GLOBAL HALAL MOBILE CHECKER

By:

MUHAMAD WAFI BIN MUHAMED (11276)

Dissertation report submitted in partial fulfillment

of the requirements for the

Bachelor of Technology (Hons)

(Business Information System)

SEPTEMBER 2011

Universiti Teknologi PETRONAS

Bandar Seri Iskandar

31750 Tronoh

Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

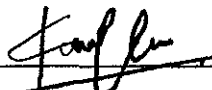## GLOBAL HALAL MOBILE CHECKER (GHMC)

By:

MUHAMAD WAFI BIN MUHAMED (11276)

A project dissertation report submitted to the
Business Information System Programme
Universiti Teknologi PETRONAS
in partial fulfillment of the requirements for the
Bachelor of Technology (Hons)
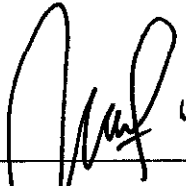(Business Information System)

SEPTEMBER 2011

Approved by:

_____

MR. FAIZAL BIN AHMAD FADZIL
Project Supervisor

UNIVERSITI TEKNOLOGI PETRONAS
BANDAR SERI ISKANDAR
31750 TRONOH
PERAK DARUL RIDZUAN

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this Final Draft that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

MUHAMAD WAFI BIN MUHAMED

ABSTRACT

The foodservice industry is deemed to be the final link in the entire food industry supply chain. Thus, it has a crucial role to ensure that the food served is safe and suitable for consumption. In Islam, looking for Halal and Toyyib food is mandatory for every Muslim. The Muslims not only need to observe that the food consumed is Halal but also safe and free from contamination. Today, as the business of Halal food experiences a rapid growth, the duty of ensuring the food is Halal has been shifted to restaurant operators and this can be seen through the introduction of Halal certification. However, many restaurant operators did not comply with this Halal standard and led to Halal fraudulent practices. Reports on Halal fraudulent decrease lack of confidence amongst the Muslims. This project is focused on developing an Android-based mobile applications designed for Halal consumers, to reduce the time taken to keep track their preferred items either it is Halal or not. By using this application, users may check directly to the authority and update their entire preferred items status using only one button. Besides, users also received alerts whenever necessary. Using barcode scanner will saves time, and cost. Above all, this application may check and balance the Halal enforcement.

Keywords: Foodservice industry, Halal compliance, hukum syarak, Halal certification

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

CHAPTER 1

PROJECT BACKGROUND

1.0   INTRODUCTION

Halal is a very sensitive issue to Muslim. There are 22.9 percent Muslim in this world that particular with the Halal status. It becomes growing an evergreen industry. To synchronize the Halal standards, each country established their Halal Certification agency to certify the Halal status on their country. The objective of the agency is to distinguish between Halal products and services which include foods, drinks, medicine, and many more. In Malaysia, JAKIM responsible to monitor, enforce, and certify the Halal status of products and services which includes food, drinks, medicine, and many more.

Currently, most of the agencies use the traditional method by awarding periodically Halal accreditation to the manufacture, based on specific criteria. By this accreditation, the supplier able to print out or display the Halal label on their items or premises. For consumer, if they see this Halal label, they will assume the offering is Halal. Ironically, there are several cases that proved that this method has flaws. Some of users found that the Halal label is printed on non-Halal items. There is also a case that a company fakes out the Halal label and the Halal Accreditation Certificate. As a result, there is increasing ambiguity among Muslim on the integrity of the Halal label.

Realizing the issues, JAKIM has come out with several strategies. Among them is the Halal Directory which available on their official site. Consumer may check the Halal status of any products or services on real time. Halal Directory directly relies on the information that JAKIM have. It is true that this strategy able to tackle the increasing ambiguity from the Muslim consumer, and create a good force for manufacturer or service provider to register with JAKIM. However, there are more rooms for improvement.

Limited with man power and also growing number of products or services, this may affected the JAKIM effectiveness and efficiency of the enforcement. JAKIM need for accountable and reliable informers with high integrity to help the Halal enforcement. It is

impossible to keep track of all Halal status on the real time, but at least we can have watchdog to help with the enforcement that can minimize the fraud cases.

As the Halal products and services are fast gaining worldwide recognition as a new benchmark for safety and quality assurance, there is a need for a technology which create a more transparent, accountable and integrity solutions to uphold the Halal standards. The power must come from the consumers which shapes the supply side. The technology must be able to ease the user, and able to sustain the good force between supply and demand of Halal products and services.

1.1   BACKGROUND OF STUDY

In the context of Final Year Project, Global Mobile Halal Status Checker (GMHC) can be defined as a mobile application that is specifically designed for users to check the Halal status of a products and services using the Global Trade Information Number (GTIN) barcode.

Uniquely, different than any other application, the application enables users to capture the products or services barcode, using smart phone camera, for data entry instead of keying each barcode number. The input (either manual entry or by camera) will be saved and processed at real time. By using the concept of antivirus with some innovations, users can keep track of their product and services by their preferences and also report directly to the JAKIM in case of fraud.

1.2   PROBLEM STATEMENT

1.2.1   Problem Identification

As described before, there is integrity issue on the Halal label which led to rising ambiguity among the Muslim consumers. Lack of Halal enforcement due to the growing numbers of products and services may require more manpower which incurred more cost, which is less efficient and not really effective. Even though with the new Act on Halal have been passed by the Parliament, there is a big question on how to curb the Halal frauds efficiently.

It is tedious for users to check the Halal status each time before buying the products or services. Currently, there are no solutions which enable users to save and keep track Halal status of their preferred products and services Halal status on real time based on the JAKIM database.

1.2.2 Significance of the Project

GMHC is significant in the sense that it will provide easily accessible mobile application for customers whenever they are, either with online or offline mode, using their mobile phone. GMHC will provide reliable data directly from the JAKIM dummy database, and will be updated within on demand. As GMHC allows the users to key in the barcode manually to the system, GMHC also enables users to take pictures of the products to be processed using the Augmented Reality Technology which capture automatically the barcode number into the application.

In addition, this application is very useful for busy users, as they no need to key in the same information, each time they buy the same products or services. For example, imagine Ms. Alia is a housewife using this application. First, she needs to register all preferred items in her kitchen. Second, next the application will update the user's database, to synchronize with the JAKIM database via net. Third, an alert will come in any case of expiry or not registered with JAKIM. So, each time she goes shopping to buy her preferred items, she only needs to views the updated lists. If they are new items she wants to buy, she will need to register it like the first step.

1.3 OBJECTIVES

The project serves the objectives of:
- Designing and constructing a Mobile Halal Status Checker to keep records users preferred products and services, status of respective products and services, and synchronize with JAKIM database.
- Displaying the Halal Status of a product on a display device.
- Providing a quick and easy way to capture the barcode of a product.

- Allows users to report directly to the authority.

1.4 SCOPE OF STUDY

In designing the GMHC, the study covers several areas of software engineering, knowledge on programming and computer interface. In understanding the technology of augmented reality scanner, it is essential to really understand its technology and mechanism in order to interface it with the mobile device. In term of developing the software, new areas of Eclipse for Android are explored in the sense that us has to integrate with the augmented reality scanner as the input device. A lot of self-study, consultation, sessions, discussions, researches, and interviews are done to produce intended product.

The scope of this project is based on the dummy database which similar to JAKIM database and others enforcement agency. The outcome of this project is directly related to the said database. We assumed the database have similar outcome among the country. By using the GTIN as the primary key, the dummy database will represent several countries for demonstration purpose.

1.5 RELEVANCY OF THE PROJECT

This project is deemed relevant as it may be the solution to the Halal issues revolving around Muslim community in the world. It will help our consumer towards the Halal awareness and increase the enforcement quality. Through this development, our Muslims consumer can get benefits from this mobile application. It will save time and cost.

1.6 FEASIBILITY OF THE PROJECT WITHIN SCOPE AND TIME FRAME

The project is feasible within the scope and time frame in terms of technical and economic feasibility. The durations of the project are two semesters, which is around 32 weeks. Time mainly spent on the following tasks:

- Justifying a suitable augmented reality scanner

- Collecting required data from related parties, for example collecting the Halal products database from JAKIM.
- Developing a mobile database system to store the data.
- Designing the system interface.
- Developing the GMHC software.
- Integrate direct reporting to JAKIM.

In term of feasibility, developer has sufficient experience and familiarity with the application used in this project, that is the Eclipse for Android as it has been extensively used to develop other Android systems for mobiles as well. The project's moderate size has also made this project feasible within the scope and time frame.

It can be said that intangible benefits may be derived from this project as it may improve customer satisfaction in the level of information they receive and better improve their purchasing power. Hence, this project is economically feasible to be developed.

CHAPTER 2

LITERATURE REVIEW

2.1 DEFINITION OF HALAL

Halal is an Arabic term meaning lawful or permitted [1]; where it is specifically the word Halal literally means permissible, and in translation it is usually used as lawful. It is also can be said proper or legitimate where the funds earn Halal profits in full compliance with the Shariah.

The opposite of Halal is Haram, which means forbidden or prohibited. Haram products include pork and pork by-products, alcohol, and other intoxicants, carnivorous animals, birds of prey, land animals without external ears and otherwise Halal products which have been contaminated by Haram ingredients.

