Mapping the Future of Halal Supply Chain Management: A Biblioshiny R Application

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ABSTRACT
The dynamic changes in the business environment unveil the evolvement of halal literature. Studies on halal encompass various perspectives such as terminologies of halal, halal certification, halal food, halal tourism and halal supply chain management (HSCM). Although HSCM plays a significant role in the success of the halal industry, HSCM literature is relatively developing. Hence, this research aims to analyze HSCM publications and visualize the emergent trend for future publication through a bibliometric analysis. The analysis was carried out on 290 articles in the Scopus database from 2009 to 2022. The data was then beingand processed and analysed using the Biblioshiny R application. The process involved investigating the number of keywords, citations, journals, and mapping themes. It was found that the number of publications in HSCM has progressively increased since 2009 and the Journal of Islamic Marketing has been the prime source in this field. Khan, Mi contributed the most publications whereas Tieman, M was the most influential author with the highest total citation of 593. An in-depth analysis of four quadrants that existed based on the network approach revealed themes such as blockchain, traceability system, halal orientation strategy, and sustainability are relevant and have the potential for the future of HSCM research. This research offers insight for researchers to venture into deeper thoughts and areas in HSCM and be useful for the practitioners in searching for betterment in the halal supply chain.

KEYWORDS: Halal, Halal Supply Chain Management (HSCM), Bibliometric, Biblioshiny R application.

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1. INTRODUCTION

Research on supply chain management has gained popularity since the 1990s. The general definition of supply chain management was described as linking the entire value chain and addressing materials and supply management from production to consumption (Tan, 2001). Three or more entities (organizations or persons) actively involved in the upstream and downstream flows of products, services, offers, funds, and information from a source to a consumer make up a supply chain management (SCM) system, as defined by Mentzer et al. (2001).

Over the years, the literature on SCM has evolved in line with the rapid changes in the business environment. SCM has thus evolved from centralized control to decentralized situations, from deterministic to stochastic demand (and stochastic supply), and from profit-maximizing to triple-bottom-line supply chains (Sodhi & Tang, 2021). In addition, the notion of supply chain performance nowadays has become a more complex concept. It may no longer be solely on the economic issues, but it is crucial to address social and environmental issues tailored to the customer needs. According to Mollenkopf et al. (2021), an effective supply chain is not a matter of how long the supply chain should be but needs to adjust according to the suitable supply chain for the customers. Having said that, numerous clusters of SCM have emerged, for example, Supply Chain Risks, Supply Chain Resilience, Supply Chain Agility, Sustainable Supply Chain and Halal Supply Chain Management (HSCM).

HSCM has gained popularity and recognition in line with the Muslim population and halal market growth. It is estimated that the Muslim community has increased to 1.97 billion and almost a quarter of the world population (Religion Information Data Explorer, 2022). Moreover, the growth of the halal market size, particularly halal food, is expected to increase to $2228.63 billion in 2026 at a CAGR of 14.6% (Global Halal Market Report, 2023).

These rising trends have contributed significantly to the demand for HSCM.

With the advent of the knowledge economy, customers demand more "value-added" products and services as output from the supply chain that have superior quality and cleanliness and lead to a healthy lifestyle. As such, halal products and services seem to be the best solution to explore, whose essence lies in safe and wholesome consumption (Khan et al., 2018). "Halal" is commonly known in Arabic word as allowable or permissible. It is embedded in the Islamic way of life, including human behaviour, communication, dress, manners and dietary (Al Jallad, 2008). The word "halal" typically comes together with "thoyyib", which means wholesome and good (Tieman, 2011). Hence, it leads to the concept of "halal and thoyyib" as "wholesome" that covers nutrition, quality, cleanliness, and safety for everyone (the Halal industry encompasses food, non-food, and services). HSCM has extended the classic supply chain concept by implementing the "halal" and "thoyyib" in each process and stage of the upstream-to-downstream supply chain to produce halal products and services.

Although the demand for halal markets was initially driven by Muslims who are religious beliefs and are concerned about halal certification (Talib et al., 2014), there is an increasing interest among non-Muslim consumers (Rejeb et al., 2021). The halal industry should be operated a "value-driven" approach along with the "customer-centric" approach (Khan et al., 2018), therefore, HSCM is needed. HSCM is crucial in assuring the integrity of halal products and services. It has been regarded as a critical approach to coordinate every aspect of production, inventory, location and transportation between the supply chain stakeholders according to the Syariah law.

The present research aims to conduct a bibliometric analysis using the Biblioshiny R application. Unlike other types of systematic review, bibliometric offers more detailed and useful information on the scientific publication in HSCM, for instance, the impact factors of the journal publication, the analysis of the citation numbers received and the analysis of co-authorships or co-citation network. Several studies have reviewed the halal supply chain or halal value chain, for instance, Indarti et al. (2020); and Omar, et. al., (2020). However, these studies applied a systematic literature review approach, and the data coverage was limited to 2019. Hence, this research aims to provide an extensive bibliometric review of HSCM literature by addressing two main objectives. First, to identify the current state of HSCM research in the past decade. Second, to identify potential future research related to HSCM.

