EXPERT SYSTEM SHELL BASED ON AIML AND FAQ

MASDUKI KHAMDAN MUCHAMAD

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DECLARATION

I declare that this thesis entitled “Expert System Shell Based on AIML and FAQ” is the result of my own research except as cited in the references. The thesis has not been accepted for my degree and is not concurrently submitted in candidature of any other degree.

Signature : .....

Name : Masduki Khamdan Muchamad

Date : 12 June 2017

APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Master of Computer Science in Software Engineering and Intelligence.

Signature : ……

Supervisor Name : Prof. Dr. Goh Ong Sing

Date : 12 June 2017

DEDICATION

I would like to present my thesis to those who did not stop encouraging me every day, my dear mother and kidness father. they never hestitate to provide me all the facilities to push me foreword as much as they can. This work is a simple and humble reply to their much goodness. I have taken over during that time. Thanks to my sisters, uncle, aunt and those entire how i love.

--- Masduki Khamdan Muchamad ---

ABSTRACT

In the 2016, Forbes Magazine put McDonald's as the best fast food chains. The main factor of McDonald's achievements is the customers convenience. Currently, the system that is running in McDonald's generally less effective and lack of its time efficiency. Based on this problem the author aims to develop an intelligent system based on AIML interpreter, this application called as McBot intelligent system which is web based mobile application by transforming it into an intelligent waiter. There are three knowledge base to build the McBot intelligent base, which are Annotated A.L.I.C.E. AIML (AAA) files, Domain Specific Conversation and Frequently Asked Questions (FAQ). To implement this research, qualitative approach is used in this research. The evaluation of the McBot's intelligence system is done by using black-box testing which is conducted using fifty datasets compiled from past competition questions of Loebner Prize Scored. The results of this testing was McBot was able to scored 72 points out of 100 points. Based on the result most of the questions are properly and correctly answered with total of 32 questions, 8 questions are partially met by the response and 10 questions are not met at all by the response. The results have shown that McBot has great potential being a conversation bot that can interact with end users. Even though the intelligent in this study is limited to only an general knowledge base and promotion, more information about the product can be added in the future. The contribution of this project is to build the McDonald's expert system shell to adapt generic AIML and FAQ.

ABSTRAK

Pada tahun 2016, Forbes Magazine meletakkan McDonald 's sebagai rangkaian makanan segera yang terbaik. Faktor utama pencapaian McDonald 's ialah kemudahan pelanggan. Pada masa kini, sistem yang di gunakan dalam McDonald 's pada umumnya kurang berkesan dan kecekapan masanya juga sangat teruk. Berdasarkan masalah ini pengarang mempunyai sasaran untuk membina satu sistem pintar berdasarkan bahasa AIML. Nama aplikasi ini ialah sistem pintar McBot yang merupakan aplikasi mudah alih berasaskan model web dengan mengubah ia ke dalam pelayan pintar.Terdapat tiga kaedah untuk membina McBot pintar ialah Annotated A.L.I.C.E. AIML fail, Domain Specific Conversation and Frequently Asked Questions.Untuk mendapatkan data, pendekatan kualitatif digunakan dalam penyelidikan ini. Penilaian sistem perisikan McBot dibuat dengan menggunakan ujian kotak hitam yang mana dijalankan menggunakan lima puluh set data yang dikumpulkan dari soalan-soalan pertandingan lepas iaitu Loebner Prize, Domain Sepific pintar dan McBot Learning. Keputusan ujian ini mendapati McBot mendapat 72 mata daripada 100 mata. Berdasarkan keputusan ini, sebahagian besar soalan dijawab dengan betul dengan jumlah 32 soalan, 8 soalan sebahagiannya dipenuhi dengan jawapan dan 10 soalan tidak ditemui langsung dan tidak di jawab. Keputusan telah membuktikan bahawa McBot mempunyai potensi yang besar menjadi bot perbualan yang boleh berinteraksi dengan pengguna umum. Walaupun demikian McBot pintar dalam kajian ini dihadkan pada pejabat penerangan umum dan promosi sahaja, lebih banyak maklumat tentang produk dapat ditambah pada masa akan datang. Sumbangan projek ini ialah untuk membina sistem pakar shell daripada McDonald's untuk menyesuaikan diri AIML generik dan FAQ.

