Developing Halal Industry in Indonesia using Interpretive Structural Modeling (ISM)

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Halal industry has become a popular object and the latest trends in the world of international business. Not only in Indonesia but also Malaysia, Thailand even Europe began to glance at the potential and opportunities for halal industry. The phenomenon that began to develop halal industry in recent years is quite the attention of businesses and consumers themselves. Labeling "halal" or "sharia" on a product, not again become a form of obligation or obedience to a Muslim but has become the strength of a strong market, which not only as a guarantee of the products that are allowed for a Muslim but also a symbol of the global for quality assurance and a lifestyle choice. In previous studies, many researchers were interested in examining issues about the potential of halal industry, while very few researchers discuss the problems of the development of halal industry in Indonesia. Though research on the obstacles and development strategies of halal industry is needed to accelerate the development of halal industry in Indonesia. Based on this problem, which is taken from the study of literature, previous research and indepth interviews with academicians and practitioners, some issues in the development of the halal industry in Indonesia is divided into five aspects: 1) Policy, 2) Production, 3) Socialization, 4) Infrastructure, and 5) Human Resources.

Keywords: Halal industry; Indonesia; Interpretive structural modeling; ISM

INTRODUCTION

The Islamic finance industry, being an object of study that is always interesting to be studied. Especially if compared with the conditions of the conventional financial industry that has already existed. For example, the results of research conducted by Nurfalah et al., (2018) which states that Islamic banking is relatively more stable compared to conventional banking in the face of shock both internally and externally. This is an interesting finding that needs to be proven through various research in the future.

One of the Islamic business and finance industry that develop today is halal industry. Nowadays the halal industry has become a popular object and the latest trend in the world of International business. Not only in Indonesia, but also in the neighboring country like Malaysia, Brunei, Thailand, and even Europe began to glance at the potential and opportunities of halal industry. Halal industry phenomenon that began to develop in several years is quite a concern of business players and consumers themselves. The labeling of "halal" or "sharia" on a product is no longer a form of Muslim obligation or obedience but has become a powerful market force, not only as a guaranteed product for a Muslim, but also a global symbol for quality assurance and chosen lifestyle. This is evidenced by the large participation and involvement of non-Muslim countries for making the halal industry as the standard of lifestyle choices.

The halal concept is basically a part of Islam religious teachings. As the religion of Rahmatan Lil alamin, Islam has regulated all the life of its people not only about worship but covers the whole part of life such as fulfilling the needs of Muslim life for example in food, Muslims are allowed only to consume halal food and drink. Not only that, the halal criterion must include the production process or the process of making it in accordance with the Sharia. Moreover, Islam also regulates Muslims in dressing as a command for women in closing their nakedness according to the word of Allah in the Surah of Al Ahdzab verse 59.

Indonesia as a country with a majority Muslim population has huge potential and opportunities in developing the halal industry. However, according to Global Islamic Economy Report 2022/2023, Indonesia is ranked 4th, far behind from Malaysia which is positioned first, from various indicators that exist (GIER, 2023). This is a big challenge for Indonesia to develop the halal industry both in terms of quality and quantity.

In the framework of the development of halal industry, the government establishes halal industrial area by forming a draft bill on JPH (Jaminan Produk Halal or halal product assurance) on 17 October 2014, and on the same day also, the Minister of Justice and Human Rights has established the bill as Bill Number 33 of 2014. In the bill consisting of the 68 clauses, it is affirmed that the products entered and traded in the territory of Indonesia must be halal certified. Therefore, the government is responsible for conducting Halal Product Assurance (JPH).

However, in the implementation of the formulation of the JPH Bill has not been effective and affect the halal industry, so in the competition of Halal Industry, Indonesia is still left behind with other countries such as Malaysia. In addition, there are still many producers and some governments that have not considered the halal industry as an important business opportunity, still a problem in developing Halal Industry in Indonesia (Republika, 2017).

