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Research Article

In the Realm of Block Chain – Cryptocurrency

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Abstract

This paper aimed to open eyes for the many functions of the blockchain technology which was the underlying program of the cryptocurrency. The cryptocurrency itself could not be that magical if not based on the blockchain technology. Recent developments had revealed how this technology could completely change the future. The boundaries of today's nations would be replaced by another kind of kingdom resided in the realm of the cryptocurrency and its blockchain technology. The paper also discussed the effort of Indonesian government to step into this area.

Keywords

Cryptocurrency, token, blockchain, smart contract.

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Introduction

When Leloup stated that cryptocurrency redefined the future of finance, it was a thriving ecosystem, quietly encroaching on conventional finance's Moradpour and Dastoori (2021), he was merely being modest, since cryptocurrency was not as simple as a currency. As like releasing the Covid-19 virus into the globe, no one could predict what would happen next with the virus, with the economy, with the country, with humanity, and ultimately, with the human-race. The same token was when Nakamoto released the bitcoin into this world, he himself may not fully understood the overall impact of releasing that bitcoin to human life.
One feature of bitcoin – the first cryptocurrency – was the "borderless currency". Meaning, the cryptocurrency would help people everywhere in the world to do a transaction without being hindered by the differences of administrative process between nations. Today, it would be too naïve to accept the phrase. Satomi Nakamoto would disagree, since it may deface his noble vision of the future of world's finance. However, he was not the only genius in the world. The cryptocurrency was only a medium to open the imagination of those geniuses in technology, to play with the many features it could create, and driven by those visionary geniuses to become whatever it could be. Therefore, it is becoming the new way of life in this digital era.
Cryptocurrency is the new kingdom in today and future universe. The governance of its own. There will still be boundaries of course, but not as nations as we are seeing today. With the many kinds of cryptocurrency being in the market today, more than 10,000 "brands" of cryptocurrency (Yin, Nie, & Han, 2021) today, each own a kingdom of its own. Then, when a nation refused to accept its existence, and many more try to cuff its root characteristics, so many more creative minds help its rapid evolution. In the realm of the cryptocurrency, really it would be a governance of its own. The question is, how could (or should) a government prepare itself to lose (or lost) its authority into this new sovereign?

Literature Review

To help new readers understanding the paper, the literature review started from the very fundamental description of cryptocurrency, basic characteristics and some jargons related to it. Also, it can not avoid mentioning some label or specific name of cryptocurrency types, such as bitcoin, the first of the kind.

Cryptocurrency – Characteristics That Built Its Definition

Defining cryptocurrency must include some of its characteristics. If not, then it would become as plain as simply digital currency. Lansky (2018) described cryptocurrency as a digital medium used for accommodating transaction, which uses a technology called blockchain to lay the basis of validating the exchanges between parties. This blockchain used cryptographic codes which was unique from one another, therefore, there was impossible to have duplicate codes for one transaction. The exchange process could be authorized by any party, that was someone - or a computer – called "miner". Therefore, the cryptocurrency bore its value only based on supply and demand (Choudhary, Merkley, & Schipper, 2021). The feature led the cryptocurrency to a significant up and down in value. Though, nowadays, there were some cryptocurrencies which claimed had a characteristic of controlling this volatility, for example the USDT (Tether), TUSD (True USD), PAX (Pazos Standard), and USD (USD Coin). They accomplished this by backing it with fiat. PWC (2019) spoke for the accounting profession regarding cryptocurrency by first classifying it into different types of cryptographic asset. Those were: cryptocurrency, asset-backed token, utility token, and security token. Whereas the practitioners used to differentiate token from cryptocurrency, that a token was derived from its parent which was the cryptocurrency itself, since the token used the preexisting blockchain technology as its parent Chohan (2017); (Gurinovich, Lapina, Tolstopyatenko, & Patrikeev, 2021; Momtaz, 2021) stated it was a kind of virtual currency or a commodity. Then, from the many definitions of cryptocurrency, it became more obvious that this cryptocurrency could be anything that the creator wanted it to be (Kudashina & Smirnova, 2021). The International

Accounting Standards upon the cryptocurrency transaction record fell in the choice between an inventory (IAS 2) and an intangible asset (IAS 38). It was based on the reasoning that inventory did not have to have physical form, however, it was held by an entity for selling as the main activity of the entity. As for the characteristic of an intangible asset, it was also did not have physical existence, however it could derive a future economic benefit. (Choudhary et al., 2021).

