A Literature Highlight: How A Traceability System Can Support Halal Supply Chain?

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Abstract

At present, halal awareness is related to food quality, both in Muslim countries and non-Muslim countries. Food safety and quality assurance of food integrity, including food safety, health, nutrition and quality. The concept of halal includes process control, packaging, storage and delivery. All activities involved in the supply chain, especially food, the question is whether the integrity of halal food products can remain halal throughout the supply chain. Halal traceability, namely recording all information on activities in producing products from upstream, namely the origin of raw materials to downstream, becomes important. This literature review aims to determine the halal traceability system in the halal food supply chain. In particular, this article discusses the traceability architecture in food products. The study suggest some topics of emphasis in developing an economic research gate: Break even point of Halal traceability and tracking, acceptable level of risk in Halal traceability and tracking, participation in Halal traceability and tracking system. The 'shades' of food integrity in the halal supply chain are offered, which can be categorized into four supply chain dimensions, related to raw materials, production, service, and the consumer.

I. Introduction

Halal awareness currently relates to food quality, both in Muslim and non-Muslim countries. The halal trend is very important because it is useful in responding to the potential risk of contamination with haram substances that can arise in food (Handayani et al., 2019). For stakeholders in the food industry, food safety and quality assurance are important issues. (Zulfakar et al., n.d.)

Halal food consumers are now more aware of the integrity of halal status and halal processes throughout the supply chain.(Yusaini H. et al., 2016). The concept of halal also includes process control, packaging, storage and delivery.(Zulfakar et al., n.d.). In short, the food integrity of the product must be maintained to fulfill halal purposes. That's when the right halal needs to be made.

Traceability is essential for monitoring the entire supply chain. Halal food product traceability systems are needed to provide transparency of information about food processing and enable customers to trace and track the processes involved in food preparation. (Poniman et al., 2015). Halal traceability, which is information on allupstream production activities, namely the origin of raw materials to downstream, becomes important.

II. Research Methods

PRISMA or Preferred Reporting Items for Systematic Reviews and Meta Analysis-the standard for conducting literature study uses on halal traceability. PRISMA also emphasizes review reports which can be used as a basis for reporting systematic reviews for other types of research. (Moher, D., Liberati, A., Tetzlaff, J., Altman, 2009).

The ATLAS.ti 7.0 software is used to help categorize and encode literature reviews. The originator of the ATLAS.ti software was named Thomas Muhr, originally from Germany. So, in German, ATLAS.ti has the abbreviation Archiv fur Technik, Lebenswelt, Alltags Sprache (Archieve of Technology, Lifeworld and Everyday Language). ATLAS name prop up the idea as a map of the world and this is described in meaningful document management. These software provides meaning of interpretation text (Friese, 2014). This ATLAS.ti software is a type of CAQDAS (Computer-Aided Qualitative Data Analysis Software) program or similar to QDA software (Qualitative Data Analysis Software).

III. Results and Discussion

3.1 Results
a. Resources

The review methods of this study is conducted using one main database, namely Scopus considering that this database is robust. However, it should be noted that no database is perfect or comprehensive including Scopus. It is considering that it is reliable database containing journals related to blockchain technology and technology in traceability.

b. The Systematic Review Process for Selecting the Articles
1. Identification

The process of selecting relevant articles in this study consists of three main stages consisting of: keyword identification, screening and eligibility. The first step is the identification of keywords. Based on keyword searches on Scopus translated 93 articles based on relevant keywords.

2. Screening

Articles about article duplication. In this study, no articles were excluded during the first hangover, so 114 articles were filtered based on several inclusion and exclusion criteria determined by the researcher in the second (as shown in Table 1). The first criterion is the type of literature in which the researchers decide to focus only on research papers, review papers, conference processes as the main source. In addition to these types of literature, such as publications in the form of series of books, books, chapters in books, brief communication, were excluded from this study. This review was also only published on articles published in English in a 5-year period (2016-2020). In total, a total of 21 articles were issued based on the criteria in Table 1.

Table 1. Criterion, Inclusion and Exclusion of Halal Traceability

Criterion	Inclusion	Exclusion
Types of literature	Research paper, review paper, conference proceeding	Book series, book, chapter in book, short communication
Language	English	Non English
Time line	Between 2010 and 2020	Before 2010
Subject Area	Supply Chain Management, Logistics, Operation Management, Research Operation	Other than Supply Chain Management, Logistics, Operation Management, Operation Research

3. Eligibility

A total of 93 articles were prepared for the third stage known as the eligibility. According to the year of issues of the papers, the following year of issues of paper publication distribution as in table 2 below.