2. LITERATURE REVIEW

The early works of "halal" publications were more related to the production of halal foods, such as Leigh and Delany (1987) on halal slaughtering, and Madhok et al. (1990) discussed halal meat. Since then, various studies on halal have been extensively researched. It can be observed from the Scopus database from 1987 to 2023; there were 2951 articles on halal. Meanwhile, the issues related to HSCM started in 2009, when Noordin et al. (2009) highlighted the governance of the halal products value chain through halal certification. Other researchers, such as Tieman (2011), Omar and Jaafar (2011) and Tieman et al. (2012), championed the principles of halal supply chain management, which were an essential source for later studies in HSCM.

To prevent contamination and preserve a product's halal integrity, the HSCM system employs a series of management processes that are carried out at various points throughout the supply chain (Ngah et al., 2015, Sentia et al., 2022). According to Nugroho et al. (2018), HSCM is more stringent compared to conventional supply chain management (SCM) throughout the process of maintaining the product flow from the production until the distribution stage. SCM aims at maximizing responsiveness and efficiency in supplying a particular market. Meanwhile, HSCM safeguards Islamic Syariah Law by facilitating the production of halal consumables and ensuring their distribution to customers (Indarti et al., 2020). The conventional supply chain focuses on increasing revenues and profit. In contrast, the objective of HSCM is more on preserving the integrity of halal food and ensuring the product is halal and thoyyib (Tieman, 2011; Ngah et al., 2015). In other words, every input of the products or services must be permissible, and every process must be executed according to the Syariah law.

Even though research in HSCM is considered in the development stage (Khan et al., 2018; Indarti et al., 2020), an evolving enthusiasm and growing research interest exist in HSCM. Recent years have seen an increase in the number of halal literature that focuses on doing in-depth research on certain fields, such as the halal food supply chain (Zulfakar et al., 2012) and halal cosmetic supply chain (Annabi & Ibidapo-Obe, 2017). Parallel to the complexities of the SCM environment, HSCM has to cope with fierce global competition, short life cycle products and high customer expectations. This has necessitated more research to improve the performance of HSCM. Hassan et al. (2016) argue that the efficiency and success of HSCM may be improved by integrating halal-related elements including certifying authorities, vendors, and operations and logistics. As such, recent literature on HSCM has given attention to the four main activities, namely halal procurement (Tieman et al., 2020; Shari et al., 2021),

halal manufacturing (Mohamed et al., 2016; Samsudin & Dani, 2022), halal distribution and halal logistics (Zailani et al., 2017; Susanty et al., 2022).

Ultimately, customer confidence and satisfaction with halal products and services are crucial. These factors have motivated previous research to extend HSCM into halal integrity (Zulfakar et al., 2012; Mohamed et al., 2022) and halal traceability (Fernando et al., 2022). In addition, conceptualizing customer satisfaction and halal integrity has directed empirical studies to integrate technological applications in the HSCM, namely blockchain technology (Tan et al., 2022) and the Internet of Things (Rejeb et al., 2021). The technological advancement helps to increase the business operational efficiency in each stage of the supply chain, meet the customers' expectations and indirectly align HSCM literature toward the current needs of the global market environment.

3. METHODOLOGY

Bibliometric is a software tool mainly used for analyzing and mapping bibliographic data simultaneously. Bibliometrics can be reviewed, changed and improved, providing a more objective and reliable analysis (Derviş, 2019). Earlier on, the term "bibliometrics" was used by Pritchard (1969) to describe the research of literature and other kinds of printed communication through the lens of mathematics and statistics. The bibliometric analysis consists of several steps that require a mapping software tool to organize the data flow and produce statistical measurement results (Broadus, 1987). One of the mapping tools is biblioshiny. Biblioshiny is a shiny bibliometrics application developed in R language (Aria & Cuccurullo, 2017). Biblioshiny allows the processing of a wide variety of statistical and graphical techniques, which is highly beneficial, particularly to those researchers with no general programming skills (Aria & Cuccurullo, 2017). Since it is an open software, biblioshiny can rapidly be upgraded and easily automate the analysis.

This research utilized the Scopus database since it is the largest citation database of peer-reviewed literature (Perez-Gutierrez & Cobo-Corrales, 2022). An initial search for the keywords "halal" and "halal supply chain" was carried out in 2022 and resulted in 336 publications from 2009 to 2023. Paper reviews ("re") and conference reviews ("cr") have been excluded to avoid double counting and centred mainly on the original research conducted in the area of the halal supply chain. The research covers all subject domains since "halal" keywords can be discussed from multidisciplinary perspectives.

Furthermore, the intention behind starting with such a broad spectrum of halal concepts was to ensure that publications were not only limited to the titles of the halal supply chain but also took into account those publications that discussed issues relevant to the HSCM processes. In other words, to uncover the HSCM articles, the research has to go deeper and richer context. Hence, to arrive at the final sample of focal documents, the research included other concepts deemed critical to the nature of SCM, such as halal logistics, suppliers in the halal supply chain, halal warehouses, halal certification, and halal distribution. Nevertheless, each document was carefully scrutinized and removed if they were explicitly unconnected to the halal supply chain, particularly from the pure sciences and technical-based perspectives. Due to this, 46 publications have been removed, leading to the final number of 290 publications to be analyzed. The search from the Scopus website is exported into bib format and retrieved in the biblioshiny database.

As described above, the search strategy for this research is adapted from Zakaria et al. (2021), which emphasizes three stages in analyzing publications for the bibliometric review: selecting the topic, scope and eligibility. Secondly, the screening and the final record were used in the research, as shown in **Figure 1**.

