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Digital Bill: A Strategy to Reduce Money Laundering Risks and Tackle the Limitations Associated with Digital Currencies

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Abstract

This paper introduces "Digital Bill (DB)" as a solution to address concerns regarding money laundering, illicit activities, and the limited adoption of cryptocurrencies. DB is a digital representation of a bill of exchange that offers unique features to establish a secure and widely accepted cryptocurrency ecosystem. A notable aspect of DB is the inclusion of a distinctive issuing number for each digital bill. This ensures traceability and authentication, minimizing the risk of fraud and enhancing transparency within the system. DB incorporates robust cyber security measures, making transactions resilient against potential threats. It also provides resistance to inflation, offering users a stable and reliable currency unaffected by market fluctuations. Unlike traditional cryptocurrencies, DB does not rely on resource-intensive mining activities. Instead, it emphasizes the regeneration of private keys for enhanced security and protection against unauthorized access. To address concerns related to DEX hacking, DB incorporates advanced encryption and secure verification mechanisms. Additionally, it includes depository insurance and trust guarantees, fostering user confidence and trust in the DB network. DB enables instant currency value adjustment, facilitating seamless and efficient transactions. This feature enhances usability and convenience for users engaging in various economic activities including international trade. The proposed approach aims to instill trust in DB, alleviate concerns about investment losses, and encourage greater adoption of blockchain technology. It underscores the importance of global acceptance and highlights the unique issuing number of DB as a means to enhance security and authentication. In conclusion, DB presents a secure and widely accepted cryptocurrency solution. While further research and development are required, the unique features of DB provide a glimpse into the potential of a transformative digital currency that addresses existing limitations and inspires confidence in the cryptocurrency landscape.

Keywords: *Cryptocurrency, Bill of exchange, Digital Bill, Minimize money laundering risks, Unique issuing number, Universally acceptance*

1. Introduction

1.1. Currency's Evolution: From Commodity to Digital Forms

Currency has a lengthy and captivating background dating back to ancient times. In earlier trade, the earliest forms of currency were commodities such as shells, beads, and cattle, used as a medium of exchange[1]. As

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[1] History of Money. Investopedia, August 16, 2021, https://www.investopedia.com/articles/personal-finance/020515/history-money.asp.

economies progressed, more standardized forms of currency were introduced to simplify trade and reduce the risk of counterfeiting. The origins of contemporary currency can be traced back to ancient China, where the first paper money was developed approximately in 700 AD[2]. Due to its convenience and ease of use, paper money quickly became popular in Europe after its introduction in the 17th century. Before this, precious metals like gold and silver were utilized as currency.

During the Civil War, the United States issued its first paper currency in 1862[3]. This fiat currency, known as the "greenback," was not backed by gold or silver but was based on the government's promise to pay the bearer on demand. Currently, most currencies worldwide are fiat currencies and depend on the government's commitment to honor the currency's value. A variety of factors, such as interest rates, supply and demand, as well as political and economic stability, determines the value of a currency. Over the past few years, digital currencies like Bitcoin have emerged as an alternative to conventional currencies. These currencies rely on complicated algorithms and decentralized networks to facilitate transactions, and their worth is determined by the market instead of any government or central authority[4].

2. Key Attributes of Currency

Currency, also known as money, has been an integral part of trade and commerce throughout history, and its evolution has played a significant role in the growth and prosperity of economies. Currency is a medium of exchange used in economic transactions[5]. There are several essential characteristics that currency should have to function effectively, which are as follows:

Acceptability: Currency must be widely accepted by people as a means of payment for goods and services. In other words, it must have value and be trusted by the public[6].

Durability: Currency must be durable enough to resist wear and tear and last for a reasonable amount of time[7].

Portability: Currency should be lightweight and easy to carry around, making it convenient to use in transactions, whether in person or remotely[8].

Divisibility: Currency should be easily divisible into smaller units to enable transactions of varying sizes[9].

Uniformity: Currency should be uniform in terms of its design and features to prevent confusion and counterfeiting, including the size, shape, and appearance of the currency[10].

Limited supply: Currency should have a limited supply controlled by a central authority, such as a government or central bank, to maintain its value and prevent inflation[11].

Stability: Currency should be relatively stable in value to provide a reliable store of value for individuals and businesses, which can be achieved through monetary policy and regulation[12].

These characteristics are crucial for currency to serve as a reliable and effective means of exchange in an economy[13].

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3 History of Money. Investopedia, August 16, 2021, https://www.investopedia.com/articles/personal-finance/020515/history-money.asp.

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7 What Makes Money Valuable? The Balance, January 20, 2021, https://www.thebalance.com/what-makes-money-valuable-3305852.

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13 Money: Its Functions and Characteristics. *Boundless Economics*, https://courses.lumenlearning.com/boundless-economics/chapter/money-its-functions-and-characteristics/

3. Exploring Crypto Currency's Evolution and Implications: An In-depth Review

Cryptocurrency refers to a digital or virtual currency that employs cryptographic techniques to secure transactions and regulate the creation of new units. Unlike conventional currency, cryptocurrency is decentralized and not controlled by any government or financial institution[14]. Bitcoin is the first and most renowned cryptocurrency, introduced in 2009. Since then, hundreds of other cryptocurrencies with their unique features have emerged[14]. The process of creating new cryptocurrency units is called mining and involves using powerful computers to solve complicated mathematical equations[14]. Transactions are validated on the blockchain, a decentralized ledger that records all cryptocurrency transactions[14]. Blockchain technology is decentralized, distributed, and records transactions on multiple computers. Each block on the chain contains a set of transactions, a timestamp, and a unique hash code. When a new transaction occurs, it is broadcast to all nodes in the network, and each node verifies the transaction before adding it to its copy of the ledger[15]. Once a node has validated a certain number of transactions, it groups them into a block and broadcasts the block to the network[15]. Other nodes in the network validate the block's transactions and add it to their copy of the blockchain[15]. Once a block is added to the chain, it becomes immutable and cannot be modified without changing all subsequent blocks[15].

The use of blockchain technology provides a secure and decentralized way to record transactions and transfer assets without the need for intermediaries. Each block contains a hash of the previous block's hash, creating an interdependent and secure chain of blocks that makes it difficult for any one individual or entity to modify the blockchain, as it would require a majority of the network's computing power to do so. This decentralized nature also ensures that there is no single point of failure, making it more resilient to attacks or system failures[16].

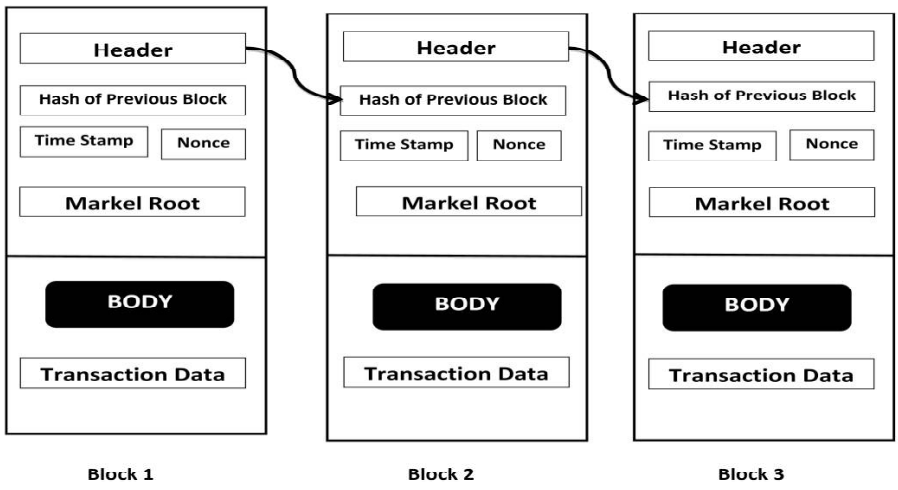

Figure 1: Block Stream Crypto Ledger[17]

One of the unique features of cryptocurrency is its anonymity and security, which is achieved through the use of complex cryptographic algorithms to record transactions on the blockchain, making them virtually impossible to hack or alter. However, this anonymity has also made cryptocurrency attractive to criminals for use in illegal activities, such as money laundering and drug trafficking[18].

