

INFORMATION COMMUNICATION TECHNOLOGY ADOPTION PROCESS  
FOR MALAYSIA HALAL TRANSPORTATION

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## ABSTRACT

This thesis reports the adoption process of Information and Communication Technology (ICT) for Halal transportation control within Malaysian Halal logistic service providers (Halal LSPs). Transportation in Halal logistics is one of the key elements in ensuring the integrity of Halal goods delivered from *farm to fork*. Thus, many Halal LSPs in Malaysia have been looking for ways to improve their transportation operation in Halal logistic through ICT based solutions. However adopting ICT in this area is challenging as indicated by low percentage of ICT based solutions adoptions among Malaysian Halal LSPs, despite the potential and benefits as indicated in literatures. In this study, data were collected from among the Malaysian Halal LSPs to identify factors influencing ICT adoption for monitoring Halal transportation operation. Roger's Innovation Decision Process Theory was used to identify the factors and to develop the ICT adoption conceptual framework and guidelines for Halal LSPs. In previous study, government incentives are the main influencing ICT adoption factors among Halal LSPs. In this study, another three additional factors namely technological factors, environmental factors, and Halal assurance factors were identified to be significant influencing factors. A guideline focuses on ICT adoption process for Halal transportation controls was proposed based on the identified factors. The conceptual framework and the guidelines provide better understanding for Halal LSPs in adopting ICT as to improve efficiency of their Halal transportation services offered.

## **ABSTRAK**

Tesis ini melaporkan proses penggunaan Teknologi Maklumat dan Komunikasi (ICT) untuk pengawalan Halal dalam operasi pengangkutan bagi Penyedia Perkhidmatan Logistik Halal (Halal LSPs) di Malaysia. Pengangkutan dalam logistik Halal memainkan peranan penting dalam memastikan integriti Halal sesuatu produk yang dihantar dari ladang ke meja makan. Kebanyakan Halal LSPs bercadang mengaplikasikan ICT dalam operasi pengangkutan untuk meningkatkan lagi prestasi perkhidmatan logistik Halal mereka. Walaubagaimanapun, penggunaan ICT dalam area ini adalah satu cabaran bagi Halal LSPs berikutan peratusan pengaplikasian ICT yang rendah, walaupun terdapat potensi dan manfaat dari kajian literatur. Dalam kajian ini, data diperolehi dari Halal LSPs untuk mengenalpasti faktor yang mempengaruhi penggunaan ICT untuk pemantauan Halal dalam operasi pengangkutan. Teori Proses Keputusan Inovasi Roger digunakan untuk mengenalpasti faktor dan membina rangka kerja konsep dan garis panduan penggunaan ICT untuk Halal LSPs. Hasil kajian lepas, insentif kerajaan adalah faktor utama yang mempengaruhi penggunaan ICT bagi Halal LSPs. Bagi kajian ini pula, tiga faktor tambahan lain iaitu faktor teknologi, faktor persekitaran dan faktor jaminan halal dikenalpasti sebagai faktor penting yang juga mempengaruhi penggunaan ICT tersebut. Satu garis panduan yang memfokuskan proses penggunaan ICT khusus untuk pengawalan Halal dalam operasi pengangkutan dicadangkan berdasarkan faktor yang telah dikenalpasti. Rangka kerja konsep dan garis panduan ini akan memberi pemahaman yang lebih jelas kepada Halal LSPs dalam penggunaan ICT untuk meningkatkan efisiensi perkhidmatan pengangkutan Halal yang ditawarkan.

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

With the rapid growth in Malaysia's economy, the Halal logistics industry in Malaysia is set to take off, and more and more logistics companies begin to adopt innovative logistics technologies. Now, the Muslim consumer requires the consumption of Halal products, not only is the production of the Halal products important but also the logistics to the consumer, in order to ensure the integrity of the product while it being delivered to consumer (Husny, 2010; Tierman, 2010). The Malaysian Halal Logistic Services Providers (Halal LSPs) are more motivated to apply an integrated system (ICT) for improving the Halal services offered in logistics activities and to support the decision-making processes, with the final aim to reach new levels of efficiency and effectiveness in satisfying customer's demands.

However, adopting Information Communication Technologies (ICT) is an adaptive challenge and a difficult task for companies of all sizes. In fact, a lot of literature focuses on the organizational readiness and changes that firms must go through in order to effectively adopt ICT because it changes the way the firms do business (Lin, 2007). The difficulties may be due to lack of strategy to guide LSPs in ICT adoption process lack of understanding the contributing factors of ICT

adoption that enable innovations in logistics (Tierman 2006a, 2010b). This research study aims to explore the ICT adoption contributing factors that influence the adoption and proposed the ICT adoption process and guidelines for Halal transportation controls within the context of Malaysian Halal LSPs. This chapter introduces the reader to the areas of concern of the research examined by this thesis.

## **1.2 Problem Background**

Logistics play a key role in protecting the Halal status of any given product through dedicated transportation, storage and handling within the supply chain, until it reaches its final destination (Tieman, 2006). Tieman also adds the main success of the Halal industry relies heavily on logistics services (management capabilities) in ensuring the integrity of Halal products. These services involve the collection, consolidation, storage handling, value added, tracking, tracing, and controls of the movement and storage of Halal products. For these purposes, LSPs play a crucial role in realizing the goal of Halal industries. Segregation of Halal products and non-Halal products from cross-contamination avoidance during the transportation process are the main element of protecting the Halal status from *farm to fork* along the supply chain.

Among the elements for controlling ‘Halal’ in logistics activities are monitoring Halal services performance controls in transportation activities. The movements by any type of transportation mode must comply with the principle of Shariah, (Halal Development Corporation, 2009). Maintaining the Halal integrity during transportation operations is a big challenge. The lack of information sharing among suppliers and community is a possible cause of these issues. Besides, there is a risk of cross contamination of Halal product with non-Halal during transportation operations. Among the issues are sharing containers, poor visibility into what inventory is in which containers, where the container transit, history of immediate suppliers, history of immediate maintenance and segregated allocation



of space between Halal and non-Halal goods in the same containers increases the risk on Halal integrity is being compromised (Husny, 2010). According to Jaafar, et al., (2011) this situation is more critical at the point of consumption level because the Halal supply chain service offered by the LSP is guaranteed only when the products are in their custody. However, once the products are transferred to the custody of the other party, the chances of breakage in chain are higher when the other party is not practicing Halal supply chain.

