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Is It Legal to Provide Liquidity on the Vexanium Decentralized Exchange in Indonesia?

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Abstract

One of the platforms in the blockchain is a decentralized exchange. The existence of these platforms helps exchange crypto assets instantly in the blockchain ecosystem without having to exchange them at a central exchange. The liquidity guarantors of decentralized exchanges are liquidity providers. This study aims to assess liquidity providers' legal safety on Vexanium, Indonesia's first public blockchain. The normative method employed in this analysis of the laws and regulations related to blockchain in Indonesia involves a preliminary examination of the liquidity provision process. This study found that the decentralized exchange platform on the Vexanium blockchain still needs to meet the criteria as an electronic system following the laws and regulations. In addition, the absence of clear information about the parties in the platform makes the liquidity provision contract voidable. This research can be utilized for platform developers in the Vexanium blockchain to pay more attention to legal aspects in creating their platforms.

I. Introduction

Blockchain technology is currently growing. Because the technology helps improve the digital economy involving businesses, and individuals around the world (Mentsiev et al., 2019). This technology is an original peer-to-peer electronic payment system that allows payments to be made electronically directly from one party to another without going through a financial institution (Nakamoto, 2008). One of the advantages of a transaction through Blockchain is the anti-hacking mechanism, which can make useful

records to solve problems related to the network of devices connected to each other (Yavari et al., 2020). In addition, blockchain is a distributed data structure made of data blocks where one block will be associated with another block through its hash value (Kemmoe et al., 2020). Finally, it can be concluded that blockchain technology represents a positive development in the Internet, characterized by decentralization, transparency, and tamper-proof information (Liu et al., 2020). In fact, during the covid-19 epidemic situation, blockchain was used as a contact tracking media solution to avoid the expansion of the spread of covid-19, even though on the other hand people were afraid of the security issues of their personal data (Kumar et al., 2020).

Blockchain technology has three types of network bases: Public, Private, and Consortium (Musleh et al., 2019). Vexanium, established in 2018, represents the first public blockchain in Indonesia, founded by a group of dedicated Indonesian blockchain enthusiasts and engineers. To enhance development, the technology center, marketing, and administration are strategically based in Singapore. Notably, Vexanium employs a consensus algorithm known as Delegated Proof of Ownership (DPoS) for its blockchain consensus methods (Foundation, 2019).

The primary function of blockchain is to record transactions (Nakamoto, 2008). Consequently, the vitality of a blockchain can be assessed by the number of transactions executed on it. These transactions are stored in blocks. According to Vexanium Explorer data available at the time of writing, over 230 million blocks have been created on the Vexanium blockchain (Vexanium, 2023).The majority of these transactions originate from Decentralized Finance (DeFi), as evidenced by the 34 decentralized applications (dApps) present on Vexanium, with most of them being DeFi applications (Dapp, 2022).

The advent of blockchain technology has led to the emergence of Decentralized Finance (DeFi), an open financial system designed to facilitate transparent interactions between traditional financial products through open-source software and decentralized networks. While the ongoing development of Bitcoin and Ethereum has garnered attention, the DeFi concept has only gained prominence in recent years. Essentially, DeFi has the potential to evolve and concentrate on the market scope of traditional banking services (Jensen et al., 2021). DeFi contracts containing a large number of digital assets rely on oracle platforms as decentralized price setters. However, there is a possibility that the oracle or smarcontract may be attacked and harm its users. Therefore, the decision to participate or not is up to the users (Fadhillah et al., 2022). On the other hand, decentralized finance also experiences obstacles related to mass adoption and development (Multazam, 2021).

One of the DeFIs in the blockchain ecosystem is the decentralized exchange. It is a liquidity provider that guarantees the smooth existence of buyers and sellers of crypto assets in the Blockchain ecosystem (Oomen, 2016). Liquidity providers are usually found in corporations, investors, broker-dealers, and regulators to recognize trading activities such as stocks, currencies, and cryptocurrencies (Jankowitsch et al., 2011). Therefore, the

influence of liquidity providers on cryptocurrencies is important to maintain the stability of buying and selling activities, so that liquidity is maintained. Because when markets are illiquid prices must be considered in all investment decisions, and liquidity becomes very important for markets, especially illiquid markets (Aspris et al., 2021). Seeing the importance of liquidity, service providers must successfully ensure that their platforms are highly concerned with asset and resource utilization and provide confidence that there is a balance of liquidity, or a balance of demand and supply capacity (Wirtz et al., 2019). In addition, factors that can affect liquidity constraints are liquidity funding, market liquidity, and their interactions. This lack of liquidity funding can have the effect of pushing assets away from their fundamental value (Jiao & Sarkissian, 2020).

