

ISLAMIC PERSPECTIVE ON BLOCKCHAIN TECHNOLOGY IN HALAL LOGISTICS

Nik Mohamad Ridhwan¹
Mohd Daud Awang¹
Aida Azrina Azmi¹

Abstract

As the global halal market grows bigger, the supply chain also increases in its complexity. This is due to the participation of various stakeholders in halal logistics. The enormous size of the market causes various issues such as lack of transparency and traceability, data silos, inefficiency in documentation as well as difficulties from the difference in the school of thoughts (*mazhab*) and halal practices. Blockchain technology was proposed to solve these issues. This research intends to study the application of blockchain technology in halal logistics from an Islamic perspective. The researcher uses literature review method to search for relevant information which consists of secondary sources such as journal articles, conference proceedings, theses, articles from website and books. Blockchain can be defined as digitalized public ledger within a peer-to-peer network containing information of transactions made. The application of blockchain technology will benefit halal logistics in increasing transparency and traceability, faster and leaner as well as a secure and reliable system. Track and trace of information and certification of halal products can be made swiftly. Smart contracts within blockchain technology can further improve the speed of transactions with different halal requirements. Lastly, the blockchain is secure and reliable, which cannot be tampered and hacked. Islam sees technology and science as assets which Muslims should have. The blockchain technology can be used as long as it is free from any forbidden elements such as *riba*, *gharar* and *maysir*. The usage should also follow the Islamic ethics and principles. Islam also encourages Muslims to achieve excellence in their works by using any resources and methods available. The features the technology brings are also aligned with the objectives of shariah. In conclusion, blockchain technology can contribute to better halal logistics and bring us a step further to achieve a halal economy.

Keywords: Blockchain technology; Halal logistics; Islamic perspective

Abstrak

Rangkaian bekalan kini bertambah rumit kerana pasaran halal dunia semakin berkembang. Ini berpunca daripada penglibatan sebilangan besar pihak berkepentingan di dalam jaringan logistik halal. Saiz pasaran yang begitu besar ini

¹ Halal Products Research Institute, Universiti Putra Malaysia

menimbulkan pelbagai isu seperti kekurangan ketelusan dan daya kebolehesanan, isu penyembunyian maklumat, ketidakcekan dalam urusan pendokumentasian serta kesukaran yang timbul daripada perbezaan mazhab fiqh bagi mendepani isu halal. Teknologi blockchain diperkenalkan untuk mengatasi masalah-masalah tersebut. Kajian ini bertujuan untuk mengkaji pandangan Islam berkenaan penggunaan teknologi blockchain di dalam aktiviti logistik halal. Pengkaji menggunakan kaedah sorotan literatur untuk memperoleh maklumat yang terdiri daripada sumber sekunder seperti artikel jurnal, prosiding konferens, tesis, artikel daripada laman sesawang dan juga buku. Blockchain boleh didefinisikan sebagai lebar digital awam yang mengandungi maklumat transaksi yang dilakukan menggunakan jaringan P2P (peer to peer). Penggunaan teknologi ini dalam logistik halal dapat meningkatkan ketelusan dan kebolehesanan, menambah kelajuan dan lebih efisien, serta lebih selamat dan dipercayai. Mengesan dan menjejaki maklumat pensijilan produk halal boleh dibuat dengan pantas. Kontrak pintar (smart contract) yang terdapat di dalam teknologi ini juga dapat menambah kelajuan transaksi yang berlainan mazhab dan keperluan. Blockchain juga lebih selamat dan dipercayai kerana ianya tidak boleh digodam. Islam melihat teknologi dan sains itu sebagai aset yang perlu dimiliki orang Muslim. Teknologi ini bebas digunakan selagi mana ianya tidak mengandungi unsur haram seperti riba, keraguan dan perjudian. Penggunaannya juga perlu mengikut akhlak dan prinsip Islam. Islam mengajar umatnya untuk melaksanakan tugas dengan cemerlang menggunakan apa sumber dan cara yang dibenarkan. Teknologi blockchain ini secara amnya tidak bercanggah dengan apa yang dikehendaki oleh syariah. Tuntasnya, teknologi ini dapat menyumbang kepada industri logistik halal dan membawa kita ke arah mencapai ekonomi halal.

Kata kunci: Teknologi blockchain; Logistik hala; Pandangan Islam

Introduction

Expansion of the global halal market causes issues and difficulties in the halal supply chain, especially in the logistics sector. The expansion is due to the increasing numbers of Muslim across the world, which was estimated to reach 26.4% of the world population by 2030 (Grim & Karim, 2011). Halal logistics can be defined as management of procuring, moving, storing and handling materials or parts, food or non-food, information and documenting and it is in accordance to principles of shariah throughout the whole supply chain (Tieman *et al.*, 2012). It keeps the halal integrity from breaking apart not only in the food and beverage industry but also in consumer goods, pharmaceutical, cosmetics, packaging, branding, finance, investment, and tourism (Faradina *et al.*, 2018; Yahya, 2016).

