

Awareness, Trust, and Adoption of Blockchain Technology and Cryptocurrency among Blockchain Communities in Malaysia

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Abstract—Blockchain technology and cryptocurrency are attracting increasing attention from consumers, investors, investment industry and regulators. Cryptocurrency has great potential to be used for transaction or investment in the future. However, level of awareness of the blockchain technology and cryptocurrency is still at infant stage, specifically in developing countries. Thus, this study aims to investigate the level of awareness, trust and adoption of blockchain technology among blockchain community in Malaysia. Quantitative approach was adopted in this study where a new questionnaire was developed in the first phase to measure the level of awareness, adoption, and trust of blockchain technology applications among Malaysian blockchain communities. The resulting questionnaire consists of items on respondents' demographic, their awareness, trust, and adoption of FinTech particularly on blockchain technology and cryptocurrency. In the second phase, a pilot study was conducted to validate the new questionnaire from 304 respondents. Reliability test using Cronbach's alpha with a value of 0.908. A real survey was also conducted in this phase using the validated questionnaire and data were obtained online from 304 respondents. Descriptive statistics were used in the analysis during the third phase of the study, and results demonstrate that the awareness level of blockchain technology and cryptocurrency are at the intermediate level. Nevertheless, the majority of respondents are confident and trust that the blockchain technology can offer a stable and secure platform, which gives positive impact on the application of the technology. Empirical results provide significant insights into the development of the blockchain technology industry in the country.

Keywords— FinTech; smart contract; exchange and wallet services; Bitcoin; Ethereum.

I. INTRODUCTION

Blockchain, a financial technology (FinTech) has been around for over a decade with the birth of the first cryptocurrency called Bitcoin. As one of the most important FinTech, Blockchain provides a platform for digital interactions that do not require a trusted third party. Blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but everything of value [1]. Blockchain is built from three technologies, i.e. (a) private key cryptography, (b) peer-to-peer network and (c) the blockchain protocols.

Blockchain is a distributed database that keeps the transaction data in a block, which can be identified by a unique string of numbers or hash [2]. Each block is chained to the next block using a cryptographic signature, allowing the block chains to be used as a ledger. There are a timestamp and information link which points to the previous block. These ledgers are transparent between users on the network. As a distributed ledger, blockchain is stored locally on the computer hard drive of every user running a full version of the Bitcoin software. The two principal

characteristics of blockchain are its trust evoking and decentralized nature.

The integrity of data in the blockchain is ensured with public-key cryptography and its transparent nature [3]. The immutable design of the database enhances trust as once a transaction is added to a block, which in turn is added to the blockchain, and this transaction cannot be altered.

Blockchain was originally used for Bitcoin implementation. It was in 2014 that people began to realize the potential of blockchain, which has a greater extent than simply for cryptocurrencies. To date, blockchain is no longer confined within FinTech, although it is the technology that is seemed to revolutionize the finance, especially the banking industry [4]. Many organizations are starting to employ blockchain technology in other industries such as manufacturing, energy, healthcare, education, and insurance. The growing demand for technology is due to its potential to reduce costs and enable new business models and market places.

Moreover, this technology can manage data complexity, security, and ownership [5]. Previous research has focused exclusively on the aspects of technological infrastructure such as security, anonymity, scalability, or the resiliency of

consensus mechanisms [6]. Blockchain technology has been proposed to make the smart city smarter [7]. To enable this, a blockchain ledger can be used to buy or sell energy.

Blockchain has been described in different perspectives by many researchers, while many have regarded it as distributed ledger technology that has potential attributes of affecting the global economy and social transformation [8]. The study of [8] further argued that blockchain could be presented as a data structure for creating middle-free digital ledger transaction and securely allows access from anyone without central authority from the middleman like financial institutions.

