A Qualitative Review on Halal Cluster Studies

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Halal has become one of the fastest-growing consumer sectors in the world. Muslims seek halal integrity in food, non-food products, and services worldwide. It was found that Halal Cluster Design influences customers to buy quality Halal food by moderating services, health standards, and organizational views. In addition, clusters can boost industrial productivity, increase cluster participants' ability for innovation and product development, and drive the establishment of new enterprises that support innovation and extend clusters, may produce new and better employment, new enterprises, diversify the local economy, and have a financial effect. This study was made to determine the development map on the topic of Halal Cluster research. This study provides a systematic review using bibliometric mapping of the development of keyword trends, authors, and journals about the Halal Cluster from several reputable Scopus indexed papers published between 2007 and 2021. Furthermore, this study was conducted to review what can be done and become the literature for future research related to Halal Clusters. The results of the study show that papers published with the theme of the Halal Cluster continue to develop, especially in 2019-2021.

Keywords: Halal Cluster; Bibliometric; Halal Industry
INTRODUCTION

Halal has become one of the world's fastest-growing consumer sectors. Muslims look for halal integrity in food, non-edible, and service products all around the world (Haleem & Khan, 2017). The halal business has expanded to cover the supply of cosmetics and personal care items, pharmaceutical and health products, tourism, logistics, and financial services to fulfill demand. (Hong, Sun, Beg, & Zhou, 2018). Halal is a notion that begins at the point of manufacture and ends at the point of consumption. This implies that Halal management demands a supply chain management strategy from the point of origin to final consumption or disposal. "Halal" is a wide phrase that includes the supplier/money, manufacturer's which should be obtained ethically. (Haleem & Khan, 2017)

Religious norms, social significance, and cultural traditions all have a role in food consumption (Bonne, Vermeir, Bergeaud-Blackler, & Verbeke, 2007). Food not only reminds us of the past but also the future (Mostafa, 2018). Muslims must seek out and consume halal cuisine, which is an Arabic term that translates roughly as "approved or permitted food" (Lubis, Mohd-Naim, Alizul, & Ahmed, 2016). Halal is no longer a modest niche business; it has grown into a massive, multinational industry (Atalan-Helicke, 2015). Cosmetics, finance, banking, fashion, media outlets, tourism, medicines, textiles, and schools are just a few of the industries where worldwide halal products and brands have lately proliferated (Yener, 2015).

The certificate logo, as well as customer impressions of raw materials, food storage, and health, are critical in a big halal market niche like halal food (Franklin & Badrie, 2015). Halal food manufacturing is encouraged by government legislation (Masnita & Puspitasari, 2021). This assistance helps to create food goods and attract investors in an indirect way (Masnita & Puspitasari, 2021). To ensure the availability and accessibility of food items, a new paradigm in arranging the manufacturing process through halal clusters is required (Trappey, Lin, Trappey, Liu, & Lee, 2011). In some domains, the halal cluster theory refers to a collection of enterprises or industries that interact and complement one another (Karlsson, Johansson, & Stough, 2014). This study offers research findings regarding the Halal Cluster and can serve as a bridge to become a research reference to the area of knowledge regarding the Halal Cluster identified by this bibliometric mapping analysis.

LITERATURE REVIEW

Porter (1990) first proposed the notion of industrial clusters in the early 1990s, and his theoretical model had a significant effect on academics and public policy. Clustering is based on the value of synergy between complementary economic activity aggregated in one place (Dubé, Haijuan, & Lijun, 2015). "A collection of industries and organizations tied together by purchasing and selling connections, or who share the same infrastructure, consumers, or skills base and whose linkages increase competitive advantage," Porter (1990) defined clusters. The capacity of clusters to form links and combine the interests of individual enterprises and the cluster's overall needs is central to the idea of clusters. (Dubé, Haijuan, & Lijun, 2015).

Consuming Halal items obtained through Halal ways is a significant responsibility for Muslims everywhere (Khan & Haleem, 2016). Halal is an Arabic term that means "allowable, acceptable, authorized, and/or lawful." Halal does not just refer to food or food items (as most people assume), but it also refers to all elements of a Muslim's life (male or female) (Khan & Haleem, 2016). As a result, customers get halal not only from the content or product but also from the process and acquisition (Masnita & Puspitasari, 2021).

