INVESTIGATING THE USE OF CRYPTOCURRENCIES FROM THE PERSPECTIVE OF IIUM STUDENTS

BY

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A dissertation submitted in partial fulfilment of the requirement for the degree of Master of Protective Security Management

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ABSTRACT

The objective of the current study was to explore the perception of cryptocurrency among IIUM students with the assistance of the TAM model. This exploratory research data was collected among IIUM students and is focused on determining whether there is a positive relationship between the student's awareness, perception, usefulness, trustworthiness and their intention to use cryptocurrency. The study was conducted among 114 IIUM students, with the use of TAM model. Questionnaires were distributed among the participants of the study. Although there was a positive relationship between the variables of awareness, perceived usefulness, trust and intention to use cryptocurrency, its perceived ease of use by the students was found to have no significant indication.

خلاصة البحث

كان الهدف من الدراسة الحالية هو استكشاف ما هو تصور طلاب IIUM حول استخدام العملات المشفرة بمساعدة نموذج TAM. تم جمع هذه البيانات البحثية الاستكشافية من طلاب IIUM وهي تركز على تحديد ما إذا كانت هناك علاقة إيجابية بين إدراك المتغير وإدراكه وفائدته وموثوقيته ونية استخدام العملات المشفرة. أجريت الدراسة على 114 طالب وطالبه من طلاب IIUM، وباستخدام نموذج TAM، تم توزيع الاستبيانات على المشاركين في الدراسة. في حين أن نتائج الدراسة تتعلق بالفرضية، كانت هناك علاقة إيجابية بين متغيرات الوعي والفائدة المتصورة والثقة والنية لاستخدام العملة المشفرة، على الرغم من أن فرضية واحدة ثبت أنها غير متسقة حيث لم تكن هناك علاقة كبيرة ونية لاستخدام عملة مشفرة.

APPROVAL PAGE

The dissertation of Mohamed Sakhaau Shaheed has been approved by the following:

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I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Protective Security Management.

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DECLARATION

I hereby declare that this dissertation is the result of my investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Mohamed Sakhaau Shaheed

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I declare that the copyright holders of this dissertation are jointly owned by the student and IIUM.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Cryptocurrencies are a phenomenon that has been emerging since the release of an anonymous seminal paper titled "An electronic peer to peer payment system" by an alias named Satoshi Nakamoto ("White Paper"). This paper is referred to as the white paper of bitcoin or cryptocurrency (Swammy et al., 2018). The majority of cryptocurrency consumers and academicians who have reviewed the white paper believe that publication of this paper is the point where this whole cryptocurrency era began, though there were some seminal theoretical publications even way before the bitcoin white paper. Those publications did not present a robust foundation as this unofficial white paper by Satoshi Nakamoto did (Lee et al., 1996). The complexity of the underlying technologies is one of the issues that was addressed by this white paper.

Since then, this white paper has been studied by academicians/researchers. The positive outcome of these reviews brought sure-fire to the project. Based on the gained understanding through the academic community, the first blockchain was coded by a group of developers, and the first block was mined. (Mukhopadhyay et al., 2016). The first-ever cryptocurrency was called bitcoin. Bitcoin is the currency which was presented in the white paper as well. All the other cryptocurrencies which were deployed after bitcoin are called alt-alternative coins.

There is a point to be noted, that this white paper is not the first to talk about a peer-to-peer cash system. There were a few other papers which started talking about these peer-to-peer systems earlier on. However, those papers presented bits and pieces of a full system. Most of them presented ideas and partial models, whereas this white

paper presented an entire full-fledged peer-to-peer cash system (Mukhopadhyay et al., 2016). This peer-to-peer cash system is also known to be a potential candidate for replacing the current fiat currency.

These early publications did not bring any momentum to the cryptocurrency moment of growth, where the release of the white paper did. Having said that and from a consumer point of view, how cryptocurrencies have been used have drastically changed within the years since the publication of the white paper. The intention of use of cryptocurrencies by people is unknown. Let's talk about a few differences the consumers are facing in consuming the cryptocurrencies (Mukhopadhyay et al., 2016).