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Another important aspect of cryptocurrency is its volatility, where its value can fluctuate rapidly and dramatically, making it a risky investment. Despite this volatility, many people have invested in cryptocurrency as a way to diversify their portfolio or to take advantage of potential gains. However, cryptocurrency has also faced regulatory challenges, as governments around the world grapple with how to regulate this new and rapidly evolving technology[19].

Some countries have banned or restricted the use of cryptocurrency, while others have embraced it as a new and innovative form of currency. The future impact of cryptocurrency on the global economy is still uncertain, but many believe that it has the potential to revolutionize the financial sector in the years to come[20].

4. Similarities Between Fiat Currency and Cryptocurrency

Despite their differences, fiat currency and cryptocurrency share some similarities in their characteristics. The following are some of the key similarities[21]:

Acceptability: Both fiat currency and cryptocurrency must be widely accepted as a means of payment for goods and services. In order to function effectively, people must have confidence in their value and be willing to accept them in exchange for goods and services.

Durability: Both fiat currency and cryptocurrency must be durable enough to withstand frequent handling and use. They should be able to resist wear and tear and last for a reasonable period of time.

Portability: Both fiat currency and cryptocurrency should be lightweight and easy to carry around. They should be convenient to use in transactions, whether in person or remotely.

Divisibility: Both fiat currency and cryptocurrency should be easily divisible into smaller units to facilitate transactions of varying sizes[22].

Limited supply: Both fiat currency and cryptocurrency should have a limited supply to maintain their value and prevent inflation. The supply of fiat currency is controlled by a central authority, such as a government or central bank, while the supply of cryptocurrency is controlled by a complex algorithm[23].

Stability: Both fiat currency and cryptocurrency should be relatively stable in value to provide a reliable store of value for individuals and businesses. Stability can be achieved through measures such as monetary policy and regulation[24].

5. Contrasts and Obstacles in Fiat Currency versus Cryptocurrency

The characteristics of fiat currency and cryptocurrency differ in significant ways. One of the main differences is that fiat currency is backed by a central authority such as a government or central bank, whereas cryptocurrency operates independently of any central authority, making it decentralized[24]. Additionally, fiat currency is physical and tangible, while cryptocurrency is intangible and exists solely in digital form[25].

Moreover, fiat currency is widely recognized and accepted, while cryptocurrency is still a relatively new and emerging technology that is not yet widely adopted by businesses and consumers[26]. Despite these disparities, both fiat currency and cryptocurrency are crucial elements of the global economy and will continue to evolve to meet the ever-changing needs and expectations of consumers and businesses[24]. However, there are still some challenges and limitations that need to be addressed before cryptocurrency can be more widely adopted as a means of payment[25].

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[26] M. Shahbaz., A. Akram. and M.S. Khan. (2021). Cryptocurrency, Fiat Currency, and their Acceptance: An Overview. *Financial Innovation*, 7(1), 1-18.

To begin with, cryptocurrency is a technology that has emerged recently and is still not widely comprehended or acknowledged by businesses and consumers. There are still doubts about the security and trustworthiness of cryptocurrency, which makes people hesitant to use it for transactions[27].

Secondly, the instability of cryptocurrency value is a major concern for businesses and individuals. The value of cryptocurrency can change rapidly and unpredictably, making it a risky investment. This instability also makes it challenging to price goods and services in cryptocurrency, as the value may fluctuate significantly between the time of purchase and payment[28].

Thirdly, the regulatory framework for cryptocurrency is ambiguous in many countries. While some countries have welcomed cryptocurrency as a new and innovative type of currency, others have banned or restricted its use. The lack of regulatory clarity makes it difficult for businesses and consumers to know how to legally and safely use cryptocurrency[29].

Fourthly, the transaction speed and scalability of cryptocurrency remain a significant challenge. Although blockchain technology has the potential to process transactions faster and more securely than traditional payment systems, current blockchain networks are still limited in their ability to handle large volumes of transactions[30].

Finally, the acceptance of cryptocurrency is limited due to the predominance of fiat currency in the global economy. For centuries, fiat currency has been the primary form of currency, and it is widely acknowledged and accepted by businesses and consumers worldwide. This dominance has made it challenging for cryptocurrency to gain widespread acceptance and recognition as a viable alternative to fiat currency[31].

In general, although cryptocurrency can bring about a paradigm shift in our understanding of money and financial transactions, it still confronts several obstacles and hindrances to gain universal recognition and implementation[32].

6. Tackling Money Laundering in the Realm of Cryptocurrency

Money laundering has been a significant challenge for governments and financial institutions globally, and cryptocurrency has received particular attention due to its potential to facilitate illicit transactions. The decentralized and anonymous nature of many cryptocurrencies makes it difficult for law enforcement agencies to trace transactions and identify the individuals involved, leading many countries to implement strict regulations and bans on cryptocurrency in an effort to combat money laundering and other forms of financial crime[33]. For example, China has banned cryptocurrency exchanges and initial coin offerings since 2017 due to concerns about financial stability and illegal fundraising activities, while Bangladesh has banned the use of cryptocurrency entirely[32]. Other countries, such as the United States, have taken a more nuanced approach to regulating cryptocurrency by requiring exchanges and wallet providers to register with regulatory authorities and comply with anti-money laundering and know-your-customer regulations under the Bank Secrecy Act (1, 2). However, despite these regulatory efforts, cryptocurrency remains a popular tool for money laundering and other illicit activities due to its ability to anonymously transfer funds across borders[32]. Therefore, the fight against money laundering and other financial crimes remains an ongoing challenge for governments and financial institutions, and the regulatory landscape for cryptocurrency is likely to continue to evolve and adapt to these challenges in the years ahead[32].

7. Uncovering Illicit Activities: Instances of Money Laundering in Cryptocurrency

The use of cryptocurrency in money laundering has become a concern for law enforcement agencies, as there are many ways in which cryptocurrency has been used to facilitate illicit activities. One way is through

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28 M. Kumagai. (2018). The Legal and Economic Risks of Cryptocurrencies. *Journal of Applied Corporate Finance*, 30(2), 105-112.

29 D. Stanciu. (2014). Legal and Regulatory Challenges of Cryptocurrencies in the European Union. *Procedia Economics and Finance*, 15, 1425-1432.

