For the past few years, there is a significant growing demand of halal products both from the Muslim and non-Muslim communities from all over the world. In the year of 2010, the halal food market makes about 16% of the world food trade and is estimated to be worth more than USD500 billion a year. As the largest Muslim country in the world, Indonesian customers should be aware of the halal aspects of food products. The halal food products should cover all halal supply chain aspects start from the raw materials from the suppliers until being delivered to the end customers. The objective of the research is to know about customer purchase intention for halal food products based on customers’ background by applying decision tree. This research also discovers the relationship between customer background and halal issues of products. Data are collected by spreading questionnaires to the Indonesian citizens randomly. The results present customer background is influencing their purchase intention for halal food products halal issues of products are well recognized by Indonesian customer.

Keywords: Customer Purchase Intention, Halal Food Products, Halal Supply Chain, Decision Tree

1. INTRODUCTION

The halal concept has obtained an increasing attention recently. This is due to the fact that the demand for halal food consumption is increasing annually as a result of the rising number of Muslim population globally, which is approximately 1.8 billion (Omar & Jaafar, 2011). Another fact said that the demand of halal product not only from Muslim communities but also from non-Muslim communities. In 2010, reference highlighted that the halal food market constituted about 16 percent of the world food trade in which the trade value has been estimated about USD 500 in the global halal market (Abdul Talib, Mohd Ali & Jamaludin 2008; Belkhatir, Bala & Belkhatir 2009). There are two main reasons that contributing to the massive growth of halal food market. First, there is a massive agricultural production by exporting countries and greater purchasing power among Muslim consumers in the importing countries. Second, healthier lifestyle has developed rapidly and one of the factor that influencing health lifestyle is the food that are selected to consume, and the people who choose healthier lifestyle would rather to consume halal food products that already known of its cleaness and not non-harmful ingredients.

On September 25th, 2014, Indonesia government approved and authorized halal product guarantee law (RFQ, 2014). It will encourage many businessmen and entrepreneurs, to transform
their industries to become *Halal* Industries. Based on *halal* product guarantee law, in 2019, all of Indonesian products should have *halal* certificate. If not, they will have struck sanction from government (Ichsan, 2014).

As the country which has the largest Muslim citizens, Indonesian customers should be aware with of the *halal* aspects of the product. In contrast, however, it is believed that consumer who tend to consume *halal* food are not aware of the *halal* supply chain principles. Currently, consumer of *halal* product usually purchase product with *halal* logo stamped on the packaging without doubting its authenticity and trusting the suppliers whole-heartedly. Most of them are unaware of the *halal* food requirement that involved the supply chain and logistics aspects. From this research, hope it can create awareness about *halal* food supply chain process.

The objectives of this study are to investigate about the Indonesian consumer awareness about *halal* food and their knowledge about *halal* food requirements and supply chain process. This is due the fact that there are many customers who don’t know yet about *halal* supply chain and logistic concept. The current supply chain and logistic process will not be changed or remain the same if the consumers are unaware with the process and do not take this issue seriously. Producers and businessman produce their product based on requirements and demand from their customers. This study is focused on Indonesian food customers.

There are two research questions to investigate about Indonesian customer purchase for *halal* food supply chain and logistic. The question is about the knowledge of the customer about *halal* food supply chain and logistic process, and whether the customers buy or not the product after they know about criteria of *halal* food supply chain and logistics. This research has aim to know the customer purchase intention after knowing about halal status of product.

This study will be important for developing *halal* food supply chain and logistics in Indonesia. From this study, hope it can increase the awareness and knowledge Indonesian customer about *halal* food supply chain. It also will be significant to the theoretical and practical advancement of the relationship between customer’s religion, cultural values, and buying behavior on wholesome *halal* food. This information will become the reference point to all academics, business stakeholder, and government to develop and socialize about *halal* food supply chain and logistic concept.

2. RESEARCH DESIGN

The research design consists of data collection, data preprocessing, model construction and model usage of decision tree, crosstab analysis, and results. The research began by spreading online questionnaires to the Indonesian customers of food product. It is use google form and spread the link via social media like Facebook, WhatsApp, and line and ask for people to fill it. This research categorized as descriptive correlational research that will be explain relationship between variables that used in this research. According to Frankel and Wallen (1993:92), minimum sample of correlational research is 50. So in this research we use 100 respondents. The number has chosen because it reflects the limit of our budget and time to distribute the questionnaire. The respondent has chosen randomly, and it doesn’t have any special criteria. There are have general criteria like must Indonesian people and the minimum age is 15 years old. The respondents were also living in multi-location in Indonesia. The questionnaires were designed to present the data about customer background and customer purchase intention’s factors. The collected data were preprocessed by a major task, namely data cleaning. Data cleaning routines work to “clean” the data by filling in missing values, smoothing noisy data, identifying or removing outliers, and resolving
inconsistencies (Han, Kamber, & Pei, 2012). Some “dirty” data can make confusion, so that it is very useful to preprocess the data.

