**International Journal of Asian Social Science**
*ISSN(e): 2224-4441*
*ISSN(p): 2226-5139*
*DOI: 10.55493/5007.v13i1.4700*
*Vol. 13, No. 1, 14-28.*

*URL: www.aessweb.com*

# From the chef's kitchen to your doorstep: Implementation of halal supply chain management for online food delivery services

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**Article History**
Received: 1 September 2022
Revised: 12 December 2022
Accepted: 26 December 2022
Published: 5 January 2023

**Keywords**
Consumer
Halal industry
Halal integrity
Halal supply chain management
Online food delivery services
Traceability.

## *ABSTRACT*

The increase of Online Food Delivery Services (OFDS) is a result of rising consumer demand. Halal food's integrity has been questioned by customers particularly on issues of hygiene and quality. There are a few OFDS literature reviews that have examined halal supply chains in-depth. The use of Halal Supply Chain Management Systems (HSCMS) by food delivery services is examined in this study. Traceability mechanisms and barriers to halal supply chain implementation will be identified. Qualitative methods are used to collect data and semi-structured questions are used to quantify information. Interviews are conducted to assess halal supply chain management practices. The Informants were the upper management of two halal food delivery companies in Klang Valley, Selangor, Peninsular Malaysia. The companies were L and B. HSCMS are crucial for addressing halal integrity concerns. This study provides valuable insights into how halal supply chains are currently managed. Through a traceability system for OFDS, multidimensional parties and academia will discover how to ensure halal integrity, safety and quality.

**Contribution/ Originality:** Due to its uniqueness, this study adds to the literature in supply chain and traceability systems, particularly in halal and *toyyib* aspects of OFDS. This is the first study to analyze the implementation of HSCM among OFDS players, establishing a new paradigm in HSCM research and providing implications for both restaurant operators and OFDS.

## 1. INTRODUCTION

The concept of halal encompasses the production and delivery of food not only the ingredients. This means that those involved in the halal industry and other commercial enterprises should regard halal-compliant practices as an integral part of their core competencies. To achieve this, halal supply chain approaches are needed to ensure that supply chain activities are aligned with Syariah requirements. To ensure halal integrity, this is crucial. The Halal Supply Chain Management (HSCM) process includes the entire process starting from handling, packaging, storing and delivering foods.

Food ordering and delivery have grown to be one of the most popular online businesses and most profitable sectors in the 21st century. Online food delivery services serve as intermediaries between customers and food outlets despite the fact that business models may vary from one on-line platform to another. By 2022, it is estimated that Economic Capital Insider will make US Dollar (USD) 956 million in yearly income as online food delivery services become popular in Southeast Asia. Malaysia's online food delivery profits are expected to reach USD 211 million in the year 2020. By 2024, the market will be valued at USD 410 million with a projected annual growth rate Compound Annual Growth Rate (CAGR) 2020-2024 of 18.0%. People's reliance on smartphones has affected how they buy products and services including food as smartphones have become increasingly important for people (Nina & Abidin, 2021). This implies that technology has advanced to the point where an alternative mode of ordering and delivering online using third-party platforms has become the norm.

Research on halal supply chains and halal transportation is still scarce despite the vast study of halal (Jaafar, Endut, Faisol, & Omar, 2011). There are several activities in a halal supply chain besides transport and warehousing, including sourcing, product handling and so on. However, transport is essential because all products must pass through these stages. Transportation is a crucial component of halal service at which halal and non-halal products may come in contact. Nor, Norkhairiah, and Rose (2021) shared the same view, emphasizing the lack of awareness of the safety and quality of prepared food items delivered from restaurants to customers via OFD services. The information available about OFDS in the halal food supply chain is limited prompting questions about their halal status. Halal products cannot be guaranteed to be halal at the point of consumption if there are no halal supply chain services. There are variations in how each OFDS implements the HSCM in Malaysia as a result of a lack of halal certification and standardization. In addition to halal certification bodies identifying potential hazards in food, each OFDS should also be versed in food safety to be able to make informed decisions regarding what to accept and what to reject. The OFDS industry will then consider the need to establish an effective traceability system that provides transparency into the production, processing and delivery of food. In addition to improving food safety and quality control, this system could identify potential hazards within the entire food supply chain and help to identify potential illegal activities, such as fraud and smuggling. This study offers a unique perspective on i) the extent to which Online Food Delivery Services (OFDS) companies advocate for HSCM implementation and ii) determines their perception of how effective online food delivery services (OFDS) perceive their existing traceability systems throughout their services and operations. iii) The challenges food delivery services are facing as they embark on this journey.

## 2. LITERATURE REVIEW

### *2.1. The Concept and Emergence of Online Food Delivery Services (OFDS)*

Ray, Amandeep, Pradip, and Puneet (2019) describe online food delivery services as buying and delivering food via a website or application from different kinds of restaurants. A consumer usually browses online for their favourite restaurant and purchases items from the menu, including their delivery address. OFDS refers to app-based services which enable consumers to order food online and get it delivered to their doorsteps (Ray et al., 2019; Yi-Shun, Tseng, Wang, Shih, & Chan, 2019). OFDS primarily work in the form of mobile applications and can be classified into two categories (Zhao & Bacao, 2020): (1) restaurants or catering enterprises such as Domino's, Pizza Hut, Burger King or Kentucky Fried Chicken (KFC) that have developed their own apps websites for receiving online orders and facilitating pick-up or delivery (Perumal et al., 2021; Ramos, 2021) and (2) third-party intermediary services (platforms) such as Uber eats, Meituan, Grubhub, Zomato and Swiggy that act as an interface between consumers and restaurants or catering services (Muangmee, Kot, Meekaewkunchorn, Kassakorn, & Khalid, 2021; Suhartanto, Helmi Ali, Tan, Sjahroeddin, & Kusdibyo, 2019; Sushant & Shah, 2021). The later platforms were developed and managed by a third party which generally combined the owner's resources and met the users' demands (Li, Hong, & Zhang, 2017). The second category of OFDS is merely a platform for companies to provide delivery order services, payment and process monitoring, and is not responsible for actual preparation

and delivery. In this regard, online food delivery apps track and monitor the delivery process (Pigatto, Machado, dos Santos Negreti, & Machado, 2017). Nowadays, Malaysian consumers are increasingly using their mobile devices for online shopping. This phenomenon may have also contributed to the increasing popularity of OFDS applications which have gained popularity as a result of an increased use of smartphones. Data showed that Malaysia's food delivery services are expected to grow continuously and reach a market size of more than USD 319.1 million by the year 2026 (Anwar, Yuvaraj, Nurul, & Ahmad, 2022). With the increasing penetration of smartphones, the consumer behaviour landscape has also changed from traditional offline food purchases to OFDS as a result of the rising use of cell phones. It is now more convenient for customers to shop at any time, any place and with just one click accessing OFDS, especially after or during a busy workday (Adriana, Silvia, & Adina, 2020; Lau & David, 2019; Nor et al., 2021).