While the monitoring Halal integrity of the product is very crucial; many researchers see the potential of technology to improve the Halal services in logistics activities. The Halal business world today demands logistic company to adopt advanced technology for monitoring Halal controls operation (Tierman, 2009; Tierman 2010). The needs to be innovative in initiating more logistics services that are based on Halal concept are crucial in meeting needs of the increasing demand by customers especially the Muslims. One of the most important technological developments in recent years has been the emergence of ICT. According to Tierman (2009), the use of ICT may increase the effectiveness and organization of the Halal supply chain. The potential benefits that an organization can obtain when it utilizes ICT in logistic are extensive. Benefits can take a number of forms, such as efficiency gains through the visibility of information and real time tracking in product handling), increased management effectiveness (e.g. in decision making), and improved Halal business performance by entering into strategic alliances with other firms.

Experiences, however, show that ICT benefits do not always materialize. Among the reasons for ICT failure are poor ICT adoption practices (Fink, 1998). The failure to adopt and absorb the benefits of advanced technologies for company's own advantage can hinder its becoming or remaining competitive in the global Halal market. This issue explains why the adoption of ICT in Halal industry is still at an early stage. According to Sullivan, (2011) it is show that the concept of adopting visibility technologies for management purposes in logistics, such as Radio-Frequency Identification (RFID) and Global Positioning Systems (GPS) is still fairly new. Besides, the fact that the demand by logistics end-users who

expressed their interest in the use of RFID and GPS as forms of logistics security management tools is high. The use of technology in Halal logistics is currently focused on warehousing, bar coding and transportation management systems. At present, it is estimated that only 35% of logistics service providers are using the technologies. The low adoption of RFID system is due to many contributing factors such as the high initial set up cost and less mature of such technology in an organization and many more (Sullivan, 2011).

By studying literatures on adoption models, it was identified that most of the adoption processes for the study of technology adoption in a complex environment such is Halal logistic, require additional adoption factors. Thus, such characteristics make Halal LSPs in Halal sectors distinct from other sectors. Besides, base on review, several additional factors were identified on Halal logistic and Halal LSPs. Among the factors are the knowledge's of Halal transportation requirement or standard, technology risks, and Halal market for new technologies that suit with Halal standards, the ICT characteristic and capabilities that fit with the Halal transportations requirement, data privacy and security, and the Return on Investments (ROI) will be reviewed. Research in ICT for Halal transportation in Halal logistic is new hence there is only few on ICT adoption process.

### **1.3 Problem Statement**

ICT has emerged as logistic technology and attempted to overcome the tracking and tracing problems at all levels (e.g. data tracking and process) and provided substantial benefits (e.g. support in collaborative decision-making). ICT is an emerging technology for logistic companies in solving their data acquisition problems. Nonetheless, it appears through a critical review of the literature that the evaluation of ICT adoption has not been widely studied on Halal transportation in

logistic and also on Halal LSPs, and as such research literature around it remains limited. Therefore, Halal LSPs are in seeking answers for the effect of ICT adoption, as it will assist them in understanding the factors such as benefits, barriers and cost that influence the adoption of ICT.

The reasons for limited research on ICT adoption in Halal transportation operation may be also due to many of LSPs differing in size, with distinctive in serving requirements, distinct organizational structures and functions and, encompassing incoherent levels of IT capacity and capabilities (human and IT infrastructure aspects). Each LSP undertakes different initiatives according to their customer requirements (certain Muslim consumer requires different taste, packaging, certification, etc. specifically for their Halal product handling), thus making it difficult to comprehend their specific initiative towards an ICT planning solution and ICT implementation as compared to other LSP (LSP that do not provide Halal services). This disparity may be attributed to the organizational readiness towards adopting ICT. Besides, their awareness to provide extra value added services that is Halal services that influenced their decision-making process in adopting and deploying versatile ICT-based solutions is high. The disparity among and within LSPs in their organizational operations and functioning, illustrates that there are no specific guidelines available specifically for Halal LSPs regarding the importance of prioritizing specific Halal related factors in ICT adoption process (Tierman, 2006; Tierman, 2010). Thus, the decision-making process for adopting ICT for Halal transportation controls in logistic are more complex. The lack of guidelines for adopting ICT might be the reason why LSPs or even Halal LSPs do not adopt advanced technology although they have the intention to adopt and realize the potential of ICT in improving Halal services.

Although a number of guideline for LSP in adopting ICT in their logistic and supply chain process exists such as 'Technology Adoption Assessment Process' (Abdullah and Shamsuddin, 2009) and "ICT adoption among Logistic Service Provider" (Evangelista, Cioffi, and Sweeney, 2005), the need to design guidelines for ICT implementations specifically for Halal controls in transportation

is still mentioned in few places in the literature (Husny, 2010; Standards Malaysia, Yayasan Ekonomi Sejagat, & Corporation, 2010; Tierman, 2006).

The Halal Logistics Orchestrating Model (Tierman, 2006) describes a guideline and complete method to design and improve Halal supply chains. Specifically, the focus is on logistic control functions in managing the goods flows and information flows in a Halal supply chain. Tierman also emphasizes that from a system perspective, the role of ICT is critical to track and trace the goods throughout the Halal supply chain and share information with all participants of this supply chain. On the other hand, the guideline by Standards Malaysia, et al., (2010) helps LSP identify preliminary steps to enable Halal risk management process/plan within transportation activities and general requirements that need an ICT solution for premises; infrastructure and facilities. These two guidelines have their own advantages but they only provide facilitation guidance for Halal transportations control in general and only emphasize the benefit of using ICT for monitoring Halal controls in transportation operations. However, the strategy of how to adopt ICT successfully for conducting Halal controls is also a great importance.

As this research is focused on ICT adoption in Halal transportation operation, the issues related to Halal transportation operations processes and requirement will be considered. The author proposes that when considering ICT adoption for Halal transportation, it will be inevitable to encounter the issues of Halal transportation requirement and Halal transportation critical controls. When LSPs draw up strategies for new ICT, they should know what factors would affect the innovation in the logistic information system and influence the technology adoption process (Kamal and Themistocleous, 2006). They suggested that it is useful to explain the adoption of information logistics technologies for the logistic industry using some related theories and conducting tests.