Based on "General Guidelines for Use of the Term Halal" (CAC/GL 24-1997 1) issued by the Secretariat of the Joint FAO/WHO Food Standard Program (1999)[2], Halal food is defined as food permitted under Islamic Law and should fulfill the following conditions which are the food does not consist of or contain anything which is considered to be unlawful according to Islamic Law, has not been prepared, processed, transported, or stored using any appliance or facility that was not free from anything unlawful according to Islamic Law, and has not in the course of preparation, processing, transportation, or storage been in direct contact with any food that failed to satisfy the first and second conditions stated above.

In addition, Halal food can be prepared, processed or stored in different sections or lines within the same premises where non-Halal foods are produced, provided that necessary measures are taken to prevent any contact between Halal and non-Halal foods. Halal foods can also be prepared, processed, transported, or stored using facilities which have been previously used for non-Halal foods provided that proper cleaning procedure, according to Islamic requirements, have been observed.

14

2.2   MALAYSIA AS HALAL HUB

As the world go for global, the Halal term become more global to Muslim and acceptable by non-Muslim worlds. Today, more consumers have given an increase attention to their foods concerning their Halal status. Malaysia have been one of the key player in Halal market, as she has long been a stated goal to establish Malaysia as a global Halal hub for the promotion, distribution, and production of Halal products and services to the Muslims countries all over the world. In 2005, the Malaysia's Deputy Prime Minister, Dato' Seri Najib Tun Razak made a statement as follow:

"....Plans to turn Malaysia into a Halal hub does not mean operations to produce Halal food must be based only in the country. Malaysian investors could invest in countries where research and development facilities and expertise are available to produce and export Halal food". [9]

In order to achieve the goal, the Government of Malaysia has embarked various strategies and actions plans to gain the world trust on Halal issues, especially when the September 11 attacks struck the Muslim community, and when the global recession in 2009 ring the Western Financial System. In 2004, the Government starts developing relationship between Islamic financial banking industry and the global Halal market, by realizing the importance of Halal industry and its bright future.

Malaysia has steps further by becoming international pioneer in expanding the scope of Halal in other instruments by researching and developing Halal instruments and products as a standard in financial services field. The Government marked a milestone when established Shariah Advisory Council in Central Bank of Malaysia.

The Shariah Advisory Council (SAC) providing the necessary guidelines under eminent Islamic economist and scholar, to mould suitable Halal investment instruments. This council also is tasked with the responsibility of classifying the organization listed in the Malaysian Stock Exchange which is dealing in accordance to the Shariah so that the Muslims can participate with a clear conscience in Malaysia's capital market and investment sector. [10]

Conversely, the Malaysian Halal Certification for food and consumable good issued by the sole authority Islamic Development Department Malaysia (JAKIM) or State Islamic Religious Council (JAIS) is also highly recognized and recommended in the international market. Despite its size, Malaysia is the only country whose Halal certification is issued by the Government, unlike in other countries whose certifications are endorsed by their respective Islamic associations. JAKIM's Halal logo is now among the most widely recognized and respected symbols of Halal compliance in the world. [11]

The launching of the Malaysian Halal Standard MS1500:2004 in August 2004 further demonstrates the Government's commitment to the creation of clear and practical guidelines for Halal compliance. This MS1500:2004 is developed in accordance with ISO methodologies and is the first Halal Standard to be developed by a Muslim nation. After several years of dedicated hard work, the National Body of Standardization and Quality (SIRIM) has completed the "Malaysian Standard MS1500, General Guidelines on the Production, Preparation, Handling and Storage of Halal Foods", which includes compliance with GMP (Good Manufacturing Practices) and GHP (Good Hygiene Practices). This new standard will further strengthen Malaysian Halal certification which is already the longest established and most widely recognized registered Halal logo in the world.

The recently approved MS 2400:2010 (MS 2400) based on the Halalan-Toyyiban (HT) Principles officially launched by the Prime Minister, Y.A.B. Datuk Seri Najib Tun Razak on June 23, 2010. The MS 2400 is based on HT principles which simply mean that Halal alone is not enough; that food consumed by the Ummah must be holistically clean, safe and hygienic. [12]

The MS 2400 effectively addresses management systems requirements for transportation, warehousing and retailing of Halal goods or cargo chain services. Apart from Shariah component, the MS 2400 standards also incorporate features of internationally recognized standards and quality management principles such as HACCP and ISO 2200. In essence, the MS 2400 assures and guarantees that products are Halal from the point of production till it reaches the end consumers.

The strong support from the Government of Malaysia through its domestic and international policy indicates that Malaysia is on the right track to be Halal hub for the world.

As the Malaysian Halal initiatives have been recognized around the world, the leadership of the current Prime Minister, Dato' Seri Najib Tun Razak have shown good quality by continuing the legacy of Tun Dr. Mahathir Mohamad, the Former Prime Minister of Malaysia.

Today, Malaysia not only recognized as the Halal Food Hub, but also the Halal Financial Hub in the world, where Malaysia become the biggest country hold the Sukuk or Islamic Bonds in the world and witness the transformation of conventional banking system to the Islamic Banking System. As this is the good example to the other Islamic country, Malaysia shall lead the transformation of Organization of Islamic Countries (OIC) and others in technology and policy making.

2.3   EMERGING OF GLOBAL HALAL MARKET

According to DagangHalal.net, the first Halal business to business portal, the Halal food industry alone was estimated at US$635bil (RM2.03tril) last year and is expected to reach US$662bil in 2011. The potential of Halal markets has created interest for the food suppliers from countries worldwide to meet the demand. Malaysia has become the first multi-religious country in the world that recognized the potential of Halal in the international arena. In Malaysia 4th Industrial Master Plan, Malaysia aims to be a major of Halal food producers. Today, most of products in Malaysia are claimed to be Halal, as the food-based Halal industries are shown to be focusing their efforts in making the plan worked.

Food and beverages are needs of living. As the health issues for non-Muslim, and as the obligation of Muslim, Haleness have become major issues. With the power of Muslim accounted as Picture of more than 1.56 billion Muslims around the world, amounting to more USD 2.3 trillion industries, the global Halal market definitely a golden market to tap into. Interestingly, the Halal is not limited to the Food and Beverages industry, but also in financial institution which currently estimated worth between USD 200 billion to USD 500 billion annually, with an annual rate forecast of 12% to 15% for the next 10 years.

Malaysia is one of the key players in this industry where the Government of Malaysia plays major roles in standardizing the Halal definition and enforcement around the world through Organization of Islamic Countries. The Malaysian Halal certificate is one of the most

17

sought after certification by Halal producers worldwide. Furthermore, Malaysia has also been hauled as the key player in the global Islamic finance market today. The Malaysian government has introduced a number of supporting measures, and beyond all doubt, this high level of government support has played a significant, if not major, role in establishing Malaysia as a leading center for Shariah-compliant finance on a global scale.

This positive development has garnered the interest of major international players to participate in Malaysia's capital market. Hence reflects the global recognition of Malaysia's position as a center of Islamic finance and enhances Malaysia's opportunity to be a leading Islamic fund and wealth management hub.

Region	Muslim population 2009 PEW Report	Muslim percentage (%) of total population 2009 PEW Report
Asia Pacific	972,537,000	24.1
Middle East – North Africa	315,322,000	91.2
Sub-Saharan Africa	240,632,000	30.1
Europe	38,112,000	5.2
North and South America	4,596,000	0.5
World Population	1,571,198,000	22.9

Table 1: Total Muslim Population in the World – PEW 2009 Report

The Picture above shows that the Muslim population in the world is huge number while the prospected Halal food market value had continuously increasing. Thus, the global Halal industry is having great potential in the future.

The dynamics driving forces [14] of the global Halal food market includes, growth in the Muslim population, the primary market for Halal food, rising incomes in primary markets for Halal food, increasing demand for safe, high quality food in primary markets, increasing demand for greater variety in primary markets, and incidents of food marketed as Halal but failing to meet Halal requirements has spurred demand for genuine Halal products.

2.4   THE INTERNATIONAL HALAL ALLIANCE

The International Halal Integrity Alliance or IHI Alliance was registered on 30th April 2007, as an international, non-profit, non-governmental, private-sector business association. IHI Alliance serves as a platform for providing services to its members, representing their interests and to liaise with governments, organizations, and business communities. The organization is led by Darhim Hashim, the Chief Executive Officer.

IHI Alliance plays a role in various program related to promote Halal in international market, especially in Halal standards and certification system, education and promotion, research and development. It focus on harmonizing the Halal standard and certification system worldwide by setting guidelines and best practice, as the Halal justification is varies in certain countries. The organization also recognized the important to create awareness and provide information, train professionals and develop human capital, and brand Halal as the standard of choice. IHI Alliance is supported by experts who develop knowledge base supported by scientific validation, set up Research and Development infrastructure to resolves new issues, and provides innovative solutions that can be commercialized.

According to Darhim Hassim [15], even though the Halal market is global, but Halal has different meanings in different countries. In most countries, Halal certification is an unregulated "cottage" industry. For example, Australia has 25 different agencies, where France has over 30 certification agencies. Surprisingly, in many Muslim-majority countries have no certification at all. There is no authority and no leadership where too many questions remain unresolved.