The second type of OFDS service is prevalent amongst Malaysians that offer their services via food delivery apps, such as FoodPanda, Dahmakan, DeliverEat, GrabFood, SmartBite, BungkusIt Delivery, LaukFood Tech, etc.Rosli (2018) reported that about 10 million people had downloaded the FoodPanda Malaysia application from the Google play store. Deliveries from Food Panda, Grab Food and Pizza Hut Delivery are classified as parcel-hailing services (p-hailing) in Malaysia, where packages and food are delivered by motorcycles using online applications. According to Jais and Marzuki (2020), due to its convenience, speed, and ease of use, P-hailing serves as a niche that delivers food services using consumption models. It has been defined exclusively as e-hailing that is facilitated by software applications (apps) (Hawlitschek, Teubner, & Gimpel, 2016; Taşkın & Ece, 2021). Malaysia's Transport Ministry recently issued guidelines for companies providing goods delivery services using motorcycles, particularly during the Movement Control Order (MCO) (Bernama, 2020). It stipulated merely very general requirements for food hygiene and safety, emphasizing the safety and hygiene practices of riders during COVID-19. There is no detail provided in this guideline on halal supply chain aspects. A very detailed concept of OFDS is summarized in Figure 1. OFDS involves food producers offering menu selections that are displayed on an online platform. Secondly, customers can choose and order their desired meals. Following that, orders are taken, they are forwarded to food outlets and payments are monitored. All these steps are made possible by food delivery applications or food applications that forward their orders to food outlets where meals are prepared and they are delivered to customers by OFDS via delivery tracking facilities once they have been prepared.

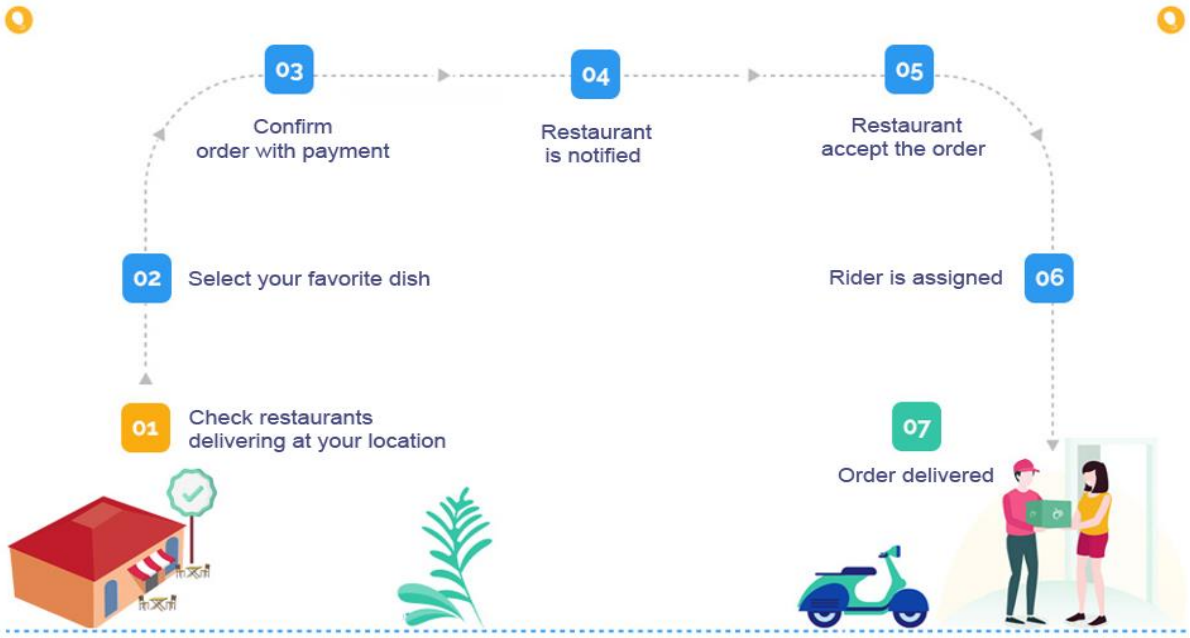


**Figure 1.** Online food delivery services concept.

**Source:** (Arun, 2021).

### *2.2. Halal Integrity: Issues of Food Safety and Quality in Online Food Delivery Services (OFDS)*

As discussed earlier, franchises such as Domino's, Pizza, Burger King, Kentucky Fried Chicken and McDonald's use their dispatchers to deliver their food directly to their customers without using third-party delivery services. Third-party food delivery services, such as Food Panda, Bungkus It and Grab Food, merely act as a platform that offers food delivery services through which companies can deliver orders collect payments and monitor processes. They are not responsible for the preparation of the food from raw materials to serving. This is because they must fulfil several requirements that encompass a wide range of stakeholders in their supply chain management, such as suppliers, logistics, and production. As a result, halal supply chains entail some risks.

There has been a great deal of discussion in previous literature regarding the convenience and positive behaviour of consumers towards OFDS, especially during the COVID-19 pandemic (Diana, Adela, Susana, & Gema, 2021; Saqib, Nadee, Hafiz, & Dewan, 2021; Sushant & Shah, 2021). As the quality of food depends on the ability of the food to meet the needs of consumers, (Dwi, David, Gundur, & Ni, 2019; Ha & Jang, 2010) it must reach consumers in a safe and fit condition. There are some drawbacks to this kind of trading. With the traditional face-to-face approach, consumers can subjectively assess the level of food quality and hygiene (Anh et al., 2018; Gabriela, Bastos, Mancuso, & Behrens, 2014). However, the current food safety chain management still seems flawed (Anh et al., 2018) when it comes to verifying the truth of food traceability and food processing information through OFDS. According to Saad (2021) online food has several problems that make customers dissatisfied with the quality of the food. There have always been customer complaints about hygiene and cleanliness. Hence, delivery can be controlled and managed by carefully rechecking the food when it is taken from the restaurants and how it is delivered (Prabowo & Nugroho, 2019; Yuchen, 2020).

On the other hand, food safety includes many issues, such as the presence of biological, chemical and physical agents in food that can expose consumers to food-borne diseases (Sarah et al., 2022). Biological and chemical food safety hazards are characterized by microorganisms found in the air, food, water, raw materials and the human body contaminating food. Physical agents can also cause illness or harm to consumers if any foreign matter is coincidentally entered into food or a naturally occurring object. As a result of unsanitary conditions during food production, storage and distribution (Singh, Rajat, Pankaj, & Ram, 2019) foreign materials are associated with food contamination. Both of these hazard control points are determined when food is ordered through an online platform and when it is prepared, packaged and delivered to the consumer (storage conditions and duration of transport).

