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Into the Look: Security Issues, Crypto-Hygiene, and Future Direction of Blockchain and Cryptocurrency for Beginners in Malaysia

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***Abstract*—This paper presents a brief overview of blockchain and cryptocurrency for beginners in Malaysia. Cryptocurrency is an innovation for financial technology (also called FinTech) which has been innovated based on the blockchain technology. The presence of several properties provided by blockchain allows cryptocurrency to be traded and exchanged in a virtual environment; just like the common currencies used today. However, as the processes for exchanging and managing blockchain and cryptocurrency are carried out over the Internet, users are vulnerable to several cyber-attacks. Besides, the existence of cryptocurrency may lead to other crimes such as money-laundering and online gambling. Therefore, this paper discusses security issues and crimes related to cryptocurrency. Furthermore, this paper proposes an improved crypto-hygiene as the guideline to mitigate and minimize the risk of cyber-attack which may also assist beginners who wish to involve with cryptocurrency or any blockchain applications in gaining some insights and opinions regarding blockchain and cryptocurrency.**

Keywords—blockchain, cryptocurrency, fraud, money-laundering, sharia-

I. INTRODUCTION

The evolution of digital technology has led to the innovation of financial technology. Blockchain technology has introduced cryptocurrency, a medium of exchange like the common currency system. Cryptocurrencies are a subset of alternative currencies and virtual currencies [1]. In Malaysia, an order which recommends the traits of digital currency aiming to enforce security laws in the country has been issued by the Securities Commission Malaysia (henceforth, SC). This order was later amended to fulfil market procedures that encompass a framework which managers of digital asset platforms ought to accomplish in order to be acknowledged by the SC. In the framework, the organization and administration of the entity, the procedures in risk management, coverage of customer assets, transparency, and market integrity are emphasized [2].

A document on the proposed approach to organize the Initial Coin Offerings (henceforth, ICO) was issued by the SC in March 2019. This document expresses that the ICO's assent by the SC is dependent on different measures and the enlistment of disclosure reports that fulfil specific requirements [3]. Besides, cryptocurrency has also become a stage for money-laundering, betting, and financing of terrorism which the central bank is unable to track [1]. Due to the anonymous nature of blockchain technology, a number of cryptocurrency-related scams have been reported [4]. The presence of a gap between consumers and technology has lead towards other security issues such as identity and wallet thefts [5].

Moreover, the advantages and importance of the technology offered by cryptocurrency and blockchain have attracted the attention of researchers from various fields, especially in the fields of information technology, finance, and economics [6]. Several studies and research work have been done on both blockchain and cryptocurrency including the application of blockchain [7], [8] and cryptocurrency [9], [10], the acceptance of cryptocurrency [4], [11], [12], the challenges of cryptocurrency [13], [14] and many more [15] - [18]. Meanwhile, the amount of cryptocurrency studies Malaysia is relatively scarce and limited.

Furthermore, cryptocurrency does not only attract the attention of researchers and businessmen or investors, but also general public regardless of their ages and backgrounds. Therefore, this paper provides a brief overview of blockchain and cryptocurrency in Malaysia. Section 2 presents the key concepts related to blockchain and cryptocurrency, respectively. Security and crime issues in blockchain and cryptocurrency are reviewed in Section 3; while in Section 4, an improved crypto-hygiene is presented. Finally, future directions for blockchain and cryptocurrency in Malaysia are discussed in Section 5 and Section 6 concludes this paper.

II. BLOCKCHAIN AND CRYPTOCURRENCY

The digital asset industry is one of the best and it is a business that allows industry players to work and communicate effectively in different time zones and enables remote management. Cryptocurrency is one of the highest financial technology innovations that is bringing change to our current global financial sector and economy. This digital currency consists of sequential hashing and digital signatures created through encryption techniques. This process is performed by thousands of computers around the world that has replaced the responsibilities of several entities (banks). The act of a digital currency transaction from sender to receiver and verified in a general ledger is known as mining process [6], [7].