Meanwhile, a study had operationally viewed blockchain as interconnected peer-to-peer technology that supports transaction of cryptocurrency and capable of recording transactions, agreements, contracts, and sales without the help of intermediaries [9]. On the other hands, other studies highlight that blockchain technology can store, read, and validated transaction in a distributed database system without interference of third party's authorities [10], [11]. Hence, this could infer that blockchain is a technology that gives a highly protected distributed ledger transaction to the users and investors towards eradicating issues of frauds and corruptions that peculiar to the traditional forms of ledger transaction.

Cryptocurrency is defined as an automated and decentralized substitute for the unconventional way to money issued by governments [12]. In other words, cryptocurrency is a digital currency that safeguards exchange-using cryptography [13]. On the other hand, cryptocurrency enjoys digital distributed consensus protocol between the users of the public ledger assets [12], [14]. The use of cryptocurrencies has been described legitimate since they have the same values and recognition as another legal tender [15]. Therefore, cryptocurrency may not be completely separated from other forms of currencies as it shares the transaction model of control and anonymous payment like traditional credit card or debit-card payment system. Hence, most cryptocurrency platforms do have an application-programming interface for acquiring market data without any form of restriction on the amount of data.

Bitcoin, as a form of cryptocurrency, has been the most widely adopted cryptocurrency with the most obvious potential for commercial and business application to goods and services [16]. However, the anonymity offered by bitcoin has been questioned in the sense of contributing true anonymity. Studies have argued that countless enhancement of anonymity in bitcoin is not helpful to trace the source of the money and beneficiaries [17]. This sometimes prevents the identity of money launders. Meanwhile, there have been different studies on understanding and perspective of cryptocurrency and blockchain among people [18], [19]. Hence, descriptive statistics, information theory, and network analysis have been stressed to use for a deep understanding of cryptocurrency's evolvement in the societies [20].

Studies have stressed that major benefit of blockchain technology is the evolvement of cryptocurrencies due to its provision of highly secure and integrity platform [8], [10], [11]. Many financial institutions adopted blockchain technology in their operations because of its low transaction

costs and optimization of transaction time. Besides that, blockchain technology dwelled on prospective attackers to compromise about 60% of their systems while intended to beat secured blocks without success and making them traceable [9]. This is due to the virtualization of the ledger books in the blockchain platform, making it impossible for the hackers to breakthrough, unlike the traditional ledger. Presently, blockchain technology is gaining more focus because of continuous support giving to its ecosystem by protecting them from online attacks, which are prominent in traditional ledger transactions. Studies have shown that blockchain has given enormous assistance to financial institutions and individuals through transparency transaction, preventing duplication of payments and ease traceability of data [21], [10]. These requirements can be achieved by applying sustainable software-development practices [22], which can lead to secure and trusted blockchain applications. Moreover, among the attractive attributes of blockchain technology are its accuracy and irreversible data transfer in the decentralized peer-to-peer distributed network [21] strengthening its fitness in financial institutions.

Awareness of blockchain and cryptocurrency is geometrically increasing in the recent, but in different directions based on the perspective of the users. Many people have become users and investors of cryptocurrencies like Bitcoin and Ethereum, which have opened ways for the creation of small and medium enterprises [23]. Besides, mining as one of the attributes of cryptocurrency gives authority to the individual (miner) to use his or her computer and power to solve blockchain algorithm and acquire more values of cryptocurrencies into their wallets. On the other hand, awareness of cryptocurrency among users or participants is still at an infant stage, specifically in developing countries. Some factors like security, lack of adequate knowledge of crypto handling, and government policy have been identified as a hindrance to the adoption of cryptocurrency [23]. Individual and business crypto-wallet could be stolen through malware attacks on computers or mobile devices using for mining. Some hackers had discovered a weakness in Android application, which could make some crypto-wallets vulnerable to attack [24]. Thus, some governments in the world, such as China and Brazil, do not support or slightly control the operation of cryptocurrency in their countries. This is to crackdown on the operation of money launders, tax evasion and to strengthen their local currencies.

