Bibliometric Review on Innovation in Business Models, in The Context of Sustainability and Digital Transformation

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Summary

The objective of this study is to carry out a bibliometric analysis to explore the relationship between innovation in business models, sustainability and digital transformation. The methodology used allowed the analysis of scientific production in these topics, integrating bibliometric analysis and visualization tools to understand the relationships, foundations and lines of current research. A total of 441 articles were reviewed, of which 228 belonged to the Scopus database and 213 to the Web of Science database. The time period analyzed was from 2022 to 2026. The analysis was carried out using the VOSviewer 1.6.20 bibliometric tools, which allowed the identification of conceptual and structured relationships within the scientific production of these topics; the Tree of Science tool allowed the identification of the structure of knowledge and its evolution through citation networks. The main findings of the research suggest the need to carry out studies in regional and local contexts to measure the real impact of innovation in business models for medium, small companies. A trend in conducting research on innovation and digital transformations on traditional business models and new businesses is concluded, which provides a clear orientation towards the sustainability of organizations.

1. Introduction

Innovation is described as the introduction of new processes, products, business models, markets or forms of management that allow new ideas to be developed generating added value. In recent decades, innovation has become important at a global level, being the priority for many companies that have achieved their competitiveness in the national and international market today, given the improvement in their efficiency in administrative processes, performance and sustainability in the market (Organisation for Economic Co-operation and Development, 2023; World Economic Forum, 2024). Similarly, innovation is related to digital transformation, sustainability and economic development, consolidating themselves as engines of business growth (European Commission, 2023). Research shows that innovative companies have higher levels of competitiveness, resilience and productivity (Organisation for Economic Co-operation and Development, 2023). In Europe, for example, innovation is a fundamental pillar for economic and business development, as policies have prioritised support to generate innovation and entrepreneurship ecosystems (European Commission, 2023)

The latest research is focusing on studying business innovation, especially in topics related to digital transformation, sustainability, artificial intelligence and circular economy, making innovation a central axis to strengthen adaptation capacities, value creation and strategies, especially in small and medium-sized enterprises (Pizzichini et al., 2025).

Innovation in business models has acquired increasing relevance within the academic and business literature, as innovative business models set trends, integrate technology, sustainability, and digital transformation. Some studies showed innovative business models that allowed companies to redefine their processes and generate value, facilitating the incorporation of new trends and strategies aimed at competitiveness and organizational sustainability (Gálvez & García, 2012). Sustainability became a principle of business innovation, so recent research began to incorporate variables related to sustainability, evidencing a progressive evolution towards business models oriented towards the balance between the economic, environmental responsibility, and technological adaptation (Organisation for Economic Co-operation and Development, 2023; European Commission, 2023)

Although there is evidence of growth in these topics at the academic and business level, there is a high thematic and methodological dispersion, especially the articulation between innovation in business models, sustainability and digital transformation. This presents a gap related to the conceptual integration of

these variables and the identification of the main knowledge trends in this area. In addition, in recent years there has been a technological evolution and the emergence of trends such as artificial intelligence, digital platforms that make it necessary to carry out a systematic and bibliometric review to understand the structure, evolution and projection in this field

Therefore, the article analyzes the state of the art and network dynamics in the scientific literature on innovation in business models and its relationship with sustainability and digital transformation, through a qualitative, bibliometric approach with the use of Tree of Science algorithms and visualization techniques in VOSviewer, in order to determine the dominant thematic clusters and current knowledge trends. Contributing to the theoretical and methodological strengthening of studies on innovative business models, providing organizational strategies oriented to sustainability and digital transformation.

2. Methodology

In this article, a qualitative research was carried out with a descriptive, analytical and exploratory approach, using bibliometric analysis techniques to examine the dynamics of the research. The methodology allowed the analysis of the scientific production of the field, integrating bibliometric analysis and visualization tools to understand the relationships, foundations and lines of research.

The methodological strategy was structured in four phases, the first definition of criteria for searching and compiling information, the second with the purification and organization of the documentary base, the third bibliometric analysis and the fourth, an analysis of the structure and evolution of knowledge.

The information collection was carried out in the Scopus and Web of Science databases, due to their international recognition and rigor of scientific articles. With this, the inclusion and exclusion criteria were created to obtain a database of 441 articles, with this data the analysis was carried out using the VOSviewer 1.6.20 software to be able to identify, analyze and graphically represent relationships between bibliographic elements of the articles taken and also the Tree of Science, which is a tool aimed at identifying the structure of knowledge and its evolution through citation networks. These two tools provide from the networks or density maps to the evolution and trend. Subsequently, the content analysis process was carried out using an integration and interpretation in a complementary way.

