White Paper

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Graphcoin

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Motivations

There is a lag in the technological innovations of banking services. Authorities are removed from the needs of the majority and financial institutions are not incentivized to develop the innovations that fit the needs of low to moderate income individuals.

Before large tech companies, like Uber and AirBnB, appealed to removing the middleman there was a more serious appeal to removing third-party trust. Ten years ago, Satoshi Nakamoto released a white paper titled: Bitcoin: A Peer-to-Peer Electronic Cash System, which solved the problem of the middleman, or needing third-party trust in a digital financial transaction.[1] The Bitcoin protocol is proof of concept that blockchain technology can serve as a means for a fee-free banking solution on a peer-to-peer network. Graphcoin is a mission-focused peer-to-peer network for digital financial transactions.

The technology that supports Graphcoin has improved scalability, sustainability, and lowers the barrier to entry to be a participant of the network. These developments are significant innovations to the mission of Bitcoin network. Removing predatory third parties and aligning interests can realize the ownership of assets for more people than the current infrastructure allows. The Graphcoin network's bottom line is a commitment to providing time and freedom to discover and pursue your passions.[2]

It is necessary to first understand the inefficiencies and profitability of third-party entities in order to understand the importance of democratizing financial services and the ownership of one's own data. Then one can apply this understanding to the potential of decentralized

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[1] Nakamoto, Satoshi. "Bitcoin: A peer-to-peer electronic cash system." 2008.

[2] Demirguc-Kunt, Asli, Leora Klapper, Dorothe Singer, Saniya Ansar, and Jake Hess. *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. The World Bank, 2018.

technology such as blockchain networks or peer-to-peer networks built on a decentralized public ledger, like the Graphcoin network.

The future applications of digital currency and blockchain technology are still at their early stages. The potential of distributed networks has yet to be fully realized and will certainly require additional innovations. The introduction of Bitcoin was the first cryptographic blockchain protocol to impact the exchange of goods and services and also gain widespread adoption. By removing the need for an intermediary in making digital payments, cryptocurrencies are the first of many financial innovations that will lead to a more efficient global economy.

Banking Services

It is easy to take for granted the services that banks provide in managing account balances and processing payments. It is assumed that if Alice sends money to Bob using a bank, the balance in each account will accurately reflect the transfer of money. One may trust that if there is a disagreement about the balance of funds in one's own deposit account, then the owner of a bank account can appeal to the financial institution to resolve the disagreement. This is an example of using a trusted third party to solve a dispute in a financial transaction. Trusted authorities arbitrate disputes by checking the history of the transaction or ledger. Ledgers are exclusively available to the financial institution and stored on their internal database.

In cryptocurrencies, the process of tracking balances is referred to as having solved the double-spend problem. Ledgers in banks are meant to track the account holder's spending and the amount of funds available to them. This record also tracks overdraft balances, number of transactions, and fees associated with that account. In contrast to traditional banking institutions, cryptocurrencies do not allow a transaction to process if funds are not available and, as a result, these fees are never incurred.

The ability to process a payment is another service that banks and merchants have to pay for in developing infrastructure. Infrastructure such as databases, processing requests, partnerships, software and infrastructure for the acquirer and receiving parties are significant overhead for these institutions. Cryptocurrencies reduce the need for the costly infrastructure by distributing the "work" or processing among participants on the currency network. The inefficiencies of verification of funds and proprietary servers can be attenuated by the use of cryptocurrencies and distributed computing networks.

International Transactions: A Case Study

Services such as international transactions are an example of where small amounts of innovation have been developed by third-party financial institutions. For example, Society for Worldwide Interbank Financial Telecommunication (SWIFT) has developed International Bank Account Number (IBAN), automating information transfer within a closed network of banks.[3] SWIFT currently offers a network of international money transfer services for a flat rate;

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[3] "What Do Consumers Without Bank Accounts Think About Mobile Payments?" The Pew Charitable Trusts. 2016.

however, it is a network that is still expensive, prone to errors and can take up to three business days. The global average cost of international remittance for banking institutions is 7.13% of the amount transacted as reported by the 2018 Q1 World Bank Report.[4] Seven percent is a significant fee to send money and unjustifiable when there is existing technology which can operate for a 1% fee and funds can be transferred in a fraction of the time.