Based on this problem taken from literature review, previous research, and in-depth interview with academicians and practitioners, the problem in halal industrial development in Indonesia is divided into five aspects, namely: policy, production, socialization, infrastructure, and human resources.

On previous researches, many researchers are more interested in researching the problem of the influence of halal tourism and halal products in adding the value of a product, while not many researchers are discussing the problems of Halal Industry development in Indonesia. Though research on constraints and strategy Halal industrial development is needed for acceleration of halal industry development in Indonesia.

LITERATURE REVIEW

Halal is something that if being used does not result in getting a punishment (sin). While haram is something that Allah forbid in doing it. With a strict prohibition on which the person who violates it is threatened with punishment by Allah in the Hereafter (Amin, 2011). In the view of Islam the issue of choosing to consume halal haram is a very important issue, even considered the core of diversity, because everyone will be using, doing, or consuming is highly demanded by religion to first ensure its halal and haram.

Halal products according Islamic Sharia is a good product or known as *halalan, thayiban, mubarakan*, and does not consist of impurity. Meanwhile, according to Dahlan (2009), halal has a meaning allowed to be consumed or used by Muslims. Furthermore, halal food

must be safe for all consumers (not just the goods, but upstream to downstream process must be sharia-compliant).

Indonesia, as one of the country with the largest number of Muslims, does not have a clear vision in positioning itself in the halal industry. Indonesia still has not seriously worked on global halal industry opportunities because the orientation of halal product development is more to protect Muslim consumers in the country and it is still a vision of halal auditor institution LPPOM-MUI.

Even though condition factor in Indonesia has the largest halal market opportunity in the world because it is the most populous Muslim country in the world, has an abundance of natural resources, as well as a recognized halal certification system. But Indonesia still has some weaknesses, such as the lack of awareness of the domestic community about the importance of halal certified products. Domestic producers are not yet aware of halal certification aspect to increase their product selling, lack of infrastructure that supports halal industry, as well as fulfilling the need of halal products of Indonesia which is more based on imports (Amalia, 2013).

Previous research conducted by Dwi Purnomo (2011) entitled Strategy of Halal Agro-Industry Development in anticipation of Global Halal Business. This research aims to produce the description of the current condition of development of halal agroindustry of Indonesia, to produce situational analysis and compile the development strategy of halal agroindustry Indonesia that can compete at international level. The conclusion of the research related to halal agroindustry problem is as follows Indonesian Halal Agroindustry has a very strategic potential. Based on the study using AHP, criteria belonging to the most important group are 1) government policies and commitments, 2) availability of infrastructure, 3) institutional synergism and 4) advocacy skills.

Other research related to Halal Industry is Rizki Amalia's research titled IMT-GT Member Country Strategy (Indonesia, Malaysia, Thailand Growth Triangle) in Halal Industry Development. This research is a study on the cooperation of Indonesia, Malaysia, Thailand Growth Triangle (IMT-GT) related to halal industry development. In particular, this study focused on the discussion of the different strategies of each IMT-GT member countries, especially in the development of halal industry in the country. The conclusion of this study is the lack of awareness of halal producers for halal certification, resulting in a low export value of halal products. Unavailability of inadequate halal supporting infrastructure, the absence of government policy strategy in the halal industry sector is also an obstacle in developing the domestic halal industry. Therefore, the commitment of the government through appropriate policies and regulations and synergize with business actors will determine the development of halal industry, the joint commitment from IMT-GT cooperation experience in the halal development sector must be followed by the government's commitment to the halal industry in the country. This implies whether or not an advanced halal industry in Indonesia, Malaysia, and Thailand.

Suhaini Zailani, Mohammad Iramanesh, et al (2017) in his research entitled Opportunities and challenges of halal logistics. This study aims to investigate opportunities and challenges for logistics companies in Malaysia in adopting the halal logistic system. The conclusion of this research is to adopt the halal logistic system in Malaysia, there are some challenges that are still ambiguous, halal certification, lack of international halal certification, lack of demand, lack of coordination between LSP, JAKIM and HDC and ineffective cost standards.

