

Uncertainty Of Temperature For Halal Cold Chain Transportation In Indonesia

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Abstract

In Indonesia is still facing the same problem in cold chain temperature on goods that do not fit the standard when shipping. The article will discuss about factors that affect the decrease in temperature of the goods and tools used to control the actual conditions using several methods, especially using RFID and WSN to determine the temperature in the base station, which collects and processes data that will be sent. The research was conducted using a qualitative approach to describe clearly and in-depth activities that have been carried out. From the results obtained is still the lack of transparency of the stakeholders because of the nature of egosistem owned from each party. As found at PT. Multi Terminal Indonesia, which has shown the process that occurs in their cold storage to customers. The results obtained there must be collaboration which symbolized the ecosystem between all stakeholders involved such as the government and community (with academics in it) to increase awareness of the importance of information about temperature stability for halal cold chains. With the implementation of this system in every distribution that carries a halal cold chain, it will be better for end consumers who also have to know how these products can be consumed. Every data from each product will be collected in the cloud system. Each party can know each other the processes of each product to be consumed. With this cloud system the information provided will be safer because no one can access data into the system. We suggested My Cargo.co.id to track and trace platform which was made in the nation. Moreover, My Cargo.co.id can monitor the temperature of the goods sent from farm to fork.

Keywords: Cold Chain, RFID, Egosystem, Ecosystem, Platform

Introduction

Cold chain has become a very important part of logistics throughout the world. In China, the increase in the production of frozen food is very high. The importance of effective cold chain management to ensure food preservation and security in China is emphasized, because waste in frozen food is a serious problem they face. They lost 5% to 20% for frozen food, and that is sufficient numbers big for a waste

(Zhao, Liu, Tian, Yan, & Wang, 2018). Control of the temperature in fresh food is important to extend the life of the frozen food (Aung & Chang, 2014). If the temperature does not reach the standards that have been determined, the quality of the food will change and it will result in losses and wastage are quite large. Understanding the performance of cold chain is often restricted by the limitations of knowledge of workers about the system on the cold chain. In the case of vaccines, most of cold chains do not have a system for routine data collection which has an impact on accurate and regular inventory updates (Ashok, Brison, & Letallec, 2017).

In Indonesia, the majority of the population is Muslim, the transporters are obliged to always keep the halal on every food that will be sent to distributors and consumers. Things that must always be considered by the transporter from the storage area to the tools that will be used to produce and move these items. Storage for each item or different fresh food must be separate if you want the quality of the product to be maintained. Selection tool too need pay attention for every goods . The selection of tools also needs to be considered for each item, the use of the same equipment in different types of food will cause cross contamination which will affect the quality of food to be sent or consumed. Cross-contamination is the entry process or the movement of a substance in a product (usually food) are not of the product itself and will cause the quality of the product being dropped so that the product is perishable and will be waste as a result of the cross-contamination.

In Islam, halal itself is defined as everything that is permitted by Allah SWT. and Tayyib is everything that is sacred, unclean and disgusting that is shunned by humans and does not affect the human mind and soul, especially in terms of food and drink (Zulaekah, 2015). Al-Quran forbids Muslims to consume pork, blood, carrion, alcohol and animals that live in two worlds. The process of making, producing or manufacturing, equipment and machines must be transmitted according to Islamic law, this is done to protect Muslims in Indonesia. To protect halal integrity throughout the supply chain or value chain, a sorting and communication system is needed to provide greater assurance to Muslim

consumers and protection for brand owners (Tieman, nd). Moreover, the halal certification of the product must also be considered.

In the cold chain, it is not only the temperature that we need to pay attention to, but also the quality of the goods from time to time, because the quality is also affected by temperature changes on food. To reduce errors and defects in the product that has been produced is by paying attention to the product quality assurance. The purpose of quality assurance itself is so that the requirements and standards of the product are fulfilled so as to produce good quality products. The use of RFID sensor tags when frozen food is being sent is very important because it will help monitor the temperature without having to repeatedly check the temperature manually. Each box will be given a label or barcode, at the top of the stack the box will be installed with an RFID interface that is connected to the device that will be held by the driver and also the manufacturer when the item is being sent. RFID or Radio-Frequency Identification is a tool for storing and retrieving data through electromagnetic transmission using radio frequency compatible circuits. (Seol, Lee, & Kim, 2016) .