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CHAPTER I

INTRODUCTION

1.1 Background of Study

McDonald's is the largest franchise in the world with 36.290 franchise units. The company's business began in 1940 with the opening of a restaurant by Mac McDonald and Dick in California. McDonald's introduced the "Spedee Service System" in 1948, which later became the basis modern fast food restaurants. The first McDonald's icon named Speede, He is a man wear a hamburger shaped head that uses a chef's hat. Speede was replaced by Ronald McDonald in 1963. So, during the 1950s until the 1960s, the McDonald's burgers are the fast food product, which distributed by direct sales. At 1955 Ray Kroc (owner of McDonald's) began selling franchises and for the first time in the San Bernandino, California uses a franchise system (McDonald's, 2016). The franchise system appears in standard style like we see today. There are many system services that are applied in several franchise chains that are Drive Thru, Customer Order Display, Kiosk, Mc Cafe and delivery order. Certainly the service serve based on problems that are arranged carefully and fully documented by detailed agreements between the companies in this regard is a McDonald's and franchisee (Klein, 1995)

McDonald's services applied to serve ordering currenly are direct services as we found in some places, especially in Malaysia. In this system, the customer service called "counter crew" must welcome the customers that come and take the tray on the table. After introducing the menu, crew asked whether to eat here or take home. After the crew

finished calculating the price then the customer pay the order and th order will be made. In the service of McDonalad's, the maximum amount of time specified in the service is around 3 minutes. The Crew serves the order using the FIFO system that is first in first out, meaning that first delivery or the first order to be taken so that no food can be left behind. Once the menu is complete, the customer has to take orders and show their bill to the crew. In the direct services, data will be recorded after the payment is done. All of the systems have the strength and weakness. The weakness of the system is that the customer has to wait. To get the order, they must pass through the two processeees. The first time is waiting for the order process (queuing) and the second time is waiting for the cooking and packing process.

Another system that is applied at McDonald's is the kiosk system. Kiosk system is to reduce the problems of the direct service system. Kiosk system can be found in the developed countries, like Australia, Canada, United State of America etc. In this system there is no customer service (crew) in general. However, customers will be provided services by LCD touch screen. The kiosk system technology aims to speed up the ordering process. Also this technology gives people more control over customizing their food, also reducing opportunities for human error. Kiosk system technology is supported by payment machines where customers can order and pay by EDC machine (Electronic Data Capture) or credit card. Of course this process is faster than the normal service. But the problem is the same, customers should wait and no activity after order. Beside that, this system uses one-way system which the machine only serves order without delivery. To determine their order, they should be alert to observe the order at the counter. Whether the order is done or not?

Figure 1.1 McDonald's Direct Service (McKroes, 2015)

Figure 1.2 McDonald's Kiosk System (Phuong, 2015)

Based on the problems above, the author has the aim to develop an intelligent system based on AIML interpreter. This application system is powered by McBot to entertain customers while waiting for the orders. This system will speed up the ordering process. That's because the existing system in an application is integrated to the website. To perform an order, customers can use their smartphone or tablet provided by the outlet. They can select favorite menu to order. After determining their choice, they can verify the order and make a payment. Then the order will be sent to the kitchen for the processing. While waiting for the orders, customers will be entertained through McBot. They can interact with the McBot in the apps. The new owner of the chains can increase their intelligent on how to conduct the McBot by filling the question and answer form. When their order is ready, they will get the notification. They can take the order and do the payment at the counter.

1.2 Statement of the Purpose

The purpose of this research is to develop both web and mobile application intelligent system based on AIML interpreter. The target of this application is McDonald's fast food chains.

1.3 Problem Statement

McBot intelligent system is a model-based web mobile food application by transforming it into an intelligent waiter. Currently, the system that is running in McDonald's generally less effective and lack of its time efficiency. McBot Intelligent system is ready to be given to the new franchise. The McBot that is given by the franchisor is having the basic system of its application only. The franchisee should be able to improve the basic capability of the McBot based on the the information in their chains. Additionally, the franchisee needs to make their self as the admin of the application because the franchisor has given the application without the admin.

McDonald's fast food chains are still using the manual recordings. Customers have to queue to get the order and wait while the order is processing. Moreover, the frequent problems are often errors in the calculation process because of the redundant data input. That is because the customer takes the wrong orders or not picking it. As a result, orders that are served will be wasted. There are several reasons why the order is not taken firstly; it is because the customer was waiting for too. If it is happened, the customers and the McDonald's are lose out, because customer satisfaction does not met. If we identify deeper, the main problem that we found out is the efficiency of the application process.

1.4 Research Question

Based on the problem statements mentioned in section 1.3, the research questions for this study are identified as follows:

1. How to integrate the McBot application to the McDonald's fast food chains?
2. How to speed up the McBot intelligent system for the ordering process?
3. How to build McBot Knowledge generator for Franchisee?

1.5 Research Objective

Based on the research questions, three objectives are:

1. To integrate McBot to the McDonald's fast food chains.
2. To develop more efficient ordering system using McBot.
3. To build knowledge generator using AIML and FAQ.

1.6 Research Scope and Limitation

This research has its scope and limitation in implementing the application such as:

1. This research will be focusing on the ordering service in the McDonald's fast food chains.
2. The communication of this application is limited in english input text.
3. This applications is developed by using Cross-Platform, Apache, MariaDB, PHP, and Perl (XAMPP) framework and Artificial Intelligence Markup Language (AIML) for bot knowledge bases.

