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SLOW MOVING PRODUCT IN RETAIL INDUSTRY: A BIBLIOMETRIC ANALYSIS OF ISSUE AND CHALLENGE

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ABSTRACT
This study investigates the phenomenon of slow-moving products in retail, which is an area of great concern because of its implications on the management of inventory, the profitability of retail, and the sustainability of the business. Even though researchers have managed to shed light on retail dynamics, only a few have researched the implications of turnover for the slow-moving stock. Thus, this study intends to address this issue by examining the literature on slow-moving products in terms of authorship, focus countries, trending keywords, and research focus over the years. Employing Scopus Analyzer and VOSviewer software, 1,036 documents were examined to determine publication trends, influential countries in the field, and networks of co-authorship spanning 1963 to 2024. The analysis pointed to the fact that the number of publications after 2010 increased significantly, and this was after the introduction of data analytics and optimization techniques that address the issues of slow-moving inventory. It emerged that the United States, China, and several European countries dominate this field owing to a strong global collaborative network. In conclusion, the study established that the research on slow-moving products has evolved from the uni-dimensional focus towards multifaceted dimensions that include technology, supply chain, and environmental responsibility. These findings highlight the critical role of international collaboration and interdisciplinary approaches in addressing the complexities of slow-moving inventory in the retail industry. The insights generated by this analysis provide a foundation for future research and practical applications in inventory and supply chain management, as well as sustainable retail practices.

1. INTRODUCTION

Slow-moving products in the retail industry are a big problem for businesses because they take up valuable shelf-space and use capital that could be better used in other places. Slow-moving products are those that experience low demand or sales levels and have high turnover inventory. These types of products may be shelf-stable. Grocery retailers can deal with this through coordination with their suppliers, which includes ensuring that products are delivered fresh and losses are minimized. Centralized control and information sharing between supply chain members often result in the improvement of the management of these products because such a system aligns the goals and also operational decisions are made better (Ketzenberg & Ferguson, 2008). In the inventory management scenario, slow-moving items are frequently such that for a long time, there is no sale, and then suddenly customers come in for a high volume. The fact that the items have irregular demand patterns means that a model must be designed that is robust enough to capture the demand pattern, and optimal stock levels should be maintained. Techniques like the generalized hurdle negative binomial model and worst-case non-parametric models have been suggested to deal with these problems. Therefore, they are the ones suitable for such an inventory system (Hahn & Leucht, 2015). Besides, other new forms, such as product matching and bundling, can be utilized to get rid of old stock, creating enough space and money that can be channeled toward excitingly profitable products (Nor *et al.,* 2023).

Consumer decision-making for slow-moving products is also influenced by the rise of multi-channel retailing, where retailers use a combination of online and offline channels to reach customers. This approach can enhance the shopping experience and drive sales by providing consumers with multiple touchpoints and purchasing options. For example, offering discounts for online purchases when in-store inventory levels are low can help retailers manage stock more effectively and reduce overall costs (Gabor *et al.,* 2021). Understanding the nuances of consumer behavior in a multi-channel environment is crucial for retailers aiming to optimize their strategies for slow-moving products and remain competitive in the market (Ewerhard *et al.,* 2019).

2. LITERATURE REVIEW

The retail industry suffers a lot due to unsalable goods that are difficult to sell, and thus, the efficiency of inventory and financial results deteriorate. According to Kumar *et al.* (2019), it aims to understand how shelf planning and object classification are useful in increasing inventory accuracy and operational efficiency. They propose monitoring assets, such as the YOLO V8 model, which in turn has better detection accuracy and can redistribute resources as desired.