The change happened not only in the fundamental acquiring of cryptos, in the early days of cryptocurrencies. Bitcoin was the only cryptocurrency which existed. The consumers were able to mine bitcoin through their personal computers processing power without requiring any additional computational power. Mining is one of the few ways a consumer can get cryptocurrencies. The rate in which the consumers acquire cryptocurrencies were, in an hour they would be rewarded 50 BTC for mining a block. Back then the computational power of a personal computer was enough to mine one block. The blockchain is designed as such that, with every solved block the difficulty level to solve the next block increases. So now with one personal computer, it is nearly impossible to solve one block. To tackle this issue a concept called as pool mining was introduced (Chiu & Koeppl, 2017).

Hence, the increase in difficulty level pool mining concept was introduced. Where the miners could be geographically located in different parts of the world and they contribute by lending computational power from their personal computers or mining special hardware. In pool mining, the miners are identified by their wallet addresses. Once a block is solved all the miners who were present in the pool and

contributed to solving the block are rewarded with some of the cryptocurrencies. Also, the pool has a fee which will be charged before the dividends are deposited pool miners (Chiu & Koeppl, 2017).

Addition to that, the other change faced by consumers is the management of the ledger. Earlier days to be a part of the blockchain the end-user had to get a copy of the most recent ledger from blockchain one of the nodes on to their local storage drives. Their ledger had to be constantly updated with the newly added transactions and other activities within the particular blockchain (Jourdan et al., 2019). With time the number of consumers has been increasing. This led to an increase in transactions and a whole lot of activities in the blockchain. It ended up increasing the file size of the ledger and now it is massive in size. According to blockchain.com (Blockchain, 2019) the bitcoin block size including all the transaction headers is a total of 245.316 GB up till October 2019. With this data, the massive response and activities within the blockchain could be understood.

Similar to the case of mining trend, managing the ledgers and being a part of the blockchain is no longer practised differently now with the increase of size and difficulty of the blocks. The pool maintainers manage the ledgers instead of the end-users. Earlier it used to be the end-user with a local copy of the ledger and managing it locally. Back then this was possible as the ledger size was not as massive as this and with a decent internet connection, it's possible to download the entire ledger. However now the ledger is massive on top the activities are high along with the difficulty levels of the blockchain. So instead of managing the ledgers by individual consumers (Jourdan et al., 2019).

The ledgers are managed by a different party. Commonly through cloud-based services. This way the end consumer does not have to have a copy, or a ledger copy or

local wallet to manage their cryptocurrencies. Instead, they access and use these services through online cloud platform/interfaces provided by huge blockchain node managing groups. Who also provide the pool mining services alongside with their mining hardware, crypto wallets and some of these service providers even give opportunities to rent cloud mining with a monthly or annual subscription. So, the consumers who wish to mine does not have to maintain their mining hardware 24/7 running. Instead, maintenance is taken care off. Just must invest in mining power. Through one of the parties who are providing cloud mining services (Veselý & Ždník, 2019).

The changes have bought some flexibilities as well as some more fees to consumers. The blockchain node managers, crypto wallet issuers and cloud mining service providers. These parties have found a clear business opportunity within the system and are providing these services to cryptocurrency consumers to a fee. With this said, there must be fundamental necessities to be a part of this and be using cryptocurrencies. As we have looked into earlier days and now to be a consumer what practices are being used within the cryptocurrency consumers (Chiu & Koeppl, 2017).

As cryptocurrencies are a part of the digital world and to be able to use them or interact with them requires an internet connection at least. Cryptocurrencies were introduced to be a potential candidate to replace the current fiat currency. In fiat currency there are no prerequisites however in cryptocurrencies there are some prerequisites in cryptocurrencies. For example, the consumer must be connected to the internet. Must have a fundamental understanding of what the technology is about. Also, own hardware, software, paper or cloud crypto wallet to hold their cryptocurrencies. But in the case of fiat money, even without owning a wallet, someone can keep them. Though modern ideology is to own a wallet (Barbosa et al., 2018).

