

2021

RESEARCH PAPER

Syscoin
By
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INTRODUCTION

Introduction to Syscoin

Syscoin is a public decentralized high-performing blockchain network that focuses on a fast, secure, and low-cost user experience with decentralized applications (dApps) that are user-friendly. The network is utilizing, patented by Syscoin, Zero Confirmation Directed Acyclic Graph (Z-DAG) technology to ensure scalability and a low-cost user experience while having near-instant transactions and a high level of security, this subject will be further highlighted in the 'Zero Confirmation Directed Acyclic Graph (Z-DAG)' chapter.

The Syscoin network utilizes a hybrid consensus method of Proof of Work and Proof of Stake. The hybrid mechanism allows Syscoin to be relatively eco-friendly, considering the network utilizes merge-mining. Therefore, the energy that is invested into the Bitcoin Network can be recycled and used to secure the Syscoin network. The hybrid consensus mechanism will be further highlighted in the chapter "Hybrid Consensus Blockchain".

The imminent release of Network-Enhanced Virtual Machine (NEVM) will allow the Syscoin platform to scale even further by parallel processing, enabling smart contract developers to implement more advanced features. The Syscoin Ethereum bridge, highlighted in chapter "Syscoin Bridge", will be significantly improved by lowering the overall complexity. The implications of the NEVM release will be highlighted in chapter "NEVM".

The Syscoin platform allows developers to launch their token on the ecosystem, a Syscoin Platform Token (SPT). The Syscoin network supports fractional (F-NFTs) and non-fractional NFTs, and the ability to mint multiple NFTs from a single token specification. The upcoming dApp 'SysMint' will make it extremely easy for non-developers to mint their own NFTs and SPTs without the complexity constraint of blockchain technology. This will be further highlighted in the chapter "Syscoin Platform Tokens (SPT)".

The purpose of the Syscoin network is essential to provide a secure, accessible, inexpensive blockchain and distributed ledger technology platform with a focus on enterprises.

Zero Confirmation Directed Acyclic Graph (Z-DAG)

The Z-DAG technology of Syscoin is an instant settlement protocol used as a complementary system to the Proof of Work consensus method in confirming Syscoin service transactions. Therefore, double the security of Syscoin considering it adds another layer of verification. The first layer is the Z-DAG layer which essentially falls back on the merge-mined Bitcoin layer. The second layer is Syscoin's PoW layer which is merge-minded with the Bitcoin Network.

Z-DAG allows Syscoin to scale with a theoretical exceptionally high TPS (i.e. 60,000 to 145,000) while retaining a high level of security. Z-DAG transactions can instantly settle as a result of the network being able to anticipate what transactions will be in the next block and how these will be ordered with confidence. Therefore, participants of the network can instantly settle payments without having to wait for block confirmations.

The parent chain miners do order a list of transactions out of their memory pool which they sort by time, this is done after they have made a list based on transaction fees (e.g. supply and demand). To ensure there are no cases of negative balances, a strict validation process by every peer is being used when processing a block, comparable with the Bitcoin balance checks (i.e. UTXOs). If the network cannot get absolute consensus, then the conflicting transactions and blocks will be rejected. The system utilizes a 10-second delay to subsequent transfers made by the same asset holder, to prevent double-spending and reduce latency of ordering transactions by time. As stated before the Z-DAG layer falls back on the merged Bitcoin layer, therefore if there are any differences between the PoW block and the real-time state it will be resolved upon the confirmation of a block, as $Block_t$ depends on $Block_{t-1}$. The Z-DAG layer allows Syscoin to reduce transaction settlement times to near-instant while having a slim risk of double-spending over a minimum latency time.

The unique aspect of the Z-DAG layer of Syscoin is that it does not compromise decentralization, neither the security of the platform nor the rewards for the miners. Therefore, the layer does not sacrifice any key components of the network while adding scalability to the ecosystem.

To put the innovative technology in perspective. The Z-DAG protocol makes microtransaction viable with instant settlements, and extremely low transaction fees. Therefore, the user can buy his groceries and perform other transactions without having to experience long confirmation times or expensive transaction fees.

Ecosystem Overview

General Overview

Project Name:	Syscoin
Ticker:	SYS
Circulating supply:	615,187,124
Max Supply:	888,000,000
Supply ratio (Max/Circulating):	69,2%

Financial Statistics

Current price:	\$0.1677
Private sale price:	\$0.002
ROI (in USD):	8000%
Market Cap:	\$67,258,626
Fully diluted Market cap:	\$147,933,057

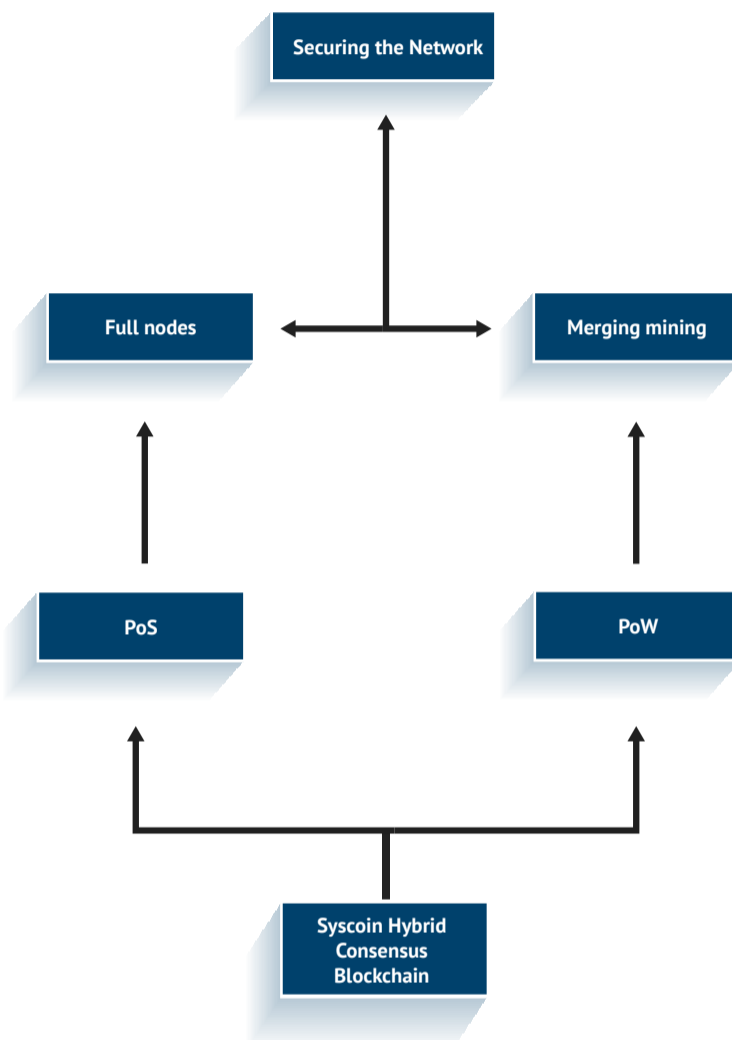
Hybrid Consensus Blockchain

The Syscoin platform is a hybrid consensus blockchain that utilizes Proof of Stake (PoS) and Proof of Work (PoW), shown in figure 1, to secure the network. Therefore the network aims to mitigate the weaknesses of each consensus mechanism.

The Proof of Work consensus method has issues, specifically environmental and security issues. The consensus method utilizes a high amount of electricity to remain decentralized and secure (e.g. preventing 51% attacks), however, the spent electricity allows the asset to have value. The Syscoin platform utilizes merged mining, essentially the miner can mine two or more cryptocurrencies without the need to spend more processing power. The Syscoin platform utilizes Bitcoin as the parent chain, which will be discussed in the chapter “Merged mining”.

The Syscoin ecosystem utilizes Proof of stake (i.e. masternodes running as full nodes) for governance, Z-DAG layer, and provide a service layer for future capabilities and features (e.g. digital identities, escrow, etc.). The implications of masternodes will be highlighted in the upcoming chapter, “Proof Of Stake”.

Figure 1 Syscoin Hybrid Consensus Blockchain model



Proof of Stake

The Syscoin network currently has approximately 2,400 active full nodes (i.e. masternodes) that are part of the vital infrastructure of Syscoin (Syscoin (SYS) Masternode - MasterNodes.Online, n.d.). The services that masternodes provide are, not limited to, the following:

- Fully validates all blocks and transactions against Bitcoin’s consensus rules.
- Validating and relaying blocks and transactions, to transmit this data to other network participants.
- Transmitting historical blocks to synchronize nodes that had downtime.
- Having voting power to vote on submitted governance proposals.
- Participate in chainlock through quorum signature signing and verification.

Thus, masternodes act as an essential component to the security of the Syscoin platform by essentially auditing the work of miners and transmitting this information to other significant network participants. Therefore, masternodes make it significantly harder to perform a 51% attack or a mesh network attack on the Syscoin platform. The security of Syscoin will be increased by the implementation of chain locks. These locks will attempt to solve a long-standing security problem in Bitcoin re-org attacks and selfish-mining. Adding an incentive for miners to publish processed blocks immediately significantly reduces the chances of selfish mining and re-orgs attacks while increasing the difficulty of performing a consensus attack (i.e. 51% attack).

The masternodes are bonded through a collateral requirement of 100.000 SYS, however, there is no slashing model and neither is there a vesting time for this collateral (Syscoin Masternodes, n.d.). The transaction fees are equally distributed between masternodes and PoW miners, therefore there is a financial incentive to run a Syscoin masternode. A seniority model incentivizes a sustainable relationship by increasing rewards of masternodes over time, up to 100% of the base rate.

Each month a pool of governance funding is generated by the Syscoin Blockchain “superblock. The current superblock reward is 151,767 Syscoin, every year the superblock rewards decline by 5% (Syscoin Masternodes, n.d.). Any individual or group can submit a proposal to receive a part of these funds. The master node operators vote on these submitted proposals, and at the end of the month, the funds are distributed to the proposals with the greatest number of votes.

Merged mining

Merged mining is that miners can mine two or more cryptocurrencies at the same time, without sacrificing any mining performance. Therefore, the miners can use computational power to mine blocks on multiple chains with the same algorithm (i.e. SHA-256 for Bitcoin). The merged mining allows Syscoin to add security to their network by PoW by recycling the energy of the Bitcoin network.

The main benefit of merge mining is that the ‘child’ blockchain can benefit from the miner network of the ‘parent’ blockchain. In this case, Syscoin can benefit from the security of the Bitcoin network provided by the miners, however, this is only the case if enough miners merge mine Syscoin. The Syscoin network currently has 24 ExaHash/s (EH/s) processing power, with an all-time high of 48.92 EH/s (Coinwarz, n.d.). The fall of the hash rate has been caused by the Chinese crackdown on cryptocurrency mining in Q2 2021.

The financial incentive to mine Syscoin should be high enough to convince Bitcoin miners to merge mine Syscoin, to prevent any security issues. Therefore, there are risks involved in implementing merge mining. These risks will be highlighted in the “Risks” chapter.

NEVM

The Syscoin Network-Enhanced Virtual Machine (NEVM) will fuel the next ambitious step of Syscoin to engage in innovative products and developments. The Syscoin NEVM will allow the platform to use Zero-Knowledge (ZK) rollups to provide further scaling for Turing-complete smart contracts, along with trustless interoperability.

