

Map Mashup for Halal Industry in Malaysia

by

Mohd Hafiz Bin Suhaimi

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Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

Map Mashup for Halal Industry in Malaysia

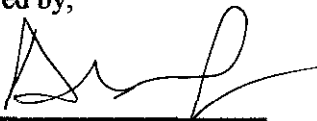
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in partial fulfilment of the requirement for the

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Approved by,



(Abdullah Sani Abd Rahman)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
September 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, 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.



MOHD HAFIZ BIN SUHAIMI

ABSTRACT

Most of consumers in Malaysia are very concerned about the Halal Principle in Islam. Halal is a Quranic term meaning "permissible, allowed or lawful". When used in relation to food and other consumer products it carries the meaning "permissible for consumption and utilization by Muslims". Halal products consist of halal raw materials, halal procedures, and some other pre-requisites. However, there are food producers who fail to get halal raw materials from suppliers for their productions because the information about the products is represented using inconvenient way by Malaysian authorities such as Malaysia Department of Islamic Development (JAKIM). Thus, the halal status of their products can be questioned by others. Map mashup is proposed in order to make the halal producers in an easier way. This project would highlight the usage of map in order to display a set of data according to their geographical attributes. The proposed approach in this project is to plot the data on a map that is generated from Google Maps API service and utilize the service to the maximum usage. Data such as location of the suppliers of raw materials are easier to be analyzed on the map itself. Besides, others can evaluate the distribution of suppliers and make their decision on where to get the closest suppliers, new opportunities to start a business at strategic places and etc. The main contribution of this project is data would be much easier to be analyzed and users can contribute to the system in order to make the data more valuable and rich in content.

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CHAPTER 1

INTRODUCTION

1.1 Background

Malaysia is projected to be a global halal-hub in the future. This objective can be achieved only if all organizations/bodies including the manufactures, traders, buyers, and consumers work together in order to position Malaysia as halal-hub central in the global market. Existing literatures show several examples on how supply chain strategy and marketing intelligence to be applied in the business [1][2]. However, many firms especially in the food industry failed to get halal raw materials to produce their products. The platform presented here will reveal the theory and practical approach in linking the suppliers, manufacturers, and consumers in the context of halal industry.

1.2 Problem Statement

In Islam, it is a must for the followers to consume good and halal food and materials. Most of the users in Malaysia are very concern about halal and non-halal products. However, the manufacturers/producers are facing hard problems which are difficulties in getting quality and halal raw materials for their productions.

The problems are in term of number of suppliers, location of the suppliers, distance between their factories and the suppliers, the quantity of supplied raw materials, and lack of expertise in supply chain management.

1.3 Objectives

The first objective of this research is to build a platform so that the suppliers, manufacturers, and consumers can interact with each other in an easier way via a standard platform. This will ensure that the manufacturers/producers managed to get their raw materials for the productions. The second objective is to conduct a usability testing after the system is ready.

1.4 Scope of Study

The general aim of the study is to develop a web application that represent the data in a more convenient way compared to the existing application and user-friendly for the interaction between suppliers, producers, and consumers. The designing processes will be according to the well-known human-computer-interaction (HCI) rules [3] and supported by the latest technology web browser such as Firefox 3.6, Internet Explorer 9, Google Chrome 9, Opera 11, and Safari 5.

CHAPTER 2

LITERATURE REVIEW

Most consumers especially in Malaysia are very concern about the principle of *Halalan Tayyiba* in Islam. This principle covers all aspects in our daily life. Many people understood that as long as the food does not contain pork and alcohol, it is halal which this thought is totally wrong in Islam. The word *halal* in Arabic means permissible according to the Islamic Law and *tayyiba* means best [4].

The halal industry involved farm-to-table process. The producers of the products have difficulties in finding halal raw materials in their production due to several problems such as lack of enforcement by the JAKIM, less collaboration between the halal certification authority and some of the suppliers/manufactures abusing the halal logo and halal certification expiry [5][6]. So, map mashup is proposed in order to help the halal industry especially for the producers and the entrepreneurs to get their own suppliers that satisfied their need and to keep the integrity of the data.

In web development, mashup is defined as an application that composed of mixing different types of software and data which produce a new service or function [7]. Map mashup was become popular after Google launch their *application programming interface* (API) in June 2005 which available for anyone to develop their own application using the API.

It is also important to note that by using *geographic information systems* (GIS) such as map mashup, users are able to analyze and manipulate the open data in an easier way because other than displaying the data geographically, users may know about the distribution and the population on the related data.

Since the API is available for everyone, more map mashups were made and a new term called *neogeography* was created. Neogeography means “new geography” and consists of a set of tools and techniques that fall outside the realm of traditional GIS. It combines the complex techniques of cartography (the study and practice of making maps) and GIS, and places them within reach of users and developers [8].

There are several companies other than Google that provide the similar API for mapping such as Yahoo and Microsoft (Bing maps). However, the service which provided by Google is simpler and faster than the others. It uses lightweight Javascript-based APIs compared to Yahoo and Microsoft which use more complex technologies such as ActiveX, Silverlight, or Flash [7].

To create a trusted system, the system itself should be competent, ethical, predictable, and should have positive intentions [9]. There are two major categories of attributes which the system must have. The first category involves perceptual attributes which refer mainly to the source's reputation and the second category involves attributes which refer to the system's functionality and overall quality.

People can argue about the credibility of the provided data from a system if the data come from unknown sources. In Malaysia, the organisations that involved in managing data on halal certification to products and services are the Halal Industry Development Corporation (HDC) and JAKIM. So, both of these organisations are credible enough on the required data within halal context.

Other than best performance of functions, a good design emphasizing on clear commitments and usability can improve trustworthiness. [10] suggest the use of pastel and cool tones and colour combinations and the use of high quality photographs could produce a good and friendlier design.

