

The Implementation of Halal Supply Chain With Private Blockchain in Indonesia

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Abstract

Since Indonesia is the country with the largest Muslim population, the demand for halal products is increasing. Indonesia has not taken the advantage of these opportunities, such as, the implementation of supply chain activities were not integrated with stakeholders like suppliers, factories, transportation, logistics and retailers. This is what has happened in PT Multi Terminal Indonesia warehousing with their halal storage. This paper explains the problem with a private blockchain technology that will help the integration and transparency of every data activities from stakeholders. This paper uses SWOT analysis and Qualitative research to determine the impact and to clearly describe the application of this system. The result of the analysis of the occurrence of collaboration between stakeholders in halal supply chain activities is synergistic and transparent. The use of the Private Blockchain will increase customer trust in halal products which raises awareness of the importance of halal supply chain. Moreover, private blockchain in transportation and logistics activities can be accessed by the customer through smartphones QR code to achieve lean logistics. It changes the mindset of consumers to switch and believe in using products based on the Halal supply chain so that Indonesians escape from the current issue of religion. The writers' propose is to manage the Halal supply chain with the Private Blockchain in Indonesia by the Government, in this case the designated State-Owned Enterprises (SOEs). To introduce this system the government must socialize the above and below the Line.

Keywords: awareness; consumers; halal products; muslim; private blockchain; transparency; trust

Introduction

Indonesia is a country with the largest Muslim population in the world with a total of 222 million Muslim population from 261.1 million with a presentation of 85%. (Simatupang, 2016) Along with the growth of Muslim customers, the awareness of halal products is increasing every year. However, the demand of halal products is not only from the halal certification of products which is labeled by the Indonesian Ulama Council (MUI), but also to the movement of goods to the

hands of consumers from upstream to downstream. Therefore, the need for halal supply chains is high, such as in Law No. 33 2014. Halal Product Process (PPH) is a series of activities to ensure the halalness of the Product including the supply of materials, processing, storage, packaging, distribution, sales and presentation of Products (UU No. 33 Tahun 2014 Tentang Jaminan Produk Halal, 2014). Unfortunately, there is still lack of information received by consumers for the guarantee of the halal supply chain from all the technical creation of halal products accepted by consumers.

With the halal supply chain transparency, consumers will be able to find out the production process which is produced by the supply chain activities based on the halal of each stakeholder making the product from upstream to downstream. Apart from this, transparency is also needed for the integrity of the stakeholder. While they have not been integrated yet, it will be difficult to realize the halal supply chain activities, because each stakeholder is still in the mind of their respective benefits. To increase trust between stakeholders in halal supply chain activities the organization can take the advantage of blockchain technology which is very well known in industry 4.0.

The Blockchain is the main technology behind Bitcoin (Tieman & Darun, 2017). This is a digital general ledger consisting of blocks of string data containing information from each stakeholder in the halal supply chain (Tieman & Darun, 2017). By the use of private Blockchain technology, an organizational unit such as a group of stakeholders will be able to mutually integrate and do data transparency in the unity of the Blockchain system or Big data. Therefore, information is easily verified only by scanning QR-codes (two-dimensional barcodes) on a product in which it is directly connected to this Blockchain technology (Tieman & Darun, 2017)

Blockchain technology is now starting to be used by every company that is always leading for innovations. For competition between industries, the industry utilizes the existence of Blockchain technology to increase market share and to make Blockchain an industry brand equity.

Halal Supply Chain Management is the process of processing the procurement, movement, storage, and handling of products through the organization and supply chain in accordance with the general principles of Shari'a law. (Tieman & Darun, 2017)

The halal supply chain can be an opportunity for Indonesia to improve the competitiveness of its products. However, to make it an opportunity, the implementation of halal supply chains requires coordination and collaboration between relevant parties, both the government, producers, logistics service providers, retailers, and related certification agencies. (Setijadi, 2016)

A strong, effective and efficient halal supply chain is only possible with more intensive collaboration between companies in the supply chain. Blockchain technology allows halal networks to better use halal assets available, such as halal warehouses & distribution centers, halal transportation & containers, and marine & air terminals that meet halal requirements. (Tieman, 2017a)