Food products must be in a temperature-controlled environment during OFDS to ensure food safety. Using OFDS can result in large-scale outbreaks due to the possibility of potentially contaminated food spreading quickly throughout cities (Nina & Abidin, 2021). To ensure food safety, food products must be in a controlled temperature environment during OFDS. Due to their short shelf life, foods prepared away from home need to be kept in a controlled environment. The growth of bacteria like *Staphylococcus aureus*, *Salmonella enteritidis*, *Escherichia coli*, *and Campylobacter jejuni* can cause illness in consumers when stored at ambient temperatures (4.4°C - 60°C). The danger zone (between 21°C and 47°C) allows pathogenic bacteria to grow rapidly. We should avoid eating food stored at this temperature for more than two hours. In addition, Ray et al. (2019) and Maimaiti, Zhao, Jia, Ru, and Zhu (2018) emphasize that OFDS applications require serious attention, especially in terms of cleanliness and safety. It appears that there are potential hazards that require control measures for food during OFDS activities. As such the above indicators regarding food quality, safety and hygiene should also be extended in the OFDS (Yuchen, 2020).

There have been issues raised by previous studies that affect the halal food industry's reputation, including illegal mixing of halal meat with non- halal meat during transportation, distribution of non- halal food as halal, and the use of false or expired halal certificates (Mohd Hafiz, Anuar, & Ab Talib, 2014). The unavailability of skilled human resources is another risk, especially when staff members do not have halal understanding levels (Mohd Imran, Abid, & Shahbaz, 2018). In order to maintain the quality of the online food industry, it is crucial to have a traceability system in OFDS.

### *2.3. Traceability System's Role in the Halal Supply Chain in OFDS*

According to Shariah principles, halal food is associated with quality, cleanliness and safety and this has led to an increase in its consumption. From the point of origin to the point of consumption, halal refers to the process from farm to fork, or from the point of supply to the point of consumption. In Halal Supply Chain Management, material flow, information and money are managed through strategic coordination, cooperation and collaboration among stakeholders, resulting in a value that enhances supply chain performance by integrating Halal and *Toyyib* into all processes, including production and consumption (Dewie et al., 2021; Mohd Imran et al., 2018). The author highlighted several significant points. Firstly, the term halal refers to Islamic law. Secondly, *Toyyib* is the definition of conditions in which food is safe, hygienic, veterinary, slaughtered following Islamic law, protected from dirty things in the environment and sustainable. Thirdly, there is a focus on flow which indicates that halal processes must be maintained throughout the entire production process. Lastly, there is coordination and collaboration which means that manufacturers, suppliers and consumers must work together to ensure that a product is halal. To ensure that products are legal, supply chain performance is crucial. Sixthly, the focus is on value, because it is expected that profits and market share will increase with halal products. The seventh element is production to consumption which illustrates the importance of halal-certified products throughout their lifecycles.

As an essential part of ensuring the quality and safety of halal products for Muslim consumers, all parties involved in the supply chain must take all necessary steps to protect the integrity of the halal food products at all times. HSCM begins with suppliers paying attention to the condition of halal and *toyyib* on the product. HSCM integrity and quality are ensured through a set of procedures and practices. Of these, the Halal Food Quality Management System consists of some steps and processes that are aimed at ensuring halal products are safe and of high quality. There are four parts to food production: 1) production 2) processing 3) distribution 4) retail and 5) consumption. Ingredients must be sourced from halal-complaint suppliers; products must be stored and transported properly to maintain their halal status; and products must be labelled to indicate their halal status (Mohd Imran et al., 2018). A comprehensive and well-managed supply chain management approach is essential in order to increase the availability of halal food products, including OFDS. In OFDS, the halal supply chain must be sustained. A product could be halal at the food outlet but if handled improperly, it could potentially cause the halal supply chain to break (Nina & Abidin, 2021).

The transportation of OFDS in halal supply chains also poses a number of logistical issues because it falls under the category of logistics management along with the aforementioned problems. During delivery and transportation, cross-contamination brought on by contaminated containers is one of the big concerns. Since the same carrier handles both types of deliveries, there is a high risk of cross-contamination if halal products come into contact with haram or hazardous substances. Because there is a chance that a product can be contaminated during transportation, it is crucial to look into the distribution procedure (Kamisah, 2018; Mohd Hafiz et al., 2014). If the latter does not practice halal logistics, which means no assets are dedicated specifically to handling halal products, there will be no assets to handle halal products when passing consignments. Halal integrity risks are associated with sharing containers which may cause halal and non-halal products to mix in one container, the segregation of halal and non-halal goods in the same container by allocating space is another alarming issue that requires special attention. In addition, The attitudes and procedures of drivers when delivering halal products at interval stops are difficult to track (Mohamed, Lim, & Vincent, 2013).

According to Tian Nur (2017), a traceability system is a necessary element for the establishment of halal food industries today (Mohd Hafiz et al., 2014) which can be used to track the status of Halal food products at every stage of the supply chain and can increase transparency in the process. Traceability of halal food is not the responsibility of one single company but a shared commitment between all players along the supply chain (Chandra, Liaqat, & Sharma, 2015). Neeraj, Anita, Dinesh, and Kamal (2019) define traceability as the sharing of information, including product description, history and location. Sharing information has been made easier with

the implementation of traceability in the manufacturing and distribution sectors. This will provide vital information that can help to effectively manage global supply chains. Traceability is essential for ensuring the quality and safety of food in food systems. Traceability includes both tracking and tracing. Tracing involves tracing food products from retailers back to suppliers while tracking involves tracking food products along the downstream supply chain as they are exchanged between trading partners.

Traceability is also seen as an effective method to preserve sustainability and lower overall supply chain costs in addition to ensure food quality and safety. Traceability is the process of tracking a product's history, application, location, and various recorded identifiers (Dandage, Badia-Melis, & Ruiz-García, 2017; Manzini & Accorsi, 2013). Implementing a traceability system can reduce the risk of liability claims and improve recall efficiency. To enable product recalls within the framework of product traceability, a traceability system is being used to identify the physical location of goods at each point in the supply chain. It is the goal of traceability to determine where, when and what physical or chemical factors were involved in the production and processing of the product (Zailani, Arrifin, Wahid, Othman, & Fernando, 2010).

In this respect, halal food businesses must adopt cutting-edge technologies. Some mechanisms are used in the traceability system, including the Global Positioning System (GPS), the Global System for Mobile Communications (GSM), the Google Map Application Programming Interface (API) and the Radio Frequency Identification (RFID) technology (Caro, Ali, Vecchio, & Giaffreda, 2018; Shuib, Ibrahim, & Yusoff, 2021; Zainuddin, Saifudin, Deraman, & Osman, 2020). Each of the devices or applications used in traceability systems is appropriate for food delivery services for their specific needs. Since dispatchers move from one stop to another, it is not easy to use only numerals or bar codes for tracking purposes because of the nature of the vehicle.