Recent research on blockchain has more often discussed its standardization (Smetanin et al., 2020). Also, crypto assets in general such as Bitcoin, Ethereum, and so on (Dabbagh et al., 2019). The focus is also often on cybersecurity, challenges and issues related to the use of security services in various application domains, Bitcoin (Taylor et al., 2020), technical smart contracts, or consensus algorithms (Lo et al., 2019).

Meanwhile, DeFI is most often discussed regarding technical governance, networking and storage (Gochhayat et al., 2020). It can be said that research in the field of social sciences over law is still very minimal. If there is a discussion in that field, it still revolves around economic benefits, the impact of blockchain technology, the Fintech revolution, and the Sharing economy (Xu et al., 2019).

The staggering increase in interest and investment in DeFi, as evidenced by the growth in Total Value Locked (TVL) from $630 million in early 2020 (fig.1) to $283.8 billion (fig.2), underscores the urgent necessity for more comprehensive research into the Vexanium Blockchain and its associated DeFi applications in Indonesia. This surge in DeFi popularity has left users navigating uncharted territory, with insufficient guidance and understanding of the associated risks and legal implications (Multazam, 2021).

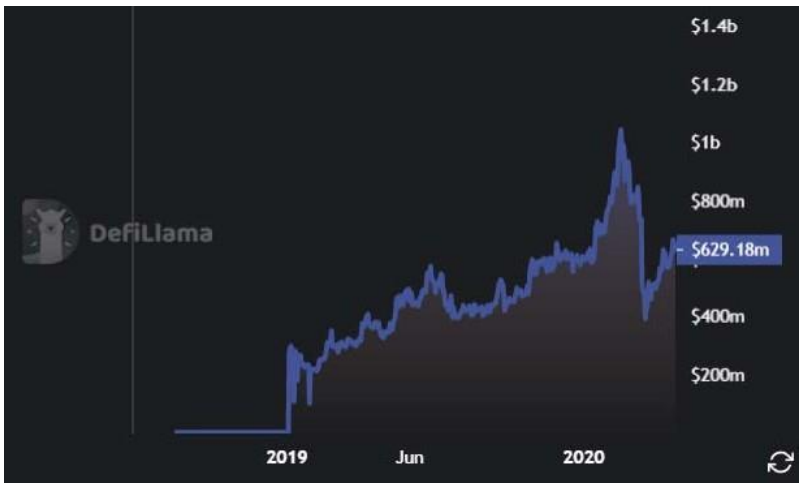

Figure 1. TVL at the beginning of 2020 (defillama, 2021).

Figure 2. Total funds locked in various blockchain ecosystems (defillama, 2021)

The Vexanium Blockchain, being Indonesia's first public blockchain, can serve as a foundation for such research, bridging the knowledge gap and providing crucial insights into the country's nascent DeFi ecosystem. By examining the evolution, applications, and potential challenges of this blockchain, researchers can not only assess Indonesia's receptiveness to blockchain technology but also identify areas for improvement and collaboration between the traditional financial sector and decentralized finance.

Furthermore, in light of the significant economic implications of the Vexanium Blockchain, understanding its potential impact on Indonesia's financial sector is paramount. This research will allow for better risk assessment and the identification of opportunities for growth within the country's broader economic system.

As DeFi applications on the Vexanium Blockchain continue to proliferate, a thorough analysis of their growth and interactions with existing financial frameworks is essential for mapping the future trajectory of decentralized finance in Indonesia. This exploration will also reveal potential gaps in the existing legal and regulatory infrastructure, thereby informing policymakers and regulators in their efforts to develop appropriate guidelines and frameworks to safeguard investments and ensure the long-term stability of the blockchain ecosystem in Indonesia. Therefore, this research focuses on DeFI, especially decentralized exchange on the first public blockchain in Indonesia, Vexanium.

Research Question: What are the legal consequences of becoming a liquidity provider on the Decentralized Exchange on the Vexanium Blockchain?

This study employs an analytical approach, examining relevant Indonesian laws and regulations alongside pertinent literature to elucidate the legal ramifications of participating as a liquidity provider in the Decentralized Exchange (DEX) on the Vexanium Blockchain. The key of Indonesian legal sources informing this inquiry include:

1. Law of the Republic of Indonesia Number 11 of 2008 concerning Information and Electronic Transactions;

2. Law of the Republic of Indonesia Number 19 of 2016 concerning Amendments to the ITE Law Number 11 of 2008 concerning Electronic Information and Transactions;
3. Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions;
4. Government Regulation Number 80 of 2019 on Trade through Electronic Systems; and
5. Indonesian Civil Code.

By meticulously scrutinizing these legislative instruments and their interplay with the emerging landscape of decentralized finance, this research aims to provide a comprehensive understanding of the legal landscape faced by liquidity providers engaging with DEX on the Vexanium Blockchain. This examination will not only offer valuable insights into the existing legal framework and its applicability to the rapidly evolving domain of blockchain technology and decentralized finance but also identify potential areas for improvement and further regulatory development. Ultimately, this study seeks to contribute to a more secure and sustainable future for the DeFi ecosystem in Indonesia.