Simultaneously, (Iles, 2007) and (Anitha & Patil, 2021) focus on sustainability and supply chain optimization, which are key aspects required to face inefficient inventory. On the other hand, Iles (2007) specifies sustainability practices in the UK and US food retail sectors. It shows that if accountability systems are well-designed, they can be incorporated into large sustainability initiatives to better manage slow-moving inventory. (Anitha & Patil, 2021) adhere to this same approach by insisting on the fact that it is mostly through efficient transport networks that the costs linked to such products, which are typically slow-moving, can be minimized. New technologies are critical in controlling slow-moving merchandise, facilitating a faster

movement of items in retail. (Leung & Chan, 2020) discuss the implementation of AI-based chatbots to control customer interactions, which are expected to further contribute to the sales of products that are slow-moving in nature by providing better product recommendations and consequently enhancing the likelihood of purchase. (Vats & Anastasiu, 2023) concentrate on automated checkout systems to reduce operational problems, including those produced by inventory with high slow-movement risks.

Likewise, Wicaksono and others (2024) propose a dynamic hybrid optimization model for solving the issues of uncertainty in inventory and production planning to a large extent, especially after the COVID-19 era. This model, which employs probabilistic and fuzzy techniques, projects profit maximization by effectively managing the parameters that are mostly responsible for the slow movement of inventories, thus benefiting the retailers that are faced with such problems. In addition, the increasing complexity of multichannel retailing also comes in. (Metters & Walton, 2007) explain how traditional economics models and online channels deviate in demand and inventory management. Therefore, making the control of slow-moving products complicated. (Jin & Shin, 2020) point out the disruptive effects of the newly developed business models on inventory management and the finding that AI-driven demand prediction can be used to overcome the problem of unstable demand. (Hu *et al.,* 2020) discuss the fact that the OMO models employed by Chinese retailers for the integration of online and offline channels turned on opportunities and operational challenges in the inventory field (especially for the slow-moving stock) in the same band. The formation of these types of models highlights the requirement for the use of more flexible methods for inventory control in multichannel retailing, where slow-moving products, on the other hand, are often at risk of becoming obsolete. The approach or strategy of warehouse management is equally vital in minimizing the problems that are associated with this slow-moving stock. Acevedo-Aybar *et al.* (2024) demonstrate that Lean-BPM methodologies, integrated with the 5S method and ABC analysis, among others, can increase efficiency in the warehouse and also lower customer suffering due to postponed deliveries or incomplete orders.

Aryza *et al.* (2024) further this by proposing a strategic distribution network model to minimize costs while enhancing supply chain efficiency. Their approach focuses on optimizing warehouse operations and inventory handling, which is essential for controlling slow-moving stock. Additionally, Montoya & Flores (2021) discuss how resilient supply chains can help overcome disruptions caused by global events like COVID-19, which have intensified the challenges of managing slow-moving inventory. Inefficient inventory management has been identified to cause both psychological and economic effects on customer satisfaction. In this regard, Premathilaka *et al.* (2019) examine queuing in retail stores and the implications for customer satisfaction. The results indicated that ineffective management of queues may lead to dissatisfaction among customers and a reduction in overall sales, especially for slow-moving items. Oh (2020) further supports this by indicating that customers' online reviews can explain how to manage inventories, including slow-moving products, through customer preference analyses. These insights show the importance of aligning inventory with the expectations of a customer to reduce slow-moving stock and improve overall satisfaction. Overall, this important literature underlines multifaceted challenges regarding managing slow-moving products in retail management by drawing attention to the main trends related to technological

adoption, supply chain optimization, and multichannel retailing. Meanwhile, partial steps have been taken to integrate AI, machine learning, and sustainable practices into slow-moving stock. Areas of improvement are still there for its holistic integration across different retail models. Future studies should be directed toward the development of hybrid models that will integrate advanced predictive analytics with sustainable practices for the effective management of slow-moving products. Furthermore, investigating the psychological effect of slow-moving inventory on customer satisfaction can provide additional insights into responsive retailing environments.

3. RESEARCH QUESTIONS
   a. What are the research trends for slow-moving products in the retail industry according to the year of publication?
   b. Who and how much has been published in the area with regard to the author?
   c. Who are the top 10 authors based on citation by research?
   d. What are co-authorship countries' collaboration?
   e. What are the popular keywords related to the study?