In recent years, the Halal Food Supply Chain (HFSC) has been poised to benefit from the emergence and proliferation of the Internet of Things (IoT), a system that enables orchestration, monitoring and optimization of supply chains through the use of interconnected devices, sensors and technologies. IoT is a network of wirelessly connected devices (i.e., Radio Frequency Identification (RFID) tags, sensors, actuators and mobile phones). By leveraging IoT, halal integrity can be maintained in HFSCs and problems related to maintaining halal integrity among halal supply chain actors can be solved (Rejeb, Simske, Rejeb, Treiblmaier, & Zailani, 2020). Beyond HFSCs, the importance of RFID in the food chain has been extensively reported in the academic literature. For example, Lorite et al. (2017) propose a smart sensor integrated with RFID tags to ensure real-time monitoring of the food chain. Grunow and Piramuthu (2013) develop and study the benefits of sensor-generated information at the item level in a highly perishable food supply chain from the perspectives of the distributor, retailer and consumer. With RFID tags, food can be tracked and traced in real-time, spoilage can be minimized and contamination can be quickly identified and isolated if necessary. The RFID tracking system outperforms traditional tracking tools like bar codes for halal food (Jalil, Norman, & Hamid, 2017) is highly secure (Mohsen et al., 2017) and improves product operational visibility across the supply chain. In addition to their high storage capacity, RFID tags can also be used to secure product information (Toha, Tajuldin, and Rahim (2012). RFID-based monitoring system for the halal meat supply chain was developed by Mohammed, Wang, and Li (2017) to test its effectiveness. By consistently monitoring container temperatures and notifying transporters when temperature levels rise above a certain level, the quality of halal meat products can be preserved.

## 3. RESEARCH METHODOLOGY

The current research objective is to analyze the issues surrounding food safety and food quality of online food delivery service providers. This study also conducts preliminary research to examine the extent to which Online Food Delivery Services (OFDS) companies advocate for HSCM implementation and determine their perception of how effective online food delivery services (OFDS) perceive their existing traceability systems throughout their services and operations. This study adopts a qualitative approach in which the data used in this study were primary

and secondary data using qualitative methodology. Since limited studies were conducted on halal issues surrounding OFDS, it is deemed necessary to conduct qualitative studies in which data is collected through a series of interviews with the industry players (Sekaran & Bougie, 2009). This study applies primary data in which purposive sampling is chosen as information is conveniently available from specific target groups. Only food delivery services that operate in the area of Klang Valley, Selangor District, Peninsular Malaysia have been chosen. This is due to the fact that Klang Valley is in a central city where demand for food delivery services is higher than in rural area. Therefore, many food delivery services focused on a central city to expand their food delivery services empire. There are no more than 10 OFDS in Klang valley are. Two companies that provide food delivery services gave a positive response in regards to the request. Information was gathered through an interview session which was conducted with two informants from two OFDS companies, both from the top management position i.e (CEO of Company B and Co-founder of Company L). A set of semi-structured questions have been prepared to be asked during the interview session. The information provided during the interview session has been analyzed and reviewed from the perspective of the findings of this research. The interview questions are derived and developed from previous pieces of literature discussed above. Although there is a scarcity of studies on the halal supply chain with special reference to OFDS, the interview questions are designed from a combination of significant information from the related halal supply chain, traceability, and halal logistics kinds of literature. This is done to establish validity and to ensure the study covers relevant and important issues. The questions have been divided into two sections i.e Section (1) and Section (2) which each consist of four items for each. The four sections consist of different parts which are Section A possesses informants' profiles that consist of name, age, gender, representation, position, and working experience. Meanwhile, Section B contains information on Halal certification, Section C contains information on the management of the Halal supply chain, Section D consists of the mechanism of the traceability system, and lastly, Section E consists of the challenges faced and its recommendation. Each section consists of about two to three questions and all of the questions were created per the research objectives of this study to make sure that the purpose of this study can be achieved. Once all the conversations are recorded and information is extracted, the data is transcribed, analyzed (data reduction and data display) and conclusions are drawn.

Apart from primary data, this study also employed secondary data to support the primary data received during the interview session. Secondary data contains library research to support the information given by the informant to validate the data. Furthermore, it can also facilitate the primary data collection to make it more comprehensive because of the support from secondary data. The authors can acknowledge the gaps and limitations as well as what additional information needs to be gathered. A review of the literature has been carried out based on the information available in the published articles. In the method of literature review, the contribution of various previously conducted research, both qualitative and quantitative, can help the results of more balanced research. Literature is taken from the source Google Scholar and well-known online publishers such as Springer, Elsevier, Emerald and other high impact journals. The literature in this study was selected with consideration of competence and has good relativity with the most current Halal Supply Chain management conditions. This study uses various types of literature such as journals and conferences. Abstracts were read to be reviewed and to make selections, followed by reading the full-text papers before choosing the final selection. Researchers then analyze the literature. To analyze the literature, the researchers focused on the problem, solution and strategy for each literature taken. The literature review and expert opinion will be used to collect data for this study as well as create the findings.

## 4. RESULT AND DISCUSSION

### *4.1. Is Food Delivery Services (FDS) Recognized as Halal Certified?*

Halal certification is not compulsory for every industry, premise or service in Malaysia. However, according to previous studies, Muslims are inclined to implement Shariah compliance in all aspects of their lives. This includes

food delivery services that have become a popular platform for Muslim consumers as they are readily available and convenient.

According to Fadhlur, Abdullah, Bakri, Musa, and Jayakrishnan (2018) there is a lack of halal standards and guidelines for food delivery services. Therefore, applying for halal certification to offer their services is not necessary. It depends on the principles, values and operations of each company as to how closely the practices of food delivery services follow Shariah. The lack of a halal standard for OFDS is highlighted in the findings of the interviews as well. Both companies B and L did not apply for halal certification because there is no halal standard for food delivery service that can be followed to obtain halal certification. According to the informant of Company B's statement as follow:

> *"No. Although we deliver 100% halal products, we did not apply for halal certification. We also questioned how to apply halal certification to food delivery services because there is no halal standard for our scheme."*
>
> [Question 1, Section (1) B]

Despite the lack of halal certification, Company B declares that they will provide halal food delivery services. They assert that they did not accept any non-halal products as stated on its official website: *"We do not deliver wet groceries, bulky items like furniture, controlled substances, live animals and non-halal items"* (Personal Communication, Company B, 2019).

This is to ensure that they remain trustworthy and reliable to Muslim consumers who have a high demand for halal food and product delivery services. Similarly, according to the informant of company L's statement also did not apply for halal certification as stated by the informant:

> *"L is yet to obtain our halal certification from the Department of Islamic Development Malaysia Islamic (JAKIM)".*
>
> [ Question 1, Section 2, B]

L is a food delivery service owned by a Muslim which its official website states: *"Freshly Cooked, Halal, Local Favorite, Hassle-Free & Value for Money".* They serve their food to satisfy the needs of Muslim consumers who want assurance of halal food consumption (Personal Communication, Company L, 2019). However, the informant did not comment further on the reason why the company does not apply for halal certification.