Battour et al, (2016) with the title of halal tourism, concepts, practices, opportunities, and challenges. This study discusses the concept of halal tourism and its components which is one part of the halal industry. The conclusion of this study is one of the effective ways to access halal markets by making the halal food market more widespread in destinations that have a high number of Muslim tourists. Therefore, good hotels for Muslims (sharia hotels) should be available in tourist destinations.

Samori et al (2016) entitled Halal tourism trends: case studies of selected Asian countries. This study attempts to explore and illustrate the concept of halal tourism in the Islamic context with particular reference to the verses of Al Quran and Hadith. This study shows that the more Muslims who travel all over the world, Muslim countries such as Malaysia have promoted halal tourism and that Japan has also opened up halal tourism to attract Muslim tourists.

Mohammad (2014) entitled the development of halal food products in Malaysia. This study aims to propose a framework for developing halal products to better manage product development processes as well as to provide a competitive advantage for products. In this study concluded that there is a growing postal procurement for halal food that provides an economic potential for many food-producing countries such as

countries with relatively few Muslims like Thailand and the Philippines that are aggressively investing in halal food products. The other researches on halal industry has been done by some academician. For the example, the research done by Soon and Wallace (2017) and also Elseidi (2018). The table below summarized the

previous studies on halal industry development aspects. Apart from that, several recent studies related to the halal industry especially in Indonesia, for example, have been carried out by Windasari et al., (2024), Prawiro & Fathudin (2023), Puspita et al., (2023), and Takhim et al., (2023).

Table 1. Previous Studies on Halal Industry Development Aspects

No	Variable aspects	Sources
1	Halal industry players	Purnomo (2011)
2	Ability & system of halal certification	Kubota et.al (2017), Purnomo (2011), Talib et.al (2017), Amalia (2013)
3	Logistic infrastructures	Ali et.al (2017), Zailani et.al (2017), Mazhar et.al (2017), Purnomo (2011)
4	Institutional networks	Purnomo (2011)
5	Market potential	Jaelani (2017), Majid & Mitra (2016), Nisha & Iqbal (2017), Purnomo (2011)
6	Availability of halal raw materials	Purnomo (2011)
7	Research & technological advance	Dahlan (2009), Purnomo (2011)
8	Innovation & product competitiveness	Olya & Al-ansi (2018), Dahlan (2009), Purnomo (2011)
9	International & local advocacy	Purnomo (2011)
10	Public & industry awareness	Elseidi (2018), Krishnan et.al (2017), Purnomo (2011), Yasuda (2017)
11	Government policy & commitment	Yousaf & Xiucheng (2018), Purnomo (2011), Gabdrakhmanov et.al (2016)

RESEARCH METHOD

Interpretive structural modeling is an advanced planning methodology used to identify, analyse and summarize various relationship among factors that define a problem, model or issue (Sage, 1977). ISM provides a means by which researchers or academician can impose an order and create models around factors of a system by developing the complexity of relationships among them (Warfield, 1974).

The method is 'interpretive' in the sense that the expert decisions develop the relationships among the variables. It is 'structural' on the basis of proposed relationships that create an overall structure extracted from a complex set of factors. Its a 'modeling' technique as the specific relationship and overall structure are portrayed carefully in a graphical model as well as words (Li and Yang, 2014). As a modeling technique, ISM has been extensively used in different domains to understand the relationship among the various factors that contribute to a whole system (Faisal and Al-Esmael, 2014). ISM analysis and modeling can help managers and practitioners visualize issues through a systems approach. It can then identify factors that have high

levels of influance and therefore require significant attention and effort to resolve them (Jabeen and Faisal, 2018).

Interpretative Structural Modeling is a decision making method took from the complexity situation by correlating and organizing the idea into the visual map. ISM basic concept is using expert and practitioners to generate complexity system into some sub system (element) and build a hierarchy structural modeling. ISM also used to give the basic understanding from the complexity situation, and arranging the strategy to solve the problems (Gorvett and Liu, 2007).