Besides, an investigation of what Halal LSP perceives as benefits (drivers) and obstacles (barriers) towards technology adoption is a crucial initial step to

further understand the influencing factors of ICT adoption. It contributes towards the development of ICT adoption process and guidelines proposed that will assist Halal LSPs in adopting ICT successfully probably by managing the drivers and reducing the negative impact from the barriers. The research area of Halal transportation activities together with ICT requirement should be looked into.

#### **1.4 Research Questions**

Based on the problem statements described in the previous section, the primary research question is “How to adopt ICT for Halal transportation controls in Halal logistics within the context of Malaysian Halal LSPs”. The research question can be further elaborated into three sub-questions as follows:

**RQ1:** What are the factors influencing the adoption of ICT in Halal transportation control within Malaysian Halal LSPs?

**RQ2:** What is the appropriate ICT adoption process for Halal transportations control?

**RQ3:** How could Halal LSPs be guided in adopting ICT for Halal transportation control?

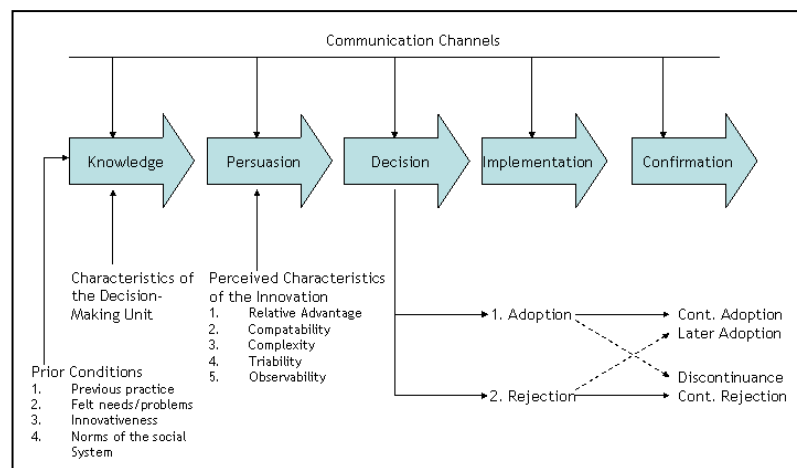
## 1.5 Research Objectives

Based on the research question described above, two research objectives are identified. They are:

- i. To understand the factors (the drivers and the barriers) that influence the ICT adoption process for monitoring Halal control in transportation operations.
- ii. To propose an ICT adoption process and guideline for Halal transportation controls by Malaysian Halal LSPs.

## 1.6 Research Design Framework

The summary of the research design framework of this research is as depicted in Figure 1.1 below.



**Figure 1.1:** Innovation-Decision Process Theory (Roger's, 1995): The Adopted Research Design Framework

This study employed the technological diffusion of innovation proposed by Rogers (1995), as the foundation for the research. This theory discussed the decision-making stage in ICT adoption according to communication channel. These three stages refer to the stage before the adoption process started until the decision to adopt is made. Implementation refers to the period during the adoption process starting when the decision to adopt has been made and continuing until the deployment of the ICT solution was completed. Evaluation or confirmation refers to the stage when the adoption process is completed and the ICT has been in use for some time.

## **1.7 Research Scope**

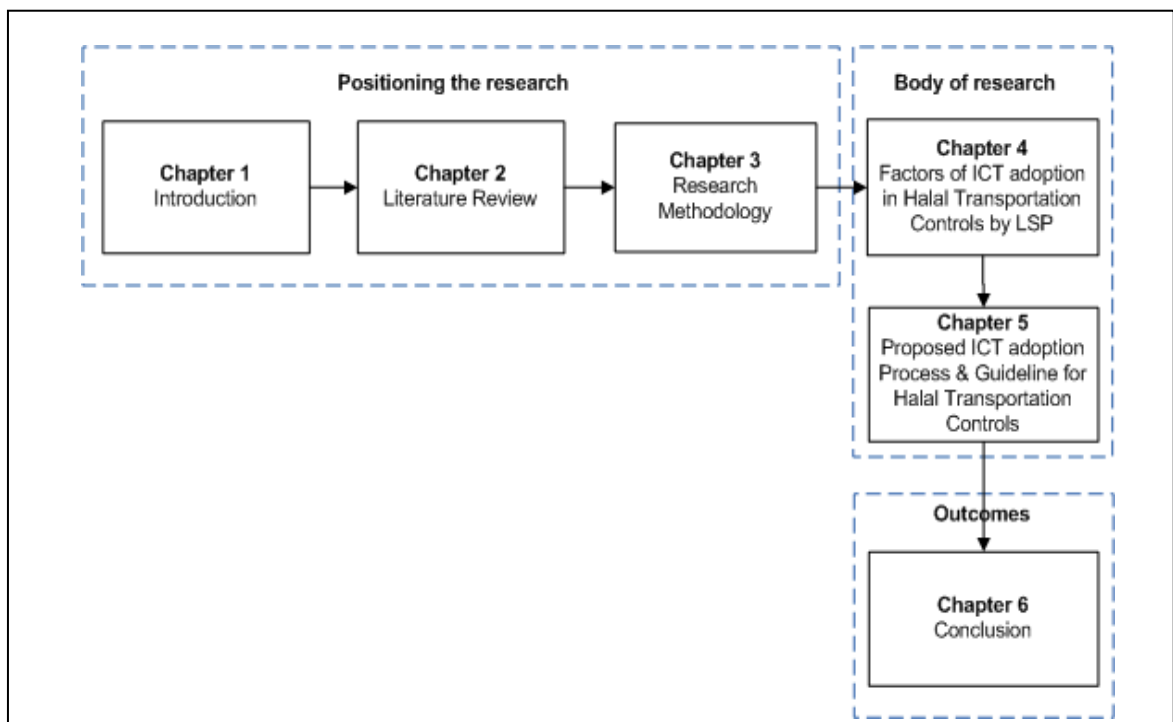
The scope of technology adoption in this research is within the Halal logistic domain and focusing the Halal transportation's operation. It does not include other logistic activities such as warehousing and retailing. The subject domain of the research is restricted to the Malaysian Halal LSPs. The unit of analysis of this research is the LSPs groups in the Halal logistic industry. Halal LSPs in the context of this research is the Halal certified company in Malaysia. The research does not include the non-halal certified companies in Malaysia.

