

Identifying Research Frontiers In Dynamic Pricing Capability And Revenue Optimization Using Bibliometric Science Mapping Techniques

La Ode Sugianto^{1*}, Dwi Warni Wahyuningsih², Siti Chamidah³, Wa Ode Sitti Nurrhamah⁴, La Harjono⁵

^{1,2,3} Department of Management, Faculty of Economics, Muhammadiyah University of Ponorogo, Indonesia

⁴ Department of Management, Faculty of Economics, STIE Anindiyaguna Semarang, Indonesia

⁵ Department of International Trade, Faculty of Economics and Business, Buton Muslim University, Indonesia

*Corresponding Author: laodesugianto@umpo.ac.id

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ABSTRACT

This study aims to identify the knowledge structure, patterns of scientific collaboration, the evolution of research themes, and research frontiers in the study of Dynamic Pricing Capability (DPC) and Revenue Optimization (RO) during the period 2020-2025. The study uses a quantitative-descriptive bibliometric approach with data sources derived from the Dimensions database using the keywords "Dynamic Pricing Capability and Revenue Optimization". The analysis was conducted using VOSviewer software through seven main visualizations: annual publication trends, network visualization, overlay visualization, density visualization, author collaboration, institutional collaboration, and country collaboration. The results show that publications in this field experienced very significant growth, especially in the period 2024-2025, indicating increasing academic attention to dynamic pricing strategies in the era of digital transformation. The themes of price and profitability optimization, supply and demand chain management, organizational capabilities and innovation, and data-driven digital transformation dominate the research knowledge structure. Collaboration analysis shows the dominance of contributions from China, the United States, and a number of leading research institutions that form a global scientific network. Meanwhile, the analysis of the theme's evolution reveals a shift in research focus from an operational approach to the integration of artificial intelligence, machine learning, the digital economy, and organizational innovation. These findings indicate that DPC has evolved into a strategic capability that supports competitive advantage and optimizes organizational revenue. This research contributes to mapping the development of knowledge and identifying future research directions in the areas of Dynamic Pricing Capability and Revenue

INTRODUCTION

The development of digital transformation has changed the method of organization, managing pricing strategies, revenues, and relationships with customers in an environment of growing business dynamics (Zaki, 2019). Change consumer behavior, increase digital platform penetration, as well as data availability in large amounts, has pushed the company to switch from a static price approach to a more adaptive and responsive approach to market changes (Nuccio & Guerzoni, 2019). In context, thus, *dynamic pricing capability* (DPC) emerges as one of the strategic abilities that allows organizations to adapt prices in real-time based on changing demand, capacity, competitive conditions, as well as customer characteristics (Akhiljyoth & Vinod, 2021; Ampountolas et al., 2020; Atbaş & Yıldız, 2024). This No Again is viewed just as an operational instrument, but rather as part of the capability supporting organizations' creation of values and advantages, competitive, and sustainable (McDougall et al., 2022). Through integration of technology analytics, systems *revenue management*, and artificial intelligence, the company is capable of increasing the accuracy of prediction requests as well as optimizing decision pricing in a more effective way (Kaul, 2018). At the same time, the increasing market complexity requires organizations to develop the ability to adapt and respond to changes in a fast and precise way. Therefore, DPC is increasingly viewed as an important element in modern business strategies that are oriented towards optimizing revenue and profitability in the long term.

Conceptually, DPC evolved from the long-standing tradition of revenue management applied in the aviation, hospitality, and various service sectors characterized by limited capacity and perishable products (Kunst, 2024). Within this framework, revenue optimization is achieved through a combination of customer segmentation, demand forecasting, capacity allocation, and price differentiation to maximize the economic value derived by the organization (Herath et al., 2023; Onita & Ochulor, 2024; Wheeler, 2021). With the advancement of digital technology, this concept has undergone a significant transformation through the use of big data analytics, machine learning, artificial intelligence, and predictive systems that enable automated, data-driven pricing decisions (R. Li et al., 2024). This shift has expanded the application of DPC to various sectors such as retail, e-commerce, logistics, energy, electric vehicle services, manufacturing, and the platform economy. Various studies have shown that dynamic pricing capabilities have a direct relationship with increased revenue optimization, operational efficiency, capacity utilization, and organizational profitability (Ballerini et al., 2023; Chen & Xu, 2023; Murimi et al., 2021). However, the literature also shows that the effectiveness of dynamic pricing strategies is highly dependent on an organization's ability to manage customer perceptions of price fairness and the transparency of its policies (Gatera, 2024; Kim et al., 2021). This situation demonstrates that

DPC is a multidimensional phenomenon that simultaneously involves aspects of technology, customer behavior, and organizational strategy.

From a strategic management perspective, DPC can be understood as a manifestation of the dynamic capabilities theory, which emphasizes an organization's ability to sense, seize, and transform in response to changes in the business environment (Ifekanandu & Ihuoma, 2024; Wong & Ngai, 2021; Zhang, 2024). Through these capabilities, organizations can identify market opportunities, respond quickly to changes in demand, and adapt business models to maintain a competitive advantage (Tallman et al., 2018). Various studies have shown that the success of DPC implementation is determined not only by technical capabilities in managing prices but also by the integration of technology resources, data, analytical competencies, and broader organizational strategy (Aghimien et al., 2022). In this context, digital transformation is a key driver enabling companies to develop dynamic pricing capabilities sustainably. Predictive analytics, artificial intelligence, and integrated information systems enable organizations to gain deeper insights into customer behavior and market dynamics (R. Li et al., 2024). Therefore, DPC is increasingly positioned as a strategic capability that significantly contributes to organizational value creation and improved business performance (Liu, 2025). These developments demonstrate that the study of DPC is not only relevant in the realms of marketing and operations but also has important implications for the development of contemporary strategic management theory.