4. METHODOLOGY
It involves the collection, processing, and analysis of bibliographic data from scientific publications, according to Alves *et al.* (2021), Assyakur & Rosa (2022), and Verbeek *et al.* (2002). It includes general descriptive statistics, such as identifying publishing journals, publication years, and main authors (Wu & Wu, 2017), as well as more complex techniques, such as document co-citation analysis. The literature review is an iterative process necessary to identify relevant keywords, search the literature, and analyze it in depth to build a comprehensive bibliography that yields reliable results. Fahimnia *et al.* (2015) conducted a successful literature review. This study targeted publications from the highest ranks since the valuable insights provided by top publications into the theoretical grounds shaping the field are indispensable. Data collection was conducted using the SCOPUS database on account of its reliability, as considered by Al-Khoury *et al.,* 2022; di Stefano *et al.,* 2010; Khiste & Paithankar, 2017. Ensuring quality, only rigorously peer-reviewed academic journals were inducted, while books and lecture notes were excluded, as considered by Gu *et al.,* 2019. Thus, publications from 2020 until December 2023 were identified using Elsevier's Scopus database due to its renowned comprehensive coverage.

4.1 Data search strategy
Advanced searching in the Scopus database is a great facility that allows researchers to execute very specific queries to achieve the information needed for research purposes. Unlike basic searches, which tend to rely on simple keywords, advanced searching utilizes a combination of different fields and Boolean operators with some specialized codes to filter search results in a highly effective manner. Parameters such as author names, document types, publication years, journal names, and keywords can be set. It is especially useful to manage large datasets or find very specific research studies as this would decrease the number of irrelevant results and increase the likelihood of correct and relevant documents. Tables 1 and 2 show examples of keyword searching and inclusion and conclusion criteria developed.

Table 1: The search string

Scopus	TITLE-ABS-KEY (retail AND industry AND product AND challenge OR issue) AND (LIMIT-TO (LANGUAGE, "English")) AND (EXCLUDE (PUBYEAR, 2025)).

Table 2: The selection criterion is searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	1963-2024	>2025

4.2 Data Analysis

VOSviewer is a user-friendly bibliometric software developed by Nees Jan van Eck and Ludo Waltman of Leiden University, Netherlands (van Eck & Waltman, 2010, 2017). Used quite often in the visualization and analysis of scientific literature, this tool has been particularly good at creating intuitive network visualizations, clustering related items, and generating density maps. Its flexibility allows for the analysis of co-authorship, co-citation networks, and keyword co-occurrence networks, hence providing the researcher with a wide research environment. The exciting interface, together with the regularly updated feature, makes navigation through large datasets efficient and dynamic. VOSviewer can be used to easily calculate metrics, create customized visualizations, and read bibliographic data from various sources, which really makes it a useful tool for making sense of complex research topics.

One of the striking features of VOSviewer is that it can import large and complex bibliometric datasets and convert them to visually accessible maps and charts. Focusing on network visualization, the software has proven skillful at clustering related items, studying patterns of keyword co-occurrence, and generating density maps. Its friendly interface is, of course, an advantage for users, letting even a newcomer to the research environment easily navigate its features. VOSviewer is in constant development, staying at the forefront of bibliometric analysis by adding valuable insight through the computation of metrics and by offering customizable visualizations. Its adaptability to various types of bibliometric data makes it a versatile tool, indispensable for scholars seeking deeper understanding and meaningful insights within their research domains, including co-authorship and citation networks.

