

A DEVELOPMENT OF HALAL CERTIFICATION FRAMEWORK USING
BLOCKCHAIN FOR MONITORING HALAL CERTIFICATE IN MALAYSIA

AMIRAH MAHIRAH BINTI RAZALI

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Faculty of Engineering
Universiti Teknologi Malaysia

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DEDICATION

Dad, this is for you. Mom, thank you for everything.

Husband, grateful to have you by my side in the adventure for the end of the race.

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ABSTRACT

The purpose of this study is to investigate and identify requirements for monitoring halal certification in Malaysia by using Blockchain technology and develop a halal certification framework by using blockchain for monitoring halal certificates in Malaysia. Researchers have studied every factor that influences information retrieval, communicative factors that include consumer confusion, consumer awareness, consumer attitudes towards halal products, and the level of individual religion are considered because halal issues are closely related to a Muslim. These factors are rarely taken care of today, especially Muslims who are required to comply with the law set by violating halal and haram. The interview method is done in a fast-food restaurant. This project conducted fast-food restaurant owners' interview methods and validation against other models to validate the framework. SHA-256 algorithm with hashing techniques has been used to secure halal certificates. This study found that organizational performance in the halal nutrition industry in Malaysia is influenced by various factors whether management factors through the blockchain-based halal certification approach in Malaysia, human capital factors, and also the organization's internal operations practices. Therefore, it is not surprising that the Malaysian government has outlined in the Malaysian Halal Certification Procedure Manual to overcome problems at the operational level. Finally, the issues concerning the blockchain-based halal certification in Malaysia are relevant, in ensuring that goods manufactured in line with halal standards and are acceptable to scholars, researchers, management and halal certification bodies, politicians, and the community.

ABSTRAK

Tujuan kajian ini adalah untuk menyiasat dan mengenal pasti keperluan untuk memantau pensijilan halal di Malaysia dengan menggunakan teknologi Blockchain dan mengembangkan kerangka pensijilan halal dengan menggunakan blockchain untuk memantau sijil halal di Malaysia. Penyelidik telah mengkaji setiap faktor yang mempengaruhi pengambilan maklumat, faktor komunikatif yang merangkumi kekeliruan pengguna, kesedaran pengguna, sikap pengguna terhadap produk halal, dan tahap agama individu dipertimbangkan kerana isu halal berkait rapat dengan seorang Muslim. Faktor-faktor ini jarang dijaga hari ini, terutama umat Islam yang diharuskan mematuhi undang-undang yang ditetapkan dengan melanggar halal dan haram. Kaedah temu ramah dilakukan di restoran makanan segera. Projek ini menjalankan kaedah temu ramah pemilik restoran makanan segera dan pengesahan terhadap model lain untuk mengesahkan kerangka kerja. Algoritma SHA-256 dengan teknik hashing telah digunakan untuk mendapatkan sijil halal. Kajian ini mendapati bahawa prestasi organisasi dalam industri pemakanan halal di Malaysia dipengaruhi oleh pelbagai faktor sama ada faktor pengurusan melalui pendekatan pensijilan halal berasaskan blockchain di Malaysia, faktor modal insan, dan juga amalan operasi dalaman organisasi. Oleh itu, tidak menghairankan bahawa kerajaan Malaysia telah menggariskan dalam Manual Prosedur Pensijilan Halal Malaysia untuk mengatasi masalah di peringkat operasi. Akhirnya, isu mengenai pensijilan halal berasaskan blockchain di Malaysia adalah relevan, dalam memastikan barang yang dihasilkan sesuai dengan standard halal dan dapat diterima oleh para sarjana, penyelidik, pengurusan dan badan pensijilan halal, ahli politik, dan masyarakat.

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LIST OF ABBREVIATIONS

JAKIM	-	Department of Islamic Development Malaysia
JAIN	-	State Islamic Religious Department
MAIN	-	State Islamic Religious Council
MCO	-	Movement Control Order
MiTI	-	Ministry of Trade International and Industry
NGOs	-	Non-Governmental organizations
NSA	-	National Security Agency
P2P	-	Peer-to-Peer
SHA	-	Secure Hash Algorithm

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Halal food is one of every Muslim's essential characteristics. There is a specific and comprehensive description of halal. There are two items that can be categorized into food: halal and non-halal. The food that Muslims cannot consume is non-halal. In Islamic terms, the ingestion of non-halal food will contribute to the flow of blood into the body. The Muslim community therefore takes the halal factor seriously because it affects everyday activities. For the Muslim community, food is a sensitive aspect, and it is important to highlight the means of production. A clean product can be assured through the process of making good food. With a halal logo, the issue of food's health and cleanliness can be minimized. It is important for every food industry to be certified with a Halal certification logo, regardless of organization, to ensure good food production.

However, there are some issues related to the approval of halal certificates in Malaysia which require the approval of religious authorities such as Department of Islamic Development Malaysia (JAKIM), State Islamic Religious Department (JAIN) and State Islamic Religious Council (MAIN). Thus, it is very difficult for the Muslim community to identify the actual halal certificate.