Turing complete smart contracts, by the definition of Vitalik, are smart contracts that allow loops. Therefore, developers do not have to write the same code over and over to execute a certain code. In general, the definition of a Turing complete system is that the system in which a program can be deployed will find an answer, although there are no guarantees regarding the runtime or memory.

ZK roll-ups

ZK Rollups is a layer 2 solution, that bundles dozens of transactions off-chain and generates a ZK proof (i.e. SNARK). The implications of a ZK-proof, are highlighted in the chapter “ZK-Proof”. The proof is posted to layer 1. Layer 2 is a collective term for solutions that are designed to support the scaling of an application by handling transactions off the Ethereum mainnet (layer 1).

The ZK-rollup smart contract is holding all the funds on the main chain, while it performs computation and storage off-chain. A ZK-proof can be used to update the state of the ZK-rollup smart contract. The main benefit of ZK-roll ups is that only a ZK-proof is needed, instead of all the transaction data. Therefore, blocks are holding fewer data, and validating is quicker, and lowering the fees for users. The amount of stored data can be even lowered by indexing instead of transaction addresses.

ZK-rollups will essentially allow smart contracts and SPTs to be handled much more efficiently, by parallel processing, while having lower fees. Due to the gas fee market being based on a supply and demand mechanism the overall cost model will be lowered. The ZK-rollups will be implemented in the Syscoin bridge and will be a significant improvement. The implications of ZK-roll ups on the Syscoin bridge will be highlighted in the chapter “Syscoin bridge”

ZK-proofs

ZK proof is a cryptographic method that allows a party (the prover) to prove to another party (the verifier) that a given statement is true, without providing any additional information, shown in figure 2. To make the idea less abstract, there is a relatively simple concept given by Chalkais and Hearn (Demonstrate How Zero-Knowledge Proofs Work without Using Math, 2017).

Your friend is color-blind and is not able to distinguish the color red from green. Your friend has a green and a red ball that are otherwise identical. Your job is to convince your friend that the balls differ in color while revealing nothing else. The concept would go as following; You ask your friend to show the balls and afterward to put them behind his back. Then he may switch the balls behind his back and shows you a single ball. The question that arises is: Did he switch the ball behind his back?

You, as prover, should be able to tell him if he did, assuming you are not color-blind. Therefore, you could convince him that the balls do differ from color with a high probability of success (i.e. 99%). However, let’s assume that the prover has malicious intent, and therefore you are lying to your friend. The two balls are the same color, according to the Law of Large numbers of Bernoulli (Dekking et al., 2005) the expected probability of you guessing right is approximately 50% after a high amount of games (e.g. 1000 switches). Since obtaining a high probability of success by guessing is highly unlikely, your friend can assume that you are stating the truth: the balls differ in color.

Figure 2 Zero Knowledge Proofs visualization



Syscoin Platform Tokens (SPT)

The ease that developers can set up their own SPT is remarkable and highlights the focus of the Syscoin developers on accessibility. The ease of setting up a token will be further highlighted in the upcoming chapter “SysMint”.

The SPTs use an unspent transaction output (UTXO) based consensus system, this means that there are no accounts or wallets at the protocol layer but instead, coins are stored as a list of UTXOs. The advantages of an UTXO-based consensus system are:

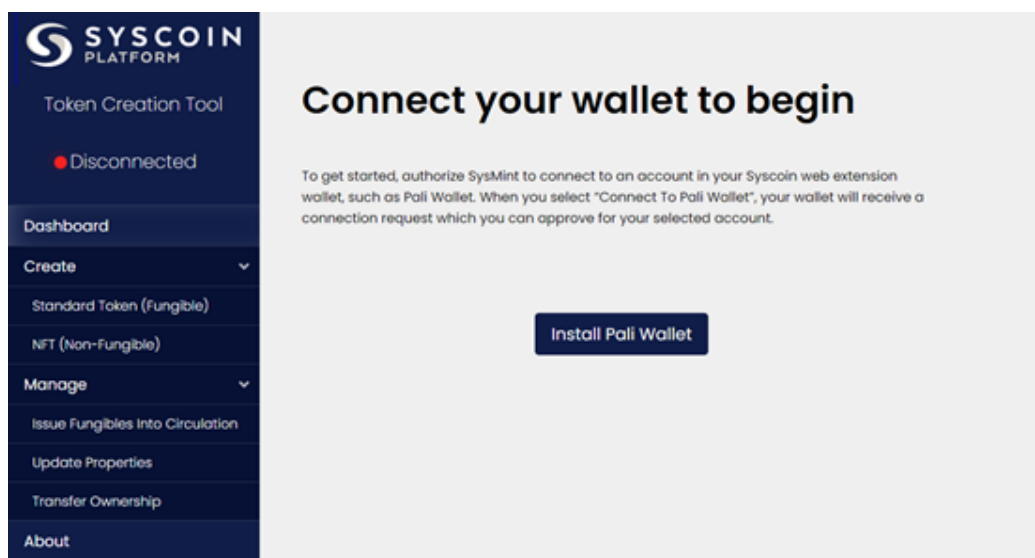
- Simplicity. UTXOs is all or nothing, considering the uniqueness of every UTXO.
- Transactions can be trivially verified in parallel since two transactions cannot affect the same UTXO.
- Privacy. Users are not bound by an account or specific wallet, but are free and encouraged to generate a new address for every incoming transaction.
- Uniformity.

The Syscoin platform has a few key components that allow users to have a smooth experience without any financial constraints. As highlighted earlier in this research, Syscoin can scale up to 145,000 TPS (Whiteblock, 2019), while being secured by the Bitcoin Network. The low fees of the platform, a positive consequence of the high scalability, allows users to utilize their SPTs without a transaction fee constraint.

SysMint

The SysMint is designed by the Syscoin Foundation and Pollum Labs (previously: Quan digital) (Syscoin Foundation, 2021). The SysMint dApp, shown in figure 3, is the next step to make SPTs and Non-Fungible Tokens (NFTs) accessible to the masses, by allowing any Syscoin holder to mint their SPTs or NFTs without having to code, or understand. The dApp allows the creator to manage their creation with a token management tool, allowing creators to adjust the circulation supply of their token by minting and to add advanced features such as Notary and Auxfees features. Therefore, the dApp gives some flexibility to the creator to utilize advanced features of the Syscoin platform in their SPTs.

Figure 3 SysMint interface



The ability to mint your own NFTs and SPTs without the need to understand the underlying technology has its benefits. The dApp allows creators to mint their creations with ease, by giving them enough tools to play around with while completely removing the complexity constraint. It creates a feeling of personal connection with the Syscoin Platform, considering your creation is living on their blockchain network. The concern of network spamming could be raised, however, a malicious actor does not necessarily need an SPT to spam the Syscoin network with transactions. Besides that, the Z-DAG layer allows the Syscoin platform to scale to theoretically 100K+ TPS, therefore spamming the network with transactions won't necessarily damage the platform.

The fee to mint your NFT or SPTs is currently one Syscoin, however, with the upcoming NEVM, the fee will be removed. The ideology behind the fee removal is that the creator will pay a transaction fee to move any of these created NFTs or SPTs, therefore the transaction fee market will put a price on any NFT or token creation comparable to how Ethereum is handling NFT and ERC-20 token creation. A concern could be raised that malicious actors could spam SPTs and NFT creations, therefore bloating the Syscoin blockchain with useless SPTs and NFTs. The footprint of NFTs and SPTs is slim, therefore bloating the Syscoin blockchain won't necessarily have a drastic impact on the blockchain size.

Pali Wallet

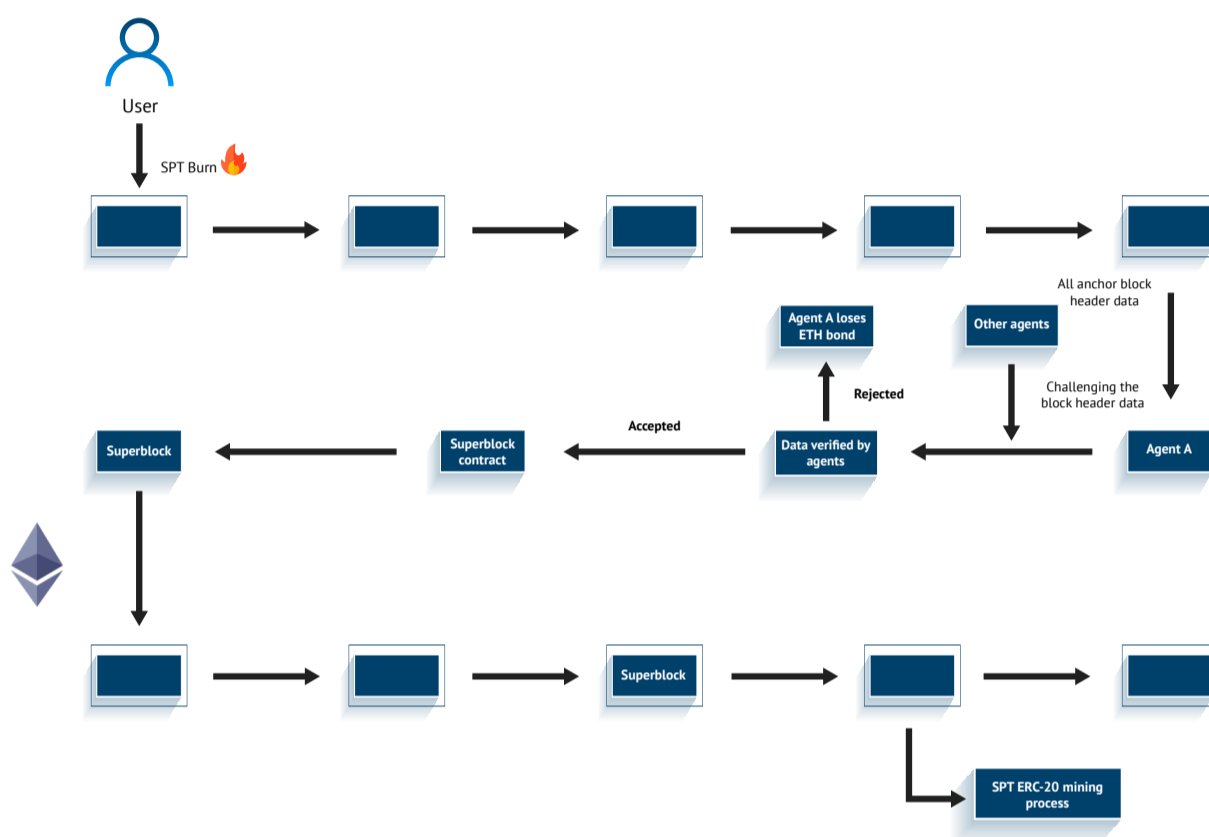
The Pali Wallet is non-custodial, that is tailored for UTXO chains such as Syscoin. A major advantage of non-custodial wallets is that only the user has control of their private keys, therefore the user remains in possession of their coins. The Pali Wallet is built up from scratch by Pollum Labs, therefore the wallet is not a fork on any other existing wallet.