Datasets containing information on publication year, title, author, journal, citation, and keywords in PlainText format were retrieved from the Scopus database for the time period ranging from 1963 to 2024. These datasets were then analyzed using VOSviewer software version 1.6.19. By applying VOS clustering and mapping techniques, this software enabled the exploration and development of visualizations. As an alternative to the MDS methodology, VOSViewer provides the specialization in placing objects within low-dimensional spaces, thereby ensuring that the proximity between any two objects precisely represents their relation and similarity (van Eck & Waltman, 2010). In this regard, VOSViewer shares a commonality with the MDS methodology (Appio *et al.,* 2014). Unlike MDS, which mainly covers the calculation of the similarity indexes such as cosine and Jaccard indices, VOS applies a more

appropriate scheme of normalizing the co-occurrence frequencies by using association strength (ASij), calculated as follows (Van Eck & Waltman, 2007):

$$AS_{ij} = \frac{c_{ij}}{w_i\,w_j},$$

which is "proportional to the ratio between the observed number of cooccurrences of i and j and the expected number of co-occurrences of i and j under the assumption that co-occurrences of i and j are statistically independent" (Van Eck & Waltman, 2007).

5. RESULTS AND DISCUSSION

5.1 What are the research trends for Slow-Moving Products in the Retail Industry according to the year of publication?
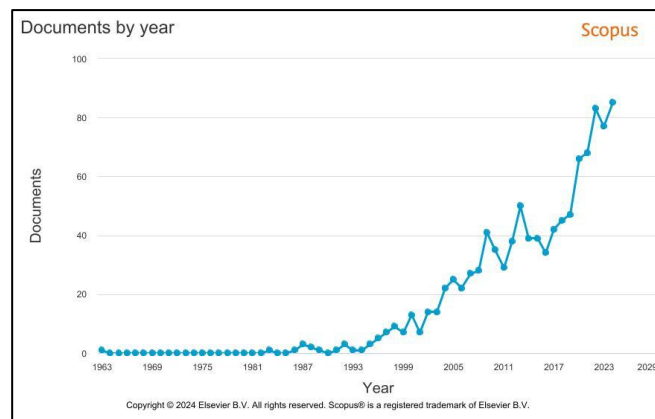
Figure 1: Plotting document publication by years

The trend of publications, as shown in the data from Scopus on the topic of slow-moving products in the retail industry from 1963 to 2024, points toward a great surge in academic interest during the last couple of decades. From 1963 until around the early 2000s, the number of documents published remained relatively low and quite stable in nature, with only minor ups and downs and few spikes of activity. This may have been due to a narrow focus on the problem of slow-moving merchandise in the retail industry or a lack of available data and analytics methods at that time period. Nevertheless, after peaking in the mid-2000s, an upward trend is discernible, indicating growing awareness of the importance of this subject in regard to retail effectiveness, inventory control, and profitability.

From 2010 onwards, the publication rate speeds up drastically, especially after 2018, with the highest point in the last few years. The recent steep increase in the number of documents shows growing scholarly and practical interest in tackling slow-moving product problems, likely due to the availability of more advanced data analytics, machine learning, and optimization methods. The retail industry is increasingly under pressure to maximize shelf-space usage and reduce waste, which may have contributed to the quite visible growth of research output. In 2024, it will be evident that this area has generated quite a lot of interest, considering the number

of publications coming close to 100. Hence, it has been an indispensable part of research in both industrial and scholarly circles.

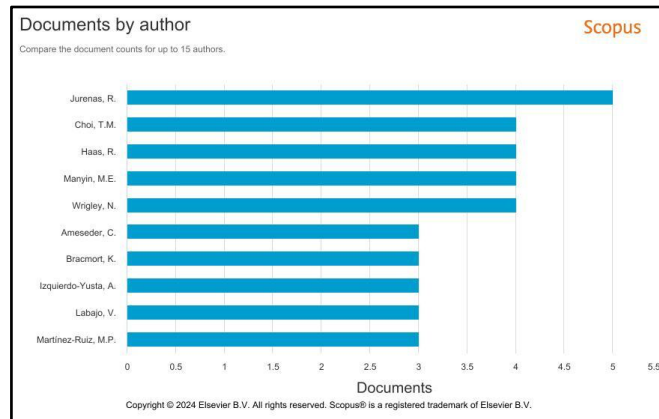**5.2 Who and how much has been published in the area with regard to the author?**