With Industrial Revolution 4.0 in view, the development of information technology has grown considerably as it becomes a part of our daily lives for convenience and

problem solving (Bawazir *et al.*, 2018). Therefore, in halal logistics, the application of blockchain technology is proposed to deal with issues and problems caused by the expansion of the market (Tieman *et al.*, 2019). The issues that arose are complexity in management, transparency problem, loss of data along the supply chain, high costs and different thoughts on halal requirements as well as practices (Bross, 2017; Jeppsson & Olsson, 2017; Sadouskaya, 2017; Verhoeven *et al.*, 2018).

Blockchain technology can be defined as an open and distributed ledger technology which securely and permanently stores records of transactions within the peer-to-peer network that can share the records among the parties involved (DHL Trend Research, 2018; Muneeza & Mustapha, 2019; Sadouskaya, 2017). The transactions involved in the blockchain can be cryptocurrency, contracts, records or any information of value (Kamarul, 2019). The operation of blockchain technology can be seen from the figure below:

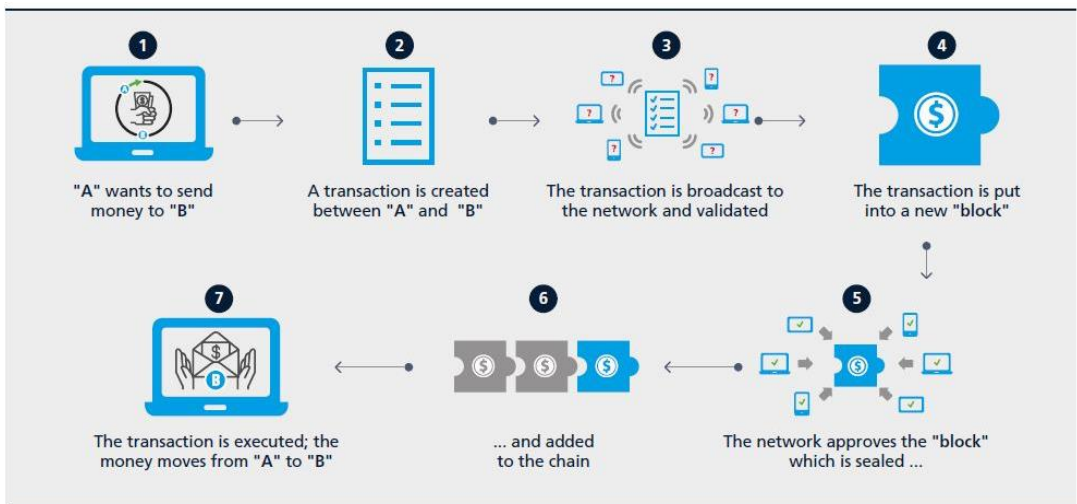


Figure 1: Operations of blockchain technology (DHL Trend Research, 2018)

Research on blockchain technology is relatively new, especially on its application in halal logistics. Therefore, this research will study the application of blockchain technology in halal logistics and the Islamic perspective regarding the usage, whether it is permissible or not.

Methodology

The researcher adopted literature review method to search for relevant information on blockchain technology in halal logistics and Islamic principles of trade (*mu'amalat*) and usage of technology. The data consists of secondary sources such as journal

articles, conference proceedings, theses, articles from website and books. From the literature, the researcher attempts to find out Islamic views on blockchain technology in halal logistics. Unfortunately, the study on blockchain technology in halal logistics lacks in number due to the field that is relatively new and currently there is no practical application of the technology.

Findings

Application of blockchain technology in halal logistics

The application of blockchain can improve several parts in halal logistics. It can be used to track and trace information across the supply chain due to the decentralization and information transparency among various participants. This will help authorities and industries to make audits and investigations within the supply chain. It also functions as a database for halal supply chain which will help certification of halal products and service. It can also be an intermediate for collaboration between stakeholders in the halal supply chain, creating mutual benefits. With blockchain as an intermediary, costs can be reduced as documents will be in a digital database. This can decrease errors from manual entry documents. Blockchain via smart contracts can serve as an operational supply chain system which automatically communicates with the instructions of halal logistics based on the market requirement, mazhab or halal practices of a country (Tieman *et al.*, 2019). The figure below shows how do smart contracts work in blockchain technology.