RFID system is also useful to see how a product is processed from the beginning until the end. To increase customers satisfaction we should make sure to them that the food we consume is halal and good for our body and health. The process of each food produced by a manufacturer will be stored or recorded, starting from the selection of ingredients from the supplier, the process of processing the raw materials to become a healthy food that is suitable for consumption, how the food is sent from the manufacturer to the distributor. The entire process will be recorded and stored in a cloud storage that can be accessed by consumers to be viewed using the barcode on each food package. Of course this requires the cooperation of the relevant transporters in the process, they must dispose of their egosystem nature to build a better ecosystem and trust from consumers. But there are still difficulties for transporters in Indonesia to share data with each other because they still have not opened up the mindset and the egoistic nature of them.

Method

The data analysis techniques used in this study are used by data collection, separation from unfocused, too detailed and others data that will reveal patterns or themes. Next is to display data (data display) that is 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 done at the time of data reduction and data display done.

Data collection is done through structured interviews, semi-structured and in-depth interviews and focus group discussions. The data analysis techniques used in this study are used by data collection, separation from unfocused, too detailed and others data that will reveal patterns or themes. Next is to display data (data display) that is 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 done at the time of data reduction and data display done.

Sources of data in this study are informants who have the capability and competence so that the information provided is credible and in accordance with the needs of this research (*purposive*).

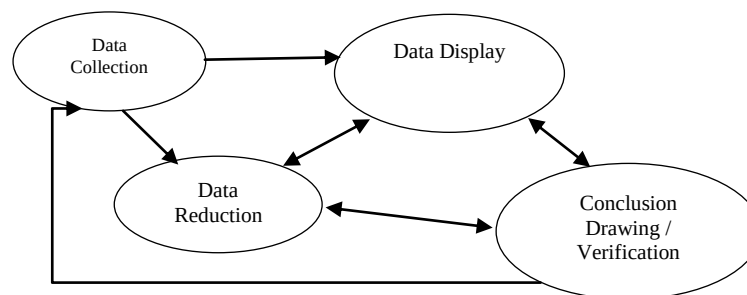


Figure 1. Data Processing Technique

Source: Miles, Huberman, & Saldana (2014)

The research is qualitative to describe in depth how to manage the uncertainty of temperature for halal cold chain in Indonesia using RFID sensor tags. Sources of data or research that is credible and in accordance with the needs of this study

(purposive). Because of this research the play objective is to know how RFID sensor tags determine temperature in the base station, collecting and processing data that will be sent. This is an information management in distribution management, but also actors who are everyday and involved in the scope of cold chain transportation in Indonesia .

Discussion and Result

The use of RFID sensor tag systems in the cold chain acts as a travel substance in various parts, including production lines, transportation, and distribution centers, however the use of these systems is based on the needs of each entity (Kang, Jin, Ryou, & Lee, 2012). The implementation of RFID tag and wireless sensor tag systems to monitor frozen food when delivery has been implemented in several countries. We present several case studies carried out by researchers about the use of this system in cold chain transportation along with the results obtained by them.

Simulation Approach in South Korea

This simulation done by Kang, Jin and Ryou (Kang et al., 2012) to introduce a systematic approach to assessing alternative operational models and to determine optimal values for some core design parameters in cold tag based RFID sensor network systems. They tested two different types of RFID systems and compared them. First is the RFID sensor tag they put on each top of the pallet, the second is the ordinary passive RFID that is attached to each box. RFID is useful for providing information about the temperature on each palette or a box that has been labeled, then it collected and stored in the SCCM information repository. In the storage and transportation section, pallets that attached to the RFID Sensor Tag system will periodically expose temperature conditions, while for RFID passive they still have to use RFID readers to find out the temperature in the food box.

The results of the case studies have shown that the functional requirements of an RFID sensor tag-based cold chain system differ in each section of a target cold chain process. Accordingly, a methodology must be optimized for the operation

model and parameter values in order to maximize the performance in all sections of the cold chain and to operate the cold chain system for a long time.