In conclusion, map mashup is an alternative to assist in supply chain management. There were manufacturers who failed to get the raw materials for their productions due to problems such as lack of enforcement from the authorities and the credibility of the data. A trusted system must have two main attributes which are best performance and quality design. It also has to own speciality in order to attract people to use it.

CHAPTER 3

METHODOLOGY

Phase 1: Gather User Requirements and Related Data

The user requirement will be defined by interviewing the public users about the system and how it should look like. Other than that, the researcher himself will define the needed specifications. Data about the suppliers and manufacturers will be gathered from HDC or JAKIM website or by requesting an official participation to the both parties.

There is a need to have a unique function such as reward or specialities in the provided services to attract users to use it. This map mashup is expected to get some input from the users where they can rate or comment on the listed products or services. The rewarding and special function features have been proven by applications such as Foursquare and Twitter. The Foursquare's users will get a special badge when they check-in at a place and fulfil the requirements. Meanwhile, the Twitter offers a unique function where the users can share their thought to their social network in less than 140 characters.

Since the system deals with real business of other people, an authentication system is required to authenticate the users who want to give rating or comments about the services. This function is crucial because others may give bad feedback about a service/product just to ruin others businesses. The common way to authenticate the users is via e-mail. However, within this research context, the authentication method is not sufficient. We cannot truly assure that the person has used the services/products by this method. One of the ways to authenticate the users is by using a secret coupon. The customers will be given a unique secret coupon and only the owners of the coupons can give the feedback about the products/services. The other effective way is only registered users of the services can give feedback on the services.

The system will have three types of user level which are the administrator, registered user, and visitor. All data and user management will be handled by the administrators. Registered users may comment or rate the listed services in the system and guest only can browse and view the available data.

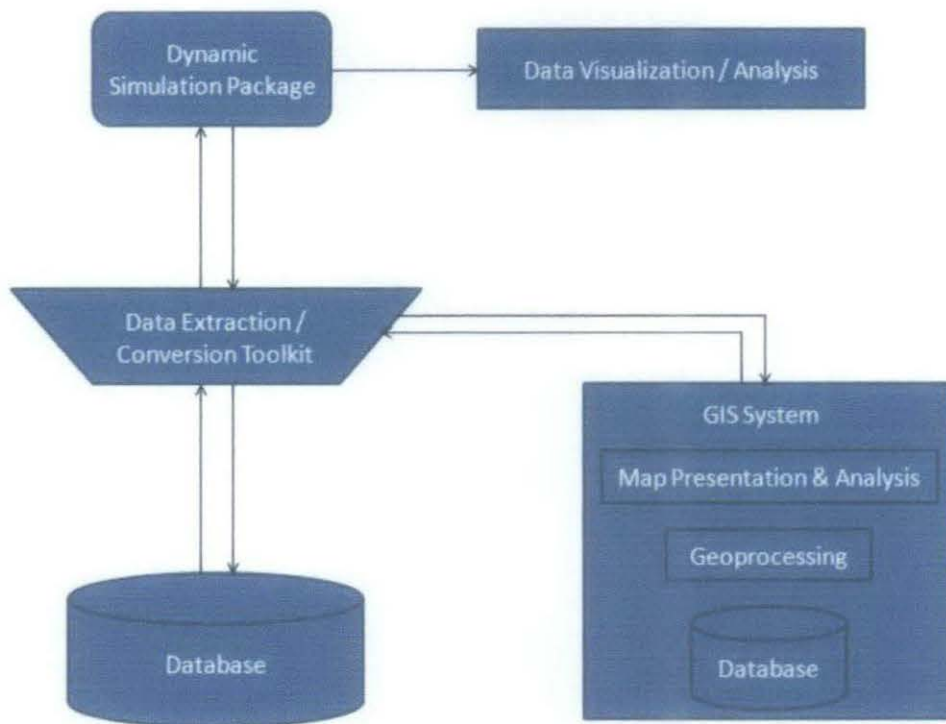


Figure 3.1: Architecture Model

GIS system in the above diagram is referring to the API service from Google. Database, data extraction or conversion toolkit, and dynamic simulation package are the parts of the platform which will be developed throughout this project. Data visualization or analysis will be interpreted at the client side (web browser).

Phase 2: Critical Review of Related Works

There are several map mashups that have been developed by others such as Wikimapia (at wikimapia.org), Find Homes for Sale (at fizber.com) FastFoodMaps (at fastfoodmaps.com), ChicagoCrime (at chicagocrime.org) and MalaysiaCrime (at malaysiacrime.com). The review will be critically focused on the functionalities, design, and the overall performance.

Wikimapia

This website basically provides information that is related to a particular location. It is an online editable map allowing everyone to add information to any location.



Figure 3.2: Wikimapia Screenshot

The website follows most of the best practise in designing user interface such as consistent design of menu, the use of three clicks rule, and it groups the related elements together. Users may register if they want to use the services. Furthermore, users also can change the visual of the map to others such as satellite, hybrid, terrain, or panoramio view.