In the United States alone, 7% of households do not have access to a bank account and are therefore unbanked. 20% of households are underbanked meaning they are using a bank and alternative financial services such as payday loans, according to a 2015 FDIC survey. This number could possibly be even higher given 5% fall under an "unknown" category or "prefer not to say".[5]

The conversation about serving the underbanked began during the recession in 2008. In that same year was the inception of Bitcoin.[1] The conversation around democratizing financial products for the unbanked has been taken up by FDIC research and data collected by the World Bank Organization, as well as the Pew research center.[2, 3] Financial inclusion of those who are currently the underbanked or unbanked is a market segment that fintech companies, academic researchers, as well as larger institutions have identified as an important area and a profitable market segment.[6, 7]

According to the Global Findex database, 60% of the unbanked report not having enough money to maintain an account and around 20% report the financial institution is too far away. More than 14% report a lack of trust in the financial institutions and 6% report religious reasons as barriers to account ownership.[2] In economies such as Colombia, Bangladesh, Ethiopia, Indonesia, Nigeria, and Pakistan, at least half of adults are unbanked. Lack of access to financial services is a global concern for a significant portion of the population in both economically developed and developing nations. It is not particularly controversial to state 1.7 billion people lack access to financial products globally and this is a concern.[2, 4]

The Role of Authority

It is clear this problem has bypassed many policy makers. For example, in the United States congressional hearing on virtual currencies, Congressman Sherman stated there is no need for alternative digital currencies because he has been able to thrive in a third-party system for his "long" life.[8] While it is a good thing the financial institutions are working for some people such as Congressman Sherman, it is not the case that financial institutions are able to fully serve 27% of the United states population. The travesty of fees when money is tight is seemingly difficult to

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[4] The World Bank. "An Analysis of Trends in Cost of Remittance Services - Remittance Prices Worldwide 2018."

[5] FDIC. "2015 FDIC National Survey of Unbanked and Underbanked Households," https://www.fdic.gov/householdsurvey/2015/2015report.pdf

[6] Gutman, Aliza. "Making the Business Case for Financial Health," Center for Financial Services Innovation. 2018.

[7] Wolkowitz, Eva, and Jeffrey Oh. "2012 Financially Underserved Market Size Study." *Chicago and Los Angeles: Center for Financial Services Innovation and Core Innovation Capital*. 2013.

[8] C-Span. "Cryptocurrency Markets." Video, 2:11:51. Posted March 2018.

understand. This is likely a side effect of growing wealth inequality and the disconnect between socioeconomic classes.[9]

In the United States, the top 20% of earners own 85% of the total wealth in the country while the bottom 40% of earners in the United States hold 0.3% of total wealth relying on small amounts of money to sustain their lives. For the bottom 40%, small fees are a concern. The burden of "small fees" does not appeal to the top 20% of earners, including legislators, bank executives, and their shareholders and their lack of empathy has led to a lack of innovation in financial products.[9] It is clear the governmental authorities are not in a position to further financial innovations and recognize product ownership to be the responsibility of the individual.

Further, it is not profitable or within the fiduciary duty of financial institutions to build products in the interest of low-to-moderate-income households. Lack of empathy or awareness displayed by authoritative and trusted institutions are a few reasons why cryptocurrencies and peer-to-peer networks were necessitated.[1]

It is our concern that many policy makers and regulators have never experienced exploits by financial institutions. Traditional financial institutions are a safe service for those who have needs such as managing and storing large amounts of wealth.

The technology and software developments of Bitcoin and Graphcoin leapfrog that of financial institutions and prove further these financial institutions lacked motivation to improve their technology in the interest of serving low-to-moderate-income households. Cryptocurrencies such as Graphcoin have been developed by people who are not waiting for authority to act on our behalf. Access to the Internet and a personal computer are all one needs to send money and participate in a global economy.