The Pali wallet is similar to Ethereum's, MetaMask with a secure and user-friendly interface. The extension allows users access to SPTs, dApps, NFTs, and Syscoin-core interfaces. Essentially it will be a cornerstone for the Syscoin Platform considering it allows dApp developers to utilize much more flexibility and features within their creations. The Pali Wallet will receive the support of Trezor:tm: hardware wallets, which allow users to use the browser extension with their favorite hardware wallet.

Syscoin Bridge

The Syscoin bridge is unique to other bridge solutions, considering it allows Syscoin to exist across any other blockchain. The capabilities of the Syscoin bridge are endless and can be leveraged to be utilized for virtually any blockchain. However, the first direct bridge was built to leverage Turing complete contract capabilities of Ethereum. In general, this makes sense considering the Ethereum Network itself has bridges to other blockchains such as Binance smart chain and Tron. To add to that, Syscoin users can use powerful Ethereum tools such as Metamask, DEXES (i.e. Uniswap), MyEtherWallet, and more.

Figure 4 Syscoin Bridge visualization



Whenever a Syscoin network user would like to use the Ethereum network with their SPT, the SPT will be burned on the Syscoin network and minted on the Ethereum network. The process of switching networks, which involves minting and burning, is visualized in figure 4. The superblock contract anchors all block header data from the Syscoin chain onto the Ethereum blockchain, thereby creating a sidechain. This sidechain is being used to mint SPT ERC20 tokens and is secured by "agents". A bond of 3 ETH is required to be eligible to run an agent. However agents get compensated for their services for every accepted bridge transaction, by the Superblock contract, they have submitted. The agents have two primary roles:

- Submitting all block header data to the Superblock Contract, hereby a Superblock is created.
- Challenging the superblock submissions of other agents. If the submitted data does not match their own, a challenge will be started whereby the loser of the challenge loses their 3 ETH bond.

Therefore, an agent that has malicious intent will be punished severely for their harmful behavior and there is a clear financial incentive for other agents to punish them.

The ZK-rollups, discussed in the earlier chapter "ZK-rollups", will be implemented in the Syscoin bridge to lower fees and overall complexity overhead of the current bridge. The implementation will allow developers to be much more flexible with their projects by lowering the overall complexity of the bridge. To add to that, the flexibility towards other blockchain bridges increases, therefore making it easier to create value for SPTs by allowing them access to other blockchain chains (e.g. Binance Chain, Zilliqa, etc.).

SYS Token

The SYS token has a maximum supply of 888,000,000 tokens, with a circulating supply of 615,552,365. The inflation of Syscoin is 38.5 Syscoin per block (i.e. 60 seconds) and deflates every year by 5%. The distribution of the rewards is as follows:

- 10% goes to governance proposals
- 67.5% goes to masternodes
- 22.5% goes to miners

The UTXO transaction fees of the Syscoin platform are being distributed equally between masternodes and miners. Whenever the supply of tokens is fully mined, the platform will pay a minimum amount to miners to produce blocks, considering the transaction fees will scale further by adoption. However, the total amount of transaction fees depend heavily on scaling innovations and adoption (i.e. Layer 2). The EIP-1559 proposal turns the transaction fee of ETH into a static subsidy (i.e. baseline), therefore the masternode subsidy will deflate to a minimum, depending on the rate of burn by the EIP-1559 proposal, which is close to the global population growth (Ethereum, 2019).

COMPANY OVERVIEW

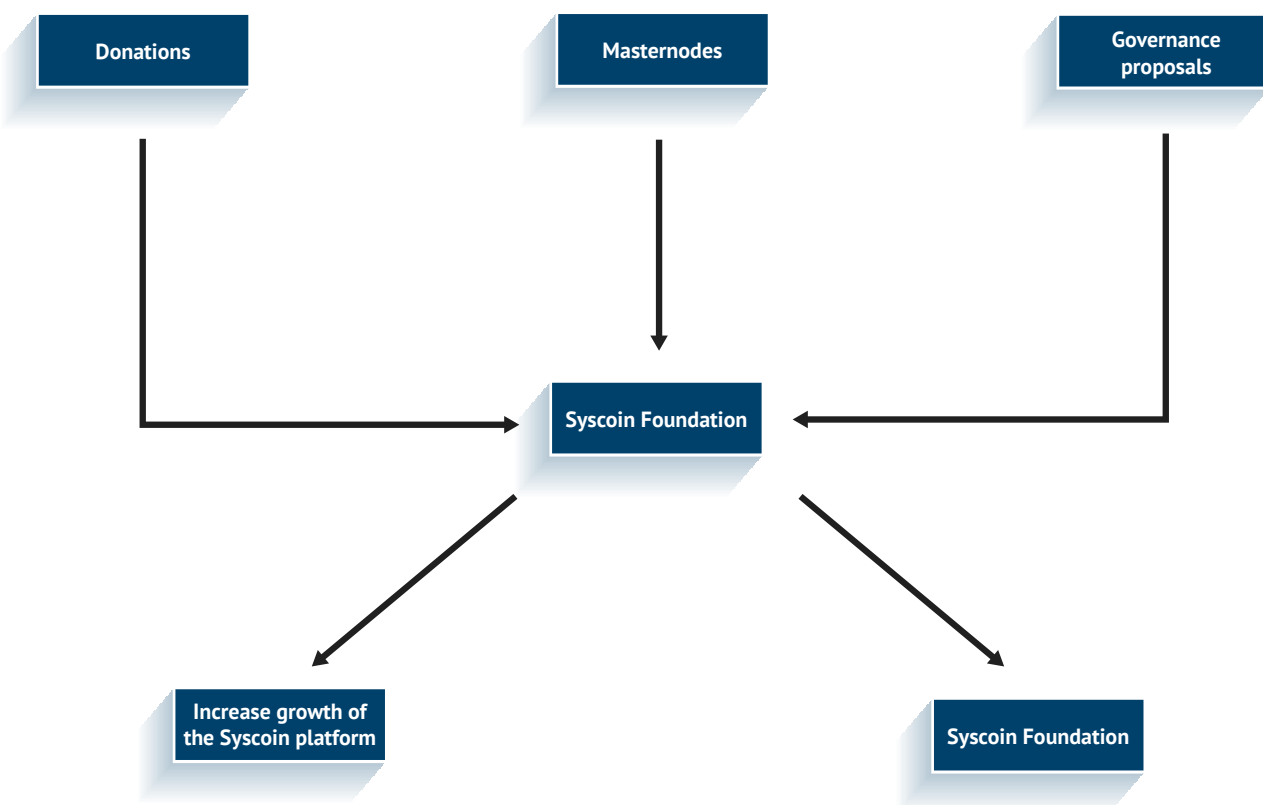
Syscoin foundation

The Syscoin Foundation is the official entity that represents the Syscoin Platform since 2019. The board of the foundation consists of developers and influential figures of the Syscoin platform. The entity is mainly focusing on the growth and overall adoption of the platform and is currently based in Eindhoven, Netherlands.

The Syscoin foundation consists of several core developers of the Blockchain Foundry, a public commercial entity that is listed on the CSE and Frankfurt exchange, a company that develops blockchain-based business solutions, and a provider of consultancy for corporate clients that seek to incorporate blockchain technology within their business model. The connection between the Syscoin Foundation and Blockchain foundry will be further highlighted in the upcoming chapter “Blockchain Foundry”.

The funding of the Syscoin foundation, shown in figure 5, comes from donations of the community, governance proposals, and masternodes. As highlighted before in this research, any entity or individual can propose a governance proposal, and the proposal with the most votes wins part of the funding. The Syscoin foundation is currently utilizing 16 masternodes, that generate revenue for the entity. Therefore, the Syscoin foundation depends on the generosity of the Syscoin community, their governance proposals, and their masternodes, essentially making it fully independent of any commercialized entity.

Figure 5 Syscoin foundation funding model



Blockchain foundry

Blockchain Foundry is the commercialized entity that thrives on the research and commercial development of the Syscoin platform. Blockchain Foundry builds commercialized blockchain solutions for enterprises on top of the Syscoin platform, which is essentially the enterprise link of the Syscoin platform. Blockchain Foundry is actively working on innovative and ambitious projects to develop and thrive the Syscoin platform further.

The latest financial statements of Blockchain Foundry show that the business just had a private placement of 10 million USD (Stockwatch, n.d.). The new injection of liquidity will be used for research and development and to increase the exposure of their products, therefore indirectly increasing the exposure of Syscoin. The company bought 1\$ million Syscoin on the open market and currently holds approximately 7 million Syscoin (Blockchain Foundry Inc., 2021).

The latest income statement of Blockchain Foundry shows that the last quarter has been relatively disappointing with a decrease in an operating margin of 34.33%. The operating income decreased from -0.1 to -0.42 million USD, while the net profit margin increased by 96.57%. However, this increase in net profit margin was a consequence of an increase in interest income according to the last quarter's income statement. The main cause of the decrease in operating margin was the increase in total operating expenses. The total operating expenses increased by 73.7%, while revenue decreased by 14.3% (Stockwatch, n.d.).

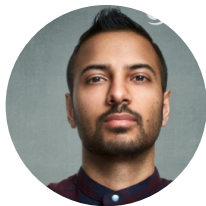
TEAM OVERVIEW

Team overview

The Syscoin platform is a decentralized blockchain platform, therefore several teams and individuals are working on the project. However, the most active and engaged individuals will be highlighted in this section and will be further referred to as the Syscoin team.

The Syscoin team, shown in figure 6, consists of experienced blockchain developers with an impressive technical background. The team has more than 65 years of combined blockchain building experience, with an impressive and impressive well over 25 years of developing large-scale applications.

Figure 6 Syscoin team overview



Jag Sidhu

Co-founder of Syscoin & Lead Core developer

- 20 years of experience in software development
- Accredited holder of a bachelor in Technology, Computer science



Michiel

Syscoin Foundation Vice President / Project manager

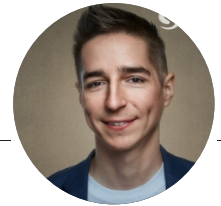
- 8+ years of experience in marketing and blockchain technology



Willy Ko

Syscoin Core Developer

- 10 years of experience in software development
- Previously, software engineer at Cisco Systems



Dan Wasyluk

Co-founder of Syscoin & Syscoin Core Developer

- 15+ years of experience in enterprise software development
- Previously, Direct of software engineering at Decision Lens



Sebastien Dimichele

Co-Founder and Foundation Board Member

- 20 years of experience in the telecommunications industry
- Previously, Project Manager at Rogers communications



Bradley Stephenson

Marketing and Development

- 20+ years of experience in IT
- Former employee of Nuance Communications, Inc



Chris

Foundation Board Member and Marketing

- 5+ years of experience as miner and blockchain technology
- Actively builds projects for the Syscoin community (e.g. sysnode.info)

GROWTH OVERVIEW

Growth of Syscoin

The blockchain industry is steadily innovating and adapting to market developments. An increasing flow of new projects and products make the blockchain industry a competitive space, with ambitious teams and concepts. Therefore, projects need to benchmark their growth to their competitors and Bitcoin, as a proxy variable. The growth of Syscoin will be highlighted in the following three sections:

- Statistical Analysis
- Digital Presence Analysis
- Development Analysis

Statistical Analysis

Daily spot price

The average daily spot price of BTC, in USD, decreased by -0,67%, shown in figure 7. While the average daily spot price of BTC decreased by -0.55% in the same period. This implies that SYS is being outperformed by Bitcoin, the benchmark, in terms of an increase in the spot value. The argument could be made that the downtrend of the crypto market has a bigger impact on the altcoin market than the Bitcoin market. To test this hypothesis, the correlation between the altcoin market and Bitcoin is analyzed.