A. Approved Digital Asset Exchanger (DAX) in Malaysia

As a result of the Capital Markets and Services (Securities Prescription) (Digital Currency and Digital Tokens) Order 2019 which was issued on 15 January 2019, the SC has now enrolled three Recognized Market Operators (RMOs) to build up and work on the exchanges of digital assets in Malaysia. Moreover, the Guidelines on Recognized Markets which were modified on 31 January 2019 which present new conditions for DAX Operators were also issued. Besides, based on the Income Tax Act 1967, the Inland Revenue Board is currently drafting a rule on incomes acquired through cryptocurrency [19].

In Malaysia, the SC has exhorted the entities that have not been endorsed to automatically halt their operations and therefore return all cash and resources that have been gathered from investors. As indicated by the SC, prior to initiating businesses that involve digital asset exchange, the public is urged to allude to the authority's sites where the lists of endorsed operators of digital currency are regularly revised. The approach taken by all approved DAX is coaching and guiding. Due to the size of community involved in cryptocurrency is still small and controlled; each of the DAX has established a closed relationship and engagement with their customers. Table 1 shows the details of approved DAX in Malaysia [20].

TABLE I. APPROVED DAX IN MALAYSIA

DAX	Location	Digital Asset
Luno	Selangor	*Bitcoin, Ethereum, Ripple, Litecoin*
Sinegy	Pulau Pinang	*Bitcoin, Ethereum*
Tokenize	Kuala Lumpur	*Bitcoin, Ethereum, Ripple*

B. Regulatory Bodies

In Malaysia, there are two main regulatory bodies responsible to coordinate and produce standard regulatory framework for this emerging financial technology innovation. Bank Negara Malaysia (BNM) is accountable for ensuring the adherence to laws and guidelines under the domain of the two regulators. The subsequent organization is the Securities Commission Malaysia (SC) which controls the production of digital assets including digital currencies and tokens via the ICO. Additionally, the exchanges of digital assets at digital assets exchanges in Malaysia are also monitored by the SC [21], [22].

With an end goal to advance precise and safe trading to investors, these digital asset-related guidelines are established for consideration and acknowledgment in the domain of securities law. Furthermore, in battling money laundering, online gambling and terrorist financing, BNM has to guarantee that ICO issuers and exchanges of digital assets associated with the issuance or exchange of digital assets with payment capacities should consent to the laws and guidelines that have been set as in the rules given by the SC [21], [22].

C. Blockchain

TABLE II. TYPES OF BLOCKCHAIN[7]

Type	Description
Permission-less	User participation does not need the consent of any entity because this blockchain has no owner. Therefore, a copy of the same ledger is distributed to all nodes in the network.
Permissioned	In order to identify trustworthy network nodes, user participation requires the consent of any entity as this blockchain ought to establish trust in a central coordinating entity. While, for open block type chains it can be accessed by anyone. However, only authorized network participants can perform transactions and / or update ledger status.
Closed or "enterprise" permissioned	Any transactions and ledger updates can only be performed by the network administrator. Like other blockchains, this blockchain also does not require a trusted third -party intermediary to perform authentication.

Blockchain is part of Distributed Ledger Technology (DLT) which functions by recording and sharing data via multifold data warehouses; known as ledgers. Within this data warehouse, a network of distributed computer servers, called nodes will handle the same data records and maintain them collectively [4], [7]. Inside the blockchain (a set) specialized mathematical algorithms will be used to create and validate ever -evolving data structures. This algorithm is known as cryptography whereby data can only be inserted while any existing data cannot be diminished. The blockhain has advanced properties compared to the tradition ledger system. Table 2 and Table 3 describe the types and properties of blockchain respectively.

TABLE III. PROPERTIES OF BLOCKCHAIN[7]

Property	Description
Peer-To-Peer	No central node required. Data can be exchanged between the participants directly.
Distributed	The ledger is advertised to the entire network.
Cryptographically Secured	Cryptography provides extra safety to the ledger from being compromised.
Add-Only	To maintain the integrity of the information, data must be included in the blockchain with consecutive requests.
Consensus	Decentralization requires the blockchain the ability to update the ledger through consensus.