With regards to their efforts to cater to halal foods for their customer, both companies have their own initiatives. For company B, although they did not have Halal certification and did not apply for it, they still held on to the principle that they only accepted halal foods and products to deliver by embedding it in their internal process. According to the informant:

> *"We have an internal process that we only deliver Halal food and products. The only effort that we have is to try our best to ensure that merchants who work with us are producing Halal food and products".*
>
> [ Question 2, Section1, B]

Company L showed more initiative by starting to follow the requirements of halal certification. As the informant said;

*"We are in the process to relocate to a proper kitchen to adhere to Halal certification requirements."*

[ Question 2, Section2. B]

Their efforts indicate that OFDS management has awareness and concern about halal certification as there is a high demand from Muslim consumers. However, further study would be needed on how far they understand and whether they can implement it well in their management and operations.

### *4.2. The Halal Supply Chain from the OFDS's perspective: The Establishment of a Halal Supply Chain in Food Delivery Services*

As consumers' reliance on food delivery services has grown in this modern era, it has become even more pertinent to ensure that there is good halal supply chain management by the service providers. The purpose of halal supply chain management is to control the production of halal goods as the consumers will be at the receiving

end. Among the challenges faced is the number of delivery men (also popularly known as 'riders') which is increasing daily, thus making it hard to trace the existence of any non-compliance among them. Food delivery services are not only responsible for delivering the food with the correct items and being punctual, they should also be responsible for protecting Muslim consumers from non-halal materials (Mohd Hafiz et al., 2014).

Food delivery services are related to halal supply chain management as they are services that include the movement of one product from restaurants to the consumers at the end. It is also because logistics management is known to be the heartbeat of halal supply chain management (Mohd Imran et al., 2018). There is also the use of third party in food delivery services which is also similar to the movement of a third-party logistics provider. However, the movement of food delivery services is smaller compared to the movement of third-party logistics providers.

The findings of this study indicated that although both companies have an adequate understanding of the definition of a halal supply chain, neither has established a halal supply chain in their food delivery services. With regards to understanding the concept, the informant of Company B stated:

> *"The Halal supply chain is a long-term story as it is the entire process of the product. We have to ensure that it is halal from start to finish. That is a critical part of the halal supply chain. They should not have excluded any part of the process of the entire halal supply chain management. For instance, if I was on my way to delivering Halal products, I should not have any encounters with non- halal things such as dogs, pigs, alcohol or any non- halal substances. Therefore, in my opinion, there is none of the companies that can confidently claim that the whole supply chain is halal."*

[Question 3, Section 1, C]

The answer given showed that the informant understood the concept of halal supply chain management although he also emphasized that it was not easy to implement halal supply chain in their services. On the other hand, the informant from company L has defined the halal supply chain as a network and further highlighted the importance of halal integrity and special emphasis on the products, merchants and workers. As explained by the informant:

> *"Halal supply chain management is a network of suppliers that gives special attention and endorsement to the products and services to ensure halal integrity throughout the network. In our case, L is making sure all the products and merchants marketed on our platform are halal. At the same time all our staff are Muslim too."*

[ Question 3, Section 2, C]

While both companies showed an understanding of the halal supply chain, they did not establish it in their operations for different reasons. Company B seemed reluctant to establish it due to lack of knowledge on how to establish halal supply chain management in food delivery services. As stated by the informant:

> *"Well, from my perspective, I do not see how the halal supply chain could be done. I also do not know how to set up halal supply chain management in this industry. As long as we cooperate with various merchants, we cannot claim that the halal supply chain can be achieved. Creating halal supply chain in food delivery services is difficult and impossible.*

[ Question 5, Section 1, C]

As for Company L, they have no plans for the implementation of halal supply chain management in their food delivery service. However, the representative mentioned that they would like to improve their management of the halal supply chain. As explained by the informant:

> *"As a new company, we would like to improve on how we manage our supply chain. Currently, L only operates from a single location in Klang. In the near future, we are planning to expand to more areas with centralized locations to produce our main ingredients for the meal."*

[Question 5, Section 2, C]

In light of above remarks, they intend to expand their food delivery service. Hence, they must enhance their supply chain management. Unfortunately, the emphasis is on increasing supply chain efficiency owing to the

growth of the business rather than the requirement to develop halal supply chain management.

### *4.3. What is the Present Mechanism Used in the Traceability System for OFDS Operation and Services?*

Traceability systems are intended to monitor the entire process to identify the types and timeline of events that have happened during the production of the product and processing such as where, when , and what is physically or chemically involved as well (Zailani et al., 2010).

In food delivery services, traceability can be defined as a system used to monitor the movement of vehicles that are used to deliver food from the merchant to the consumer. Company L explained the perspectives of the traceability system by defining the process of traceability. As traceability can be defined from different perspectives, the informant stated that they are monitoring the products or goods from farm to fork. As the informant said:

> *"Traceability systems are used to monitor product and ingredients chain from inputs (farm, factory) to outputs (ready-to-eat, paste, any food products)".*
>
> [Question 6, Section 2, D]

According to Company B, it is impossible to establish a traceability system in food delivery service management as it is too challenging to trace many vehicles at one time. Additionally, it is also impracticable to monitor riders' activities during their break because there are many possible places that they could go to. Hence, it is difficult to know whether their vehicles were contaminated with non- halal substances or not. As the informant said:

> *"Too many problems are preventing the items from being traced. Sometimes, those who work in Halal restaurants also work for non-Halal restaurants. It is not enough simply to sanitize the hands, sertu must be perform on the entire body to ensure that no contamination has occurred. There is no way to monitor this kind of thing. So, this is the biggest concern in the halal supply chain. The ability to trace and to enforce is not easy."*
>
> Question 6, Section1, D]

The high number of riders has also been highlighted by Lydia (2021) which showed that during the enforcement of the Movement Control Order (MCO), Malaysians became more dependent on food delivery service riders whereby more than 100,000 riders were recruited to support OFDS businesses. Thus, it is indeed a challenge to monitor many riders at one time. According to the informant, traceability cannot be implemented as it is not as simple as sanitizing the contaminated area by ritual cleansing which is called *sertu* (*a method of Islamic cleansing and ritual purification of any parts of the body that come into contact with 'najis mughallazah' (pigs or dogs and their descendants). It must be cleansed once with water mix with soil then six-time with cleansed/ Mutlaq water).* The mechanism in the traceability system is known as an instrument that is convenient for the limited power of mankind to monitor many things at one time. Furthermore, since the nature of vehicles used by dispatchers is moving from one stop to another, it is not easy to use only numeral codes or bar codes for traceability purposes.