There are various challenges towards standardizing Halal worldwide. The first challenge is to get consensus from industry and government. There are dichotomy of interest where the interest of industry versus the interest of the consumer. As the Halal standard introduced, the non-Halal industries player feel uncomfortable and refuse to change. In other hand, the Halal industries failed to offer favorable at demand price. There are also issues in secular versus dogmatic countries which see Halal as the Islam new ways of expanding the religion influence. As the market try to adjust according to the demand, the market also need time to adjust the cost management, hence requires more time to commit to the Halal market.

19

Harmonizing the global Halal market is a big challenge for IHI Alliance. As there are more significant standards such as ISO/IEC Guide 65, the alliance need certifying bodies that can benchmark the standard. As one of IHI Alliance strategy, the alliance incorporate Tayyiban into various standards such as Food Safety Measures (HACCP, GMP), Food Safety & Quality Management (BRQ, SQF, ISO 22000, ISO 9001), fair trade by ensuring fair transactions, Islamic finance, developing Halal policy within each organization, establishing in-house Halal committee, Waste Management & Environment Care (ISO 14000), continuous education and training on Halal Matters, Workers Health & Safety (OHAS 18001), Animal Welfare, Corporate Social Responsibility (SA8000, BSCI, FLA), and Traceability System.

IHI Alliance is a good influential platform and reference for Malaysia to embark the Halal standardization policy, and the technology on enforcement.

2.5   THE INCREASING USAGES OF SMART-PHONES

According to the Economist Magazine, the sales of "smart" phones are still growing even during the recession period, in mobile-phone business. Sales of mobile phones were 10% lower in the second year of 2009 than in 2008, but sales of smart-phones were up nearly 15%. There are projections that by 2015, almost all handset sold will be "smart".

The market for smart-phones is expected to grow so quickly in part because of the demand of the Generation Y and the changing lifestyles. Expensive smart-phones such as iPhone and Blackberry, which let users watch videos and download whatever applications they want, are giving way to new models that come with popular services built in, but are less versatile or run on open-source operating systems, and often cheaper. It is time where the firms that run networks and make hardware migrating to make software and offer services.

Most smart phones are offered today feature built-in support for online services such as banking services, games, including popular social networking sites such as Facebook and Twitter. On the iPhone, in contrast, the necessary software has to be downloaded and installed. What is more, both phones can automatically add contacts from such sites to their address books. The fact is more people are accessing social networks using a handset; Facebook already has more than 65 million mobile users.

Prices of smart-phones are now on a downward spiral, says Ben Wood of CCS Insight, a research firm. [16] Several other handset-makers are already offering cheap smart-phone-like devices. Android allows cut-price Chinese firms such as Huawei and ZTE to enter the smart-phone market, which they had previously stayed out of for lack of the necessary software. The T-Mobile, a British subsidiary started selling the Pulse, an Android-powered smart-phone made by Huawei, for only £180. (The cheapest iPhone model sells for £340 in Britain if bought without a contract.) The lower price will increase the numbers of smart-phones users.

As the numbers of smart-phones user are estimated to increase by double by 2015, the numbers of "smart" users will increase correspondingly. Users become more mobile powerful and communicate actively by leveraging the social network, thus helping to shape more regulated world and help to globalize the Halal standards.

2.6   THE POWER OF SOCIAL NETWORKING

The rapid growth of social networking that has been observed over the last two to three years is indicative of its entry into mainstream culture and its integration into the daily lives of many people. In parallel with this, there has also been considerable media coverage of the growth of social networking, its potential positive outcomes and concerns about the way that some people are engaging with it.

Social networking sites offer people new and varied ways to communicate via the internet, whether through their PC or their mobile phone. They allow people to easily and simply create their own online page or profile and to construct and display an online network of contacts, often called 'friends'. Users of these sites can communicate via their profile both with their 'friends' and with people outside their list of contacts. This can be on a one-to-one basis (much like an email), or in a more public way such as a comment posted for all to see.

Ofcom [17] research shows that just over one fifth (22%) of adult internet users aged 16+ and almost half (49%) of children aged 8-17 who use the internet have set up their own profile on a social networking site. For adults, the likelihood of setting up a profile is highest among 16-24 year olds (54%) and decreases with age. The high Internet penetration, the

revolution of Web 2.0 and Web 3.0, and user-friendly application will rapid the use of social networking.

The social networking has become one of communication channel in real life. The unique of social mapping enables communication between the community especially for the key leaders despite the time and location. Social networking such as Facebook has the potential to loud on special cause. In 2010, a group of more than 200,000 Facebook users have formed a cause to object the Government of Malaysia plans to build RM 25 billion tower in Kuala Lumpur. This cause has caught the attention of mass media, recognizing the power of social networking.

In the context of Halal enforcement, social networking has potentials to help the enforcement officer to uphold the rights of consumers, as well to curb the problems among unethical businesses. The consumers through their own social network can share the information with regard their interest such as the Halal status among the social map and add value to the current information such as the actual "value" of the product and services.

There are cases where businesses buy fake Halal label to be printed on their products. In this case, a user who are concern with the Halal status of the product have made a quick search on the Jabatan Kemajuan Islam Malaysia (JAKIM) Halal Status Check on the Internet after buying, and found out that the product is not in the JAKIM database, as it is not registered with JAKIM. This means that the products is not Halal certified by JAKIM and may not Halal or Haram, leads to the uncertainty of the consumers.

This user knows this product may be Halal or Haram, but because of uncertainty, he or she avoid it. This information made available for all his or her family. As they Facebook, most of them share the story on the Facebook and spread it among their friends. The information have been circulated well through the social map, and made an impact to community, as well to the enforcement officer, as they also have Facebook account.

Today, everyone is able to access their social network using the smart phones, anywhere at any time. The advances of technology boost the usage of social networking and make it more interesting and users-friendly to the users. It is estimated, by 2015, almost all

handsets will be "smart" phones. This marks the new era of "smart" users that utilizing online social network in their daily life.

There is a need for a system that enables Halal consumers to check the Halal status of a products and services on the spot, either offline or online, despite the location, as the Internet penetration is still not on full scale in Malaysia, utilizing the social networking platform in upholding the Halalness in the market, and rely only on the authority information.

2.7 THE EXISTING OF HALAL SYSTEM

Among reliable Halal system is JAKIM Halal Directory which provided by JAKIM itself. It is embedded on JAKIM official website. The Halal directory is one of the most important and major component under e-Halal. The portal www.halaljakim.gov.my is the main platform for manufacturers and consumers' access. Through the website, user may type in a barcode number from a product in specified field and by clicking certain button; they can get the status of a product in no time.

Besides the JAKIM Halal Directory, JAKIM also introduced the Halal JAKIM SMS system which has been developed as a Halal Information references service. With this system, mobile phones users may check directly with JAKIM pertaining to food, food premise, which obtained Halal Certification from JAKIM. A user may check the Halal status any time by typing 'Halal', space and followed by the barcode number of the product they wish to check and send to 32728 (DAPAT).

Within a short while, the user will receive a reply from JAKIM on the Halal status of that product. There are types of messages that will be sent to user depending on the barcode number sent. If the product is valid, the answer will be 'Valid Certificate'; if the product's certificate has expired, the answer will be 'Expired Certificate', and if JAKIM has no record on the product, the answer will be 'Not in List'.

JAKIM has also send information on related companies and Halal items through the SMS subscription. Indirectly, companies may also promote their Halal products and services through JAKIM.

However, the website and SMS system are not practical enough for concerned customers. It is not very likely that user will surf a web to get the Halal status of a product they have already bought, As for the SMS system, users may think twice before sending an SMS to know the Halal status of product because of the amount charged for each SMS sent is fifty-cent. Nevertheless, the SMS system is also undeniably an easy option for users to check the Halal status of a product for time being.

CHAPTER 3

METHODOLOGY AND PROJECT ACTIVITIES

This chapter will highlight on how this project will be developed. Suitable methodology and project activities are most important part to make sure that the project is working. Moreover, this chapter will also discuss the procedure identification, project work, key milestone, Gantt chart, and tools required. This whole methodology and project activities are based on experimental and consistent research.

In developing the application specifically, there must be some methodology used. The methodology used to achieve the objectives of the project is to follow the system development life cycle consists of data analysis, research and design, identification of the problem, interprets data, use of the mobile base application language, and implementation of mobile application.