4. RESULTS AND DISCUSSION

The bibliometric analysis utilized in this research helps to identify the HSCM issues that gained the most interest among researchers. As mentioned earlier, although bibliometric analyses have certain similarities with other forms of review, specific analysis of the publication data enriches the information on the literature review. As such, the inclusion of the analysis of citations, the co-citation networks and the thematic analysis. The results of the bibliometric research allow us to address the following concerns.

The results have been organized in an attempt to address the objectives of the research. Therefore, the descriptive analysis focuses on identifying the current state of HSCM publication and from there, lead to mapping the future direction of HSCM.

4.1 Current State of HSCM Publication

4.1.1 Main Information

The first section of the results provides general information on the data, mainly on the sources, document contents, authors' collaboration, and document types, as presented in **Table 1**.

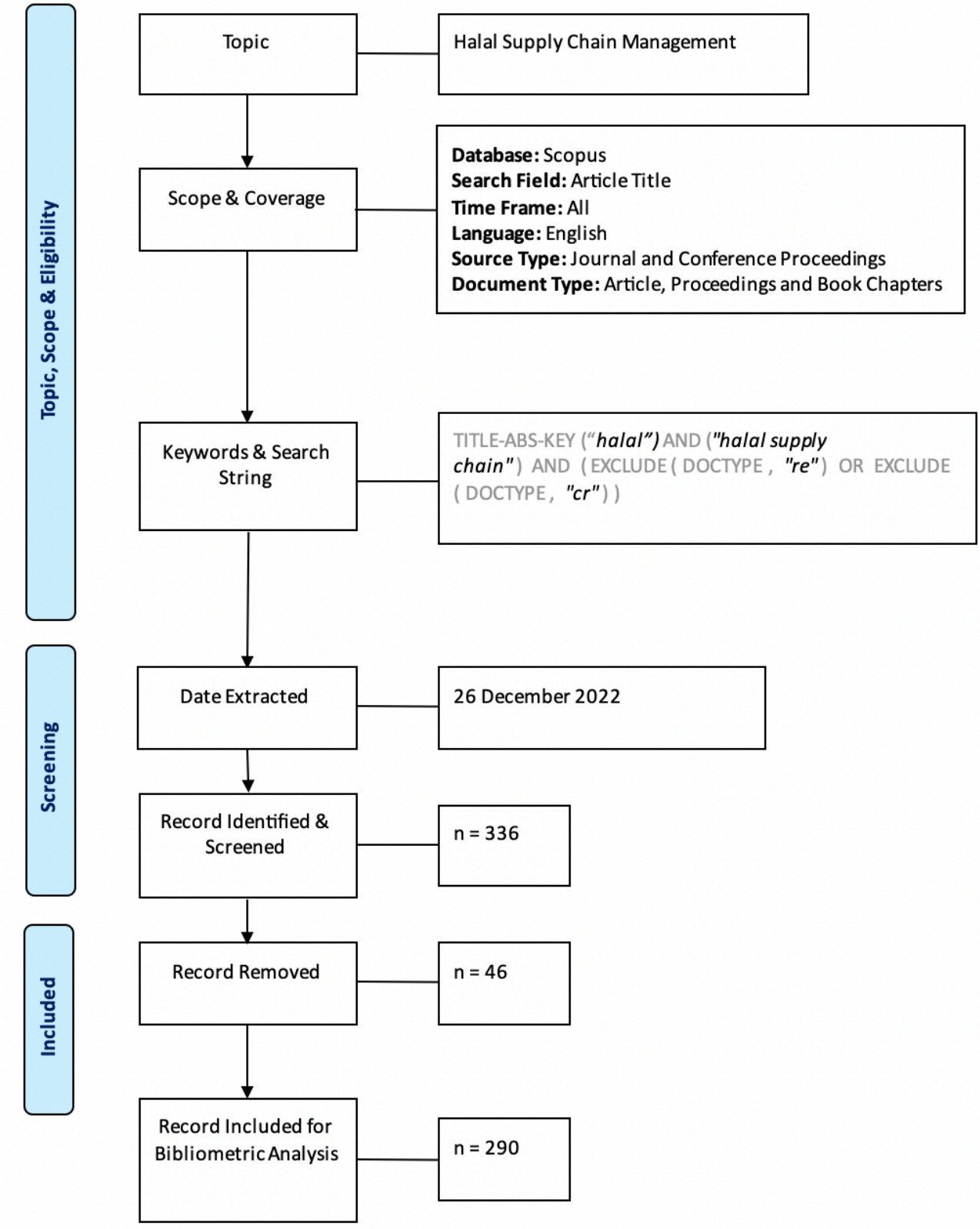


Figure 1. *Flow diagram of the search strategy. Source: Zakaria et al. (2021)*

Table 1: *Main information regarding selected articles.*

Description	Results
MAIN INFORMATION ABOUT THE DATA	
Timespan	2009:2023
Sources (Journals, Books, etc.)	127
Documents	290
Document Average Age	2.99
Average citations per doc	12.2
References	13794
DOCUMENT CONTENTS	
Keywords Plus (ID)	491
Author's Keywords (DE)	693
AUTHORS	
Authors	691
Authors of single-authored docs	11
AUTHORS COLLABORATION	
Single-authored docs	14
Co-Authors per Doc	3.51
International co-authorships %	25.17
DOCUMENT TYPES	
Article	220
Book	1
book chapter	23
conference paper	45
Note	1

The Scopus database is used in this research, ranging from 2009 to 2023. The number of documents used is 290, which are divided into five types of document categories, namely journal articles (220), book (1), book chapter (23), conference proceedings (45) and notes (1). There were 691 authors involved in the publication, with approximately four authors per document, and international co-authorship was 25.17%.