Table 2. Paper Publication Distribution Based on Year of Issues

Year	The Amount of Articles
2016	2
2017	4
2018	53
2019	28
2020	2
Total	93

At this stage, with reasons that excluded due to articles are not based on focus on traceability using blockchain technology. Finally, a total of 4 remaining articles is ready to be analyzed.
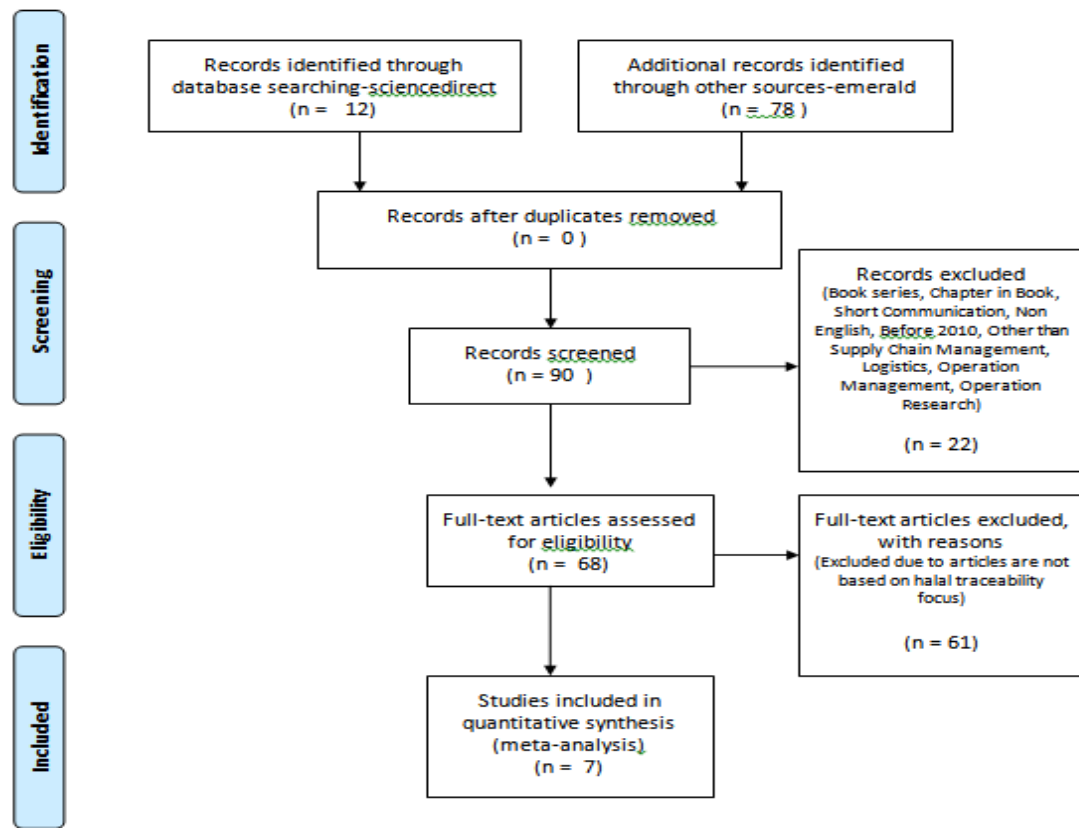
c. Data Abstraction and Analysis

Figure 1. *PRISMA Traceability Using Blockchain Technolgy*

This table 3 is a summary of the review of halal traceability based on systematic literature review.

Table 3. A Summarry of The Review of Halal Traceability

No	Authors	Year	Title	Theories	Methodologies	Summary of Findings	Suggestion for Future Research
1	Mohd Hafiz Zulfakar , Marhani Mohamed Anuar, Mohamed Syazwan Ab Talib	2012	Conceptual Framework on Halal Food Supply Chain Integrity Enhancement	Norman, Nasir & Azmi 2008; Norman et al. 2009; Mohd Albakir & Mohd-Mokhtar 2011	Literature Review	Halal integrity is the foundation of the Halal food industry. Protective and preventive measures must be taken to ensure that the Halal food products still remain Halal even though it have travelled greater distance and undergone various handling activities within the supply chain. All parties in the supply chain, downstream and upstream, must take individual and joint responsibilities to protect the Halal food products from being cross contaminated, whether intentionally or unintentionally. It is impossible for any single party to oversee these huge responsibilities. As the demand for Halal food products is expected to grow even bigger in the near future, factors such as Halal certification, Halal standard, Halal traceability.	Further empirical studies can be carried out to test the relationship between the factors and also uncover other factors that can help in enhancing the Halal integrity