II. Decentralize Exchange and Centralize Exchange

A centralized exchange, or "CEX," is a platform that allows users to buy and sell cryptocurrencies using traditional currencies, such as USD or EUR. CEXs are operated by a central authority, which sets the rules and regulations for trading on the platform. One of the main advantages of using a CEX is that it provides a user-friendly interface and a wide range of features, such as trading charts and market analysis tools, that make it easy for users to track the prices of different cryptocurrencies and make informed trading decisions. CEXs also typically offer a high level of liquidity, which means that users can buy and sell cryptocurrencies quickly and easily (George, 2022).

A key limitation of Centralized Exchanges (CEXs) is their inherent lack of decentralization, necessitating users to rely on a central authority for the secure and transparent management of their funds. Moreover, CEXs are subject to government regulation, which can pose challenges for users attempting to access specific cryptocurrencies or engage in trading across certain jurisdictions. In some cases, governments may restrict the trading of particular cryptocurrencies or prohibit transactions between their domestic CEXs and those of foreign countries (Barbon & Ranaldo, 2021).

In the Indonesian context, the regulatory oversight of crypto assets is the responsibility of the Commodity Futures Trading Regulatory Agency (CoFTRA), also known as BAPPEBTI in Bahasa. The primary governing legislation is the Regulation of the Commodity Futures Trading Supervisory Body Number 8 of 2021, which pertains to the Guidelines for the Implementation of Crypto Asset Physical Market Trading on Futures Exchanges. This regulatory framework establishes a legal foundation for the

technical administration of crypto asset transactions on futures exchanges, categorizing these assets as commodities to be traded within the Indonesian market, as opposed to functioning as a medium of exchange. This regulation provides a legal basis for the technical administration of crypto asset transactions on futures exchanges, positioning these assets as commodities to be traded within the Indonesian market rather than as a means of exchange.

The regulation sets forth the requirements and procedures for establishing Centralized Exchanges (CEX) or, as they are referred to in the legislation, physical crypto asset traders. Additionally, it delineates the criteria for determining which crypto assets are eligible for trading by these entities.

Contrary to CEX, a decentralized exchange, or "DEX" is a platform that allows users to buy and sell cryptocurrencies without the need for a central authority. DEXs are typically built on top of a blockchain network, such as Ethereum, and use smart contracts to facilitate peer-to-peer trading (Dai, 2020).

One of the main advantages of using a DEX is that it is decentralized, which means that users have complete control over their funds and are not required to trust a central authority to handle their transactions. DEXs also offer a high level of security, as transactions are recorded on the blockchain and cannot be altered or censored.

However, one of the main drawbacks of using a DEX is that they can be less user-friendly than centralized exchanges. DEXs often have more limited features and lack the same level of liquidity, which can make it difficult for users to buy and sell cryptocurrencies quickly and easily. In other words, DEXs offer users a decentralized and secure way to buy and sell cryptocurrencies, but they come with some trade-offs in terms of usability and liquidity.

DEX uses a mechanism called smart contracts to verify and settle transactions. A smart contract is a digital contract written in a programming language and executed automatically by the blockchain network. Smart contracts allow DEXs to execute transactions automatically according to the rules set out in the contract, so that no single authority controls or regulates the exchange. Smart contracts can also be used to store and access transaction data in a secure and decentralized manner (Dai, 2020).

The main elements of dex (dex) are as follows (Dai, 2020):

1. Peer-to-peer trading: DEX allows consumers to trade directly without third intermediaries like centralized exchanges.
2. Smart contracts: DEX employs blockchain-based smart contracts to enable trading.
3. Decentralization: DEX users have full control over their assets and don't need to trust a third party to manage their transactions.
4. Blockchain technology: DEX secures transaction data with blockchain technology.

Meanwhile, the parties involved in DEX include the following (Aspris et al., 2021; Bose et al., 2019):

1. Users: DEX users buy and sell cryptocurrency.
2. Liquidity provider: DEX users who provide crypto asset liquidity enable DEX trading.
3. DEX developers: DEX developers create, implement, manage, and update the DEX.
4. Blockchain network: A blockchain network is a blockchain technology platform used by DEXs, such as Ethereum, to store transaction data and run smart contracts.

Other related parties are DEX token holders, who usually benefit from DEX revenue. However, they are not directly related to the core business of DEX (fig. 3).