In this study, the companies were asked about their knowledge of mechanisms in the traceability system. Having a good traceability mechanism will help assure the management of the halal supply chain of the OFDS. Findings indicated that although technology is used to trace the riders' whereabouts and to record orders, both companies do not implement the mechanism as part of the traceability system.

For company B, although the informant knows the effectiveness of the traceability system in halal supply chain management, the company does not implement any traceability system except that they have an order record in their system to track customers' orders before being delivered to the designated location. The informant also acknowledged that the mechanism in the traceability system was not to his knowledge as he was not part of the traceability system management. According to him:

> *"Unfortunately, I do not know because I have not been part of the traceability system and we did not go through the application of Halal for the traceability system. Therefore, we do not have any traceability system. We do have a record order for our system such as on a map where we can see our rider from point A to point B. However, the*

*mechanism used is not for a traceability system. Besides, we also had a numerical code but it was only on our side and not a physical code which means that the items were not sealed and so on. So, it cannot be called one of the mechanisms used for the traceability system but only for counting purposes."*

[Section (1) D, Question 8]

For company B, the only tracking system that they had was numerical code and it was not in the form of physical code as it was only used as their reference to track orders from their customer. Therefore, it cannot be called a mechanism that was supposed to be used in the traceability system. However, company B does have one of the mechanisms used in the traceability system known as the Google Map Application Programming Interface (API) although this is not used to establish a traceability system in their food delivery service.

On the other hand, company L only mentioned the purpose and effectiveness of implementing a traceability system in food delivery services. The informant demonstrated the understanding of mechanism and how it is used to show the direction of products from suppliers through to end consumers. As the informant said *"In practice, traceability systems are record-keeping systems that show the path of a particular product from suppliers through intermediate steps to consumers. These characteristics such as identification, information and the links between supply chain participants are shared by all processes and products."*

[ Question 8, Section 2, D]

However, the informant fails to specify any technique that any technique that their food delivery service used that was also known as the mechanism in the traceability system. Hence, the author concludes that company L does not use traceability systems such as Global Positioning System (GPS) and Global System for Mobile Communications (GSM) in their food delivery service.

### *4.4. What Are the Challenges Faced in Implementing Comprehensive Halal Supply Chain Management?*

According to previous studies, there are various challenges in implementing halal supply chain management as it is a long process of distributing halal goods from the manufacturer to the consumers. Avoiding contamination during the delivery process, operations such as transporting, material handling, and collaboration and maintaining the Shariah compliance aspects by the merchants are a few of the problems (Zailani, Iranmanesh, Aziz, & Kanapathy, 2017).

In this study, both companies were asked about the challenges faced by food delivery services in implementing halal supply chain management. According to company B, it is challenging to execute due to the high number of riders. In addition, the informant showed that there is a lack of halal standards and regulations regulating food delivery services. Previous research has also highlighted the issue of the lack of halal standards and guidelines for halal logistics (Fadhlur et al., 2018). Although a new halal standard has been developed, governmental support and intervention are still required as it is difficult for food delivery services to fully integrate Halal into their business. Although OFDS are expanding all over the country, it can be noted that only a small number actually adopt halal in their entire supply chain management.

On the other hand, company L asserted that their food delivery services did not face any big challenges in implementing halal requirements in their management as they only focused on delivering local food and merchants. The informant said:

*"For us at L, we do not have a big issue implementing Halal requirements as we only focus on local food. Having a majority of Malay or Muslim customers keeps us in check in making sure the integrity and cleanliness of the meal are in the best state for consumption."*

[ Question 9, Section2 E]

According to the informant, L has managed to ensure the integrity and sanitation of the meals for the best consumption as they primarily have Muslim consumers. However, when suggesting to the informant that having local merchants did not guarantee that the food provided by them was halal and *toyyiban*, he agreed with this

opinion. Overall, it can be concluded that there are issues with establishing a halal supply chain among OFDS due to the challenges in its unique nature of business and this requires not only a comprehensive standard but also training to increase the knowledge of the business owners.

## 5. CONCLUDING REMARKS

In light of the above discussion and analysis, it is clear that HSCM is crucial to food delivery service operations to ensure suppliers, operations and logistics as well as certification bodies are efficiently and effectively managed since it keeps non-halal substances from contaminating the products. Consequently, a traceability system is crucial as it would make it possible to track all product-related information from a product's origin to its consumption. The study may have a positive impact on the need for halal supply chain management in the future for online food delivery services (OFDS). OFDS members must have a thorough understanding of the halal food supply chain and traceability system before starting their journey. The selected OFDS top management interview revealed that the food supply chain has not yet been systematically tracked. Among OFDS providers the adoption rate for the halal supply chain is also relatively low. Some barriers prevent them from adopting while other factors can make it easier for them to do so. The interviews performed revealed that there may be a lack of understanding of OFDS, competitive and consumer pressure as well as a lack of regulation and standards that prevents them from implementing Halal supply chain services. The government and other stakeholders can strengthen the halal food industry, especially for OFDS services by developing comprehensive halal standard specifically for OFDS services. Even though it is not mandatory for OFDS stakeholders to obtain halal certification having an OFDS halal standard could serve as a guideline for the implementation of a better halal supply chain with an effective traceability system.

**Funding:** This study received no specific financial support.
**Competing Interests:** The authors declare that they have no competing interests.
**Authors' Contributions:** All authors contributed equally to the conception and design of the study.
**Acknowledgement:** This research is supported by Academy of Contemporary Islamic Studies, Universiti Teknologi MARA Shah Alam, Selangor, Malaysia.

## REFERENCES

Adriana, B.-S., Silvia, P., & Adina, D. (2020). The impact of food delivery applications on Romanian consumers' behaviour during the COVID-19 pandemic. *Socio-Economic Planning Sciences*, *82*(A), 101220. https://doi.org/10.1016/j.seps.2021.101220

Anh, K. D., Bach, X. T., Cuong, T. N., Huong, T. L., Hoa, T. D., Hinh, D. N., . . . Roger, C. M. H. (2018). Consumer preference and attitude regarding online food products in Hanoi, Vietnam. *International Journal of Environmental Research and Public Health*, *15*(5), 1-12.

Anwar, A. P., Yuvaraj, G., Nurul, S. Z., & Ahmad, K. (2022). Determinants of customers' intention to use online food delivery application through smartphone in Malaysia. *British Food Journal*, *124*(3), 732-753. https://doi.org/10.1108/bfj-01-2021-0075

Arun, G. (2021). Food delivery app development – cost and key features. Retrieved from: https://www.octalsoftware.com.sg/blog/food-ordering-app-development-in-singapore.

Bernama. (2020). Guidelines for food, drinks and parcel delivery services using motorcycles, or p-hailing (parcel-hailing). Retrieved from: https://www.malaysiakini.com/news/521753.

Caro, M. P., Ali, M. S., Vecchio, M., & Giaffreda, R. (2018). *Blockchain-based traceability in Agri-Food supply chain management: A practical implementation.* Paper presented at the In 2018 IoT Vertical and Topical Summit on Agriculture-Tuscany (IOT Tuscany), IEEE.

