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**• Introduction**

“Imagine a technology that could preserve our freedom to choose for

ourselves and our families, to express these choices in the world, and to

control our own destiny, no matter where we lived or were born. What new tools and new jobs could we create with those capabilities? What new business and services? How should we think about the opportunities? The answers were right in front of us, compliments of Satoshi Nakamoto.”

From Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World by Don Tapscott and Alex Tapscott

Since the introduction of Bitcoin, blockchain technology has grown by leaps and bounds. Blockchain has allowed not only cryptocurrencies to flourish but has allowed traditional sectors such as financial institutions to utilize this technology. A sharp rise in price and usage of Bitcoin as well as other cryptocurrencies like Ethereum, Ripple, NEM, Litecoin, Dash, Monero — has shown the world that the global financial system is ready for a change. The change that will take the industry to a whole new level where transparency, data integrity, and decentralization will become the main pillars of its growth.

Bitcoin is the most known and valued cryptocurrency by the market

capitalization. Altcoins is a collective name for all other cryptocurrencies, and they have been diluting Bitcoin‘s market share in recent times. Blockchain has been the dominant design of peer-to-peer crypto currencies. However, blockchain technology is still relatively young, and have the potential for exponential growth, leading to new offerings in the market.

The VinCoin is one of such new offerings. Its state of the art solution is built around most advanced technological capabilities of ParaMining & Lightning Network to deliver blazing fast, secure and near-zero cost payments to anyone in the world. It is designed to overcome well-known inefficiencies within government central banks and other crypto currencies. It induces transactions that are fully secure, private and anonymous.

However, such a rapid upward trend in the popularity of cryptocurrencies came with its drawbacks that may threaten the further integration of the digital, decentralized currencies:

1. Increasing number of attacks and forks

2. Double spending

3. Poor network security

4. A limited number of available coins

5. Increasing complexity of coin mining

6. Slow transaction processing

7. Increasing transaction fees

8. Price fluctuations

9. Lack of malleability within the network

The solution to the problems mentioned above is VinCoin (Alternative Technology Base) Coin. VinCoin is an innovative decentralized cryptocurrency incorporating the advanced technologies that tailor the needs of primary market players - users, investors, and business owners.

**2. Key technologies**

Blockchain technology is the foundation of crypto currency and is the next “industrial revolution.” It is a decentralized ledger system with enhanced security, is simple in design and inexpensive to operate. This system allows for transactions to be done with complete accuracy because it is a fusion of computer peer-to-peer (p2p) technology, cryptography and database systems.

The fusion of these technologies leads to a data-storage system that is

immutable and irreversible, meaning that transactions cannot be modified after signed and added to a block chain. Deals become final, and there is no double spending. Cryptography not only utilized for encrypting messages on the ledger but is also used to sign the transactions of users and to prove these transactions are valid. With cryptography, blockchain does not require extra security solutions to protect the authenticity of operations.

Blockchain‘s decentralized and p2p nature means that the ledger eliminates the need for a data-center and a disaster recovery center (DRC). The result is that the ledger will always be up and running.

VinCoin incorporates the best features of POS-based crypto currencies.

VinCoin's users can achieve better decentralization, transparency, privacy, and cost-efficiency in their financials. Low energy consumption, ease of use, and better network participation incentives work in line with doubled network capacity, smart contracts, lightweight wallet, and cloud mining to provide people from all over the world a worthwhile, stable, and more reliable way of handling their financial needs.

**2.1. Proof-of-stake**

The first crypto currencies based on the Proof-of-stake algorithm, or POS,

appeared in 2012 with Peercoin, followed by Emercoin in 2013, and NXT and BlackCoin in 2014. The primary objective of the cryptocurrency blockchain algorithm is to achieve the distributed consensus within the network that is secured by a significant number of nodes.

POS algorithm designed as a more eco-friendly, resource efficient, and

reliable alternative to crypto currencies based on the Proof-of-work

algorithm, or POW, that require massive amounts of energy to maintain the proper functioning and growth of the network.

Coins of POS-based crypto currencies are created through staking. In other words, all nodes in the network that possess any amount of coins in their wallet and keep the node online are automatically included in the coin forging pool and are therefore are eligible to create and sign blocks, securing the distributed consensus.