Halal assurance is required in Muslim markets to handle cross-contamination, risk of contamination, and Muslim consumer perception, whereas halal assurance is only required in non-Muslim markets to address cross-contamination and risk of contamination (Tieman, 2017). To regulate food production and marketing, the halal cluster design is essential. The design creates halal food products that are of high quality and tailored to the demands of the user. It consists of various pillars that serve as guidelines or requirements for halal food businesses, such as Muslims (Masnita & Puspitasari, 2021).

In his study, (Masnita & Puspitasari, 2021) found that Halal Cluster Design influences customers to buy quality halal food items by moderating services, health standards, and organizational views. Furthermore, clusters can boost industrial productivity, increase cluster participants' ability for innovation and product development, and drive the establishment of new enterprises that support innovation and extend clusters, according to Porter (2000). Clusters, according to Sheffi (2012) may produce new and better employment, new enterprises, diversify the local economy, and have a financial effect.

Tieman (2015) analyzed clusters in the Malaysian and Dubai halal clusters to provide a better
understanding of the halal cluster model and its sustainability. The weak link in the halal value chain has been identified as food production and trading. A new paradigm in better organizing the production and trading of halal food through halal clusters is necessary to ensure availability and access to halal food. The Muslim customer, education and research, halal integrity network, halal supply chain, and enablers are the five pillars of a halal cluster model suggested.

**RESEARCH METHODOLOGY**

This study uses data on publications of papers sourced from various journals from 2007-2021 with research-themed Halal Cluster. Data collection was carried out through a search for articles indexed by Scopus, the search was carried out by typing the keyword 'Halal Cluster', then selecting papers relevant to the research theme of the Halal Cluster, for the criteria of journals that were filtered and processed in the Scopus indexed. From the search results, there are 30 articles published from 2007-2021. The data in the form of topics used in the publication of Halal Cluster-themed papers were analyzed using Microsoft Excel 2010. The trend of publication development on the Halal Cluster theme was analyzed using VOSViewer software.

The computer program that was introduced was called VOSviewer. VOSviewer is a program developed for creating and viewing bibliometric maps. This program is available free of charge to the bibliometric research community (see www.vosviewer.com). VOSviewer can create author maps or journals based on cocitation data or create keyword maps based on shared incident data. The program offers a viewer that allows bibliometric maps to be examined in detail.

To build the map, VOSviewer uses the VOS mapping technique, where VOS stands for visualization similarity. For previous studies where the VOS mapping technique was used. VOSviewer can display maps constructed using appropriate mapping techniques. Therefore, this program can be used to display maps built using the VOS mapping technique and display maps built using multidimensional scaling techniques. VOSviewer runs on many hardware and operating system platforms and can be started directly from the internet.

Bibliometric analysis is widely applied in studies in various scientific fields. In the field of economics, for example, bibliometric studies can be seen in Laila et al., (2021), As-Salafiyah et al., (2021), Nasution et al., (2022), and Puspita (2023). Meanwhile in the field of management, studies using a bibliometric approach can be found in Antonio et al., (2020), Al-Qital et al., (2022), Uula & Devi (2021), and As-Salafiyah et al., (2023). As for the legal field, the application of bibliometric studies can be seen in studies conducted by Antonio et al., (2021), Fitrin et al., (2022), and Maulida & Ali (2023).

Other examples of studies using bibliometric methods include accounting studies (Taqi et al., 2021; Taqi et al., 2022; Firmsyah & Rusydiana, 2021), finance (Srisulisawati et al., 2021; As-salafiyah et al., 2022; Maulida, 2023), marketing (Uula & Avedta, 2023; Putri & Irfany, 2023; Sari & Maysyaroh, 2022) Islamic economics (Marlina et al., 2021; Sukmana et al., 2023; Nuraini, 2022), social finance (Nuraini, 2021; Niswah, 2022) and studies related to the halal industry (Izza, 2021; Nekha & Kartikawati, 2022; Rahardjo, 2023; Al Qital, 2022). The tools most widely used in bibliometric studies are VosViewer (Uula & Ikhw, 2022; Avedta, 2023; Sanrego & Taufiq, 2023; Riani, 2021) and the Biblioshiny-R application (Gunawan & Herman, 2022; Nuraini & Jazil, 2023; Puspita et al., 2023; Ikhw, 2021).