List of the features in Wikimapia.org:

1. User registration
2. Add new landmark, region, and create your own map in your account
3. Categories of the data
4. Distance measure between selected location
5. Add comments to listed data
6. Multi-language
7. User guide

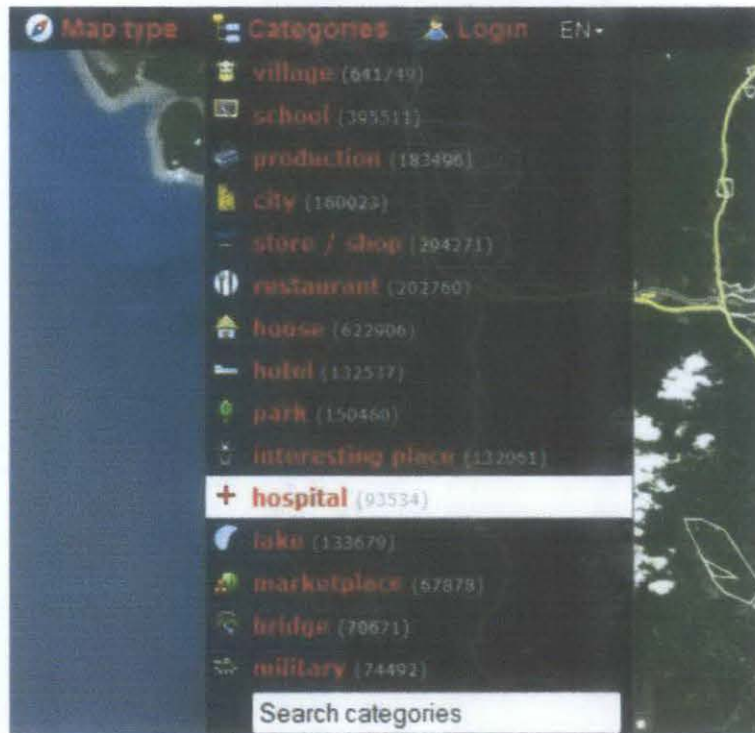


Figure 3.3: Wikimapia Menu

FastFoodMaps

The map mashup is basically shows the geographic distribution of fast food locations in the United States of America and it shows the address of selected restaurant. There is no complicated function offered in the application. Users can jump into a specific location via a drop down menu.

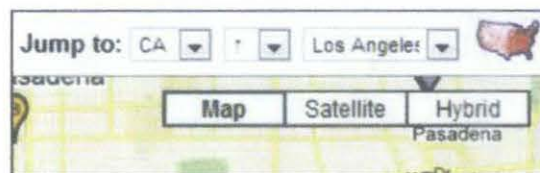


Figure 3.4: FastFoodMaps Menu

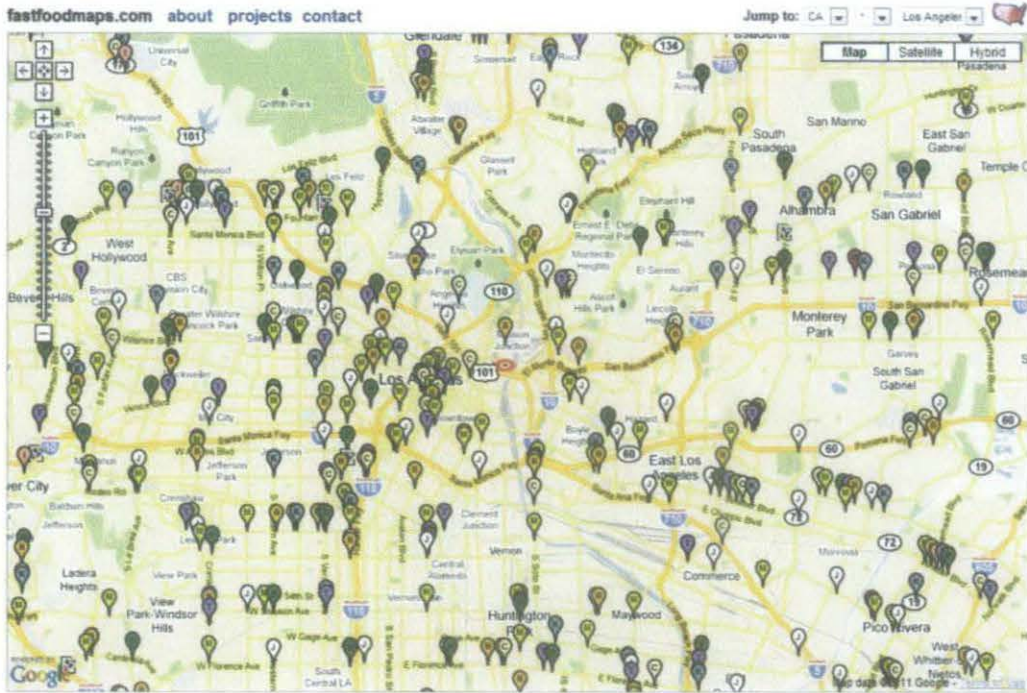


Figure 3.5: FastFoodMaps Screenshot

<p>Restaurant Info</p> <p>Burger King 916 Veterans Memorial Blvd. Metairie, LA 70005 (504) 835-9610</p> <p>Pan to Center Send Back Send Forward</p> <p>Detail Control</p> <p>Showing: Restaurants</p> <p>Link to Current Map</p>	<p>Screen Stats</p> <table border="0"> <tr><td>41</td><td>McDonald's</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>28</td><td>Burger King</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>7</td><td>Pizza Hut</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>13</td><td>Taco Bell</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>9</td><td>Wendy's</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>4</td><td>KFC</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>0</td><td>Jack</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>0</td><td>Hardee's</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>0</td><td>Carl's Jr.</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>0</td><td>In-N-Out</td><td></td><td><input checked="" type="checkbox"/></td></tr> <tr><td>102</td><td>Total</td><td></td><td></td></tr> </table>	41	McDonald's		<input checked="" type="checkbox"/>	28	Burger King		<input checked="" type="checkbox"/>	7	Pizza Hut		<input checked="" type="checkbox"/>	13	Taco Bell		<input checked="" type="checkbox"/>	9	Wendy's		<input checked="" type="checkbox"/>	4	KFC		<input checked="" type="checkbox"/>	0	Jack		<input checked="" type="checkbox"/>	0	Hardee's		<input checked="" type="checkbox"/>	0	Carl's Jr.		<input checked="" type="checkbox"/>	0	In-N-Out		<input checked="" type="checkbox"/>	102	Total		
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0	In-N-Out		<input checked="" type="checkbox"/>																																										
102	Total																																												

Figure 3.6: FastFoodMaps Right Panel

MalaysiaCrime

MalaysiaCrime.com is a web directory where anyone can submit any crime that happened nearby their neighbourhood. Technically, there is no authorised party who verified the submitted report on the web directory. However, the site is practising open data philosophy whereby the data are freely available to everyone, without restrictions from copyright, patents or other mechanisms of control.