3.1   SYSTEM METHODOLOGY

3.1.1   Procedure Identification

This project implements throwaway prototyping-based methodologies. This methodology is used for a very different purpose which has a relatively thorough analysis phase that is used to gather information and to develop ideas for the system concept. Each of the prototypes is used with the aim to minimize risk associated with the system; by confirming that important issues are understood before the real system is built. Once each issue resolved, the project moves into design and implementation. This prototype will balance the benefits of well thought-out analysis and design phases with the advantages of using prototypes to refine key issues before a system is built.
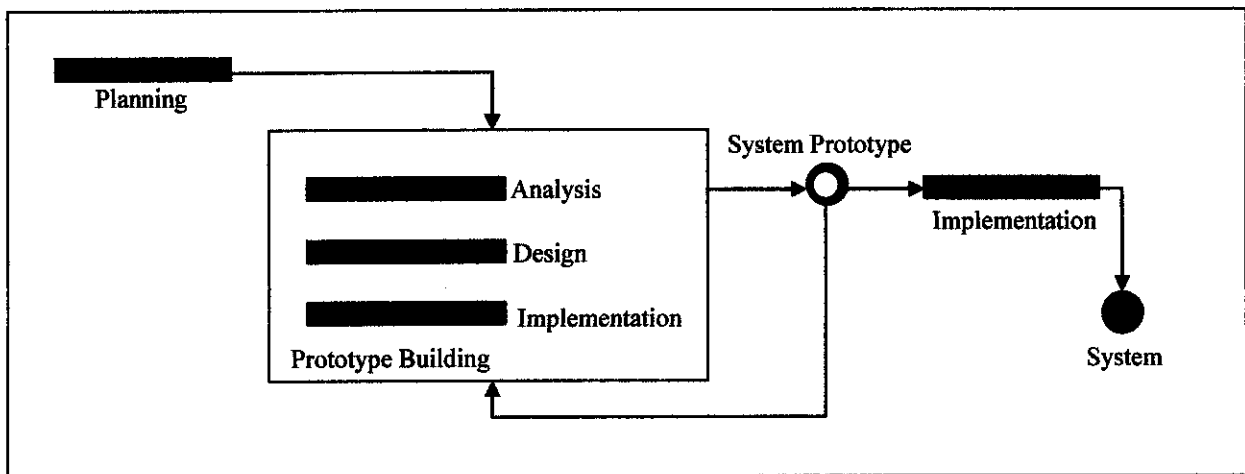
Picture 1: Throwaway Prototyping-based Methodology

3.1.2   Data Interpretation

Next is interpreting data. To interpret the data, the main problems should be understand and analyzed. This is important so that the project development will not fall out from the right track. Each term used in the application should be interpreted properly because this will ensure the user's understandability. The way on how data is arranged then the format used in Halal Status Checking should be clarified correctly so that the format will not be too awkward and no redundancy problems exist. Data interpretation is very important because each term used in application will be compiled as a Help menu. This format and how it works

26

for each section should be clearly interpreted because this development will show the performance. If user does not understand, then the objective is not achieved.

3.2 RESEARCH METHODOLOGY

3.2.1 Interview

Interviewing method is the main method use in this project, due to the fact that it is easier to meet with involved persons directly in order to gather for the information. The data captured might be more accurate and meaningful as the movements and the gestures of the interviewees could be physically seen and interpreted. This physical contact might initiate another idea which can lead into another important information acquirement. Moreover, by interviewing the person, it helps in building a relationship between us and him or her and later this relationship might be used again as one of the important resources in continuing to develop the project.

Interview held with information professionals and knowledge workers which are expertise in knowledge management field.

Interview also conducted with representative from JAKIM to get more information on Halal matters.

3.2.2 Questionnaire

Second method use is the usage of questionnaire to collect data on the respondents. It is a simple and cheap way of retrieving and acquiring the information in order to proceed with the findings. Questionnaire method is and effective way to provide statistical data. We can target one large group by using questionnaire.

Questionnaire distributed among first year second semester, Information Communication Technology program, UTP which comprises of male and female around 30 students.

3.3   PROJECT ACTIVITIES

3.3.1   Project Planning

As being discussed, the author has focused in each part from the planning until the development part. Planning part is such as objective of the project, purposes, problem statement, project proposal, and the software to be used. During this stage, proposal was sent to the FYP committee for approval. Scope of study was also established during this period.

3.3.2   Project Analysis

The purpose of this phase is to understand the requirements and build a logical model of the system. Moreover, in this phase the author need to do a lot of research and analysis such as finding facts, information related, data collecting, and Pictures relevant. In addition, scopes have been narrowed down and identified a few characteristic that are suitable for the project. The problems need to be studied and understood where the problem consists of to build a global Halal status checker, and apply modification and deleting data function. The best software to be used must be decided, therefore comparisons made to some software in term of capability and experiences, corresponds to the studied and developed user's requirements. The analysis developed as many as user requirements so that the design will not be out of scope. The analysis moved further on how to have the best data storage that will keep, maintain, and update the tracking of the Halal status data.

3.3.3   Project Design

Currently, the application will be designed based on the analysis. There some more aspects need to be defined including the data types, program specification, the interface, information to be displayed, interactivity of the layout, back-end development especially focusing on database efficiency, create formulas, and the database format to store data. The design will inherited from the designation of the use case, ERD diagram, and Class Diagram of the application. As for the data types and program specification, these are referred to the original problem statements that required building the application. Next, the requirements that are categorized by input and output analysis is identified. All the formats, formula used, data type, and constraints for each object will be recognized.

After that, the design flow is created based on the functional requirements. The flow starts from the process, input and output. Then, a data context diagram is designed to show the basic level of the system. The input and output is user, while the process will sort out the database checking base on the information given. There is also data flow diagram to show flow of the system, which involve input, output, process, and file use (user information). The attributes used in application are listed and normalization is done where the attributes are grouped based on the classification. The flowchart is designed to shows the overall flow of the system presented in symbols. Lastly, from the flowchart the logical chart is outlined to differentiate the distribution of the mobile application.

3.3.4 Project Development and Implementation

The first thing to be considered is tools and software to be used to develop the project. Since this project will be based on mobile application, Eclipse will be used for the main development. Besides, it was chosen due to the compatibility to the mobile operating system and familiarity to the system.

The implementation and development or coding phase is started by developing simple code and main function first. The suitable objects are used to represent user's selection such as text box to minimize user's error. The development uses J2ME on Eclipse. The references of the syntax are based on the book. The syntax will be gradually change or modified to make corrections and enhancement.

3.3.5 Project Testing

As discussed, testing has will be done after each part of system development had completed. The objective is to detect any errors and in functionality of the application. Each time when errors occurred, the author will enhance the project. For the testing phase, there were two types of testing which are unit and integration testing where each of it will test the effectiveness and the flow.

In planning, when the mobile application almost completed, a system testing is done to all modules. At this time, the real data is applied but in small amount to know the

usefulness of the mobile application. The objective is to check for data accuracy and application smoothness and as well as functionality.

3.4   GANTT CHART AND MILESTONE

Activities	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Requirement Analysis													
Selection of Project Topics	▓												
Determine Project Scope		▓											
Submit Project Proposal			▓										
Determine Project Scheldule				▓									
Specify Objectives													
Preliminary Research Work						▓							
Submission of Extended Proposal					■								
Design and Spefication													
Research					▓		▓						
Designing the Flowchart							▓						
Designing the Interface								▓					
Development													
Program the project						▓	▓	▓	▓				
Prepare for Viva									▓				
Prepare Interim Report						▓	▓	▓	▓	▓			
Viva									■	■	■		
Submission of Interim Proposal											■		
Testing													
Protype testing								▓	▓	▓	▓		
Presentation													
Preparing Final Technical Report											▓	▓	
Submit Technical Report													■

■ Milestones   ▓ Timelines

3.5   TOOLS REQUIRED

As a vital requirement for the completion of this project, several tools are required including:

Hardware

1. PC with Windows/Linux Platform
2. A Server
3. An Android phone

Software

1. Android SDK
2. Eclipse
3. Android Emulator
4. SQLite 3

CHAPTER 4

RESULTS AND DISCUSSION

4.0   ANALYSIS

4.1   Design

A user types the barcode of a product using the mobile application to check the Halal status of the product. The application then passes the barcode information to the server that reads the barcode symbol and converts it to human readable characters or the GITN number. Upon getting the number, the server later access the Halal database (either online if not existed in user's phone database or offline if it existed in user's phone database) to compare it and later, sends the product information and respective Halal status retrieved back to the users mobile application and display them for the user. Users may update their preferred products and services database (on the phone), tally to the JAKIM Dummy Database.

Users see the result of this proves on the system interface as such in Picture 1 (Prototype). Based on the barcode number scanned or keyed in, the system informs user of the manufacturer name, the product information, the product information, the Halal status and the expiry date if applicable, for a product during online.
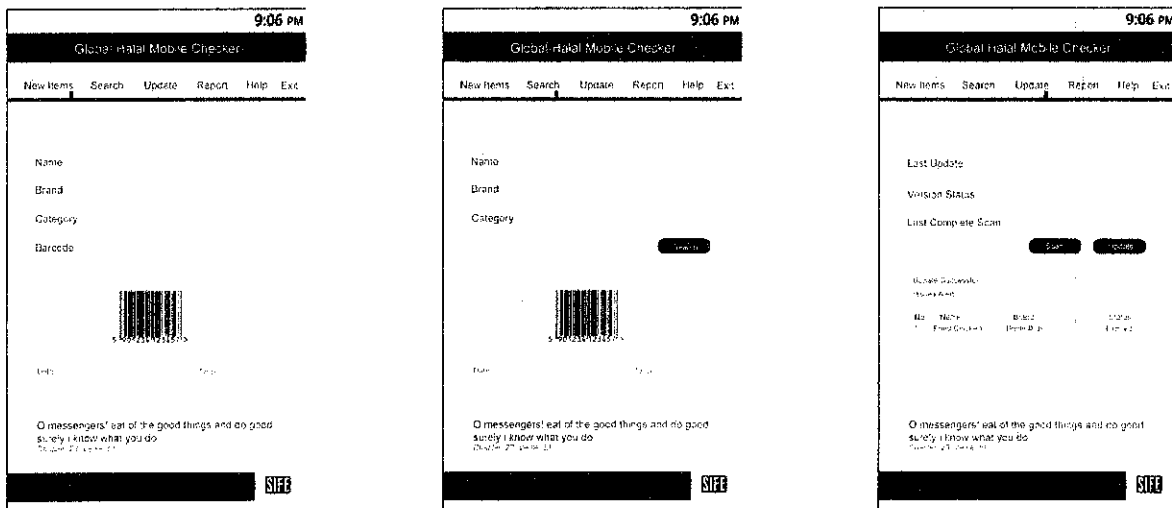
Picture 1: Interface Design

4.2   System Functionality

The system provides a means for the user to view the information such as manufacturer name, product information, and the expiry date, and most importantly the Halal status of a product. In order to view all the information mentioned, the user need to key in their favorite product/services barcode into the system for the initial process. After that, the user no need to key in the details again as it is already in the user's internal system. The system will notify the user if there is product/service that already expired without connecting to the Internet. In certain time, the system will connect to the server to download the latest information about the product/services, provided there is an Internet connection.