In the context of Malaysia, the central bank, which is the highest banking authority, has welcomed the usage of cryptocurrencies (such as Bitcoin, Litecoin, Dogecoin) in the country for transaction and innovation purposes like mobile payments [23]. This is believed to open channels for self-businesses and surge in small-scale businesses. A study by [25] has revealed that there are 26 Bitcoin-accepting merchants with 2,000 Bitcoin users in Malaysia as of May 2017. However, this is considered low if compared with over 18 million users of cryptocurrencies in the world. Thus study on awareness, trust, and adoption of blockchain and FinTech is crucial for the cryptocurrency is to be used for transaction or investment in the future.

This study has looked into the awareness, trust and adoption of blockchain technology among blockchain

community in Malaysia, aiming to provide significant insight into the development of the Blockchain technology industry in the country. This paper is structured as follows: Section 2 presents the methodology of the study while the findings of the study are discussed in Section 3. Concluding remarks are presented in Section 4.

II. MATERIALS AND METHOD

A. Sampling Design:

Both random and non-random sampling can be employed [29]. Random sampling is referred to as probability sampling, as every element of the population has an equal and independent chance of being selected for the [28]. In this study, simple random sampling was adopted in selecting the respondents from the blockchain communities in Malaysia, as the goal was to facilitate generalization of the study findings. The respondents were drawn from blockchain and cryptocurrency user and industry practitioner communities in Malaysia, and they were identified through the eWallet system (<https://bcmy.io>) register offered by BC Venture Sdn. Bhd. Thus, the sampling unit is the blockchain community, comprising of users of the technology as individual respondents.

B. Procedures

Quantitative approach was adopted in the present study to examine opinions, behaviors, and attitudes of individual respondents. The study has been divided into three main phases: i) questionnaire development, ii) validation of questionnaire and real survey and iii) empirical study.

1) *Phase one, questionnaire development:* Extensive literature review was carried out to identify the issues and gaps related to the phenomena of interest related to blockchain, cryptocurrency, and Fintech. A literature survey is used to assemble the main ideas and information through revision of peer-reviewed journal articles, papers published in conference proceedings, as well as pertinent books, documents, and reports. Subsequently, the problems, related issues, and scope of the study were identified based on the knowledge gained. Specifically, the questionnaires employed adopted and adapted in developing the questionnaire used in this study [27], [28]. It aims to measure the level of awareness, adoption, and trust of blockchain technology applications among Malaysian blockchain communities. The resulting questionnaire consists of items on respondents' demographic, their awareness, trust, and adoption of FinTech, particularly on blockchain technology and cryptocurrency.

2) *Phase two, validation of questionnaire and real survey:* Since the questionnaire that has been used is considered a new questionnaire, a pilot study has to be performed to validate the questionnaire before it can be used for the real survey.

- Pilot study: The aim of the pilot study was to test how well the questionnaire is capable of measuring what it was designed to measure [31]. Indeed, the pilot study is necessary to perform because it allows the researchers to discover inadequacies that may result

in biases, as well as assess the reliability of measurement factors before the distribution of the questionnaire to the respondents in the real survey [32]. Also, feedback and suggestions from a blockchain expert were sought to ensure questionnaire validity before commencing the main survey. The expert's suggestions and comments were documented and implemented in the final survey questionnaire. Between 10 to 30 participants have been recommended [33] for a pilot study. Hence, 33 blockchain community members and users were invited for the pilot test. The questionnaire for the pilot test was distributed in mid-August 2017, and the responses were obtained in September 2017. To ensure that the questionnaire functions effectively, a reliability test using Cronbach's alpha was conducted. The alpha value of this pilot study is 0.908, which is considered good, as stated in [30] that values exceeding 0.8 are considered good. Subsequently, based on the information obtained from the pilot study, improvements in the wording of items were incorporated to the final version of the questionnaire for further clarity before the real survey was implemented.