The First Who Rolled the Dice - Bitcoin

The first bitcoin transaction occurred when its creator, Satoshi Nakamoto, had intrigued Hal Finney to download the software, create a wallet to pocket cryptocurrency, and started mining a block of fifty bitcoins. Finney became the Node Number Two who became the first miner. Then, Nakamoto transferred ten coins to Finney's wallet for the first time as a test. (Chakrabarty & Engels, 2022). The process of using bitcoin for a transaction today would follow these paths: first, one who wanted to do a transaction using bitcoin had to download the software to create a wallet. Then, he could get the coin transferred by other who wanted to pay him a sum of coins in a transaction. Or, he had to mine the bitcoin to earn his coin and stored it in the wallet. Or, today, he could buy the coin in a market, an exchange/trading company by trading the coin with fiat. The wallet could be store online or in a software in a private hardware/computer, depending on the consideration of the user whether he needed full control (privacy, security, anonymity) on the wallet (Liu, Tang, & Xu, 2021). Satoshi Nakamoto created bitcoin as the first cryptocurrency with some specific features which were to rival the conventional financial authority by the established world of financial ecosystem (Chakrabarty & Engels, 2022). First and foremost, the bitcoin was made decentralized by utilizing miners to verified (= authorized) a transaction. From there, the decentralized system held all what were to come.
Second, the transaction would stay anonymous since the transaction were established by a program (a machine) which no party had authorization on it. The third was that the transaction were borderless, thanks to the decentralized system. Then, the fourth, the transaction could be settled in mere of minutes -if not seconds- compare to the conventional payment system which could take up to a week to settle. Again, it was because of the decentralized system, which allowed the bitcoin transaction to skip many steps (involving many parties, in the conventional financial system), without loosing the necessity of security. Then, the fifth, the transaction process was not as costly as the conventional payment system, merely because the mechanism cut many intermediary parties, since it used the decentralized system. Last, but not least, when a transaction occurred, a sum of cryptocurrency moved from one wallet to another without any specific party could peek into the wallets. The bitcoin transaction used blockchain technology as the media for authenticating the transaction. The bitcoin technology was based on the encrypted codes placed in the blockchain to form the record of a verified transaction. The unique code as the output of the cryptographic algorithm of a message was called a hash. A hash could not or was almost impossible to break (Liu et al., 2021).The verification process of the blockchain to produce a hash was carried out by miners (group of computers). One miner who succeeded in producing a hash for a specific transaction would get some fee for the authentication process using his computer. The record of transaction itself would then be distributed among every miner who join the system at the time and in the future. Therefore, the database would be kept not in a single authority, but spread among users/miners. Thus, there were no additional costs for keeping one database warehouse as in the conventional financial system (Liu et al., 2021).

Cryptocurrency – the many faces

From that paragraph it was clear that one eminent feature – the decentralized system - could lead to a many-advantages in the bitcoin transaction mechanism. The blockchain technology could reveal many more opportunities in the future of cryptocurrency. The mechanism had raised several parties who involved in the cryptocurrency realm. First, there were buyer and seller. Between them, arose the miners. Then, the cryptocurrency exchanger emerged and

the trading begun when investor came along. Later, the currency developers had their way. In the middle of 2020, Armansyah identified the ecosystem of cryptocurrency could be separated into 4 categories, which were exchange, mining, trading, and cryptocurrency development. Those areas were described as follows:

Exchange & trading

A software to do a trading process was called an exchange. Through this platform, an individual could do a transaction which used cryptocurrency as the media for payment. The exchange platform could also be used as a media for currency trading. Today there were many trading companies with their exchange platform offering many features. Some of them trade only stable coin, the coin which considerably stable when exchanged to another kind of coin, or even to fiat. Some of them served only for a limited circle of investors for specific purposes in the coin's whitepaper.

