

SwagStation0x

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Abstract

SwagStation0x is a decentralized marketplace for users to buy and sell blockchain merchandise. SwagStation0x was invented to solve a problem, users on various blockchain networks struggle to find markets which accept cryptocurrency as payment. SwagStation0x, an online store where users can buy and sell products using cryptocurrency, is the solution. As such, the SwagStation0x platform offers a place where users can transact for digital assets, digital art, technology hardware, and other blockchain products.

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Introduction

A. Commerce

Digital commerce is now the central means by which global economic systems operate. Across online networks, transacting parties are now trading various digital assets including cryptocurrencies and software code in exchange for goods and services. For example, cryptocurrency is a digital token, created with blockchain technology.ⁱ A blockchain is a cryptographically secure digital ledger that maintains a record of all transactions that occur on a network according to a programmatic protocol.ⁱⁱ These and other digital assets began evolving at increasingly rapid rates with the spawning of the Bitcoin network in the year 2008.

Created by Vitalik Buterin in the year 2013, Ethereum is the second blockchain, which uses its own cryptocurrency to reward miners called Ether.ⁱⁱⁱ The central innovation for the Ethereum network is a mechanism by which decentralized smart contracts can be executed. Moreover, Ethereum also includes a platform and protocol for application development which is becoming increasingly popular. Now, Ethereum is home to several blockchain networks. For example, District0x is a decentralized marketplace for the Ethereum network.^{iv} The District0x network hosts several Districts, which operate like digital stores for goods and services.

B. Problem

While blockchain technologies, including the Ethereum and District0x networks are making great strides in online commerce, still users on various blockchain networks struggle to find markets which accept cryptocurrency as payment. As such, many network participants spend money liquidating their crypto assets to fiat currency before making online purchases. However, this presents a problem because liquidation costs include expensive transaction fees, which reduces incentives for network participants, as well as the network's overall efficiency. Thus, there exists a need for an online marketplace friendly to blockchain based payments systems.

C. Solution

The solution is an online store where users can buy and sell products using cryptocurrency. Users of the SwagStation0x platform will be able to purchase digital assets, digital art, technology hardware and other blockchain products. Not only will SwagStation0x be a place for users to shop for blockchain goods, but it will also be act as a promotional hub for blockchain projects to gain community exposure. SwagStation0x will operate on the Ethereum network as a District within the District0x platform, leveraging the stability and existing infrastructure from both platforms to offer a safe and secure store.

I. Market

A. Overview

The global blockchain market now exceeds \$1.3 trillion. Since the year 2015, online transactions using Ethereum and Bitcoin have increased from a daily average of \$27.26 million, to a daily average of \$74.77 billion in the year 2021. Figure 1 shows the combined daily volume for transactions on the Bitcoin and Ethereum networks.

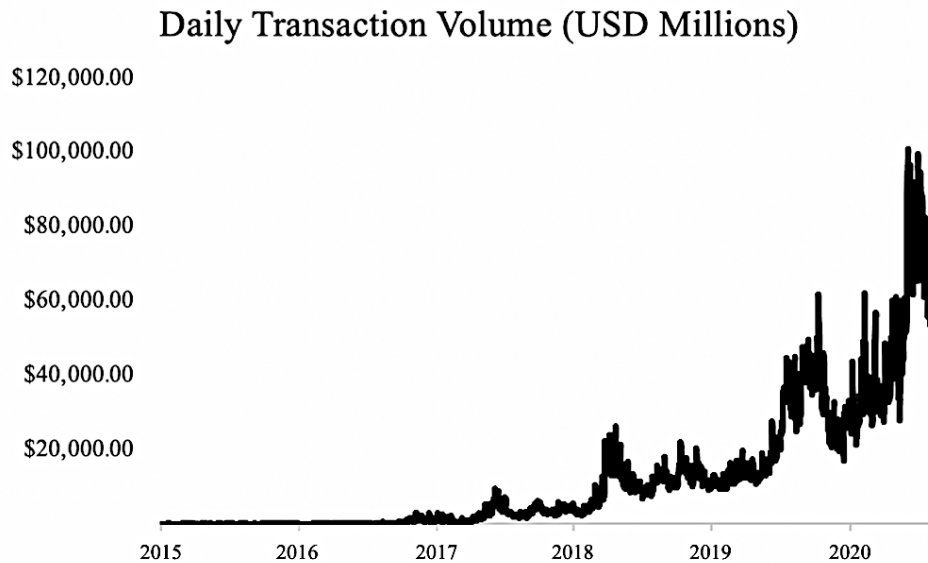


Figure 1

The market is growing fast. Large financial institutions are now publicly announcing plans to service decentralized financial transactions, including J.P. Morgan, BNY Mellon, PayPal, and Goldman Sachs. Moreover, the world's largest auto manufacturer, Tesla Motors, reported purchasing \$1.50 billion in Bitcoin to the SEC in January 2021 and now accepts Bitcoin as a form of payment for vehicles.^v

B. Decentralization

Blockchain networks are decentralized databases, maintained by distributed networks of computers. Scholars, industry leaders, and commentators rave about blockchain technology. For example, Scholar Primavera De Filippi asserts, “blockchain technology constitutes a new infrastructure for the storage of data and the management of software applications, decreasing the need for centralized middlemen.”^{vi} As an architecture, a blockchain is a distributed ledger which records transactions between parties. In other words, blockchain technology is both an infrastructure for data storage and management.^{vii}

The main innovation stemming from the District0x platform is a decentralized marketplace. SwagStation0x will utilize this marketplace as a platform where users can buy and sell decentralized goods, including technology hardware, blockchain merchandise, and digital art. By tailoring the SwagStation0x platform to the needs of the decentralized community and focusing the substantive transactions on decentralized merchandise, SwagStation0x will add value to the greater blockchain community.