The increasing academic attention to DPC and revenue optimization is also reflected in the expanding range of industry contexts being researched (Rena et al., 2024). In the retail and e-commerce sectors, DPC is used to optimize pricing based on customer behavior, competitive dynamics, and rapidly changing market demand (Zhong, 2024). In the logistics and transportation sectors, dynamic pricing strategies are utilized to improve distribution efficiency, manage service capacity, and optimize operational costs. Meanwhile, in the hospitality and tourism industries, the implementation of revenue management systems has become a key practice in increasing occupancy rates, room revenue, and company profitability (Deng, 2024; Guo & Kim, 2023; Huang et al., 2020). In the energy and electric vehicle services sectors, DPC is used to more effectively balance demand and network capacity. This diversity of contexts demonstrates that the DPC concept has evolved into a multidisciplinary research area involving operations management, information systems, marketing, supply chains, and the digital economy (Ivanov et al., 2021). However, this expansion of applications has also led to knowledge fragmentation, as research tends to develop separately across various disciplines and industry contexts (Gagliardi et al., 2023). Consequently, a comprehensive understanding of the knowledge structure and direction of DPC research remains relatively limited (Rena et al., 2024).

Despite the increasing number of publications on DPC and revenue optimization, the existing literature still reveals several important research gaps that warrant attention (Rena et al., 2024). First, most studies focus on empirical testing within specific industry contexts

without providing a comprehensive overview of the evolution of knowledge and the relationships between research themes. Second, previous research has focused primarily on technology implementation and financial performance improvement, while the relationships between DPC, digital transformation, data governance, sustainability, and customer experience remain unsystematically mapped. Third, the rapid development of artificial intelligence-based technologies has generated a variety of new themes with the potential to become research frontiers, but the identification of these themes remains limited. Furthermore, few studies have evaluated the patterns of collaboration among authors, institutions, and countries in shaping the development of knowledge on DPC. These limitations have led to a lack of understanding of the key actors, scientific collaboration networks, and the intellectual structures underlying the development of this research field. Therefore, an approach that systematically integrates various research dimensions is needed to generate a more comprehensive understanding of the development of knowledge in this field.

One approach that can address these needs is science mapping-based bibliometric analysis. This approach allows researchers to identify knowledge structures, intellectual relationships, collaboration patterns, thematic evolution, and future research directions through the analysis of scientific publications available in academic databases (M. Li et al., 2025; Yazdi et al., 2024; Zhai & Razali, 2023). Techniques such as co-occurrence analysis, co-authorship analysis, overlay visualization, and density visualization enable mapping of relationships between concepts, authors, institutions, and countries that contribute to the development of a particular research field. Furthermore, science mapping can identify emerging themes with the potential to become the focus of future research through the analysis of keyword evolution and knowledge networks (Dong et al., 2020). In the context of DPC and revenue optimization, the bibliometric approach is highly relevant because it can provide a comprehensive overview of how this field has evolved over the past few years. By utilizing scientific visualization techniques, research can uncover intellectual structures that have been scattered across various disciplines and industry contexts (Zhao et al., 2023). The results of this mapping will provide a significant contribution to researchers and practitioners in understanding the direction of scientific development and future research opportunities.

This research differs from previous studies in that it does not focus on examining the relationships between variables or evaluating DPC implementation in a specific industry. Instead, it seeks to map the development of global knowledge on DPC and revenue optimization using a science mapping-based bibliometric approach based on publications indexed in the Dimensions database during the period 2020-2025. The research's novelty lies in the integration of various bibliometric analysis techniques, encompassing publication trends, keyword networks, research theme evolution, author collaborations, institutional collaborations, and country collaborations, within a single, comprehensive analytical framework. This approach allows for the identification of research frontiers that have not been widely explored in previous studies. Furthermore, this research provides an empirical

overview of the key actors shaping the development of the DPC and revenue optimization fields globally. Thus, this research not only produces a knowledge map that illustrates the current state but also provides a scientific basis for developing a future research agenda. This uniqueness makes this research a significant theoretical and methodological contribution to the literature on strategic management, marketing, and digital transformation.

Based on the above description, this study aims to identify the knowledge structure, scientific collaboration patterns, thematic evolution, and research frontiers in the field of Dynamic Pricing Capability and Revenue Optimization through a science mapping-based bibliometric approach. This research is expected to provide a more comprehensive understanding of the development of global literature while uncovering themes that have great potential for future development. Academically, the research results will enrich the literature on DPC by presenting a macro perspective that has so far been limited. The research results can serve as a reference for organizations in understanding the direction of development of dynamic pricing strategies and revenue optimization in the era of digital transformation. Thus, this study seeks to bridge the gap between theoretical developments and managerial practices in the field of DPC. Based on these objectives, the formulation of this research problem is: What is the knowledge structure, scientific collaboration patterns, research theme evolution, and research frontiers in the study of Dynamic Pricing Capability and Revenue Optimization during the 2020-2025 period based on bibliometric analysis using the science mapping approach?

RESEARCH METHODS

This study uses a quantitative-descriptive approach with bibliometric analysis methods to map the development of science (Shofiyah et al., 2025) in the field of Dynamic Pricing Capability and Revenue Optimization. Bibliometric analysis was chosen because it can systematically identify publication development patterns, knowledge structures, relationships between scientific actors, and emerging research themes within a field of study (Donthu et al., 2021). The research focuses on scientific publications discussing "Dynamic Pricing Capability and Revenue Optimization" indexed in the DIMENSIONS database during the period 2020-2025. This period was selected based on the increasing academic attention to digital transformation, artificial intelligence, big data analytics, and the application of dynamic pricing strategies in various industrial sectors, which are driving the acceleration of research development in this field. The units of analysis in this study include scientific articles, authors, institutions, countries, and keywords contained in publication metadata. Through these units of analysis, the study can comprehensively describe the development of literature both in terms of scientific productivity and the intellectual structure of the field of study (Skute et al., 2019).

The research data source comes from the DIMENSIONS database with the search keywords "Dynamic Pricing Capability and Revenue Optimization." All publication metadata that meets the search criteria is exported in Comma Separated Values (CSV) format for

further processing in bibliometric analysis software. The data collection process is carried out in several stages (Donthu et al., 2021). The first stage is determining research keywords that specifically represent the study's focus. The second stage is a document search in the Dimensions database using predetermined keywords and a publication timeframe of 2020-2025. The third stage is data verification to ensure the completeness of metadata, including article title, author, institutional affiliation, country, keywords, and year of publication. The fourth stage is data cleaning to eliminate duplicate metadata and standardize terms with similar meanings, resulting in a dataset ready for analysis.