In May 2017 the world’s second largest cryptocurrency, Ethereum,

announced that it would make a transition to a Proof-of-stake algorithm by the end of 2017.

**2.1.1. POW and DPOS Comparison**

As mentioned above, the only thing that nodes within a POS cryptocurrency need to do to is to maintain the security of the network itself. Therefore one needs to have a certain amount of coins in the wallet and keep the wallet online to be eligible to earn. This mechanism eliminates the human factor in the mining/forging process and helps to avoid spending massive amounts of electricity on creating coins. It is the backbone and the most laconic property of the Proof-of-stake algorithm.

Apart from the Proof-of-Stake, two other algorithms exist in the

cryptocurrency world. The Proof-of-Work (POS) and Delegated Proof-of-

Stake (DPOS) algorithms, which are both meant to help blockchain reach a distributed consensus and maintain the integrity of the network.

Distributed consensus, is a term widely used in computer science and crypto currencies. It should be interpreted as a mutual consensus among the majority of its users, on whether the data about the transaction in the last block is valid. If this is the case, the distributed consensus is achieved, and the block will be successfully signed, ensuring proper functioning of the network.

If the data in the last block is false, then distributed consensus among active members of the network will not be reached, and therefore this block will not be signed, avoiding the possibility of various kinds of attacks that jeopardize the system integrity or allows for double spending.

In cryptocurrencies that use POW the distributed consensus in the network is reached with the help of its active members, or miners, who need to use real computing produced by hardware to hash blocks and mine coins. Though this may seem like the most robust and true-to-life method of reaching the distributed consensus, actually it leads to several serious problems:

1. It requires massive amounts of energy due to the increasing difficulty

to mine coins.

2. Miners are required to purchase expensive equipment to survive in

the ever-growing mining market. The hardware gets outdated fast and

eventually ends up at a landfill site, harming the environment even more.

3. Such system leads to the appearance of miner monopolies that tend

to negatively influence the commission fees and transaction processing times and also leaves the possibility of carrying out a 51% attack.

Delegated Proof-of-stake, or DPOS, is the latest blockchain algorithm which is currently used by cryptocurrencies like BitShares. In its essence, it’s very similar to POS, but it still has quite a few changes that make it different from the Proof-of-stake algorithm.

Network nodes in DPOS cryptocurrencies create coins in the same way as it is in the POS-based ones - by storing the currency in the wallet. However, all necessary decisions within the network in DPOS cryptocurrencies are performed via the results of elections organized by the members of the network.

At first sight, this mechanism may look more democratic and transparent, but it also makes the system complicated, potentially less secure due to the human factor involved, and decreases the user participation rate, in this way causing centralization concerns.

**2.1.2. Encryption**

VinCoin uses Curve25519 as cryptographic algorithms for purposes of ensuring the blockchain integrity and safety of its users’ coins.

Cryptographic algorithm ensure stable functioning of the VinCoin blockchain network where the ownership of coins can be easily verified, and distributed consensus is achieved without the risk of double spending.

**2.1.3. Blocks and block creation**

Since VinCoin is a cryptocurrency based on POS algorithm, the creation of blocks is carried out through a provision of proof that the active network node possesses a certain amount of coins and therefore can participate in the generation of blocks.

If the active network node—meaning that it is a user who keeps their wallet open—possesses a certain amount of coins, it will be eligible to enter the block creation process by sending the coins to itself and proving their ownership.

Selection of the creator of the next valid block is made by using deterministic randomization formulas that take both the stake size and the lowest hash value into account, therefore avoiding centralization of the cryptocurrency by not letting the wealthiest members of the network infinitely accumulate their capital.

**2.1.4. Coins and forging process**

Based on the POS algorithm, an active node of the blockchain network in

VinCoin is randomly selected. The choice is based on their stake size. The appropriate wallet will receive a daily reward or ROI for the contribution to achieving the distributed consensus.

To fight the inflation and the market glut, two years after the ICO and

creation of the genesis block the daily ROI will decrease twofold. The

reduction in the reward by two times will be repeated every two years until the daily compensation rate reaches almost zero.

As a POS cryptocurrency, VinCoin will start with an open ICO. During the

ICO anyone will be able to purchase VinCoin tokens and also can receive a certain number of VinCoins as a bonus. The total number of coins that are offered to the public during the ICO equals a number of coins in the genesis block, which is 10 000 000 VinCoin.

