveys, or with secondary data, both in the behavioral and organizational scope, as presented in the fourth topic. Other bibliographic research can also be developed addressing other topics, such as motivation in the organizational environment, Environment, Social and Governance (ESG), Stick Cost, Burnout syndrome, and Dark Triad behavior.

## REFERENCES

Andriopoulos, C., & Lewis, M. W. (2009). Exploitation-Exploitation Tensions and Organizational Ambidexterity: Managing Innovation Paradoxes. *Organization Science, 20*(4), 696-717. https://doi.org/10.1287/orsc.1080.0406

Arekrans, J., Ritzén, S., & Laurenti, R. (2022). The role of radical innovation in circular strategy deployment. *Business Strategy and the Environment*. https://doi.org/10.1002/bse.3108

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics, 11*(4), 959-975 https://doi.org/10.1016/j.joi.2017.08.007

Atuahene-Gima, K. (2005). Resolving the Capability Paradox Rigidity in New Product Innovation. *Journal of Marketing, 69*(4), 61-83. https://doi.org 10.1509/jmkg.2005.69.4.61

Bedford, D. S., Bisbe, J., & Sweeney, B. (2018). Performance measurement systems as generators of cognitive conflict in ambidextrous companies. *Accounting, Organizations and Society, 72*, 21-37. https://doi.org/10.1016/j.aos.2018.05.010

Benner, M. J., & Tushman, M. L. (2003). Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited. *The Academy of Management Review, 28*(2), 238-256. https://doi.org/10.2307/30040711

Benner, M. J., & Tushman, M. (2002). Process Management and Technological Innovation: A Longitudinal Study of the Photography and Paint Industries. *Administrative Science Quarterly*, 47(4), 676–707. https://doi.org/10.2307/3094913

Bresciani, S., Ferraris, A., & Del Giudice, M. (2018). The management of organizational ambidexterity through alliances in a new context of analysis: Internet of Things (IoT) smart city projects. *Technological Forecasting and Social Change*, *136*, 331-338. https://doi.org/10.1016/j.techfore.2017.03.002

Brown, J. S., & Duguid, P. (2001). Knowledge and Organization: A Social Practice Perspective. *Organization Science, 12*(2), 198-213. https://doi.org/10.1287/orsc.12.2.198.10116

Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects. *Organization Science, 20*, 781-796. https://doi.org/10.1287/orsc.1090.0426

Christensen, T. B., Wells, P., & Cipcigan, L. (2012). Can innovative business models overcome resistance to electric vehicles? Better Place and battery electric cars in Denmark. *Energy policy*, 48, 498-505, https://doi.org/10.1016/j.enpol.2012.05.054

Danneels, E. (2002). The dynamics of product innovation and the competencies of companies. *Strategic Management Journal, 23*(12), 1095-1121. https://doi.org/10.1002/smj.275

Davenport, S., & Bibby, D. (1999). Rethinking a national innovation system: The small country as' SME'. *Technology Analysis & Strategic Management, 11*(3), 431-462. https://doi.org/10.1080/095373299107447

Donthu, N., Kumar, S., Pattnaik, D., & Lim, W. M. (2021). A bibliometric retrospection of marketing from the lens of psychology: Insights from Psychology & Marketing. *Psychology & Marketing, 38*(5), 834-865. https://doi.org/10.1002/mar.21472

Duarte Ribeiro, W., Alves, C., & Vieira de Santana Júnior, O. (2023). Creativity and innovation: cralves framework application analysis to generate new business ideas in a publishing startup. *Brazilian Journal of Management and Innovation* (*Revista Brasileira De Gestão E Inovação*), 10(2), 40–55. https://doi.org/10.18226/23190639.v10n2.03

Erzurumlu, S., & Smith, N. (2023). Managing Technological Innovation Capabilities to Align Exploration and Exploitation with Technological Changes. *International Journal of Innovation and Technology Management*. https://doi.org/10.1142/s0219877023500128

González-Ramos, M. I., Guadamillas, F., & Donate, M. J. (2023). The relationship between knowledge management strategies and corporate social responsibility: Effects on innovation capabilities. *Technological Forecasting and Social Change, 188*, 122287. https://doi.org/10.1016/j.techfore.2022.122287