30 A. Swan. (2015). *Blockchain: Blueprint for a New Economy*. O'Reilly Media, Inc.

31 N.B. Szabo. (2001). Shelling Out: The Origins of Money. *Journal of Libertarian Studies*, 15(3), 39-77.

32 A. Bhutoria. (2021). Cryptocurrency: Opportunities and Risks. *Congressional Research Service.*

33 Financial Crimes Enforcement Network. (2021). Bank Secrecy Act/Anti-Money Laundering. Retrieved from https://www.fincen.gov/what-we-do/bank-secrecy-act-anti-money-laundering

darknet markets, which operate on the dark web and require payment in cryptocurrency to maintain anonymity. This has led to the development of "tumbling" services that mix and launder cryptocurrency to make it more difficult to trace. Another way is through Ponzi schemes, where fraudsters use cryptocurrency to collect money from investors and launder it through multiple accounts and transactions. Ransomware attacks also involve demanding payment in cryptocurrency, which criminals can then launder through tumbling services or by converting it into other cryptocurrencies. Finally, cryptocurrency has been used to launder the proceeds of cybercrime, as criminals can anonymously purchase goods or services online or convert it into fiat currency through cryptocurrency exchanges or peer-to-peer networks. As cryptocurrency gains mainstream adoption, it is likely that criminals will continue to exploit it for illicit purposes, making it crucial for governments and law enforcement agencies to evolve their regulatory and enforcement strategies to stay ahead of the criminals[34,35,36,37].

8. Unveiling Digital Bills: Merging Trustworthy Assurance with Cryptocurrency Advantages

In light of the drawbacks of cryptocurrency, an alternative solution is to create a digital bill that combines the benefits of cryptocurrency with the trusted confidence of a traditional banknote. To understand the concept of a digital bill, it is important to understand the function of a banknote. Banknotes, such as the US$100 bill, are legal tender for all debts, public and private, and are issued by the Federal Reserve as Federal Reserve notes[38,39].

In the case that an individual lacks confidence in banknotes, they can exchange them for government-issued currency at the Federal Reserve[40]. This exchange is possible domestically or nationally, but in the case of international trade, banknotes are worthless in another jurisdiction as they have no value in foreign markets[41]. To address this limitation, a digital bill would need to be created that is accepted globally.

A digital bill could potentially provide the same trusted confidence as traditional banknotes while also offering the benefits of cryptocurrency, such as decentralization and anonymity. However, the development and adoption of a digital bill would require extensive research and testing to ensure its security and reliability[42].

The topic of silver in China's economic history is intriguing and often misunderstood[43]. Even though the majority of the world's silver, around 85 percent, was produced in Mexico and Peru from 1500 to 1800, at least a third and possibly over 40% of that silver eventually made its way to China[42]. This influx of silver was not the result of charity from Europe, but rather an exchange for highly valued goods such as silk, porcelain, and tea, demonstrating the robustness of the Chinese economy and its extensive foreign trade[42]. This contradicts the common misconception that China was only interested in domestic affairs and not global trade.

China's use of silver as its primary currency is due to the lack of trust in paper money[42]. Silver became the preferred medium of exchange in China's international trade[42]. As a result, international trade began with the exchange of precious metals, and the gold standard for international trade eventually emerged, where gold's intrinsic value was acceptable worldwide[44]. Countries still maintain gold reserves as a hedge against inflation and as a store of value[43]. Gold has been used as a currency and a store of wealth for thousands of years and continues to play a crucial role in the modern global economy[43]. One of the main reasons why countries hold

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gold reserves is to protect against inflation[43]. When the value of a country's currency declines due to inflation, the value of its gold reserves typically increases, allowing the country to sell some of its gold reserves to support its currency during times of inflation or economic crisis[43].

Gold reserves are not only a defense against inflation but can also function as a shield against geopolitical risks and market volatility[45]. Being a safe-haven asset, gold is in high demand during times of instability and uncertainty[44,46]. Countries can hold gold reserves to help stabilize their economies during crises and insulate themselves from market fluctuations[44]. In addition to its perceived safety, gold is also a highly liquid asset that can be quickly converted into cash or used to settle international transactions[44,45]. Many countries use gold as collateral when borrowing from other countries or international organizations, which helps them secure better borrowing terms and lower interest rates[45]. Despite the rise of digital currencies and other forms of investment, gold remains an important part of countries' monetary policies, and its value is likely to persist in the future[47].

As such, a currency that is backed by gold or other precious metals has been a popular means of payment throughout history. This is because gold has been universally recognized as a store of value, and even those who are skeptical of paper currency can have confidence in the intrinsic value of gold[48].

Historically, many countries used gold coins as their primary means of currency. However, in the modern era, the use of gold-backed currency has become less common due to the difficulty of maintaining a gold standard. Countries that use gold-backed currency must maintain large reserves of gold to back the value of their currency, which can be difficult and expensive. Additionally, fluctuations in the price of gold can make it difficult to maintain a stable currency value[49].

Despite these challenges, some countries still maintain gold reserves to back their currency. For example, the United States used a gold standard until 1971 when it abandoned the practice due to economic pressures[50]. Today, some countries like China and Russia are increasing their gold reserves, as they see it as a way to diversify their currency holdings and reduce their reliance on the US$[51].

In recent years, the idea of a digital currency backed by gold or other precious metals has gained traction. This would allow individuals to make transactions using a currency that is backed by something tangible, while also benefiting from the convenience of digital transactions. Some companies and organizations have already begun developing digital currencies that are backed by gold or other precious metals[52].

Overall, a currency backed by gold or precious metals has many advantages, including its intrinsic value and universal acceptance[53]. While it may be challenging to implement on a large scale, the idea of a gold-backed currency is still relevant today and may continue to gain popularity in the future.

In the world of cryptocurrency, stable coins backed by precious metals like gold have gained popularity in recent years[54]. But what if we could take this concept one step further and create a digital currency that was not

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45 Why do Countries Hold Gold Reserves? World Gold Council, https://www.gold.org/goldhub/data/why-do-countries-hold-gold-reserves.

46 M. Lucey, Brian., Fergal A. O'Connor. and Simon Peers. (2012). Gold Markets Around the World—Who Spills Over What, to Whom, When? *Applied Financial Economics*, 22(8), 589-601.

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52 Digital Currency Backed by Gold: A Realistic Possibility? *Cointelegraph*, September 24, 2020, cointelegraph.com/news/digital-currency-backed-by-gold-a-realistic-possibility.

53 Currency Backed by Gold or Other Precious Metals. Investopedia, https://www.investopedia.com/terms/c/currency-backed-by-gold.asp.

54 What Are Gold-Backed Cryptocurrencies?, *Forbes*, https://www.forbes.com/advisor/investing/gold-backed-cryptocurrencies/.

only backed by precious metals, but also functioned as a bill of exchange? This is where the concept of the "Digital Bill" comes in[55].

Imagine a digital currency that combines the convenience and security of traditional bank notes with the decentralized nature of cryptocurrency[56]. A Digital Bill would be a digital representation of a piece of precious metal, such as gold, which would allow users to make transactions in a secure and transparent manner[54]. The digital representation of the precious metal would be stored on a blockchain, ensuring that the ownership and transfer of the asset are easily verifiable[57].

One of the key benefits of the Digital Bill is that it would provide a familiar and trusted form of currency for individuals who may not have confidence in government-issued fiat currency or traditional bank notes[58]. If someone were to lose faith in their national currency, they could easily replace it with a piece of precious metal-backed Digital Bill, which they would know is a secure store of value[54].

The Digital Bill has the potential to facilitate international trade in an efficient and secure manner, as it would be universally accepted as a medium of exchange, independent of any specific national currency or banking system, making it a bill of exchange[59]. The idea of the Digital Bill is promising, as it merges the convenience of digital transactions with the security and reliability of precious metals. As the world of cryptocurrency develops, it remains to be seen if this concept will be widely adopted and become a reality[60].