## **1.8 Research Significance**

Based on the research question and research objectives, this research will contribute to process for adopting ICT for Halal transportation by LSP. The process can be one of the useful resources for Halal LSPs that can assist in strategic ICT plan for current and future Halal transportation. The collection of ICT adoption process together with associated factors strategy for adopting ICT solutions proposed would be a great benefit for future decisions that Halal LSPs have to make.

## 1.9 Chapter Outlines

This thesis is organized in seven chapters. The structure of the thesis, as shown in Figure 1.2, is grouped into three sections: positioning the research, body of research and outcomes. There are interrelationships between different chapters and sections of the thesis and they are clearly stated in the chapters



**Figure 1.2:** Structure of Thesis

Chapter 1 introduces the research area of concern. The chapter begins with the description of the research background, discussing the issue surrounding ICT adoption and its significance construct despite its importance towards increasing the performance of Halal transportation in Halal logistic. The role of Halal LSPs in the Halal logistic discipline, the critical issue regarding Halal transportation control points in logistic, the respectively Halal transportation standard applied for monitoring Halal controls, the government initiatives and the current implementation of ICT in conventional logistic are also elaborated in the research background section. The chapter proceeds with the problem statement, arguing on the needs to explore and understand the influencing factors for ICT adoption that



contribute towards the effectiveness of Halal transportation's performance and in order to manage it successfully in the context of Malaysian Halal LSPs. The chapter then describes in detail the research questions and research objectives. Then, a scope of the research is described and the subject domain is clarified. The chapter also describes the significance of the research, based on its contributions to knowledge, and practice probably in the Halal industry. Finally, the chapter gives an overview of the thesis structure.

Chapter 2 discusses the literature related to ICT adoption in Halal transportation's operations. The discussion begins with the conception of Halal transportation and the reviews on definitions by some authors. The chapter then discusses the ICT adoption process surrounding the Halal transportation's process in logistic from the seminal literatures. To position the research within the current study, research approaches and current research trends on the construct are reviewed from selected articles from information systems, Halal journals and logistic information system discipline. The discussion then proceeds into the reviews of literatures on the notion of Halal transportation process, describing its nature and main features, probably the Halal critical controls involved. To place the discussion in the Halal LSPs context, the chapter briefly describes the role and features of the Halal transportation process within the Halal logistic context including the current ICT initiative in Halal logistic and also in Malaysia's Halal industry. The literature review stage was for investigating existing guidelines of ICT adoption and will examine the related factors influenced the ICT adoption.

Chapter 3 describes the methodology used in the research. The chapter begins by discussing the research paradigm of the research. The chapter continues with the discussion on the rationale of using multi-methodological approach to explore ICT adoption process in Halal transportation's operation. The chapter then presents the research overall process framework that describes the phases and activities of the research in detail. The chapter also discusses the methods and tools used in the research. They include qualitative approach, which serves as the main method of collecting and analyzing data from a case study. Data collection methods

and procedures are also discussed mainly the interviews and observations. In the following section, the author will discuss the case study conducted and proceeds by describing the findings of the case study regarding the data collection and analysis methodology. The analysis of content using the qualitative data software analysis is also explained.

Chapter 4 describes the process of achieving the first objective of the study that is to identify the factors influenced the adoption of ICT probably the drivers and the barriers. During this section, the finding and discussion of factors that has been identified conceptual framework will be discussed. The conceptual framework has been used for data collection and analysis. Next, the data collection process will be explained, where participants were selected and interviewed. The data gathered through extensive interviews with the Head of Halal operations, Head of Logistics Infrastructure and ICT manager. In data analysis, the author describes how the data interviews will transcript. The codes extracted from the interview transcripts later interpreted and arranged in order to understand the factors together with issues surrounding ICT in monitoring Halal transportation's controls. Besides, the results and findings from data collection and analysis will be discussed, which include the influencing factors of ICT adoption, and the revised framework from the initial framework.

Chapter 5 discusses the ICT adoption process and guideline proposed for Malaysian Halal LSPs in monitoring Halal transportation controls. The portion of Roger's theory was clearly applied to explain the process of ICT adoption. This chapter highlighted the importance of ICT adoption process as a competitive resource for Halal LSPs. This chapter discusses in detail the findings of the data collection whereby an ICT adoption process proposed and the phenomenon, together with the important elements that contribute towards how to adopt ICT successfully is discovered. Verification of the substantive elements that important in the adoption process (in a case of Halal transportation operations) is also discussed through literature compared to the existing work. The components in ICT adoption process proposed for Halal transportation operations will be discussed. The proposed ICT adoption process explains the key components of the ICT

adoption process involves. Those components also will be compared to what have been discussed in the previous chapter, the Innovation-Decision Process Theory by Roger's (1995). Finally, the author will discuss the proposed guideline. Generally, the guidelines identified and explained the elements that the author believe is important to be considered when planning to adopt ICT in Halal transportation's process. ICT adoption guidelines for Halal transportation's operation in Malaysian Halal LSPs consist of seven steps that are considered as an important step for ICT adoption. The comparison between existing ICT adoption process model that were used for conventional logistic with ICT adoption process in the Halal transportation process were then identified the important elements formulated in the guidelines. The guideline is proposed to assist Malaysian Halal LSPs in adopting ICT for Halal transportation control in Halal logistics.

Chapter 6 concludes the research and identifies the research contributions. The chapter draws the conclusions by describing the research outcomes in relation to the achievement of the research objectives. The chapter then examines the research contributions to knowledge and practice. Lastly, the chapter discusses recommendations for future research.