Generally, the blockchain technology is closely known as the backbone of digital or virtual currency schemes, payments, and financial services. However, from a more detailed perspective, the scope of blockchain use is very broad and can be applied in various sectors including collateral pledges, registration of shares, bonds and other assets, on the transfer of real estate tiles, and on land register

operations. However, this study only focuses on the blockchain technology in cryptocurrency. Fig. 1 depicts the application of blockchain in cryptocurrency. Firstly, users will set up a wallet within the mobile application which stores the cryptocurrency in an address for payment purposes. When cryptocurrency is transferred from user A to user B, the blockchain technology will handle this process replacing the bank's tasks. Next, each user's account and transaction will be managed in the Distributed Ledger Technology (DLT) which will be advertised in the network [4], [7].

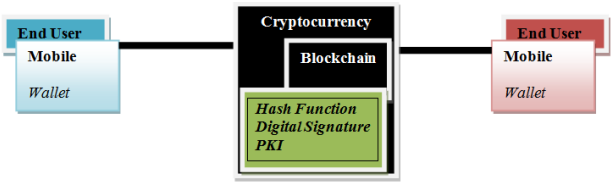

Fig. 1. The application of blockchain in cryptocurrency.

The main principles of the blockchain technologies are digital signatures and the Public Key Infrastructure (PKI). Public Key Cryptography is a cryptographic system that utilizes a couple of keys; the private key which will not be disclosed while the public key which will be broadcast to the network. The genuineness and integrity of the message delivered via this system is guaranteed [23], [24].

Bitcoin uses Public Key Cryptography to ensure the integrity of messages created in protocols involving the creation and signing of wallet transactions. To enable the public address used by Bitcoin users to send and receive funds, Bitcoin uses a public key with a hash function. In order to sign a digital transaction in guaranteeing the validity of the transaction, the private key is utilized. Since Bitcoin is decentralized, Decentralized Public Key Infrastructure (DPKI) is utilized whereby there are concerns related to building up trust relations between all parties. Be that as it may, today, there is no requirement for the third-parties whereby blockchain acts as a novel way to deal with assembling a more capable and secure PKI framework. In the DPKI, blockchain goes about as the decentralized key-value storage that is equipped for getting the information perused to forestall MITM attacks as well as to limit third-parties' control [25].

In addition, with the presence of the blockchain technology in the system, DPKI settles the issues related to the traditional PKI system by guaranteeing that no single third-party can think twice about integrity and security of the framework. In blockchain-controlled DPKI, the new third parties are recognized as miners or validators where they should observe the standards of the convention that would financially compensate or punish these third parties to successfully overcome negative conducts in the blockchain as well as restricting their roles [25].

III. Security Issues and Crimes

Blockchain and cryptocurrency are still developing worldwide. Therefore, security issues and crimes related to blockchain and cryptocurrency are expected to rise. Since the introduction of Bitcoin, consequently, blockchain has been applied in large-scale today due to its robustness and integrity-support. However, there is still lack testing on the blockchain infrastructure especially on the endpoints of the cryptocurrency network for instance, the "wallet". As the ecosystem of blockhain grows, more vulnerability could be discovered and exploited by hackers. Furthermore, because of the regulation standardized for the cryptocurrency is still insufficient and there are only few countries that own it, there are groups of people who gain benefits from the anonymity of the blockchain itself (such as money-laundering and gambling activities) or from the mistakes of others (for instance, victims of scams and frauds).

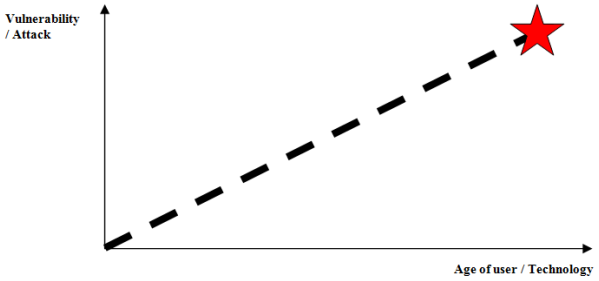

Fig. 2. Relationship between age of user – technology and the vulnerability - attack.