3. Results

For the definition of search criteria and information collection, the Scopus and Web of Science databases were used due to their wide academic recognition, multidisciplinary coverage, and rigor in the indexing of publications. The documentary search was supported by the review of indexed articles published from 2022 to 2026 through the two databases (Web of Science and Scopus), using keywords such as Business Model Innovation* AND Innovation AND Sustainability OR Digital*, as can be seen the terms were combined using Boolean operators AND and OR to expand the thematic coverage and guarantee the retriment of relevant documents.

Within the search criteria, the inclusion criteria were presented, which are publications between 2022 and 2026; scientific articles ("article"); documents published in English; open access publications ("open access"); research belonging to the Business, Management and Accounting thematic area and documents indexed in the Scopus database and Web of science. Likewise, duplicate documents, editorials, book chapters and publications with incomplete information were excluded.

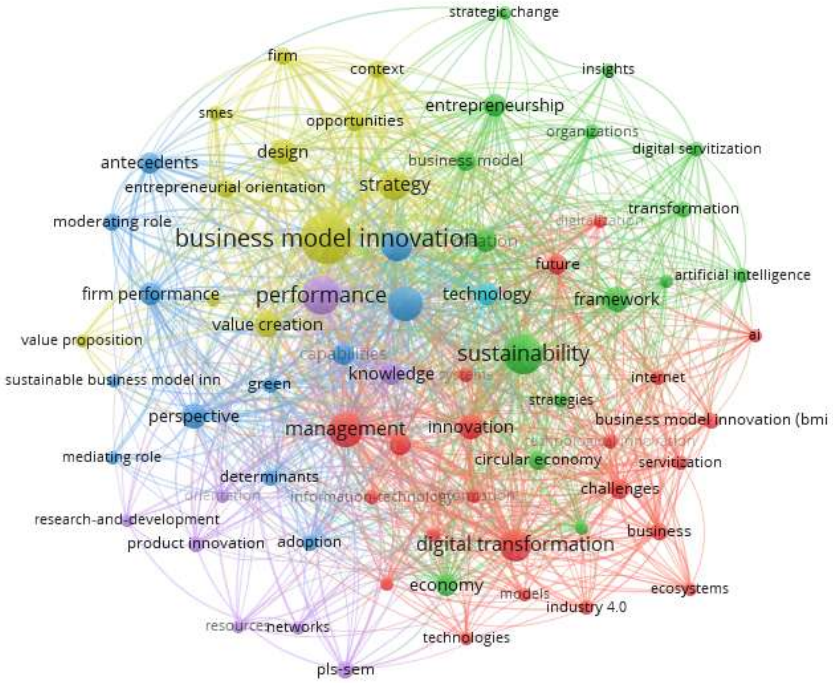
With the above, the Scopus database yielded 228 and the Web of Scince 213, having a total of 441 articles, these records were exported in formats compatible with the tools, including information related to authors, titles, abstracts, keywords, references and citation data to be able to perform the corresponding analysis.

3.1. Bibliometric Analysis

The bibliometric analysis was developed using the VOSviewer software version 1.6.20, widely used in bibliometric network analysis, which allowed the identification of conceptual and structured relationships within scientific production. It was put into co-occurrence analysis with the authors' keywords and the complete count method, then the minimum threshold was established by placing six words to debug irrelevant terms and optimize the clarity of the network, thus obtaining network maps, density and analysis of conceptual relationships.

The network visualization evidenced a structure based on the production of articles associated with innovation, business models, sustainability and digital transformation, through an analysis of the co-occurrence of keywords, five main clusters were identified, managing to show the relevance of the study and the approaches of research in technology, innovation and sustainability. Studies such as Luo et al.,(2022) demonstrate that digital capabilities and innovation in sustainable business models strengthen corporate social responsibility and organizational development. Also Geissdoerfer et al., (2023) They stressed that innovation in sustainable business models is related to transformation, strategy and competitiveness within companies.

Figure 1. Network visualization of innovation in business models, sustainability and digital transformation



Source: Authors' elaboration based on VOSviewer software.

The most important cluster is the yellow one on innovative business models which appears as the articulating axis in the network, due to its size and position indicates that it constitutes the main point and is linked to variables such as performance, sustainability and digital transformation, which emphasizes that today's business models respond to the strategic, digital and sustainable consolidation.

Within the development of business models, the concepts of strategy, value proposition, organizational design, value of creativity and innovation appear. Various authors affirm that innovative business models constitute a strategic mechanism to compete in highly competitive environments and when they combine it with digital capabilities they enhance and strengthen it (Andrianto et al., 2022). The value proposition was taken as a component within the model because it generates organizational differentiation and adapts to the needs of the market (Nawroth et al., 2022). In the same way (Guo et al., 2022) He concluded that business models are directly related to the company's performance, capabilities, and organizational design.