4.1.2 Annual Publication Trends

Figure 2 shows the trend of publication in HSCM from 2009 to 2022. Publication in 2023 was not included in the diagram as the data taken for this research at the early year of 2023 and there were still only a few studies that were published. Generally, articles written from 2009 to 2018 have progressively increased, representing 37% of the total publication. The trend continued to increase by 56% in 2020 (from 34 to 53 publications). The numbers dropped in 2021. Nevertheless, the big leap from 38 articles in 2021 to 57 articles in 2022 suggests that HSCM will likely attract more researches to be conducted.

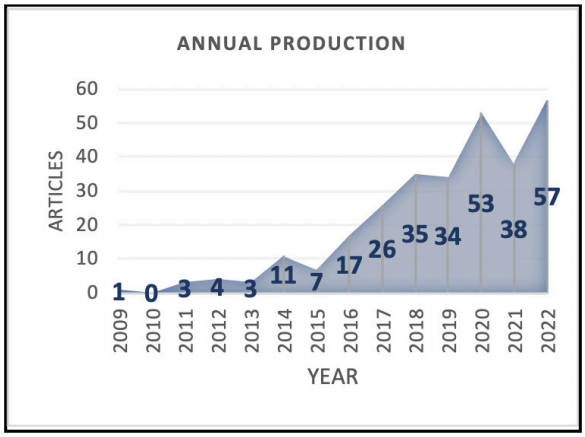


Figure 2: *Annual publication trends*

4.1.3 Most Relevant Sources

Figure 3 below shows the top 10 most relevant sources that have published papers with a theme pertinent to HSCM. Journal of Islamic Marketing has been the prime source for halal supply chain papers, where 57 articles have been published. Next is the International Journal of Supply Chain Management (33 articles). British Food Journal and Halal Logistics and Supply Chain Management: Recent Trends and Issues are ranked third as both published 16 articles. Other Scopus publications that also received public interest in the HSCM topics are the IOP Conference: Material Science and Engineering, IEEE International Conference on Industrial Engineering and Engineering Management, International Journal of Innovation, Creativity and Change, ACM International Conference Proceeding, Advance Science Letters and Food Research.

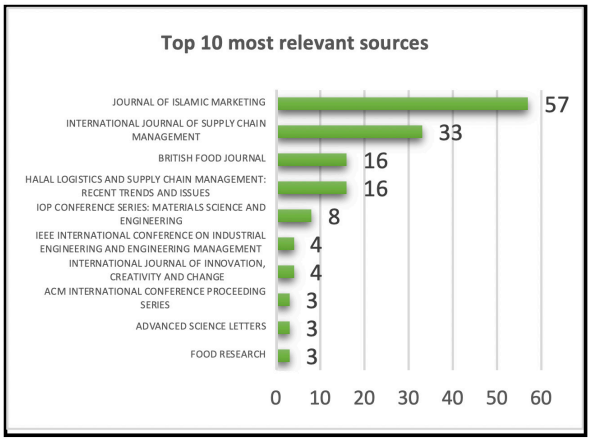


Figure 3: *Most Relevant Source*

4.1.4: Source Impact

Figure 4 below shows the H-index value depicted in the nodes. As the leading journal in HSCM publication, the Journal of Islamic Marketing received the top position with an H-index of 20. Meanwhile, the second and third positions are the British Food Journal and the International Journal of Supply Chain Management, with H-index values of 13 and 7.

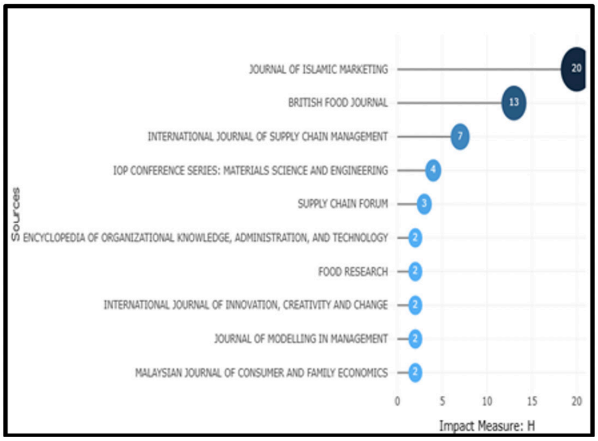


Figure 4: *Source Impact*

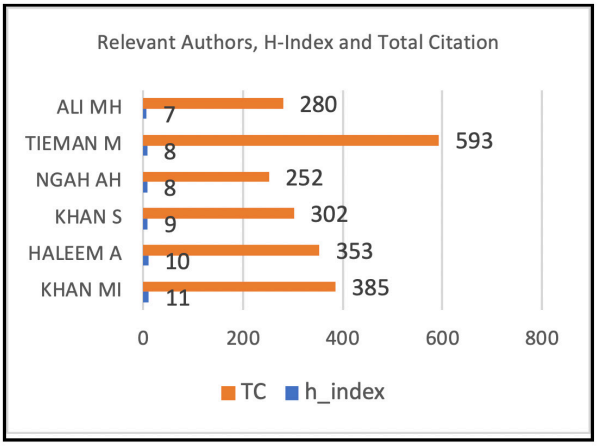


Figure 6: *Authors with the most publication (more than ten articles), H-index score and total citation.*

4.1.5 Relevant Authors

Besides the sources, the productivity of the authors actively involved in the research field of HSCM can also be measured. A total of 691 authors published at least one article. **Figure 5** presents the top 20 authors contributing to the HSCM publication from 2009 to 2023. Khan, Mi has contributed the most articles (15), followed by Haleem, A. (14), Khan, S. (13), Ngah, AH (13), Tieman, M. (12) and Ali, MH (11).