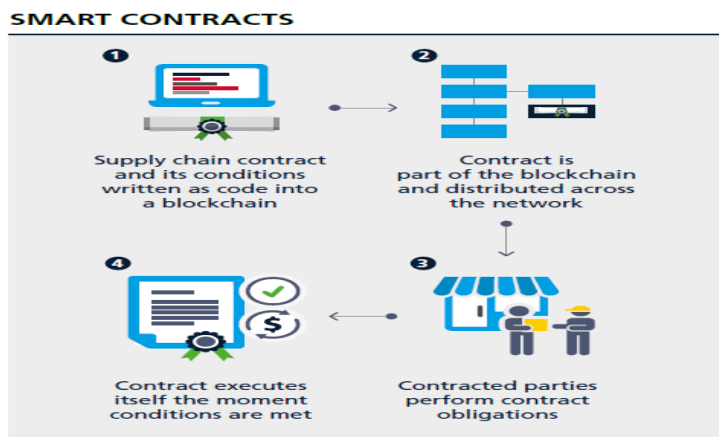


Figure 2: Smart contracts (DHL Trend Research, 2018)

Worth mentioning that when blockchain technology integrates fully with halal supply chain, it can be a catalyst for realizing the halal economy which encompasses finance, farm and fork, making it easier to manage the halal ecosystem. In conclusion, the application of blockchain technology can improve transparency and

traceability in the halal supply chain, creating a faster and leaner logistics and also establishing a secure and reliable system for a halal database.

Islamic perspective on blockchain technology in halal logistics

Islam is a way of life, and it encompasses every part of Muslims' lives. Muslims are required to comply with the guidelines and recommendations, as stated in al-Quran and Hadiths. In Surah al-Baqarah verse 208, Allah said: 'O you who have believed, enter into Islam completely (and perfectly) and do not follow the footsteps of Satan. Indeed, he is to you a clear enemy.' Therefore, every activity and work that are done by Muslims cannot contradict what is intended from the Islamic jurisprudence.

Technology and science have always been in parallel with Islam (Amda, 2016). The very first verse of al-Quran that was revealed is a command to read, which can be interpreted to seek knowledge. It can also mean to think about creation and words. Al-Quran has put a high position regarding science that it was mentioned 750 times during the revelation. Therefore, not only Muslims should possess such knowledge and technology but to actively pursue it to acquire the most developed technology (Bawazir *et al.*, 2018).

In the usage of blockchain technology, certain criteria need to be followed and understood. First of all, the general guideline of *usul fiqh* that is 'the origin of everything is permissible until there is an indication of its forbiddance.' (Zulkifli, 2018). Blockchain system is a tool for business and transactions, so within this scope, it needs to be free from three elements which are; *riba* (interest), *gharar* (ambiguity) and *maysir* (gambling) (Zubaidi & Abdullah, 2017). As long as it is free from any elements that are forbidden, the technology can be freely used.

The technology was briefly described before in this paper, and the blockchain itself does not have any of the three elements. So, the blockchain on its own is permissible. The second criteria is that the usage of blockchain needs to comply with the Islamic laws, principles and ethics (Bawazir *et al.*, 2018). Using the blockchain to handle business with forbidden transactions may also lead to haram. Any usage that is against Islamic ethics should be avoided during the use of the technology as perfecting the ethics (*akhlaak*) of mankind was one of the reasons the Prophet was sent.

Other than that, Bawazir also stressed that Islam encourages Muslims to improve their attitudes and behaviours using any methods or resources available. The saying of Prophet Muhammad PBUH, "Allah loves someone who when works, he performs it in a perfect manner (*itqan*)."

Therefore, the usage of technology such as blockchain which functions to help operators to achieve better and more efficient work is in line with the Islamic point of view. In addition, seeking *halalan toyyiban* (permissible and

wholesome) is an act of worship and order from God. So, there is no doubt that technology can be used and suggested if it helps the workers to achieve excellence in their works.

In fact, the features that come along with blockchain technology such as transparency, security, efficiency and trust can be considered as incorporating Islamic values (Muneeza & Mustapha, 2019). This also goes aligned with the objectives of Shari'ah (*maqasid*) which is to preserve the wealth as the technology will help to reduce operating costs, especially in the documentation as well as track and trace activity. Other than that, security and transparency can eliminate any ambiguity and activities that are not accepted in Islam. Alas, blockchain is expected to integrate with the halal logistics further to enhance the halal integrity of the supply chain as there is a need for this technology as a tool for embracing globalization in the modern world.

Conclusion

The blockchain technology can bring changes and transform the halal supply chain. It helps halal logistics with features such as transparency and traceability, efficiency and lean, secure and reliable. The application of blockchain technology can be seen from track and trace activity. Consumers can easily determine the halal status and retrieve information of a product. Certification of halal products and services can be done faster. In regards to halal logistics, blockchain technology can help to achieve leaner and faster transportation with the help of smart contracts. Digital and integrated system will lead to less faulty documentation which will save costs. It is also a secure system that cannot be hacked and tampered with.