Bitcoin Introduction

Included in any introduction to financial networks on a blockchain, we must introduce the basics of Bitcoin.[1] Bitcoin was first introduced in a paper of unknown origin, authored under the pen name of Satoshi Nakamoto. This influential paper combined cryptography to a list of conditional rules, also known as a protocol, then to networking software for the purposes of democratizing peer-to-peer digital payments. The protocol solved what is referred to as the 'double-spend' problem, as explained above, which allowed for a way to store or send money instantly to anyone around the world without a bank.

The Bitcoin protocol removes the need for a third party such as a bank by maintaining account balances by tracking the number of Bitcoin in each address and this information is available to anyone with access to the Internet. Unlike a bank, no one person is responsible for the accuracy of the ledger and no one person can change this ledger: it is immutable. Once a payment is made, it is recorded and irreversible. Because the ledger can guarantee the available funds in an individual's account at the time of the transaction, no third parties are needed, and no fees are charged. Because of these features, Bitcoin is referred to as a trustless peer-to-peer network.

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[9] Norton, Michael I., and Dan Ariely. "Building a better America—One wealth quintile at a time." *Perspectives on psychological science* 6, no. 1, 2011: 9-12.

Proof-of-Work and Mining

Double-spend is a problem of building consensus in a network. The first consensus solution Bitcoin applies is that all miners of the network agree that processing power or central processing units (CPU) is a valuable resource. Miners facilitate payments, verify available funds, and secure the history of the ledger.[1] CPU power and, transitively, the requirement of electricity to power CPUs to generate consensus required to create this coin appeals to the value of the currency. CPUs and the expensive electricity needed to mine Bitcoin are resources and this consensus is an inherent agreement of the proof-of-work protocols. The network protocol that powers Bitcoin rewards miners who contribute CPU to the network and host the ledger by giving them the opportunity to earn Bitcoin.[1] The computing contributed by the user is securing the network by distributing and limiting any one bad actor's ability to influence the accuracy of the network's transaction history. The Bitcoin network has been functional for ten years without compromise of its ledger. This level of security is unique to the Bitcoin network.

Further, the current amount of processing power needed to solve the hashes on the Bitcoin network have raised environmental concerns about its use for everyday payments.[13] The amount of "hashing" power or CPU needed to secure the network is not environmentally sustainable and presents issues for scalability.[10] Therefore, Graphcoin, in order to maintain the innovations of Bitcoin in providing fee-free banking, has chosen to use a proof-of-stake consensus protocol. Proof-of-stake is a consensus algorithm that can scale, thus imposing a fraction of environmental degradation of proof-of-work algorithms. Currently, the Bitcoin network consumes as much electricity as the country of Chile.[11]

The Graphcoin network, like the Bitcoin network, gives one the ability to use a currency in the network for peer-to-peer payments. Graphcoin is paired with the use of a distributed ledger. This is similar to Bitcoin; however, Graphcoin is sustainable and provides networking incentives. In owning Graphcoin, you own a part of the network and you can send Graphcoin transactions without a financial institution. Owning part of the Graphcoin network can be likened to owning part of a bank.

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[10] de Vries, Alex. "Bitcoin's Growing Energy Problem." *Joule* 2, no. 5 (2018): 801-805.
[11] https://digiconomist.net/bitcoin-energy-consumption

The Solution

Scalable peer-to-peer networks further democratizing existing innovations through more complete alignment of interest between community members.

Alignment of Interests

To further democratize current technology, we have lowered the barrier to entry to participate in our network. Rewards in proof-of-stake allow for further distribution of the coin to those holding any amount of Graphcoin who are securing the network and providing processing power similar to how Bitcoin rewards encourage network growth. Unlike Bitcoin, proof-of-stake protocols do not have two tiers of participants with different goals. In contrast, all participants are incentivized to improve security, efficiency, and adoption of the network [12, 13]

By simply owning any small amount of Graphcoin, one can contribute and participate in project proposals and voting. There is no requirement to buy expensive hardware, and the network is efficient enough to process instant payments without the latent cost of amplifying environmental degradation.[12]

Rewards are an incentive structure built into the consensus protocol to encourage network effects. Rewards are distributed as a by-product of mining for proof-of-work consensus protocols. Miners both power the network and secure the ledger from being altered in proof-of-work algorithms. Proof-of-work algorithms which rely on computational power, or

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[12] https://deviantcoin.io/