**RESULT AND DISCUSSION**

The following is a table that shows the collection of documents used in research with the theme of Halal Cluster in Islamic economic research. Of the total 30 documents used, they are divided into 6 types of documents, including journal articles (22 documents), anthology/book chapters (1 document), Editorial (1 document), Review (2 documents), Conference Paper (3 documents), Conference Review (1 document).

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<tr>
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<th>Document Types</th>
<th>Number of Articles</th>
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<tbody>
<tr>
<td>1</td>
<td>Journal article</td>
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<tr>
<td>2</td>
<td>Conference Paper</td>
<td>3</td>
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<tr>
<td>3</td>
<td>Review</td>
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<td>4</td>
<td>Book Chapter</td>
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<td>5</td>
<td>Editorial</td>
<td>1</td>
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<tr>
<td>6</td>
<td>Conference Review</td>
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<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>30</strong></td>
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</table>
Based on the results of grouping the types of documents above, the most widely used document types as research subjects with the Halal Cluster theme are documents in the form of journal articles with a percentage of 73% or as many as 22 documents. Meanwhile, the least used documents are in the form of Conference Reviews and Editorials, and Book Chapters, each with 3% or 1 document. This shows that the references used are quite valid because most of them come from documents in the form of scientific journals.

Bibliometric Graph Analysis

Bibliometrics is based on the calculation and statistical analysis of scientific outputs in the form of articles, publications, citations, patents, and other more complex indicators. It is an important tool in evaluating research, laboratory, and scientist activities, as well as scientific specialization and country performance. The report, after establishing the background for bibliometric development, presents the database from which the bibliometric was created, as well as the main indicators used.

To explore the results of the meta-analysis, this section will present a visual mapping chart of 263 journals published by the Halal Cluster. The results of the keyword mapping analysis become the basis for mapping together important or unique terms contained in certain articles. Mapping is a process that enables one to recognize elements of knowledge and their configuration, dynamics, interdependencies, and interactions.

Related to bibliometrics, science mapping is a method of visualizing the field of science. This visualization is done by making a landscape map that can display topics from science. The results of the network visualization of 30-word map journals with the Halal Cluster theme can be seen:

Co-Authorship Analysis

Furthermore, the bibliometric results will be displayed based on the sub-themes, namely authors, organizations, and countries.

1. Co-authorship Authors

Using the VOSViewer software, we found the author’s bibliometric mapping as shown in the following figure. The bigger the shape and the brighter the color, it indicates that the author is publishing more and more his writings related to the Halal Cluster.
The appearance of the cluster density depends on the level of yellow light brightness. This identifies that the yellow color on the map depends on the number of items associated with other items. This section is useful for getting an idea of the general structure of a bibliometric map by paying attention to which parts of the light are considered important to analyze. From the map, it is possible to interpret the authors who have published the most.

In general, each researcher has different tendencies. Some writers are indexed as a single author, others co-author with other researchers so that multiple clusters appear which are indicated with different densities. However, the authors with a fairly large density indicated that they published more research on Halal Cluster themes than those with a lower density, so this result can be used as a reference for future researchers.

Based on these results, the bigger and brighter the name of the author, the more papers he publishes. The authors who publish the most publications related to the Halal Cluster theme based on bibliometric mapping, are Ben-Porath E. N., Blendon R. J., and Guirgis S.

2. Co-authorship Institution (Co-citation)

In bibliometric analysis, the author’s institution can be seen from which institution they come from. Through these results, we were able to interpret the institutions that wrote the most publications.