Method

The approach of this research is qualitative to depict in depth how is the implementation of Halal Supply Chain with private Blockchain in Indonesia. Data collection is conducted through a structured interview, semi-structured and in-depth interview and FGD. The data analysis techniques used in this study was an approach developed by Miles and Huberman that includes (after data collection) data reduction, data separation from unfocused, too detailed and others so that the data will reveal patterns or themes. Next is to display the data (data display) that is served to help the understanding of advanced analysis of an information or event. The last process is the conclusion of the researchers based on the pattern and theme. Withdrawal conclusion is done continuously, that is while doing at the time of data reduction and data display done. (Miles, Huberman, & Saldana, 2014)

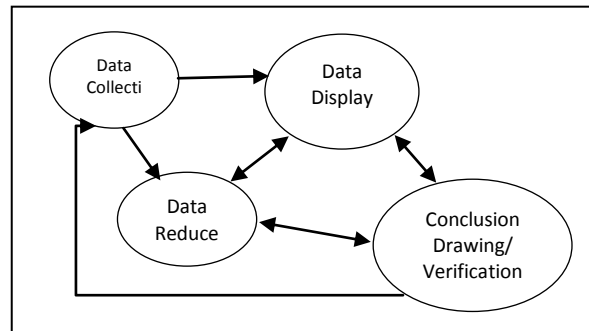


Figure II.1.
Data Processing Technique
Source: Miles, Huberman, & Saldana (2014)

SWOT analysis is used for the research. SWOT analysis (SWOT analysis) includes efforts to identify strengths, weaknesses, opportunities, and threats that determine the company's performance. A site visit has been carried out at PT. Lookman Djaja Jakarta and PT. Multi Terminal Indonesia Halal Logistics & Cold Storage (MTI).

Discussion and Result

The halal supply chain in Indonesia is required in considering that Indonesia is a country with the largest Muslim population in Indonesia, from that point the Halal supply chain is the answer to utilizing opportunities for the largest Muslim population.

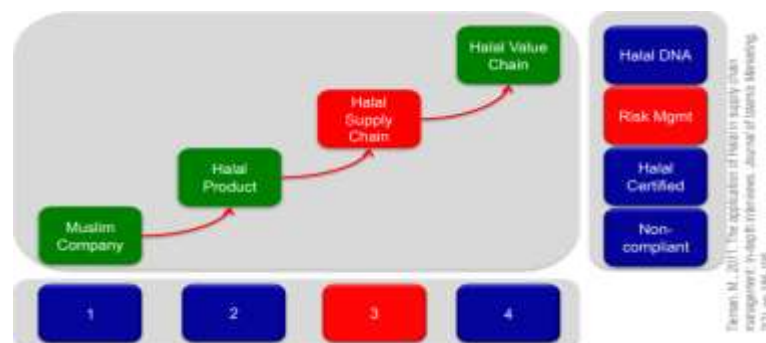


Figure III.1
Halal Maturity
Source: (Tiemann, 2011)

The picture explains that there are 4 levels of halal product development that starts with the company of Shari'a, then halal products with the halal logo of MUI, stage 3, namely the movement of goods in the supply chain using the principle of shari'a from upstream downstream to the halal value chain. Where at this time it is already in stage 3 of the halal supply chain and one of the countries that have implemented and developed it is Malaysia.

But the aspect of cooperation between stakeholders in the supply chain is still not committed. Therefore, by using private Blockchain technology, halal supply chain activities can be integrated into each stakeholder. Supply chain activities are needed by the commitment of each stakeholder who oversees the halal supply chain from upstream to downstream that will be integrated into a single technology unit namely private Blockchain. The private blockchain is a digital book that can only be accessed by a number of "stakeholders" by being granted access permissions provided by the "platform".

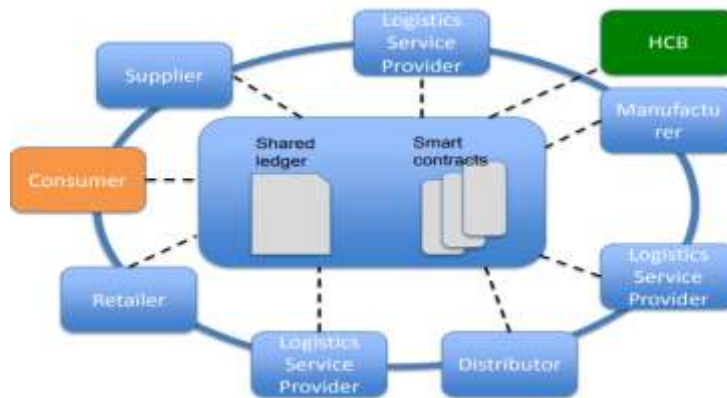


Figure III.2

Private Blockchain

Source (Tiemann, 2017b)