**2.1.5. Nodes**

The POS algorithm doesn’t require massive amounts of electricity wasted on hashing blocks that are used to store a large amount of data. The nodes in VinCoin are lightweight and use SPV, standing for the Simplified Payment Verification mode, which allows users to download only a part of the blockchain relevant to their node instead of downloading the whole copy of blockchain.

**2.1.6. Transactions: fees and processing time**

If we take an average transaction processing time in a POW-based

cryptocurrency and compare it with the same metrics in a POS-based one, we shall see that the POS algorithm processes the transactions at least two times faster.

Thanks to the usage of ParaMining, on average each block is four-times more

efficient than the regular one. On top of that, the VinCoin network creates a new block within 1 minute against 10 minutes in POW-based crypto currencies.

Worthwhile to mention is that the capacity to perform multiple transactions inside the VinCoin network is just sensational in the case of using the Lightning Network protocol - a side-chain payment solution on top of the original blockchain. The Lightning Network is an ideal platform for the micropayments industry.

When it comes to the transaction fees, they are estimated to be at least ten times lower than those in cryptocurrencies powered by the POW algorithm. Such a significant decrease in the transaction costs is possible thanks to a lack of physical mining of coins in POS algorithm and well-balanced distributions of coins among all active members of the network.

**2.2. ParaMining**

Since more and more people are currently using crypto currencies for their everyday financial needs, the overall number of transactions grows very rapidly. ParaMining is created to improve blockchain scalability by increasing the block size limit thus decreasing the transaction processing time and fees. The ParaMining technology also enables execution of Smart Contracts as well as of side chain solutions like Lightning Network mentioned above.

Due to the blockchain properties, a txid (transaction id) of a block also

includes information on the previous inputs and outputs of coins and wallets associated with this transaction occupying up to 60% of the block size. The increasing numbers and size of block slow down and overload the network itself, leading to slower processing times and higher fees.

**2.2.1. Overview**

ParaMining allows for writing up to 4MB into a single block. The scriptSig data is moved out of the transactions and blockchain, both enhancing the network performance and preventing any possibility of malleability attacks.

Apart from this, ParaMining provides a broad range of other important features like increased P2SH security (P2SH encryption key length is 256 bits now), linear scaling of sighash operations, reducing UTXO growth, overall efficiency gains, and so on.

Segregated Witness, which is most often called ParaMining, is a proposed update to the Bitcoin protocol that was officially released October 6, 2016, in version 0.13.1 of the Bitcoin Core and this technology is fully implemented in VinCoin.

**2.2.2. Security**

All blockchain networks let their users perform a kind of escrow transactions called multisig. Multi-signature transactions require up to five signatures from different parties to sign a transaction.

Currently, the majority of crypto currencies use pay-to-script-hash (P2SH)

protected by 160-bit HASH160 algorithm that is known to have loopholes,

letting a corrupt multisig transaction member to steal money. In ParaMining this vulnerability is fixed by using HASH160 only to sign single key transactions. All the multisig transactions are hashed using the 256-bit SHA256 algorithm.

**2.2.3. Block size and network capacity**

Initially, the block limit size of 1MB was set by Satoshi Nakamoto in 2010 in Bitcoin for purposes of protecting the network from DoS and spam attacks, but since then it became the default value used by the majority of world’s cryptocurrencies.

Also, an increased block limit size that is introduced in ParaMining improves the overall security of the network and therefore allows for a seamless and safe implementation of Smart Contracts and a broad range of second layer solutions.

Since this limit leads to slower transaction approval time and higher

transaction fees within a busy blockchain network, leading to lower overall performance, ParaMining increases this limit to up to 4MB per block by excluding witness data, scriptSig and scriptPubKey fields with the

signature data that occupies 60% of the transaction size, out of the

transaction.

With the new block weight algorithm that ParaMining proposes, all non-witness data in a block amounts 4 weight units per block and the witness data takes 1 weight unit per block in the same block. This constitutes a 4x increase in the network capacity and performance.

**2.2.4. Malleability and Smart Contracts**

When a transaction is sent over the blockchain network, any node that

processes it can make minor changes to the signature data in the txid of

this transaction. These small changes cannot influence the input and

output transaction information meaning that it still will be sent and

received by the right people but it can make the txid information

unreliable, making it more difficult to trace it within the blockchain.