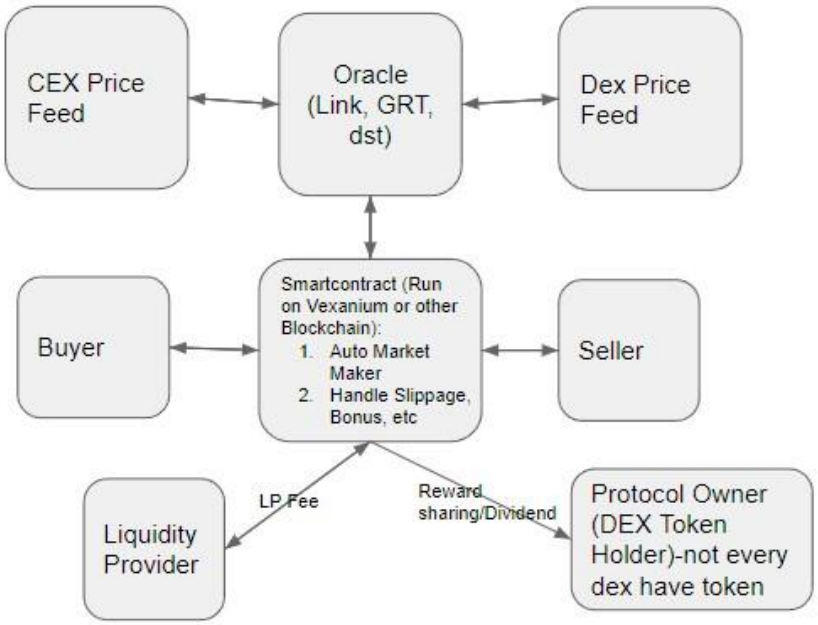

Figure 3. DEX Workflow

III. Role of Liquidity provider in DEX

Liquidity provider in digital asset exchanges means a person or organization that can purchase or sell digital assets at a predetermined price. Liquidity is the ability to trade digital assets at a predetermined price. Liquidity providers are businesses or individuals that own digital assets designed to be traded and are willing to deposit them into an exchange's order book so other users can buy or sell them. This enables digital asset trades on the exchange. Liquidity providers boost their chances of obtaining exchange fees or commissions for each transaction. Liquidity providers can increase exchange liquidity and lower the spread, the price difference between buying and selling.

In addition to getting fees or commissions from transactions that occur, becoming a liquidity provider can also provide other benefits for a person or entity that becomes a liquidity provider. Some of them are as follows (Aigner & Dhaliwal, 2021):

1. Adding value to owned digital assets. By including digital assets in an exchange's order book, liquidity providers can increase the liquidity of those assets and increase their value.
2. Profiting from the price difference. Liquidity providers can buy digital assets at a lower price and sell them at a higher price on an exchange, thus profiting from the price difference.
3. Profiting from price volatility. Liquidity providers can take advantage of fluctuations in digital asset prices to make profits, for example by buying assets when the price drops and selling them when the price rises.
4. Liquidity providers help build the digital asset ecosystem. This can expand knowledge about digital assets and blockchain technologies. Developer, user, and liquidity provider interdepend. The DEX developer builds and maintains the platform for trading, while liquidity providers provide the assets.

The swap user relies on both the liquidity provider and the DEX developer to be able to trade on the DEX. Without liquidity providers, there would be no assets to trade, and without a DEX developer, there would be no platform on which to trade them.

Another part that has a key role in DEX that blends those three parties is AMM technology. An auto market maker (AMM) is a type of algorithm used on decentralized exchanges (DEXs) to automate the process of providing liquidity. AMMs are designed to automatically adjust the supply and demand of assets on a DEX to ensure that users can always trade the assets they want to trade (Bartoletti et al., 2021). AMMs utilize arithmetic to set DEX asset prices. This formula considers asset supply, demand, trading fees, and DEX liquidity. AMMs enable users trade assets at fair prices by constantly modifying DEX asset supply and demand.

IV. Is it legally safe to be a liquidity provider in Indonesia?

In general, being a liquidity provider on a digital asset exchange is considered safe if the exchange is reputable and has taken adequate security measures to protect its digital assets and user information. However, as with any investment or transaction, becoming a liquidity provider also has certain risks that must be considered. Some of the risks that may occur include:

1. Security risks. Digital asset exchanges can be subject to hacker attacks or digital asset theft, so becoming a liquidity provider also has risks to the security of digital assets owned (Taylor et al., 2020).
2. Price volatility risk. Digital asset prices can fluctuate significantly over time, so being a liquidity provider also has a risk of unexpected price changes, causing impermanent loss. (Aigner & Dhaliwal, 2021).
3. Regulatory risk. Digital asset exchanges may experience regulatory changes that can affect the activities of being a liquidity provider, so being a liquidity provider also has the risk of unwanted regulatory changes (Covarrubias & Covarrubias, 2021).