All the said information lies on the JAKIM dummy database. User can retrieve said information by the provision of a search button and may continue to retrieve other product's information by the provision of a new search button. This process is visualized in a user-case diagram as portrayed in the following Picture 2:
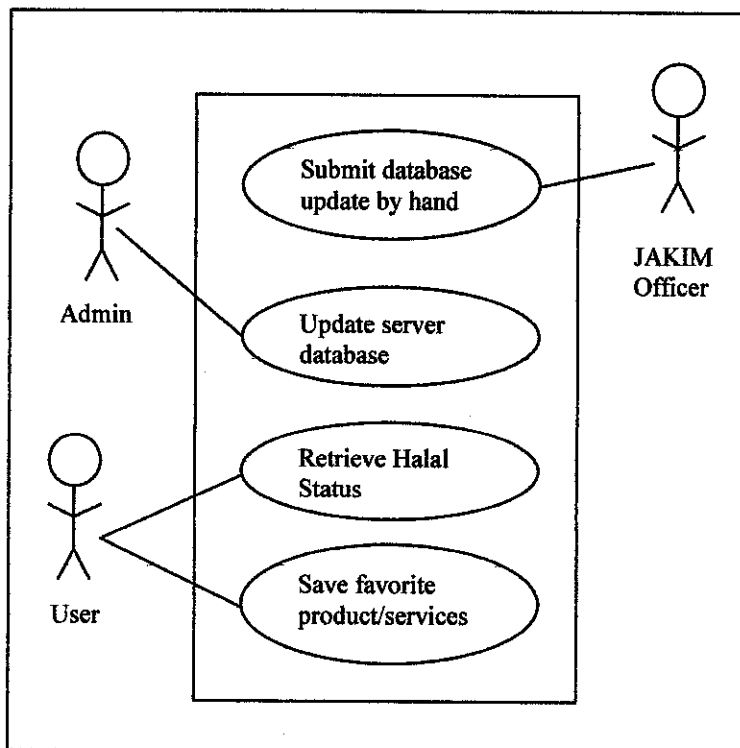

Figure 2: Use-Case Diagram of the System

The system displays the Halal status based on the Halal database supplied by JAKIM. There are three possibilities of Halal status that is displayed based in the barcode scanned:

1. Halal Certificate
2. Expired Certificate – The applied certificate has expired for a product
3. No record found.

The 'Halal Certificate' displayed indicates that the products is certified Halal for Muslim consumers. The 'Expired Certificate', on the other hand informs user that the Halal Certificate endorsed by JAKIM to a manufacturer for a product has expired and hasn't been renewed. The 'In the process of application' status signifies that JAKIM is still processing the application for Halal status of the particular product that has been sent to them. No record found may indicate that a manufacturer may have not applied for JAKIM's Halal Certificate.

Picture 2: Scanning the barcode
using smart phone camera
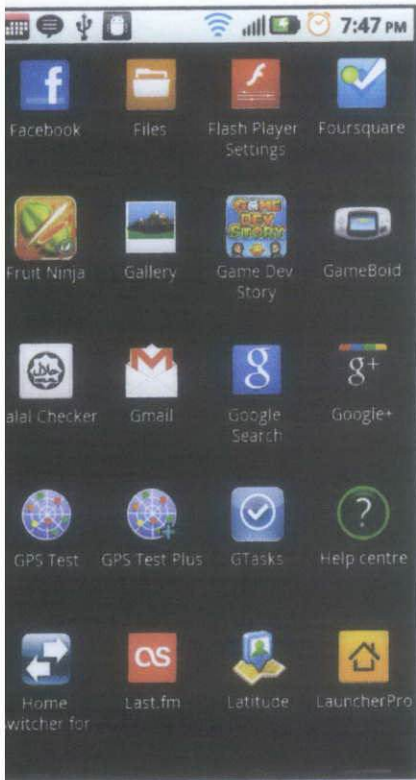
Picture 3: Halal Checker launcher icon

Picture 4: To register new item based on preferences.

Picture 5: Search Function

Picture 6: Preferred Items Halal Status

Picture 7: Register new items with input

Picture 8: Checking with JAKIM dummy database

The following are the details of the fields on the system.

1. Registration Tab

No.	Field Name	Field Type	Length	Option	M	Description
1	NID	Numeric	12		Y	Example: 8905230753333
2	Password	Password	16		Y	Example: ******
3	Email	Text	45		Y	Example: prof.wafi@gmail.com
4	Contact Number	Numeric	12		Y	Example: 0103888095
5	Timestamp	Date/Time				Default – Invisible Example: 4/21/2011 13:43:13

2. Register new items

No.	Field Name	Field Type	Length	Option	M	Description
1	Barcode	Numeric	Button			Y	Scan the barcode using phone camera
2	Category	Text - Selection	Drop-down menu		Foods	Y	
					Drinks	Y	
					Premises	Y	

No.	Field Name	Field Type	Length	Option	M	Description
3	Name	Text			Y	Example: Fried Chicken
4	Brand	Text			Y	Example: Uncle Bob
5	Status	Text	Halal		Y	Default value - Invisible
6	Timestamp	Date/Time			Y	Default – Invisible Example: 4/21/2011

3. Search items

No.	Field Name	Field Type	Length	Option	M	Description
1	Category	Text - Selection	Drop-down menu		Name Brand Company	Y	
2	Input	Text				Y	Example: Fried Chicken

4. Results for Search Items, based on the input text

No.	Field Name	Field Type	Length	Option	M	Description
1	No.	Numeric				Y	Example: 1
2	Product	Text					Example: Fried Chicken

No.	Field Name	Field Type	Length	Option	M	Description
	Name					
3	Status	Text				Example: Halal, Inactive, Unknown

5. Alert when near expired (2 days to expiry date)

No.	Field Name	Field Type	Length	Option	M	Description
1	Name	Text			Y	Example: Fried Chicken
2	Brand	Text			Y	Example: Uncle Bob
3	Status	Text			Y	Example: Inactive

6. Report/Complaint

No.	Field Name	Field Type	Length	Option	M	Description
1	Name	Text	Search		N	Select from user's phone database
2	Brand	Text	Search		N	Select from user's phone database
3	Barcode	Numeric	Search		N	Select from user's phone database
4	Description	Text - Multiline			Y	
5	Send	Button			N	Notify to JAKIM

4.3   Survey Results

Questionnaire has been conducted among 48 students in third year first semester, Information Communication Technology and Business Information System program in Universiti Teknologi PETRONAS.

The purpose of the questionnaire was distributed is to collect data and analyze the following:

a. The Halal awareness among the respondent?
b. How the respondents react when they witness irregularities of the Halal status?
c. How do they confirm their consumable product/service is Halal?
d. The level of confidence in the printed Halal logo.

4.3.1   The Background of the Respondents

The average age of the respondents is 21 years old make them in the third year first semester of their study in universities.

4.3.2   The Survey Results and Analysis

All respondent know the basic concept of Halal and its significance. As the religions of respondents are all Islam, the author found that they have the basic knowledge in judging either a food/drinks is Halal or Haram. However the level of knowledge is varies as some of them take great concern on the source of foods/drinks, and some of them just say it is Halal by knowing the main ingredients of the foods/drinks, and rely to the printed Halal logo.