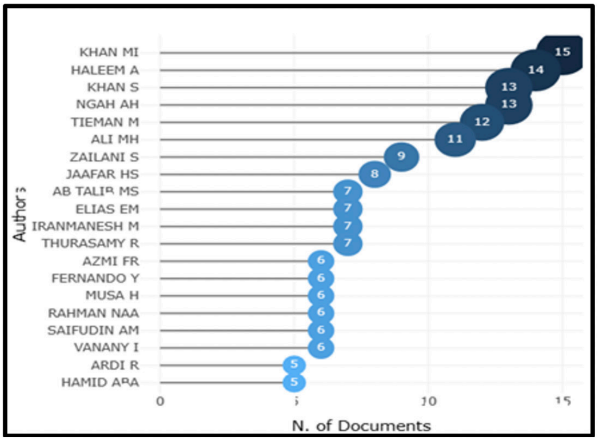


Figure 5: *The top 20 most relevant authors*

In addition, the most relevant authors, with a cut-off point of more than ten articles, are presented further regarding the H-index and total citation (TC), as shown in **Figure 6**. Tieman, M seems to be the most influential author with the highest total citation of 593. The author's early workin 2011 and 2012 on the principles and application of HSCM have been the primary references for other researchers in the field. Meanwhile, Khan, Mi, the author of the most published articles since 2017, obtained a TC of 385 with an H-index of 11

Regarding the author's production over time, **Figure 7** below illustrates the timeline of the top 20 authors, with the nodes representing the author's publication in the given year. Jaafar, HS and Tieman, M. are among the authors with the longest time in HSCM publications from 2011 to 2022 and 2011 to 2020, respectively.

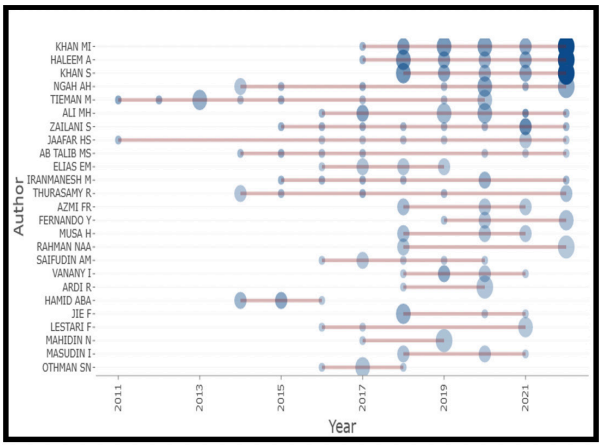


Figure 7: *Top Author's Production All the Time*

A co-citation network in **Figure 8** shows the relationship among the cited-reference works, as portrayed through the nodes and network.

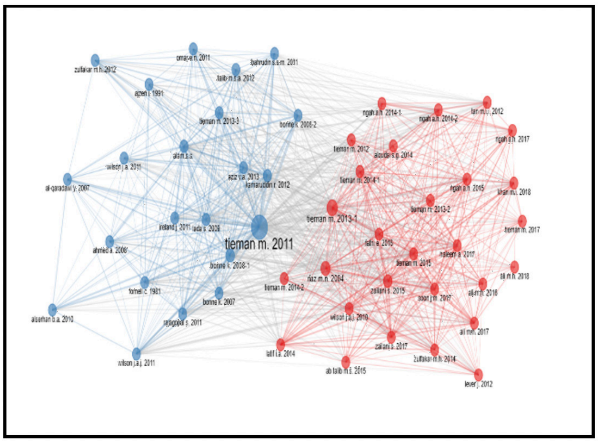


Figure 8: *Co-citation Network*

4.1.6 Most Frequent Keywords

The bibliometric metric analyzes the word counts based on the author's keyword as portrayed in the word cloud and Word Tree Map (**Figure 9 and Figure 10**). Both figures display the descriptions of words that often appear in the HSCM articles. The word cloud shows an overview of words with various font sizes. The font size depends on the frequencies of the words mentioned in the papers. Similarly, the word tree map arranges the words in the boxes, and the square area will also rely on how often the words appeared in the papers. The word "halal" has the most prominent font with 70 frequent occurrences and occupies 14% of the tree map space, as it is the prime source of the HSCM. A halal supply chain followed them with 49 occurrences and 10% space in the tree map. Halal food, Halal logistics, Malaysia and Halal certification, were also important keywords that have appeared in the HSCM publications in the past 13 years.