The regulatory risks that may arise for liquidity providers on DEX are as follows:

1. Bans: Strict regulations may lead to DEXs being banned in a country or region, hindering user access to DEXs and reducing market liquidity.
2. Legal uncertainty: Legal uncertainty may lead to liquidity providers being unsure about what is allowed or prohibited on a DEX, limiting their ability to offer liquidity.
3. High cost burden: Strict regulations may lead to liquidity providers having to pay high fees to meet regulatory requirements, reducing the profitability and attractiveness of DEXs for liquidity providers.

Being a liquidity provider is also not free from the risk of becoming a victim of crime in the blockchain ecosystem. The following are the types of crimes in the blockchain ecosystem that can harm liquidity providers (Fadhillah et al., 2022).

1. Asset theft: Asset theft can occur through direct theft, such as stealing a liquidity provider's privacy keys, or through indirect theft, such as using hacking techniques to steal a liquidity provider's assets from a wallet or exchange.
2. Fraud: Fraud can occur through various means, such as tricking liquidity providers into buying fake assets or offering unrealistically high returns to attract liquidity provider funds.
3. Transaction forgery: Transaction forgery can occur through manipulation of transaction data on the blockchain, such as falsifying the amount or destination address of a transaction to deceive liquidity providers.

This is not to mention the possibility of attacks on the DEX such as DDOS Attacks. DDOS attacks are attacks that send a large number of requests to the DEX in a short period of time, causing the DEX to become unresponsive and reducing DEX performance. Hacking attacks, Hacking attacks are attacks that attempt to break into the DEX and take control of the DEX or steal DEX user data. 51% attacks, 51% attacks are attacks that rely on large computational power to manipulate transactions in the DEX and take control of the DEX blockchain (Wani et al., 2021; Yang et al., 2019).

Therefore, before providing liquidity, you must research the decentralized exchange. Before using a decentralized exchange, check its reputation. These steps will complete this task (Multazam, 2021):

1. Check DEX user reviews. Decentralized exchange (DEX) users often post reviews on digital asset forums or social media platforms like Twitter or Reddit. The DEX's reputation can be gleaned from user evaluations and feedback.
2. Assessing the DEX development team's technological, management, and networking competencies is recommended. Developers backed by international firms or established communities can be beneficial, but they cannot guarantee success.
3. DEX history and performance. Decentralized exchanges (DEXs) with a good track record have a better reputation than newer ones. The DEX's history can be found on its website or in digital asset-related media and forums.

4. Contacting DEX customer care. The DEX's customer care team can provide further information on the DEX's status, licenses, regulations, and performance. For further information, contact DEX customer care through email, chat, or phone.

Currently, Indonesian legislation does not regulate DEXs. The Regulation of the Commodity Futures Trading Supervisory Body Number 8 of 2021 focuses on CEX oversight. However, given the rising popularity of decentralized finance (DeFi) and DEXs, Indonesian authorities may need to create or alter rules to accommodate these platforms.

Countries regulate DEXs are different. Some jurisdictions have created new laws and regulations for DeFi and DEXs, whereas others have not. In the United States, multiple federal authorities likely have jurisdiction over aspects of DeFi, including the Department of Justice, the Financial Criminal Enforcement Network, the Internal Revenue Service, the Commodity Futures Trading Commission, and the SEC. The SEC has a FinHub and has dedicated significant resources to providing feedback, supporting innovation, and developing in-house expertise to ensure regulatory approaches are based on an accurate understanding of the technology. The SEC recently settled an enforcement action with a purported DeFi platform and its individual promoters for failing to register their offering (Crenshaw, 2021).

Furthermore, The European Union (EU) is working on regulating decentralized exchanges (DEX) within the framework of decentralized ledger technology (DLT) networks1. The EU's regulatory text called MiCA (Markets in Crypto-Assets) aims to harmonize regulations across member states and set stronger consumer protection standards, as well as rules for digital asset issuance and public offerings The EU's approach to regulating DEX and DeFi projects is still evolving, and it seeks to provide legal certainty and support for cryptocurrency exchanges while maintaining consumer protection and compliance with European principles (Directorate-General for Financial Stability, 2022; Handagama, 2021).

The Indonesian government must evaluate the international legal landscape and consider the pros and cons of different DEX regulatory measures due to the global heterogeneity of DEX regulation. A balanced and forward-looking DEX regulatory framework will promote innovation, investor protection, and financial stability in Indonesia. Therefore, DEX users should check local rules before making transactions.

Thus, that all legal events on DEX, especially buying and selling transactions and providing liquidity, return to the concept of agreement law in general. However, it is important to underline its function as a machine that records, displays, and validates electronic transactions (Nakamoto, 2008). Blockchain can be said to be an electronic system referred to by Article 1 number 5 of Law Number 19 Year 2016 (ITE Law). Therefore, the development of the ecosystem in blockchain certainly needs to follow the provisions of the electronic system in the ITE Law.