9. Investigating the Potential of Digital Bills

The idea of a Digital Bill is a concept that has yet to be fully realized, but there are some companies and organizations that are exploring the possibilities of this technology. For instance, the Bank of Canada has researched Central Bank Digital Currencies (CBDCs) that could be used instead of physical banknotes, while Tangem and Otonomos have created physical "smart banknotes" that use blockchain technology to allow secure and traceable transactions. Nonetheless, using a physical printed paper-based currency for cross-border trade still raises concerns about whether it is acceptable to all parties involved. If China earns Canadian CBDC backed by Canadian Dollar during an international trade with Canada, for example, there is no intrinsic value in the Canadian printed dollar, and other countries may not agree to exchange Canadian dollars. The Digital Bill solves this issue by allowing instant currency value adjustments[61].

One of the potential advantages of a Digital Bill is that it could address some of the downsides of cryptocurrency, such as its association with illicit activities and limited acceptance. By integrating robust security measures and acknowledging physical precious metals, a Digital Bill could provide an alternative to both fiat currency and cryptocurrency, offering the convenience and efficiency of digital currencies combined with the reliability of precious metals. However, there are also concerns regarding privacy and security, since traceable digital currency could be exploited to monitor and manage people's financial activities in invasive ways[62]. Furthermore, developing a secure and trustworthy system for storing and transferring Digital Bills resistant to hacking and other cybercrimes is a significant challenge[61].

10. Assessing the Feasibility of Digital Bills

Various organizations and companies have explored the potential of Digital Bill (DB) as an alternative to traditional fiat currency and cryptocurrency. The concept of DB, which has been around for some time, proposes

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55 The Digital Bill: A Precious Metal-Backed Cryptocurrency, Strategic Wealth Preservation, https://swpcayman.com/digital-bill-precious-metal-backed-cryptocurrency/.

56 The Future of Money: Gold-Backed Cryptocurrency, Goldco, https://goldco.com/future-of-money-gold-backed-cryptocurrency/.

57 What Are Gold-Backed Cryptocurrencies?, Forbes, https://www.forbes.com/advisor/investing/gold-backed-cryptocurrencies/.

58 The Digital Bill: A Precious Metal-Backed Cryptocurrency, Strategic Wealth Preservation, https://swpcayman.com/digital-bill-precious-metal-backed-cryptocurrency/.

59 Investopedia. (2022). Bill of Exchange. https://www.investopedia.com/terms/b/bill-of-exchange.asp

60 Forbes. (2018). The Case for a Digital Currency Reserve. https://www.forbes.com/sites/forbestechcouncil/2018/06/05/the-case-for-a-digital-currency-reserve/?sh=6c397d6e4918

61 Exploring the Possibilities of Digital Bills. CoinMarketCap, March 9, 2021, https://coinmarketcap.com/alexandria/article/exploring-the-possibilities-of-digital-bills.

62 The Advantages and Challenges of a Digital Bill, Bitvo, August 25, 2020, https://bitvo.com/the-advantages-and-challenges-of-a-digital-bill/.

that each unit of currency is backed by a fixed amount of precious metals, such as gold, silver, or platinum, to increase its stability and reduce its vulnerability to market fluctuations[63].

Money laundering poses a significant threat to the global financial system because it enables illegal activities and undermines the integrity of the financial system. To combat money laundering, many countries have enacted strict regulations, with some even prohibiting certain financial transactions. For instance, in 2018, the Reserve Bank of India (RBI) banned banks and other regulated entities from dealing with cryptocurrency due to concerns about money laundering and terrorism financing[64]. Similarly, China has tightened regulations on cryptocurrency trading and Initial Coin Offerings (ICOs) due to concerns about money laundering and financial stability.

In contrast, some countries have chosen to regulate cryptocurrencies instead of prohibiting them. In the United States, the Financial Crimes Enforcement Network (FinCEN) requires virtual currency exchanges and other crypto-related businesses to register with the agency and adhere to rigorous anti-money laundering (AML) and Know-Your-Customer (KYC) requirements[65]. In addition, the European Union's Fifth Anti-Money Laundering Directive (5AMLD) mandates that virtual currency exchanges and custodian wallet providers register with national authorities and comply with strict AML and KYC regulations[66].

Governments worldwide are taking action to prevent the use of cryptocurrencies for illicit purposes, as the fear of money laundering remains a serious concern. Some countries have prohibited cryptocurrency transactions completely, while others have implemented stringent regulations to combat money laundering and ensure the financial system's integrity. Nonetheless, criminals continue to use various techniques to launder their money, and cryptocurrency has emerged as a new tool in their arsenal[67]. The anonymous nature of cryptocurrencies, coupled with the lack of regulation, makes it an attractive option for money laundering. There are several reasons why criminals prefer cryptocurrency for money laundering, including anonymity, lack of regulation, difficulty in tracing, and global reach. Transactions can be made without disclosing the parties' identities, making it difficult for law enforcement to trace the money. The cryptocurrency market operates in a mostly unregulated environment, making it easier for criminals to use it for illegal activities. It is challenging to trace cryptocurrency transactions back to the individuals involved, particularly if they use mixers or other tools to obscure their identities, as these transactions are recorded on a public ledger known as a blockchain. Furthermore, cryptocurrency transactions can be made across borders without a financial intermediary, making it easier for criminals to move money across different jurisdictions, making it more difficult for law enforcement to track[68].

11. Instances of Cryptocurrency Deployment in Money Laundering

Cryptocurrencies have been used for money laundering in various instances. For example, the Silk Road was an online marketplace that enabled illegal activities such as drug trafficking and money laundering. Bitcoin was the preferred payment method on Silk Road because of its anonymity and lack of regulation[69]. Another example is Mt. Gox, a cryptocurrency exchange that was hacked in 2014, resulting in the theft of millions of dollars in Bitcoin. The stolen Bitcoin was later sold on other exchanges, making it challenging to trace[70]. Cryptocurrencies are also commonly used on darknet markets, which sell illegal goods and services and

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[63] Exploring the Viability of Digital Bill. Gold Silver Reports, March 8, 2019, https://www.goldsilverreports.com/news/exploring-the-viability-of-digital-bill/.

[64] RBI Bans Banks from Dealing with Cryptocurrency. *The Economic Times*, April 6, 2018, https://economictimes.indiatimes.com/news/economy/policy/rbi-bans-banks-from-dealing-with-cryptocurrency/articleshow/63610591.cms.

[65] FinCEN Takes First Enforcement Action Against Peer-to-Peer Cryptocurrency Exchanger. U.S. Department of the Treasury, April 18, 2019, https://www.treasury.gov/press-center/press-releases/Pages/sm0418.aspx.

[66] Fifth Anti-Money Laundering Directive. European Banking Authority, 2018, https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2545547/Fifth%20Anti-Money%20Laundering%20Directive.pdf.

[67] F. Panetta. (2018). Cryptocurrencies and Distributed Ledger Technology: What Financial Institutions Need to Know. *Journal of Payment Strategy and Systems*, 12(4), 345-358.

[68] T. Rans. (2020). Anti-Money Laundering and Cryptocurrencies: The Global Landscape in 2020. *In Bitcoin and Beyond*, 125-139, Routledge.

[69] S. Talbot. (2017). The Silk Road, Bitcoins and the Global Prohibition Regime on the International Trade in Illicit Drugs: Can this Storm be Weathered? *European Journal of Risk Regulation*, 8(1), 91-107.

[70] N. Popper. (2019). Digital Gold: Bitcoin and the Inside Story of the Misfits and Millionaires Trying to Reinvent Money. HarperCollins.

enable anonymous transactions[71]. In conclusion, the anonymity and lack of regulation associated with cryptocurrencies have made them an attractive option for criminals seeking to launder their money. As the use of cryptocurrency for illegal activities becomes more prevalent, regulators face increasing pressure to implement stricter regulations and monitoring of the cryptocurrency market.