When we look into the world internet usage statistics and the world population. The world population till October 2019 is around 7.7 billion from United Nations data and according to internetworldstats.com (WIUS, 2019). The population who has internet access from the globe is around 4.7 billion. Slightly over 50% of the world population (WIUS, 2019). As the internet is one of the pre-requisites to cryptocurrencies, these statistics show a great gap in reaching cryptocurrencies to the world population. Where in the case of fiat currency as long as consumers belong to one of the countries on earth. Surely, they must be exposed to some form of fiat currency. Most likely it will be their national currency. These are some of the challenges to cryptocurrencies and consumers (Mahmoud et al., 2019).

Another worrying factor is that cryptocurrency is not regulated or owned by anyone. Even the underlying technologies like blockchain though the peace of code is written by someone or a team. The person does not have any power over what happens within the blockchain nor he/she has any power over the activities which is happening within the blockchain. In general, this is where the countries have issues in accepting cryptocurrencies as a method of payment or as a currency (Valdivia et al., 2019). As it is not a regulated system, and no one owns it. However, some of the countries have recognized cryptocurrencies and accepted it as legal tender. Japan is one of the few countries who has accepted cryptocurrency as one of their legal tenders. As this study is focused on Malaysia and IIUM – "International Islamic University Malaysia" students in specific. We will talk about Malaysia progress in recognition of cryptocurrencies. And how familiar IIUM is with cryptocurrencies based on known facts. Before that, we will take a look at the Malaysian federation standpoint in the matter of cryptocurrencies (BNM, 2018).

Malaysia is a multi-confessional country. However, Islam is granted to be the religion of the federation. Whenever a matter which contradicts the legal legislations of the country. A fatwa is call upon from respected scholars in Federal Territory Mufti Office also known as "Pejabat Mufti Wilayah Persekutuan" (Muftiwp, 2017). And if the matter requires further investigation/research or enlightenment. The project is backed by the Department of Islamic Development Malaysia also known as JAKIM. With this practise Malaysia have carried a lot of researches in various disciplines including the matter of cryptocurrencies (SS Dato 'Seri Dr. Zulkifli Bin Mohamad Al-Bakri, 2018).

Malaysia does not recognize cryptocurrencies as a legal tender (BNM, 2018). However, the Malaysian public has been using cryptocurrencies. This is known from a fact which was presented by Deputy Chief governor Abdul Rasheed of Bank Nagara. According to him in Malaysia, an estimated amount of RM75 millions of bitcoin transaction along with other cryptocurrencies happen within a month. Resembling how involved the Malaysian public is with cryptocurrencies (SS Dato 'Seri Dr. Zulkifli Bin Mohamad Al-Bakri, 2018).

To safeguard and to ensure that effective measures are taken to the risk of an unlawful act such as money laundering and other unlawful activities using cryptocurrencies as every cryptocurrency market is subjected to Anti-money laundering Proceeds of Unlawful activities (Anti-Money Laundering, Anti-Terrorism Financing Proceeds of Unlwful Activities Act 2001, 2001) law. A policy was published by Bank Nagara Malaysia "Anti-money laundering and Anti-money terrorism Financing Policy for Digital Currency (Section 6)" (Anti-Money Laundering, Anti-Terrorism Financing Proceeds of Unlawful Activities Act 2001, 2001). Which made the existing cryptocurrency marketplaces in Malaysia to be more transparent. All the companies

who are involved in cryptocurrency activities are required to comply with the published policy.

These crypto marketplaces were required to report to Bank Nagara Malaysia along with the information such as business contact details and person held responsible for the activities which take place with the particular crypto exchange and many more. Also, this existing crypto exchange information's were publicly made available on bank nagara Malaysia website. However, Bank Nagara also states that these listed crypto exchanges are not in any means licenced, authorized or endorsed by Bank Nagara Malaysia to provide these services in Malaysia. The listing is being provided public as a countermeasure to the potential risk evolving in the crypto exchange market place and to make the services more transparent (BNM, 2018). Yet Malaysia is in the verse of regulating cryptocurrencies.