Organizational design and the identification of opportunities make companies collaborative, adaptive to changes in the environment and flexible, helping to connect with digital transformation and sustainability. Ancillai et al., (2023) y Bashir, (2023) They mentioned that flexibility and orientation to the updated development of organizational design strengthen the capacity for innovation under contexts of uncertainty, while Ding, (2026) He identified that leadership is an important variable for the implementation of the business model and that it is properly developed. Micheli & Jansen, (2024), Zhou et al., (2024), Chin et al., (2025) y Wang et al., (2025) They showed that creativity and innovation are essential within business models and even more so when they are created with artificial intelligence, digital platforms and adaptive ecosystems.

Of the models presented in the articles, Teece's (2010) stands out, which focused the models towards a lateral and vertical relationship where there is a consumer-company relationship, strategy, innovation management and the economic environment in order to take into account the internal aspects of the company such as the business model and its strategies with the external as the customer, distributors that affect innovation. Jabeen et al., (2023), emphasized what was done by Chesbrough (2003) who associated the open business model with open innovation, highlighting that in order to accelerate internal innovation in the company, it is necessary to develop an environment of collaboration and the generation of partnerships with research and development institutions in order to encourage and commercialize intellectual property for the creation of economic value.

With regard to digital business models, the research of The Man & Hausberg, (2023), Xie et al., (2022) y Chin et al., (2025) who showed that organizations are adopting digital platforms, advanced analytics and artificial intelligence to optimize organizational processes, strengthen innovation and improve

business competitiveness. As well as the development of sustainable business models where companies integrate environmental, social and economic sustainability as a fundamental strategy in the company (Geissdoerfer et al., 2023; Zoppelletto & Orlandi, 2022; Sun et al., 2025).

The blue cluster is related to organizational performance, dynamic capabilities, perspective and value creation, therefore, it highlights how innovative business models impact the performance of the organization, creating value and generating a new strategic perspective. The research of Najafi-Tavani et al., (2025) where it is mentioned that business models positively influence performance, and competitiveness, while Shahri et al., (2023) He stressed that sustainable models must be taken to improve organizational capacities and favor competitiveness and integral development.

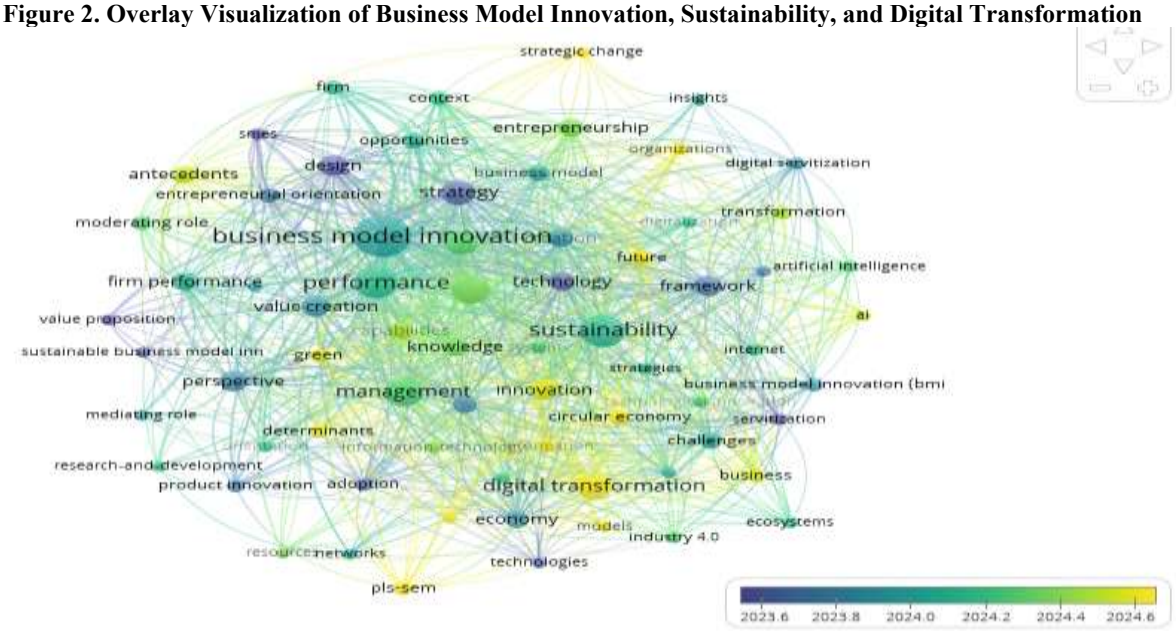
The green cluster was associated with entrepreneurship, transformation and emerging technologies, it stood out for the research that took traditional models to models with digital transformation supported by artificial intelligence, digital servitization and innovation ecosystems. This was presented with the study of Zhang et al., (2025) which shows the ability of social and digital networks to strengthen the company's performance and on the other hand Sjodin et al., (2023) y Mohamad et al., (2026) they led them to artificial intelligence and digital platforms, changing the business ecosystem.