1.2 Problem Background

In January last year, Bernama reported that the Ministry of Domestic Trade and Consumer Affairs took action against two restaurant premises displaying expired halal certificates in an integrated operation, with both restaurants being investigated under Section 16 (1) of the Trade Affairs Act 2011. Meanwhile, a well-known Indian culinary restaurant in George Town, Penang has been charged by the state Municipal Council for displaying a halal logo without JAKIM's permission.

Meanwhile, in Kuantan, a Vietnamese food store in Kuantan Pahang is facing RM250,000 fine for abusing its halal logo and for packing its products in its premises. The Chief Executive Officer, Alwi Abdul Hamid, Pahang Domestic Trade and Consumer Affairs (KPDNHEP) said the action was taken following the second mistake in showing the halal logo without the certificate of halal referred by the Department of Islamic Development of Malaysia (JAKIM) (BERNAMA, 2019). Alwi Abd Hamid said that 63 restaurants were investigated in Malaysia and found guilty out of the two restaurants. To holders of JAKIM's issued halal certificates, the use of the halal certificate or logo is a mistake. Therefore, KPDNHEP took steps over the past couple of years to confiscate the halal logo on two premises to avoid misleading users as if the premises had been JAKIM approved halal.

In the year 2018, Malaysia represented just 1 percent of the global halal market, which proves that an open and trusted halal center has great possibilities and space for improvement. Although the Muslim population is expected to increase to 30% of the global population by 2050, one of the driving forces of industry growth, the exposure of the halal meat scandal is a set-back in Malaysia's rising halal industry (Jamari Mohtar, 2020). Nevertheless, the issuing authorities – in this case, JAKIM for halal certification – must go the blockchain path immediately, a constructive step to be placed in place.

1.3 Problem Statement

As we know, only JAKIM and MAIN can issue the Malaysian Halal Certification Certificate of Trade Order 2011 (Halal Certificate and Marking) where clearly provides that JAKIM and MAIN are the authority or authority to issue the Malaysian Halal Verification Certificate or to acknowledge that any food, goods or services relating to such food or goods are lawful under the Trade Descriptions Order 2011 (Halal Definition).

1.4 Research Objectives

The researcher proposes three research objectives as a guide throughout the research process based on the problem statement mentioned in the previous section. The objectives of the study include:

- (a) To investigate and identify requirement for monitoring of halal certification in Malaysia by using Blockchain technology.
- (b) To develop a halal certification framework by using blockchain for monitoring halal certificate in Malaysia.
- (c) To validate the developed blockchain-based halal certification framework by using expert interview and comparison against other models.

1.5 Research Questions

The main objective of this research is to monitor the integrity of halal certification in Malaysia. This research, therefore, answered the following research questions.

- (a) What is the requirement for monitoring of halal certification in Malaysia by using Blockchain technology?
- (b) How to develop a halal certification framework by using blockchain for monitoring halal certificate in Malaysia?
- (c) What is the process to validate the developed blockchain-based halal certification framework by using expert interview and comparison against other models?

1.6 Research Scope

The scope of the project is focused on Malaysia halal certification process, which is the premises of Malaysia. The framework is based on the procedures and processes of halal certificates in Malaysia.

This project involves the organization of premises and JAKIM. This project is based on the requirements of the premises using the checklist from the Malaysian Halal Certification Procedure Manual (MPPHM) and the Malaysian Standard (MS1500: 2009). Data collection is done to ensure the need for this project for the premises. These frameworks and applications are intended for the use of premises that have halal certificates throughout Malaysia.

1.7 Research Significant

This project will enable the premises to retain the halal certificates recognized by JAKIM and MAIN. File systems are made using blockchain-based computer technology that can securely store halal certificates. Indirectly, the premise does not have to worry about the loss and falsification of the halal certificate obtained. Premises can easily recover stored halal certificates. The premises can also monitor the use of

halal certificates carefully. In addition, the premises that use this system know the necessary procedures in more detail. This organization can ensure and monitor their premises to remain in compliance with JAKIM's procedures. This facilitates the premises to apply for and renew their halal certificates. The JAKIM also makes it easy to approve the application upon finding that the premises are following the requirements.

1.8 Research Outline

This section will provide an outline regarding the study to be conducted according to the phases as defined. It contains six chapters in this research.

- (a) Chapter 1 is to discuss about introduction, problem background that faced, research scope, objectives, research questions and scope about this research. Finally, significant of study are also addressed.
- (b) Chapter 2 is to introduces the different types and previews of theory relevant for this study. The study and hypothesis framework are based on previous research studies and the framework justification is addressed in chapter two.
- (c) Chapter 3 is contained and justify the methodology of research applied in this thesis. This chapter presents the methods for analysis used in this report. It starts with research, followed by framework design, application prototype, data collection, and methodology for data validation.
- (d) Chapter 4 is elaborate about the experiment design in which used during this research, the flow of the experiment and the setup. Since this research base on proving the propose method is better, thus, in this chapter also explain the modification had been done before the experiment.

- (e) Chapter 5 will include the validation and evolving HAL-Cert framework to make it ready to use as a knowledge representation infrastructure to support domain knowledge sharing.
- (f) Chapter 6 will discuss and conclude this study. This chapter includes summary of the findings, limitation of the research, future recommendation and finally the conclusion of the study.

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