2	Delma Poniman, Sharon Purchase, Joanne Sneddon	2013	Traceability in Halal Food Supply Chains from a Business Network Perspective	Regattieri et al., 2007	Qualitative approach using case study	The proposed framework will be of interest to any manufacturer or retailer as it will provide an understanding of current business relationships and provide interesting insights of ways to improve the current relationships to achieve mutual benefits for all parties involved within the network. The proposed conceptual framework is a useful tool to assist all parties in the Halal Ecology when analysing the variety of relationships in which they currently operate. Halal Ecology here refers to individuals who are directly and indirectly involved in the Halal food manufacturing operations organisations (from purchasing, production, marketing, sales and other relevant departments in the organisations), the organisations' suppliers', the suppliers, the Islamic Organisations, the Government as well as the competitors in the Halal industry.	As a final point, this paper contributes to knowledge development in food supply chains by integrating traceability systems and data transparency within a network context (i.e. the IMP framework). Previous literature on traceability focused on consumer attitudes or single actor issues while this paper addresses the gap in understanding it at the network level
3	Yusaini H. Mohamed1, Abd Rahman Abdul Rahim2, Azanizawati Binti Ma'ram3, Mohd Ghazli Hamza	2016	Halal Traceability in Enhancing Halal Integrity for Food Industry in Malaysia – A Review	Zailani et al., 2010 Meuwissen et al., 2003	Literature Review	Halal traceability allows industry stakeholders to detect and track vital information at each stage of production and allows to reduce the withdrawal of the product and the number of cases of compliance found by authorities will result in a negative impact on the growth of this industry. Halal Traceability implementation can reduce the cost of removing the product from the market. Food manufacturers can implement product recall management that can effectively ensure the safety and halal status of food products in their own approaches	Preventing the occurrence of product recalls, especially in terms of halal assurance, will lead to the level of customer confidence in the integrity of Halal industry. This in turn will increase the positive development of the halal hub in Malaysia.
4	Suhaiza Zailani, Zainal Arrifin, Nabsiah Abd Wahid, Rosly Othman and Yudi Fernando	2010	Halal Traceability and Halal Tracking Systems in Strengthening Halal Food Supply Chain for Food Industry in Malaysia (A Review)	Meuwissien et all, 2003	Literature Review	Every each of the players has particular weaknesses when participating in the halal markets. The important weaknesses are the lack of knowledge about halal markets, halal technology, and the proper use of Halal inputs. Obviously, these are serious problems than can adversely affect their ability to adopt the Halal traceability and tracking systems.	The study suggest some topics of emphasis in developing an economic research gate: Break even point of Halal traceability and tracking, acceptable level of risk in Halal traceability and tracking, participation in Halal traceability and tracking system
5	Noorsiah Ahmadª, Sariwati Mohd Shariff	2015	Supply Chain Management: Sertu Cleansing for Halal Logisitics Integrity	Mohd Shariff, Jaafar & Muhammad (2014)	Literature Review	Halal integrity in halal logistics is an integral part of the halal supply chain management. Halal integrity encompasses cleanliness, sertu cleansing of transport, containers and trucks, operations' compliance with Shariahlaws and tracking and traceability. Sertu cleansing is warranted for machines, utensils or equipment that are being used previously in manufacturing of non-halal food products. Sertu ritual cleansing also needs to be carried out if severe najs such as dogs, pigs and its derivatives are present in the warehouse. Carrying out sertu needs in-depth understanding of Shariah requirements and carrying out this Islamic ruling is not a task to be taken lightly. This paper concludes sertu	In conclusion, the literature on sertu operations can used as a reference for the halal authority, halal logistics service providers and researchers in halal logistics and supply chain management.