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## APPENDIX A

### QUALITATIVE DATA ANALYSIS USING NVIVO SOFTWARE

#### Technological Factors (ICT Diffusion of Innovation)

<Internals\Articles\Annual Report Century 2011> - § 1 reference coded [15.40% Coverage]

Reference 1 - 15.40% Coverage

*To ensure the 'Halal' integrity throughout the entire supply chain, our IT system has been enhanced with the critical checkpoint list and traceability functions.*

<Internals\Articles\NDSB report> - § 2 references coded [5.05% Coverage]

Reference 1 - 3.60% Coverage

*The seamless, visible and integrated on-dock Halal logistics facilities allow customers to enhance their Halal logistics handling in Halal hub operation procedures integrate the process of receiving, storing and delivering Halal goods from source to demand point*

Reference 2 - 1.46% Coverage

*Northport contributes to the supply chain of the Halal trade by ensuring efficiency in the delivery system*

<Internals\Interviews\Dr Norazman - Kontena Nasional Bhd > - § 2 references coded [7.59% Coverage]

Reference 1 - 5.70% Coverage

*Barcoding ini bantu dari segi SKU, Stock-Keeping Unit (retail inventory) untuk kita ketahui maklumat product Halal manakala dari segi status Halal atau tidak ataupun sijil Halal tu masih laku atau tidak, kami masih perlukan salinan sijil Halal untuk product itu.*

Reference 2 - 1.89% Coverage

*Setakat ini, RFID kita belum implement sebab pada saya barcode sahaja sudah mencukupi.*

<Internals\Interviews\En Akmal - Kontena Nasional Bhd> - § 1 reference coded [0.30% Coverage]

Reference 1 - 0.30% Coverage



*KN ada aplikasi banyak ICT*

<Internals\Interviews\En Mahadi - Kontena Nasional Bhd> - § 4 references coded [30.10% Coverage]

Reference 1 - 11.34% Coverage

*ICT ni penting sbb kita boleh nampak dan boleh trace pergerakan lori menggunakan GPS and RFID. kita boleh tau kemana lori kita pergi. Sejarah pergerakan dari A-Z setiap hari boleh direkodkan. Dr segi pengaplikasian CCTV, kita trace ape yg ade dalam gudang. Satu isu yg perlu dipandang penting adalah pakaian pekerja. Harus menutup aurat. walaupun sebenarnya peraturan pemakaian itu lagi utama untuk production, tapi disebabkan ianya salah satu requirement Halal so kita kena ikut.*

Reference 2 - 4.81% Coverage

*Dari segi ICT, sudah tentu bila kita apply IT, dengan characteristic IT tu customer akan lebih yakin barang mereka ke mana dan KN memang provide those information sbb that's one of our value added services.*

Reference 3 - 9.88% Coverage

*ICT ni membantu. Ia bukan sahaja memastikan business kita bagus setelah kita amik decision untuk apply IT tapi ia membantu kita mencapai company objective especially for Halal..tanpa system ni, kita da ada standard dan guideline utk container. klu container kita da seal. Cuma peranan ICT ni untuk melicinkan lagi pengawalan Halal tu seperti kita nak monitor pergerakan produk. kt situ wujudnye keperluan system ia membantu kita.*

Reference 4 - 4.07% Coverage

*..untuk memastikan confident client pada service kita tinggi. Kita pn x nak ade keraguan disebabkan cara kita handle the product samada semasa di gudang atau semasa pengangkutan.*

<Internals\Interviews\En Rosli - Kontena Nasional Bhd - § 4 references coded [6.40% Coverage]

Reference 1 - 1.06% Coverage

*Sememangnya pengaplikasian teknologi pada logistik boleh membantu dalam memudahkan semua kerja*

Reference 2 - 1.89% Coverage

*Tetapi pengaplikasian teknologi seperti RFID ini memang memerlukan komitmen yang besar. Cuma syarikat-syarikat yang besar sahaja kebanyakannya mampu. SME biasanya tidak.*

Reference 3 - 1.61% Coverage

*Century tidak guna teknologi selain barcode disebabkan kos pembelian teknologi tersebut. Just imagine, 1 machine will cost you easily about 200k.*

Reference 4 - 1.84% Coverage

*Plus kita pun kurang orang yang expert dalam teknologi baru macam RFID, GPS..sebab tu kita outsource apabila melibatkan IT dan sebagainya. itu realiti di Malaysia.*

<Internals\\Interviews\\En Zainal Abidin - Kontena Nasional Bhd> - § 2 references coded [4.38% Coverage]

Reference 1 - 3.13% Coverage

*KN ada pasang GPS tracking so KN boleh tau lori itu divert tempat lain ke, bawa lebih laju ke. Sebelum lori tu keluar dari certain points pn kita check. so goods are tracked when they pass through certain points- its like real time operation la.*

Reference 2 - 1.25% Coverage

*...Pemeriksaan dari JAKIM macam ini buat KN nampak lagi bagus in term of kebersihan dan keselamatan*

<Internals\\Interviews\\JAKIM> - § 2 references coded [1.62% Coverage]

Reference 1 - 1.28% Coverage

*Kita membangunkan system e-halal, ia boleh membantu pelanggan untuk mengetahui maklumat produk yang mana dalam e-halal itu kita ada maklumat-maklumat berkaitan dengan pensijilan, jaringan antara negeri-negeri yang mana negeri juga mengeluarkan sijil halal tapi kita selaraskan.*

Reference 2 - 0.34% Coverage

*...tapi yang peringkat bawah ini, nak buat secara barcode pun tidak mampu.*

## Governmental Factors

<Internals\Interviews\Dr Norazman - Kontena Nasional Bhd > - § 2 references coded

[8.56% Coverage]

Reference 1 - 3.77% Coverage

*Setakat ini kita implement bar-coding dalam warehouse kita. Barcoding ini bantu dari segi SKU, Stock-Keeping Unit (retail inventory) untuk kita ketahui maklumat product Halal*

Reference 2 - 4.79% Coverage

*kos untuk RFID tu ye..mmg mahal..tp kita x menolak kemungkinan pada masa akan datang kita akan guna juga. Ia satu investment bila apply new technology tuk manage kita punye technology resource, communication dan sbgainya*

<Internals\Interviews\En Akmal - Kontena Nasional Bhd> - § 1 reference coded [1.62%

Coverage]

Reference 1 - 1.62% Coverage

*Kalau mengikit saiz syarikat kami, kami mempunyai fleet yang amat besar..cawangan yg merata-rata di malaysia..memang KN ada aplikasi banyak ICT*