The red cluster focused on digital transformation, circular economy and industry 4.0 and servitization. With this network, it was possible to show that the digital part joins the circular economy, demonstrating that digital transformation contributes to the sustainability, social responsibility and efficiency of production systems. The above was confirmed by Phuthong, (2026); Li et al., (2024) y Osei et al., (2026) who related the circular economy with digital technologies, favoring sustainable innovation and managing to stand out in the market, as well as Florek-Paszkowska & Ujwary-Gil, (2025) They highlighted the role of digital ecosystems and digital service in strengthening smart and sustainable business models. Within the cluster, it is also worth mentioning the appearance of the word management, which evolves from traditional administrative approaches to strategic management models supported by organizational innovation, sustainability and digitalization.

Finally, there is the purple cluster that took the variables of product innovation, adoption, research and development, networks and Partial Least Squares-Structure Equation Modeling (PLS-SEM). The trend towards structural statistical models to validate relationships between innovation, performance and sustainability is observed. For example, the research of Bashir, (2023), (Colovic, 2022) y Batuparan et al., (2025) they used PLS-SEM models to analyze the relationship between innovation, organizational performance, dynamic capabilities and digital transformation, using data analytics to have a closer real approach to the results.

The Software made it possible to identify the evolution of the main lines of research related to innovation in business models, sustainability and digital transformation during the period 2022 to 2026, this made it possible to recognize the topics that are most talked about and the consolidated areas of scientific knowledge where dark blue tones represent research in previous stages while yellow tones show emerging trends and more recent research topics (see figure 2).

Figure 2. Overlay Visualization of Business Model Innovation, Sustainability, and Digital Transformation



Source: Authors' elaboration based on VOSviewer software.

The map shows the concepts of innovative business models, sustainability and performance as the central core, but the temporal visualization shows the progressive evolution towards new terms linked to digital artificial intelligence, circular economy and dynamic capabilities. The areas where they correspond to the most recent, represented by yellow and light green colors, the terms such as digital transformation, artificial intelligence, circular economy, strategic change, business innovation and PLS-SEM stand out. Recent studies such as the Zare & Persaud, (2025), Merín-Rodrigáñez et al., (2024) y Chung et al., (2024) They concluded that technology is significantly transforming business innovation and organizational sustainability processes.

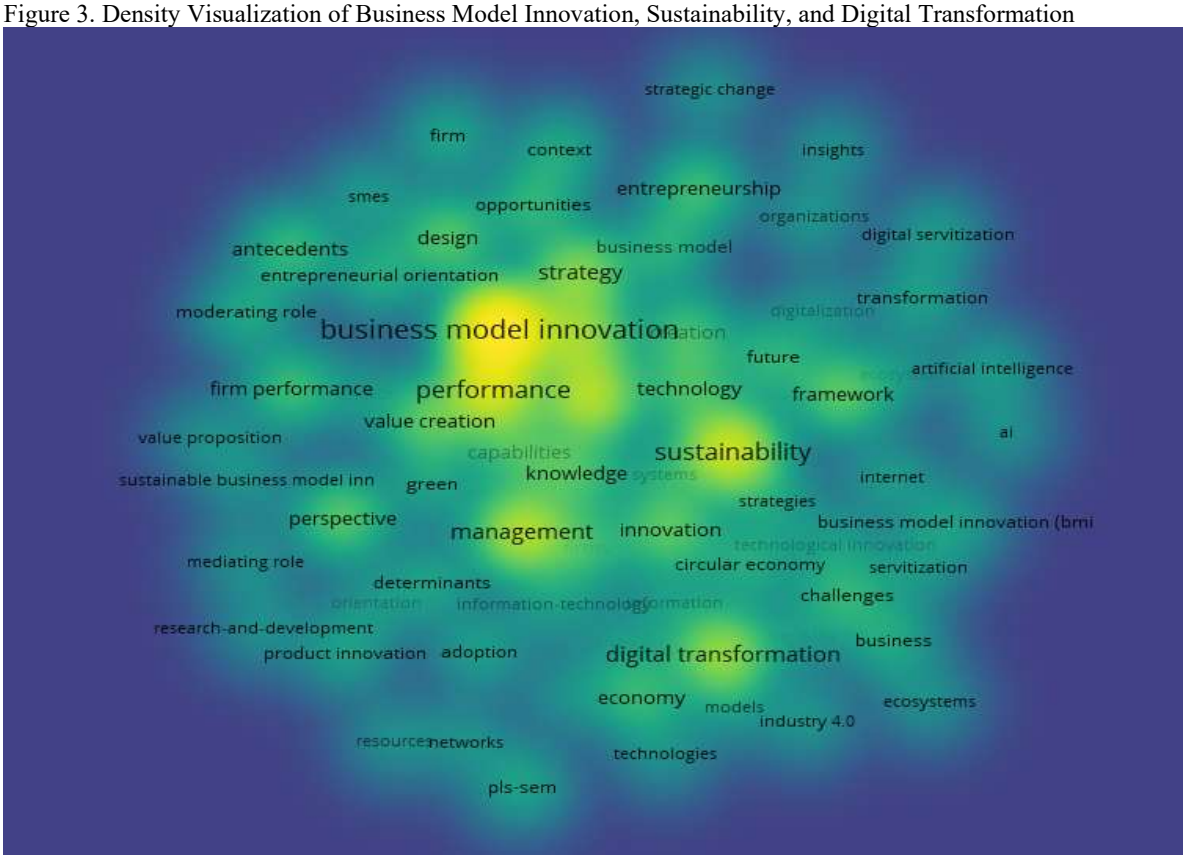
The map should highlight the appearance of artificial intelligence that, although due to its size within the network is not so large, its temporal location is recent and tends to have an important connection, so it integrates artificial intelligence in business innovation processes, sustainability and its business models can bring favorable results, this is evidenced by the studies of Renfei & Zhongwen, (2026), Wang et al., (2023) y Ghosh, (2025) who highlighted that artificial intelligence and digital platforms are driving new business ecosystems.