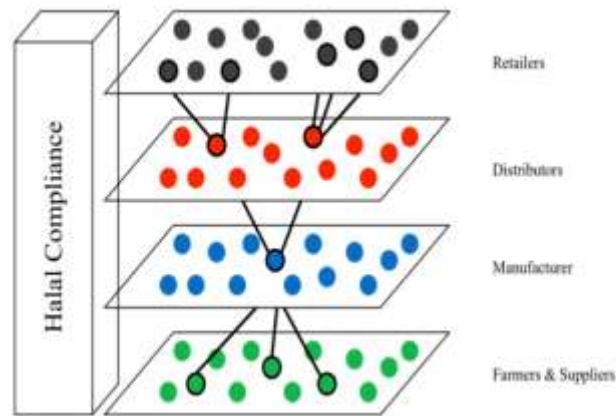


Figure III.3

Halal Compliance Process

Source (Tieman, 2017b)

The picture above explains that the data owned by each stakeholder can only be accessed by stakeholders and without the need to transfer the data to each company, just upload the data to the blockchain and each stakeholder will find that data on the Big data owned by the Blockchain

To support halal supply chain with blockchain in the stakeholders' activities, it is necessary to strengthen the concept, according to Mr. Sucahyo, as the General Manager of MTI. The basic rules for implementing halal supply chain activities are immediately needed. The new Law No. 33 of 2014 only covers the halal products but has not been able to cover the halal supply chain management so that the activity has a legal umbrella and the Standard Operating Procedure (SOP) is valid from the applicable law and obtains direct supervision by the MUI in this case the BPJPH (Halal Product Guarantee Organizer) supervises and can be accessed on the private Blockchain.

From the consumer side, Blockchain technology increase the level of awareness of halal products due to the transparency of the halal products they obtained. Blockchain technology can use the QR Code system. (Tieman, 2015)

The QR code will clearly display the information of the halal product. The origin of the product, halal certificate, and halal process, based on the halal supply chain, only by scanning the QR Code with the consumers' smartphone as the existing of Halal restaurant with Barcode. Consequently, the level of consumer confidence will increase with the transparency of the information they get. Moreover, the consumers will think that halal products for Muslim consumers will fade where the plural Religion has hampered the creation of a Halal supply chain.

Halal supply chain activities are very effective and efficient, with the application of blockchain technology. Even it can reduce the activities as in Lean logistic. Data accessed on blockchain or big data reduces human movement and decrease the use of paper, but this does not reduce logistic costs because by applying halal supply chain with blockchain technology will change a product into a premium level.

- **Analysis SWOT**

Based on internal strengths and weaknesses and existing external opportunities and threats, four alternative strategies will be obtained which can be formulated as follows.

SWOT Matrix

Table III.1

IFE EFE	Strength	Weakness
	- The halal industry is very promising and needed today - MUI halal certification - High blockchain technology security - Blockchain is a decentralized system - Halal logistics PT. MTI	- The absence of legal protection - Less of support from the government - The impact is there is a Premium Product - Lack of Consumer awareness of halal products - The difficulty of uniting stakeholders in the supply chain
Opportunities - The highest number of Muslim population - Halal product demand is increasing - Become an added value of halal products - Halal business development - Progress of halal supply chain with technology - Consumers need a transparent Halal supply chain from upstream to downstream	Strategy S-O - Expanding the halal industry in Indonesia - Promoting guaranteed halal products - Increase public awareness about halal products - Conduct socialization in using blockchain technology to find out halal products - Halal Logistics Collaboration with other stakeholders	Strategy W-O - Making a law regarding the Halal supply chain - Increase the commitment of government support for halal supply chain activities with blockchain technology - The preparation of blockchain application development is interesting and user friendly - Providing workshops to increase halal industry knowledge - Integrate all stakeholders in the halal supply chain
Threat - Religious issues - Left behind with other countries - Professional hackers	Strategy S-T - Eliminating the mindset about prioritizing a particular group in terms of halal supply chain so that there will be no disputes between religious communities - Doing a halal industry breakthrough by using block chain technology so that it can catch up with technology with other countries - Working with blockchain associations to support the implementation of blockchain technology	Strategy W-T - Increase consumer awareness - Make a socialization about the awareness of halal products so as to avoid the existing religious issues - Creating a cyber team to prevent data hackers