- An online survey approach using Google Forms was used to capture survey responses, allowing easier data collection. This approach was chosen because it usually yields a higher response rate and the time taken to obtain the required data is faster, as it is available online in real time [34]. Potential survey participants were contacted via e-mail and were given the URL for accessing the online questionnaire. The real survey was conducted using the validated questionnaire on a population of 2,000 users and industrial players. Data were obtained from 304 respondents, giving a 15.2% response rate. These respondents worked in various companies, and there is a possibility of one respondent representing the same company. The survey was conducted from December 2017 until January 2018.

3) *Phase three, empirical study:* In this phase, data gathered were cleaned, coded, and rechecked several times before commencing the analysis and interpretation of the results. Descriptive statistics and correlations were used to examine the respondents' perceptions.

III. RESULT AND DISCUSSION

Results of the analysis are presented in two (2) sections: i) the respondent profile and, ii) the awareness, trust, and adoption.

A. Respondent Profile

Three hundred and four respondents participated in this survey. The blockchain community consists of 120 (39.5%) industry players and 184 (60.5%) end users as shown in Figure 1. The majority (98%) is Malaysian. More industry players are found in the lower age category as compared to the end users, which are more prominent in the age category of 35-44 and above. The highest academic qualification of the respondents is a Doctoral degree (1%); the majority

holds a Diploma (44%) as depicted in Figure 2. The trend of education level is the same for both industry players and end users. This shows that education background does not play an important role in determining the involvement of respondents in blockchain and FinTech. Blockchain is an open source platform that can be participated, explored, and used by anyone.

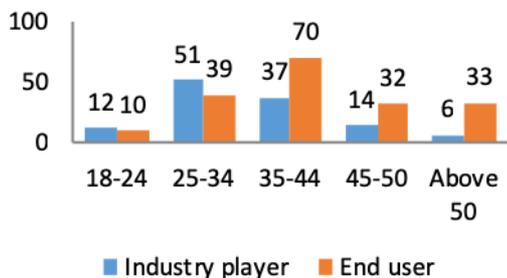


Fig. 1 Role in blockchain community by age

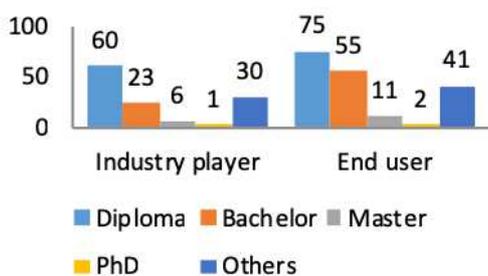


Fig. 2 Education level by a role in the blockchain community

Overall, respondents work in various departments within the organizations/ companies, including Administration/Human Resources (15%), IT (7%), Finance (5%) and Sales/Marketing (28%). The rest (45%) work in various other departments. The trend is the same for both industry players and end users. The majority (97%) of the companies are based in Malaysia where 43% of the respondents are involved in their company's decision-making; slightly more than half (56%) have more than ten years' working experience. Having knowledge in IT and finance is not crucial for those who want to participate in blockchain and FinTech. There is no dominant industry for industry players. The recorded industries are education, manufacturing, financial, healthcare, and ICT. Approximately one-third of the respondents are employed in small size companies with a workforce of less than 50. The majority are employed in medium-size companies while a small percentage (16%) works in large companies (workforce of more than 500 staff members).

B. Awareness, Trust and Adoption

The awareness level of the respondents concerning FinTech is at the intermediate level. The same awareness level also applies to blockchain technology and cryptocurrency. Findings concerning the knowledge level demonstrate a normal distribution curve, which reflects about 68% of the respondents' falls within the basic to master knowledge level.