Islam has always been encouraging the usage of technology as long as it does not contain any elements which are haram. The usage itself is also guided by Islamic ethics and principles so that the technology will not be used in a wrong way. The Prophet also suggested that Muslims should do their works with perfection and excellence; therefore, any methods or resources should be used in order to achieve that. In addition, the features of the blockchain technology are incorporated within Islamic values and are aligned with the objective of shari'ah which is to preserve wealth. With blockchain technology integrated with halal supply chain, the vision for the halal economy which covers financial, farm and fork is no longer a pipe dream. Unfortunately, research on blockchain technology in halal logistics is still lacking, and more researches are suggested to obtain empirical data on its capabilities to leverage the halal industry.

References

- Amda, A. D. (2016). Science and technology in the Islamic perspective. *Academic Journal of Islamic Studies*, 1(1). <https://doi.org/10.1080/0140528790010105>

- Bawazir, M. A., Mahmud, M., & Molok, N. N. A. (2018). Persuasive technology from Islamic perspective. *International Conference on Information and Communication Technology for the Muslim World*. <https://doi.org/10.1109/ICT4M.2018.00055>
- Bross, P. (2017). *The potentials of Blockchain technology in logistics*. Jonkoping University.
- DHL Trend Research. (2018). Blockchain in logistics. In *DHL Customer Solutions & Innovation*. <https://www.logistics.dhl/content/dam/dhl/global/core/documents/pdf/glo-core-blockchain-trend-report.pdf>
- Faradina, A., Hussein, M. Z., Husny, Z. J., Yazid, M., Mazlan, Z., Rayner, T., Fauziah, A. R., Zani, M., & Adnan, N. (2018). Halal logistics: Halal integrity and legal enforcement challenges. *International Journal of Supply Chain Management*, 7(4), 42–47.
- Grim, B. J. & Karim, M. S. (2011). The future of the global Muslim population. Projections for 2010-2030. In *Pew Research Center's Forum on Religion & Public Life* (Vol. 13, Issue 1).
- Jeppsson, A. & Olsson, O. (2017). *Blockchains as a solution for traceability and transparency*. Lund University.
- Kamarul. (2019). *5 instances of how blockchain is changing the halal industry*. HMEDIA. <https://hmedia.my/5-instances-of-how-blockchain-is-changing-the-halal-industry/?fbclid=IwAR0prgTqVozPlzILfKMsz9VIGiZ8JWWfuPfbLOWuCR2zOhkDjURcVWcyPwx>
- Muneeza, A. & Mustapha, Z. (2019). Blockchain and its shariah compliant structure. In *Halal cryptocurrency management* (pp. 69–106). Springer International Publishing. <https://doi.org/10.1007/978-3-030-10749-9>
- Sadouskaya, K. (2017). Adoption of blockchain technology in supply chain and logistics. In *Kaakkois-Suomen Ammattikorkeakoulu Oy*. <https://doi.org/10.15480/882.1444>
- Tieman, M., van der Vost, G. A. J., & Maznah Che, G. (2012). Principles in halal supply chain management. *Journal of Islamic Marketing*, 3(3), 217–243. <https://doi.org/10.1108/17590831211259727>

- Tieman, M., Darun, M. R., Fernando, Y., & Ngah, A. B. (2019). Utilizing blockchain technology to enhance halal integrity: The perspectives of halal certification bodies. In X. Yunni & L.-J. Zhang (Eds.), *SERVICES 2019* (pp. 119–128). Springer, Cham. <https://doi.org/10.1007/978-3-030-23381-5>
- Verhoeven, P., Sinn, F., & Herden, T. (2018). Examples from blockchain implementations in logistics and supply chain management: Exploring the mindful use of a new technology. *Logistics*, 2(3), 20. <https://doi.org/10.3390/logistics2030020>
- Yahya, N. (2016). Halal logistics. In *Fundamentals of operational logistics* (pp. 215–225). Oxford University Press.
- Zubaidi, I. B., & Abdullah, A. (2017). Developing a digital currency from an Islamic perspective: Case of blockchain technology. *International Business Research*, 10(11), 79. <https://doi.org/10.5539/ibr.v10n11p79>
- Zulkifli, M. A. B. (2018). *Irsyad usul al-fiqh siri ke-20: Kaedah “Asal bagi sesuatu perkara adalah harus dan kaitannya dengan hukum merokok.”* <https://muftiwp.gov.my/ms/artikel/irsyad-usul-fiqh/2326-irsyad-usul-al-fiqh-siri-ke-20-kaedah-asal-bagi-sesuatu-perkara-adalah-harus-dan-kaitannya-dengan-hukum-merokok>