Source : (Susilawati, 2016)

Data Source : Authors

a. Strategy Strengths – Opportunities (S-O)

First, expanding the halal industry in Indonesia. With the increasing needs of the Indonesian people regarding halal products. It is also necessary to develop halal business in order to meet the needs of the public in obtaining halal products. Second, promoting guarantee for halal products. Introducing halal products to the public through various media so that people will know that the product is halal. Halal products labeled with halal certification from the MUI (Indonesian Ulama Council) can guarantee that their products are truly halal guaranteed. Third, increasing public awareness about halal products, since nowadays, people mostly are more careful in buying products. Fourth, conduct socialization in using Blockchain technology to find out halal products.

Socialization is a very important thing in providing an education on how to know the halal product.

b. Strategy Weaknesses – Opportunities (W-O)

First, make a law regarding the Halal supply chain. The government should quickly make regulations regarding the halal supply chain so that it will not only be a discourse but must be implemented properly. Second, increase the commitment of government support for halal supply chain activities with Blockchain technology. In addition to making regulations regarding halal supply chain, the government must also be able to facilitate blockchain technology. Third, prepare blockchain application development which is interesting and user-friendly. Applications that are useful for data transparency must be able to facilitate access to information quickly and clearly so that the level of comfort of access increases. Fourth, provide workshops to improve halal industry knowledge. Today's public awareness is still insignificant where we have to provide information dissemination so that the level of awareness is increased. Fifth, integrate all stakeholders in the halal supply chain. Integration is required to achieve halal supply chain objectives, namely transparency from upstream to downstream wherein the activities of the Shari'a principles are implemented.

c. Strategy Strength - Threat (S-T)

First, eliminate the mindset of prioritizing a particular group in terms of the halal supply chain so that disputes between religious communities do not occur. Giving thought that the halal supply chain is not only for Muslims but for all circles. In fact, the halal supply chain is aimed for all good (Tayyib) (Simatupang, 2016). Second, do a halal industry breakthrough by using blockchain technology so that it can catch up with the technology of other countries. Indonesia must be the halal industry in the world where Indonesia cannot be left behind from other countries. Third, collaborate blockchain associations to support the implementation of blockchain technology. The need

for associations to engage with blockchain technology has the effect of facilitating clear aspects to be better understood in the making of these technologies.

d. Strategy Weakness – Threat (W-O)

First, increase consumer awareness. Consumer awareness is the main goal of this concept. The use of private blockchain technology will make consumers' purchasing power towards halal products increased. Third, create a cyber team to prevent data hackers. Security is very important. So far, security in cyberspace is still not good in which hackers are everywhere that cause highly risk of system hacked. at this time and a big risk if a system is hacked.

Input stage matrix IFE

Table III.2
IFE

No.	Strength	Weight	Rating	Score
1.	Halal industry is very promising and has become a necessity today	0,08	3	0,24
2.	Halal Certification of the MUI (Indonesian Ulama Council)	0,1	4	0,4
3.	The security of blockchain	0,12	4	0,48
4.	technology is high	0,1	3	0,3
5.	The blockchain is a decentralized system	0,1	3	0,3
	The existence of Halal Logistics at PT. MTI (Multi Terminal Indonesia)			
	TOTAL			1,72
No.	Weakness	Weight	Rating	Score
1.	The absence of legal protection	0,12	2	0,24
2.	Less support from the government	0,1	3	0,3
3.	The impact is a premium product	0,08	3	0,24
4.	Lack of consumer awareness of halal products	0,08	2	0,16
5.	The difficulty of uniting stakeholders in the supply chain	0,12	4	0,48
	TOTAL	1		1,42
				3,14

Source: (Authors)

The conclusion is that IFE matrix achieved a total score of 3.14 , which indicates a strong internal position that can use the power of implementing halal supply chain using Blockchain technology properly and can maximize existing weaknesses.