![Image of bibliometric map]

**Figure 2. Co-authorship Institution (Co-citation)**

Based on the following figure, the cluster of institutions that are visible with glowing circles shows how productively these institutions have contributed in publishing papers with the theme of Halal Cluster. The largest number of institutions is calculated from the number of publications and the number of links to other institutions, where an author can write many papers in different journals.

The most popular institutions are calculated based on the number of publications and the number of links to other institutions, where a paper writer can write many papers in different journals. The ranking of the most famous institutions shown by the results of bibliometric mapping is the Harvard T H Chan School of Public Health, Boston, United States.
3. Co-authorship Country

Furthermore, the visualization of the journal publisher mapping is illustrated in the bibliometric image of the journal source below. Based on the picture, it can be seen that some of the country clusters appear to publish the most articles with the Halal Cluster theme.

![Figure 3. Co-authorship Country](image)

Keywords that have a larger form indicate that the word is used more in journals related to the Halal Cluster topic.

This data can be used to find out the trend of keywords in recent times. The bibliometric analysis shows several keywords that are widely used in the research paper. The more keywords that appear, the wider the circle indication will be. While the line relationship between keywords shows how much they are related to other keywords.

Based on the results of the analysis using VOSviewer on keywords with the theme of Halal Cluster, there are many clusters and are interrelated with other keywords. Keywords that have the same color indicate a very close relationship. The most used keywords in Halal Cluster-themed journals are Animal, human and halal authentication.

**Co-occurrence Analysis**

Furthermore, the bibliometric results will be displayed based on the sub-themes, namely all keywords, author keywords, and index keywords.

1. Co-occurrence All Key Word

VOSViewer can also find a bibliometric mapping of the most used keywords in Halal Cluster themes related to Islamic economics. The bibliometric mapping of the keywords used can be seen in the image below.
2. **Co-occurrence Authors Key Word**

VOSViewer can also find a bibliometric mapping of the most used keywords by authors in the Halal Cluster theme related to Islamic economics. The bibliometric mapping of the keywords used can be seen in the image below. Keywords that have a larger form indicate that the word is used more by authors in journals related to the Halal Cluster.
Based on the results of the analysis using VOSviewer on keywords that are widely used by authors in the Halal Cluster-themed journal, there are many clusters and are interrelated with other keywords. Keywords that have the same color indicate a very close relationship. The keyword most used by the author is Halal Food.

3. Co-occurrence Index

Then, this study also obtained results in the form of an index that is often used by authors and is interrelated in the Halal Cluster theme related to Islamic economics as shown in the image below. An index that has the same color indicates a very close relationship.

![Image of co-occurrence index]

Based on the results obtained, the lighter the color, the more recent the index is used. In the word index of the paper with the theme of Halal Cluster related to Islamic economics, there are some of the most widely used words, namely Human and Animal.

Halal cluster typically refers to a group of businesses or organizations that operate within the halal industry. Halal refers to what is permissible or legal in traditional Islamic law, and it applies to various aspects of life, including food, finance, cosmetics, and more. A halal cluster could include companies involved in halal food production, halal certification agencies, Islamic finance institutions, halal tourism providers, and other businesses catering to the needs of Muslim consumers who adhere to halal principles. These clusters may collaborate, share resources, and support each other to promote and expand the halal market both domestically and internationally.

Table 2 shows the 10 most cited articles related to the Halal Cluster. The first article, namely Rapid identification of pork for halal authentication using the electronic nose and gas chromatography-mass spectrometer with headspace analyzer (Nurjuliana, Che Man, Hashim, & Mohamed, 2011) was cited at most 106 times. In his research, he studied volatile compounds from pork, other meat and meat products using a nasal chromatography-mass spectrometer and electronic gas chromatography with a head chamber analyzer (GCMS-HS) for halal verification. Principal component analysis (PCA) was applied for data interpretation. Analysis with PCA can classify and distinguish pork from other types of meat and sausages. The results show that PCA can...
provide good sample separation with 67% of the total variance recorded by PC1.