There are some step to analyze ISM method, *first stage* is problem decomposition to the expert or practitioners (who has better understanding related to the problem discussed/ brainstorming) to identify the ideas of the organization development, has better understanding about halal industry development problem. From this discussion, will be explored the development strategies, and the variables used in ISM model. *Second stage* is constructing Structural Self Interaction Matrix (SSIM) model. SSIM is constructed

from the variables founded from decomposition step, then develop the contextual relationship among variables and gathering into one variable *i* and variable *j*.

Third stage is creating reachability matrix (RM) by conversing the V, A, X, and O used into the numbers 1 and 0. *Forth stage* is creating canonical matrix to identify the level through the iteration. If the intersection is not found anymore, next step is creating the model resulted from the ISM software. The model resulted used to solve the problem (in this study: halal industry development model). From the model also explored the road map of organization development (level).

According to Marimin (2004) the process of ISM method is calculated according to the Transivity Rule where the correction of SSIM is done until a closed matrix occurs. SSIM modifications require input from panelists / experts, with special notes for attention shown only on certain sub-elements. The revised results of the SSIM and the matrix eligible for the Transivity Rules are further processed. For revision can also be done transformation matrix with computer program.

Table 2. Interconnection between Sub-elemen in ISM

No.	Type	Interpretation
1.	*Comparative*	. A more important than B
2.	*Definitive*	. A is attribut of B . A including inside B . A interpret B
3.	*Influence*	. A cause B . A is the cause of B . A develop B . A improve B
4.	*Spiral*	. A is south/north B . A above B . A to the left B
5.	*Temporate/Time Scale*	. A precedes B . A follow B . A have more priority then B

There are several studies on Islamic economics and finance that have been done using the ISM method. Some of them are done by Rusydiana and Devi (2018) about sharia cooperatives, Ascarya et.al (2012) about development of shariah banks, and Devi and Rusydiana (2016) on group lending model. Meanwhile Bolanos et.al (2005), and Kanungo & Batnagar (2002) for other industrial applications. The research using ISM method with more theoretical has been done by Lee (2007) and Takkar et.al (2007).

RESULT AND DISCUSSION

Based on the identification of Indonesian halal development problems, solutions, and strategies above, an ISM network structure was developed. To develop the contextual relationship among the factors, the ISM method suggests the use of experts opinions. For this research, an expert group was formed by contacting several academicians and practitioners. To develop the model initially, we decided to follow the traditional method of conducting a brainstorming and depth interview, where we could receive inputs of the expert and revise simultaneously. A summarized literature on halal development was communicated to the experts.

For analyzing the relationships among the enablers of Halal development, a contextual relationship of 'leads to' type was chosen, meaning that one enabler led to another. On the basis of this, the contextual relationship between the factors was developed. Experts were asked in questionnaire to compare the column statement with the row statement for each cell and to choose a value from the set (V, A, X and O) to represent their perception of direct relationship between two sources at each time.

Structural Self-Interaction Matrix (SSIM)

The 11 variables were put in a row and column format (in Indonesia Halal strategies), where variables in rows and columns are represented by i and j, respectively. Thus, each pair of variables is analysed separately after the formation of grid, which was obtained in the above process. Four keywords are used

to represent the direction of the relationship between a set of the variables (i and j):

(a) V indicates that variable i helps to achieve variable j;

(b) A indicates that variable j helps to achieve variable i;

(c) X indicates that variable i will help to achieve variable j and variable j will help to achieve variable i, or causality relationship; and

(d) O indicates that variable i and j are unrelated.

The relationships between variables are presented in a matrix known as structural self interaction matrix (SSIM) with the value for each pair of variable being an agreed upon value among experts.