Chandra, G. R., Liaqat, I. A., & Sharma, B. (2015). *Blockchain redefining: The halal food sector.* Paper presented at the in: 2019. Amity International Conference on Artificial Intelligence (AICAI).

Dandage, K., Badia-Melis, R., & Ruiz-García, L. (2017). Indian perspective in food traceability: A review. *Food Control*, *7*, 217–227. https://doi.org/10.1016/j.foodcont.2016.07.005

Dewie, S. A., Imam, B., Mushonnifun, F. S., Arman, H. N., Gde, D. A., & Muhammad, U. A. M. (2021). *Literature analysis of halal supply chain management in Micro, small and medium enterprises (MSMEs).* Paper presented at the 3rd International Conference on Business and Management of Technology (ICONBMT 2021, Advances in Economics, Business and Management Research.

Diana, G., Adela, B.-C., Susana, F.-L., & Gema, M.-N. (2021). Innovation in online food delivery: Learnings from COVID-19. *International Journal of Gastronomy and Food Science*, *24*, 100330. https://doi.org/10.1016/j.ijgfs.2021.100330

Dwi, S., David, D., Gundur, L., & Ni, N. T. (2019). Millennial experience with online food home delivery: A lesson from indonesia. *Interdisciplinary Journal of Information, Knowledge, and Management*, *14*(4386), 277- 294.

Fadhlur, R. A., Abdullah, A., Bakri, M., Musa, H., & Jayakrishnan, M. (2018). The adoption of halal food supply chain towards the performance of food manufacturing in Malaysia. *Management Science Letters*, *8*(7), 755-766.

Gabriela, V. M., Bastos, D. H. M., Mancuso, A. M. C., & Behrens, J. H. (2014). A scale to evaluate customer attitudes towards food risks in restaurants. *Health Surveillance in Debate: Society, Science & Technology*, *2*(4), 53-61. https://doi.org/10.3395/vd.v2i4.337

Grunow, M., & Piramuthu, S. (2013). RFID in highly perishable food supply chains–Remaining shelf life to supplant expiry date? *International Journal of Production Economics*, *146*(2), 717-727. https://doi.org/10.1016/j.ijpe.2013.08.028

Ha, J., & Jang, S. S. (2010). Perceived values, satisfaction, and behavioral intentions: The role of familiarity in Korean restaurants. *International Journal of Hospitality Management*, *29*(1), 2-13. https://doi.org/10.1016/j.ijhm.2009.03.009

Hawlitschek, F., Teubner, T., & Gimpel, H. (2016). *Understanding the sharing economy - drivers and impediments for participation in peer-to-peer rental by understanding the sharing economy.* Paper presented at the 49th Annual Hawaii International Conference on System Sciences (HICSS), 4801. Kauai Hawaii.

Jaafar, H. S., Endut, I. R., Faisol, N., & Omar, E. N. (2011). *Innovation in logistics services – Halal logistics.* Paper presented at the The 16th International Symposium on Logistics (ISL 2011), Berlin, Germany 10-13, July.

Jais, A. S., & Marzuki, A. (2020). E-hailing services in Malaysia: Current practices and future outlook. *Planning Malaysia: Journal of the Malaysian Institute of Planners*, *18*(3), 128 – 141.

Jalil, N. S., Norman, A. A., & Hamid, S. (2017). Studies on technology and Halal Food Security: A review. *Pertanika Journal of Social Sciences & Humanities*, *25*, 225–239.

Kamisah, S. (2018). *Cross-contamination in processing, packaging, storage, and transport in halal supply chain, Editor(s): Md. Eaqub Ali, Nina Naquiah Ahmad Nizar.* Paper presented at the In Woodhead Publishing Series in Food Science, Technology and Nutrition, Preparation and Processing of Religious and Cultural Foods, Woodhead Publishing.

Lau, T. C., & David, N. C. Y. (2019). Online food delivery services: Making food delivery the new normal. *Journal of Marketing Advances and Practices*, *1*(1), 62-77.

Li, Z., Hong, Y., & Zhang, Z. (2017). *An empirical analysis of on-demand ride sharing and traffic congestion.* Paper presented at the Proceedings of the Annual Hawaii International Conference on System Sciences, Volume 2017-January, Pages 4 - 132017 50th Annual Hawaii International Conference on System Sciences, HICSS.

Lorite, G. S., Selkälä, T., Sipola, T., Palenzuela, J., Jubete, E., Viñuales, A., . . . Uusitalo, S. (2017). Novel, smart and RFID assisted critical temperature indicator for supply chain monitoring. *Journal of Food Engineering*, *193*, 20-28. https://doi.org/10.1016/j.jfoodeng.2016.06.016

Lydia, N. (2021). Fatigue sets in among delivery riders as MCO 2.0 progresses. Retrieved from: https://themalaysianreserve.com/2021/02/08/fatigue-sets-in-among-delivery-riders-as-mco-2-0-progresses/. [Accessed 24th September 2022].

Maimaiti, M., Zhao, X., Jia, M., Ru, Y., & Zhu, S. (2018). How we eat determines what we become: Opportunities and challenges brought by food delivery industry in a changing world in China. *European Journal of Clinical Nutrition*, *72*(9), 1282-1286.

Manzini, R., & Accorsi, R. (2013). The new conceptual framework for food supply chain assessment. *Journal of Food Engineering, 115*(2), 251–263.

Mohamed, S. A. T., Lim, R., & Vincent, K. Z. (2013). Qualitative research on critical issues in halal logistics. *Journal of Emerging Economies and Islamic Research, 1*(2), 1-20.

Mohammed, A., Wang, Q., & Li, X. (2017). A cost-effective decision-making algorithm for an RFID-enabled HMSC network design a multi-objective approach. *Industrial Management & Data Systems, 117*(9), 1782–1799. https://doi.org/10.1108/imds-02-2016-0074

Mohd Hafiz, Z., Anuar, M. M., & Ab Talib, M. S. (2014). Conceptual framework on halal food supply chain integrity enhancement. *Procedia-Social and Behavioral Sciences, 121*, 58-67. https://doi.org/10.1016/j.sbspro.2014.01.1108

Mohd Imran, K., Abid, H., & Shahbaz, K. (2018). Defining Halal supply chain management. *Supply Chain Forum: An International Journal, 19*(2), 122-131. https://doi.org/10.1080/16258312.2018.1476776

Mohsen, K., Yusof, Z. M., Shah, A., Karbasi, M., Ali, N. I., & Koondhar, M. (2017). Halal products recognition using Rfid/Nfc technology. *Science International, 29*, 687-692.