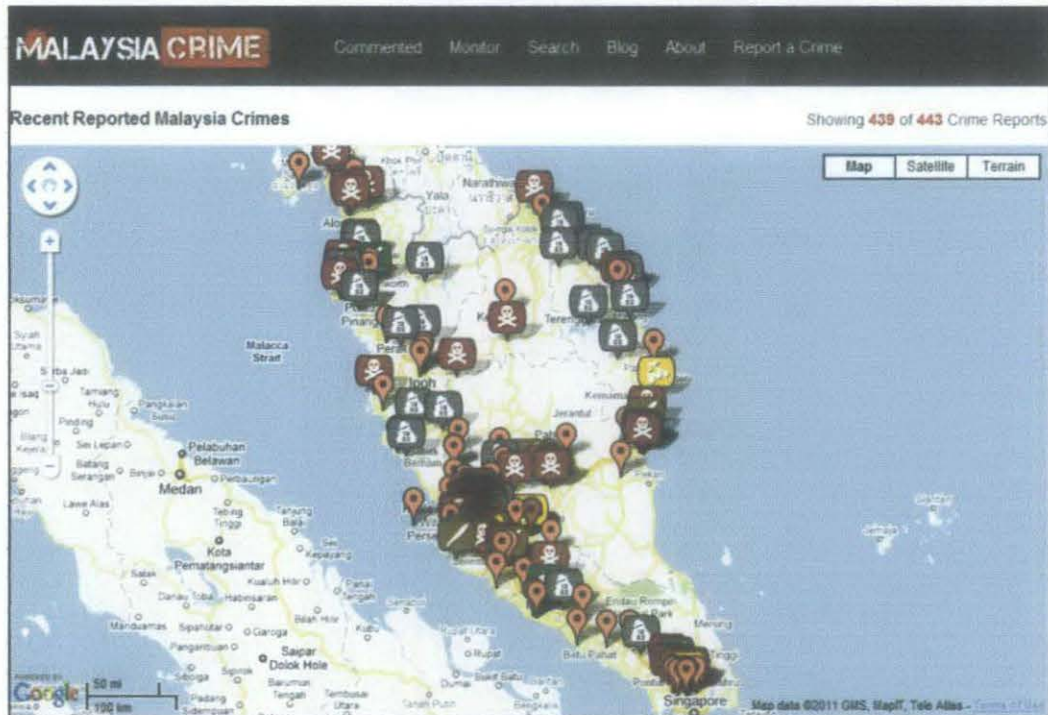


Figure 3.7: MalaysiaCrime Screenshot

Users also are allowed to edit the submitted report. Reporters will be given passwords after the submission of report. So, only the users with correct passwords are able to edit the submitted report. Furthermore, others also can leave comments on the submitted report.

Phase 3: Design and Development A Prototype

Development Model

Web development process usually does not take much time. The most effective development model to be used is *rapid prototyping*. Using this technique, prototype of the product can be produce in the early of processes and several objectives can be achieved which are:

- To decrease development time and cost mistakes
- To minimize sustaining technology changes
- To extend product lifetime by adding necessary features and eliminating redundant features early in the design

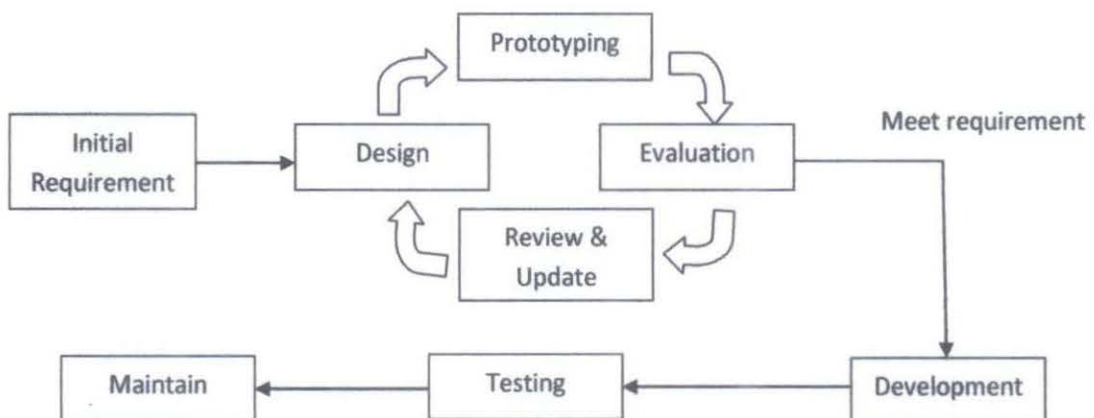


Figure 3.8: Rapid Prototyping Model

Development Process

The structure of the website will be designed first after all user requirements are gathered as following the *rapid prototyping model*. In order to make the prototyping process goes faster, a web framework named CodeIgniter will be use. After the prototyping process is done, the functions will be added up into the website. The next process is designing the database structure and the final process is to process the gathered data from the Phase 1.

Web Services

The main functionality in the web application is the mapping function. There are several companies that provide their API for public usage such as Google, Yahoo, and Bing. However, the Google's API is chosen because their services are reliable, easy to work with, and complete documentation. In the world history, it is proven that Google has provides very reliable services and their servers are never down compared to Yahoo which Yahoo's server was down back in 2006. Meanwhile, the Bing's services are not popular compared to Google or Yahoo.