Figure 2: Top 10 authors by document count in research on issue and challenge product in retail industry

Table 3: Top 10 authors based on citation by research

Author Name	Number Of Document	Percentages (%)
Jurenas, R.	5	0.483
Choi, T.M.	4	0.386
Haas, R.	4	0.386
Manyin, M.E.	4	0.386
Wrigley, N.	4	0.386
Ameseder, C.	3	0.290
Bracmort, K.	3	0.290
Izquierdo-Yusta, A.	3	0.290
Labajo, V.	3	0.290
Martínez-Ruiz, M.P.	3	0.290

Figure 2 depicts the contributions of different authors in the "Slow-Moving Product in Retail Industry" domain by considering the number of documents published by each author. Jurenas, R. stands out as the most prominent author for having had five publications, which indicates a huge commitment to this area of study. This suggests that Jurenas may be a key researcher whose work could provide foundational or cutting-edge insights into the challenges associated with slow-moving products in retail. Following Jurenas, authors like Choi, T.M., Haas, R., and Manyin, M.E., each with four publications, also contribute substantially to the knowledge base. Their frequent publications suggest they maintain active research efforts, probably developing theoretical frameworks, case studies, or empirical analyses that advance the understanding of inventory management and efficiency within a retail setting.

The next generation of authors, Wrigley, N., Ameseder, C., and Bracmort, K., each has three publications. Their publishing activity is slightly lower, but it still represents a high volume of engagement on the topic. The areas of specialization under such authorship probably center around specialized aspects or explicit problems in the field that perhaps include demand forecasting, shelf-space optimization, or profitability impacted by slow-moving goods. These researchers contribute individually to advancing the field with diverse perspectives and focus on different aspects of managing slow-moving products, thereby filling gaps in existing literature or presenting new methodologies. In addition, several authors within this study have more than one publication, such as Izquierdo-Yusta, A., Labajo, V., and Martínez-Ruiz, M.P., which helps to emphasize the wide base of contributors. Those researchers may provide other insights or in-depth analyses that will complement the works of the more active publishers. The list of contributors reflects the multi-dimensional nature of the slow-moving product problem, spanning many subfields of retailing, operations, and supply chain management. The overall mass of research studies reflects an increasing awareness of slow-moving products as a major operational challenge, with a heterogeneous academic community exploring possible solutions and improvements within different retail settings.

5.3 Who are the top 10 authors based on citation by research?
Table 4 gives the top 10 authors based on citation counts, from which one would observe that these authors have contributed much in relation to "Slow-Moving Product in Retail Industry." For instance, Buzby J.C. and Hyman J., with a total of 516 citations, have been quite prominent in the write-up on food loss—a very key dimension to slow-moving products in the retail industry. The high citation count shows that their academic output has received much attention and has been a crucial starting point for subsequent research. The topic of food loss is closely related to the problems faced by retailers in managing inventory with a low turnover rate, which then leads to wastage and increased costs—researchers like Vermesan O. In addition, Friess P. and others, with 286 citations, underline the importance of technological advancement, especially the Internet of Things (IoT), in solving slow-moving product problems. IoT applications through inventory tracking and real-time data monitoring optimize stock levels, reduce slow-moving items, and finally minimize losses. The high number of citations their work receives indicates its importance in showing how modern technologies change retail operations and manage slow-moving inventory more effectively. Finally, the influence of authors like Kim A.J. and Ko E. (416 citations) portrays the confluence of retail and social media, which bears important implications for demand forecasting and product circulation. The impact of social media on the luxury fashion brand was examined by them, interlinking brand perception with marketing strategies to affect consumer behavior and possibly hasten or decelerate product circulation. The elevated citation frequencies associated with these authors underscore the importance of marketing and consumer engagement strategies in the administration of slow-moving products, as these factors significantly impact purchasing behaviors, inventory turnover rates, and, consequently, the necessity for proficient inventory management within the retail sector.