Smart Contracts is a technology that adds specific logic to the

transaction and serves as an evidence of possession of claim over

something by someone (e.g. tangible/intangible funds and resources as

well as intellectual or any other property). Smart Contracts turn a

regular transaction into a powerful tool for accounting purposes.

**2.2.5. Lightning Network**

The Lightning Network is a solution that allows for sending instant

and near-zero cost transactions to one or more users of the network.

The idea behind the Lightning Network is to create payment channels

off the blockchain so that users can send an unlimited amount of

transactions between each other either by securing them with only

one ledger entry in the blockchain and using the blockchain as the

arbiter through Smart Contracts or by applying to a trusted third

party for escrow purposes.

**3.Key features**

Apart from the features peculiar to the Proof-of-Stake algorithm, VinCoin is beefed up with ParaMining, and Lightning Network protocols. On top of that, VinCoin boasts a wide array of features such as user-friendly and

lightweight wallets, cloud mining availability, forging incentives, and so

much more. We've implemented this all to make our product convenient for everyone regardless of their financial needs.

**3.1. Wallet**

VinCoin comes with an array of wallets for desktop, iOS, Android, and web applications. VinCoin Wallets provide all necessary features for the comfortable daily use of the cryptocurrency and do not require much space on your PC or smartphone.

The outstanding advantage of the VinCoin Wallet is that it requires a very tiny amount of space for its installation compared to the Bitcoin Core and therefore can be used by anyone, anywhere, and anytime. VinCoin is designed over a Proof-of-stake algorithm, which makes full node wallets a thing of the past.

Since there’s no physical mining of coins required and the distributed

consensus is achieved via proof of possession of coins in one’s wallet ; you are not obliged to download the full copy of the blockchain to use VinCoin, resulting in less disk space usage.

**3.2. Cloud mining**

As it was mentioned above, users of VinCoin do not need to constantly hash data using costly equipment that consumes a lot of electricity. However, to enter the coin forging pool and be able to earn with VinCoin, one simply needs to keep the wallet online to be considered an active blockchain node.

Aforementioned is definitely a better and a lot more eco-friendly way of

maintaining the blockchain integrity and security yet it might likewise lead to some little unnecessary power spending. This is one of the reasons why VinCoin offers a cloud mining service available for all of its users irrespective of whether they are just regular users or big investors.

The cloud mining services will be provided by VinCoin and several other

trusted third-party companies so that the cryptocurrency members can enjoy a wide selection of payment options and service conditions tailored especially to their needs.

**3.3. Low energy consumption**

According to publicly available statistics, currently, some of the POW based cryptocurrencies use up to 14.18 TW/h of electricity annually, which is comparable to the total power consumption in the entire country of Slovenia.

A rapid growth of any POW based crypto currency will undoubtedly lead to a sustainable increase in electricity consumption.

**3.4. Agility and cost-efficiency**

Since VinCoin is based on the Proof-of-Stake algorithm, which was also

developed to make cryptocurrencies more resource efficient and eco-friendly, our users don’t need to buy expensive equipment also known as ASICs. Most likely these ASICs get obsolete within just one year after purchase and eventually end up at the rubbish dump. It's a waste of massive amounts of electricity on performing unnecessary

calculations.

**4. Risks and risk management**

Cryptocurrencies offer a whole range of tools and measures that are meant to contribute to the development of a more transparent, just, and open global financial market and ensure the security and growth of the investor's capital.

Like any other complex and elaborate systems, cryptocurrencies as a thing present certain flaws and risks associated with any financial instrument. In the sections below we will explain such risks and talk about the ways of balancing them and cutting their impact down to the reasonable minimum.

**4.1. Security: attacks and hard forks**

There are various kinds of attacks and vulnerabilities to which a crypto

currency can potentially be exposed. The most significant of these threats are a majority attack (51% attack) that has to do with monopoly problems and a double spending attack.

A most devastating attack can be performed when one of the nodes of the blockchain possesses 51% or more computing power of the whole network and therefore gains complete control over it. Such attacks may theoretically take place in the POW-based cryptocurrencies only. In such a case the evildoer needs to purchase some serious mining equipment with the total cost of more than $15 billion. That sounds like a lot, but in fact, it is doable.