<Internals\Interviews\En Mahadi - Kontena Nasional Bhd> - § 2 references coded [7.29%

Coverage]

Reference 1 - 1.57% Coverage

*Kita akan provide information berkenaan Halal untuk info pelanggan.*

Reference 2 - 5.71% Coverage

*Contohnya penggunaan e-lock. Skng ni belum ada customer yg request e-lock ni untuk bawak barang Halal mereka. e-lock kita letak pada container untuk Halal. tu btul2 nk trace container la..stakat ni kita tak de pemrintaan lg. klu ade kita akan buat*

<Internals\Interviews\En Rosli - Century Logistic> - § 1 reference coded [2.90%

Coverage]

Reference 1 - 2.90% Coverage

*Yes kerajaan nak menggalakkan kita untuk sama2 memajukan industry Halal, so...invest untuk pengaplikasian ICT tuk Halal juga. Khususnya memang ia salah satu faktor jugak yang menyumbang keperihatinan Century pada Halal dan aplikasi teknologi-teknologi baru ni.*

<Internals\Interviews\En Zainal Abidin - Kontena Nasional Bhd> - § 1 reference coded [2.04% Coverage]

Reference 1 - 2.04% Coverage

*Untuk betul2 ICT yang kita apply hanya untuk cater Halal sahaja, kita belum fikirkan lagi. mungkin in future kita akan apply lebih ICT tuk cater Halal quality.*

## **Environmental Factors**

<Internals\Articles\ Kontena Nasional Bhd report> - § 1 reference coded [2.81% Coverage]

Reference 1 - 2.81% Coverage

*In order to become the truly Halal Hub for the entire world, a full Halal body authorities is require to manage the whole chain and flow of the Halal issue. As to make sure the objective can be achieve.*

<Internals\Interviews\Dr Norazman - Kontena Nasional Bhd > - § 1 reference coded [8.24% Coverage]

Reference 1 - 8.24% Coverage

*HDC juga ada launch program-program training untuk Halal. Sekarang pun ekonomi da fokus pada Halal industri. Jadi kami mula involve dari situ. Sekarang ada standard logistic terbaru MS2400 yang ada cover tentang pengangkutan, pergudangan and ICT rules for monitoring*

Halal pn ade cover di standard tu. Yang itu kami cuba apply. Sekarang kami ada cetificate SIRIM (MS1900:2005).

<Internals\\Interviews\\En Rosli - Kontena Nasional Bhd > - § 1 reference coded [6.02% Coverage]

Reference 1 - 6.02% Coverage

*Jadi bagusnya MS2400 ni, bila kita sebagai 3PL, die akan link kita dengan manufacturer. Kita akan jadi 1 total solution daripada input hingga ke output. MS2400 merangkumi semua walaupun kita hanya in the end. Jadi maksudnya bila MS2400 certified, kita link automatically. Because in term of requirement, more or less lebih kurang sama cuma akan lebih kepada pengangkutan dan pergudangan. Of course when we talking about total logistic solution at least we are talking 3 total businesses that are transportation, warehouse and retail.*

<Internals\\Interviews\\En Zainal - HDC> - § 3 references coded [5.00% Coverage]

Reference 1 - 2.43% Coverage

*Standard is an entrepreneurial led standard; user is an entrepreneur and private enterprise. MS 1500 is Halal food standard. When goes for transportation logistics company is responsible. If want to have international global Halal trade must have farm to fork concept.*

Reference 2 - 0.59% Coverage

*Standard adoption is voluntary but when adopted it is mandatory.*

Reference 3 - 1.98% Coverage

*Do you see Halal opportunities behind Logistics Supply Chain? Integrity of supply chain, for example Egypt is looking for Halal chicken. So they have to find Malaysia because this is only one that provides the market.*

<Internals\\Interviews\\En Zainal Abidin - Kontena Nasional Bhd> - § 2 references coded [16.12% Coverage]

Reference 1 - 7.72% Coverage

*Kita tengok di Malaysia barang makan semuanya request Halal. Kalau kite tengok skng pn dalam ekonomi, siapa yg control pengeluaran dan pergerakan makanan Halal? Kebanyakannya bukan orang Islam. So this is where KN mainkan peranan, as KN sebagai syarikat yg besar di bawah PNB kita rase mcm tanggungjawab untuk explore Halal business ini..antara sebab 1) because of the business aspect la maksudnya dalam keadaan ekonomi down ke tidak, makanan tetap org nak..dan yang 2) is tanggungjawab kita pada orang Islam n ini adalah satu kewajiban pada kita yang mengetahuinya dan saya rasa ia perlu dilaksanakan.*

Reference 2 - 8.40% Coverage

*Kite percaye customer Halal juge banyak. Sebab public trust. Setakat ini apa kami boleh katakan KN pioneer dalam bidang Halal ni. banyak juga LSP lain yang sedang apply standard - Halal standard. ada yang cakap Halal compliant tapi sebenarnya tidak. kami sendiri tengok mereka ni x Halal compliant (off record). because sekarang ni permintaan Halal da makin meluas so semuanya nak kata mereka Halal compliant. besaing lah. why kita rasa kita tak kehilangan pelanggan walaupun hanya bawak barang Halal je sekarang sebab people start concern Halal now. As i said, customer Halal pun banyak. Baik kte involve skang. Banyak kebaikan bila kita involve Halal ni.*

<Internals\\Interviews\\Pn Azlina - Kontena Nasional Bhd> - § 2 references coded [5.75% Coverage]

Reference 1 - 5.07% Coverage

*So the way we control based on ISO standard sebab kita pun memang even before kita dapat Halal pun kita memang dah ISO certified company which is our process is all control and monitor according to the SIRIM standard. So bile kita dah ada Halal tu, it is upgraded into Halal level. So what we did that we use the ISO Standard to become part of the Halal proseses. We just put the Halal elements insight which is safety and hygiene.*

Reference 2 - 0.68% Coverage

*Everything pun we have the standard to control everything.*

## Halal Assurance Factors

<Internals\Interviews\Dr Norazman - Kontena Nasional Bhd > - § 3 references coded [20.37% Coverage]