[13] Bitcoin Green. "Bitcoin Green: The Sustainable, Proof-of-Stake Bitcoin," 2017.

mining along with consensus, have in recent years excluded those without expensive computing capabilities from being able to successfully mine.[10, 11, 12, 14] Furthermore, proof-of-work protocols such as Bitcoin have led to a two-tiered system where the miners who own powerful computing equipment, and now the people mining, are no longer the people who power the network. This creates a two-tiered system where interests again are not aligned. Given the increasing exclusivity of mining incentives, Bitcoin has become largely centralized, meaning only a few members of the network are able to contribute and receive rewards for mining and securing the network.[11, 10]

Misalignment of interests has led to controversies for proof-of-work networks. The different incentive structures for miners and currency users have caused disagreements about the future of the coin and protocol development, such as the size of blocks. Some users of the currency, most of which are not miners, desire greater efficiency of the Bitcoin network. Those who secure the network, or miners, are economically incentivized by the difficulty of the Bitcoin network.[13] This creates a similar problem of a lack of innovation and high fees that follow from misalignment of interests between users of financial products and banks, as mentioned above. Since the introduction of Bitcoin, there have been protocols that improve scalability, sustainability, and better alignment of interests for a more democratic peer-to-peer networking services. The technology employed in the Graphcoin blockchain is focused on optimizing accessibility to digital payment processing networks.

Maternode Implementation

Masternodes are a single server in the network.[15] Masternode ownership is a more serious commitment to the network requiring a significant investment of 5,000 Graphcoin held as collateral in one address. Masternodes provide stability to the network and participate in processing specific private transactions and instant payment processing requests known as SwiftX. SwiftX is a wallet feature that supports instant sending of transactions. This feature adds the transaction to the next block which have enough space to support said transaction.

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[14] Dash. "Dash Documentation," 2018. https://docs.dash.org/en/latest/

[15] King, Sunny, and Scott Nadal. "Ppcoin: Peer-to-peer crypto-currency with proof-of-stake." self-published paper, *August* 19 (2012).

Owning a masternode returns the largest amount of block rewards to individual participants and receives the largest overall portion of the block reward throughout the maturation of the network. Graphcoin's reward system is meant to drive development while maintaining a low barrier to entry for all members by splitting rewards evenly amongst staking participants and masternode owners for early adopters in the beginning stages of the blockchain. This system is designed to encourage network participation at all levels. Maintaining a low barrier to entry is a priority and Graphcoin does this by allocating a significant portion of rewards to those who do not have the funds to purchase a masternode. Requirements to benefit from the network are a personal computer and access to the Internet. The Graphcoin reward system and protocol is designed to incentivize networking effects and the use of the platform while, at the same time, maintaining a secure, scalable network.

Coin Specifications

By following the best practices in our industry, we are implementing a technology similar to that of PIVX.[14] Where our coin implementation differs is that we plan to employ a unique use of our funds in the interest of our community of innovators, which includes the masternode owners, as well as stakers. Our reward system employs what we see to be best practices for adoption while encouraging long-term gradual growth.

Proof-of-Stake and Staking

Graphcoin, in pursuit of being a sustainable and scalable cryptocurrency, has chosen to use a proof-of-stake protocol. For proof-of-stake consensus, the network is not secured by processing power and hardware capabilities, but by coin ownership or 'staking.' [13] Because consensus is not based on processing power and large amounts of electricity, the environmental impact is close to 0.6% that of Bitcoin.[12]

Structures where the security of the network are dependent on owning coins in that network appeals to all members of the community and reduces friction in the decision to join the network. Unlike proof-of-work protocols, for proof-of-stake protocols, those who secure the network are necessarily identical the users of the network and thus the currency.

Proof-of-stake allows individuals to earn rewards and contribute to the securing of the network through ownership and 'staking' small amounts of Graphcoin. Therefore, the record-keeping ledger is dependent on the staking participants. In contrast to proof-of work, there is no differentiation between miners and those who are using the currency. All levels of buy-in and any member of the network can earn rewards on the Graphcoin network.