The main instruments used in this study were the DIMENSIONS database as a source of bibliographic data and VOSviewer software as a bibliometric network visualization tool. VOSviewer was chosen because of its ability to visualize relationships between bibliographic elements in the form of a network (*network visualization*), the evolution of research themes (*overlay visualization*), and the density of research themes (*density visualization*) (Sood et al., 2021). Furthermore, this software is capable of identifying research clusters based on relationships between keywords, authors, institutions, and countries. The analysis was conducted using the association strength normalization method, commonly used in bibliometric mapping, to measure the strength of relationships between elements in a research network (Skute et al., 2019). Through this approach, conceptual and collaborative linkage patterns in the fields of Dynamic Pricing Capability and Revenue Optimization can be identified more accurately.

The data analysis technique was conducted through seven complementary bibliometric visualizations (Sood et al., 2021). The first analysis was annual scientific production to identify the development of the number of publications each year during the research period. The second analysis was *keyword co-occurrence network visualization*, used to map the conceptual structure and relationships between research topics based on the co-occurrence of keywords. The third analysis was an *overlay visualization*, aimed at identifying the evolution of research themes and the emergence of new topics based on the time DIMENSION. The fourth analysis was *density visualization*, used to determine the level of research density on certain themes, thus identifying areas that have developed and areas that still have research opportunities. The fifth analysis was the co-authorship analysis to identify the most productive authors and collaboration patterns between researchers. The sixth analysis was a *co-authorship organization analysis*, used to map institutional collaboration networks in developing related research. The seventh analysis was the *co-authorship country analysis*, aimed at identifying contributions and cooperation patterns between countries in developing global knowledge in the fields of Dynamic Pricing Capability and Revenue Optimization.

The analysis results of the seven visualizations were then interpreted descriptively to identify the knowledge structure, dominant themes, scientific collaboration patterns, and emerging research frontiers in the literature (Skute et al., 2019; Sood et al., 2021). Interpretation was conducted by considering node size, link strength, cluster formation, and

color distribution in each visualization (Donthu et al., 2021). Through this procedure, this study produced a replicable and transparent scientific mapping that can be used as a basis for understanding the development of Dynamic Pricing Capability and Revenue Optimization research globally and identifying potential research opportunities for future development.

RESULTS of BIBLIOMETRIC ANALYSIS

1. Development Publication of Dynamic Pricing Capability and Revenue Optimization to 2020-2025

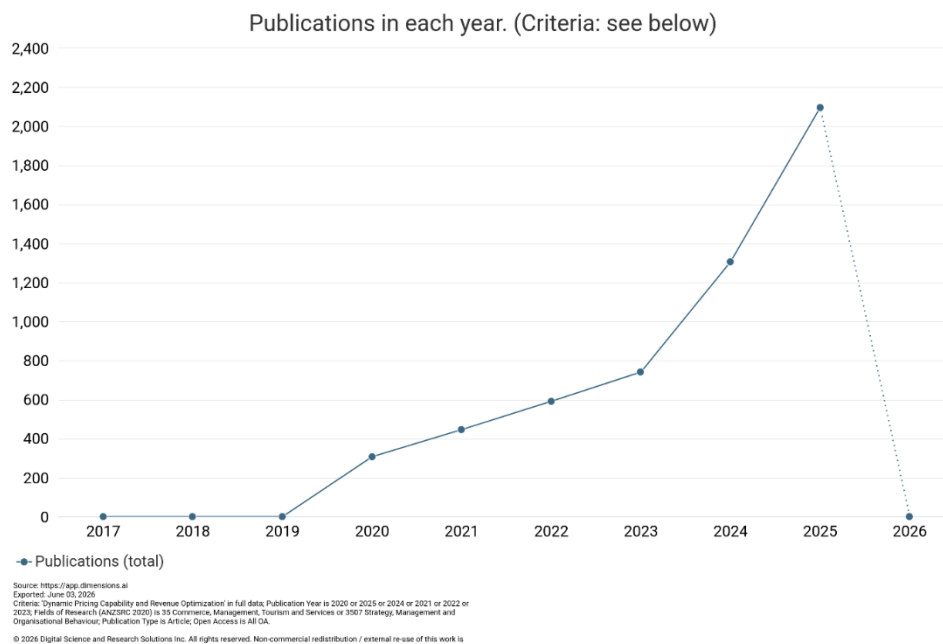


Figure 1. Development Publication of Dynamic Pricing Capability and Revenue Optimization to 2020-2025

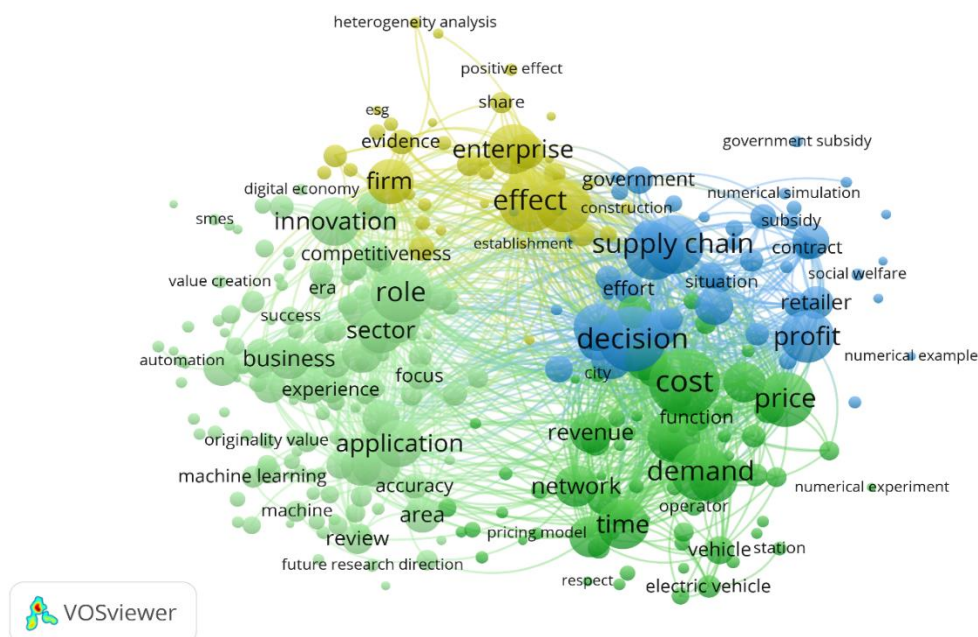
Analysis development publication shows that the study about *Dynamic Pricing Capability* and *Revenue Optimization* experienced very significant growth during the period 2020-2025. Based on the *Annual Scientific Production*, the total publication increased from around 300 documents in 2020 to more than 2,100 documents by 2025. The increase in the show existence improvement attention academic on pricing strategy dynamic, optimization revenue, digital transformation, and acquisition decision data -based in various sector industries. Relative growth consistent in the 2020-2023 period indicates phase consolidation knowledge, whereas a sharp surge in 2024 and 2025 shows phase expansion, very fast research. Phenomenon: This can be associated with increasing adoption of technology, including artificial intelligence, *machine learning*, *big data analytics*, and systems automation, making decisions in modern business practice. In addition, the development of the digital economy and business platforms based on data also pushes the need for studies related to optimizing prices and income. Thus, the field study can be categorized as an area of ongoing research that is developing rapidly (*rapidly growing research field*).