Scripting Language

PHP is likely to be chosen as the scripting language in this web project because there are lots of developers who mastered the language and the community is very large compared to the PERL and the Ruby community. It is very easy to ask for help since PHP is known worldwide.

Phase 4: Evaluation, Testing, and Further Enhancement

Usability testing will be conducted as the release candidate version 1 (RC1) is ready for testing. Several users from different backgrounds will be selected to help the evaluation process.

The result and feedback from the testing will be use for further enhancement of the system.

CHAPTER 4

RESULTS & DISCUSSIONS

4.1 Comparison between Existing Directories

a) JAKIM directory.

Available feature(s):

- Search function with no option. Users are able to perform searching function but the graphical user interface (GUI) is poor. Users cannot perform specific searching and the results of searching are populated into a table.

Bil	Nama & Alamat Syarikat	Syarikat
1.	RASA AYAMAS SDN BHD LEVEL 14, WISMA KFC NO 17 JALAN SULTAN ISMAIL 50250 KUALA LUMPUR	28/02/2011 14/11/2011 31/03/2012 30/04/2012 30/04/2012 30/04/2012 14/07/2012 15/11/2012 31/12/2012
2.	AYAM KENS KINGDOM FOODSTUFF ENTERPRISE (M) SDN BHD 9, JALAN 10/108C, TAMAN SG. BESTI, 57100 KUALA LUMPUR, WILAYAH PERSEKUTUAN.	30/10/2011
3.	AYAMPLUS FOOD CORPORATION SDN. BHD. TANJUNG BEH DUAH, TRADING UNIT, 5001	14/11/2011

Figure 4.1: JAKIM Directory

b) HDC directory.

Available feature(s):

- Search function with more options, better than JAKIM directory. Users can search items according to the industry (small, small & medium, multi-national) and states. However, the result also populated in a table format.

The screenshot displays the Halal Directory website interface. At the top, there is a green header with the text "Halal Directory". Below this is a "Search Criteria" section with three input fields: "Text" (a text box), "Industry Size" (a dropdown menu set to "ALL"), and "State" (a dropdown menu set to "ALL"). Below the search criteria are "Search" and "Reset" buttons. A horizontal line separates this from the "Company" section, which features a yellow building icon and the word "Company". Below the icon is a green bar with four buttons: "2444 Company", "115762 Product", "3130 Premises", and "31 Abattoir". Below this bar is another green bar with "Company" text, "Item Per Page" (set to 20), "Page No" (set to 1), a "Search" button, and a pagination indicator showing "page 1 of 123". The main content area shows a list of companies under the heading "2444 Company". Three companies are listed: "B-DEX BEAUTY CENTRE SDN. BHD." with address "A9-1A, TINGKAT 1, SRI DAGANGAN, LORONG TUN ISMAIL 6, 29000 KUANTAN, PAHANG.", "BUMI INTAN MAJU SDN BHD" with address "No.24 Jalan Raja Bot, Jalan Raja Bot, 50300 Kuala Lumpur.", and "(BOH PLANTATIONS SDN BHD) TEH DARA SDN BHD" with address "TEH DARA SDN BHD BUKIT RIDAN ESTATE BATU 43, JALAN RAYA SEGAMAT/KUANTAN 26700 MUADZAM SHAH PAHANG DARUL MAKMUR".