12. Establishing Trust: The DB's Mechanism to Minimize Money Laundering

The Digital Bill (DB) aims to establish a mechanism for preventing money laundering and fraudulent activities by relying on a network of honest nodes that maintain the integrity of the blockchain[72]. Nodes within the DB network are responsible for ensuring the accuracy and security of the blockchain, and any attempt to manipulate it is immediately flagged and investigated by the network[71]. Law enforcement agencies also monitor vulnerable nodes outside of the network, which helps prevent illicit activities and promote safety in financial transactions[71]. By creating a trusted network and implementing robust surveillance measures, the DB aims to provide a high level of security and protection against money laundering[71]. To achieve this, the DB proposes several processes to mitigate the risk of illicit financial activities and ensure the integrity of the digital currency system[73]. By building trust through these measures, the DB can encourage greater adoption and confidence in the digital currency[71].

13. Forming a Volunteer Committee

To ensure the successful development and governance of the Digital Bill (DB), it is necessary to establish a robust volunteer committee[74]. This committee will have several responsibilities, including consensus building, decision-making, and community building. Consensus building will be crucial for the DB network, and the volunteer committee will be responsible for ensuring that agreement is reached on key technical details, such as block size and transaction fees[73]. Additionally, the committee will make important decisions about funding, marketing, and partnerships to guide the network towards long-term success[73]. Furthermore, the volunteer committee will play a vital role in community building, including developing educational resources, organizing events, and fostering a culture of collaboration and innovation[73].

In summary, the volunteer committee will be an integral part of the Digital Bill's development and governance, providing essential support and direction to ensure its long-term success[73]. Although the structure of the committee is not discussed in this proposed approach, further research is needed as it will play a critical role in the DB network[73].

14. Imprinting Crucial Features in the Block

The incorporation of additional stamping in each block can prove to be a crucial measure for mitigating the risk of money laundering and protecting the future of cryptocurrencies[75]. The addition of extra stamping to each transaction block enables easier tracking and tracing of transactions, making it more difficult for individuals to conceal the origin of funds or launder money through digital currencies[74]. Additionally, the inclusion of extra stamping in each transaction block can help to address the issue of lost or inaccessible private keys, which can result in the loss of cryptocurrency[74]. The identification and verification of the rightful owner of the cryptocurrency become easier through this mechanism, thereby ensuring the recovery or transfer of cryptocurrency holdings to the appropriate beneficiaries in the event of the owner's death or incapacity[74]. Apart from these practical advantages, adding extra stamping to each transaction block can also enhance public confidence in cryptocurrencies by demonstrating a commitment to transparency and accountability[74].

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[71] N. Christin. (2013). Traveling the Silk Road: A Measurement Analysis of a Large Anonymous Online Marketplace. In Proceedings of the 22nd international conference on World Wide Web, 213-224, ACM.

[72] A. Asif. (2021). Understanding Digital Currency and Its Anti-Money Laundering Challenges. In Handbook of Blockchain and Cryptocurrency, 1313-1326, Springer, Cham. doi: 10.1007/978-3-030-58464-4_54

[73] C.A. Agbo. and A.E. Omankhanlen. (2020). Designing a Digital Currency for Nigeria: A Proposed Framework. In Proceedings of the 3rd International Conference on Inventive Systems and Control (ICISC 2019), 1751-1759, Springer, Singapore. doi: 10.1007/978-981-15-0138-5_165

[74] E. Kim. (2021). Establishing a Volunteer Committee: Proposal for the Development and Governance of Digital Bill (DB). ResearchGate. Available from: https://www.researchgate.net/publication/353163787_ Establishing_ a_Volunteer_ Committee_ Proposal_for_the_Development_and_Governance_of_Digital_Bill_DB.

[75] Böhme, Rainer., Nicolas Christin., Benjamin Edelman. and Tyler Moore. (2015). Bitcoin: Economics, Technology, and Governance *Journal of Economic Perspectives*, 29(2), 213-38.

This can contribute to building trust among users and attracting new investors and users to the market[74]. As a result, the incorporation of additional stamping in each transaction block can be critical in protecting the future of cryptocurrencies and ensuring their growth and acceptance over time.

15. Distinctive Issuance Number for DB

Divisibility is an essential aspect of any currency, and this would also hold true for Digital Bill (DB). By dividing each unit of DB into one thousand units, it will allow for easy transactions of varying sizes[76]. Moreover, each DB unit will be assigned a unique currency number, ensuring secure and traceable transactions while also preventing counterfeiting and other fraudulent activities[75]. With each transaction being duly recorded in each numbered DB unit, it will be possible to accurately identify the nature of the transaction and the involved parties[75].

When a customer wishes to purchase DB, they will provide a certain quantity of gold or fiat currency equivalent to the value of the desired DB unit[75]. The committee will determine the fiat exchange rate based on the current value of gold or other criteria at the time of purchase. Once the payment is received and verified, the committee, who is the sole operator of DB, will issue the requested number of digitally numbered DB units and transfer them to the customer's wallet[75].

Depending on the customer's purchase request, the committee may issue a single unit of numbered DB or a bundle of numbered DBs[75]. The customer will be able to view their total DB balance in their wallet and also check the detailed numbered DBs in their account if they wish.

To maintain the security and integrity of the DB blockchain, a specific stamping process is required for issuing specific denominated DB units of any value[75]. This process involves issuing new numbered DBs, recording a new transaction in the blockchain, assigning the particular denominated DBs to the customer's wallet, and officially validating the transaction for the customer to use the DBs.

Figure 2: Hypothetical Design for a Digital Bill Wallet[77]

16. Transforming Crypto Wallets

The proposed DB system is set to revolutionize crypto wallets. Unlike traditional wallets that hold the total amount of cryptocurrency a user possesses, the client's wallet in the proposed DB system holds the same total amount of DB but in denominated numbered units, which are divisible. This means that when a client executes

[76] What is Digital Bill (DB)? CoinMarketCap; https://coinmarketcap.com/currencies/digital-bill/.

[77] Sharif, Md Romel. (2023). Digital Bill: An Approach to Minimize Illicit Activities and Other Drawbacks of Crypto Currency (May 1, 2023). Available at SSRN: https://ssrn.com/abstract=4434303; p-23.

a transaction, they will use specific numbered DB units instead of the total amount. Additionally, a client's wallet may hold a bundle of numbered DBs, and the wallet is designed in such a way that it displays the total amount of DB but automatically delivers the equivalent amount of numbered DB units at the time of spending. This feature is similar to physical wallets where individuals do not have to check the issuing number of banknotes while spending.