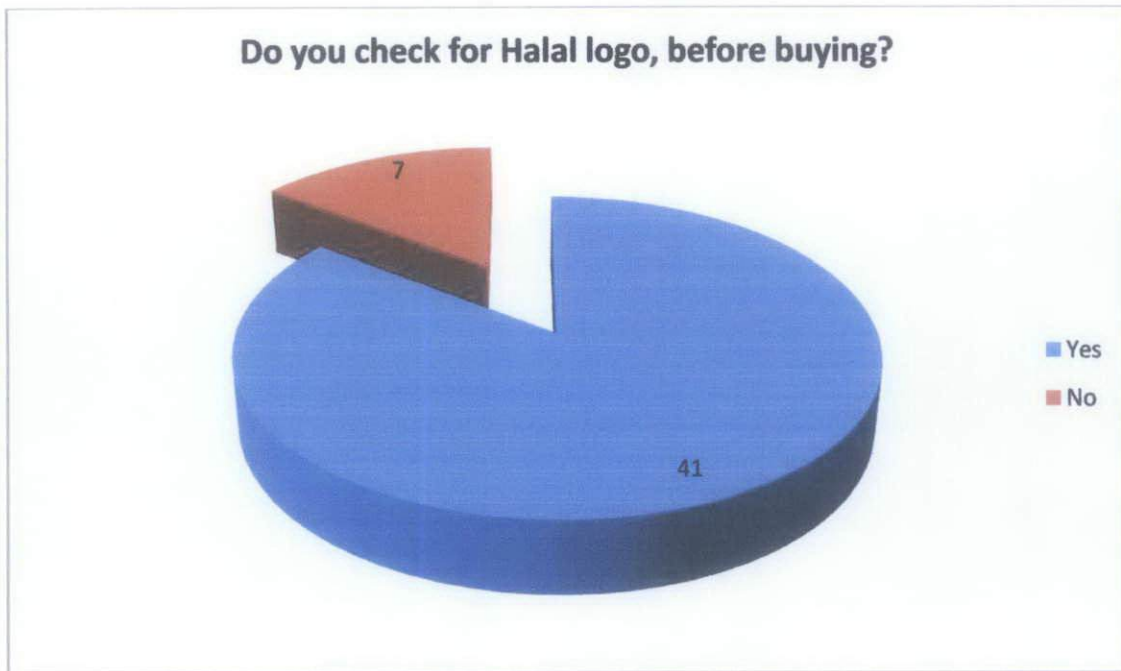## Do you check for Halal logo, before buying?

Figure 3: Do you check for Halal logo, before buying?

Forty one (41) respondent checks for the Halal logo before purchasing something, while seven (7) respondents do not care for it. This show that the majority of respondent really care on what they are consuming. In other hand, the minority may rely and belief on the integrity of the seller to sell only the Halal product/services or foods/drinks.

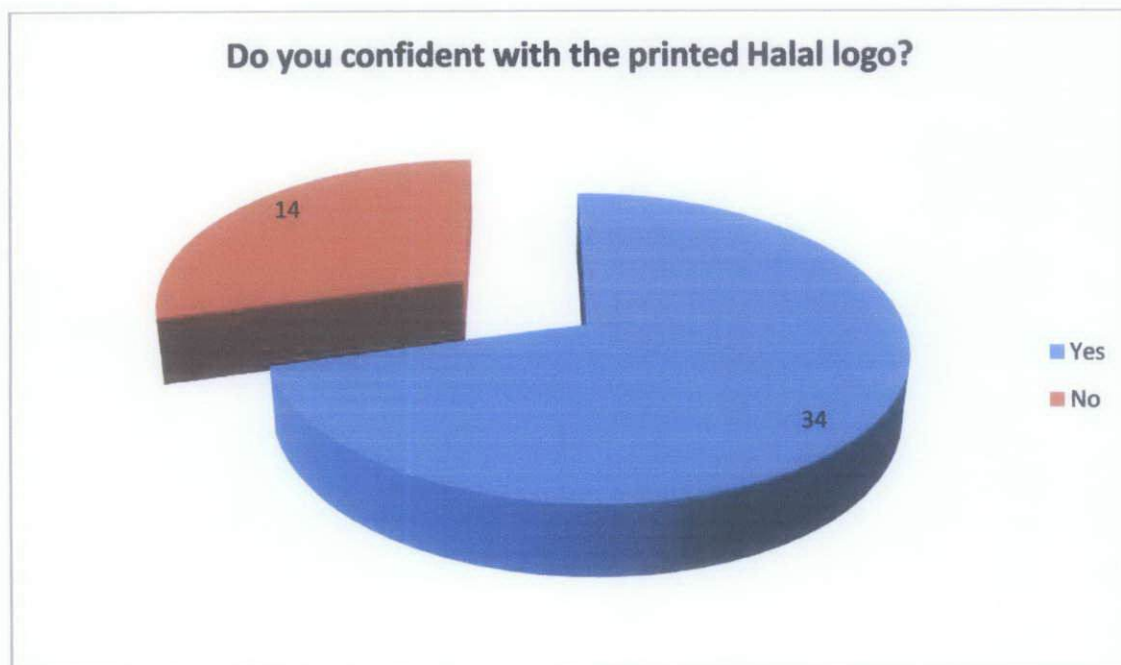## Do you confident with the printed Halal logo?

Figure 4: Do you confident with printed Halal logo

Surprisingly, even though forty one (41) respondents checks for the Halal logo before buying, eleven (11) respondents don't have the confident in the Halal logo. Based on the

question given, thirty four (34) respondents have the confident on the printed Halal logo, while the remaining fourteen (14) respondents are vice versa.

This may as the result of several cases of the fake certificate and Halal logo published in the media. The following are the selected response from the respondents on why they have no confidence in the Halal logo.

No, because it fake sometime
3/14/11 11:29PM View Responses
Sometimes they are not certified by JAKIM
3/14/11 5:51PM View Responses
Sometimes i doubt on it
3/11/11 7:57PM View Responses
Some halal logo looks suspicious, because some of them are from different country than Malaysia. So, we don't know whether the logo is accurate or not
3/11/11 5:51PM View Responses
No
3/11/11 11:43AM View Responses
Because a lot of piracy log nowadays
3/10/11 6:25PM View Responses
If not follow the standard one
3/10/11 6:18PM View Responses
Not really
3/10/11 4:37PM View Responses
No
3/10/11 1:45AM View Responses
Not really if the logo different from JAKIM's logo
3/9/11 1:58PM View Responses
Not really
3/9/11 12:16AM View Responses
That certain org have been given authorize to do so.... if they didn't do it well, they should know better...
3/9/11 11:18AM View Responses
Mjwb soalan no4: it's depends actually, sy sbg pengguna utk check stp satu2 produk adalah agak meyusahkn, letak kepercayan pd JAKIM,msiaw pun ade sesetngh issue masyrkt arise ttg creadibilty mrk (maksudnye betul2 buat keje check brg tue halal ke x) tp islam memudahkn, x bermakne sy kate amek mudah. maka, conclusi letak kepercayan yg stp logo yg dtg dr jakim, diyakini...tp utk logo yg tulis jawi pun salah, cth dekat : keropok2 maka wajar diragui kehalalnye. tq. (hidayahtaufik)
3/9/11 8:18AM View Responses
Some look very fake. Doesn't comply with the logo Jakim has
3/9/11 7:55AM View Responses

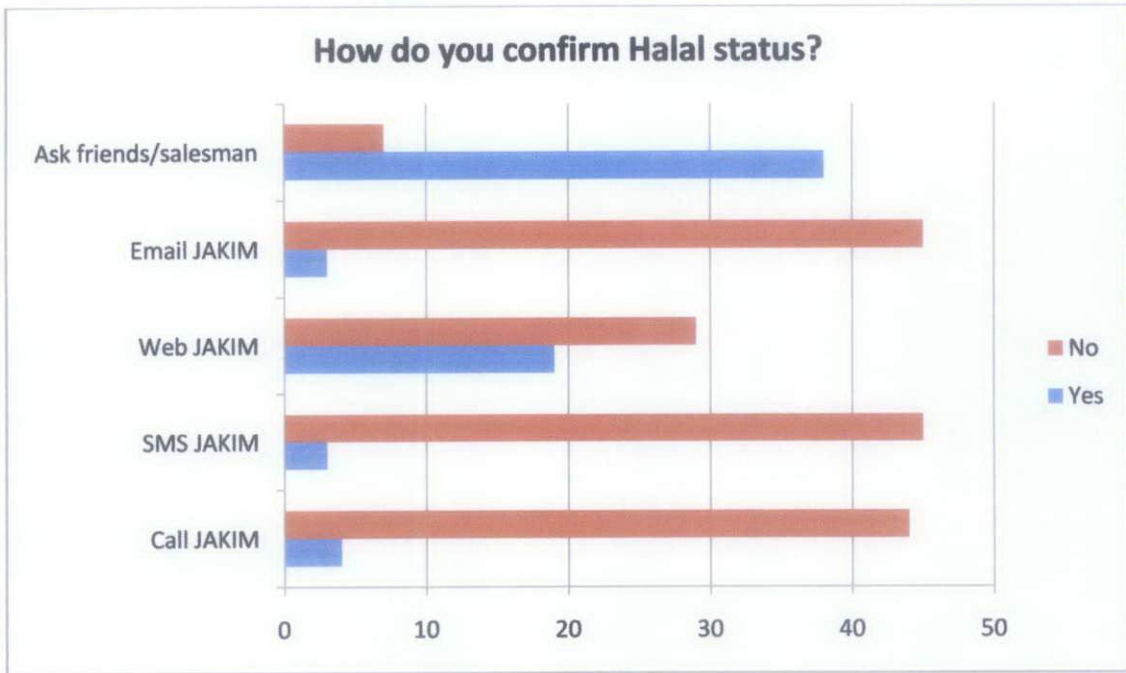*This are selected responses have been captured during the questionnaire.

Figure 5: How do you confirm Halal status?