The respondents obtained information about blockchain from various sources. Coindesk appeared to be the main source (25%), followed by Blockchain News (24%). Despite many other sources such as Bitcoin.com, The Cointelegraph, Reddit, Bitcoin magazine, LTB Network, and Blockgeeks, 23% of respondents seemed to prefer to refer to the 'Others' source (Figure 3). Twenty-five respondents as their preferred 'Others' have stated dinar Dirham. It comes as no surprise that Coindesk and Blockchain News became the most referred sources because their articles can be accessed easily through social media such as Facebook.

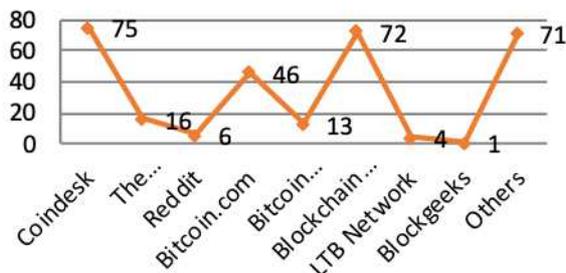


Fig. 3 Information source for blockchain

On the topic of obtaining updates on blockchain or cryptocurrency news, approximately half of the respondents update themselves every day, while a quarter does so once a week, and the remaining updates themselves every month.

Another result that was obtained revealed approximately two-thirds of the respondents knows a financial institution that has organized its blockchain alliance. In terms of start-up companies, the majority of the respondents recognize Dinar Dirham as the blockchain start-up company, while Neuware and Lux Tag are the least recognized. Moreover, the majority of the respondents have adequate understanding about the concept of inception, verification, and security of blockchain transactions. Slightly more than half of the respondents believed that none at their workplaces monitors blockchain or Bitcoin development.

Slightly more than one quarter (28.6%) of the respondents stated that "transparency with no alteration or deletion of transaction" is the most primary benefit of blockchain or cryptocurrency while the quality of data appeared to be the least realized.

In terms of familiarity with cryptocurrency forms besides Bitcoin and Dinarcoin, the majority (94.7%) of respondents were familiar with Ethereum, while Digital note was the least recognized cryptocurrency, as shown in Figure 4.

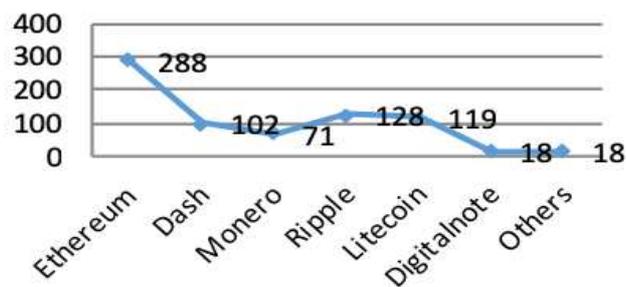


Fig. 4 Familiarity with cryptocurrency

Of all the 304 respondents, 27% confirmed that cryptocurrency is stable and secure, and 23% confirmed the stability and security of cryptocurrency. On the other hand, only 1% of the respondents agreed that cryptocurrency is totally unstable and insecure. The results demonstrate that the majority of the respondents are confident and trust that blockchain can offer a stable and secure platform. This is because blockchain uses distributed technology, which is difficult to be hacked and altered. In addition, blockchain provides transparent and secure traceability for cryptocurrency transactions.

Slightly more than 80% of the respondents stated that they used blockchain or cryptocurrency for Peer-to-peer payment. Very few of them used blockchain or cryptocurrency for gambling.

Further, concerning respondents' involvement with blockchain/cryptocurrency, their main involvement was due to investment even though a small percentage claimed that it was due to their work that requires knowledge in the blockchain. This applies to all 304 respondents, regardless of their years of working experience.

Revealing the type of blockchain products purchased by respondents in a multi-answer question, the majority (78.3% and 67.8%) have a history of purchasing Bitcoin and Ethereum, while very few have purchased shares in non-equity crowdfunding. Their main reason for purchasing the cryptocurrency is for investment.