In the event of a cyber-attack or ransomware incident affecting a node of Digital Bill (DB), the node owner can request the volunteer committee to cancel or ban the specific numbered DBs associated with their node, and request the issuance of new DBs in their name. The volunteer committee verifies the latest transaction records on the blockchain before issuing new DBs, ensuring that the integrity and security of the DB system are maintained. Similarly, if a crypto exchange or DEX experiences a cyber-attack, they can request the committee, who are the sole operators of the DB network, to reissue the DBs. The committee analyzes the previous data to determine the appropriate amount to reissue, protecting users from losses due to the cyber-attack and highlighting the importance of having a volunteer committee to manage and regulate the DB network

17. Strengthening Anti-Money Laundering Measures through Location and IP Address Verification

Incorporating Location and IP Address Stamping to Enhance Anti-Money Laundering Measures: The recording of transaction locations and IP addresses in the Digital Bill (DB) network can help authorities trace the flow of funds and identify suspicious patterns or connections. By detecting and deterring illicit activities such as the funding of criminal organizations or terrorist groups, this approach can help prevent money laundering and terrorist financing[78]. Additionally, the creation of a database of high-risk areas and individuals can be used by financial institutions and law enforcement agencies to flag and investigate suspicious transactions[79]. This would help prevent such activities before they can cause significant harm. Blockchain technology can also help promote accountability and transparency in financial systems by providing clear and transparent records of every transaction[80]. Incorporating location and IP address stamping in the blockchain is a powerful tool in the fight against money laundering and terrorist financing and helps to promote greater transparency and accountability in financial systems[81].

In addition to stamping location and IP address in the blockchain, device identification through IMEI (International Mobile Equipment Identity) and MAC (Media Access Control) addresses can be incorporated into transactions to create a more robust system for tracking and preventing illicit activities[82]. IMEI is a unique identifier assigned to every mobile device, while MAC address is a unique identifier assigned to every network interface. This approach helps to strengthen the ability to combat financial crimes[83].

18. Top of Form Incorporating Browser's CSS Code: Significance of Browser and Absence of Dark Net

It should be noted that using a reputable browser and excluding the dark net from the DB network would make it harder for criminals to engage in illegal activities using this currency[84]. The use of well-known browsers and the absence of the dark net can make DB a more secure and transparent method of conducting transactions. To achieve this, the proposed blockchain network should include the CSS code of reliable and trustworthy browsers in the block. CSS, which is the primary language for defining the presentation of web pages, can be used to

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78 Financial Action Task Force. (2019). Virtual Assets and Virtual Asset Service Providers. https://www.fatf-gafi.org/media/fatf/documents/recommendations/RBA-VA-VASPs.pdf

79 Brigitte Unger., Duygu Yenerim. and Rutger de Graaf. (2020). Exploring the Use of Blockchain Technology for Anti-money Laundering Purposes. *Crime Science*, 9(1), 1-10. https://doi.org/10.1186/s40163-020-00117-6

80 X. Liu., J. Liu. and X. Chen. (2021). Research on Blockchain-based Anti-money Laundering of Commercial Banks. *Journal of Physics: Conference Series*, 1952(1), 1-6. https://doi.org/10.1088/1742-6596/1952/1/012056

81 T. Schlecht. (2020). Blockchain: The Next Frontier in Anti-money Laundering Compliance. *ACAMS Today*, 19(1), 28-31. https://www.acamstoday.org/blockchain-the-next-frontier-in-anti-money-laundering-compliance/

82 S. Kumar. and M. Sharma. (2021). A Novel Approach for Enhancing the Security of Blockchain Using MAC Address. 2021 3rd International Conference on Computing, Communication, and Security (ICCCS), 1-5. https://doi.org/10.1109/ICCCS51659.2021.9398349

83 PWC. (2020). Financial Crimes: How Can Technology Help Combat the Risks in the Middle East? https://www.pwc.com/m1/en/services/consulting/forensics/financial-crimes-technology-combat-risks-middle-east.html

84 X. Li., P. Jiang., T. Chen., X. Luo. and Q. Wen. (2018). Design and Implementation of a Blockchain-based Intelligent Transportation System. *IEEE Transactions on Intelligent Transportation Systems*, 19(3), 689-703. doi: 10.1109/TITS.2017.2702875

tailor the presentation of web content to various types of devices, and it is independent of HTML and can be used with any XML-based markup language[85]. No CSS code of darknet browsers is acceptable, and even VPNs are not allowed since proper IP addresses and locations are required for this blockchain, and the network will deny any transactions without them.

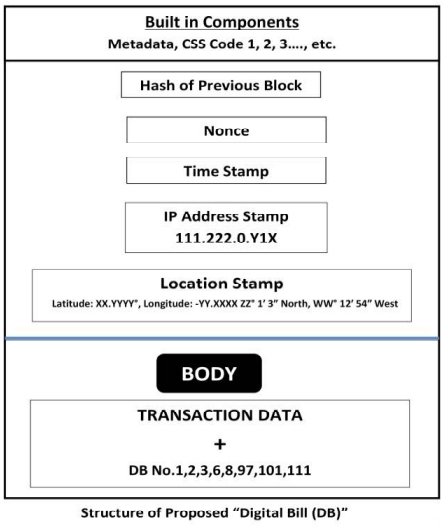

Figure 3: Potential Framework for the Proposed Digital Bill[86]

One might question why a reputable browser company would offer its CSS code, and the CSS code may need to be updated frequently due to bug fixes, browser compatibility problems, or changes to the CSS specification itself[82]. Nonetheless, the proposed approach for the Digital Bill is for the DB to operate through its own wallet system and run on its own separate network, if possible, ensuring a secure and safe environment for transactions[82].

19. Deliberating Nonce Exclusion in the Future

Satoshi Nakamoto introduced the nonce to secure the Bitcoin network by adding a random number to each block to solve a cryptographic puzzle in the Proof-of-Work (PoW) consensus mechanism used in Bitcoin, ensuring that the blockchain remains tamper-proof and secure[87]. Despite its importance in the security of the blockchain network, the computational process required to generate a nonce leads to significant energy consumption, which can harm the environment by increasing carbon emissions and global warming[88].

To minimize the negative environmental impact of the blockchain, it is crucial to explore alternative methods for generating a nonce that minimize energy consumption. However, adding the nonce function to the early stages of Digital Bill's (DB) network can provide a necessary level of security against double-spending attacks, making it essential for the security of the DB network[85]. Once the DB network achieves mass adoption, a transition to a proof-of-stake (PoS) consensus mechanism can help reduce energy consumption and increase efficiency[86].

Although the Nonce function is necessary at present for the security of the DB network, it may be possible to omit it altogether in the long term as better solutions for tamper-proofing the network emerge. This approach aligns with the growing focus on sustainability and reducing the environmental impact of blockchain

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85 MDN Web Docs. (n.d.). CSS. Retrieved from https://developer.mozilla.org/en-US/docs/Web/CSS

86 Sharif, Md Romel. (2023). Digital Bill: An Approach to Minimize Illicit Activities and Other Drawbacks of Crypto Currency (May 1, 2023). Available at SSRN: https://ssrn.com/abstract=4434303; p-25.

87 S. Nakamoto. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System [Internet]. Available from: https://bitcoin.org/bitcoin.pdf

88 X. Bai., Y. Zhang., X. Liu., X. Liu., K. Liu. and X. Gao. (2020). Energy Consumption Analysis and Optimization of Blockchain-Based Applications: A Survey. *IEEE Access*. 2020;8:216541–67.

technology[85]. As with any emerging technology, developers and researchers should continue to explore new approaches and adapt to changing circumstances to ensure the long-term success of Digital Bill[89].

20. Safeguarding Crypto from Extinction

When someone possesses crypto assets, it is crucial to ensure the security of the private key, which is the sole means of accessing those assets. If the private key is misplaced, stolen, or forgotten, the crypto assets become irretrievable. Similarly, if a crypto asset holder passes away without bequeathing the private key to their heirs, the assets are lost forever[90].

To avoid such a scenario, one can adopt various measures such as using a secure hardware wallet, backing up the private key, or entrusting it to a trusted third-party custodian. However, these measures are not completely secure and can still leave the assets vulnerable.