On the other hand, digital transformation appears as a trend topic where innovation and business models are closely connected to sustainability, demonstrating that this concept is consolidating itself as a driver of change and business competitiveness in the proximity of business transformation and the circular economy, reflecting a trend towards sustainable business models with technological and environmental efficiency (Triguero et al., 2025 & Zheng et al., 2025).

This allows us to consolidate the evidence of the evolution that research has led in this area, taking into account that the focused approach focused on organizational aspects, strategy, value creation, among others, and now there is talk of a digital transformation, artificial intelligence, sustainability, circular economy, allowing us to infer that the new lines of research will be integrated with more technological, sustainable and interconnected business models.

Density visualization was able to identify the concepts with the greatest appearance and with a greater level of interrelation within the bibliometric network, where warm colors such as yellow and intense green represent research nuclei with greater thematic density, while cold tones show secondary or emerging themes.

Figure 3. Density Visualization of Business Model Innovation, Sustainability, and Digital Transformation



Source: Authors' elaboration based on VOSviewer software.

As can be seen in Figure 3, the colors or nuclei that are focused on are innovative business models, performance and sustainability, within these variables it is also observed that much of the scientific literature has focused on understanding how business models contribute to organizational performance and business sustainability. Research such as that of Bashir et al., (2025), Najafi-Tavani et al., (2025) y Veksler et al., (2024), concluded that innovation and sustainable business models strengthen organizational resilience, strategic capability, and corporate sustainability.

Then, a high-density area associated with digital transformation, technology, innovation and framework was observed, which demonstrated the growing academic interest in organizational transformation in business models through technologies, becoming a driver in business innovation and accelerated change scenarios in the world.

In the same way, the presence of the concepts of circular economy, industry 4.0 and artificial intelligence made it possible to identify lines of research towards the integration of intelligent and automated technologies and although they present a lower density on the map, there is evidence of a growing trend towards these concepts and how they are linked to the business ecosystem confirmed in the studies of Paiola et al., (2024), Marcon et al., (2022) y Gasparin et al., (2022), which highlighted these issues from the transformation of business innovation processes and the generation of organizational sustainability.

Likewise, as mentioned above, the term management appears in the bibliometric network, evidencing that research addresses innovation from management, organizational capabilities and business administration, showing the importance of developing a good innovative business model, which is supported by the research of Dai & Lu, (2025), Ghinoi & Di Toma, (2022) y Baye & Yusuf, (2023) which concluded that strategic management capabilities and organizational leadership play a fundamental role in the implementation of innovative and sustainable business models.

The bibliometric analysis showed that the field of study is in an accelerated process of transformation, where business innovation evolves by connecting the leader with the innovative, digital and sustainable business model, this trend seeks that companies develop models that adapt and manage to be in market trends.

3.2. Structure and evolution of knowledge

In order to see the evolution and lines of development of the field, the Tree of Science tool was used for citation analysis that frames important articles according to impact, citations, analysis and narrative (Giraldo et al., 2014). With this tool, it was possible to select in an agile way the scientific articles with the most relevance and relevance to the research, yielding 90 documents, 20 with a high degree of entry and zero output (roots), 20 with a high degree of intermediation (trunk) and 50 with a high degree of citations, impact and outputs (sheets).

- Root

At the root there were 20 articles, that is, these documents are the ones with the greatest theoretical influence within the area of study. The results showed that the base literature is influenced by the contributions of classic authors such as Teece (2010), Zott (2010), Chesbrough (2010) and Osterwalder and Pigneur (2010). who consolidated the main theories related to organizational innovation, business models and organizational performance.