Table 3. Structural Self Interaction Matrix (SSIM)

No	Variable description	11	10	9	8	7	6	5	4	3	2	1
A1	Halal industry players	V	V	X	A	A	O	X	V	A	A	
A2	Ability & system of halal certification	V	A	V	V	V	A	V	V	A		
A3	Logistic infrastructures	X	X	V	V	X	X	V	V			
A4	Institutional networks	V	A	V	V	A	A	A				
A5	Market potential	X	X	V	V	A	O					
A6	Availability of halal raw materials	X	X	X	X	X						
A7	Research & technological advance	A	V	X	A							
A8	Innovation & product competitiveness	A	O	A								
A9	International & local advocacy	V	V									
A10	Public & industry awareness	X										
A11	Government policy & commitment											

Notes: Entry in the cell: V when row influences the column; A when column influences the row; X when row & column influences each other; and O when there is no relation between row & column.

Reachability Matrix

The reachability matrix is obtained from structural self interaction matrix (SSIM) using a two-step process. In the first step, the alphabets used to indicate the relationships among the variables in SSIM are replaced by "0" or "1". The value in the reachability matrix depends on the type of relationship in the SSIM (Faisal, 2015) and is summarized below:

(1) If the relationship between a variable in a row with another variable in a column is "V", then in the initial reachability matrix, the row entry becomes "1" while the column entry between these two variables becomes "0";

(2) If the relationship between a variable in a row with another variable in a column is "A", then in the initial reachability matrix, the row entry becomes "0" while the column entry between these two variables becomes "1";

(3) If the relationship between a variable in a row with another variable in a column is "X", then in the initial reachability matrix, the row entry becomes "1" while the column entry between these two variables becomes "1";

(4) If the relationship between a variable in a row with another variable in a column is "O", then in the initial reachability matrix, the row entry becomes "0" while the column entry between these two variables becomes "0";

Based on the above rules, the initial reachability matrix for the enablers to Halal development is constructed. Next, by incorporating transitivities (Ravi, 2015), the final reachability matrix is obtained. The transitivity of the contextual relation is a basic assumption made in the ISM. It states that if variable X is related to Y and Y is related to Z, then X is necessarily related to Z (Venkatesh et.al, 2015; Jabeen et.al, 2017). The reachability matrix also provides the driving power and dependence power of each enabler. Similarly, the values of driving power and dependence are calculated for all the remaining enablers.

From the final reachability matrix, the next step is to establish reachability and antecedent sets. The reachability set for a particular enabler consists of the enabler itself and the other enablers that it may help achieve. Similarly, the antecedent set consists of the enabler itself and the other enablers that influence it. The intersection of these sets is derived for all the enablers. The enablers for which the intersection and reachability set are the same form the top level of the hierarchy in the ISM model. These enablers would not help achieve any other enabler above their level (Jabeen and Faisal,

2018). The identified levels help in building the diagraph and the final model of ISM.

Problem Identification

Based on the results of previous research and indepth interviews with academics, practitioners and regulators, the problems in the development of halal industry in Indonesia are divided into five aspects: 1) Policy 2) Human Resources 3) Socialization 4) Infrastructure 5) Production. The whole clusters are grouped into problem clusters, and strategies. For more details explanation of aspects and clusters can be explained as follows:

a. Policy

Halal industrial area has great potential to be developed in Indonesia, especially by seeing the large number of Indonesian population who are Muslims. So halal industry can be one of the contributors to the economic growth of the nation as has been done by Malaysia. In order to support the economic growth of the nation, it is necessary to have a government policy that speaks specifically in the development of halal industry, as the development of halal industry is still much under developed. The problems in the policy are 1) the unfinished implementation of the JPH (*Jaminan Produk Halal* or Halal Product Assurance) law, 2) The lack of halal product standardization and certification, 3) The absence of Roadmap for the development of Halal Industry.