Figure 9: *Word Cloud*

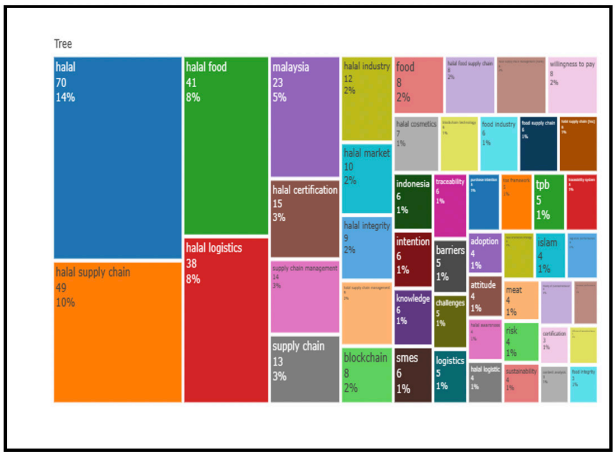


Figure 10: *Word Tree Map*

4.1.7 Trend Topics

Other than analyzing the most frequent keywords, it is also interesting to understand the evolution of themes applied in the HSCM field. **Figure 11(a)** shows the trend topics in HSCM from 2009 until 2016. HSCM received recognition in the early years. This recognition grew consistently with the awareness of Islamic practices, Islamic markets and halal brands. Other pertinent issues in halal products would be halal meat production and logistics. As such, three studies (Tieman et al., 2012; 2013; Velarde et al., 2014) deliberately applied the issues in a non-Muslim country, namely the Netherlands. The concerns on the halal meat terms continue until 2020.

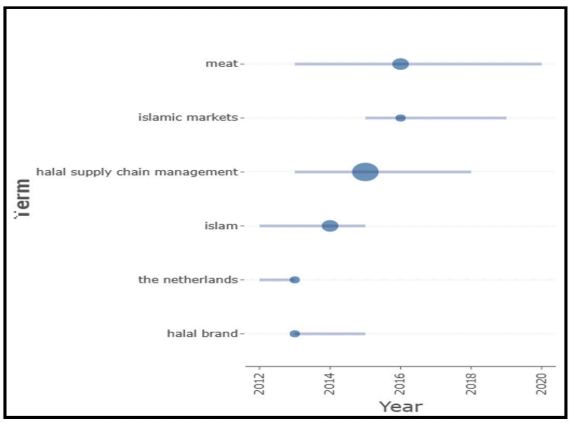


Figure 11(a): *Trend Topics of the Authors' keywords in HSCM research from 2009 to 2016.*

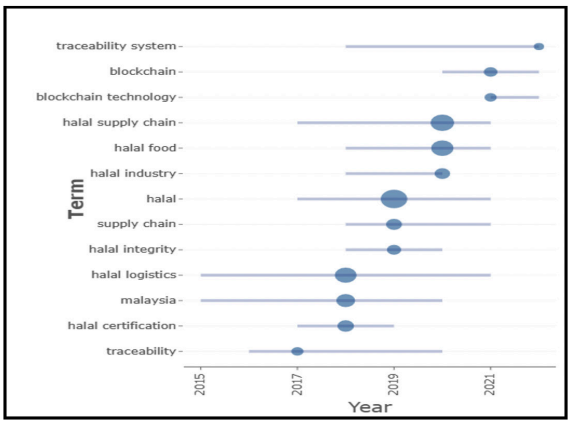


Figure 11(b): *Trend Topics of the Authors' keywords in HSCM research from 2017 to 2023.*

Meanwhile, from 2017 to 2023, various trends appeared. The "Halal" themes have been broken down to more distinct trends such as "halal supply chain", "Halal Logistics", and "Malaysia" as showed in **Figure 11(b)**. It can be surmised that more specific terminologies have been introduced in the HSCM research field, for instance, traceability systems and blockchain technology.

In the word cloud and word tree map, it can be seen that halal and halal food were still the most popular topics to be discussed. Among the supply chain activities, most authors were more interested in debating specifically on halal logistics (Haleem & Khan, 2017; Zailani et al., 2017) and halal warehouses (Ngah et al., 2015). In addition, as portrayed in the trend topics, halal logistics issues remain relevant. Halal logistics practices ensure that Muslim customers receive halal and thoyyib products.

Hence, proper physical segregation of halal products must exist from non-halal products in transportation, warehousing, and terminal, from the point of suppliers to the point of the end user (Karia et al., 2019). Other than halal logistics, halal traceability has also received growing interest. Traceability is accessing information relating to what is being considered, throughout its life cycle, using recorded identification (Schuitemaker & Xu, 2020). The concerns are not only limited to the halalness of the products along the supply chains, but there is also a need to track the halal status of certain products in each stage of the supply chain, increase halal transparency, and strengthen halal integrity (Masudin et al., 2022).

4.2 Future direction of HSCM

To understand further the current publications of HSCM, biblioshiny is able to develop the conceptual structure that may lead to some indication for potential areas. The conceptual structure links various concepts from the data set through some set of common parameters (Ahmi, 2022). The conceptual structure leads to some indication of which are the most important recent issues. Within the conceptual structure, the thematic map can be used to visualize the co-occurrence of keyword networks and typological themes.

4.2.1 Thematic Map

As demonstrated in **Figure 12**, the relevant themes in the HSCM field have been segmentized into four quadrants: Emerging or Declining Themes, Basic Themes, Niche Themes and Motor Themes. Moreover, the quadrants are characterized based on relevance (centrality) degree and development (density) degree. According to Callon et al. (1991), centrality refers to the level of interaction among the co-word networks, while density measures the internal strength of the networks.