One of the most relevant articles within the root corresponded to Teece (2010), this author established that business models are fundamental mechanisms to capture value and generate sustainable competitive advantage and is considered one of the pillars in the concepts of innovation in business models, because it integrates strategic organizational elements to explain the importance of business adaptation in dynamic environments. Within these theories, one of the main authors of open innovation was related, which was Chesbrough (2010), who managed to relate business models with open innovation, managing to transform companies to flexible and collaborative models to take advantage of the environment and respond to accelerated changes.

The work of Zott and Amit (2010) represents one of the most influential theoretical lines because their research introduced the vision of business models as systems of interdependent activities aimed at creating value, expanding the traditional approach to business strategy by incorporating networks of organizational design and value proposition. Likewise, the authors Osterwalder and Pigneur (2010) developed the methodological relevance and applied to the Business Model Canvas as one of the most used tools for the design and analysis of business models, this approach has had a wide adaptation both in academic and business contexts due to its ability to structure strategic, financial and operational components in different types of companies.

On the other hand, the works of Principato et al., (2023), Pedersen et al., (2026) y Tura & Laukkanen, (2024) They identified the evolution of the field towards integrated approaches where innovation, sustainability and organizational transformation are brought together, relating innovation to business models with circular economy and sustainability, marking an important transition in the business environment. The appearance of Barney (1991) reflected the influence of resource-based theory in conceptual development, where he argues that competitive advantage depends on the internal resources and capabilities of the organization.

Therefore, this part of the tree showed that the research is based on innovation in business models, value proposition, open innovation, organizational transformation, competitive advantage, sustainability and circular economy and how they have transcended traditional strategies to more holistic perspectives that allow us to understand the organizational dynamics in each era.

- Trunk

As a second part of the tree, the trunk was found, which analyzed the articles and allowed identifying and consolidating the studies that structure and lead to the conceptual part of the terms, connect the theoretical bases with the research, managing to reconcile between theory and the actual. This leads to evidence how the articles that are located in the root are adapted and applied to more updated scenarios according to organizational dynamics.

Among the results, it can be obtained how digital transformation is related to innovation in business models, highlighting the digital strategic capacity for the strengthening of business innovation and organizational performance, this makes companies transform within their culture, structure and value proposition. Social networks and digital incorporation in the environment, made organizations think about their organizational performance and strategically integrate them within their business model (Chen, 2025; Guo et al., 2022; Zhou et al., 2024).

Sustainability was taken as a transversal axis of the field of studies, as Kilinc et al., (2025); Orlandi et al., (2024); Trotter & Brophy, (2022) They integrated variables related to business sustainability, social responsibility and sustainable business models, taking a step further in business models oriented not only to profitability but also to a vision that integrates their environmental responsibility. Within these articles, there is a recurring presence of concepts such as "sustainable business model innovation" or "economics sustainability" and "ecosystem-based business model innovation" that demonstrate that it is a central component in the current literature.

Another topic that could not be left aside is artificial intelligence, Big data and emerging technologies since researchers such as Ciacci & Penco, (2023), Tetteh et al., (2025); Wang et al., (2025) showed a transition towards business models supported by predictive analysis, automation and artificial intelligence applied to strategic innovation processes, these lines are oriented towards intelligent ecosystems capable of improving the efficiency of the organization.

Concepts such as leadership, motivational orientation, strategic flexibility and dynamic capabilities appeared recurrently in research, these findings indicate that recent literature recognizes that innovation in business models does not depend only on technology but also on human, cultural and strategic capabilities.

On the other hand, the presence of research focused on small and medium-sized enterprises and enterprises was observed at this point, suggesting that innovations in business models became an important tool for this type of companies, since it generates competitiveness and sustainability in dynamic and highly competitive contexts. This part of the tree showed that the process of the study area and the consolidation of new important topics are priorities within the research in order to guide organizations.

- Leaves

The last part managed to represent the most recent specialized studies, which condense the new lines of research and demonstrate where knowledge in this area is evolving.

One of the main results corresponded to the growing integration between digital transformation and sustainability, various studies such as Islam et al., (2025), Salamzadeh et al., (2023), Van de Wetering et al., (2023) They analyzed how organizations used digital strategies to strengthen green innovation processes, business sustainability, and organizational resilience, demonstrating a perspective that leads to sustainability not only being a traditional issue, but one that is supported by automation, digitalization, and technological development.

For this reason, research related to digital platforms, artificial intelligence and advanced data analytics was taken into account. Works such as Florek-Paszkowska & Ujwary-Gil, (2025), Mejia-Duque & Guerrero-Alvarado, (2025), Xie et al., (2022) They concluded that artificial intelligence, algorithms, digital ecosystems and intelligent platforms became strategic mechanisms to boost business efficiency and competitiveness.