2 MB Block Size

Graphcoin has a block size of two megabytes (2MB). 2MB is a large enough block size that the network is efficient and payments are not waiting for approval. On the other hand, it is also a sustainable size, where large amounts of computing power are not necessary to process a payment or host a masternode.

Privacy

The objective of Zerocoin is to improve privacy beyond pseudo-anonymity of Bitcoin. The Zerocoin protocol described by Peercoin is now widespread.[17] The end result of this protocol is the obfuscation of transactions via a private network. When using the Zerocoin protocol, we are required to mint coins broken into uniform denominations. The coins are then minted, mature and, when sent, your transaction amount is only visible from your wallet. Because coins are minted in specific amounts, there is no way to trace the amount back to the sender. Thus, for all other members of the network, the payment origin is unclear. Zerocoin protocol as applied to our blockchain is further referred to as zGRPH.

The decision to include zGRPH was made to allow individuals to be stewards of their own data. By employing the Zerocoin protocol, zGRPH is a real first step towards technology that allows individuals access to their own information. This is extremely powerful and a real step towards true ownership over one's data. The user has the option to share this zGRPH data with those whom they choose. Only the sender can see their transaction history on zGRPH; not a bank, not the government, not Google, not Facebook, unless they choose to share their data with a third party.

While Bitcoin has truly revolutionized digital money, it has faults of its own. Advocates of cryptocurrencies have been hard at work improving these technologies to optimize scalability and network effects. Graphcoin is focused on leveraging best-in-class technology, on improving sustainability, and product development and complete execution with accountability. Developing open-source best practices for collaborative innovation networks in a commons-based peer production environment is a massive undertaking. In the Graphcoin community, we approach this task with building a community of leaders and mentors. Our developers and engineers are focused on leveraging best practices for a meaningful infrastructure of peer-to-peer exchange of information.

The Graphcoin Mission

The Graphcoin Mission is to give individuals the time and freedom to discover and pursue their passions.

We believe fulfillment comes from the time and freedom to discover and pursue your passions. This opportunity arises through:

1. *A trust-less, decentralized banking system with open access to financial commodities for all, and*
2. *Ownership of assets that cover your basic human rights - food, clothing, shelter, and healthcare*

As a global community, we can help each other move towards a world where basic needs are met and opportunities for fulfillment are available to all. It is our belief that stress is not a motivating state or the driver of a healthy economy. On the contrary, time and freedom to discover and pursue one's passions are the true drivers of innovation. Value of the network is related to the ability for it to ignite network effects and innovation. Graphcoin is a defensible organization because of the community that has emerged as a result of the joint mission towards innovation.

Thus far, we have implemented a decentralized network, distributed Graphcoin, and have taken the responsibility to document the developments and progress for best practices in protocol development while providing a space for permissionless innovation and decentralized yet structured project execution.

Decentralized Project Management

The value of the Graphcoin network and the work that it accomplishes is dependent on the ability of the network to ignite a *collaborative innovation* amongst Graphcoin community members. Decentralized networks allow for aligning the interest of the innovators and the providers of the commodities that we rely on, such as financial services. By owning Graphcoin, you are a part of a collaborative innovation network (CoIN) where commons-based peer production (CBPP) drives innovation.[16, 2]

Peer-to-peer networks are better able to solve this problem by aligning the interests of the network with the interests of the user. In contrast, existing financial institutions' fiduciary responsibility is to act in the interest of shareholders by increasing their profits. Peer-to-peer networks are compelled to align the interests of the network with the interest of the user. Throughout developing Graphcoin, we have become a part of a global community. Thus, our mission is to create a network where the goals of the network are in line with that of the global community of innovators. And now this energy drives our mission. How we plan on accomplishing this mission is outlined below.

Building decentralized projects is a task of the highest magnitude, thus we are focused on limiting funded proposals to optimize productivity on the network. Starting with a hands-on project development, that is both inline with our mission and can scale as our network grows.