Reference 1 - 1.47% Coverage

*For segregation process, kita ada pegawai kita yang akan melakukannya.*

Reference 2 - 16.80% Coverage

*Kita pun ada dedicated warehouse untuk makanan sejuk beku. Kita da segregate awal2.*

*Setakat ini, apakah peranan kerajaan yang menggalakkan lagi syarikat anda mahu menceburi bidang Halal dan pengaplikasian ICT pada Halal? (Tax Incentives for 'Halal' Food Production, use of modern and state-of-the-art machinery and equipment in producing high quality 'halal' food that comply with the international standards)?*

*Sebab Halal ni 1 service yang bukan sahaja Halal, tp bersih, selamat..that's toyyiban concept. It's a new concept and byk jugak program-program yang dianjurkan. Bekenaan tax, yes sy setuju sbb ia juga salah satu sbb kita..involve dalam market Halal ni..itu satu inisiatif kerajaan to encourage new investment in 'halal' food production for the export market.*

Reference 3 - 2.10% Coverage

*So far we haven't apply RFID yet and for any specific technology just untuk control Halal saja.*

<Internals\Interviews\En Rosli - Kontena Nasional Bhd > - § 2 references coded [4.25% Coverage]

Reference 1 - 0.44% Coverage

*As for Halal, banyak lagi secara manual.*

Reference 2 - 3.81% Coverage

*Kita apply barcode saja sebab barcode tu boleh detect product kita dari mana and tuk Halal saya rasa ini penting. you know kita nak tau sape yang bawak barang/cargo dlm kontena. Kalau ada pun kebanyakan IT untuk conventional yang lebih kepada track route dan sebagainya, tiada specific lg untuk control Halal. Saya nampak innovation di situ.*

<Internals\Interviews\En Zainal Abidin - Kontena Nasional Bhd> - § 3 references coded [5.64% Coverage]

Reference 1 - 0.51% Coverage

*KN mula buat proper cold chain tuk Halal*

Reference 2 - 3.47% Coverage

*technologies. Yang kedua adalah how you manage data yang deal dengan supplier and all this thing. Kita tidak beli software/teknologi baru ke ape, tapi kita apply yang existing sebab kita tengok yang existing ni da cukup untuk kita kawal intergriti Halal pada service kita.*

Reference 3 - 1.66% Coverage

*dalam warehouse kami juga ada kami pasang CCTV untuk melihat pergerakan barang dan juga pekeja-pekeja kami buat kerja dalam gudang.*

**Halal Transportation Controls and ICT Adoption Process**



<Internals\Articles\ Kontena Nasional Bhd report> - § 1 reference coded [4.01% Coverage]

Reference 1 - 4.01% Coverage

*Most of the shipment of the product that is conducted by Northport is segregate from the port before entering the warehouse. If any extra process need to be done as required by the client, Northport will sure do. Any other requirement by the client should be inform or notify from the system.*

<Internals\Interviews\Dr Norazman - Kontena Nasional Bhd - § 2 references coded [15.43% Coverage]

Reference 1 - 5.27% Coverage

*Sebenarnya tiada beza pun antara Halal dan conventional. Yang penting adalah product handling. Kalau you handle dengan baik, maka tiada berlaku contamination. Kita pun ada dedicated warehouse untuk makanan sejuk beku. Kita da segregate awal2.*

Reference 2 - 10.16% Coverage

*Kalau untuk memproses request dari customer, kita ade ada system yang manage data-data ini. Kita ada warehouse management system (WMS), dan untuk kita tahu record supplier, destinasi penghantaran dan sebagainya, kita ade transportation management system (TMS). System ni semua da kita gunakan beberapa tahun yang lepas. selain itu kita guna emails, EDI untuk procurement. So far we haven't apply RFID yet and for any specific technology just untuk control Halal saja.*

<Internals\Interviews\En Akmal - Kontena Nasional Bhd> - § 2 references coded [6.03% Coverage]

Reference 1 - 1.77% Coverage

*tidak pernah mengasingkan pengawalan Halal untuk pengangkutan dan pergudangan. kami sentiasa rangkumkan aktiviti tu bersama sebab dia adalah total logistic.*

Reference 2 - 4.26% Coverage

*...biasanya pelanggan akan menggunakan 3<sup>rd</sup> party punya transporter dan masuk ke gudang kami. See disinila ada sedikit masalah sebab yg bahagian pengurusan oleh 3<sup>rd</sup> party ni yg kami tak dapat nak kawal..masalah nye kami tidak dapat maklumat barang tu maksudnya dari mana source nya, supplier and all the information..kami dapat kawal apabila barang tu da masuk ke gudang sahaja.*

<Internals\Interviews\En Rosli - Kontena Nasional Bhd > - § 3 references coded [14.57% Coverage]

Reference 1 - 6.41% Coverage

*Di Century, pengawalan atau pemantauan proses Halal banyak tertumpu semasa proses receiving. 2 jenis receiving iaitu menerima barang dari kontena dan lori. Dari situ, Century susun dan mengasingkan mana barang yang request Halal (mesti ada Halal certificate) dan memastikan tidak bercampur dengan barang lain. Sekiranya pelanggan mahukan perkhidmatan Halal untuk kontena mereka, Century akan lakukan aktiviti Samak dahulu pada kontena itu. Produk yang require perkhidmatan Halal akan diutamakan dahulu untuk mengekalkan integrity Halal pada produk tersebut (tidak lewat, rosak)*

#### Reference 2 - 3.30% Coverage

*In Century, kita ada seorang syariah officer yang akan train muslim and non-muslim staf mengikut requirement yang telah ditetapkan". "Pegawai syariah itu pula akan pergi mana- program atau training program luar dan seterusnya ilmu dan panduan itu akan diaplikasi dan diajar pada staf di Century*

#### Reference 3 - 4.86% Coverage

*Century tidak menyediakan perkhidmatan Samak sendiri tetapi melantik satu Samak kontraktor luar untuk melakukan proses/aktiviti Samak. Selesai melakukan proses Samak pada kontena, kontraktor Samak ini akan beri laporan kepada pegawai Syariah di Century untuk proses pemeriksaan dan pengesahan (checking and verification) . Selesai proses pemeriksaan, sekiranya lulus, barang-barang yang request Halal tadi akan dimasukkan ke dalam kontena*