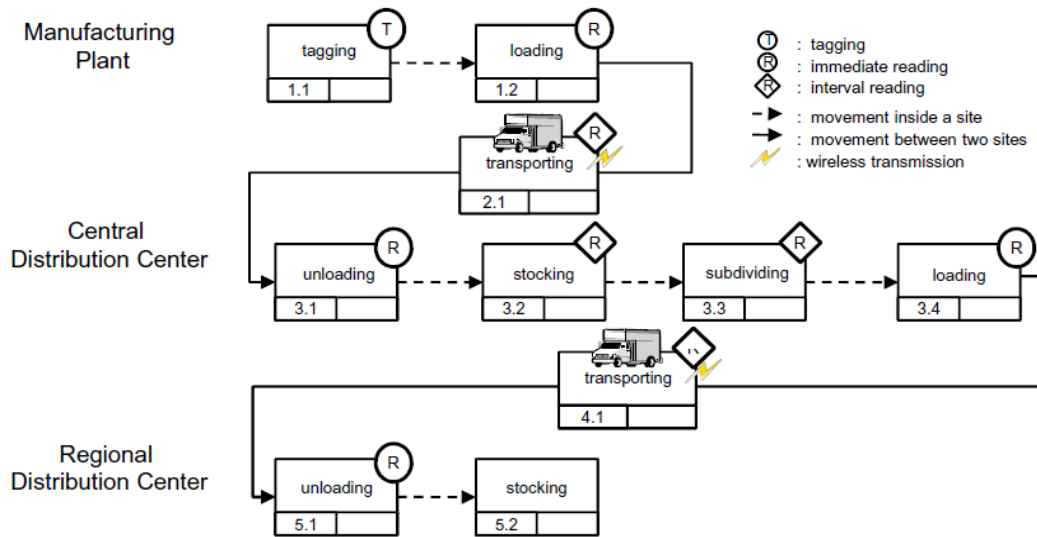


Figure 2. Detailed process of a cold-chain system scenario

Source: Kang et al., 2012

Cold Chain Logistics Technology in Taiwan

The Institute of Industrial Technology Research in Taiwan makes several solutions that have been used for frozen food delivery without having to worry about the temperature flowing or descending. The beginning of this research was due to the pattern of life needs of people who already knew how important a healthy, safe, comfortable and diversified life was and also the increasing need for cold chains to fulfill their needs. The increasing needs of the people in frozen food encourage the emergence of markets for cold chain logistics to ensure food temperature integrity during each process of production, storage, transportation, and sales. But the cold chain situation at that time was not possible, there were still many shortcomings that had to be covered immediately so that cold chain transportation would be better.

Industrial Technology Research Institute in Taiwan has described what challenges faced by cold chain logistics today. First is the quality of the product, the product

must remain at a certain temperature to maintain its quality so as not to decrease. And the second is reserved realibility, temperature on frozen food should always be monitored and recorded periodically. Thus ITRI developed several solutions to this problem, in order to maintain the temperature of a food they have made several types of cold boxes, namely insulated container boxes, cold plates and insulated backpacks. They also created an application called iMeasure which can be accessed via smartphones and computers that are connected to factories, warehouses, distribution and even transporters, and there is also a wireless sensor tag inside to monitor the temperature of frozen food being sent. iMeasure also has a cloud system platform to collect data obtained from each existing process, so that every part of the distribution network can see the process.

These things that have been done by these two countries can be applied in Indonesia because manufacturers, distribution centers and transporters can work with mycargo.co.id to monitor food temperature on trips, they have a temperature monitoring system on each of their vehicles. Not only that, they also have a cloud system called Telkom Cloud System which can be used to store data from the process of how frozen food is processed from the beginning to the end. But because the mindset has not changed and still chooses not to be open to each other.

Conclusion

To develop a better ecosystem, distribution agents should negotiate on this matter, because this is a problem that is often we faced. With a system that helps in monitoring the temperature when the transporter sends frozen food. Collecting data as long as frozen food is processed from beginning until the end is also very useful, thus consumers are not worried about the food they consume every day whether it is halal or not. Collecting data from suppliers in the selection of materials, manufacturing in processing food, transporters in sending frozen food and the equipment used is safe and free from non-halal matters. All of that will be collected in a cloud system that can be accessed by everyone.

They should eliminate the egoistic nature of each party to work together. There is a need for government intervention to make regulations so that all parties are willing to develop the ecosystem. For better globalization and sustainable development, it is necessary to intervene from the government in making regulations to always pay attention to the temperature of food on each journey and also to improve quality in service to achieve customer satisfaction and stakeholders must strengthen their cooperation in this regard in order to build ecosystems and lead to the profits they earn. That way we recommend that distribution agents use mycargo.co.id as a platform for temperature monitoring and also the Telkom Cloud System by the nation's children to collect data from the food processing from beginning to the end of the process.

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