To overcome this challenge, certain crypto projects have introduced the idea of a "dead man's switch," which is a mechanism that ensures that the assets are not lost in the event of the owner's death or incapacitation[91].

The importance of securing and protecting private keys for crypto assets has been discussed earlier[87]. Measures such as using a secure hardware wallet, backing up the private key, or entrusting the key to a trusted third-party custodian can be taken to prevent the loss of assets[87]. However, these measures are not foolproof and can still leave the assets vulnerable[87].

To address this issue, some crypto projects have introduced the concept of a "dead man's switch"[87]. Alice is given as an example of a crypto holder who sets up a dead man's switch, which requires her to regularly confirm her identity and presence using a predetermined method[87]. If Alice fails to confirm her identity for a certain period of time, the dead man's switch is triggered, and the Bitcoin is automatically transferred to a specified beneficiary[87].

Multi-signature wallets are another example that can be used to ensure access to assets in case of the owner's death or incapacitation. In this case, multiple signatures, including the owner's, are required to access the assets. If the owner is incapacitated or deceased, the other signatories can still access the assets and transfer them to the intended beneficiaries.

These mechanisms can help ensure that crypto assets are not lost or forgotten in case of the owner's death or incapacitation. Crypto holders should consider these options and choose the one that best suits their needs and circumstances.

In the case of DB, a simplified process is followed. The nodes do not have to deal with the complexities of recovering lost private keys or accessing assets after the owner's death. Instead, they can simply apply to the DB committee for reissuing new DBs. If a user forgets their private key or loses access to their wallet, they can apply to the committee to reissue their DBs. Similarly, in the case of the owner's death, the legal heirs or nominees can claim ownership of the assets by submitting the required documents to the committee. The committee will then transfer the ownership of the DBs to the rightful heirs or nominees, and the assets will be accessible through their registered wallet.

This simplified process ensures a seamless transfer of assets in case of death or loss of private keys, without the need for complex key recovery mechanisms

21. Employing Pseudonymous Private Key instead of Anonymity

The utilization of a pseudonymous public key system instead of an anonymous private key can be an essential feature in guaranteeing the security and transparency of a divisible digital currency (DB)[92]. The recording of every transaction on a blockchain allows for the tracing of the flow of DB units from one user to another, providing a permanent and tamper-proof record of all transactions[89]. The advantages of this feature are

[89] V. Buterin. (2014). A Next-Generation Smart Contract and Decentralized Application Platform, Available from: https://github.com/ethereum/wiki/wiki/White-Paper

[90] What is a Private Key? *Bitcoin Market Journal*; https://www.bitcoinmarketjournal.com/private-key/.

[91] Williams, Ollie. (2022). Crypto's Dead Man's Switch: How to Provide for Your Heirs Without Centralizing Your Funds. CryptoSlate. March 8, 2022. https://cryptoslate.com/cryptos-dead-mans-switch-how-to-provide-for-your-heirs-without-centralizing-your-funds/.

[92] P.H. Patel., N.P. Modi, M. Patel and K. Patel. (2018). Implementation of Secure and Transparent Divisible E-Currency Using Blockchain Technology. *International Journal of Engineering and Technology*, 10(2), 557-563.

numerous, as it can prevent fraudulent activities such as counterfeiting and double-spending by uniquely identifying each DB unit[89]. Additionally, it can impede money laundering and other illicit activities by enabling the easy identification and investigation of suspicious transactions[89]. However, the usage of blockchain technology for transaction tracing could also result in privacy issues[93]. Even though the blockchain provides a secure and transparent method of recording transactions, it can also be accessed by anyone with access to the blockchain, thereby raising privacy concerns[90]. It is vital to maintain a balance between privacy and transparency when using a unique issuing number for each divisible unit of a DB[89]. The pseudonymous public key system can provide this balance by assigning each user a unique public key visible on the blockchain, which would not reveal their actual identity[94]. This system would enable users to maintain a degree of privacy while allowing law enforcement and other authorities to trace suspicious transactions and investigate potential criminal activity on the blockchain[91]. In conclusion, the use of a pseudonymous public key system can help achieve a balance between privacy and transparency, while also preventing illicit activities such as money laundering and terrorism financing in a DB[89,91].

22. Forging a Sustainable Future with Environment-friendly Digital Bills

The utilization of a "Green Digital Bill" that does not rely on mining offers a notable advantage in terms of reducing carbon emissions[95]. The process of mining cryptocurrencies such as Bitcoin consumes a large amount of computational power, which in turn necessitates significant amounts of electricity. This has raised concerns about the environmental impact of cryptocurrencies and the sustainability of the mining process. By avoiding the need for mining and instead relying on transaction fees to support the volunteer committee, the DB can notably decrease its carbon footprint[92]. Since transaction fees are generally much lower than the energy costs associated with mining, the currency can operate with a minimal environmental impact. This shift toward a more sustainable digital currency is a significant stride in creating a more environmentally-friendly world. As climate change concerns persist, it is vital that we take action to reduce our carbon footprint and lessen the environmental impact of our financial activities. By establishing a digital currency that is both secure and sustainable, we can encourage a more environmentally responsible approach to conducting financial transactions[92].

23. Transparency within the DB Network

Transparency plays a crucial role in the DB network, as it fosters trust and confidence in the integrity of the currency among investors and users. A public ledger records all transactions on the blockchain, ensuring that users can see how their funds are being handled securely and ethically. This ledger is tamper-proof and available to everyone, ensuring that the transparency of the DB network is maintained. The DB network also relies on a decentralized structure that distributes control and decision-making across the network, preventing any single entity from exerting too much control over the network. This decentralization ensures that the network remains transparent and democratic, promoting greater trust and confidence in the currency. Therefore, the transparency of the DB network is an important factor in promoting a more secure, stable, and trustworthy financial system for all users and investors.

24. Regenerating Private Keys and Implementing Cold Locker Storage

The security and reliability of the DB network are strengthened by two important features: the regeneration of private keys and the use of a cold locker for storage[96]. In traditional blockchain networks, the loss or theft of a private key could result in permanent loss of funds since the key cannot be regenerated or lost funds recovered. However, in the DB network, the volunteer committee is responsible for reviewing and approving applications from users who have lost their private keys[93]. If the committee determines that the user is legitimate, they can

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[93] T. Meiklejohn, M. Pomarole, G. Jordan, K. Levchenko, D. McCoy, G.M. Voelker. and S. Savage. (2013). A Fistful of Bitcoins: Characterizing Payments Among Men with No Names. in Proceedings of the 2013 Conference on Internet Measurement Conference, Barcelona, Spain, October, 127-140.

[94] A.F.A. Ghani., H. Norouzi, and A. Shahrestani. (2021). Decentralized E-currency: A Pseudonymous Public Key System for Secure and Transparent Transactions. in 2021 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE), Istanbul, Turkey, July, 99-103.

[95] H. Ahn. and H. Kim. (2021). Design of a Sustainable Digital Bill Using Transaction Fees. Sustainability, 13(17), 9767. https://doi.org/10.3390/su13179767

[96] Cold Storage. Investopedia, Investopedia, March 12, 2022, www.investopedia.com/terms/c/cold-storage.asp.

regenerate the private key, thus allowing the user to regain access to their funds. Additionally, the DB network utilizes a cold locker, which is a secure offline storage facility that protects users' funds from theft or loss[93]. The cold locker is accessible only to authorized users and is safeguarded by multiple layers of security, including physical security measures and advanced encryption protocols. Together, these features provide users with greater protection against financial loss and theft and ensure that the DB network is more secure and reliable than traditional blockchain networks[93].