The altcoin market dataset consists out of the top 20 altcoins, by market capitalization. The correlation between the dataset and Bitcoin is above 90%. That means that there is a statistical relationship between Bitcoin and the Altcoin market, considering the two datasets are linearly related. To further verify this claim, we plotted the daily growth of asset value of Zilliqa, Elrond Network, Syscoin, and Cordano. The hypothesis is that the growth of every project follows a similar trend, which would mean that the coins themselves are correlated which makes sense considering they all have a high correlation with Bitcoin. As shown in figure 8, the projects are following the same trend, therefore the assumption can be made that the Bitcoin market and altcoin market are closely tied to each other.

Daily volume

The average daily volume of SYS has increased by a whopping 74.50%, shown in figure 9. While the average daily volume of BTC has increased by 1.09%. The difference between the increase of daily volume of SYS and BTC is 73%. The main cause of this abnormal difference is that the Syscoin volume has a few outliers, one of these is on the 30th of April with an increase of 3400%. Therefore the rate of average daily volume growth of SYS is slightly inflated in the last 90 days. The adjusted average daily volume of SYS is 24,49%, which seems to be a more logical number.

The average daily volume of SYS has been outperforming Bitcoin by a mile. The market in the last 90 days was considered positive for altcoins, and the Syscoin platform had a few notable releases that brought some buzz to the project. The overall volume growth of Syscoin is healthy, however, it is far from stable. Nonetheless, the overall growth of daily volume of the last 90 days is significant.

NVT RATIO

The NVT ratio essentially highlights if an asset is over-or undervalued. If the NVT is high, in comparison with the normal trend, then it signals that the value of the network is higher than the value being transacted on the network suggesting the network is either overvalued or growing abnormally. The NVT ratio is calculated as follows:

$$\text{NVT Ratio} = \frac{\text{Total Network Value}_t}{\text{Daily USD volume}_t}$$

The NVT Ratio is solely useful if sufficient historical data is available to construct a trend line to benchmark. The daily USD volume variable is a proxy variable for the network usage, and market capitalization is being used as a proxy variable for Total Network Value.

The NVT ratio of Syscoin is drastically higher than the Bitcoin NVT ratio, shown in figure 10. However, there are a few interesting outliers that the NVT of Syscoin is drastically lower than Bitcoin (e.g. datapoint on 30/04/2021). The formula of the NVT ratio consists of two variables, therefore if one variable abnormally increases in comparison to the other variable, the NVT variable will be skewed. In this case, as highlighted earlier in this report, the volume of Syscoin abnormally increased and therefore the NVT got skewed.

The monthly NVT of Syscoin, shown in figure 11 in the appendix, is well above the NVT of BTC implying that SYS is either overvalued or the overall network usage is growing abnormally. As shown in figure 9, the volume of Syscoin has in comparison with the price, shown in figure 7, more outliers that impact the NVT ratio. Therefore, the assumption could be made that Syscoin is experiencing growth in network usage.

Figure 7 Growth of Asset value

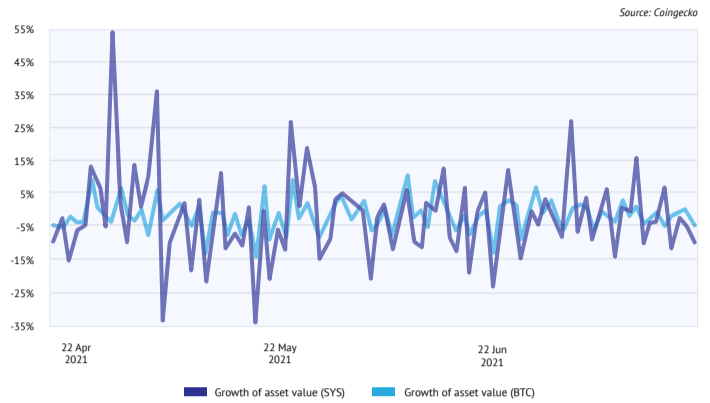


Figure 8 Growth of value benchmarked

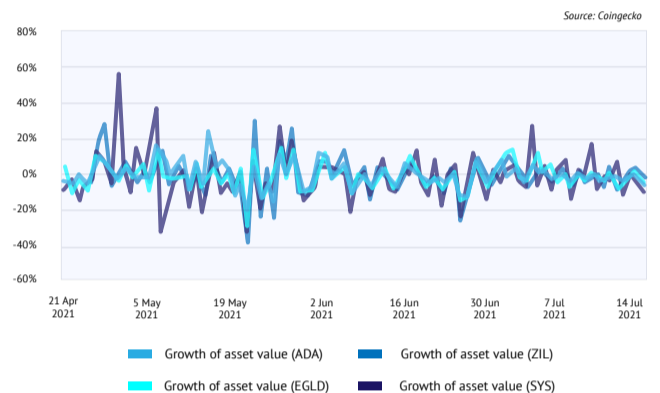


Figure 9 Growth of daily volume

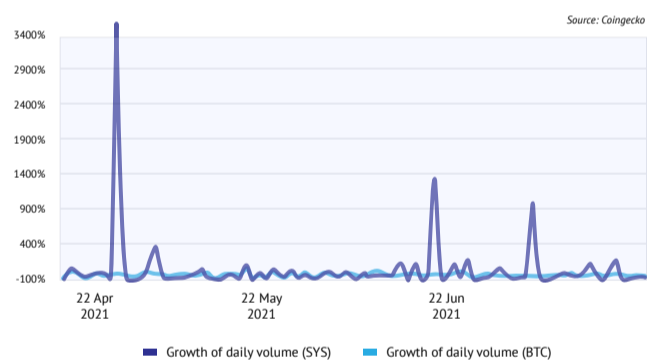
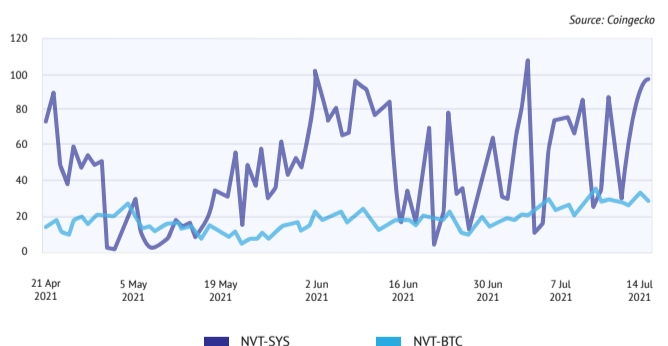


Figure 10 NVT Ratio

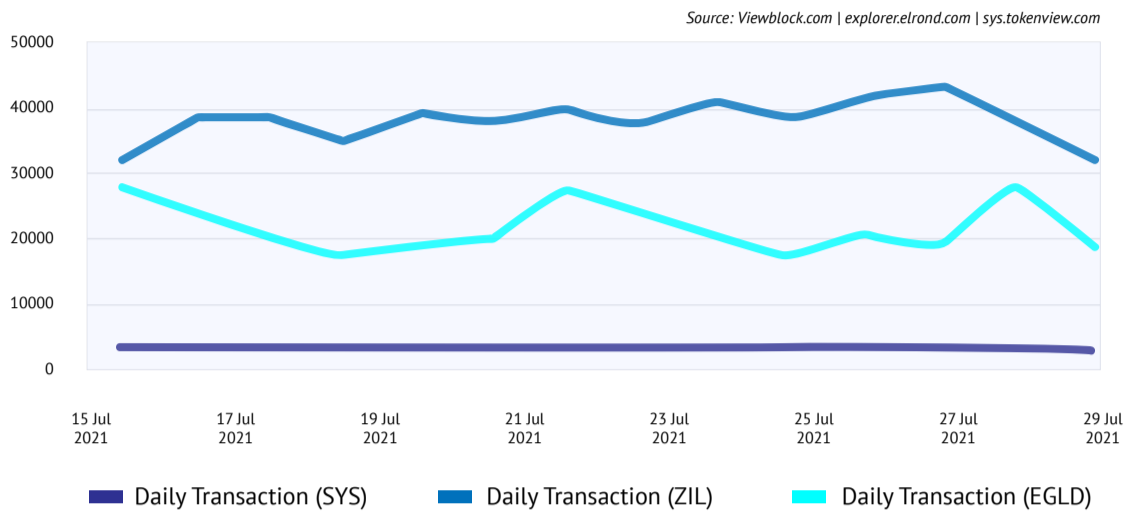


Transaction count

The network usage of Syscoin is considerably lower than other Layer 1 projects, shown in figure 12. Despite the growth in network usage, the project is experiencing significantly less usage by users. The reasons for the relatively low usage of Syscoin, in comparison with its direct competitors, could be various and hard to pinpoint. As stated before, it could be a marketing issue considering the digital presence of Syscoin is considerably growing at a lesser speed than its competitors. The underlying technology of Syscoin as a blockchain project is not the issue, as it is secure, allows instant settlements, and is inexpensive. To add to that, the Syscoin platform provides advanced features to developers for their projects.

The upcoming NEVM will most likely give Syscoin an advantage over some of its competitors. It allows developers to use ZK-proofs, and a much more flexible cross-chain bridge to flourish smart contract functionality. Considering the flexibility it gives to developers by allowing interoperability, therefore making it much easier to use smart contracts, it could lead to a substantial increase in network usage.

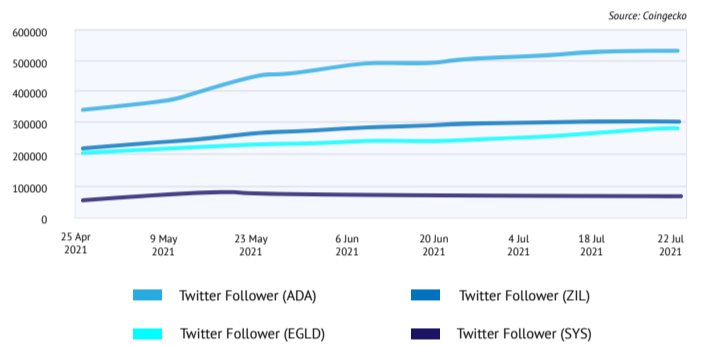
Figure 12 Daily transactions per ecosystem



Statistical Analysis

The function of social media for blockchain projects is mainly to inform and reach users and investors. Therefore, expanding their reach and exposure on social media could be beneficial for the value and usage of a blockchain project. The usage of blockchain projects, in most cases, has a direct correlation with the total amount of transaction fees. Furthermore, the number of transaction fees can attract developers to develop projects on a specific blockchain, considering it is a proxy variable of the usage of a blockchain network. In summary, the position of social media is getting more prominent within blockchain projects, and therefore, blockchain projects can use social media to attract new users and investors.