Fig. 2 shows that the technology is growing together with risk such as cyber-attacks that can be harmful towards end users of the technology. Users that use the technology vary in terms of age. For the elderly, the gap of the technologies during their time and todays' technologies is the main concern because it requires users to have knowledge on how to use the technology wisely. The elderly is an age group that is more vulnerable to be compromised by the irresponsible persons [5].

In addition, users of cryptocurrencies are vulnerable to cyber-attacks regardless the types of cryptocurrency [26]. Due to the advancement in information technology and the acceptance of using social media, the chances for cyber-attack such as fraud or scam also increase. Fraud can be described as a fraudulent activity by using the advantages of the Internet, either through emails, websites, or social media. Often, these fraudulent activities will offer goods or services that do not actually exist or in other words, are counterfeit to consumers [4]. Other than that, another technique of scamming is by social engineering that is done by obtaining confidential information by taking advantage of an individual's weaknesses through persuasion or temptation techniques [26].

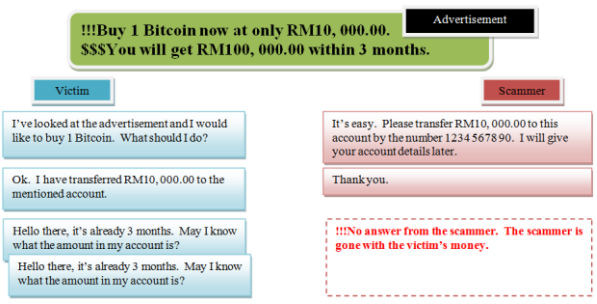

Fig. 3. A Scenario of cryptocurrency scam.

Commonly, crypto-scammers develop a website that can convince users to buy and invest in cryptocurrency, for

instance, purchasing Bitcoin. In addition, they will invite the users to a trusted group in various social media platforms [27]. Because of the state of cryptocurrency in Malaysia is still new and growing, users or Malaysian citizens are generally more eager to get involved in cryptocurrency as it promises a simpler way to become rich. In information security, this situation is called "user confuse" where the user is unable to think wisely for his involvement in cryptocurrency investment [27]. Fig. 3 illustrates the scenario on how a user, also called a victim, is scammed by investing in Bitcoin.

A. *Vulnerability and Risk of Mobile Device*

Cryptocurrency requires user to install the application on their mobile devices. The application, which is provided by the DAX, will give access for the user to the cryptocurrency network. Crypto-wallet is one of the features in the application. Therefore, the security risks of the mobile device itself can cause the vulnerabilities to the user's crypto-wallet and identity. The security risks of a mobile device include the mobile device being misplaced, shoulder surfing and unattended, the connection vulnerabilities, accessing untrusted content, and deployment model.

The example of connection vulnerabilities is when the user is connecting to the insecure public network whereas the user might be vulnerable to eavesdroppers who can steal data in the transmissions and view sensitive information. With their mobile device, the user tends to access content immediately. For instance, the user might access the content through quick response code (QR-code) which may indirectly install the malware to their mobile device. Finally, following the advancement of technology, the nature of doing the routines is also changed. Companies can deploy the Bring Your Own Device (BYOD) model which allows their employers to use their own personal mobile devices for business purposes. When the user connects to the corporate network, their personal information in their mobile device might be discoverable by others [24].

B. *Crypto-laundering and Gambling*

Cryptocurrency can be misused such as in money laundering activities and online gambling. This is because the handling of cryptocurrency is made hidden, decentralized and it is new in the market, so it has many systemic gaps. There are difficulties that may lead to no detection that can be made by the authorities. Moreover, the acceptance of cryptocurrency by the world has also made cryptocurrency as a platform for these criminal activities. The existence of online gambling sites using cryptocurrency payment methods is also rapidly developing [27].

IV. An Improved Crypto-hygiene

Hygiene for cryptocurrency is important for any beginners. Much like computer-hygiene [29], cyber-hygiene or network-hygiene [30], crypto-hygiene is a set of guidelines and precautions for users involved in cryptocurrency. Crypto-hygiene includes self- hygiene + computer-hygiene + network-hygiene; which can be defined as self-protection that starts from the self then to the devices used by the user and the network. This paper proposes an improved crypto-hygiene to include several types of hygiene in order to mitigate the vulnerabilities at the endpoints of cryptocurrency network as illustrated in Fig. 4.