This map helps to emphasize the keywords and frequencies of occurrences further. The lower left quadrant is themes that have experienced a decreasing trend with low centrality and low density. The themes located here can be regarded as either emerging or disappearing themes. Hence, most of the themes in this quadrant are discussed theoretical perspectives, for instance, the theory of planned behaviour, willingness to pay and the halal concept. Nevertheless, some themes, such as issues in halal cosmetics and transportation, can emerge to be more developed or specific.

The lower right quadrant is a basic theme with high centrality but low density. Fundamentally, all publications will be centred on halal issues. The basic concept of halal themes such as halal food, SCM, halal industry and halal integrity is vital but not relatively developed.

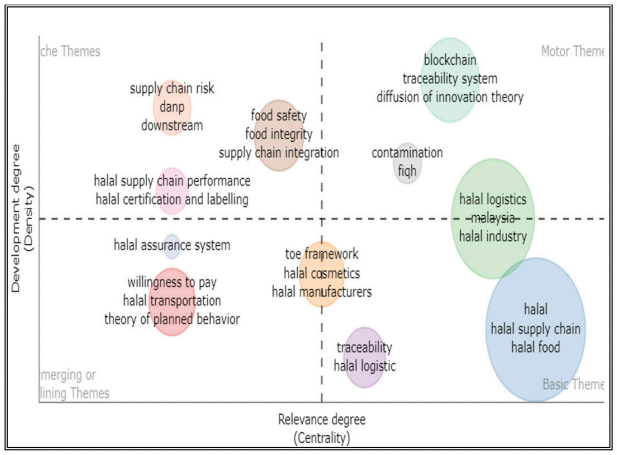


Figure 12: *Thematic Map*

Meanwhile, the upper left quadrant is known as the niche theme, representing a specific and rare theme. In this quadrant, the themes such as supply chain risk, food safety, food integrity, supply chain integration, halal supply chain performance and halal certification labelling are included. These themes are well-developed internal linkages yet unimportant external ties. Hence, these themes are marginally relevant and very specialized for HSCM research. Finally, the upper right quadrant (motor theme) is a driving theme characterized by high density and high centrality. The themes in this quadrant, namely blockchain, traceability system, halal orientation strategy, sustainability, contamination and Fiqh issues, are relevant and well-developed for structuring the research in the HSCM field.

4.2.2 Co-occurrence Network

In addition to the thematic map, the data can be analyzed through a co-occurrence network to visualize another perspective of potential clusters related to HSCM. The author keywords of halal supply chain publications have been used, resulting in a graphical overview, as shown in **Figure 13**.

The network connection shows the number of relationships between one element (node) and another. Three clusters can be identified based on the colours (green, orange and purple). Each colour indicates the focal theme of the cluster. At the same time, the network shows how often the thematic keywords are connected. Cluster one (green nodes) refers to the central topic with the most significant node that belongs to the theme "Halal". General halal issues included under this cluster are halal certification, halal challenges, food and small and medium enterprises (SMEs).

Cluster 2 (orange nodes) mainly focused on the "halal supply chain" related issues. Under the halal supply chain topics, the "halal logistics" theme is the most trending theme. Halal logistics has been described as in the infant stage (Ziegler et al., 2022), hence, attracted

more empirical studies to dig deeper into the halal logistics principles and practices. For instance, studies from Karia et al., (2019) and Abd Mubin et al. (2022) discuss halal logistics implementation and performance. Most of the studies were conducted in Malaysia.

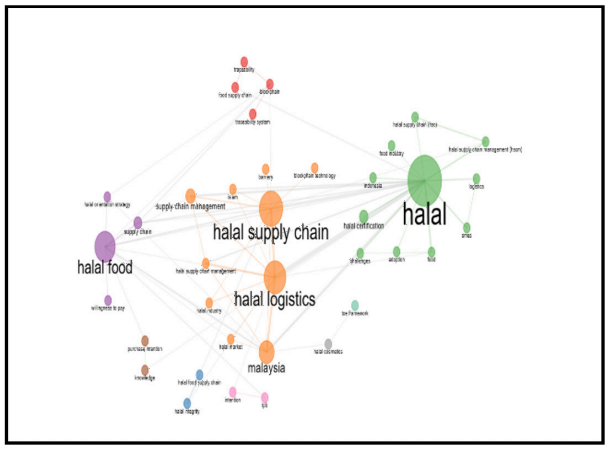


Figure 13: *Co-occurrence network*

Finally, Cluster 3 (purple nodes) concentrates on halal food-related studies. Although there are studies that venture into other types of halal industries, such as halal cosmetics (Shahid et. al., 2023) and halal tourism (Battour et. al., 2021), halal food remains the main focus among the researchers. Hassan and Bojei (2011) highlighted that consuming halal food reflected the Muslim customers' attitudes and obedience toward the Syariah law. Therefore, related research has been conducted, e.g., on customers' willingness to pay for halal food (Iranmanesh et al., 2021) and halal orientation strategy (Zailani et al., 2017; Talib et al., 2018) to improve the availability and quality of halal food that meets customers' expectations.