Table 1. Publication Trends Annual

No	Year	Amount Publication ($\pm$)
1	2020	310
2	2021	450
3	2022	595
4	2023	745
5	2024	1,310
6	2025	2,100

Table 1 presents the annual publication trend for the period 2020-2025, indicating significant and consistent year-on-year growth. The number of publications increased from 310 in 2020 to 2,100 in 2025, indicating a cumulative growth rate of approximately 577% over the five-year period. The sharpest increase occurred between 2023 and 2024, from 745 to 1,310 publications (an increase of approximately 76%), followed by a substantial increase of approximately 60% in the period 2024-2025. This growth pattern is accelerative, reflecting increased scientific productivity likely influenced by the expansion of online publication access, the increase in the number of active researchers, and increased research funding during this period.

2. Structure Conceptual Based on Network Visualization

**Figure 2. Analysis Network Visualization**

Analysis Network Visualization shows the automation structure of complex knowledge, with some keywords in a dominant role as the center of network research. Keywords that have the largest node size include decision, supply chain, effect, cost, demand, price, profit, enterprise, innovation, role, and application. The magnitude node size indicates the height frequency keyword occurrence in the literature. Keywords *decision* is one of the

A strong connection between keywords *cost*, *price*, *profit*, and *demand* shows that the main study is still related to search combination optimal price to maximize profit while managing market demand. On the other hand, the emergence of keywords *innovation*, *enterprise*, *digital economy*, and *machine learning* shows the integration between pricing strategies, dynamics with digital transformation, and innovative organizations. The structure of the network indicates that the field develops in a multidisciplinary way, involving perspectives on economic management operations, technology, information, and artificial intelligence.

heterogeneity analysis

positive effect

share

esg

evidence

enterprise

government subsidy

government

numerical simulation

construction

subsidy

contract

social welfare

retailer

profit

numerical example

price

demand

operator

vehicle station

electric vehicle

respect

time

pricing model

network

revenue

cost

function

city

decision

effort

situation

supply chain

establishment

effect

firm

digital economy

innovation

competitiveness

role

sector

success

business

automation

value creation

era

focus

experience

application

machine learning

accuracy

machine

area

review

future research direction

originality value

innovation

The Density Visualization results show that the research area with the highest density is marked by bright yellow, centered on the keywords effect, enterprise, firm, innovation, role, and evidence. The high density in this area indicates that most research still focuses on the impact of dynamic pricing strategy implementation on company performance and business value creation. This theme is at the core of the literature development because it is directly related to the question of the effectiveness of dynamic pricing in increasing organizational revenue and profitability.

High density was also found for the keywords innovation and firm, indicating that dynamic pricing is increasingly viewed as part of a company's innovative capabilities. Meanwhile, areas with medium density emerged for the keywords supply chain, decision, cost, price, and profit. This finding suggests that research is beginning to move toward a more operational and analytical approach, particularly in the context of data-driven business decision optimization. On the other hand, several keywords, such as electric vehicle, government subsidy, numerical simulation, and social welfare, remain in areas with lower density. This condition indicates that these themes still have ample room for development as future research agendas.