Mining

Mining was a process to verify the blockchain by a group of computers to create a hash. The computer which did the calculation of the hash was the miner. In this process, the hash created by a miner would be matched with the hash from a new block, After the hash was verified then the new block would be added to the blockchain.
The calculation for creating a hash was called the cryptographic, which involved a complex mathematic calculation. Therefore, the computer doing it would consume a lot of electricity energy. The miner who succeeded in creating a valid hash and add a new block to a blockchain would get some fee.
The regulation of how to get the fee was a consensus issued by the cryptocurrency issuer. Today, there were 2 kinds of consensus, those were:
a. Proof of Work – the consensus of giving the fee to the fastest miner that created a hash and verified a transaction.
b. Proof of Stake – the miner who had the most of cryptocurrency got the highest opportunity to be chosen to become the verificator and get the fee.

Cryptocurrency Development

Creating a cryptocurrency and designing its blockchain was first in the area of currency development. Since bitcoin, many organizations creating new cryptocurrency offered its coin to public via Initial Coin Offering (ICO), just like a shares Initial Public Offering. There were some benefits in having a cryptocurrency of its own since it was a strong marketing tools which differentiate the organization from its competitors. The organization could offer some features which had not been developed by other cryptocurrency before it, such as faster time in closing a transaction, controlled value/avoiding volatility, cheaper operational cost, etc.
The development of cryptocurrency had created token. Token was differentiated from coin mainly from the fact that a coin had its own blockchain, while a token used an existing blockchain, in other words, a token would piggyback to a specific coin's blockchain technology. This condition emerged because developing a new blockchain from scratch was difficult, time consuming and costly (Gurinovich et al., 2021).The area of cryptocurrency development was growing very fast. In a year after, there were many other features were developed to compete other existing cryptocurrencies, especially regarding the blockchain technology, which was useful not merely for building a cryptocurrency platform but many other things. This blockchain technology was open to opportunities for many creative ideas. Today, a year after Armansyah presenting his paper, the cryptocurrency development – the blockchain technology, to be more specific - had moved into many other areas, even other than cryptocurrency.

Discussion

After considering the above literatures, it was clear that the development of the cryptocurrency was inevitably can not be retained. It was as vast as its creator wanted it to be. One's creativity was the limit, and no one could tell how far it could go. A year after Mealings, Douglas, and Olver (2012) pointed that he found at around 5,759 kinds of coins in the market on July 21, 2020, the same link revealed as many as 10,410 kinds of coins, with a market capitalization worth of $1,485, 396,194,881. Among those, the dominance was the bitcoin (44,5%) and the second was the ETH or Ether (17,9%) (Shahab et al., 2021). The link also showed The link also showed a new word "Gwei" on the top row. This Gwei was a denomination for ETH which was used on the Ethereum network for payment. One Gwei or gigawei equals to 1,000,000,000 wei. It was commonly used because a gwei specify the Ethereum gas prices (Kern, 2021). A Gas was the measuring unit to calculate the effort of executing a specific operation in the Ethereum network. The gas fee mechanism was important to prevent spamming or looping whether accidental or hostile, and other computational wastage in code. (@TheBicPen et. al;2021).Anyone who had had familiar with those two paragraphs above could be considered as ready for the future with the underlying blockchain technology of the cryptocurrency. Those were the very small example of what could become in the variety of the technology. Here were some current developments to be considered as we discussing the blockchain technology which continuously opening the many possibilities in the area.

Arbitrage:

The most weakness of cryptocurrency was its volatility due to the lack of authority to control it. An arbitrage scheme then emerged. It was an opportunity to gain benefit from a difference coin's prices between markets by buying and selling simultaneously. There were two kinds of arbitrage, one was the simple arbitrage which involved only 2 parties in the process, and the second was the triangle arbitrage which involving conversion into fiat. Both methods required high-speed networks with low-latency interference, however, both schemes had almost zero level of risk. This scheme had created a software to quickly zap the opportunity to get a gain in a transaction and it also had created the robot computer to do the job. (Levus, Berko, Chyrun, Panasyuk, & Hrubel, 2021).

Insurance:

The cryptocurrency transaction also opened the opportunity for insurance to cover some risks. The risks could include economic risk, liquidity risk and technology risks. The risk arose because of the decentralized financial scheme were not protected by any controlling authority (Schär, 2021). One kind of it was called swap, where the insurance software enabled a single-sided pool of coin instead of a pair of them to be exchanged to mitigate risk of permanent loss.