A 51% attack is not realistic in VinCoin network for the two following

reasons:

1. VinCoin is a POS-based cryptocurrency, the attacker will need to

possess at least 51% of all network resources. A hacker will need to purchase at least 25.5 million of VinCoins, which is 51% of the genesis block right after launch.

2. Even if such an attack happens, it won’t be beneficial for the attacker

himself. This attack will affect the market rate of the cryptocurrency

negatively, meaning that the hacker will be attacking himself and will suffer from losses.

When it comes to double-spending attacks, in VinCoin they are prevented by confirming every transaction that a specified block contains. To be confirmed and considered as valid by the blockchain, a transaction needs to receive at 6 or more confirmations.

**4.2. Inflation**

Due to the fundamentals of the POS algorithm that proposes a daily

reward in exchange for the user’s cooperation in achieving the distributed consensus, all POS-based cryptocurrencies usually face inflation issues.

Inflation risks in VinCoin are minimal thanks to the relatively small amount of coins in the genesis block. VinCoin's genesis block contains only 50 million in coins, and the reward will be decreasing by 50 percent every two years.

That will ensure a stable workflow for the new users of VinCoin in the years to come.

**4.3. Centralization**

Another issue for all crypto currencies irrespective of whether they are based on POW, POS, or DPOS algorithm is centralization concerns.

Since it’s both illogical and too costly to perform a 51% attack for a POS based cryptocurrency, the centralization of the network in VinCoin is very unlikely.

As an additional measure against centralization, the creator of the next valid block in the VinCoin blockchain will be selected using deterministic

randomization formulas. These formulas are based on the stake size and the lowest hash values that will limit wealth accumulation possibilities and ensure that the cryptocurrency doesn’t get centralized.

**5. Micropayments**

A micropayment is traditionally defined as an online or mobile, real-time or deferred, financial transaction below $12 amount. Micropayment is a small online payment that is usually not feasible through traditional money transfer mechanisms like credit cards due to the fees being a significant percentage of the transaction.

Micropayments are used in a variety of contexts, from paying for access to a single article to tipping someone on the Internet. You can charge customers on a purchase-by-purchase basis for a range of digital goods, apps, including access to news content, online music, TV shows & films, mobile recharges and transit payments.

In today's online world, there are three general models of managing

micropayments. One of the models, called pay-as-you-go, is what one might consider "classic micropayments": a user is priced on the fly. This model does not often work due to many reasons, and instead, two other models have been proposed that attempt to solve the shortcomings of pay-as-yougo. The Prepay model and the Postpay accordingly. Each has its advantages and disadvantages, with none of the models being perfect.

**5.1 Pay-As-You-Go**

With the pay-as-you-go model, Internet users are charged on the fly for

purchases that they would like to make. This means that as soon as the user wants to purchase access to an article or some other virtual good, their credit card will be charged for the amount of the transaction.

**5.1.1 Advantages**

Allows the user a pure a la carte experience. They only purchase what they want, and they pay when they want to.

The merchant can market low cost virtual goods to a user who may otherwise balk at paying a higher price for bulk access.

When credit card information is stored with the merchant, the low price of individual micropayments may encourage the user to partake in “impulse” buying, similar to how retailers put low cost candy bars, magazines, etc. in check out lanes.

**5.1.2 Disadvantages**

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**5.2 Prepay**

With the prepay model, a customer authorizes the merchant to charge their card for a certain amount, which is usually converted into a virtual currency.

That currency can then be used to purchase whatever that particular

merchant is offering online. An alternate form of prepaying eliminates the online transaction and instead places gift cards in brick and mortar stores.

Customers can purchase these cards and enter unique codes on the back of the card online to have their account credited for the amount they paid.

Prepay can also take the form of subscription models where users pay up

front for monthly or yearly access to certain content, such as newspapers

and premium content in online games.

**5.2.1 Advantages**

Paying a large sum up front makes the transaction worth it in terms of the processing fees that get tacked on.

If physical gift cards are available, users can choose how to pay, which is

especially useful when the user does not have a credit or debit card to use online.

**5.2.2 Disadvantages**

Merchants need to maintain a system that tracks how much credit every user has on hand.

If the merchant has gift cards in brick and mortar stores, they must pay to

distribute them.