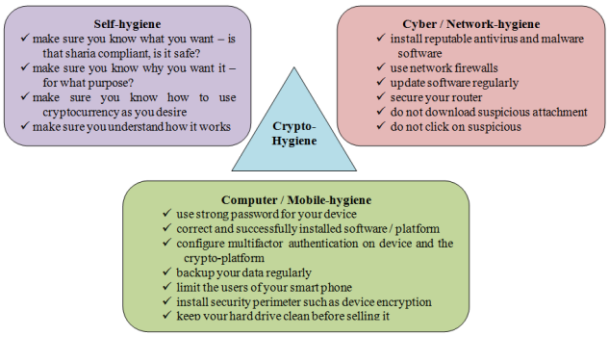

Fig. 4. An imptoved crypto-hygiene.

V. Future Direction Of Blockchain And Cryptocurrency In Malaysia

Blockchain and cryptocurrency both have potential in Malaysia. Table 4 summarizes the future direction and movement on blockchain and cryptocurrency. The robustness of distributed ledgers developed based on the blockchain technology can be used for insurance and land ownership management. Despites, blockchain can be used for online voting systems. With the help of the blockchain technology, it can help companies to save time, increase costs in transparency, comply with regulations, and build better products and markets [14], [32].

TABLE IV. Future Directions of Blockchain and Cryptocurrency in Malaysia

Direction	Explanation
Insurance and land grant title	The blockchain technology can be used to create insurance policy and land grant title because the data or information can be secured from modification or alteration.
Payment and investment	Citizens will use cryptocurrency as the medium of payment and investment instead of the existing digital assets.
Securities Commission Approval	More Digital Asset Exchanger (DAX) will be approved by Securities Commission.
Sharia-Compliant	The authorities will work further on sharia-compliant so that the cryptocurrency can be accepted and adopted in Islamic community.
Health record	The blockchain technology can be used to create and maintain health record.

The use of blockchain can expand the trust and use of cryptocurrency in Malaysia [10], [14], [15], [32]. Cryptocurrency can be used in business for payments and investments. Therefore, more DAX will be approved by the SC as long as it complies with the terms and conditions. The acceptance of cryptocurrency by the Muslim community in Malaysia is still in its infancy [31], [32]. Cryptocurrency is now a hot topic among researchers, scholars, and academics. The results of a recent study indicate that compatibility, awareness and facilitation conditions have a significant impact on the investment of the Malaysian Muslim community in the Bitcoin market [31], [32]. Cryptocurrency

can be accepted by the Muslim community if and only if it is sharia compliant and consumers know where the money is coming from and where it will go through the cryptocurrency network. This is because, in crypto exchanges, the source of cryptocurrency funds may be related to illegal activities [31] - [34].

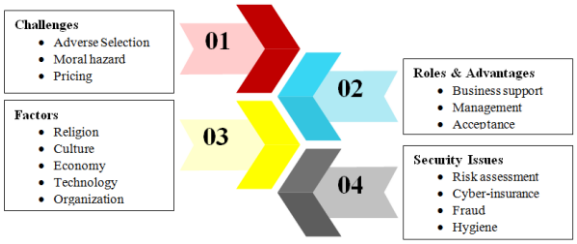

Fig. 5. Blockchain and cryptocurrency research areas.

VI. Conclusion

Blockchain and cryptocurrency itself can bring more benefits to end users. This innovation can lead to a broad opportunity in expanding the existing business processes. If evaluated based on the advantages of the blockchain technology adopted in cryptocurrency, there are many advantages. However, since this cryptocurrency is still new, it also has its drawbacks. There are not many sources that can be referred to. Therefore, the results of the study are much needed to enable more people to understand blockchain and cryptocurrency. Further studies on the effectiveness of the proposed an improved crypto-hygiene, blockchain and cryptocurrency from the context of Malaysia are strongly recommended for future works as presented in Fig. 5.

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