No	Author	Year	Title	References	Methodology	Key Findings	Relationship
						cleansing is important to assure halal and toyyib (clean and safe) and the responsibility lies on the logistics service providers and the enforcement on its compliance lies in the halal authority.	
6	Zurina Shafii and 2W.M.N. Wan Siti Khadijah	2012	Halal Traceability Framework for Halal Food Production	Golan, E., B. Krissoff, B. Kuchler, L. Calvin, K. Nelson and G. Price, 2003	Qualitative approach with in depth interview	Halal traceability framework for Halal food producers based on Halal traceability deployments in a Halal certified food production company. The case study method is employed to learn about the initiatives of the company in relation to traceability of Halal food production. Based on the experience of the studied case, a framework is generated that Halal food producers can refer to as a proper guideline to ensure Halal compliance along the production, transportation and distribution system. The framework has theoretical interest for replicability to other Halal food producers.	The summarization of the main findings results to a generation of Halal traceability framework which may be referred to other companies in the similar setting of producing Halal products. For future research, it is recommended that more traceability adoption in Halal production companies in order for comparative practices could be studied so that the Halal traceability framework could be improved. It would also facilitate in studying the effectiveness of the traceability systems used in the companies.
7	Mohd Helmi Ali, Norhidayah Suleiman	2018	Eleven shades of food integrity: A halal supply chain perspective	David et al., 2017, pp. 7–19; Elliott, 2012; Zailani et al., 2010).	Literature Review	Key findings and conclusions: Eleven 'shades' of food integrity in the halal supply chain are offered, which can be categorized into four supply chain dimensions, related to raw materials, production, service, and the consumer. Each shade is defined and aligned with the results in the literature, and areas for future research are suggested. Theoretical and managerial implications are provided. The 'shades' highlighted can be used and considered by managers as fundamental insights to ponder in safeguarding the integrity of halal products	The relationship between practice and performance has been highlighted in the literature, and firms need to be extra vigilant in considering the most appropriate approach in managing halal integrity in the long term. The halal food industry is relatively less matured, and reliance on a certification mechanism is far too often being mistaken as the panacea for food integrity. Similarly, the halal food industry is dependent highly on the consumer trust of its food integrity, thus suggesting the actors in the halal supply chain pay equal responsibilities in ensuring that all the products fulfills the requirements at all time. The literature highlights that consumer willingness to purchase is

3.2 Discussions

Halal Ecology here refers to individuals who are directly and indirectly involved in the Halal food manufacturing operations organisations (from purchasing, production, marketing, sales and other relevant departments in the organisations), the organisations' suppliers', the suppliers, the Islamic Organisations, the Government as well as the competitors in the Halal industry.

Marketing is a process of planning and execution, starting from the conception stage, pricing, promotion, to the distribution of goods, ideas and services, to make exchanges that satisfy the individual and his institutions (Dianto in Asmuni *et al*, 2020). According to Tjiptono in Marlizar (2020) marketing performance is a function that has the greatest contact with the external environment, even though the company only has limited control over the company's environment. Performance is the result that has been achieved from what has been done by the owner or manager in running the business. Marketing performance can be measured by using sales growth, customer growth and product success to measure the impact of the strategy adopted by the company. Promotion strategy is a concept that is close to communication science. In the promotion, there are various forms of communication learned in communication science such as advertising, publicity, communication from mouth to mouth, personal sales, and direct marketing (Amin, 2019). Previous literature on traceability focused on consumer attitudes or single actor issues not at the network level. It is an important thing to make a development in food supply chains by integrating traceability systems and data transparency within a network context. (Poniman et al., 2015). All parties in the supply chain, downstream and upstream, must take individual and joint responsibilities to protect the Halal food products from being cross contaminated, whether intentionally or unintentionally. It is impossible for any single party to oversee these huge responsibilities.

As the demand for Halal food products is expected to grow even bigger in the near future, factors such as Halal certification, Halal standard, Halal traceability (Zulfakar et al., 2014). Halal traceability guarantees the quality of product in the supply chain, besides traceability can authenticate and identify products in order to protect consumers. Halal Traceability will help increase consumer confidence in food safety. Other than that, Halal Traceability implementation can reduce the cost of removing the product from the market. Food manufacturers can implement product recall management that can effectively ensure the safety and halal status of food products in their own approaches. Preventing the occurrence of product recalls, especially in terms of halal assurance, will lead to the level of customer confidence in the integrity of Halal industry (Mohamed et al., 2016).

To identify what is wrong related to halal, in a company's supply chain, a good tracing system is needed that is able to reveal the problems that occur along the chain. An effective traceability system of Halal Industry needs the local halal supply chain to be developed and modelled as an important aspect for the industry to survive in the global halal food market and industry (Shafii et al., 2012). The study suggest some topics of emphasis in developing an economic research gate: Break even point of Halal traceability and tracking , acceptable level of risk in Halal traceability and tracking, participation in Halal traceability and tracking system (Ahmad & Shariff, 2016). The 'shades' of food integrity in the halal supply chain are offered, which can be categorized into four supply chain dimensions, related to raw materials, production, service, and the consumer (Ali et al., 2017).

IV. Conclusion

Based on literature review, implementation of halal traceability will enhance food quality and consumers trust as its impact. Traceability systems is a strategic tool in the Halal Industry. An effective traceability system of Halal Industry needs the local halal supply chain to be developed and modelled as an important aspect for the industry to survive in the global halal food market and industry. The study suggest some topics of emphasis in developing an economic research gate: Break even point of Halal traceability and tracking , acceptable level of risk in Halal traceability and tracking, participation in Halal traceability and tracking system. The 'shades' of food integrity in the halal supply chain are offered, which can be categorized into four supply chain dimensions, related to raw materials, production, service, and the consumer.

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