With subscription models of prepay, the a la carte experience is lost. Users pay up front for access to everything, whether they want it or not.

Depending on the prepaid amounts available, users may not easily dish out $10, $25, or $50 for a virtual credit as they would on a pay-as-you-go model.

**5.3 Postpay**

In the postpay model, instead of paying up front or paying on the fly, users instead pay after they decide to make a purchase, similar to more traditional online shopping models. Postpay is an effective alternative to pay-as-you-go due to microtransactions being aggregated rather than charged individually.

What usually happens is that a merchant will track a user's individual

microtransactions, and then after a certain amount of time where no more transactions are made, the merchant will aggregate the individual purchases and bill them as one amount.

Similar to prepay, postpay can also adopt a subscription model where users gain unlimited access to certain features and are then billed a standard fee at the end of the month. This is less common, however, than prepay subscription models.

**5.3.1 Advantages**

Users do not need to pony up a larger sum of money to start making

purchases. The a la carte experience is preserved.

Aggregating payments can drastically reduce a number of transaction fees that a merchant will pay.

The impulse buying that is in the pay-as-you-go model is also preserved in

postpay.

**5.3.2 Disadvantages**

Merchants need to create a system that tracks purchases and then attempts to aggregate them thoughtfully to reduce transaction fees.

Users can still purchase only one item, say a 99-cent song, and then not

purchase anything else, leaving the merchant no choice but to process the microtransaction by itself.

This does not allow for users without a credit or debit card to make a

purchase, as users can with prepay gift cards.

**5.4 Future of micropayments**

Several companies such as Flattr and PayPal provide micropayment support and solve specific use-cases. Cryptocurrency makes micropayments easy to implement and send without involving any third-party to implement their micropayment protocols.

Bitcoin fees make it hard to send fractions of a dollar as value, but this is still possible with VinCoin. The basic problem with micropayments is that it requires a considerable fee to the third party (the centralized service) and hence makes such transactions effectively expensive. Bitcoins and other crypto currencies charge minimal transaction fees (it could even be free in some cases), and that doesn't depend on the number of transactions. Hence it offers a viable alternative for such transactions. The process involved is much simpler and definitely avoids the headache of currency conversions.

**5.5 VinCoin: Solution for micropayments**

There hasn’t been any innovation in online payment space in the past

decade. All online payment services, such as Dwolla and PayPal, are more or less the same and work with your credit card or bank account or both. The opportunity to create a system that can significantly cut down credit card and bank fees to the payment networks can be a huge benefit for ecommerce and online retailers that operate on small margins would benefit greatly from cost saving. VinCoin is not centralized and does not depend on any banks or credit card companies; thus, the transaction costs are much much lower than those of the existing payment systems.

In the world of the Internet of Things, the use of VinCoin can reduce

transaction costs and limitations of cash and card payments. This includes

any service or machine that relies on automated payment such as bus ticket booths, vending machines, car rentals etc. With VinCoin we have a truly autonomous environment where two machines can interact and exchange funds without human factor involved. For example, your car may have a digital wallet that can be used to pay for gas, tolls, or any other automated services.

The electronic payment space needs some innovation, and perhaps the time is right for a digital currency such as VinCoin to disrupt the market and bring the next wave of technology and startups.

**6. Conclusion**

This whitepaper has been prepared to provide the most detailed information about VinCoin concerning its key characteristics and features, the most important technologies used in its development, and risks associated with it.

We have succeeded in finding out and establishing that the Proof-of-Stake consensus VinCoin is based on fact to be a more secure, just, and eco-friendly as well as less corrupt and less difficult to use in comparision to the Proof-ofwork algorithm.

At the same time, the latest technologies that VinCoin is powered on like ParaMining and Lightning Network and the proprietary features like cloud mining and forging incentives make it a truly agile, cost- efficient, and user-friendly tool that can satisfy the needs for financial freedom of any person irrespective of their place of birth, technical competence, or social status.

Despite the potential of micropayment systems very few systems have been successful as their acceptance is limited to certain communities such as specific online games or social networks.

VinCoin is a new progressive crypto currency, which supports an unlimited number of transactions between different devices at high speed with its Lightning Network technology, which makes it a viable option for micropayments. VinCoin has already signed contracts with some big players around the world, and we are ready to take the financial industry to the next level.