#### <Internals\Interviews\En Zainal Abidin - Kontena Nasional Bhd> - § 1 reference coded [3.69% Coverage]

#### Reference 1 - 3.69% Coverage

*Kita ambil kontena dari Maersk, - samak – dan setelah itu baru kita masukkn barang kemudian kita seal. Orang yg terime itu die kena pastikan seal tu tidak tercemar/terkoyak dan sebagainya. Sekiranya seal terbuka atau sebagainya, itu da kira tercemar maka KN akan bertanggungjawab menyiasat.*

#### <Internals\Interviews\JAKIM> - § 2 references coded [3.26% Coverage]

#### Reference 1 - 2.22% Coverage

*Oleh kerana kita perlu kepada sistem yang berdedikasi (dedicated),maksudnya suatu yang halal dan suatu yang haram tidak boleh duduk bersama ataupun dikeluarkan bersama oleh satu-satu kilang, ataupun disimpan bersama dalam satu stor, atau*

diangkut bersama dalam satu kapal. Ini dinamakan dedicated. Sebab itu baik dalam penyimpanan iaitu penstoran atau pengangkutan maka kita menekankan aspek dedicated. Maksudnye proses atau penyimpanan atau pengangkutan hanya produk halal sahaja.

#### Reference 2 - 1.03% Coverage

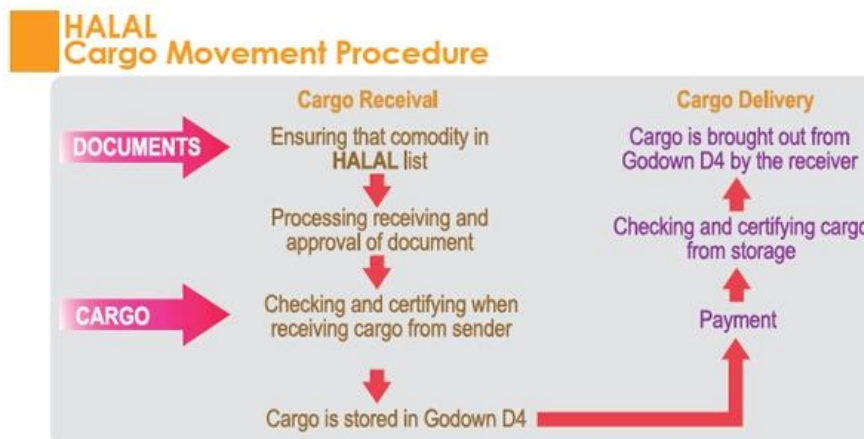
Yang kedua, semasa proses tidak bercampur dengan barang yang haram, peralatan- peralatan mestilah suci dan keempat, semasa proses dan semasa menyimpan hendaklah tidak berdekatan ataupun tidak menyentuh atau punkontiminasi

<Internals\Articles\ Kontena Nasional Bhd > - § 2 references coded [4.02% Coverage]

#### Reference 1 - 4.01% Coverage

Most of the shipment of the product that is conducted by Northport is segregate from the port before entering the warehouse. If any extra process need to be done as required by the client, Northport will sure do. Any other requirement by the client should be inform or notify from the system.

#### Reference 2 - 0.01% Coverage



<Internals\Interviews\Dr Norazman - Kontena Nasional Bhd - § 2 references coded [11.44% Coverage]

#### Reference 1 - 1.28% Coverage

Setakat ini kita implement bar-coding dalam warehouse kita.

#### Reference 2 - 10.16% Coverage

Kalau untuk memproses request dari customer, kita ade ada system yang manage data-data ini. Kita ada warehouse management system (WMS), dan untuk kita tahu record supplier, destinasi penghantaran dan sebagainya, kita ade transportation management system (TMS). System ni semua da kita gunakan beberapa tahun yang lepas. selain itu kita guna emails, EDI untuk procurement. So far we haven't apply RFID yet and for any specific technology just untuk control Halal saja.

Reference 2 - 1.07% Coverage

*Yang kedua adalah how you manage data yang deal dengan supplier and all this thing.*

<Internals\Interviews\En Akmal - Kontena Nasional Bhd> - § 2 references coded [2.34% Coverage]

Reference 1 - 1.54% Coverage

*...dan sistem yg kami gunakan untuk pengangkutan, 1- untuk pengurusan penghantaran kontena yg juga ada berkaitan dengan sistem di pelabuhan..*

Reference 2 - 0.79% Coverage

*lagi sistem- sistem tracking secara live dan sistem ni baru diwujudkan*

<Internals\Interviews\En Mahadi - Kontena Nasional Bhd> - § 2 references coded [16.27% Coverage]

Reference 1 - 4.93% Coverage

*RFID- Hanya di aplikasi ununtuk projek Bernas bagi barangan tertentu seperti beras dan susu. Dengan penggunaan teknologi ini dapat membantu pemantauan pergerakan barangan tersebut dari kilang, gudang dan kedai.*

Reference 2 - 11.34% Coverage

*Penggunaan ICT ni penting sbb kita boleh nampak dan boleh trace pergerakan lori menggunakan GPS and RFID. kita boleh tau kemana lori kita pergi. Sejarah pergerakan dari A-Z setiap hari boleh direkodkan. Dr segi pengaplikasian CCTV, kita trace ape yg ade dalam gudang. Satu isu yg perlu dipandang penting adalah pakaian pekerja. Harus menutup aurat. walaupun sebenarnya peraturan pemakaian itu lagi utama untuk production, tapi disebabkan salah satu requirement Halal so kita kena ikut.*

<Internals\Interviews\En Rosli - Kontena Nasional Bhd > - § 1 reference coded [1.03% Coverage]

Reference 1 - 1.03% Coverage

*Kalau ada pun kebanyakan IT untuk conventional yang lebih kepada track route dan sebagainya,*

<Internals\Interviews\En Zainal Abidin - Kontena Nasional Bhd> - § 2 references coded [4.20% Coverage]

Reference 1 - 3.13% Coverage

*KN ada pasang GPS tracking so KN boleh tau lori itu divert tempat lain ke, bawa lebih laju ke. Sebelum lori tu keluar dari certain points pn kita check. so goods are tracked when they pass through certain points- its like real time operation la.*