b. Human Resources

As the country with the largest Muslim population. Indonesia has the biggest opportunity to develop halal industry. Ideally, the Muslim population is a supporting factor of the development of halal industry. The problems that include on human resources are as follows: 1) There are still many producers who are less concerned about halal products, 2) lack of knowledge of small industries related to halal products.

c. Infrastructure

To optimize the potential of Halal Industry in Indonesia needs adequate infrastructure facilities. Therefore, it is necessary to improve the infrastructure services from both the government and the private sector. However, there are still obstacles in the development of infrastructure, namely: (1) lack of coordination of institutions dealing with infrastructure (2) lack of adequate infrastructure

d. Production

In building a halal industry that can be trusted by the community, it is necessary to increase attention to the product quality. Not only the problem of halal labeling in a product, but also there is a need for clarity in the production process that can be guaranteed by the existence of halal certification. Because in order to be able to compete and provide added value to the product. So the refinement or improvement of the product quality can provide stimulus in increasing productivity. However, there are still some constraints in production such as: (1) Limited supply of raw materials fulfilling halal criteria (2) There are still some sectors dependent on imports such as the pharmaceutical sector, 3) There is no standard definition of halal products

e. Socialization

To support the implementation of halal industry, business subject, regulators and the public need to understand the urgency of the halalness of a product, not only related to food, beverage but anything related to halal industry. Therefore, there is a need for special socialization in introducing halal industry. But on the other hand, there are still many obstacles in the socialization problem such as: (1) Not aggressive in promotion (2) Lack of education, socialization and information.

Based on the analysis of ISM, from the aspect of halal industry development in Indonesia, from 5 criteria found, the important aspects are Human Resource, Infrastructure aspect, and Production aspect. The next priority aspect is Policy related and the last aspect of Socialization. Human resource problem is one of the main problems in the development of halal industry in Indonesia, both from the side of the person and existing experts. This is relevant to the results of research conducted by Jaelani (2017) and Junaidi et al., (2019). In addition to human resources, infrastructure and production aspects become the next challenge in the development of halal industry.

Infrastructure issues are the secondary importance in the development of halal industry. This is consistent with several studies such as Ustadi & Osman (2022), Nisha & Iqbal (2017), Gabdrakhmanov et al (2016), and Majid & Mitra (2016). Meanwhile, production problems within the framework of halal industrial development have relevance in research conducted by Ali et al (2017) and Mazhar et al (2017).

The next priority problem is related to policies and socialization. The policy of a country does have a very important role in the development of halal industry anywhere including Indonesia. This is confirmed by the results of research conducted by Gabdrakhmanov et al (2016) and Majid & Partners (2016). Meanwhile, socialization factor becomes the last thing but no less important in the development of halal industry in Indonesia. Good socialization and marketing is one of

the key things in the development of halal industry going forward (Nasution et al., 2023; Boediman, 2017; Krishnan et al, 2017; and Battour & Ismail, 2016).

CONCLUSION

Indonesia is a country with majority Muslim population, has the potential and opportunities in developing a world-scale halal industry. However, according to Global Islamic Economy Report 2022/2023, Indonesia is ranked 4th, far behind from Malaysia which is positioned first, from various indicators that exist (GIER, 2023). This become a big challenge for Indonesia to develop halal industry both in terms of quality and quantity.

Based on the results of literature studies and in-depth interviews with experts, there are several important issues related to the development of Halal Industry in Indonesia that is 1) policy 2) Production 3) Socialization 4) Infrastructure 5) Human Resources (HR). Based on ISM analysis result, from 5 criteria found, the biggest weight is Human Resource, Infrastructure aspect, and Production aspect. The next priority aspect is Policy related and the last aspect of Socialization.

As for the recommendations that can be given, among others, is the need for education and training to the halal industry players. This is an important step to be done in order that the problem which still a lot of producers who are less concerned about halal products, and the lack of knowledge Small industries related halal products are expected to be resolved. Similarly, the need for joint efforts of all parties, both regulators, halal practitioners and academics for the potential of such a large halal industry can be captured by our country.

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APPENDIX