Figure 4.2: HDC Directory

4.2 The Application's Flow

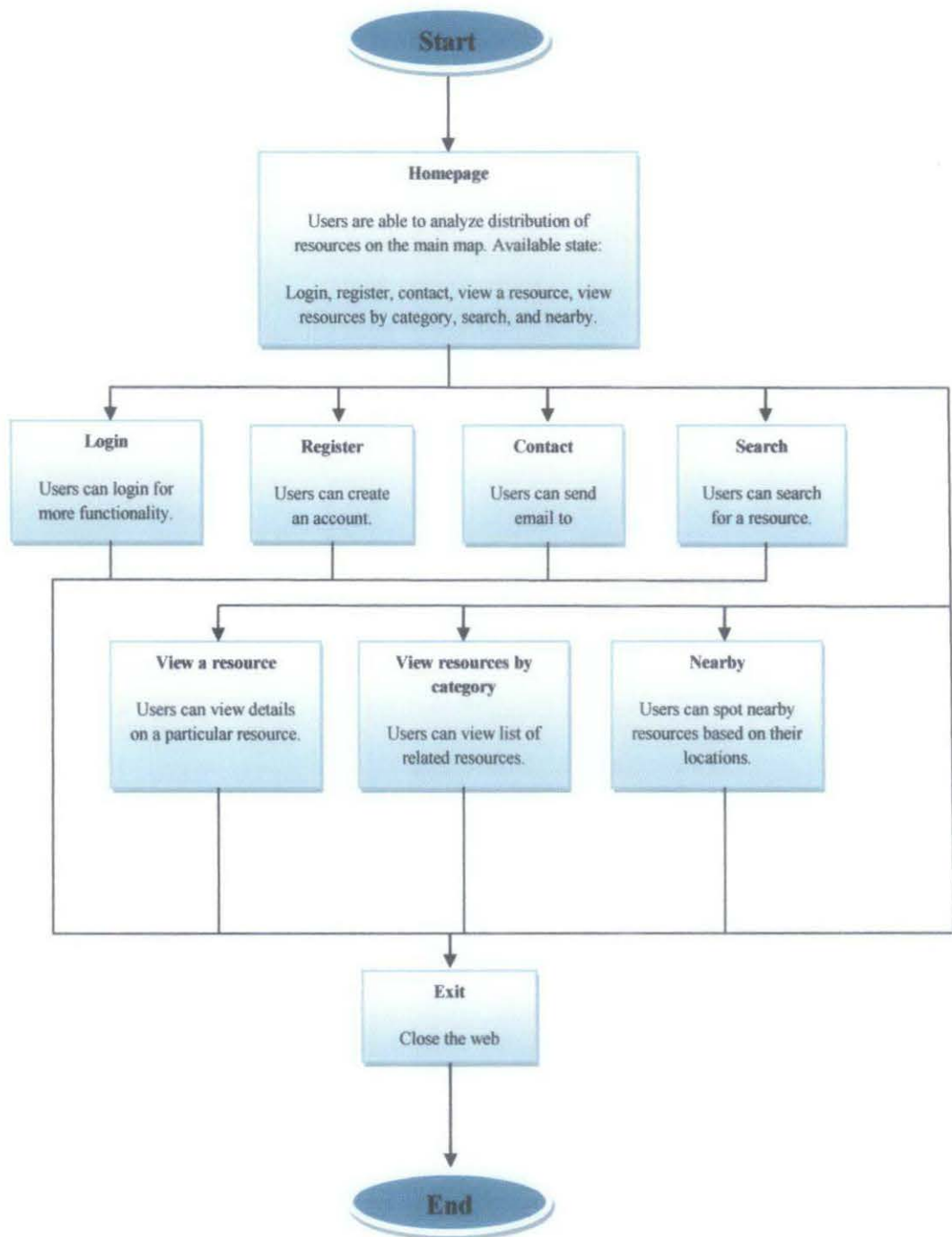


Figure 4.3: Application's Flow

4.3 Deliverable's Interface

Based on the analysis and review about the map mashups that have been developed by the others, the researcher has come out with the design as below.

4.3.1 Homepage



Figure 4.4: Homepage

When a marker on the map is clicked, it will open a new webpage which shows the detail about the marker.

The new page will show the detail about a particular services / product / supplier such as the address, contact detail, rating, comments, and halal status.

4.3.2 Item's Detail

Halal Maps Login Register

Home About Category Find Lat/Lng Search

AYAMPLUS FOOD CORPORATION SDN. BHD.

Map

LICENSE
Valid until November 14, 2012

DATA

Name
AYAMPLUS FOOD CORPORATION SDN. BHD.

Address
No. 1739, Jalan Bukit Panchor 14300 Nibong Tebal S.p.z. Pulau Pinang, Malaysia.

Contact
Email: ayamplus@gmail.com
Phone: 04-5931651

Direction
[Click here to get direction from your location](#)

DESCRIPTION

Reference number:
JAKM(S)(22.00)492/2/ 3 001-05/2004

Officer in charge:
Teh Saw Fang

Fax number:
04-593 2651

COMMENT (0)

Be the first!

COMMENT FORM

Please login to comment

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Disclaimer - Privacy Policy

Figure 4.5: Item's Detail

Users will be able to comment or rate the item after they log into their account. However, all comments will be reviewed by administrators first before published.

4.3.3 Login

The screenshot shows the Halal Maps website's login interface. At the top, there is a navigation bar with links for Home, About, Category, Find Location, Search, and Nearby. The main content area is divided into two columns. The left column, titled 'LOGIN FORM', contains a 'Login' button, a 'Login to your account.' heading, and input fields for 'Email' and 'Password'. Below these fields is a 'Keep me logged in:' checkbox and a 'Login' button. A 'Forgot Password' link is also present. The right column, titled 'REGISTER AN ACCOUNT', includes a heading 'Dont have an account? No worries' and a 'Create one now. It is easy!' section. The footer features logos for JABATAN KEWAJIBAN ISLAM, HDC, HALAL DEVELOPMENT CORPORATION, HALAL WWW.ID, and WEB SP, along with copyright information for Malaysia Halal Maps.

Figure 4.6: Login

Via this page, users also are able to retrieve new password if they lost their password. A confirmation email to confirm their identity will be sent to users who request a new password. The new password will be sent to the email after the users confirmed their identity.

The password is random generated. The administrators never know what the users' password is.