In the aspect of respondents' thoughts on the current maturity stage of blockchain, more than half of the respondents confirmed that the present maturity stage has already had a significant influence on the blockchain/Bitcoin sector. Concisely, the majority of the respondents have positive thinking about the impact of blockchain technology.

As part of a multi-answer question, the majority of the respondents indicated that the American Dollar followed by the Malaysian Ringgit is the national currencies that support cryptocurrency. Recently, more Malaysians have been turning to digital currencies or cryptocurrencies as an investment alternative. This was indicated by 67.1% and 47.4% of 304 for American Dollar and Malaysian Ringgit respectively, as shown in Figure 5.

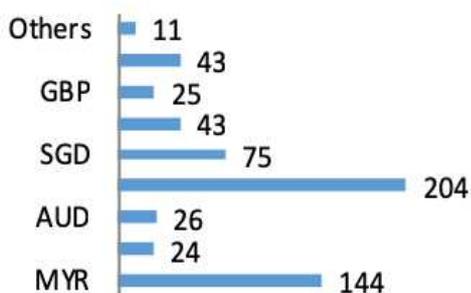


Fig. 5 National currency that supports cryptocurrency

Multi-answer questions were provided to the 304 respondents to gather information in the aspect of companies' market capital share, growth, and safe haven during the first three quarters of 2017. The respondents indicated that Bitcoin and Ethereum shared almost the same performance. However, Bitcoin has shown the most market share and significant growth and enjoyed the status of haven

assets during that period. The majority of the respondents (87.2%) confirmed that Bitcoin experienced the largest average daily transactions during the first three quarters of 2017. This is because Bitcoin is considered as the 'mother' of cryptocurrency. Similar to USD in the fiat money system where it has a significant impact on the market share. As shown in Figure 6, Bitcoin is the major cryptocurrency (84.2%) that is widely supported by participating exchanges, wallets, minings and payments.

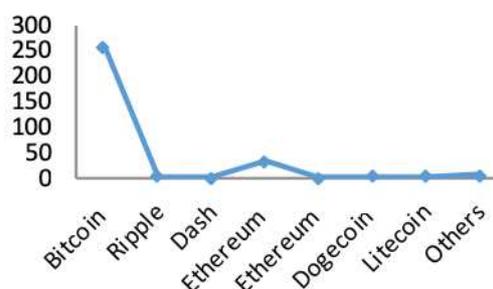


Fig. 6 Cryptocurrency usage by supporting services

Survey of 120 industry players revealed that a slightly smaller number of them are from companies that provide either exchange, wallet and payment service. Only about 40 industry players stated that their companies offered all three services and majority (55%) of them are from small size company in terms of workforce. Furthermore, in a multi-answer question about the types of services offered by the companies, results indicated that majority of the respondents are from companies with a small number of users. This shows that the small company is not bound by a complex organizational structure in the aspect of FinTech.

IV. CONCLUSIONS

Blockchain technology and cryptocurrency have already had an impact on individuals and organizations in Malaysia. Involvement in this does not depend on education level, age, or industry sector. Up to 2017, the level of knowledge on blockchain and related technologies reached the intermediate level but there are also a small number of experts. The blockchain community adopts the technology in various ways such as use for Peer-to-Peer payment. Besides Bitcoin, the blockchain community is familiar with Ethereum. Many purchased more than one form of cryptocurrency in which the main reason for their participating is due to investment as they have trust in the long-term vision and value of the tokens they purchased. However, the growth of the technologies could be hindered by government regulation. To date, the Central Bank of Malaysia has not issued any guidelines on blockchain or cryptocurrency, leading the community, especially financial institutions, to face various challenges in adopting the technologies. Future works could focus on awareness research for other than blockchain communities in Malaysia, and the application development of blockchain technology.

ACKNOWLEDGMENT

BC Ventura Sdn. Bhd. supported this research (Grant number: S/O code: 13792).

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