Figure 13 Twitter follower per ecosystem

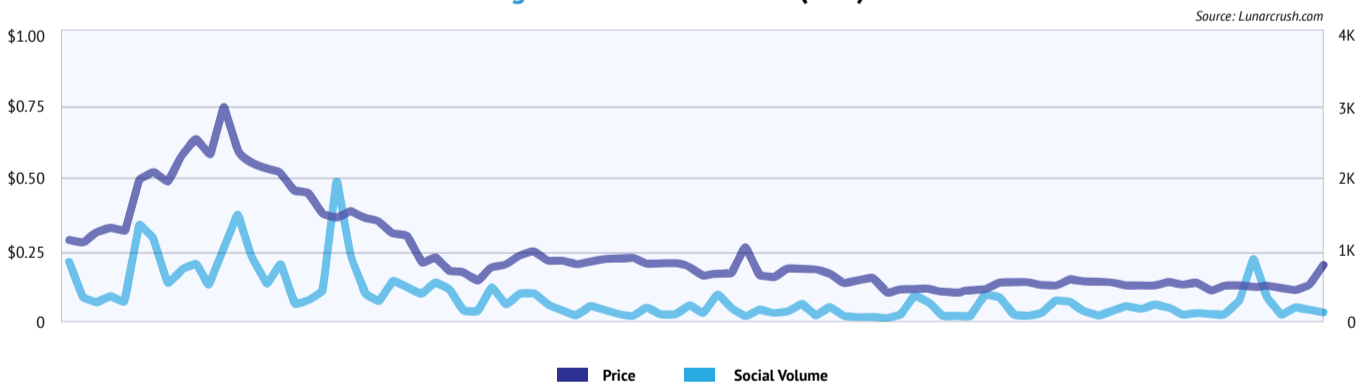


Social reach

The Twitter community of Syscoin grew by 1.21% weekly, with a 14% increase in the last 3 months. The overall growth of the Twitter community of Syscoin is considerably lower than competitors, as shown in figure 13, Zilliqa and Cardano experienced twice the relative growth of Syscoin while having more followers on Twitter. The cause of the lagging growth is most likely that the overall marketing of Syscoin is either less effective or isn't using as many funds as their competitors, this issue will be highlighted in chapter "Risk".

The overall social volume of Syscoin is decreasing, shown in figure 14. The increase of social volume in May can be traced back to the release of Syscoin Lux, which brought many features that are highlighted in the "Ecosystem Overview" chapter. The social volume decreased by 79%, from the spike to the current social volume, the downturn in social volume can be the consequence of a decreasing interest in the cryptocurrency industry as a whole. A similar trend is observable with a direct competitor of Syscoin, Zilliqa, which lost over 90% of social volume from the peak to the current volume, shown in figure 15 in the appendix. To add to that, another observable trend that impacts social volume and engagement is that cryptocurrency projects are waiting with the releases upon a more favorable cryptocurrency market (i.e. bull market). Therefore, the social volume and engagement decrease because projects aren't releasing major releases and neither are they utilizing their marketing to increase exposure for these releases.

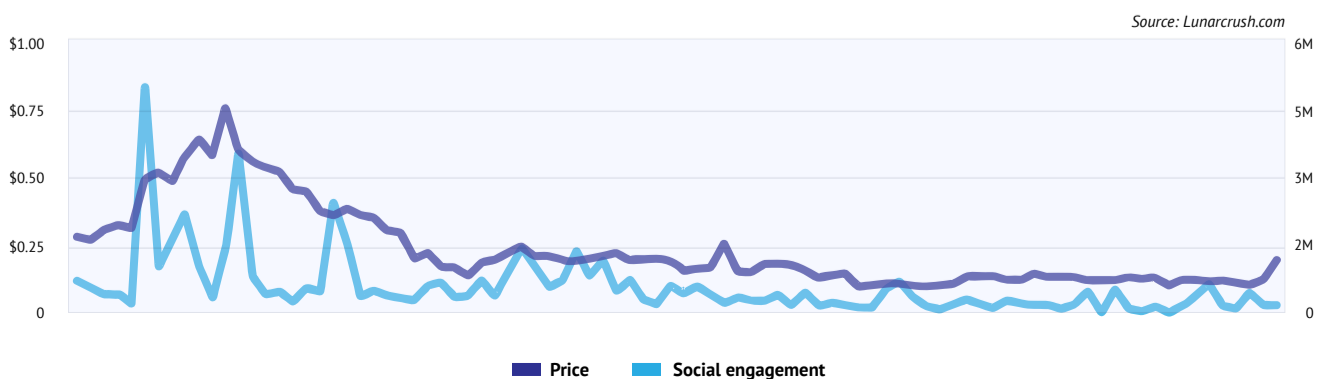
Figure 14 Social Volume (SYS)



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Figure 16 Social Engagement (SYS)



Development analysis

The development of a cryptocurrency project is essential for sustainable growth. The improvements on a product or project are essential for investors, and to attract new investors. Therefore, in an advancing market, a constant of improvements is important to keep up with your direct competitors. A high development activity implies in a public GitHub repository that:

- The project is likely to release new features or improve existing features.
- The probability of an exit scam or fraud is significantly lower.
- The project is much more likely, to be honest about its business proposition.

GitHub analysis

Most research firms are using GitHub commits to gauge a project's commitment to creating a working product, while constantly polishing and upgrading its features. However, in reality, most GitHub numbers are skewed because of forking. GitHub counts forking projects as commits, therefore a project could appear as a high developer activity project but in reality, they forked most of their commits. Therefore, tracking the number of GitHub events is a much more reliable way, considering forking a repository that generates just a single "ForkEvent".

The Syscoin public repository is one of the most active repositories of the cryptocurrency industry, as shown in figure 17. Syscoin is a fork of the Bitcoin network, therefore it does share GitHub commits. However, the Syscoin team has to merge and review all the commits. The commits of the public repository are therefore somewhat inflated, around 15-30% of the commits are unique ones of Syscoin team.

The overall development of Syscoin in the public repository is lower than its competitors, as shown in figure 18. There could be various reasons for the difference in developer activity between projects. The main reason is that most projects are using a private repository for their work in progress, another reason is that counting events is not necessarily taking into account the quality of the events. Therefore, the public repository could show a low developer activity, in comparison with other projects, but in reality, most of the work is being done behind the scenes that will be pushed later on to the public GitHub repository. In the case of Syscoin, the development is notable with several considerable releases and upcoming developments. The Syscoin team has highlighted that most of their work is being done in a private repository before it gets pushed to the public branch.

Figure 17 GitHub commits on public repository (Syscoin)

Source: cryptomiso.com

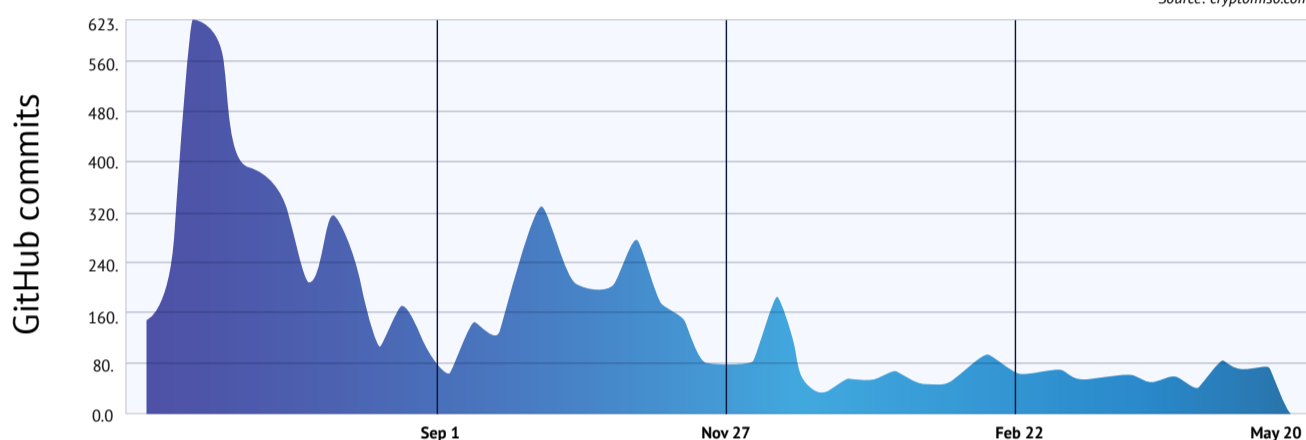
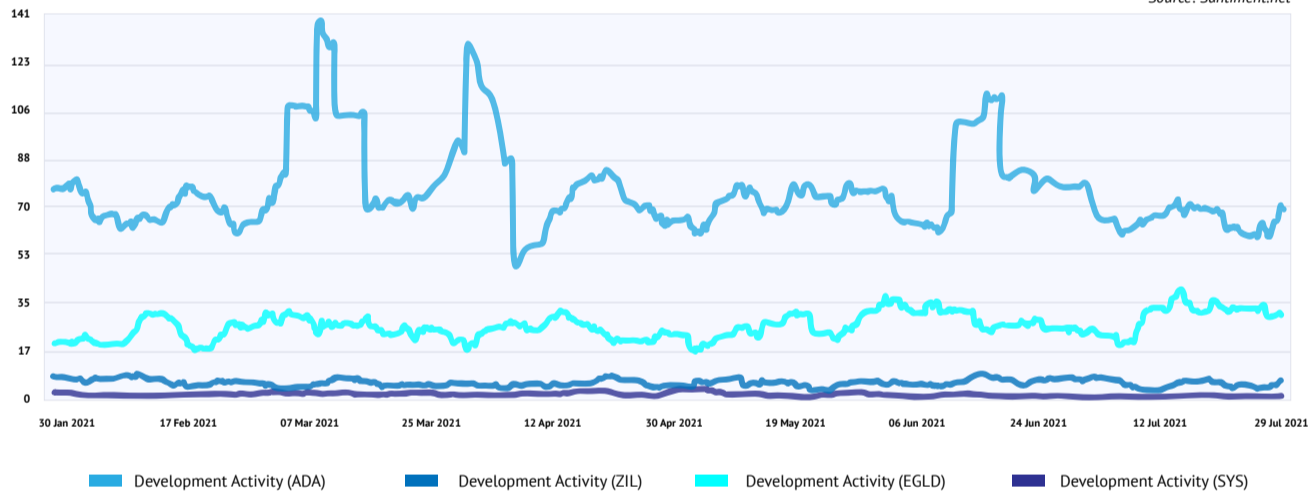