Table 4: The top 10 authors by citation in article in the field of slow-moving products in the retail industry

Authors	Title	Year	Journal	Cited by
Buzby J.C.; Hyman J. (Buzby & Hyman, 2012)	Total and per capita value of food loss in the United States	2012	Food Policy	516
Vermesan O.; Friess P. (Vermesan & Friess, 2014)	Internet of things applications: From research and innovation to market deployment	2014	Internet of Things Applications: From Research and Innovation to Market Deployment	286
Kim A.J.; Ko E.(Kim & Ko, 2010)	Impacts of Luxury Fashion Brands' social media marketing on customer relationship and purchase intention	2010	Journal of Global Fashion Marketing	416
Lianou A.; Sofos J.N. (Lianou & Sofos, 2007)	A review of the incidence and transmission of Listeria monocytogenes in ready-to-eat products in retail and food service environments	2007	Journal of Food Protection	293
Delen D.; Hardgrave B.C.; Sharda R. (Delen *et al.,* 2007)	RFID for better supply-chain management through enhanced information visibility	2007	Production and Operations Management	284
Hussein H.S.(Hussein, 2007)	Prevalence and pathogenicity of Shiga toxin-producing Escherichia coli in beef cattle and their products.	2007	Journal of Animal Science	270
Ferreira V.; Wiedmann M.; Teixeira P.; Stasiewicz M.J. (Ferreira *et al.,* 2014)	Listeria monocytogenes persistence in food-associated environments: Epidemiology, strain characteristics, and implications for public health	2014	Journal of Food Protection	566
Kadariya J.; Smith T.C.; Thapaliya D. (Kadariya *et al.,* 2014)	Staphylococcus aureus and Staphylococcal Food-Borne Disease: An Ongoing Challenge in Public Health	2014	BioMed Research International	646
Tonini D.; Albizzati P.F.; Astrup T.F. (Tonini *et al.,* 2018)	Environmental impacts of food waste: Learnings and challenges from a case study on UK	2018	Waste Management	247
Bell D.R.; Lattin J.M.(Bell & Lattin, 1998)	Shopping behavior and consumer preference for store price format: Why "large basket" shoppers prefer EDLP	1998	Marketing Science	370

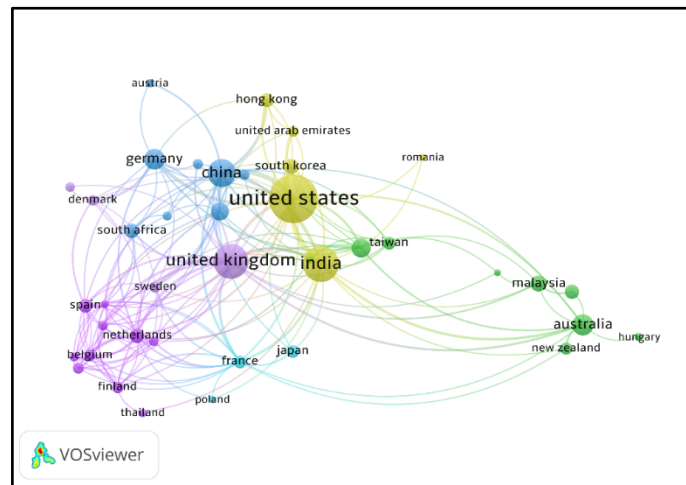**5.4 What are co-authorship countries' collaboration?**

Figure 3: The countries whose authors collaborate on issues and challenge products in the retail industry