In the same way, the role of dynamic capacities and organizational skills in innovation processes was revealed. Studies such as Ali et al., (2022); Ghina et al., (2025), Tripathi et al., (2025), Zhu et al., (2026) They stressed that organizations need to be adaptive, flexible and with continuous learning to be able to respond to uncertainty scenarios, especially technological ones, showing that technological and innovation organizational aspects have begun to be deeply integrated throughout the organization.

A relationship between the circular economy and green innovation was also seen as priority lines of research. Al-Hattami et al., (2026); Chabowski et al., (2025); Espinosa Sáez et al., (2023) They redesigned traditional business models incorporating energy efficiency, reducing environmental impacts and taking advantage of the sustainability of resources, also with digitalization that contributes to production processes and strengthens corporate strategies.

Some articles within this research present analyses of technology startups, supply chains, manufacturing, rural ecosystems, the financial sector, digital platforms and small and medium-sized enterprises,

giving a role to innovation in their business models because it contributes to becoming more prominent and stronger companies in the market.

Table 1 presents characterizations of the three components analyzed in the Tree Of Science.

Table 1 Representation of the Tree of Science with its components

Componente Tree of Science	Main focus	Dominant concepts	Representative authors/studies	Contribution to the scientific field
Root	Theoretical and strategic foundations of business innovation	Business Model Innovation, Dynamic Capabilities, Value Creation, Competitive Advantage, Open Innovation	Teece (2010), Zott & Amit (2010), Barney (1991), Chesbrough (2010), Osterwalder & Pigneur (2010), Foss & Saebi (2017)	They establish the conceptual bases of innovation in business models, value creation and dynamic capabilities as mechanisms of organizational competitiveness.
	Sustainability and circular economy in business models	Sustainability, Sustainable Business Model Innovation, Circular Economy	Geissdoerfer et al. (2018), Massa et al. (2017)	They incorporate sustainability and circular economy into contemporary business models, expanding on the traditional approach to business innovation.
Trunk	Consolidation of digital transformation and organizational capabilities	Digital Transformation, Strategic Change, Organizational Capabilities, ESG, Firm Performance	Chatterjee et al. (2023), Colovic (2022)	They consolidate the relationship between digital transformation, sustainability and organizational performance through strategic and digital capabilities.
	Business Innovation and Digital Ecosystems	Entrepreneurship, Digital Servitization, Innovation Ecosystems, Networks	Wang et al. (2023), Najafi-Tavani et al. (2025)	They show the transition towards more collaborative, digital business models oriented towards innovation ecosystems.
Leaves	Artificial intelligence and intelligent business models	Artificial Intelligence, AI-driven Innovation, Smart Ecosystems, Digital Platforms	Zhou et al. (2024), Wang (2025), Florek-Paszkowska (2025), Chin (2025)	They represent emerging trends geared towards automation, artificial intelligence, and intelligent business ecosystems.
	Sustainable innovation and advanced digital transformation	Digital Sustainability, Industry 4.0, Circular Economy, ESG, Green Innovation	Sun et al. (2026), Nazir et al. (2026)	They integrate sustainability, digital transformation and smart technologies as new axes of organizational innovation.
	Dynamic Capabilities and Organizational Adaptation	Dynamic Capabilities, Organizational Ambidexterity, Strategic Flexibility	Zhu (2026), Tripathi, (2025)	They highlight the need for adaptive capabilities and strategic flexibility to respond to complex

				technological and sustainable scenarios.

Source: Authors' elaboration based on the Tree Of Science platform and the authors cited

Table 1 shows the area of research treated is in acceleration and research expansion, it no longer focuses only on something traditional but articulates it to the trends and opportunities found in the environment, managing to show that globalization has led to organizational and research changes, by generating studies on sustainable and resilient intelligent companies, where artificial intelligence, digital platforms and the circular economy are highlighted.

4. Discussion

The environment is aware of the changes that have been experienced in the world and therefore the importance of carrying out a bibliometric analysis is evident to strengthen the foresight and the trend of the areas within the research. It was possible to determine that innovation in business models has evolved from topics that focused on organizational performance and competitive advantage to comprehensive perspectives where artificial intelligence, digital transformation and sustainability converge, dynamically integrating them within organizational processes.

In relation to theory, the results confirm what was developed by authors such as Teece (2010) who developed concepts of organizational innovation and the key concepts of strategy and innovative business models, stating that companies must be adaptive to respond to scenarios characterized by technological uncertainty and accelerated business transformation. Similarly, we agreed with the authors Zott and Amit (2010) who stated that innovation in business models should be oriented towards creativity and the creation of a value proposition.

Likewise, innovation focused on economic development strategy or approaches is no longer observed, but on business models that are sustainable and integrate environmental and social objectives, as presented by Geissdoerfer et al. (2018) and Bashir et al., (2025) in his research on circular economy and sustainability.