Guan, J., & Liu, N. (2016). Exploitative and exploratory innovations in knowledge network and collaboration network: A patent analysis in the technological field of nano-energy. *Research Policy*, *45*(1), 97–112. https://doi.org/10.1016/j.respol.2015.08.002

Hiebl, M. R. W., & Pielsticker, D. I. (2023). Automation, organizational ambidexterity and the stability of employee relations: new tensions arising between corporate entrepreneurship, innovation management and stakeholder management. *The Journal of Technology Transfer*. https://doi.org/10.1007/s10961-022-09987-1

Instituto Brasileiro de Geografia e Estatística [IBGE] (2021). *Indústria e Construção*. https://www.ibge.gov.br/estatisticas/economicas/industria.html

Jayanthi, S., & Sinha, K. K. (1998). Innovation implementation in high technology manufacturing: A chaos-theoretic empirical analysis. *Journal of Operations Management, 16*(4), 471-494. https://doi.org/10.1016/S0272-6963(98)00025-4

Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. W., (2006). Exploratory Innovation, Exploratory Innovation and Performance: Effects of Organizational Background and Environmental Moderators. *Science of Administration, 52*(11), 1661-1674. https://doi.org/10.1287/mnsc.1060.0576

Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research*, *64*(4), 408-417. https://doi.org/10.1016/j.jbusres.2010.09.010

Keller, J., & Chen, E. W. (2017). A road map of the paradoxical mind. In Wendy K. Smith, Marianne W. Lewis, Paula Jarzabkowski, & Ann Langley (Eds.). *The Oxford handbook of organizational paradox* (pp. 66-86). Oxford University Press.

Kumar, S., Pandey, N., Lim, W. M., Chatterjee, A. N., & Pandey, N. (2021). What do we know about transfer pricing? Insights from bibliometric analysis. *Journal of Business Research*, *134*, 275-287. https://doi.org/10.1016/j.jbusres.2021.05.041

Lee, Y., & Hemmert, M. (2023). Performance implications of combining innovation and internationalization for Korean small- and medium-sized manufacturing firms: an exploration–exploitation perspective. *Asian Business & Management, 22*, 1-25. https://doi.org/10.1057/s41291-020-00144-w

Lennon, N. J. (2022). Balancing incremental and radical innovation through performance measurement and incentivization. *The Journal of High Technology Management Research, 33*(2), 100439. https://doi.org/10.1016/j.hitech.2022.100439

Li, P., Liu, H., Li, Y., & Wang, H. (2023). Exploration–Exploitation Duality with Both Tradeoff and Synergy: The Curvilinear Interaction Effects of Learning Modes on Innovation Types. *Management and Organization Review*, 1-35. https://doi.org/10.1017/mor.2022.49

Lin, H., McDonough, E. F., Lin, S. J., & Lin, C. Y. (2013). Managing the exploitation/ exploration paradox: The role of a learning capability and innovation ambidexterity. *Journal of Product Innovation Management, 30*(2), 262-278. https://doi.org/10.1111/j.1540-5885.2012.00998.x

Lissillour, R., & Rodriguez-Escobar, J.A. (2023). Organizational ambidexterity and the learning organization: the strategic role of a corporate university. *The Learning Organization*, 30 (1), 55-75. https://doi.org/10.1108/TLO-01-2021-0011

March, James G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71-87. https://doi.org/10.1287/orsc.2.1.71

Martini, A., Laugen, B. T., Gastaldi, L., & Corso, M. (2012). Continuous innovation: towards a paradoxical, ambidextrous combination of exploration and exploitation. *International Journal of Technology Management*, *61*(1), 1. https://doi.org/10.1504/ijtm.2013.050246

Michelino, F., Caputo, M., Cammarano, A., & Lamberti, E. (2014). Open Innovation Inbound and Outbound: Organization and Performances. *Journal of Technology Management &Amp; Inovação, 9*(3), 65-82. https://doi.org/10.4067/S0718-27242014000300005

Negulescu, O. H. (2020). Innovation management: the source of continuous improvement of competitive advantage and organization's performance. *Review of General Management, 32*(2)