The article that ranks second is Halal clusters (Tieman, Halal clusters, 2015) which is an article cited 46 times. Where the research aims to propose the concept of a halal cluster to better regulate the production and trade of halal food. It was found that Food production and trade are described as a weak link in the halal value chain. To ensure the availability and access of halal food, a new paradigm is needed in managing the production and trade of halal food through halal clusters. The proposed halal cluster model is based on five pillars, namely Muslim consumers, education and research, halal integrity network, halal supply chain, and enablers.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Title</th>
<th>Author</th>
<th>Year</th>
<th>Journal</th>
<th>Total</th>
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<tbody>
<tr>
<td>1</td>
<td>Rapid identification of pork for halal authentication using the electronic nose and gas chromatography mass spectrometer with headspace analyzer</td>
<td>Nurjuliana M., Che Man Y.B., Mat Hashim D., Mohamed A.K.S.</td>
<td>2011</td>
<td>Meat Science</td>
<td>106</td>
</tr>
<tr>
<td>2</td>
<td>Halal clusters</td>
<td>Tieman M.</td>
<td>2015</td>
<td>Journal of Islamic Marketing</td>
<td>46</td>
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<tr>
<td>3</td>
<td>Towards successful adoption of Halal logistics and its implications for the stakeholders</td>
<td>Haleem A., Khan M.I.</td>
<td>2017</td>
<td>British Food Journal</td>
<td>44</td>
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<tr>
<td>4</td>
<td>A rapid ATR-FTIR spectroscopic method for classification of gelatin gummy candies in relation to the gelatin source</td>
<td>Cebi N., Dogan C.E., Mese A.E., Ozdemir D., Arıcı M., Sagdic O.</td>
<td>2019</td>
<td>Food Chemistry</td>
<td>25</td>
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<tr>
<td>5</td>
<td>Clustering halal food consumers: A Twitter sentiment analysis</td>
<td>Mostafa M.M.</td>
<td>2019</td>
<td>International Journal of Market Research</td>
<td>20</td>
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<tr>
<td>6</td>
<td>Food safety and halal food in the supply chain: Review and bibliometric analysis</td>
<td>Wahyuni H., Vanany L., Ciptomulyono U.</td>
<td>2019</td>
<td>Journal of Industrial Engineering and Management</td>
<td>19</td>
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<tr>
<td>8</td>
<td>Halal food: structured literature review and research agenda</td>
<td>Secinaro S., Calandra D.</td>
<td>2021</td>
<td>British Food Journal</td>
<td>16</td>
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<tr>
<td>10</td>
<td>Chemical and Chemometric Methods for Halal Authentication of Gelatin: An Overview</td>
<td>Hassan N., Ahmad T., Zain N.M.</td>
<td>2018</td>
<td>Journal of Food Science</td>
<td>9</td>
</tr>
</tbody>
</table>

Consuming halal food and the prohibition of using haram products and things that are indecisive are included in Islamic values (Zakaria & Abdul-Talib, 2010). To regulate food production and marketing, the halal cluster design is required. The design creates halal food products that are of high quality and tailored to the demands of the user. It contains several pillars that are employed as standards or requirements for halal food businesses, such as Muslims. (Masnita & Puspitasari, 2021).

The government and businesses are becoming increasingly concerned about the integrity of halal supply
CONCLUSION

The focus of this research is to try to find out how far the development of Islamic finance is to find out how many journals are written with the Halal Cluster theme. The results show that there has been an increase in the number of published articles with the theme of Islamic Financial Stability since 2007.

Halal Cluster research has been carried out in various countries. An increase in the Halal Cluster score in a country will be positively related to economic growth in that country, which makes economists do a lot of research related to the Halal Cluster. Based on research using the bibliometric method, it was found that Ben-Porath E. N., Blendon R. J., and Guirguis S. wrote the most about the Halal Cluster. The institution that publishes the most papers related to the Halal Cluster is the Harvard T H Chan School of Public Health, Boston, United States. And the country that publishes the most papers related to the Halal Cluster in Malaysia. For all the most used keywords related to Halal Cluster is Animal. The keywords most used by authors in journals with the theme of Halal Cluster are Halal Food. The words Animal and Human are the words most used in the index paper with the theme of Islamic Financial Stability.

REFERENCES


Halal and Sustainability