Figure 18 Development activity per ecosystem

Source: Santiment.net



Pali wallet review

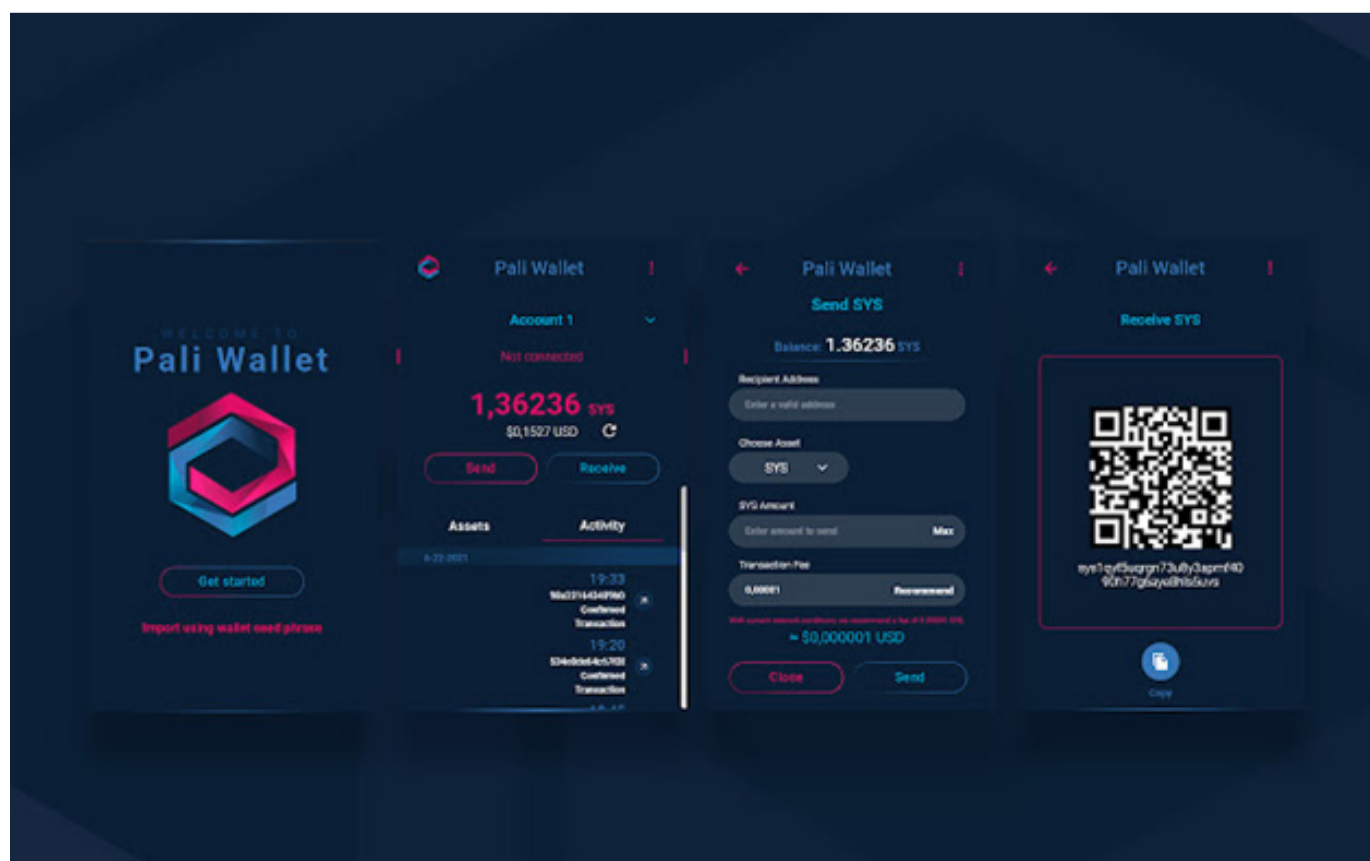
House of Chimera gained exclusive access to the upcoming Pali Wallet, shown in figure 19, and tested the features and overall experience. The browser wallet extension is currently in late-stage development, and House of Chimera tested the features out on the testnet.

The design of the Pali wallet is outstanding, the color scheme and UI are impressive. The wallet has an intuitive UI with an accessible interface and is quick to respond to users' input. The non-custodial wallet is easy to set up for users, similar to MetaMask, while providing the user an enjoyable experience.

The overall speed of sending transactions with the current version of Pali Wallet is fast, however, the WebSocket design is not implemented yet, therefore the wallet is pulling updates at specific intervals. The main downside is that these intervals do not reflect the true speed of Syscoin. To put this in perspective, let's assume that the pull interval is every 10 seconds while the Syscoin transaction speed is instant. The user will not experience the instant settlement considering their wallet won't be updated in time. The WebSocket design for the Pali wallet is considerably more complex because of the Z-DAG layer for tokens, therefore the WebSocket design will be implemented later on.

The overall experience of the Pali wallet is excellent and the color scheme gives it a premium feel. The browser extension is an essential addition to the Syscoin platform that will create value for users and developers.

Figure 19 Pali wallet



MARKET OPPORTUNITY

Innovation

The technological advancement in the last 50 years has been truly remarkable and allowed humans to drastically improve labor and capital-output. This paper will utilize Moore's law as a proxy variable for technological advancement. The Moore law is the theory that the processing power of computers (i.e. number of transistors) doubles every two years or so, shown in figure 20 in the appendix. Moore's law hasn't been valid since 2013, as it is getting harder to fit more and more transistors onto boards. However, with the rise of quantum computing, it will most likely be a matter of time until the law is valid again. Moore's law highlights the technological advancements that have been made in the last 50 years, and are visible in nearly every industry. The current world economy is completely reliant on computers, and this is especially true for the financial industry.

The technological advancement of payment systems

The technology landscape of transaction processing and payment systems is rapidly changing. The first electronic payment system was founded in 1871 by Western Union (Hendrix, 2021) that allowed people to send money between New York, Chicago, and Boston. In the 1990s, online internet banking services were offered to bank consumers yet those were anything but user-friendly. Users had to have very specific encryption knowledge and had to utilize data transfer protocols. Later on, the eventual invention of web 2.0 set the stage for online sites to participate in eCommerce.

The current modern financial system is still evolving by focusing on the user experience, adding new features, and instant settlements between national banks. However, the focus on financial inclusion by removing economic boundaries by allowing everyone accesses to financial services without any financial constraint has fallen short.

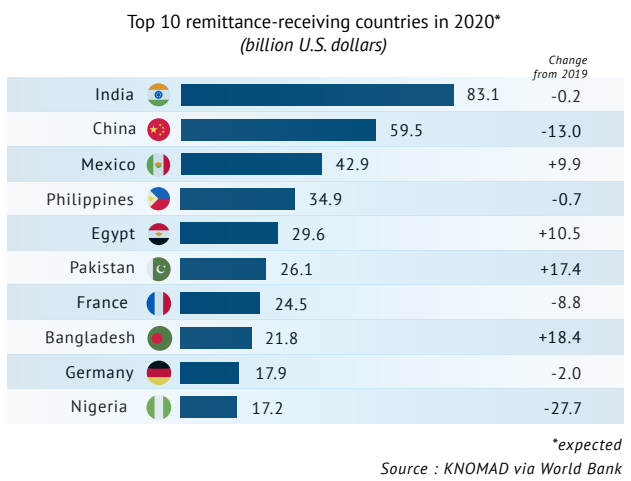
The price of the modern financial system

The modern financial system does not necessarily support the idea of equality, therefore, there are huge differences in financial costs and services between countries and, even more specifically, continents. To highlight this issue, the costs of remittance will be further analyzed in this chapter. The definition of remittance is:

“A remittance is money sent to another party, usually one in another country. The sender is typically a foreign worker and the recipient a relative back home” (How Remittances Help People in Developing Nations Battle Poverty, n.d.)

According to the world bank the low- and middle-income countries received 540\$ billion in remittances in 2020. As shown in figure 21, the top recipient of remittances was India in 2020 with a total inflow of 83 billion USD. India has been the largest recipient of remittance since 2018. The countries most reliant on remittance inflow are Tonga (37.7% of GDP), Somalia (35.3% of GDP), and Lebanon (32,9% of GDP) (Infographic: These Are the World's Top Remittance Recipients, 2021).

Figure 21 The World's Top Remittance Recipients



The cost of remittance is different for every continent and country, however, in Q1 2021 the global average cost of sending remittance was 6.38%, while banks remain the most expensive type of financial service provider with an average cost of 10.66% (World Bank, 2021). The cost of remittance depends on various factors, such as geographical location, type of remittance, and type of service provider.

The trend in the global cost of remittances, figure 22, highlight that it is significantly cheaper to send a remittance digitally than in cash with a difference of nearly 3%. Therefore, it is considerably cheaper to send a remittance digitally than in fiat. However, the countries that rely the most on remittances are not necessarily technologically developed. As shown in figure 23 in the appendix, the least technologically developed countries are mainly located in Africa while this continent also remains the most reliant on remittances. The average cost of remitting 200\$ in South Africa is 14,31%, while the average cost of remitting in Italy is 4,76%. (World Bank, 2021). The sub-Saharan African region has the highest average remittance costs with 8.02%, shown in figure 24.

The bank is by far the most expensive financial provider with an average cost of 10.66%, closely followed by the post office with 8.2%, shown in figure 25. In general, low- and middle-income countries do rely on banks and post offices as these do play a much more vital role in the infrastructure in comparison to high-income countries. In high-income countries, mobile operators and MTOs play a vital role because the necessary infrastructure is available and the remittance fees are considerably lower. Mobile operators have low overhead costs, in comparison to banks, and in general, are much cheaper than banks, sometimes the difference in remittance fee can be as high as 300% (World Bank, 2021).

Figure 22 Trends in the global cost of sending \$200 in remittances²

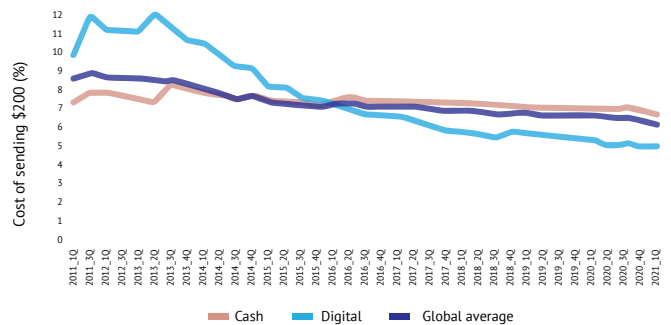
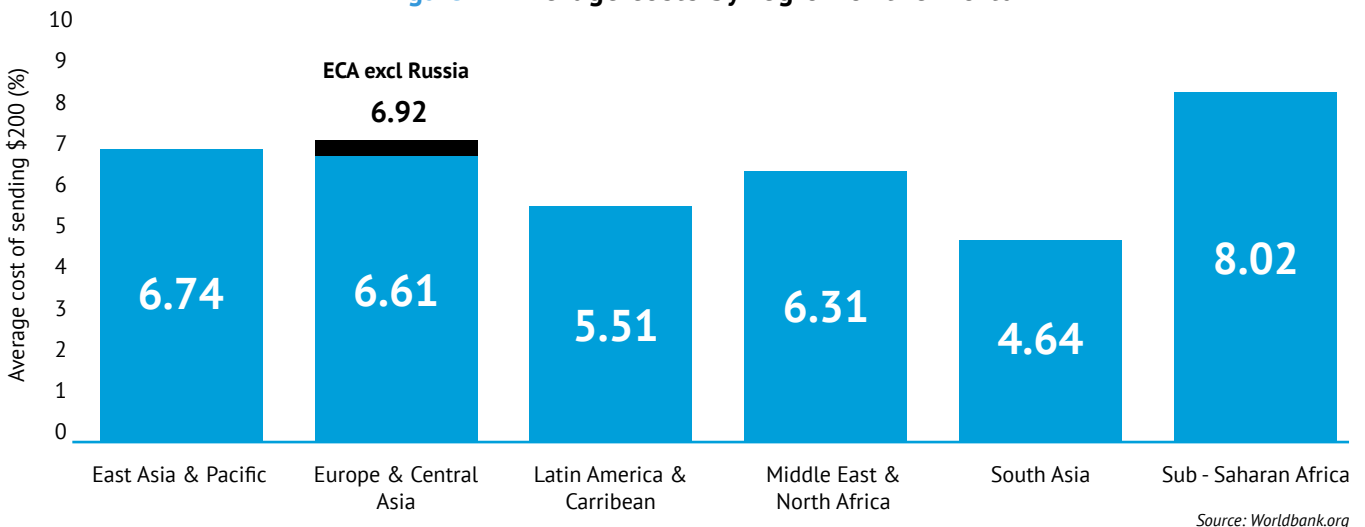