Let's talk about IIUM "International Islamic University Malaysia" and its familiarities with the cryptocurrency plus technologies associated with it. International Islamic University Malaysia (IIUM) was formed by Islamic scholars in Malaysia to establish Muslims in all the fields of knowledge. The proposal was met by Tun Dr Mahathir Mohamed, Prime Minister of forth Malaysia in the year of 1982. IIUM was formally established in the following year 1983 by the Malaysian government (IIUM, 1983).

Since then, the university has been at the forefront of a variety of leading research projects and academic conferences. The university offers major programs in various leading fields to PhD level. In addition to that, the university has also incorporated professional certifications in leading areas of information technology and also these certifications are offered to local as well as international students. (IIUM, 1983).

IIUM also facilitates various campuses throughout Malaysia. These places are dedicated to a different field of studies. The largest campus is in a way that the campus falls to two districts of Malaysia, Selangor and Gombak. which is also known to be the main campus of IIUM (IIUM, 1983).

About cryptocurrencies and related technologies. IIUM is the first Malaysian institute to use e-scroll service. A verification service for certifications issued by IIUM. To avoid fake certificates, which uses blockchain technology as a base technology for providing the service. Blockchain is also the robust technology powering all cryptocurrencies (Rusly, 2018). The institute has been a great contribution in powering research proceedings in the conflict of cryptocurrencies and Islamic shariah. These research eventually be the understanding foundation for Islamic scholars to release the fatwa in the matter of cryptocurrency. In addition to that, leading scholars in the field of cryptocurrency and related technologies are a part of the IIUM team. There are several publications regarding the topic of cryptocurrencies and related technologies by the university. Which also represent the contribution the institute has towards the matter.

1.2 STATEMENT OF THE PROBLEM

Cryptocurrencies have been introduced and have been in use since 2008. Even in Malaysia, the consumption rate for cryptocurrencies is estimated to be of close to RM 75 million in a month (Muftiwp, 2017). However, the factors for users using cryptocurrencies are unknown. And these factors are yet to be identified.

As we have highlighted above there are people using cryptocurrencies daily. The reason why they are consuming, advantages/benefits of using cryptocurrencies, disadvantages and what are the consequences which might arise of using

cryptocurrencies are all unknown matters which could be hypothesised but which requires a statistical backing to narrow down and to pinpoint the actual consumption factors.

1.3 PURPOSE OF THE STUDY

Student communities are excelled with knowledge and usually, they talk about the most recent studies and findings of their discipline. As such IIUM student community is also known to be one of the best to do research on different disciplines and to talk about the most recent findings on a matter. The purpose of the study is firstly to identify how well the topic of cryptocurrency is known within the IIUM student community and to figure out the relationship between the usage factors of cryptocurrency.

1.4 RESEARCH OBJECTIVES

The study aimed to achieve the following objectives:

1- To determine if awareness has a positive relationship with the intention to use cryptocurrencies.

2- To determine if perceived ease of use has a positive relationship with the intention to use cryptocurrencies.

3- To determine if perceived usefulness has a positive relationship with intention to use cryptocurrencies.

4- To determine if perceived usefulness partially mediates the relationship between perceived ease of use and intention to use cryptocurrencies.

5- To determine if perceived trustworthiness has a positive relationship with intention to use cryptocurrencies.

6- To establish the efficacy of the Technology Acceptance Model (TAM) in the current study.

1.5 RESEARCH QUESTIONS

1. Is there a positive relationship between awareness and intention of using cryptocurrencies by IIUM students?

2. Is there a positive relationship between perceived ease of use with the intention of using cryptocurrencies by IIUM students?

3. Is there a positive relationship between perceived usefulness with the intention of using cryptocurrencies by IIUM students?

4. Is there a relationship between perceived usefulness partially mediate, perceived ease of use with the intention of using cryptocurrencies by IIUM students?

5. Is there a relationship between perceived trustworthiness with the intention of using cryptocurrencies by IIUM students?