Smart Contract:

The blockchain technology also had created the smart contract to facilitate any kind of contract, from buying and selling, and even giving a heritance to grand-children we had never met before in hundred years in the future. Smart contract provide efficiency and saving since there would no need any intermediaries. It would instantly valid as soon as all the contract's terms and conditions were met. It was transparent and safe because no one could alter the blockchain for his own benefit, since a hacker had to alter all the blockchains connected to the transaction in the platform, which was nearly impossible because that would mean altering all the data that had been validated and stored in every miner around the world involved in the chain (Wijaya, Sinaga, & Roespinoedji, 2021)

Ownership:

This one feature of cryptocurrency was quite intriguing. The name Andre Cronje was behind the creation of the new cryptocurrency nation on its own when he released the token which enable its owner to decide how to implement the protocol. The token had no intrinsic value, however it could be bought using other specific coin, then the holder had a collective right to develop the protocol, in other word, to govern the kingdom. The holders gathered on-line through a forum to vote on proposals which would determine the future of protocol. Then, the holder could also stake the token and earn regular return paid in other coin. (Schär, 2021). Those obviously were the new system for share, dividend and General Meeting of Shareholders. One oil company had step further by preparing the convenience of paying fuel with cryptocurrency straight from one's wallet. As the person filling his automotive with gasoline, the tool calculating the charge he has to pay in cryptocurrency and transferring the currency from the wallet to the gas company. No middleman's gas station was required. Again, cut the cost for the mediator. This is one example of how this new technology would cut all the unnecessary burden in the economy. A nation, like China, prepared the country to be ready for all the new governance in the future. The share system could be implemented to achieve a more democratic governance in all aspects. With the involvement of every citizen to drive the nation, it would be a better environment. However, it would be the job for the legal government to keep the game fair. That is, a guarantee that could ensure that there would be no single "share" could be bought by a group of rich people who would pay for "the crown".

Accounting profession led a way to Indonesian government to acknowledge the cryptocurrency at least to one of its characteristics, which was as an inventory or an intangible asset. In 2019, the first Indonesian government official acknowledgement of cryptocurrency was the regulation released by The Commodity Futures Trading Regulatory Agency (Badan Pengawas Perdagangan Berjangka Komoditi/Bappebti) no. 5/2019. It gave way for trading cryptocurrency (labelled as crypto asset) as a commodity, not as a medium for payment. The crypto asset could be a utility crypto or crypto backed asset. Since then, the government seemed to try to rival the increasing trade of these crypto asset and later then announced the plan to issue its own digital currency: Central Bank Digital Currency (CDBC) for a medium of payment, if needed in the future (Victorino, 2021). The currency would be named Digital Rupiah (Andriani & Fitriani, 2021). However, along with explanations regarding many regulations in Indonesia, the Indonesian government strictly prohibit – still – the use of cryptocurrency as a medium of payment. A day before the announcement of the CDBC, The Central Bank of Republic Indonesia released a statement that in 10 years period ahead, the Central Bank did not have any plan to authorized the crypto asset to be used as a digital currency (Muarif, 2021).Engaging in the digital era is a must. It can not be denied that a government should be ready and prepare the future government, the future generation for the dynamic realm of this new world. Therefore, the Indonesian government seemed to prepare to embrace this future currency one step at a time. The primary question was: could the nation be ready in time, because this required an immense number of resources. Not only in the form of funding but especially in the form of creativity, since the blockchain technology offered countless variety of opportunity.

Conclusion & Suggestions

With the many possibilities offered by the blockchain technology, a conventional nation could be in "danger" of collapsing into a nothing to govern in the future. New generations are more and more familiar with this new, liberal, self-control concept. It is important to a nation to grasp all the aspects, all the possibilities, as soon as possible. Stepping on it one by one would not be good enough or even fast enough, since it is a comprehensive world. Therefore, a nation should mobilize its citizen highly capable in the programming technology, side by side with the visionaries to build a roadmap of the new nation governance with the blockchain technology as the fundamental. Not only it is important to prepare the hardware or the software, but most

importantly is to take a deep look on the players today, especially to fully understand their ways of thinking, and how to shape a better world from there.

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