The co-authorship of countries bibliometrically proves some prominent patterns in studying "Slow-Moving Product in Retail Industry." The United States stands first with 222 publications, 8042 citations, and an overall link strength of 69, thereby signifying its preeminent position in contributing to research and fostering international collaboration. Its high citation count basically attests to the importance and high impact of the research being performed in the United States in this field. China is second with 74 docs and 995 sites, plus a link strength of 46, which indicates high research productivity and collaboration efforts, especially for the Asia-Pacific region. The high level of citations by both the United States and China proves that these countries have contributed heavily to the present state of knowledge in the field of retail and inventory management, including perspectives on managing slow-moving inventory. The United Kingdom also features prominently in collaboration strength, with 114 documents, 2701 citations, and a link strength of 60—making it a strong collaborator, on par with the likes of the U.S. and China. Other strong contributors among European nations include Germany, France, and the Netherlands, as supported by their high citation counts and link strengths: Germany with 777 citations and a link strength of 24, France with 225 citations and a link strength of 32, and the Netherlands with 677 citations and a link strength of 27. Figure 2 shows widespread research activity across Europe, with collaborative networks extending to multiple countries to address concerns around slow-moving products in the retail sector. The fact that even countries such as Belgium and Finland have moderately high citation counts and link strengths only furthers the claim of Europe's proactive engagement in this research area. Emerging economies, including India and Malaysia, are participating in this domain, with India generating 123 documents and exhibiting a link strength of 52. This signifies an expanding scholarly engagement in retail studies, notably in tackling issues related to slow-moving inventory. Although India's citation count (669) is relatively modest compared to Western nations, its substantial

document production reflects a burgeoning emphasis on research within this area. Malaysia, with 24 documents and a link strength of 8, is typical of its contributions to the Southeast Asian region. In contrast, countries like Brazil and South Africa have lower citation counts and link strengths, which indicate that while these countries are indeed taking part in the research arena, their impact remains relatively limited, likely owing to smaller research networks or a nascent academic focus in this specific field. Overall, the data suggests a blend of dominant and emerging countries actively collaborating on retail industry studies, with the United States, China, and European countries leading in influence and collaboration. The United States, China, and European countries are leading in influence and collaboration.

5.5 What are the popular keywords related to the study?
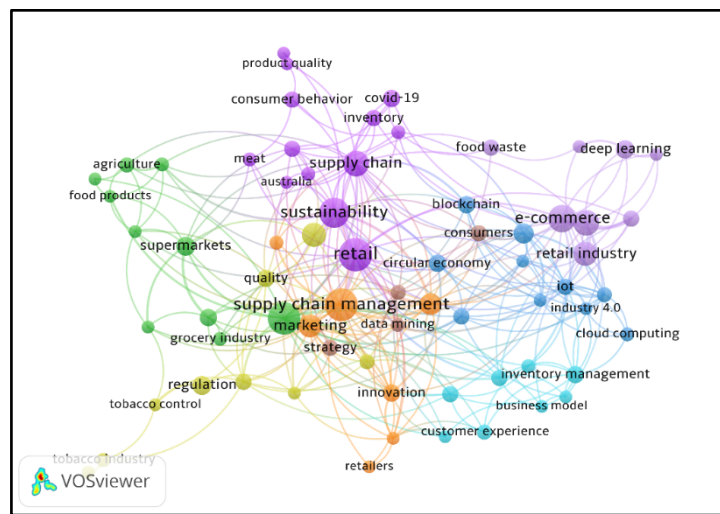

Figure 4: Network visualization map of keywords' co-occurrence.

The bibliometric analysis of Slow-Moving Products in the Retail Industry reveals significant insights based on keyword occurrences and link strengths related to retail and its associated fields. Keywords such as retail and retailing appear with the highest occurrences (33 and 31, respectively) and substantial link strengths, indicating a core focus on retail dynamics in recent research. This focus aligns with studies examining consumer demand patterns, inventory management, and the retail industry's structure, which are crucial for understanding slow-moving products. Notably, supply chain management and supply chain also show high occurrences (32 and 20) and strong link strengths (28 and 26), underscoring the importance of logistics and supply chain efficiency in managing slow-moving products, as effective supply chain practices directly influence inventory turnover and product movement in retail. Further examination highlights sustainability and e-commerce as prominent topics with substantial occurrences (27 and 22) and high link strengths. The emphasis on sustainability indicates a shift toward environmentally conscious practices in managing retail products, including slow-moving items, as retailers look to reduce waste and optimize resources. The high occurrence of e-commerce keywords suggests the impact of digital platforms on inventory management and customer demand patterns, especially relevant for products with slower sales velocities. E-commerce