Even JAKIM have two systems which are SMS and Online Halal Status for the Halal consumer to check the Halal status, the level of awareness, and usage for both is not really good. The author found that some of the respondents even don't realize the existent of the systems. On the other hand, some of them know about the system, but rarely use it for the reference. In contrast, most respondent feel more comfortable to refer to their friends and the salesman.
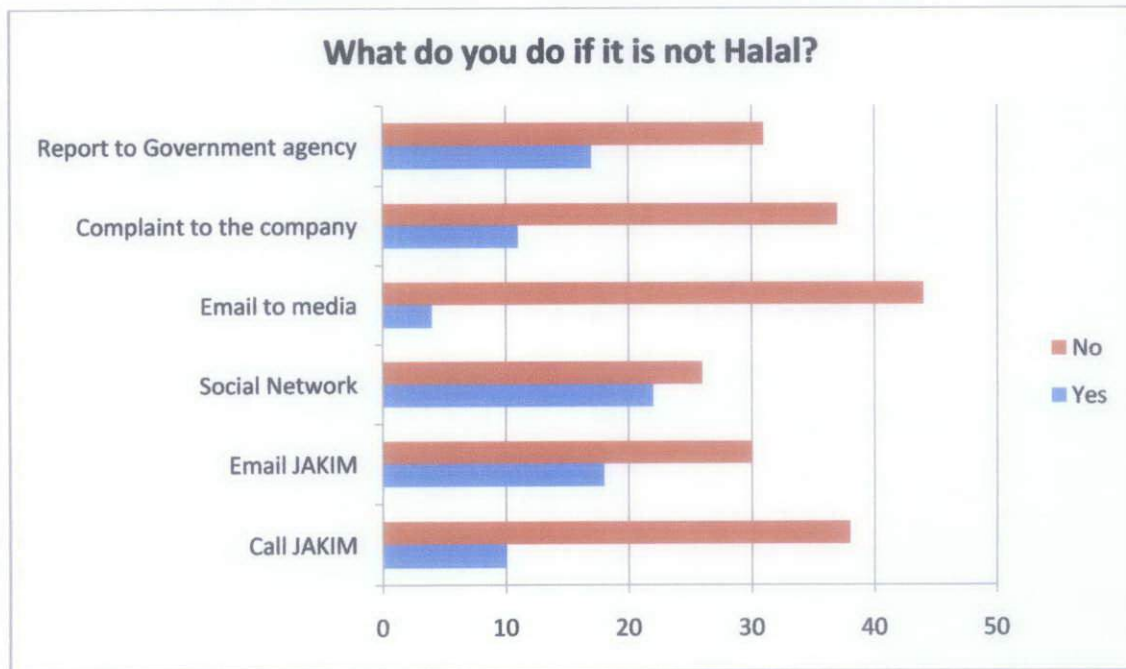

Figure 6: What do you if it is not Halal?

Based on the questionnaire, the author can concluded that even though if a respondent witnessed irregularities on the Halal status on product/services or food/drinks, not all the Halal consumer lodge report to the authority. Most of them prefer to wait and see or just spread the news among their friends using varies channel of communication.

This will be a lagging indicator which will have negative impact to the authority such JAKIM, where the enforcement on the compliance also depends on the consumer input/complaint. At the end, JAKIM will suffer image damage, as previously mentioned, 14 respondent does not have confident in Halal logo.

In other perspective, the JAKIM also need to rethink its modus of operandi and how it operates. As far as the author concern, the rapid changes of technology have become major challenges to the agency, besides relying to inadequate manpower to regulate the Halal compliance around the country.

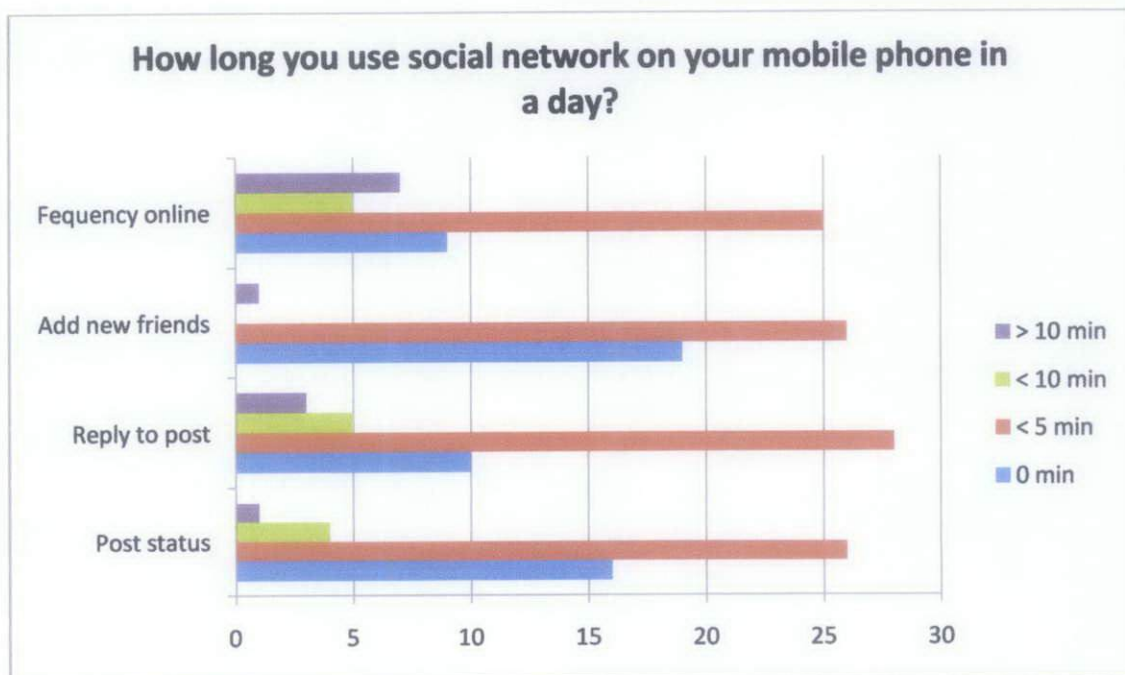Figure 7: How long you use social network on your mobile phone in a day?

The booming of social networking have change the world perspectives where people are more open to share what they do, what they know, and what they want. Based on the Trend watching report, the largest average users of social networks in the world is Malaysia, where the majority have at least one social network account. This mark a revolution era in

information sharing in the millennium age and we should see this as a powerful weapon for consumer to determine only the good product/service are available for the market.

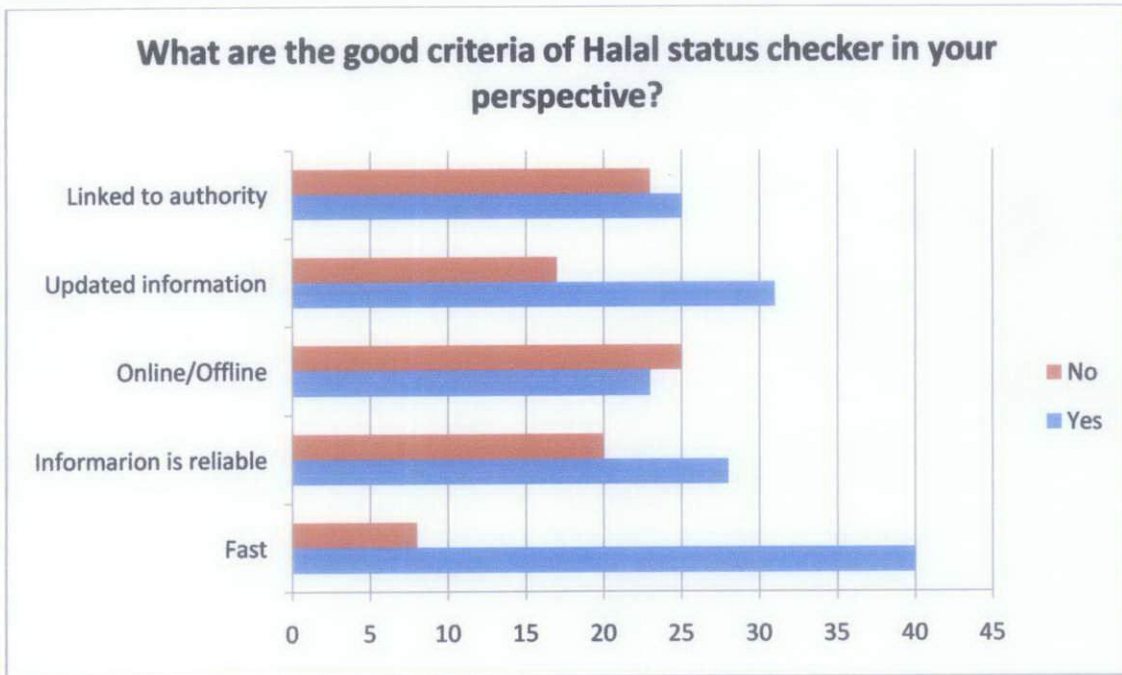**What are the good criteria of Halal status checker in your perspective?**

Figure 8: What are the good criteria of Halal status checker in your perspective?

Based on the questionnaire, the author understand that time become an important factor for the users to use this Global Mobile Halal Checker. We can see that most respondent also demand for reliable information (directly from the authority), integrate online with offline, updated information, and have the capability to link to the authority. As far as the author concerned, all this factors will be taken into consideration.