In general, the results have exhibited some evolutionary turning points and reflected various key research topics. The analysis of the thematic map revealed several prominent keywords in the quadrant "motor topics" which is highly relevant and therefore, critically important to be studied further. The themes in this quadrant include blockchain, traceability systems, diffusion of innovation theory, contamination and fiqh. Other than that, another set of keywords served as the foundation in HSCM publications, particularly halal logistics, Malaysia and the halal industry. Meanwhile, in the co-occurrence network, three obvious clusters that emerged are halal, halal supply chain and halal food. This impliedly shows halal food dominated the research interest in the halal industry and eventually trigger more research into the halal supply chain components and implementation.

Accordingly, future research may be advanced from these insights in the following direction:

i) Customer Orientation in HSCM

Today customers want the "value" can be realized beyond the obvious final output (Erkin & Muborak, 2022). They expect the value-added offerings to be instilled in every component in the supply chain, from the procurement and preparation of genuine halal ingredients to the manufacturing and delivery of the final product to customer shelves. In this conjuncture, researchers may provide conceptual frameworks that guide those companies involved in the halal market toward the appropriate level and type of value-added required by the customers. Researchers need to emphasize the HSCM procedures and the fiqh (Islamic Jurisprudence) matters that help the customers' understanding and practices that comply with the Islamic Syariah. In general, the halal concept has permeated the lifestyle of Muslim customers, leading to many studies being conducted in Malaysia, Indonesia and other Muslim countries. Nonetheless, consistent with the suggestion given by Wilson (2014) and Indarti, Lukito-Budi and Islam (2020), concerns with promoting research agenda in HSCM should also address the needs of Muslims living in non-Islamic countries and those customers with non-halal backgrounds.

ii) Innovation Creation in HSCM

The post-pandemic crisis has encouraged many companies to leverage cloud, mobile, social and artificial intelligence technology breakthroughs to deliver personalized and immediate experiences. These technologies allow customers to expect more choices and better experiences from any company they deal with. Findings from this research have highlighted the popular keywords of blockchain and traceability systems in the HSCM publication. Thus, it reflected the current customer demands on halal integrity and traceability in the supply chain process. Muslim consumers need protection from non-halal products. Therefore, the halal transparency system is crucial. Information about the ingredients that make up a product, and the sources and processes must be presented to ensure the halalness of the product (Hidayati et al., 2023). In this context, stakeholders and organizations in the supply chain should cooperate and share valuable information to build customers' trust in halal products and services. This has offered direction for future HSCM research to elaborate on an open innovation process necessary in the field of HSCM. Open innovation can be a theoretical lens to understand how different stakeholders and organizations can cooperate and share knowledge to achieve innovation and gain superior performance (Zhang et al., 2023). Since new and emerging technologies such as artificial intelligence and the Internet of Things (IoT) have become the basis for competitive advantage, it demands exploration of how this technology development and integration can improve HSCM performance and whether an innovative HSCM sector can be created.

iii) Effective HSCM

In parallel with capabilities and performance-based research in SCM, HSCM should also uncover the capabilities that provide positive performance, as outlined by previous researchers (Talibet et al., 2018; Supian et al., 2019). These authors pointed out that HSCM can improve business performance and meet customers' needs whilst adhering to Syariah principles. However, to be responsive, agile and sustainable in the long term, halal industry players should adopt well-integrated halal-focused supply chain strategies (Zailani et al., 2017; Supian et al., 2019). These strategies focus on critical resources and capabilities by considering the current dynamic environmental conditions (Abd Mubin et al., 2022). As such, future research on HSCM may assess organizational capability in executing HSCM. The dynamic capability perspective is crucial since HSCMs are process-oriented and are highly based on capabilities embedded in organizational routines (Den Hertog et al., 2010). Exploring and examining the relationship between organizational capabilities and HSCM performance will help a plethora of research opportunities and lead to a more viable and effective HSCM.

5. CONCLUSION

This research was conducted using bibliometric review via a Biblioshiny R application on HSCM. There were 290 publications relevant to HSCM extracted from the Scopus database. By synthesizing the literature, this article contributes to the existing literature in two aspects: (1) identifying the current state of the HSCM publication and (2) mapping the potential areas that can be investigated for future directions. It can be surmised that publications in the HSCM have progressively increased since 2009. Journal of Islamic Marketing was the most relevant source whereby Tieman, M was recognized as the most influential author in the HSCM field. Based on the keywords, it was observed that publications encompassed a wide range of issues, yet most of them focused on halal food, supply chain management, halal logistics, halal certification and the halal industry. Pertaining to future research, the thematic map result highlighted themes such as blockchain, traceability system, halal orientation strategy, sustainability, contamination and Fiqh issues, which are relevant and well-developed for structuring the research in the HSCM field. The current research has certain limitations. Firstly, the selection of publication was based on the keywords in English that contain "Halal" and "Halal Supply Chain". Therefore, there is a tendency that publications in other languages or using different keywords, yet relevant to the halal supply chain, has been overlooked. Secondly, this research utilized only the Scopus dataset from 2009 to the early year 2023. Results can be enhanced if the dataset can include those from other databases such as WoS, Dimensions, Lens, PubMed and Cochrane Library and covers a longer period. Hence, researchers can address these research limitations in their future bibliometric analysis. In addition, the bibliometric results have mapped several potential research areas in HSCM, particularly in topics related to customer orientation, innovation creation and effective HSCM that ultimately contribute significant impacts on the halal industry.

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