Nie, X., Yu, M., Zhai, Y., & Lin, H. (2022). Explorative and exploitative innovation: A perspective on CEO humility, narcissism, and market dynamism. *Journal of Business Research, 147*, 71-81. https://doi.org/10.1016/j.jbusres.2022.03.061

Nooteboom, B., Van Haverbeke, W., Duysters, G., Gilsing, V., & Van Den Oord, A. (2007). Optimal cognitive distance and absorptive capacity. *Research Policy, 36*(7), 1016-1034. https://doi.org/10.1016/j.respol.2007.04.003

Paul, J., Lim, W. M., O'Cass, A., Hao, A. W., & Bresciani, S. (2021). Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR). *International Journal of Consumer Studies*. https://doi.org/10.1111/ijcs.12695

Peris-Ortiz, M., García-Hurtado, D., & Román, A. P. (2023). Measuring knowledge exploration and exploitation in universities and the relationship with global ranking indicators. *European Research on Management and Business Economics, 29*(2), 100212. https://doi.org/10.1016/j.iedeen.2022.100212

Raisch, S., Birkinshaw, J., Probst, G., & Tushman, ML (2009). Organizational Ambidexterity: Balancing Exploitation and Exploitation for Sustained Performance. *Organization Science, 20*(4), 685-695. doi:10.1287/orsc.1090.0428

Sabidussi, A., Lokshin, B., & Duysters, G. (2021). The innovator's dilemma: the performance consequences of sequential or flexible exploration and exploitation patterns in turbulent environments. *Technology Analysis & Strategic Management*, 1-13. https://doi.org/10.1080/09537325.2021.1975033

Shafique, I., Kalyar, M.N., Shafique, M., Kianto, A. & Beh, L.-S. (2022). Demystifying the link between knowledge management capability and innovation ambidexterity: organizational structure as a moderator. *Business Process Management Journal, 28*(5/6), 1343-1363. https://doi.org/10.1108/BPMJ-11-2021-0713

Shen, S., Venaik, S. & Zhu, Y. (2023). A Dynamic Model of Internationalization and Innovation in Emerging Market Enterprises: Knowledge Exploration, Transformation, and

Exploitation. *Manag Int Rev*. https://doi-org.ez71.periodicos.capes.gov.br/10.1007/s11575-023-00509-1

Smith, W. K., & Lewis, M. W. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. *Academy of Management Review, 36*, 381-403. https://doi.org/10.5465/amr.2009.0223

Solís-Molina, M., Hernández-Espallardo, M., & Rodríguez-Orejuela, A. (2018). Performance implications of organizational ambidexterity versus specialization in exploitation or exploration: The role of absorptive capacity. *Journal of business research, 91*, 181-194. https://doi.org/10.1016/j.jbusres.2018.06.001

Tidd, J., & Bessant, J. (2015). *Gestão da inovação* (5a ed.). Bookman.

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *California Management Review, 38*(4), 8-29. https://doi.org/10.2307/41165852

Van Neerijnen, P., Tempelaar, M. P., & Van de Vrande, V. (2022). Embracing Paradox: TMT paradoxical processes as a steppingstone between TMT reflexivity and organizational ambidexterity. *Organization Studies, 43*(11), 1793-1814. https://doi.org/10.1177/01708406211058640

Van de Vrande, V., Jong, J. P. J., Vanhaverbeke, W., & de Rochemont, M. (2009). Open innovation in SMEs: Trends, motives, and management challenges. *Technovation, 29*(6-7), 423-437. https://doi.org/10.1016/j.technovation.2008.1

Warglien, M. (1995). Hierarchical Selection and Organizational Adaptation. *Industrial and Corporate Change*, *4*(1), 161-186. https://doi.org/10.1093/icc/4.1.161

Zheng, F., Li, Y., Jian, Z., & Lu, R. (2023). Industrial productivity dilemma in management and economics: Retrospect and prospect. *International Journal of Management Reviews*. https://doi.org/10.1111/ijmr.12327

Zhou, K. Z., & Wu, F. (2009). Technological capacity, strategic flexibility, and product innovation. *Strategic Management Magazine*. https://doi.org/10.1002/smj.830