By developing networks of innovators, we can decentralize financial services and, as a community, improve the current models of product development. The long-term benefits include decentralizing corporations where the users' data is the product and returning the value of the data to the referent of the data. Thus, democratize the work performed by this individual to return the gains to the agent who performed the work, as opposed to a shareholder whom did not produce the works. By using distributed network technology, we no longer require the use of intermediaries to safely transact and store information such as digital payments, messages, or personal data, and because of this innovation, further innovation on protocols, hardware management, user interface development, and privacy solutions can be developed based on need as opposed to speculation. This would also require development of compensation measures where developers can be rewarded directly for the value derived from services for a more efficient, more global economy. The first known example of a network that has accomplished this distribution and scale, in the context of finance, is the Bitcoin network.

We are working to develop a framework for focused innovation in decentralized environments and to open source these understandings for better and further innovation by starting with optimizing proposals and allocation of funds. The core development team will be working hands on with one project per quarter to better understand how to communicate project development of distributed networks. Our diverse team of mentors will begin this journey as a resource for project development and, in that time, document our experiences and report back to the network so that the innovators can stay focused on their development efforts. In a society of information overload, we want to optimize the ability for ongoing projects to stay focused and simultaneously keep the community informed.

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[16] http://www.ickn.org/index.html

Pre-mine Allocation

Five million Graphcoin were pre-mined for the Foundation, in contrast to collecting block rewards throughout the lifetime of the coin. The most obvious reason to maintain a premine was to provide transparency about the use of funds. Being in this new innovative space the Foundation used the premine to secure the network from opportunist participants inflating the currency. The hackers attempted to submit false solutions to the network, thus compromising the reward system. In response we were able to use the pre-mined coins to weight the network and prevent an inflated supply of Graphcoin from being distributed.
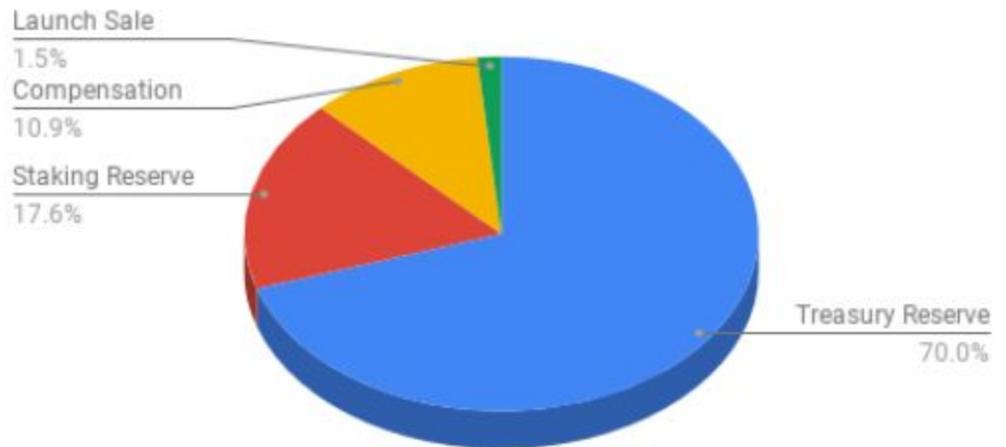
Launch sale: (offline) listings, pre-launch development efforts, future listings, development, marketing, advertisements
Compensation: (offline) Graphcoin Core-Team, feature development, maintenance, code updates etc.
Treasury Reserve: (offline) Funding of Proposal Projects
Staking Reserve: (online) community manager budget, inflationary measures

Graphcoin Core

Graphcoin Core is an independent organization responsible for code updates and partnerships. Our original core team of software developers, behavioral scientists and business leads will remain a part of the project in support of the mission. Our core team is committed to compliance with the rapid changes and updates necessary in implementing cryptocurrencies.

1. **Help solve access to a decentralized payment network by leveraging best practices and keeping the following specifications up to date:**

   a. Employing proof-of-stake
   b. 2 MB block size
   c. SwiftX instant transactions powered by masternodes
   d. Zerocoin privacy protocol

2. **Focus development for usability, adoption, and personal data security.**

The Foundation

The Foundation will consist of a global team. The role of the members of the Foundation is to oversee efforts of the project proposals and help manage the communication between the community and current developments of the proposals. The foundation members will also be committed to assisting all projects selected by the community to their fullest ability.