Figure 24 Average costs by region of the world



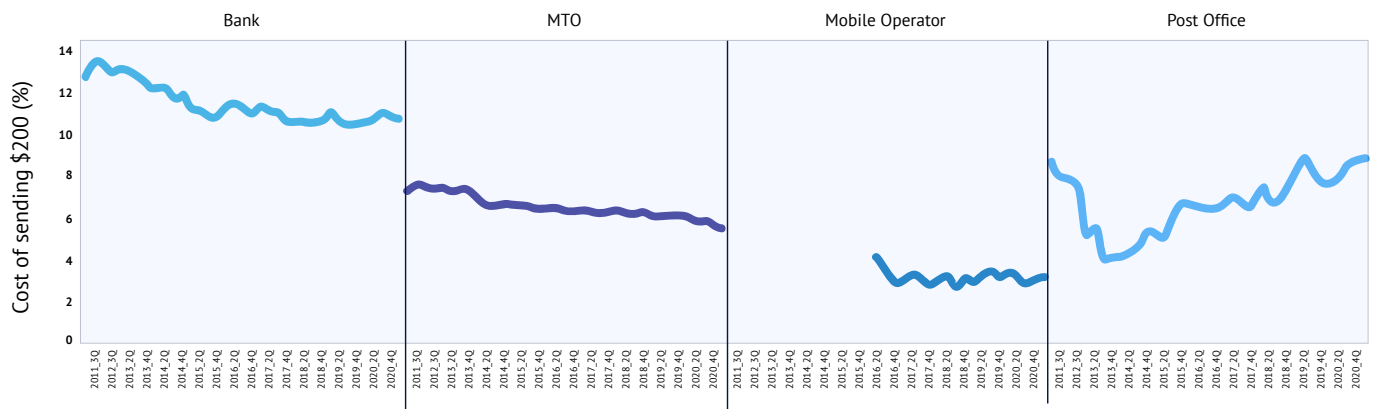
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Financial exclusion

In 2017 there were 1.7 billion unbanked adults, which means that 31% of the global adult population was unbanked (UFA Home, n.d.). In general, low-income countries do have a high rate of financial exclusion because of high transaction fees for financial services. The cause of high rates of financial inclusions are various, Tanzania has a financial exclusion rate of over 90%, the financial institution outreach doesn't meet the sufficient basics to lower financial exclusion (Rhyne, 2012). The consequences of financial exclusion can include an extension from mainstream financial services, such as savings or pension schemes, and can lead to a disconnection from essential utilities. In general, financial exclusion tends to be in combination with social exclusion (Fernández-Olit et al., 2016).

The ambitious target of Universal Finance Access by 2020 of the World Bank Group with private and public partners (i.e. 34 partners) is not achieved by a milestone, therefore the conclusion can be made that the focus on financial inclusion has fallen short (UFA Home, n.d.).

Figure 25 Total averages over time by RSP type



Source: Worldbank.org

Syscoin

The Syscoin platform is a high-performing blockchain that can handle instant settlements while being secure and extremely affordable. The current transaction price of Syscoin is extremely low, 10,000 transactions do cost 0.08\$ (Syscoin Fee Comparison Chart, n.d.). Therefore, the Syscoin platform is extremely suitable as a payment system considering it can instant settle.

A payment system has to utilize an underlying asset that is either able to be used as a reliable store of value or has instant settlement times so that customers don't have to hold it for long periods. Bitcoin is not able to be used as a reliable store of value in its current form, and the transaction speeds are too long with the current volatility the asset is being exposed to. The Syscoin platform can handle instant settlements, because of the Z-DAG layer, while being secure. The platform can scale up to theoretically 100,000+ TPS, which in normal circumstances should not be fully utilized, and can therefore meet any real-world demand. Thereby, remittance costs will be lowered to a minimum by removing the dependency on banks in low- and medium-income countries. The platform is extremely flexible to ever-changing cryptocurrency policies with the Notary feature for SPTs.

The security of a payment system has to be military-grade to prevent any malicious intent. The Syscoin platform infrastructure relies on merged mining and full nodes. These mechanisms secure the chain against double-spending and other imminent problems. To add to that, Syscoin implemented even more security features with the upcoming chainlocks, that prevent PoW issues (i.e. Selfish mining and re-orgs).

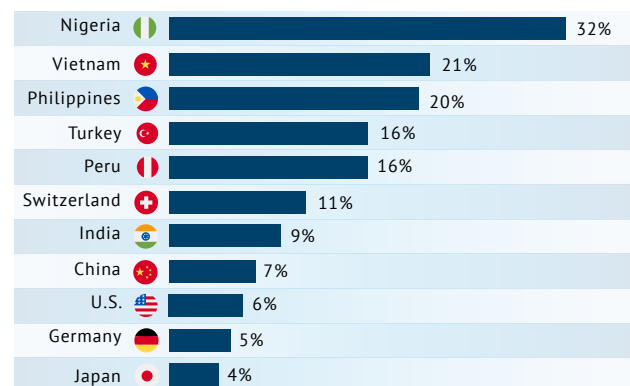
Daily volume

The Syscoin platform has unique characteristics that allow anyone with an internet connection to be included in a financial system. Currently, approximately 60% of the world population has access to the internet and this number is rapidly growing (Statista, 2021). The low- and medium-income countries are using cryptocurrency more in comparison with high-income countries, shown in figure 26. Due to the high financial services fees in these countries, it makes sense that the citizens of these countries seek alternatives.

The upcoming NEVM will allow developers more flexibility and much more opportunities to work on dApps on the Syscoin platform, therefore the Syscoin platform can turn into a well-designed smart contracts platform alternative. The upcoming Pali wallet, NEVM, and SysMint are the first steps to be that worthwhile competitor.

Figure 26 How Common Is Crypto?

Share of respondents in selected countries who said that they used and owned crypto currencies (2020)



1,000-4000 respondents per country. Representative of online population
Source : Statista Global Consumer Survey

COMPETITION

Smart contract platform competitors

The Syscoin platform has plenty of competition from other smart contract platforms, however, every platform has its benefits and flaws. Syscoin takes a different approach than most smart contract platforms by utilizing UTXO based consensus method for SPTs, instead of the more common account-based method. In this chapter, we will benchmark substantial competitors, Zilliqa and Ethereum, to the Syscoin platform.

Zilliqa

Zilliqa is a high-performing blockchain project and is one of the fastest-growing projects in the industry. To meet demand Zilliqa uses sharding while ensuring security and decentralization with Scilla and the practical Byzantine Fault Tolerance (pBFT) consensus method. The approach Zilliqa is taking is unique, considering it utilizes its own smart contract language 'Scilla' instead of using Ethereum's solidity.

The differences between Zilliqa and Syscoin are plenty, Zilliqa utilizes an account-based model instead of a UTXO based model, Zilliqa is targeting specific geographical regions together with its partners. The main difference is that Syscoin is mainly focused on the development of their project while slightly neglecting the marketing side of the project. Zilliqa is utilizing venture and accelerator funds to attract new projects to their platform. Geographical targeting has advantages and disadvantages. The main benefit of geographical targeting is that you can target specific areas where cryptocurrency is more likely to be adopted, however neglecting parts of the world can be a severe disadvantage in the long run.

Ethereum

Ethereum is the most established smart contract platform, with dozens of traditional companies and cryptocurrency projects integrating Ethereum in their products. The Ethereum network is currently upgrading to Ethereum 2.0, to lower the transaction fees, by implementing sharding, while improving the overall transaction speed. However, the full implementation of Ethereum 2.0 could be years away considering the complexity of the whole overhaul.

Ethereum has a global geographic target audience, due to the established nature of Ethereum, which is logical. The network of partners of Ethereum is beyond any project, and especially in a developing market that is impressive. However, the probability of a zero-sum game is extremely low therefore there will be enough opportunities for other smart contract platforms to develop and gain market share.

RISKS

Scattered information

Syscoin was founded back in 2014, therefore it is one of the oldest, that is still being actively maintained, cryptocurrencies in the cryptocurrency industry. The platform began with Syscoin 1.0 and is currently on Syscoin 4.0, with quite a few versions in between. The different versions had their fair share of innovative concepts and developments, but over the years the Syscoin team has changed direction a few times. The team of Syscoin is greatly experienced in building blockchain applications, backed by dozens of academic papers and articles. However, the average investor is not interested in reading these complex articles. Therefore, the information about the current state of Syscoin is not accessible for investors, and on top of that is relatively hard to find. The consequence of outdated information of features that either does not exist anymore or are appreciated, is that investors are confused about the state of Syscoin and are not able to value the ecosystem.

The current developments of a Syscoin should be accessible and easy to understand for investors. Thereby, it allows the investor to perform their due diligence without having read through dozens of outdated articles that have zero educational value on the current state of Syscoin. The lack of direction that Syscoin had before seems to be resolved with the upcoming NEVM update, and an overall more clear understanding of their future goals.

Marketing gap

The digital presence of Syscoin is lacking behind their direct competitors such as Zilliqa and Elrond Network. The platform is currently insufficiently marketed, and the reason for this could be various. It could be either the marketing budget, strategy, or even the marketing approach. A disadvantage for Syscoin is that the project is considered to be an old project, while some of its newer competitors can take advantage of the hype surrounding their project.

The digital presence of cryptocurrency projects is incredibly important to stay relevant to investors. The assumption could be made that the cryptocurrency market is not entirely efficient, therefore the projects with the best underlying technology aren't necessarily being noticed.

Merge mining dependency

Merge mining does allow Syscoin to benefit from the security of the Bitcoin blockchain. There are a couple of risks involved with merge mining, however, most of these risks are covered by innovative protocols and layers to prevent any malicious intent. However, the dependency of the Bitcoin blockchain has its disadvantages.

The dependency of a parent chain can be troublesome. As shown in figure 27, the hash rate of Syscoin is correlated to the Bitcoin hash rate. Therefore, if the Bitcoin hash rate falls it is likely that the Syscoin hash rate also falls because of the positive correlation. This could open small opportunity gaps for malicious actors to execute malicious intent to the Syscoin platform. The probability of the hash rate of Bitcoin falling to 0 is extremely slim, however, if it does the security of Syscoin is not compromised. The platform utilizes chainlocks, provided by full nodes, as an extra security measure against selfish mining and other malicious intent. Whenever the hash rate of Bitcoin falls to 0, the ecosystem will fully rely on its chainlocks. As stated before in the chapter 'Proof of Stake', these chain locks are being serviced by the Syscoin masternodes. The hash rate of Syscoin has fallen lately because of the Chinese crackdown on cryptocurrencies but is expected that it will stabilize and rise in the future.