1.6 THEORETICAL FRAMEWORK

TAM could be explained with a very good question that is "Why do people use technology?". One theory to explain this is called TAM (Technology Acceptance Model). This model tries to explain why people use a certain technology. The theory states that people use technology as it is useful for them and easy to use. This theory was developed by Davis in 1989. At the time of production of TAM theory there were technologies such as email and word processing systems. And those could replace systems such as writing a letter by hand (Surendran, 2012).

The theory does not say about the technology itself, but it says a lot about how the users believe or perceive the technology that they are using to be. In other words, whether the technology is easy to use or is useful depends on the user's perception, not to the technology. So, this may change depending on how old the person might be or what gender the person be or the user's perspective to that technology. This is not because the technology is different to different people (Surendran, 2012). It is because people who use/consume them are different. For these reasons, TAM is a great choice to conduct this study. As such this theory was chosen and also, there are studies which have been done to assess the same factors as this study, that is to assess the cryptocurrency consumption factors using TAM and the application of TAM as a base theory worked well (Shahzad et al., 2018).

More in-depth explanation and why this theory was chosen over other potential theories will be discussed in Chapter 3.
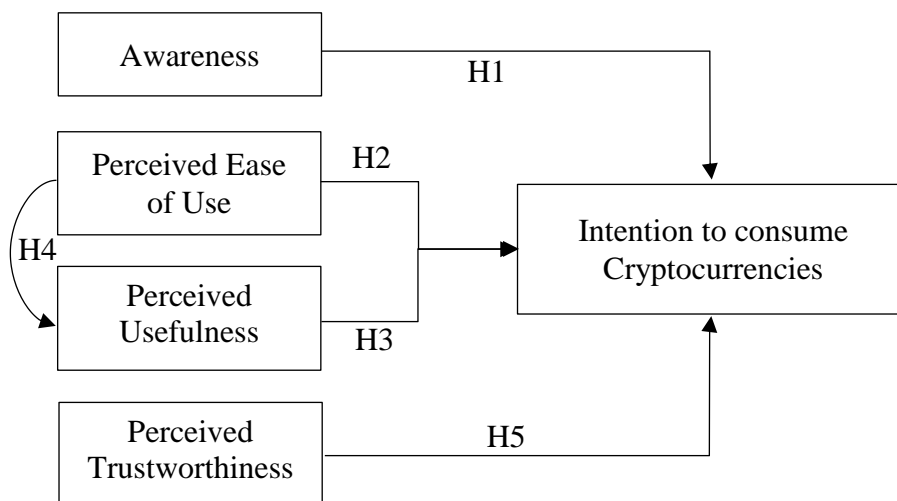

Figure 1.1 - Research Framework

The independent variables are "Awareness", "Perceived Ease of Use", "Perceived Usefulness" and "Perceived Trustworthiness". The depended variable is "Intention to use Cryptocurrencies".

This research model has been used in one of the studies like this paper. That was done in mainland China. With a sample size of n = 376, they focused on assessing whether there is a positive relationship between the factors with the adoption of cryptocurrencies among the people of china mainland (Shahzad et al., 2018). More on this study and other relative papers in the upcoming literature review chapter.

1.7 RESEARCH HYPOTHESES

The hypotheses are as follows:

H1   Awareness has a positive relationship with the intention to use cryptocurrencies.

H2   Perceived ease of use has a positive relationship with intention to use cryptocurrencies.

H3   Perceived usefulness has a positive relationship with intention to use cryptocurrencies.

H4   Perceived usefulness has a positive relationship between perceived ease of use and Intention to use cryptocurrencies.

H5   Perceived trustworthiness has a positive relationship with intension to use cryptocurrencies.

1.8 SIGNIFICANCE OF THE STUDY

As we have gone through the topic of cryptocurrency. It is understood that awareness and understanding of the technology as well the consumer point of view is very important to understand. In creating a policy for cryptocurrency related acts and to regulating cryptocurrency or even to refresh the current policy statements that a government has published into account cryptocurrency-related issues. These studies on consumers are very much important as the policies and regulations are made to manage and regulate the consumer's behaviour.