As far as the database concerned, this system prototype enables user to check the Halal status of the products whose manufacturer's initial are in the range of A to L only. Therefore, for other products out of that range, it is not possible to tell whether the product is never certified Halal or it is not covered in the database range. Besides, the database provided by JAKIM will not display the 'non-Halal' status of a product, and instead user may assume that only the certified Halal products are truly Halal. Thus, the 'no record found' may suggest that the product is non-Halal although not all of them are non-Halal consumption or use. It is also relevant to assume that the manufacturers of non-Halal products will not send their products to JAKIM for Halal certification, hence resulting in the 'no record found' in the system.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1   CONCLUSION

This project will serve the need of a reliable Global Halal Mobile Halal Checker for Halal consumer to refer to, as it integrate offline and online, using the reliable data directly from the Halal authority, and it is updated in certain acceptable duration.

The unique of this application is that the user can manage its favorite's product/services in their mobile phone in background where the system will inform if there is an update on the product/service status. This means the user no need to key / scan for barcode for many times.

The system also will establish a proper communication between the user and the Halal authority to report, update, and manage user ambiguity or related information. This will ensure there will continuity and a good relationship between these two parties in the enforcement of Halal compliance.

The author planned to use the live data from the Halal database managed by JAKIM, however due to the limitation of time and resources, the system will use dummy database. The system also does not cover all Halal products that have been certifies by JAKIM. For concerned users, in this project we assume that only products with the Halal certificate status are really Halal as the non-Halal status will not be displayed in this system.

5.2   Recommendation

Future improvement that can be done is to use live data from the Halal database server. By using this data, there will no doubt on the lapse time between the scheduled information update and different expiry date of product and services.
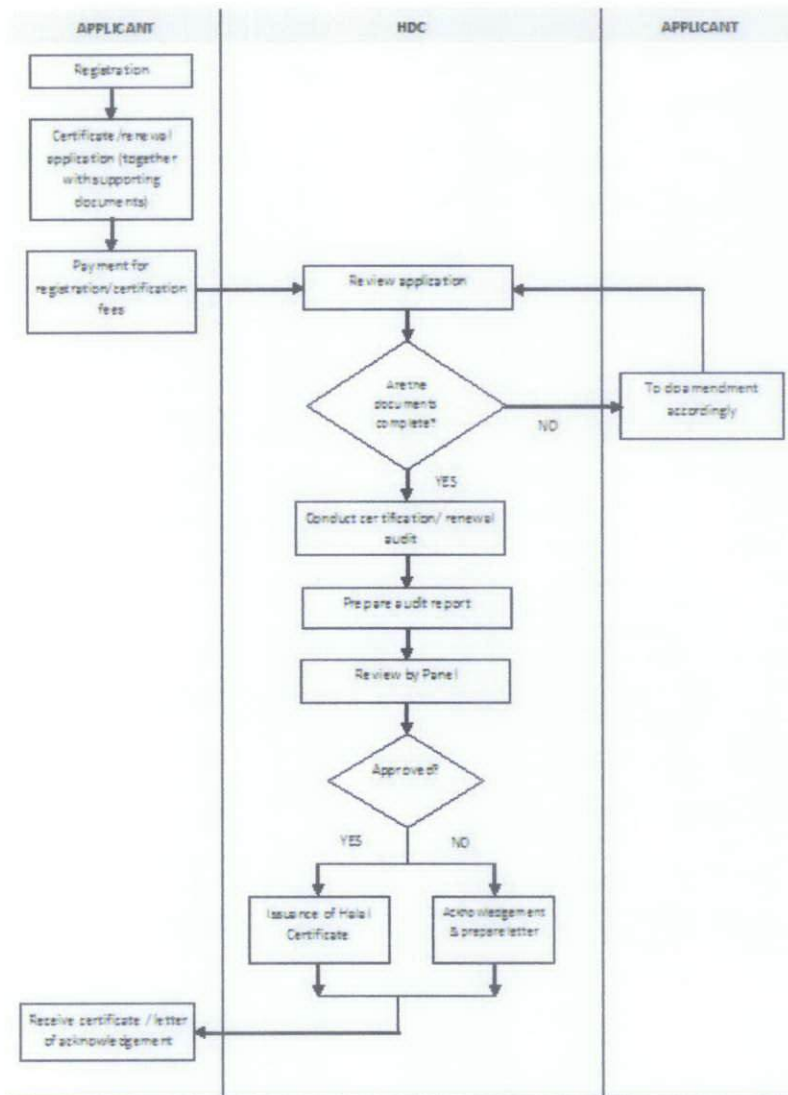
Another important factor is to minimize the usage of the user's mobile phone memory storage by transferring the data to their existing social network. The flexibility of API and high performance of the social network, added by the trends will increase the efficiency of the channel of communication and the integrity environment.

REFERENCES

1. Retrieved February 28, 2011 from the World Wide Web:
   http://en.wikipedia.org/wiki/Halal

2. Anonymous, 1999. General Guidelines for Use of the Term "Halal". The Secretariats of Joint FAO/WHO Food Standards Program, Rome. [Online] Available:
   http://www.fao.org/docrep/005/y2770e/y2770e08.htm

3. Retrieved February 28, 2011 from the World Wide Web:
   http://en.wikipedia.org/wiki/Haraam

4. Retrieved February 28, 2011 from the World Wide Web: http://www.islamic-laws.com/halalharamfooddrinks.htm

5. Retrieved February 28, 2011 from the World Wide Web:
   http://en.wikipedia.org/wiki/List_of_countries_by_Muslim_population

6. Retrieved February 28, 2011 from the World Wide Web:
   http://www.bnp.org.uk/news/%E2%80%9Csix-million%E2%80%9D-halal-meat-consumers-britain-says-meat-trades-journal

7. Retrieved February 28, 2011 from the World Wide Web:
   http://www.who.int/mediacentre/factsheets/fs113/en/

8. Retrieved February 28, 2011 from the World Wide Web:
   http://pewforum.org/newassets/images/reports/Muslimpopulation/Muslimpopulation.pdf

9. Adam, R. Z. (2006, November 1). KL keen to tap lucrative halal industry. Business Times. [Online]
   Available: http://www.halaljournal.com/ artman/ publish/article_511.shtml. (February 5, 2006).

10. Samsudin, M.A. (2005, September 24). Najib confirms Malaysia's halal hub potential. Business Times. [Online] Available:
    http://www.halaljournal.com/artman/publish/article_384.shtml. (February 5, 2006).

11. Badawi, A.A. (2004, August). Window to the global halal network. Paper presented at the official launch of the Malaysia International Halal Showcase (MIHAS) 2004. [Online] Available: http://www.pmo.gov.my/WebNotesApp/ PMMain.nsf/314edc1. (February 5, 2006).

12. Retrieved February 28, 2011 from the World Wide Web: http://muxlim.com/blogs/HalalFocus/malaysia-ms24002010-poised-to-take-centrestage-at-mihas/

13. Anonymous. The Emerging of Global Halal Market. [Online]. Available: http://www.dagangasia.net/articles/dh_the_emerging_of_global_halal_market.asp

14. The International Halal Integrity Alliance Report for year 2010. Retrieved February 28, 2011 from the World Wide Web: http://www.ihialliance.org/news_detail.php?nid=150

15. Retrieved October 1, 2009 from the World Wide Web: http://www.economist.com/node/14563636

16. Anonymous. The Boom in Smart Phones. BBC. [Online] Available: http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/02_04_08_ofcom.pdf

17. Nurulhuda Nordin, Nor Laila, Mardziah, Zainal, Value Chain of *Halal* Certification System: A Case of the Malaysia Halal Industry. Faculty of Information System and Quantitative Sciences. Universiti Teknologi MARA.

18. Evelyn, E and Cathie L.B. 2002, Project-Based Software Engineering, Addison Wesley.

19. Sunny and Kim. 200, The Complete Idiot's Guide – Project Management, 2nd Edition, Marie Butler Knight.

20. The Halal Journal. Kaseh Dia Sdn. Bhd.

21. Jabatan Kemajuan Islam Malaysia. 2011, E-Halal – Sistem Maklumat Halal JAKIM. R Retrieved February 28, 2011 from the World Wide Web: http://www.halaljakim.gov.my.

22. Mohammad Sadek. 2006. 'Marketing Niche for Halal Food Supply: A Framework for the Establishment of an International Halal Food Market'. In Sheikh Mohd, S.M.S & Azrina, S. (Ed.).Food and Technological Progress an Islamic Perspective. (pp. 85-100). Kuala Lumpur: MPH.

23. Mohd Adly, R. 2005. 'A Halal Grant for the RM560 Billion Market'. The Halal Journal Nov + Dec 1, 2005. (pp.39). Kuala Lumpur: Kaseh Dia Sdn. Bhd.

24. Retrieved October 1, 2009 from the World Wide Web: http://www.halaljournal.com/article/1295/globalising-halal-standards:-issues-and-challenges

APPENDIX 1.0

Halal Certification Process

APPLICANT	HDC	APPLICANT
Registration		
Certificate/renewal application (together with supporting documents)		
Payment for registration/certification fees	Review application	
	Are the documents complete? — NO →	To do amendment accordingly
	YES ↓ Conduct certification/renewal audit	
	Prepare audit report	
	Review by Panel	
	Approved?	
	YES — Issuance of Halal Certificate	NO — Acknowledgement & prepare letter
Receive certificate/letter of acknowledgement		

Sources: http://hdcglobal.com/mainpage/PSS/HI_halalCertification.asp