4. Evolution of Research Themes Based on Overlay Visualization

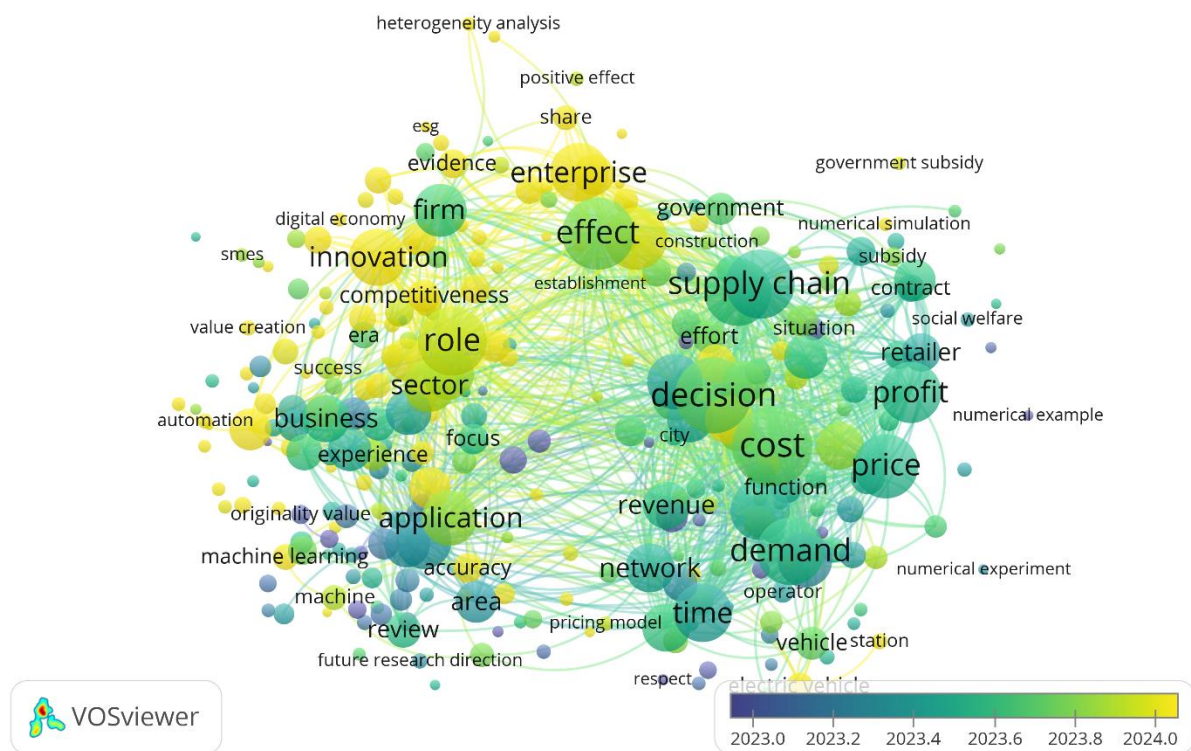


Figure 4. *Evolution of Research Themes Based on Overlay Visualization*

Overlay Visualization analysis was used to identify the temporal development of research themes throughout the analysis period. Blue indicates relatively early themes, while yellow indicates more recent themes. The visualization results show that keywords such as decision, supply chain, profit, and retailer tend to emerge in the early phases of research development. These themes are widely used in studies focusing on price optimization in supply chains, inventory management, and economic decision-making.

Over time, the research focus has shifted toward more strategic and technology-based themes. Keywords such as innovation, enterprise, effect, evidence, share, heterogeneity analysis, and digital economy appear in shades closer to yellow, indicating that these themes

developed in a more recent period. This change indicates a paradigm shift from research focused on operational optimization to studies emphasizing digital transformation, organizational capabilities, and the strategic impact of dynamic pricing on a company's competitive advantage.

The overlay findings also indicate that the integration of dynamic pricing, innovation, and the digital economy is one of the fastest-growing research frontiers. Furthermore, the growing attention to heterogeneity analysis indicates that researchers are beginning to consider differences in industry, organizational, and customer characteristics when evaluating the effectiveness of dynamic pricing strategies.

5. Analysis Collaboration Author (Co-Authorship Author Analysis)

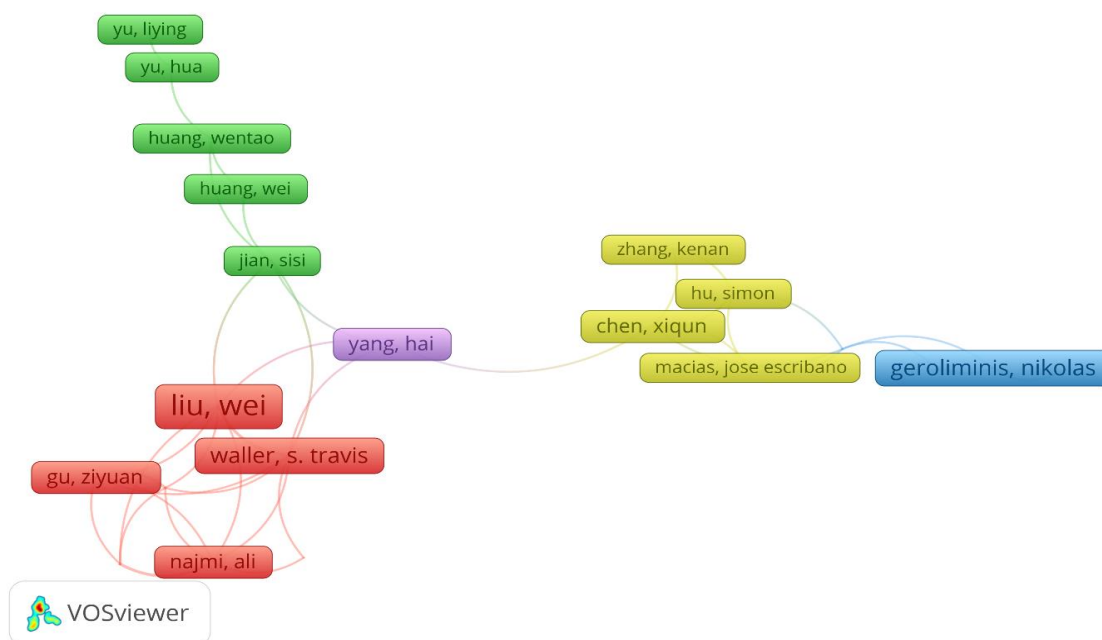


Figure 5. Analysis Collaboration Author

The visualization of author collaborations shows that the collaborative network of researchers is still structured around several small, relatively separate clusters. Authors with central positions in the network include Liu Wei, Jian Sisi, Yang Hai, Chen Xiqun, Hu Simon, and Geroliminis Nikolas. The presence of several loosely connected clusters suggests that research in this field is still developing within specific academic communities and has not yet been fully integrated at the global level.

The cluster led by Liu Wei demonstrates quite intensive collaborative relationships with Gu Ziyuan, Najmi Ali, and Waller S. Travis. Meanwhile, another cluster developed around Chen Xiqun and Hu Simon, who have connections with Zhang Kenan and Macias Jose Escribano. These findings suggest that knowledge development is still influenced by certain research groups specializing in specific themes such as pricing optimization,

transportation, or supply chain analytics. This situation opens up opportunities to expand cross-group collaboration to accelerate knowledge integration and generate more comprehensive research innovations.