In the context of networking and financial systems where third parties are not required, it is the obligation of the members of the network to optimize network effects. In a decentralized financial model for peer-to-peer payments such as Graphcoin, Bitcoin, and other digital currencies, as a network we have open sourced the opportunity to develop financial products and distribute them to friends and family. Decentralized network effects have proven to be extremely efficient and empower innovators and early adopters to improve the network and their ability to bank themselves by expressing their passions, knowledge, and experiences.

For now, as we work as a community to better understand decentralized networks and possible applications of governance, all proposals must appeal to these ends - protecting the democratization of collaborative innovation networks.

Digital decentralized currencies are currencies that are not backed by the strength of a government but instead backed by the strength and value of the network. Graphcoin will serve to develop and refine a framework or model for project development and execution that will be open sourced as best practices for decentralized project development focusing on accountability and community engagement in project proposals. Proposals can be found on the Graphcoin Website. Graphcoin will improve upon current approaches to coin networks by focusing on the following outcomes. The following two main problems the Graphcoin network aims to better understand:

1. Development of best practices for project execution in a decentralized innovation network.

   a. Developing consensus in the network that Foundation funds are solving the right problem with the right approach, and communicating this with the network.
   b. Security of our currency and focus on developing best practices for decision-making as a network.
   c. Prioritize accountability by following through to execution.

2. Responsible and accountable allocation of the Foundation Graphcoin pre-mine by following the maxim of time and freedom.

   " Our Foundation is committed to
   providing individuals the time and freedom
   to discover and pursue
   their passions. "

Graphcoin is designed to align product development with the needs of the users in pursuit of permissionless innovation. The ideal realization of Graphcoin is permissionless innovation,

where the values of one's work is a function of the number of people served as a result of that innovation.

An economy where an individual's compensation for their work is proportionate to the time and freedom their contribution provides others has yet to be realized.

Conclusion

In a theory outlined by David Ronfeldt in his paper titled "Tribes, Institutions, Markets, Networks: a Framework about Societal Evolution," the next phase of societal evolution will be realized as an organizational network.[2] Networks, as explained by Ronfeldt in contrast to competitive markets, "refer to organizational networks, mainly the "all-channel" design where all members are connected to and can communicate with each other."[2] I will suggest that one piece of technology that may facilitate the development of networks is the adoption of distributed ledger technology. At the time of authorship in 1993, Ronfeldt might have witnessed early examples of distributed networks such as Usenet and the early versions of the Internet. Prior to the development of robust user interfaces and search engines that made navigating the Internet easy, engineers used these technologies as a space for innovation.[17]

Graphcoin is designed to align product development with the needs of the users, in pursuit of *permissionless innovation*. The ideal realization of blockchain technology is permissionless innovation, where the values of one's work is a function of the number of people served as a result of that innovation.

In introduction, the ideals of networks are distant from current economic understanding of capitalist markets. Distributed systems where the individual reward for one's work is proportionate to the time and freedom it provides others has yet to be realized. The problems in

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[17] Ronfeldt, David. "Tribes, institutions, markets, networks: A framework about societal evolution." 1996.

developing these include monetizing them and incentivizing further development and solution innovations.

Digital currencies and token economies have opened minds and encouraged permissionless peer-to-peer collaborative innovation and a healthy skepticism of authority and dissent in pursuit of passion and shared experiences and beliefs. The true innovation that has come out of Bitcoin is proof that, despite the dogma and the scams, the network has grown, innovation has progressed, and communities continue to develop in the interest of cryptocurrencies. The reality of decentralized digital assets has become very real for many blockchain innovators around the world.[1, 5] It was not the need to engage in illicit activities that incentivized the development of cryptocurrencies. Banks were working fine for these purposes for many years.

On the contrary, when banks led us to a global recession, Bitcoin was born. When ten years later two billion people worldwide are still unbanked and income inequality is growing, Graphcoin is necessary. Access to financial products is not a luxury, it is a need. Our right to participate in the global economy will not be barred by fear of technology and fear of what people might do when they can communicate without surveillance. Being aware of the seriousness of money, we are committed to developing solutions that discourage and expose harmful people from engaging with our platform. As we move forward with our mission, our focus is on human fulfillment through the time and freedom to discover and pursue one's passion as a means to a better world.

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