4.3.4 Search

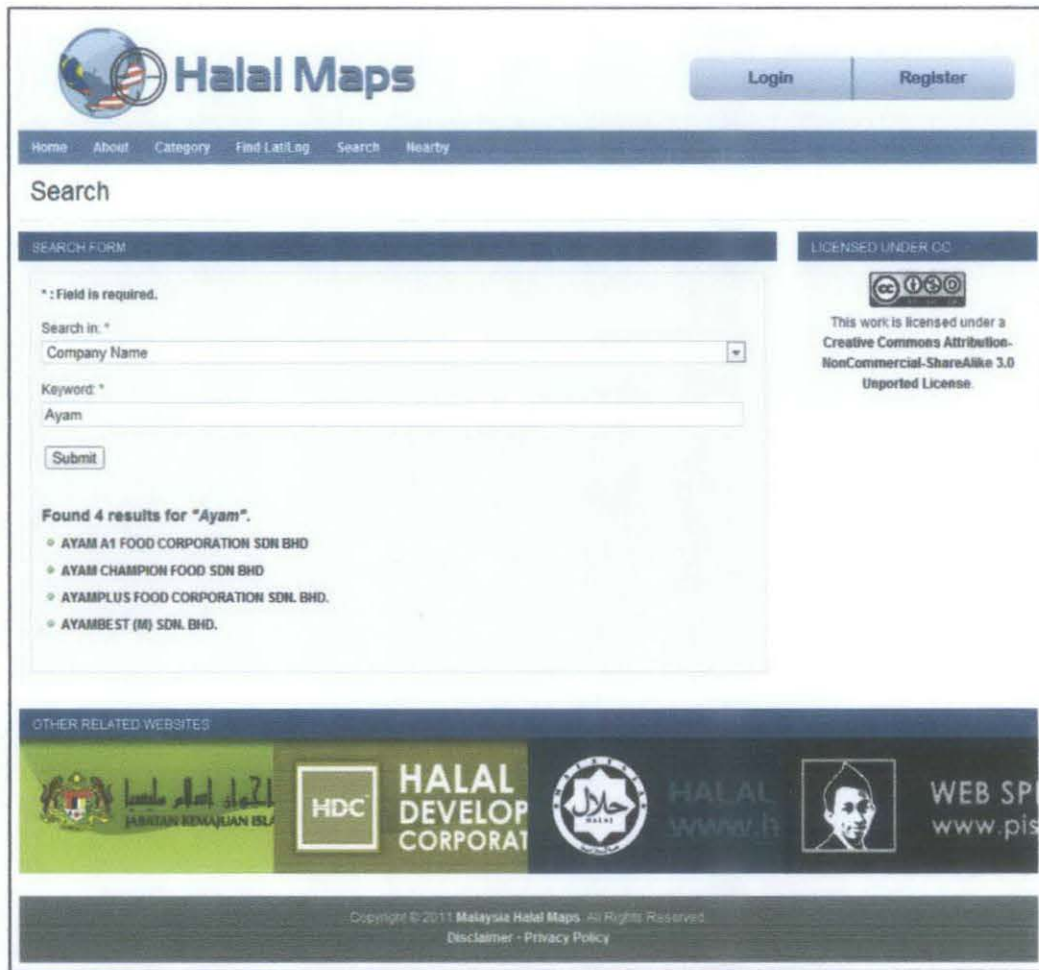


Figure 4.7: Search

Users are able to perform search using several options such as company name, address, category, and state. The result will be appears at the bottom of the search form.

The listed items are linked to their own page. So, to view more details of an item, users need to click on the item.

4.3.5 Nearby

The screenshot displays the Halal Maps website interface. At the top, there is a logo for Halal Maps and buttons for 'Login' and 'Register'. Below the navigation bar, the 'Nearby' section is active. The user's location is set to 'penang' and the search radius is 15 km. A map shows the area around Penang with a 15 km radius circle. Below the map, there is a legend with checkboxes for various categories: Abattoir, Agriculture, Beverages, Food Additives, Miscellaneous, and Pharmaceutical. A list of 2 resources is displayed below the legend, each with its name and distance from the user's location. The footer contains logos for HDC, HALAL DEVELOPMENT CORPORATION, and other related websites.

Halal Maps

Login Register

Home About Category Find Lat/Lng Search Nearby

Nearby

Your location: penang Radius (km): 15 (Default) Search

LEGEND

- Abattoir
- Agriculture
- Beverages
- Food Additives
- Miscellaneous
- Pharmaceutical

Unlick to Hide

Found 2 resources within the radius!

1. AYAMPLUS FOOD CORPORATION SDN. BHD. [9.659km]
2. NASMIR HARD GELATIN CAPSULES SDN. BHD. [10.58km]

OTHER RELATED WEBSITES

HDC HALAL DEVELOPMENT CORPORATION

HALAL WWW.HALALMAPS.COM

WEB SP www.pis

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Figure 4.8: Nearby

If there are resources within the radius, they will be listed just below the map. It also shows the distance between the resources and user's location.

4.3.6 Administrator Dashboard



Figure 4.9: Administrator Dashboard

4.3.7 Normal User Dashboard



Figure 4.10: Normal User Dashboard

4.3.8 Import External CSV

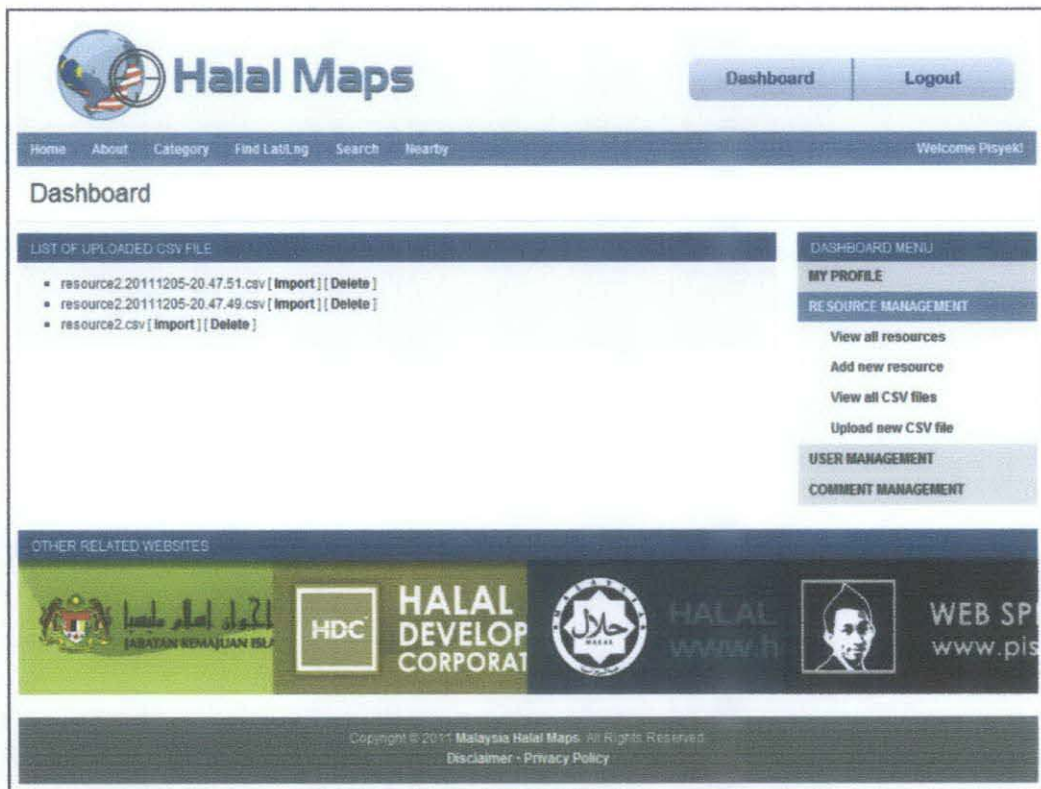


Figure 4.11: Import External CSV

Other than key in data one by one, the data also can be imported via csv file. However, the data in csv file must follow a specific format so that it can be able imported into database automatically.