6. Analysis Collaboration Institution

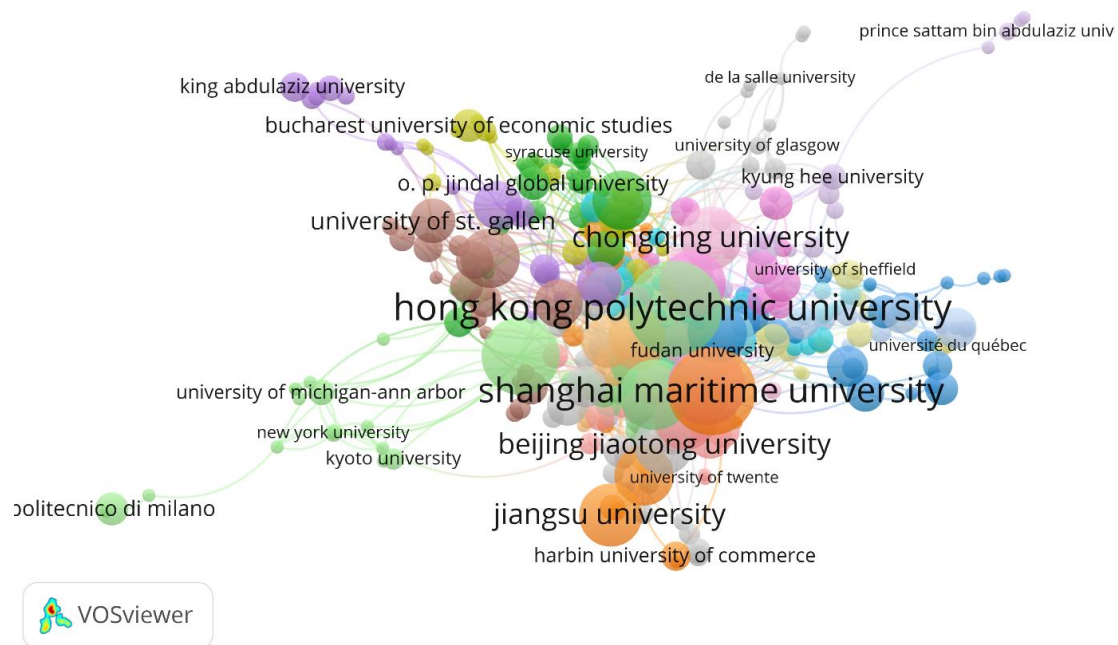


Figure 6. Analysis Collaboration Institution

Co-authorship organization analysis shows that several universities play a dominant role in the development of Dynamic Pricing Capability and Revenue Optimization research. The institutions with the largest node sizes include Hong Kong Polytechnic University, Shanghai Maritime University, Chongqing University, Jiangsu University, and Beijing Jiaotong University. The large node size indicates the high productivity and intensity of these institutions' collaboration in this research field.

Hong Kong Polytechnic University is seen as the center of an institutional network connecting universities in Asia, Europe, and North America. This central position demonstrates the institution's crucial role in shaping the development of global knowledge regarding dynamic pricing and revenue optimization. Furthermore, the dominance of Chinese institutions indicates that China is a major center for research in this field. The involvement of institutions such as the University of St. Gallen, the University of Glasgow, Kyung Hee University, and the University of Michigan demonstrates that research has progressed through extensive international collaboration. However, a number of institutions remain peripheral, leaving ample opportunities for strengthening international cooperation.

7. Analysis State Collaboration

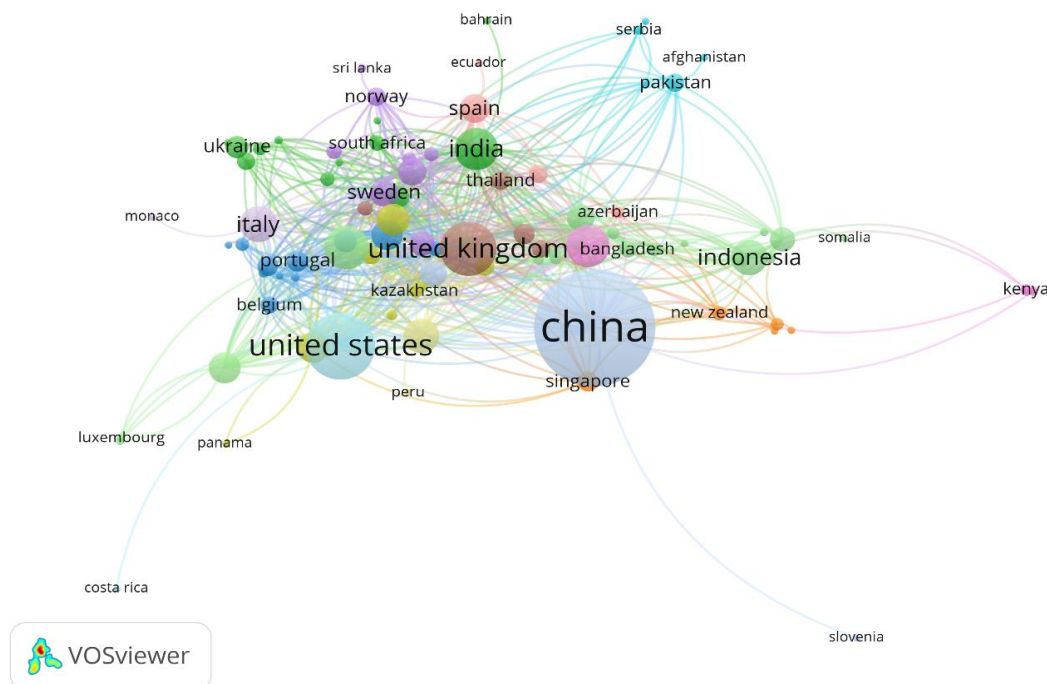


Figure 7. *Analysis State Collaboration*

The results of the co-authorship country analysis show that China is the country with the greatest contribution and influence in Dynamic Pricing Capability and Revenue Optimization research. This is evident in the size of China's nodes, which are more dominant than those of other countries. Besides China, other countries with significant contributions are the United States, the United Kingdom, India, Italy, Indonesia, Sweden, and Spain.

China's position as a network hub demonstrates both its high publication productivity and the breadth of international collaborations. Strong ties between China and the United States, the United Kingdom, India, and Indonesia indicate cross-border knowledge exchange, contributing to the accelerated development of this research field. Interestingly, Indonesia also emerged as one of the countries with relatively well-connected international networks, particularly with Asian and European countries. These findings demonstrate that research on dynamic pricing and revenue optimization has evolved into a global issue involving various geographic regions.

Overall, the country collaboration network shows that the centers of scientific development are still dominated by countries with high research capacity, particularly China and the United States. However, an increasing number of developing countries are starting to actively contribute, making the global collaboration structure more diverse and inclusive.

8. Synthesis Findings Bibliometrics

Based on all the visualizations, research on Dynamic Pricing Capability and Revenue Optimization develops through four major themes. First, the theme of optimizing pricing decisions and profitability is represented by the keywords "decision," "price," "profit," and

"cost." Second, the theme of supply chain and demand management, which focuses on supply chain coordination and demand management. Third, the theme of organizational capability and innovation, reflected by the keywords "enterprise," "firm," "innovation," and "role." Fourth, the theme of digital transformation and intelligent technology, demonstrated by the emergence of keywords "digital economy," "machine learning," and "application."