An articulation was seen between digital transformation, industry 4.0, servitization, and digital ecosystems, leading companies to review their innovation processes through automation, platforms, and technological capabilities, which coincides with the approaches of Marcon et al., (2022); Wang et al., (2023); Zhang et al., (2023), who highlighted that digital transformation strengthens competitiveness and facilitates organizational adaptation processes in dynamic environments.

Likewise, trends in digital sustainability, al-driven innovation and statistical methodologies such as PLS-SEM were presented, aimed at validating and sustaining advanced intelligent automation capabilities in order to validate the development and performance of the company. Also, the results made it possible to identify emerging trends within the scientific field. Among the main ones are: circular economy, digital servitization, industry 4.0, artificial intelligence applied to business models and oriented to sustainability. Within these terms, the one that presents the greatest recent growth in the literature is artificial intelligence, since companies are being integrated with algorithms, intelligent, advanced analytics and platforms to strengthen competitiveness, innovation and sustainability.

On the other hand, there are gaps related to the comprehensive understanding of their impact on sustainable business models and organizations. It was also possible to identify limitations related to the assessment of social and environmental impacts derived from business digitalization processes, especially in emerging economies of small and medium-sized enterprises, which leads to an opportunity for research on digital sustainability and digital ecosystems. Another important point to highlight is the lack of integration between strategic leadership and artificial intelligence, although research recognized the importance of both for organizations, there is still little research that articulates these terms.

In another perspective, it was evident that research tends to concentrate on technological and manufacturing sectors while sectors such as education, public administration, creative industries and social enterprises with less research development are left, giving an opportunity to expand the analysis of business models towards these sectors.

Within the study, it was identified that research is orienting towards business models based on artificial intelligence, governance, smart ecosystems, green innovation, industry 5.0 and organizational transformation based on smart technologies, making it a starting point to be able to develop new research.

5. Conclusions

The bibliometric analysis shows a sustained growth in scientific production that relates innovation in business models with sustainability and digital transformation, especially during the last decade. This increase reflects the global interest in integrating responsible business practices with emerging technologies, highlighting the convergence between sustainability and digitalization as a strategic axis. Likewise, it is identified that business models that go hand in hand with innovation, in addition to seeking the generation of economic value, also allow the creation of social and environmental value, generating

a triple impact as a dominant trend in the literature on business models.

From a knowledge network perspective, the analysis shows a high concentration of research in developed countries, although with a growing participation of emerging economies. International collaborations and interdisciplinarity have been key factors for the development of the field, integrating areas such as management, entrepreneurship, technology, economic environment and sustainability. In addition, the thematic clusters identified reveal that digital transformation acts as a fundamental enabler for the implementation of sustainable business models, through the use of tools in artificial intelligence, advanced analytics and digital platforms.

The results made it possible to identify that innovation in business models constitutes an articulating axis in the research and maintains a relationship with organizational management and business sustainability. A high interconnection between important variables such as competitiveness, value creation in companies was demonstrated, confirming that innovation continues to be a strategic point and a mechanism for organizations to adapt to new technologies, the digital world and sustainability.

The temporal analysis showed a progressive transition from traditional approaches of business models focused on organizational performance to models focused on sustainability, digital transformation and adaptive capabilities. A growing trend is identified in studies on the circular economy, digital servitization, analytical capabilities and technological integration with business models, demonstrating that digital transformation has been consolidated as an innovative and strategic axis that favors the organizational ecosystem since it generates value and sustainability in a changing world.

Within the research, five strong clusters were identified: the first and most important is that of innovative business models, in turn articulating the network and related to aspects of management, creativity and strategy. The second cluster is related to organizational performance and value generation from innovative business models. The third cluster analyzes entrepreneurship as a result of moving from traditional business models to those with digital transformations. The fourth cluster highlights the importance between digital transformation and the circular economy. The last cluster explores research that uses mathematical models to validate relationships between innovation, performance and sustainability. With the analysis of Overlay Visualization, the evolution of the main lines of research related to innovation in business models, sustainability and digital transformation was identified.

Smart, sustainable and interconnected business models are built thanks to a new stage characterized by artificial intelligence and intelligent digital ecosystems that are capable of responding to the challenges of the environment and also adapting to market and competition trends, ensuring that, regardless of the size of the organizations, they must transform their business models to generate sustainability in the business world.

Finally, it is concluded that there is a conceptual evolution towards more resilient, adaptive and inclusive business models, driven by digitalization and oriented towards sustainability. However, the analysis also highlights gaps in research, particularly in the measurement of the real impact of these innovations in local contexts and in small and medium-sized enterprises, suggesting the need to carry out future studies that delve into the practical applicability and the generation of real indicators that allow the contribution of innovation in business models to sustainable development to be comprehensively evaluated.

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