![Research Design Flowchart](image)

Figure 2.1 Research Design Flowchart

The collected data were processed by applying decision tree as the classifying method. The constructed model can be represented as decision trees. The step process in model construction are (1) Defining the training data for model construction. The training data is 90% of the data set (100 data) and the rest can be the testing data for model usage in the next step. (2) Constructing decision trees as the model. Decision tree is flow-chart-like structure, where each internal node is denoted by rectangles, and leaf nodes are denoted by ovals. All internal nodes have two or more child nodes. All internal nodes contain splits, which test the value of an expression of the attributes (Ahmed & Elaraby, 2014).

In the process of inducing decision tree, there is attribute selection measure process. The attribute selection measure is important to select the most useful attribute for classifying the data. This research applied information gain measure as attribute selection measure to find the optimal way to classify the training set. The attributes for the customer purchase intention decision trees are shown in Table 2.1.

<table>
<thead>
<tr>
<th>Decision Tree</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer purchase intention decision tree based on customer background</td>
<td>Religion</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
</tr>
<tr>
<td></td>
<td>Education level</td>
</tr>
<tr>
<td></td>
<td>Occupation</td>
</tr>
<tr>
<td></td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td>Income</td>
</tr>
</tbody>
</table>

Table 2.1 The Attributes Used for Customer Purchase Intention Decision Trees

Decision tree usage was applied for classifying the testing data which is 10% from the data set. This process is estimating the accuracy of decision tree. The accuracy rate is the percentage of testing data are correctly classifying by the decision tree. If the accuracy is acceptable, then the
decision tree can be applied for unknown objects (Han, Kamber, & Pei, 2012). In this research, the accuracy rate for proposed decision tree is 70%.

This research also applied the crosstab analysis. The crosstab analysis is used for discover the relationship between categorical variables. The input data for crosstab analysis must be nominal or ordinal data. Degree of error (α) is 5% used for crosstab analysis. In this research, through crosstab analysis, the relationship between customer background and customer purchase intention’s factors will be presented.

3. RESULTS

In order to answer two research questions, two type data was collected. The first data to answer the relation of the customer background and customer purchase intention factor use customer purchase decision tree based on customer background. The customer background has attributes such as religion, gender, education level, occupation, age, and income. The second data to answer the question about whether the customers buy or not the product after they know about criteria of halal food supply chain and logistics use customer purchase decision tree based on customer purchase intention's factors. The customer purchase intention's factors have attributes such as halal logo, halal logistic, halal packaging, halal ingredients, separate storage, cleanliness of the store and halal production process. This attribute based on combination between halal concept and supply chain concept. The meaning of halal is not only about the materials, but also all of the process to produce food. Then, it combines it with supply chain concept that have meaning all process to produce the product from raw material until finished good and also about material flow from raw material at supplier until the finished good at customer. Supply chain activity are included product development, procurement, purchasing, supply, planning and control, production, distribution, and return (Pujawan & ER, 2010). So, based on combination two concepts, it can have concluded that to fulfill halal criteria, all of supply chain process like packaging, storage, cleanliness, and others must halal. So, the customer purchase intention can define from that variables, because if one of the criteria contain non-halal factors, it can make the product become haram and can change the customer purchase intention.

3.1. Customer Purchase Decision Tree Based On Customer Background

Questionnaires distributed randomly to 100 respondents by considering customer background of each respondent. Then, the results of the questionnaire were processed using Weka Software version 3.7.4 and generate pruned decision tree as in Figure 3.1. Prunned decision tree selected to make the tree easier to understand, and reduce the risk of overfitting to the training data. Prunned decision tree being able to classify the training data perfectly.
Based on the results of the attributes selection measure, it was found that the rank of attributes based on information gain is as follows: (1) religion, (2) occupation, (3) education level, (4) age, (5) income, and (6) gender. Can be seen based on information gain from Weka software, the most critical attributes for purchasing intention was a religion. From the overall attributes (religion, gender, education level, occupation, age, and income), the classification with decision tree pruned in Figure 3.1 produces that consumer with Muslims and Confucianism background religion, always pay attention to halal products in the purchase of food products. Meanwhile, consumers with Buddhism, Christianity, and Hinduism background religion do not pay attention to halal products in the purchase of food products. The accuracy is around 79%.

Based on the results of the attributes selection measure, it was found that the rank of attributes based on information gain is as follows: (1) religion, (2) occupation, (3) income, (4) gender, (5) education level, and (6) age. In accordance with the results of the attributes selection measure, obtained pruned decision tree shown in Figure 3.2. From the overall attributes (religion, gender, education level, occupation, age, and income), the classification with decision tree pruned in Figure 3.2 produces that consumers who are Muslims always pay attention to halal products in
the purchase of drink products. Meanwhile, other religion do not pay attention to halal products in the purchase of drink products. The accuracy is around 81.1%.