Furthermore, the overlay analysis shows that the latest developments are moving toward integrating dynamic pricing with the digital economy, organizational innovation, artificial intelligence, and heterogeneity analysis. Therefore, these themes can be categorized as research frontiers with the potential to dominate research developments in the coming period. This finding confirms that dynamic pricing is no longer understood solely as a pricing technique, but rather as a strategic capability integrated with digital transformation, data-driven decision-making, and the creation of sustainable competitive advantage.

Discussion

The research question is: What are the knowledge structures, scientific collaboration patterns, research theme evolution, and research frontiers in the Dynamic Pricing Capability and Revenue Optimization study during the 2020–2025 period based on bibliometric analysis using a science mapping approach?

Based on the results of the bibliometric analysis, it can be stated that the knowledge structure in the fields of Dynamic Pricing Capability (DPC) and Revenue Optimization (RO) is built by four main clusters: price and profitability optimization, supply chain and demand management, organizational capabilities and innovation, and data-driven digital transformation. The pattern of scientific collaboration reveals the dominance of certain research groups and institutions, which are concentrated primarily in China, the United States, and several European countries. The evolution of research themes reveals a shift from an operational focus, such as price, cost, and demand management, to more strategic issues, including organizational innovation, digital transformation, artificial intelligence, and the digital economy. Meanwhile, research frontiers emerging during the 2020–2025 period include the integration of DPC with artificial intelligence, machine learning, the digital economy, data analytics, the platform economy, and strategic innovation. These findings indicate that the field of DPC and RO research has evolved from the traditional approach to revenue management to a broader perspective as a strategic organizational capability that supports the creation of sustainable competitive advantage. Thus, the research problem formulation can be answered explicitly: the development of the DPC and RO literature demonstrates a highly dynamic conceptual, methodological, and practical transformation in the context of global digital transformation.

Dynamic Pricing Capability as Capability Organizational Dynamics

One of the key findings of this study is the dominance of keywords such as enterprise, firm, innovation, role, and effect in network visualizations and theme density. These findings indicate that DPC is no longer understood solely as a pricing adjustment technique but has

evolved into a strategic organizational capability. These findings align with the dynamic capabilities perspective, which emphasizes a company's ability to sense, seize, and transform to constantly changing market opportunities (Ifekanandu & Ihuoma, 2024; Wong & Ngai, 2021; Zhang, 2024). In this context, dynamic pricing capabilities enable organizations to identify changes in demand, respond quickly to customer behavior, and continuously adjust business strategies.

The dominance of themes related to enterprise and innovation also indicates that recent research is beginning to link DPC to long-term value creation. This finding expands the traditional view that has positioned revenue management solely as an operational tool for increasing revenue. Instead, recent research views DPC as a strategic resource that enables companies to increase flexibility, adaptability, and competitiveness in uncertain business environments. Therefore, DPC can be positioned as a form of dynamic capability that contributes to organizational sustainability in the digital era.

Furthermore, these findings demonstrate that companies capable of integrating analytical technology, information systems, and pricing strategies have a greater chance of maintaining a competitive advantage than those still using conventional pricing approaches. In other words, DPC has transformed from a tactical function into a strategic capability that determines an organization's success in navigating the dynamics of the global market.

Evolution from Traditional Revenue Management towards Digital Revenue Optimization

The overlay visualization results indicate a shift in research themes from keywords focused on price, cost, demand, and profit to themes related to innovation, the digital economy, heterogeneity analysis, and enterprise. This shift demonstrates a significant conceptual evolution in the fields of DPC and RO. Early literature often positioned revenue management as a pricing and capacity optimization mechanism in the hospitality, aviation, and service industries, which are characterized by limited capacity (Akhiljyoth & Vinod, 2021; Herath et al., 2023; Wheeler, 2021). However, the development of digital technology has expanded its scope of application to various economic sectors.

The findings of this study indicate that the concept of revenue optimization is increasingly linked to digital transformation. Companies no longer rely solely on historical data but instead utilize real-time data, predictive algorithms, artificial intelligence, and machine learning to generate more accurate pricing decisions. These results support the arguments of Chen & Xu (2023), Alam & Shabbir (2024), and Johnson et al. (2024), who stated that technological advancements have transformed revenue management practices into more complex, data-driven decision-making systems.

These changes have significant implications for organizations. While in the past, revenue optimization success depended on the ability to manage capacity and customer segmentation, today, success is increasingly determined by the ability to manage data, develop predictive algorithms, and integrate multiple sources of information into the decision-

making process. Thus, the evolution toward digital revenue optimization demonstrates that technology has become a central factor in the development of this field.

Supply Chain and Demand Management as Foundation Knowledge

Network visualization shows that supply chain and decision are two key terms central to the knowledge structure of DPC and RO. These findings demonstrate that dynamic pricing strategies are inseparable from supply chain management and demand management. These results support various studies emphasizing the importance of integrating price, capacity, and inventory in achieving revenue optimization (Chen & Xu, 2023; Tsai & Chang, 2022; Wong & Ngai, 2021).

In the context of the supply chain, dynamic pricing serves as a coordination mechanism that allows companies to adjust prices based on inventory conditions, production capacity, logistics costs, and demand fluctuations (Pourmohammad-Zia et al., 2025). Therefore, the success of DPC is determined not only by marketing strategy but also by an organization's ability to manage operations efficiently and the supply chain (Kopalle et al., 2023). This finding explains why many recent studies link DPC with supply chain analytics, digital logistics, and inventory optimization.

Furthermore, the dominance of the demand management theme indicates that demand management remains at the heart of dynamic pricing strategies. Price is used not only as a tool to increase revenue but also as an instrument to direct customer behavior and optimize capacity utilization. Thus, the relationship between DPC, supply chain, and demand management demonstrates that dynamic pricing strategies have a multidimensional function that simultaneously involves marketing, operations, and technology.

Research Frontiers: Artificial Intelligence, Digital Economy, and Innovation

One of the key contributions of bibliometric analysis is its ability to identify research frontiers. Based on the overlay visualization, some of the fastest-growing themes include the digital economy, innovation, machine learning, artificial intelligence, and heterogeneity analysis. The emergence of these themes suggests that future research directions will increasingly be dominated by the integration of intelligent technology with dynamic pricing strategies.