Figure 27 Syscoin Hashrate Chart

Source: Coinwarz.com



DISCLAIMER

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Overview](#)[Market
Opportunity](#)[Competition](#)[Risks](#)[Disclaimer](#)[Appendix](#)

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APPENDIX

Appendix

Figure 11 Monthly Average NVT

Source: Coingecko

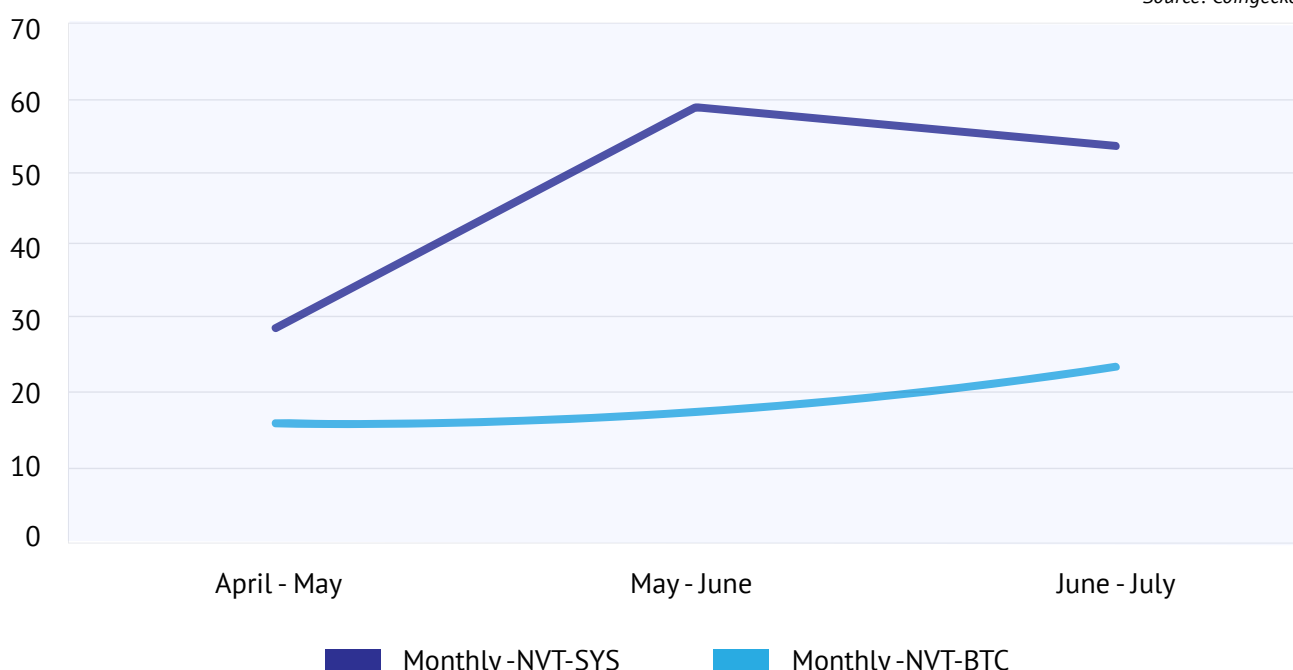


Figure 15 Social Volume (ZIL)

Source: Lunarcrush.com

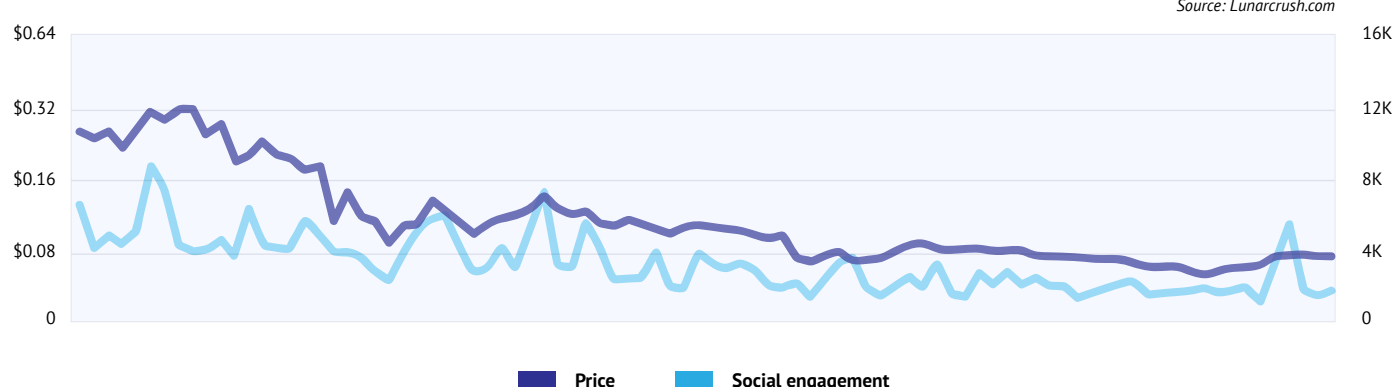


Figure 20 Moore's Law

Source: OurWorldInData.org

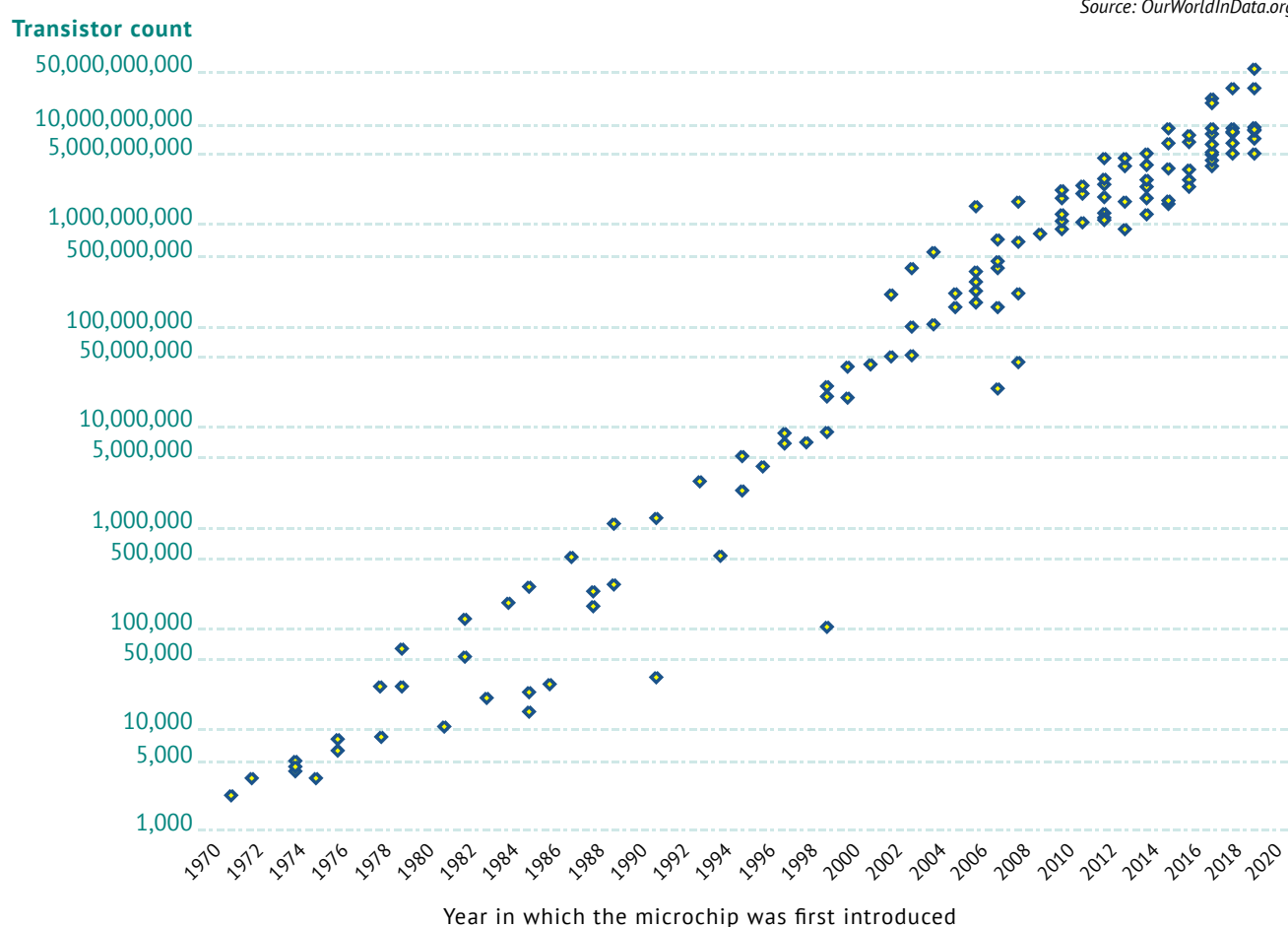
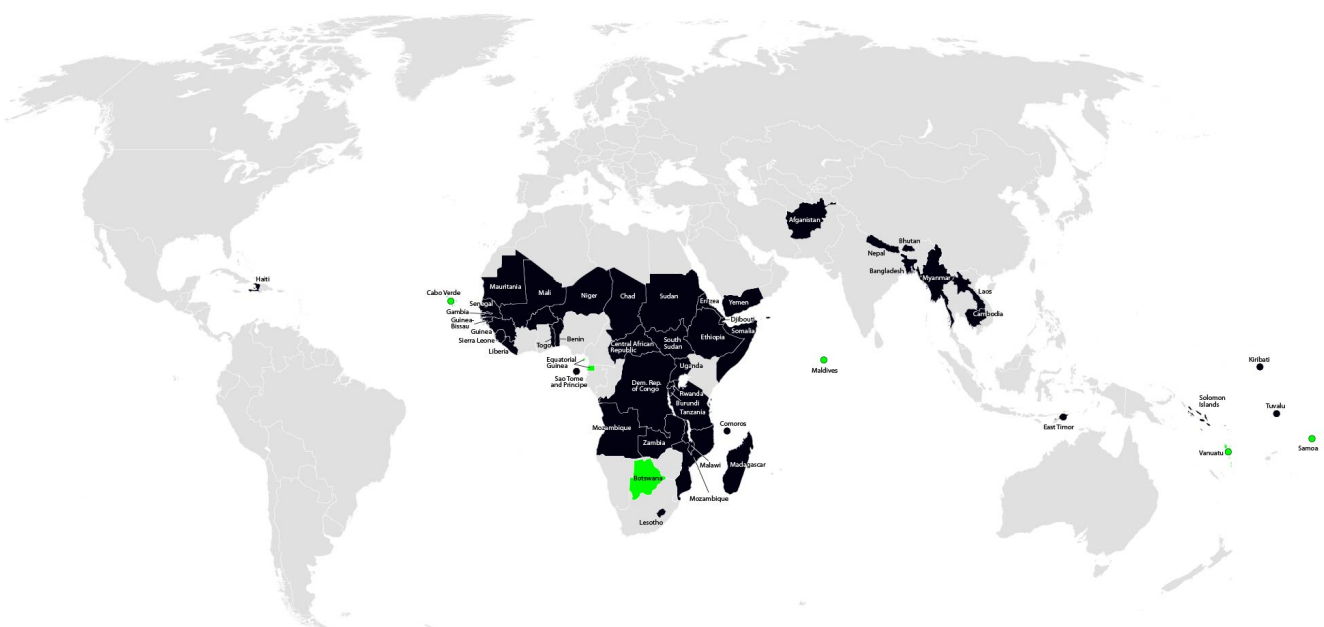


Figure 23 Least technological developed countries



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