The ITE Law has rigidly regulated the implementation of Electronic Systems in Indonesia. Starting from the basic criteria listed in Article 16 paragraph (1) of the ITE Law. Electronic systems must display complete, correct, and clear information to avoid confusion or misunderstanding of information (Article 9 of the ITE Law). The organizer in an electronic system (PSE) must be willing to be responsible for all existing problems (Article 15 of the ITE Law). PSE must provide a mechanism for deleting irrelevant electronic documents/information (Article 28 of the ITE Law). And PSE is obliged to register itself with Kominfo according to the provisions of Article 2 paragraph 2 of PP 71/2019. However, the sanctions for not registering are still relatively light, ranging from reprimands, fines, to blocking.

Rigid regulations in Indonesia related to PSEs must also be followed by DEX developers running on the Vexanium blockchain without exception. Because they are PSEs. However, it seems that this has not been done. It can be seen in the Vexswap DEX which is the main DEX of Vexanium (fig. 4).

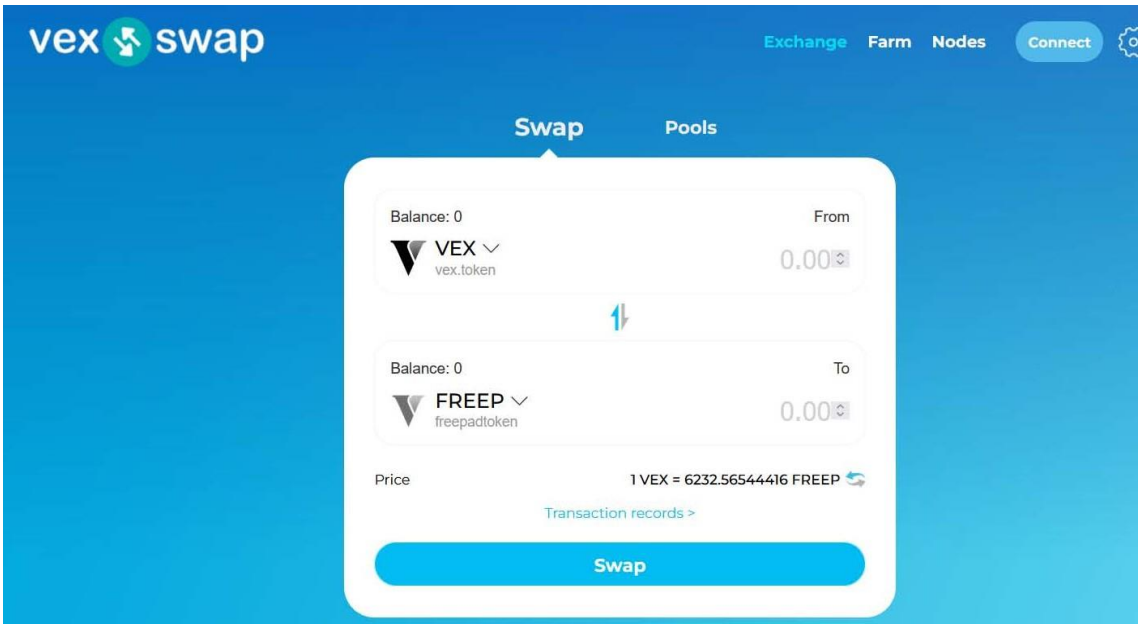

Figure 4. VexSwap homepage

On the VexSwap page, not much information can be found. Such as development team information, information on how the platform works, security information, and other information that can help users or liquidity providers conduct due diligence.

For comparison we can look at the Uniswap DEX, which is the oldest DEX in the Blockchain ecosystem. On the website, even the platform page and the information page are separate, with quite complete information, such as governance, ecosystem, and platform development documentation. As can be seen in Figure 5.