Artificial intelligence is a crucial frontier because it enables companies to develop automated pricing systems that continuously learn from market behavior (Abrardi et al., 2022). Machine learning enables predictive models to become more accurate in estimating demand and price elasticity (Ban & Keskin, 2021). Meanwhile, the digital economy is creating a new business environment that demands more flexible pricing strategies that are responsive to market changes. These findings align with the arguments of Gatera (2024), Onita & Ochulor (2024), and Johnson et al. (2024) regarding the increasing role of technology in modern revenue optimization practices.

Furthermore, the innovation theme demonstrates that research is no longer solely focused on increasing revenue, but also on how DPC can drive organizational innovation.

From this perspective, dynamic pricing is seen as a mechanism that helps companies create new value through business model adaptation, digital service development, and the exploration of broader market opportunities (Kwon et al., 2020). Therefore, the current research frontier is moving toward the integration of technological capabilities, organizational innovation, and digital business strategy.

Significance Scientific and Contribution Theoretical

Theoretically, this study makes an important contribution by demonstrating that DPC and RO have evolved into a multidisciplinary research domain linking theories of dynamic capabilities, revenue management, digital transformation, and supply chain management. These findings expand the literature, which previously tended to discuss DPC only partially within the context of marketing or operations. Using a bibliometric approach, this study successfully demonstrates the interconnections between the various theoretical perspectives that shape the field's knowledge structure.

The second theoretical contribution is the identification of the evolution of research paradigms. The results demonstrate a shift from a price optimization-based approach to an organizational capability-based approach and digital transformation. This shift demonstrates that DPC is no longer merely an operational tool but rather a strategic capability that influences organizational competitiveness. Thus, this research enhances understanding of how organizations create value through the integration of technology, data, and pricing strategies.

The third theoretical contribution is the identification of research frontiers that can form the basis for future theory development. Themes such as artificial intelligence, the digital economy, and innovation present significant opportunities for developing new conceptual models that link DPC to organizational transformation and digital value creation.

Academic Implications

From an academic perspective, the results of this study provide a knowledge map that researchers can use to understand the intellectual structure of the DPC and RO fields. Identification of research clusters, dominant themes, and collaboration patterns allows researchers to determine their research's position within the broader scientific landscape. Furthermore, identifying research frontiers can help researchers select topics with high relevance and the potential for significant contributions.

This research also demonstrates the importance of a multidisciplinary approach in studying DPC. The close relationship between dynamic pricing, supply chain, artificial intelligence, and digital transformation suggests that future research needs to integrate multiple theoretical perspectives to generate a more comprehensive understanding. Therefore, cross-disciplinary collaboration is crucial for the development of this field.

Limitations Study

Despite producing important findings, this study has several limitations. First, the analysis used only the Dimensions database, so there may be relevant publications not

indexed in that database. Second, the study used a bibliometric approach that focused on publication metadata, thus preventing an in-depth evaluation of the theoretical substance of each article. Third, the analysis period was limited to 2020-2025, so research developments prior to that period were not included in the mapping.

Furthermore, the interpretation of network visualizations is subject to a certain degree of subjectivity, as it depends on the parameter configuration and clustering process used in the VOSviewer software. Another limitation is the lack of citation and co-citation analysis, which could provide a more in-depth picture of the intellectual structure and knowledge base of the research field. Therefore, future research is recommended to combine more diverse databases, expand the analysis period, and integrate additional bibliometric techniques such as co-citation analysis, bibliographic coupling, and thematic evolution analysis to produce a more comprehensive mapping.

CONCLUSION

This study aims to identify the knowledge structure, patterns of scientific collaboration, the evolution of research themes, and research frontiers in the study of Dynamic Pricing Capability (DPC) and Revenue Optimization (RO) through a science mapping-based bibliometric approach to publications indexed in the Dimensions database during the period 2020-2025. The analysis results show that this research field experienced very rapid publication growth, especially in the period 2024-2025, indicating increasing academic attention to dynamic pricing strategies and revenue optimization in the era of digital transformation. The formed knowledge structure shows the existence of four main theme groups: price and profitability optimization, supply and demand chain management, organizational capabilities and innovation, and data-driven digital transformation. These four groups form a conceptual foundation that explains how DPC has evolved from a traditional revenue management approach to a more strategic and multidisciplinary perspective. These findings indicate that research on DPC and RO is no longer limited to price and capacity management but has evolved into a vital part of organizational strategy in creating sustainable competitive advantage.

From the perspective of scientific collaboration, this study found that knowledge development is still dominated by a select group of researchers, institutions, and countries with high productivity and strong collaborative networks. China emerged as the country with the largest contribution to the development of DPC and RO research, followed by the United States, the United Kingdom, India, Italy, and several other countries. At the institutional level, major universities, especially those from Asia, play a central role in shaping global research networks. Meanwhile, the authors' collaboration analysis shows that the research community still develops in several relatively separate clusters, so opportunities for strengthening cross-institutional and cross-national collaboration remain wide open. These findings suggest that the development of DPC and RO fields is strongly influenced by research capacity, access to digital technology, and the ability to build sustainable international collaborations.

Analysis of the evolution of research themes reveals a significant shift in focus over the research period. Initially, research focused primarily on operational issues such as pricing, costs, demand, profitability, and supply chain management. However, with the advancement of digital technology, the research focus shifted to more strategic themes such as organizational innovation, the digital economy, artificial intelligence, machine learning, and data-driven analytics. This shift demonstrates that DPC is increasingly understood as a strategic capability that enables organizations to adapt to changing business environments quickly and effectively. Thus, the research evolution identified through bibliometric analysis demonstrates a paradigm shift from an operational approach to a capability-based approach and digital transformation.

The main contribution of this research lies in its ability to systematically map the development of science in the fields of DPC and RO and identify future research directions. Based on the results of overlay visualization and density visualization, themes such as artificial intelligence, digital economy, innovation, machine learning, heterogeneity analysis, and the integration of dynamic pricing with digital platforms can be categorized as research frontiers with great potential for development in the coming years. Therefore, further research is recommended to explore the relationship between DPC and digital transformation, artificial intelligence, business sustainability, data governance, and organizational value creation in various industry contexts. Furthermore, the use of a broader database and a combination of bibliometric methods such as co-citation analysis, bibliographic coupling, and thematic evolution analysis can produce a more comprehensive mapping. Thus, this research not only provides an overview of the current state of the DPC and RO fields but also provides a strong scientific foundation for developing a future research agenda in the increasingly dynamic digital economy era.

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