25. Enforcing DCFCL in the DB Network

The DB network aims to establish a more secure and reliable financial system by implementing Departmental Control and Functional Checklist (DCFCL), which is a tool commonly used in the banking sector to ensure the implementation of various security measures and controls. The DCFCL provides a comprehensive list of security and control measures that financial institutions must adhere to in order to ensure the safety of their operations and customer data[97]. It covers various areas such as physical security, access controls, network security, application security, business continuity planning, and disaster recovery to mitigate potential risks such as fraud, cyber-attacks, and data breaches[94]. The DCFCL is regularly reviewed and updated to keep pace with changing security threats and technologies[94].

By implementing a combination of advanced security measures and innovative technology, the DB network can build a secure and trustworthy financial system. To achieve this goal, the DCFCL will ensure that all entities operating within the network follow strict security standards and functional checklists[94]. These checklists will cover aspects such as secure storage of private keys, encryption of user data, and regular security audits[94]. Exchanges that are considered financial institutions will have additional security measures in place, such as a guard like Heimdall, which is responsible for monitoring the exchange's security systems and responding to any potential security threats in real-time[94,98]. By implementing these measures, the DB network can ensure that all entities operating within it are secure and protected from potential security threats, which will increase user trust and confidence in the network[94]. This, in turn, will lead to greater adoption and usage of the DB currency.

26. Competitive Edge of the DB: Sustainability and Ethical Standards

The DB currency can gain a competitive edge over other digital currencies due to its emphasis on sustainability and ethical practices, such as the use of a volunteer committee and eliminating carbon emissions from mining[99]. This focus on sustainability is especially attractive to users who are environmentally conscious, which can contribute to the popularity and long-term success of the DB currency. Therefore, the DB currency's unique characteristics, such as transparency, traceability, anti-money laundering measures, intrinsic value, and sustainability, make it a compelling choice for investors and users looking for a reliable and secure digital currency[96].

27. Ensuring Depository Insurance and Multi-Layered Security

To ensure the protection of investors, the DB network can implement a depository insurance mechanism, which would offer protection against losses resulting from cyber-attacks such as ransomware[100]. This would provide an additional layer of security to investors, especially given the increasing frequency of cyber-attacks. Depository insurance works by creating a reserve fund from contributions made by all investors in the network, and compensating any investor who suffers a loss from a cyber-attack[97]. The reserve fund will be managed by a third party, and will be subject to regular auditing to ensure its responsible management. Apart from depository

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[97] The Departmental Controls and Functional Checklists (DCFCL) is a tool used in the banking sector to ensure the implementation of various security measures and controls in the banking system. It is designed to cover a wide range of areas, including physical security, access controls, network security, application security, business continuity planning, and disaster recovery. The DCFCL is regularly reviewed and updated to keep pace with changing security threats and technologies.

[98] Heimdall is a fictional character in Norse mythology who is often associated with watchfulness and security. In the context of the DB network, Heimdall refers to a group of security specialists who are responsible for monitoring the security systems of Financial Institutions (FIs) operating within the network and responding to potential security threats in real-time.

[99] Digital Bits - The Evolution of Currency. Digitalbits.org, 2021, https://www.digitalbits.org/evolution-of-currency.

[100] N. Aggarwal. (2021). Depository Insurance and Multi-Layer Security. *The Journal of Internet Banking and Commerce*, 26(1), 2021. [Online]. Available: https://www.icommercecentral.com/open-access/depository-insurance-and-multilayer-security.php?aid=87887.

insurance, the DB network can also put in place other security measures, including multi-layer encryption, biometric identification, and two-factor authentication, to prevent unauthorized access to the network[97]. Through the combination of these security measures, the DB network could emerge as one of the most secure and trustworthy digital currency networks in the world, attracting even more investors and users to the platform[97].

28. Obstacles and Factors to Consider in Creating a Precious Metals-backed Digital Bill

The development of a digital bill backed by precious metals is an innovative concept that could potentially transform the way we store and transfer value. However, there are several logistical and storage challenges that must be addressed during the development phase. One of the primary challenges is the secure and reliable storage of precious metals to prevent theft or damage, which can be achieved through the use of advanced security measures in secure facilities[101]. Another challenge is the safe and efficient transportation of precious metals, which requires careful planning and coordination using modern transportation and logistics systems[102]. Furthermore, ensuring the accuracy and precision in the measurement and verification of the precious metals is essential to back the value of the digital bill, but technology advancements can help to accurately measure and verify the amount of precious metals in real-time[103]. Moreover, it is important to consider the environmental impact of storing and transporting precious metals and implement sustainable and environmentally-friendly solutions[104]. Despite these challenges, the development of a digital bill backed by precious metals can offer a secure, reliable, and efficient method of storing and transferring value while also providing a unique investment opportunity[105].

29. Conclusion

The benefits of the "Digital Bill" concept are numerous and represent a significant advancement in the development of digital currencies. One of its most noteworthy advantages is its ability to provide improved anti-money laundering protection through the use of the DB network. This feature is particularly essential in today's regulatory environment, where efforts are being made by financial institutions and governments to combat financial crime and money laundering. Thanks to its strict security protocols and compliance framework, the DB network is well-placed to provide users and investors with greater confidence and security when conducting financial transactions[106].

Another important advantage of the DB network is its strong cyber security protection. It has been built with advanced security features to offer nodes with exceptional protection against cyber-attacks, ensuring that their funds remain safe and secure at all times. This aspect is particularly important in today's world where cybercrime and cyber-attacks are becoming more sophisticated and prevalent, and the risk of financial loss due to hacking and other cybercrimes is a major concern[107].

In addition to these security benefits, the DB currency is highly resistant to inflation due to its backing by precious metals such as gold, silver, and platinum. These metals offer a stable store of value over time, making the DB currency a dependable and stable medium of exchange for investors and users, unlike other digital currencies that are subject to volatility and fluctuation[108].

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Furthermore, the DB network is a more eco-friendly and cost-effective alternative to traditional blockchain networks because it does not rely on mining to generate new currency. Additionally, the DB network provides a volunteer committee responsible for regenerating private keys in the event of loss or theft, ensuring that users can always regain access to their funds[109] .

The concept of the "Digital Bill" (DB) offers several advantages that can significantly advance the evolution of digital currencies. One of the most significant benefits is its decentralized structure, which makes it highly resistant to DEX hacking and other forms of centralized exchange manipulation, providing users with greater confidence and trust in the network's security and protection[110]. Moreover, nodes on the DB network are protected by depository insurance, which provides an additional layer of security against financial loss.

The widespread adoption of the DB network has the potential to create an ecosystem that centers around financial transparency[111]. In this ecosystem, individuals can easily submit their financial information to the government, including income, expenditure, and balance sheet data with just a click. This can help promote greater financial accountability, tax compliance, and reduce the risk of money laundering and other illicit activities. The use of smart contracts on the DB network can also enable automatic tax deductions and streamline other financial processes, leading to a more efficient and transparent financial system. The adoption of the DB network can pave the way for a more secure, transparent, and trusted financial future.

In summary, the DB network is a significant step forward in the evolution of digital currencies, offering a more secure, reliable, and stable medium of exchange for users and investors[112]. The DB network's strong focus on security, compliance, and reliability, makes it ideally positioned to become the preferred currency for people seeking a more secure and stable medium of exchange. Ongoing research and development will enable the DB network to become the future of currency, providing users around the world with unprecedented levels of trust, security, and convenience.

Competing Interest

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