1.7 Organization of the Thesis

This thesis is organized in the following orders:

Chapter 1: Introduction

This chapter introduces the background of McDonald's services system, the problems that is facing by this appliation, the objectives of this research and the proposed solution.

Chapter 2: Literature Review

This chapter reviews the reliable literatures from intrnational journals, papers, articles on McBot Intelligent system. Lastly, the proposed solution which in this case are using NFC, Artificial Intelligent Markup Language, Program O, Chatbot and other fields.

Chapter 3: Metthodology

This chapter explain the methods applied in this research to achieve the objectives and the system architecture.

Chaper 4 : Implementation

This chapter discuss about software installation, McBot knowledge base and McBot Interface

Chaper 5 : Implementation

This chapter explain the evaluation and the result of black-box testing of McBot.

Chaper 6 : Implementation

This chapter concludes the research, discusses the advantages, limitation, conclusion and future work.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review explains the summary and essence from journals, papers, books, internet sources, magazine, article, report, handouts and the related lecture notes. The issue of this research will be described deeply by using Artificial Intelligent (AI), Chatbot, Artificial Intelligence Markup Language (AIML). Subsequently it would be focused on facts and findings.

The first question of this research is sought to determine that McBot intelligence system is able to speed up the ordering process. McDonald's ordering process system is still considered as slow. Therefore this chapter will explain more detail about NFC technology as a communication medium to accelerate wireless data communications. Besides the literature review will discuss the chatbot that will entertain customers while waiting for the process. This chatbot is one of the applications that is using the artificial intelligence. The development of chatbot uses an AIML (artificial intelligent markup language) programming language and the discussions will be explained based on a study that has been conducted.

2.2 Fast food Restaurant

A Fast food restaurant is a specific type of restaurant characterized both by its Fast food menu and by business model. Fast food restaurants are typically part of franchise or fast food chains operation. Provisions Standardized ingredients or pack and supplies to each chains through controlled supply channels both management and recipe The menu served in fast food chains typically offer to a western food and limited menu; cooked in bulk in advance and keep warm; packaged to order and finished; and usually ready to take home though table may be provided. (Merriam–Webster, 1951).

Figure 2.1 Fast food restaurant logos in the world (iCanEat, 2016)

There are more than thousands of fast food companies in the world. Forbes magazine stated that currently there are at least 29 companies that master the fast food in the world. They are WingStreet, White Castle, Wendy's Supa Sundaes, Taco Bell, TCBY, Subway, Tim Hortons, Wendy's, Starbucks, Arby's, Quizno's, Pizza Hut, Nando's, McDonald's, Sonic Drive-In, Au Bon Pain, Long John Silver's, Buffalo Wild Wings, Krispy Kreme, Burger King, KFC, Carl's Jr., Dairy Queen, Jollibee, Hungry Jack's, Hardee's, Dunkin' Donuts, Domino's Pizza (Solomon, 2016). The name list of the fast food companies is shown in Table 2 as follows:

Table 2.1. Top 12 Biggest Fast Food Chains in the Word

No	Company	Since	Countries	Franchisee	Website	Mobile Apps	Excellent
1.	**McDonald's**	**1940**	**121 countries**	**35,000 outlets**	***www.mcdonalds.com/***	✓	**comfortable**
2.	**Subway**	**1965**	**107 countries**	**42,070 outlets**	***www.subway.com/***	✓	**taste**
3.	**KFC**	**1952**	**118 countries**	**18,875 outlets**	***www.kfc.com/***	✓	**cheap**
4.	**Startbucks**	**1971**	**64 countries**	**23,187 outlets**	***www.starbucks.com/***	✓	**speed**
5.	**Burger King**	**1954**	**95 countries**	**13,667 outlets**	***www.bk.com/***	✓	**variants menu**
6.	**Pizza Hut**	**1958**	**94 countries**	**11,139 outlets**	***www.pizzahut.com/***	✓	**service**
7.	**Domino's Pizza**	**1960**	**70 countries**	**11,000 outlets**	***www.dominos.com/***	✓	**speed**
8.	**Dunkin' Donuts**	**1950**	**33 countries**	**11,000 outlets**	***www.dunkindonuts.com/***	✓	**cheap**
9.	**Taco Bell**	**1954**	**30 countries**	**6,500 outlets**	***www.tacobell.com/***	✓	**comfortable**
10.	**Dairy Quen**	**1940**	**30 countries**	**5,700 outlets**	***www.dairyqueen.com/***	✓	**taste**
11.	**Papa John's Pizza**	**1983**	**33 countries**	**4,000 outlets**	***www.papajohns.com/***	✓	**speed**
12.	**Arby's**	**1964**	**4 countries**	**3,400 outlets**	***arbys.com/***	✓	**speed**