4.4 Usability Testing

After the web application is ready for usability testing, 15 users with various backgrounds have been selected to perform the test. The users were given 10 minutes to explore the application. No instructions or guides are given during the test.

Below are the test's results:

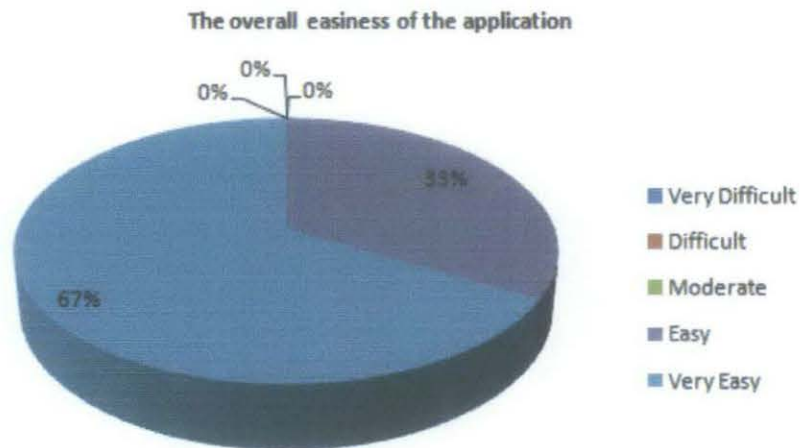


Figure 4.12: Learnability Result

5 of the respondents find that the application is easy to use while the others say it is very easy.

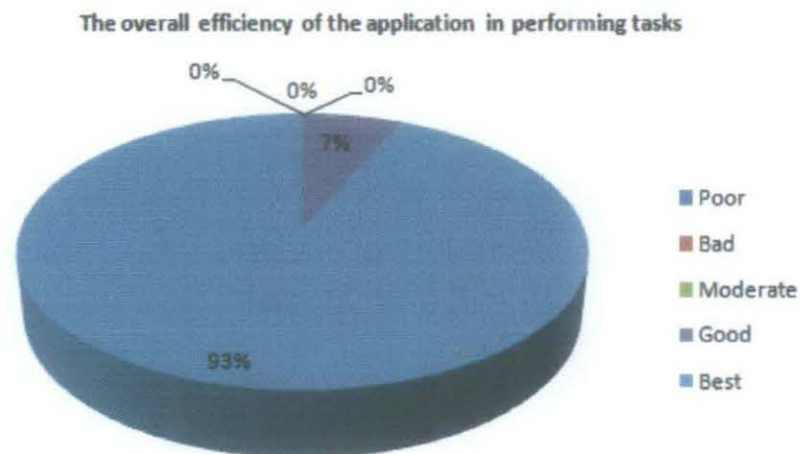


Figure 4.13: Efficiency Result

Almost all respondents say that the application is working as expected and it is easy to redo the tasks.

The overall satisfaction towards the application while using it

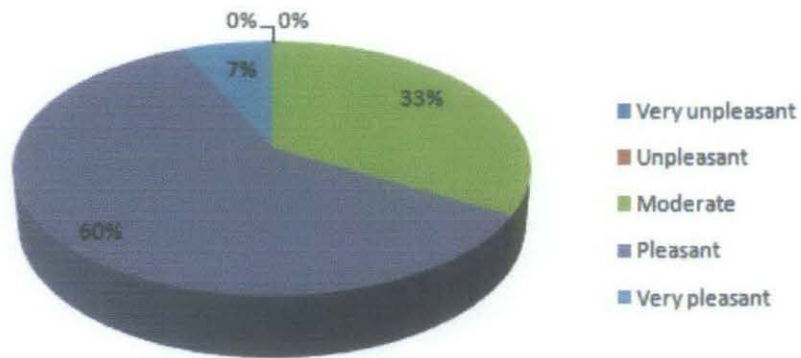


Figure 4.14: Satisfaction Result

5 of the respondents say moderate, 9 of them say pleasant and the other 1 say very pleasant. From the given feedback, they want the application to accept third party login such as Facebook or Twitter.

CHAPTER 5

CONCLUSION

Halal directory is a common thing nowadays. But with this mashup, users not only get a list of data, they also may know about the location and analyze the data up to what they need.

There are more works to be done to complete the application. One of the recommendations is to suggest JAKIM to open their API so that the developer can make use the data easily.

Furthermore, this application also can be built for mobile gadgets such as smartphones and tablets so that it is more convenient for users to use.

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APPENDICES

1. Gantt Chart

Task Name	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Dec
Map Mashup for Halal Industry in Malaysia										
Stage 1 - Proposal & Approval										
Submit Project Proposal										
Gain Approval on the Project Topic										
Submit Project Extended Proposal										
Stage 2 - Research & Development										
Phase 1 - Initial Planning										
Find and assess on literature review										
Gather requirement needed in order to develop the platform										
Phase 2 - Analysis										
Review related mashup										
Phase 3 - Design & Development										
Design and develop the platform										
Phase 4 - Testing & Evaluation										
Conduct User Acceptance Test on target user										
Get user's feedback										
Stage 3 - Submission										
Submission of Project Dissertation										