Based on the results of the attributes selection measure, it was found that the rank of attributes based on information gain is as follows: (1) religion, (2) occupation, (3) education level, (4) age, (5) gender, and (6) income. In accordance with the results of the attributes selection measure, obtained pruned decision tree shown in Figure 3.3. From the overall attributes (religion, gender, education level, occupation, age, and income), the classification with decision tree pruned in Figure 3.3 produces that consumers who are Muslims and Confucianism, always pay attention to halal products in the restaurant. Meanwhile, consumers who are Buddhism, Christianity, and Hinduism do not pay attention to halal products in restaurant. The accuracy is around 71.1%.

3.2. Relationship between Customer Background and Purchase Intention through Crosstab

Crosstab statistical method is done to know the relationship between customer background and purchase intention factor. The crosstab method is done using SPSS 16.0 Software. The p-value, denoted by “Asymp.Sig” is the value which used to make a judgment about the null hypothesis. If p-value is bigger than 0.05, thus we accept H0. In contrast, we reject H0 when the p-value is less than 0.05. Table 3.1 shown the relationship between customer background and purchase intention factor through crosstab statistical method.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Product's Halal Logo Factor</th>
<th>Storage Factor</th>
<th>Cleanliness Store Factor</th>
<th>Ingredients Factor</th>
<th>Production Process Factor</th>
<th>Shipping Factor</th>
<th>Product's Packaging Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asymp. Sig</td>
<td>Note</td>
<td>Asymp. Sig</td>
<td>Note</td>
<td>Asymp. Sig</td>
<td>Note</td>
<td>Asymp. Sig</td>
</tr>
<tr>
<td>Religion</td>
<td>0 Reject Ho</td>
<td>0 Reject Ho</td>
<td>0.997 accept Ho</td>
<td>0 Reject Ho</td>
<td>0.007 accept Ho</td>
<td>0.005 accept Ho</td>
<td>0.021 accept Ho</td>
</tr>
<tr>
<td>Age</td>
<td>0.794 accept Ho</td>
<td>0.888 accept Ho</td>
<td>0.912 reject Ho</td>
<td>0.773 accept Ho</td>
<td>0.618 accept Ho</td>
<td>0.798 accept Ho</td>
<td>0.808 accept Ho</td>
</tr>
<tr>
<td>Education Level</td>
<td>0.923 accept Ho</td>
<td>0 Reject Ho</td>
<td>0.18 reject Ho</td>
<td>0.63 accept Ho</td>
<td>0.48 reject Ho</td>
<td>0.781 accept Ho</td>
<td>0.693 accept Ho</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.984 accept Ho</td>
<td>0 Reject Ho</td>
<td>0.1 accept Ho</td>
<td>0.964 accept Ho</td>
<td>0.905 accept Ho</td>
<td>0.8 accept Ho</td>
<td>0.993 accept Ho</td>
</tr>
<tr>
<td>Income</td>
<td>0.333 accept Ho</td>
<td>0.763 accept Ho</td>
<td>0.923 accept Ho</td>
<td>0.646 accept Ho</td>
<td>0.728 accept Ho</td>
<td>0.305 accept Ho</td>
<td>0.569 accept Ho</td>
</tr>
<tr>
<td>Gender</td>
<td>0.408 accept Ho</td>
<td>0.998 accept Ho</td>
<td>0.949 accept Ho</td>
<td>0.221 accept Ho</td>
<td>0.986 accept Ho</td>
<td>0.709 accept Ho</td>
<td>0.491 accept Ho</td>
</tr>
</tbody>
</table>

Based on the Table 3.1 above it is know that the customer backgrounds which have relation with purchase intention factor are religion, age, education level, and occupation. Age relates to cleanliness store factor. Education level and occupation relate to the same factor which is storage.
factor. Religion relates to three purchase intention factors, product’s halal logo, storage, and ingredients factor.

### 3.3. Other Findings

There are 7 factors that become consideration to determine halal level of food and drink products. The factors are the halal logo, 100% halal logistic separate storage or display, 100% halal ingredients, cleanliness of the store, and 100% halal production process. The questionnaires shown around 80 respondents saying that they are not going to buy food or drink product if one of the seven halal factors doesn’t fulfilled. It shows that Indonesian customer already aware with halal supply chain. Besides the factors, consumer also said that expired date factor can become consideration to determine the halal level of the product.

### 4. CONCLUSION

This research is conducted to know about relation of the customer background and customer purchase intention factor and whether the customers buy or not the product after they know about criteria of halal supply chain and logistic. The relation of the customer background, known that religion gave the great influences to the customer purchase intention factor. Muslim peoples more aware about halal supply chain rather than other religion (Buddhism, Christianity, Hinduism, and Confucianism).

Based on crosstab analysis, customer religion has big effect for customer intention factors. It means that customer awareness of halal food products more likely based on their religion. So, in case the government want to increase the halal awareness of the customer, they can start from the religion aspect first.

### REFERENCES