allows for better tracking and adjustment of stock levels, potentially alleviating the burden of slow-moving products in physical stores through online sales channels. Emerging technologies such as machine learning and artificial intelligence (with occurrences of 20 and 8 and link strengths of 22 and 13) are increasingly applied to enhance inventory predictions and demand forecasting, which are critical for handling slow-moving products. These technologies, along with big data and IoT (Internet of Things), provide retailers with advanced tools for analyzing vast datasets, identifying patterns, and making informed decisions about inventory and product placement. Implementing these technological advancements allows for more precise predictions and a potential reduction in slow-moving inventory by better aligning stock with customer preferences and trends. Overall, the keyword analysis reflects a multidimensional approach to managing slow-moving products, combining supply chain efficiency, sustainability efforts, and cutting-edge technology to drive retail industry advancement.

6. CONCLUSION

A study, to the best of our knowledge, regarding Slow-Moving Products in the Retail Industry offers a comprehensive overview of research trends. This trend is, initially, slow (which can be traced back to the 1960s). However, it has increased significantly since the mid-2000s (each period presented by a decade), as shown below. The rise of this topic underscores the growing acknowledgment that retail is grappling with a slow-moving product dilemma, propelled by advancements in data analytic techniques, machine learning, and optimization strategies that enhance inventory performance and profitability. We observe a noteworthy increase in publications after 2018, which signals intensified efforts from both academia and industry to address retail inefficiencies, leading to over 100 documents by 2024 on this subject. The bibliometric overview of authorship and citations reveals a diverse network of researchers contributing to this field. This includes foundational researchers with multiple publications and highly cited authors whose work influences contemporary practices. Authors like Buzby and Hyman provide substantial insights into inventory loss, although Vermesan and Friess emphasize the role of IoT in managing inventory effectively. The notable citation counts (1) for these, along with other key authors, imply that the research has been crucial in formulating strategies to tackle the challenges posed by slow-moving inventory. This research offers a comprehensive understanding of the issue. However, it does so through various academic perspectives. Although these insights are valuable, they must be considered in the context of ongoing discussions in the field because there are always new developments that could influence future strategies.

The co-authorship analysis across countries in the field of Slow-Moving Products in the Retail Industry highlights notable collaboration patterns, with significant contributions led by the United States, China, and the United Kingdom. The United States, with an exceptionally high volume of publications combined with a reasonably high citation score, emerges as the leading contributor and thus provides a seamless network of international research. Some bumps behind are China, which shows a high citation count due to quite a bit of output and its means of operating actively in Asia, and a collection of European countries, including the United Kingdom, Germany, and France, which are also playing a central role in contributing good-quality research through a well-structured network across the continent. The emerging economies of

the likes of India and Malaysia indicate a growing interest worldwide in dealing with the challenges that slow-moving products would impose in retail. These countries presently reflect moderate citation counts and weaker link strengths as compared to their Western counterparts. In the keyword analyses, emphasis is laid on retail dynamics, supply chain management, and sustainability. Frequently using keywords such as retail, supply chain, and supply chain management underlines the dominant nature of efficient logistics and inventory practices accompanying slow-moving products. Furthermore, emerging technologies—machine learning, artificial intelligence, and big data—are also given prominence here, pointing at a changing trend toward using advanced tools for inventory forecasting and optimization. The presence of sustainability and e-commerce in the discussion speaks of the retail industry's leanings toward being eco-friendly and digital with respect to inventory handling. Thus, these keywords indicate an industry-focused synthesis of the efficiency of supply chains, technologies, and sustainability directed toward addressing the challenges posed by slow-moving retail products.

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