Muangmee, C., Kot, S., Meekaewkunchorn, N., Kassakorn, N., & Khalid, B. (2021). Factors determining the behavioral intention of using food delivery apps during COVID-19 pandemics. *Journal of Theoretical and Applied Electronic Commerce Research, 16*(5), 1297-1310. https://doi.org/10.3390/jtaer16050073

Neeraj, K., Anita, S., Dinesh, K. S., & Kamal, K. (2019). Toxicity of food additives. In Food safety and human health. In (pp. 67-98). Academic Press.

Nina, N. N. A., & Abidin, S. A. S. Z. (2021). Online food delivery services: Make or break the halal supply chain? *Journal of Food and Pharmaceutical Sciences, 9*(1), 384-394. https://doi.org/10.22146/jfps.1149

Nor, S. S., Norkhairiah, H., & Rose, A. (2021). *The emergence of online halal food delivery services in brunei darussalam amidst Covid-19.* Paper presented at the Proceedings 4th International Aciel (Annual Conference on Islamic Economy and Law), 22th February , Brunei.

Perumal, I., Parthasarathy, R., Ayyapan, M., Jayabalan, M., Nair, S., & Selladurai, S. (2021). The effects towards quality of online food delivery services during COVID-19 pandemic in Malaysia. *Science International, 33*(6), 429-435.

Pigatto, G., Machado, J. G. d. C. F., dos Santos Negreti, A., & Machado, L. M. (2017). Have you chosen your request? Analysis of online food delivery companies in Brazil. *British Food Journal, 119*(3), 639-657. https://doi.org/10.1108/bfj-05-2016-0207

Prabowo, G. T., & Nugroho, A. (2019). *Factors that influence the attitude and behavioral intention of Indonesian users toward online food delivery service by the Go-Food application.* Paper presented at the 12th International Conference on Business and Management Research (ICBMR 2018) (pp. 204-210). Atlantis Press.

Ramos, K. (2021). Factors influencing customers continue usage intention of food delivery apps during COVID-19 quarantine in Mexico. *British Food Journal, 124*(3), 833-852.

Ray, A., Amandeep, D., Pradip, K. B., & Puneet, K. (2019). Why do people use food delivery apps (FDA)? A uses and gratification theory perspective. *Journal of Retailing and Consumer Services, 51*, 221-230. https://doi.org/10.1016/j.jretconser.2019.05.025

Rejeb, A., Simske, S., Rejeb, K., Treiblmaier, H., & Zailani, S. (2020). Internet of Things research in supply chain management and logistics: A bibliometric analysis. *Internet of Things, 12*, 100318. http://doi.org/10.1016/j.iot.2020.100318

Rosli, L. (2018). Foodpanda records 100pct growth in 2017. New Straits Times Online. Retrieved from: https://www.nst.com.my/business/2018/06/381431/foodpanda-records-100pct-growth-2017. [Accessed 24th September 2022].

Saad, A. T. (2021). Factors affecting online food delivery service in Bangladesh: An empirical study *British Food Journal, 123*(2), 535-550. https://doi.org/10.1108/bfj-05-2020-0449

Saqib, A., Nadee, K., Hafiz, M. U. J., & Dewan, M. Z. I. (2021). Consumer adoption of online food delivery ordering (OFDO) services in Pakistan: The impact of the COVID-19 pandemic situation. *Journal of Open Innovation: Technology, Market and Impact Complexity*, *7*(1), 1-23.

Sarah, B. B., Jesse, B., Patrick, J. K., Paul, D. A., Elisabetta, L., Stella, N., & Eva, M. C. (2022). Changing behavior, attitudes, and beliefs about food safety: A scoping review of interventions across the world and implications for empowering consumers. *Foodborne Pathogens and Disease*, *19*(1), 19-30.

Sekaran, U., & Bougie, R. (2009). *Research methods for business: A skill-building approach* (5th ed.). Hoboken: John Wiley and Sons Inc.

Shuib, A., Ibrahim, I., & Yusoff, F. H. (2021). *Traceability system of halal chicken supply chain*. Paper presented at the In 2021 IEEE 12th Control and System Graduate Research Colloquium (ICSGRC), IEEE.

Singh, P. K., Rajat, P. S., Pankaj, S., & Ram, L. S. (2019). Chapter 2 - food hazards: Physical, chemical, and biological, Editor (s): Ram Lakhan Singh, Sukanta Mondal,Food Safety and Human Health. In (pp. 15-65). London, United Kingdom: Academic Press.

Suhartanto, D., Helmi Ali, M., Tan, K. H., Sjahroeddin, F., & Kusdibyo, L. (2019). Loyalty toward online food delivery service: The role of e-service quality and food quality. *Journal of Foodservice Business Research*, *22*(1), 81 - 97.

Sushant, K., & Shah, A. (2021). Revisiting food delivery apps during COVID-19 pandemic? Investigating the role of emotions. *Journal of Retailing and Consumer Services*, *62*, 102595. https://doi.org/10.1016/j.jretconser.2021.102595

Taşkın, D., & Ece, C. (2021). Role of mobile food-ordering applications in developing restaurants' brand satisfaction and loyalty in the pandemic period. *Journal of Retailing and Consumer Services*, *62*, 102608. https://doi.org/10.1016/j.jretconser.2021.102608

Tian Nur, M. r. (2017). Perception on halal traceability on chicken meat supply chain. *Agroindustrial Technology Journal*, *1*(1), 33-42.

Toha, S. F., Tajuldin, A. A., & Rahim, K. Z. A. (2012). *Smart handheld budget and halal tracker*. Paper presented at the In: Proceedings of International Conference on Computational Intelligence, Modelling and Simulation.

Yi-Shun, W., Tseng, T. H., Wang, W.-T., Shih, Y.-W., & Chan, P.-Y. (2019). Developing and validating a mobile catering app success model. *International Journal of Hospitality Management*, *77*, 19-30. https://doi.org/10.1016/j.ijhm.2018.06.002

Yuchen, G. (2020). Factors affecting online food quality control among delivers in delivery process in Malaysia. *IOSR Journal of Business and Management*, *22*(5), 26-29.

Zailani, S. Z., Arrifin, N. A., Wahid, R., Othman, Y., & Fernando. (2010). Halal traceability and halal tracking systems in strengthening Halal food supply chain for food industry in Malaysia: A review. *Journal of Food Technoogy*, *8*(3), 74–81.

Zailani, S., Iranmanesh, M., Aziz, A. A., & Kanapathy, K. (2017). Halal logistics opportunities and challenges. *Journal of Islamic Marketing*, *8*(1), 127-139.

Zainuddin, N., Saifudin, A. M., Deraman, N., & Osman, A. A. (2020). The effect of halal traceability system on halal supply chain performance. *International Journal of Supply Chain Management*, *9*(1), 490-498.

Zhao, Y., & Bacao, F. (2020). What factors determining customer continuingly using food delivery apps during 2019 novel coronavirus pandemic period? *International Journal of Hospitality Management*, *91*, 102683. https://doi.org/10.1016/j.ijhm.2020.102683