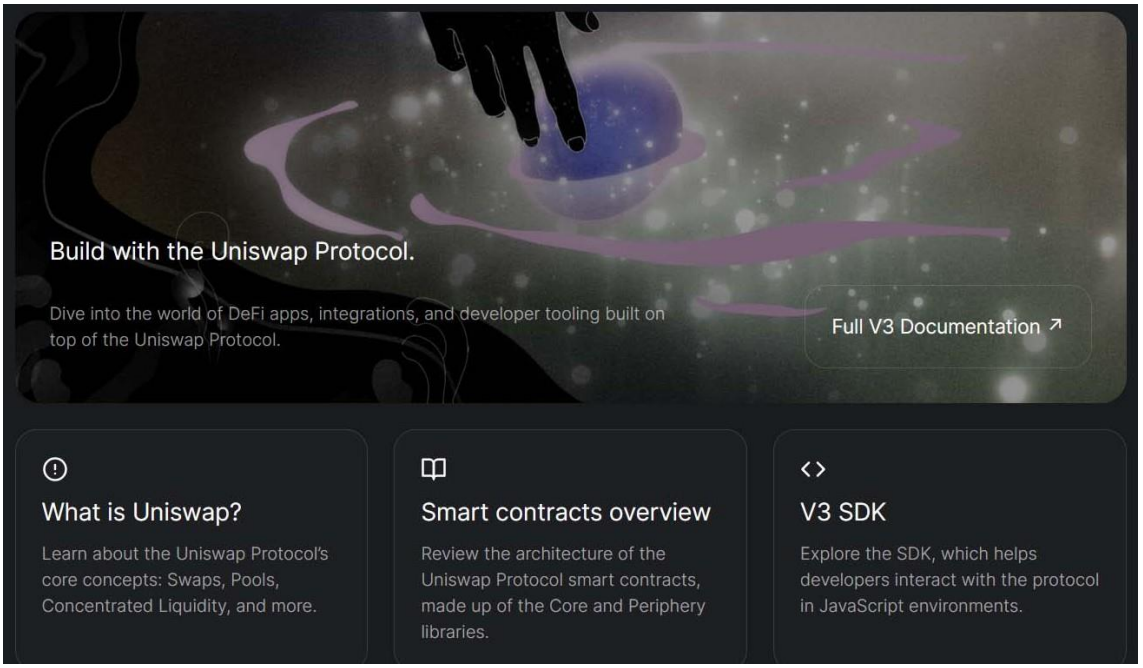

Figure 5. UniSwap Information Page

The most important thing in an electronic system is the existence of clear terms and conditions. Especially the information on the contents of the contract. The contract in the blockchain is of course realized in a smart contract. Therefore, users need to know clearly the smart contract used. However, this is not seen in DEX on the Vexanium blockchain. Take DEJAVESwap for example, which is the second largest DEX after VEXSwap in terms of total value locked. There is no smart contract information found on the yield farm. So it makes it difficult for users to do due diligence. As can be seen in Figure 6.

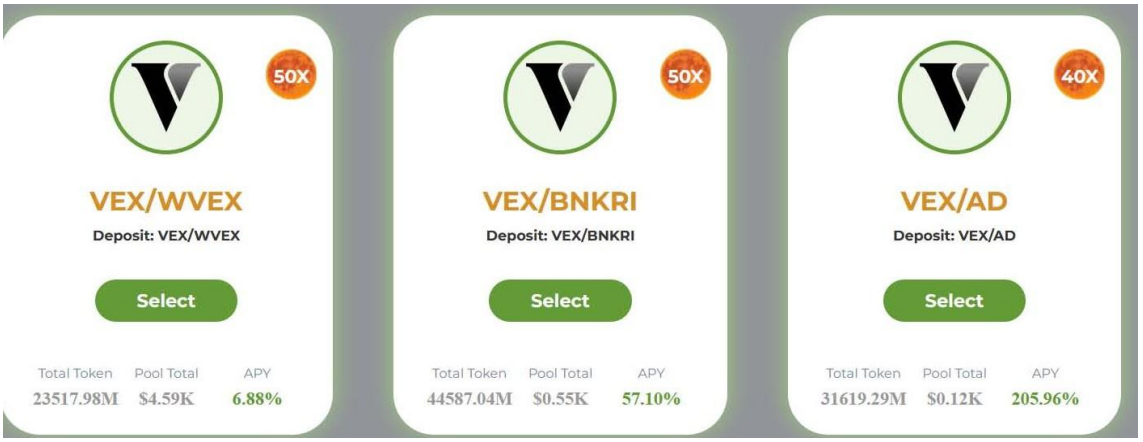

Figure 6. Dejave Swap Yield Farming page

In comparison, the yield farming page on PancakeSwap, the World's second largest DEX includes smart contract links and paired token information, allowing users to perform due diligence quickly and accurately. As can be seen in Figure 5.

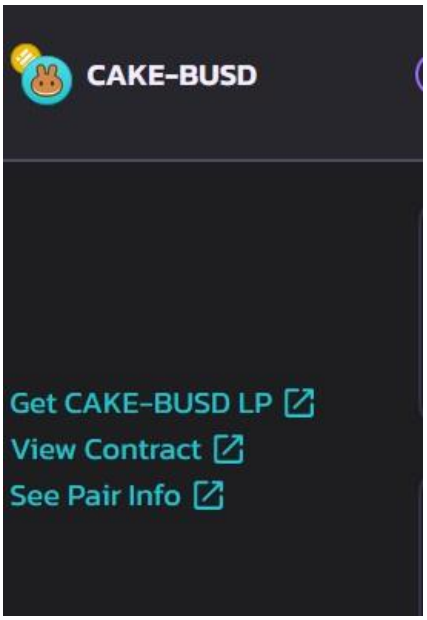

Figure 5. Smart contract information on DEX Pancakeswap

In addition, both dejave and vexswap were observed not to be among the PSEs registered with Kominfo RI as of December 11, 2022. This certainly violates the provisions of Article 2 paragraph 2 of Government Regulation Number 71 Year 2019 on the Implementation of Electronic Systems and Transactions (PSTE).