Input stage matrix EFE

Table III.3
EFE

No.	Opportunity	Weight	Rating	Score
1.	The highest number of Muslim	0,12	3	0,36
2.	population	0,12	3	0,36
3.	Halal product demand is increasing	0,08	2	0,16
4.	Become an added value of halal	0,1	3	0,3
5.	products	0,12	3	0,36
6.	Halal business development			
	The progress of the halal supply	0,1	3	0,3
	chain with technology			
	Consumers need a transparent halal			
	supply chain from upstream to			
	downstream			
	Total			1,84
No.	Threat	Weight	Rating	Score
1.	Religious issues	0,12	3	0,36
2.	Left behind with other countries	0,12	3	0,36
3.	Professional hackers	0,12	4	0,48
	TOTAL	1		1,2
				3,04

Source: (Authors)

The Cconclusion is that EFE matrix gets a total score of 3.04, that indicates a strong internal position. The implementation of the halal supply chain with Blockchain technology can effectively givebenefit from the existing of opportunities and minimize the negative effects of external threats.

Analysis:

Internal analysis coordinate: (Total strength score + total weakness score): 2

$(1.72 + 1.42): 2 = 1.57$

External analysis coordinate: (Total opportunity score + total threat score):2

$(1.84 + 1.2): 2 = 1.52$

With these coordinates, the position of implementation of halal supply chain with Blockchain technology based on SWOT analysis is in Quadrant I (Growth/Aggressive), can be seen in the following figure:

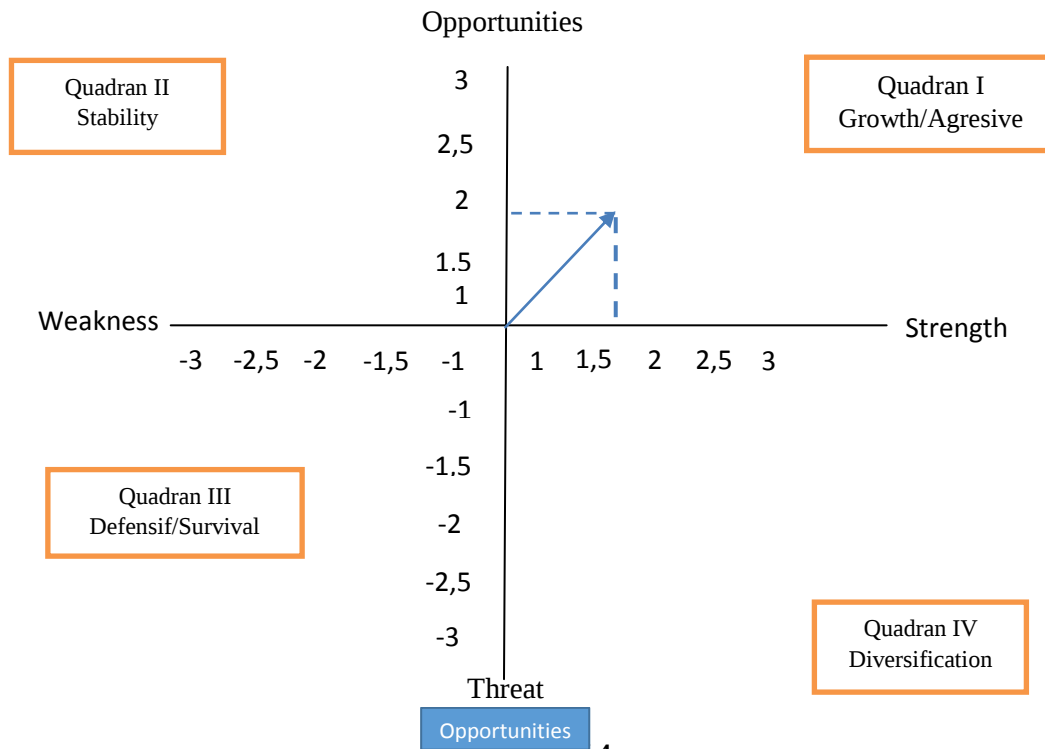


Figure III.4
SWOT Quadrant

Source Quadrant: (Eko Nurmiyanto, Arman Hakim Nasution, & Syafril Syafar, 2004)
Data Source : (The Authors)

Conclusions

The application of halal supply chain with Private Blockchain technology is indispensable in Indonesia, the largest Muslim population country. The level of consumer awareness of halal products will increase. The synergy between stakeholders required to be implemented. The use of Blockchain technology with Big Data can reduce the activities of obtaining Lean Logistics. The implementation of private Blockchain, will change a product into premium quality level.

Suggestion

It is highly proposed that the Government in this case, the State-Owned Enterprises (SOEs), to manage the Halal supply chain with the Private Blockchain in Indonesia. Socialization can be conducted by Government using above the line and below the line strategy.

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