The ambiguity in Indonesian contract law regarding the complexity of smart contracts and the anonymity of blockchain technology poses significant challenges in establishing their legality. According to Article 1330 of the Indonesian Civil Code, the legality of the parties involved is a prerequisite for the validity of a contract. This requirement becomes difficult to fulfill due to the inherent anonymity of blockchain-based smart contracts. Furthermore, the subjective elements of Article 1320 of the Indonesian Civil Code can potentially lead to the nullification of smart contracts, despite the fact that they are subject to contract law as applicable to digital agreements.

In order to be considered valid, smart contracts must satisfy the conditions of mutual agreement, clear and unambiguous proposal and acceptance, as well as the presence of consideration. The anonymity feature of blockchain technology presents a challenge in determining legal capacity, which is a crucial element in establishing the validity of contracts. This consequently creates a barrier to the legalization of smart contracts. In contrast, several jurisdictions, including the US and the European Union, have enacted legislation to legalize the use of smart contracts, acknowledging them as legally binding agreements under respective regulations (Filatova, 2020).

The Indonesian legal landscape pertaining to smart contracts is characterized by its intricacy and susceptibility to ongoing modifications. Notwithstanding the fact that digital agreements conform to the fundamental tenets of contract law, the issue of legal capacity remains a salient concern, warranting elucidation and direction. The burgeoning international acceptance of smart contracts as legally enforceable instruments has precipitated the promulgation of a myriad of legislative enactments aimed at fostering their widespread adoption. Within the Indonesian context, the ITE Law, PSTE Regulation, and Government Regulation No. 80 of 2019 on Trade through Electronic Systems (PMSE Regulation) collectively constitute the foundational framework governing the implementation of blockchain-based smart contracts.

A key principle of these regulations are technology neutrality, explicitly stated in Article 3 of the ITE Law and applied in the definition of electronic contracts in Article 1, as well as in the freedom to contract. The definition of electronic contracts offers a general understanding of electronic contracts as agreements formed within an electronic system, enabling blockchain-smart contracts to have binding legal force. Additionally, the automatic nature of blockchain-smart contracts does not invalidate them as electronic transactions; rather, they are considered a form of electronic agent that operates automatically based on predetermined conditions.

Both Indonesia and Singapore, as well as the United States, have adopted the principle of technology neutrality in regulating electronic transactions to ensure that existing legal frameworks can anticipate future technological developments without necessitating the creation of new legal instruments. Unlike the United States, which allows for anonymous transactions, Indonesian and Singaporean regulations require sufficient identification in electronic transactions to ensure the validity of smart contracts as agreements. The division of electronic transaction regulations within the PSTE Regulation initiates the requirement for electronic contracts in e-commerce activities to be presented in the Indonesian language, in conjunction with the use of automatic devices known as electronic agents (Kadly et al., 2021).

To effectuate the efficacious implementation of blockchain-smart contracts, it is imperative to achieve harmonization between the PSTE regulation, as the implementing regulation of the ITE Law, and the PMSE Regulation. Additionally, updates pertinent to automatic electronic transactions in the form of computer code are warranted. This necessitates the formulation of specific regulations mandating providers to configure computer code in a language comprehensible to the general populace, thereby safeguarding the rights and obligations of parties engaged in transactions facilitated by blockchain-smart contracts.

Despite the current regulatory framework acknowledging automatic contracts (Article 47 of the PMSE Regulation), constraints persist, requiring the explicit identification of both parties involved (Article 47 of the PSTE Regulation). This stipulation is incongruous with the decentralized principles underpinning Decentralized Exchanges (DEX) and blockchain technology itself. Furthermore, limitations pertaining to the execution of

automatic transactions are manifest in the minimum requisites delineated in Article 37 of the PSTE Regulation. These requirements encompass features such as the capacity for correction, cancellation of orders, confirmation or reconfirmation, transaction status verification, and the perusal of agreements prior to conducting transactions.

V. Conclusion

This research has an impact on the development of the blockchain ecosystem in Indonesia. Because to the best of our knowledge. There has been no research in Indonesia that discusses the blockchain ecosystem, especially DeFi, from a legal perspective. It was found that the DeFi platform in the vexanium blockchain ecosystem, especially the decentralized exchange, does not meet the criteria as an electronic system that complies with the mandate of laws and regulations. Both in terms of licenses and basic criteria. In addition, the absence of clear contractual information of the parties, especially from the side of the platform provider or party as well as the platform user, has the consequence that the agreement in the decentralized exchange service can be canceled. This is because it is not known for certain whether the parties are legally competent to carry out the agreement.

Acknowledgments

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