C. Rewards

To incentivize early participation in online transactions, SwagStation0x will reward participants for buying and selling merchandise in its online store. The reward structure will return 5.00% to buyers on all purchases in the online store. The returns may be paid using tokens from various blockchain networks including Ethereum, District0x, and SwagStation0x.

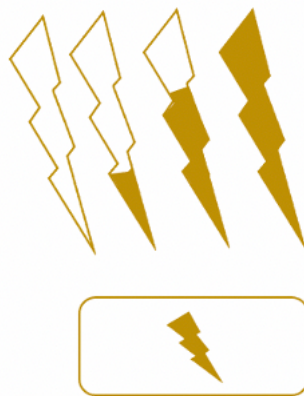


Figure 2

For example, Figure 2 includes models for a lightning reward system, where users receive lightning tokens as a reward in response to a successful transaction. The lightning rewards may simultaneously act a reputation mechanism, to assure network participants are verified. For example, if a user has a fully charged lightning symbol by their username, this may reflect repeated validation and verification by the network. The rewards structure is programmatically flexible, allowing adjustment based on network need and customer communications.

II. Protocol

A. Access

Once the user creates a profile with login information, they are then granted access to buy and post merchandise to the marketplace. Figure 3 maps the process by which new users enter the network.

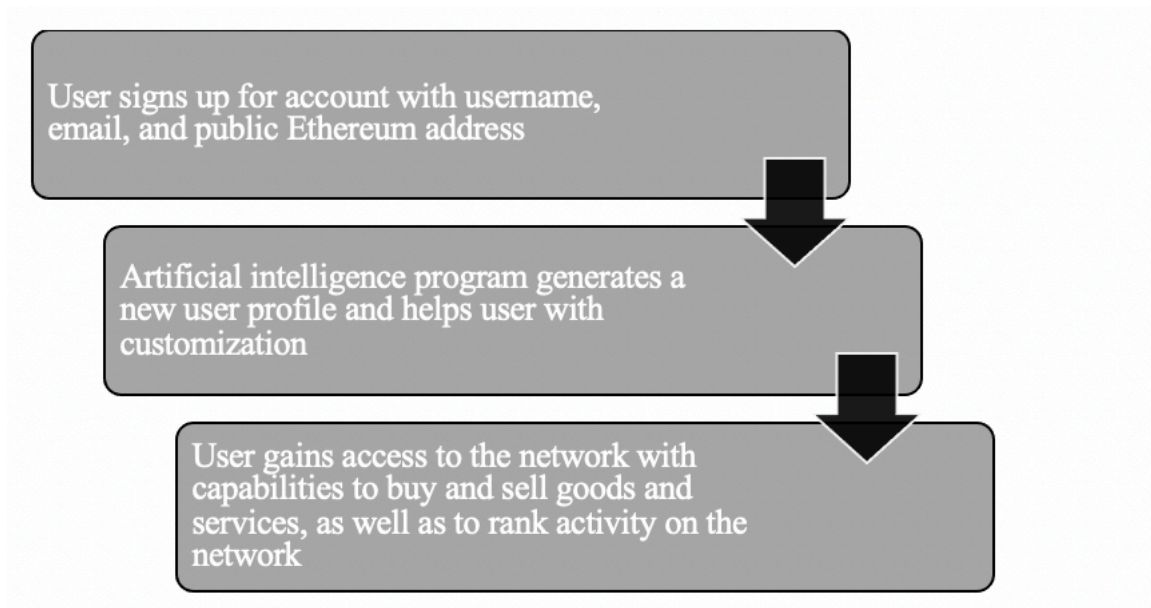


Figure 3

The process to access the network has three steps. First, the user provides basic information necessary for validating their ability to participate in the network. Next, an artificial intelligence program acts as a new user host, guiding the user through an initiation process. Third, the user gains access to the network with a defined capability and scope, including buying and selling goods through a decentralized listing web page.

B. Creation

A key feature for the SwagStation0x market is the ability for network participants to list goods for sale. An item for sale may include data about the item including the sale price, quantity available, and shipping information.

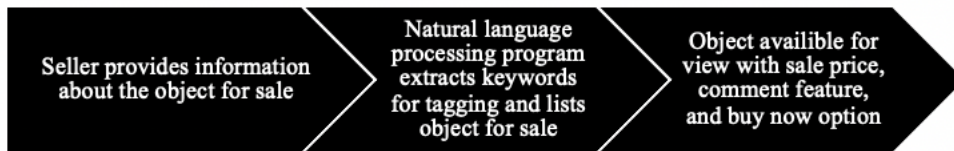


Figure 4

Figure 4 illustrates the process by which goods and services may be listed for sale in the SwagStation0x market. The creation process includes three basic steps. First, the seller provides information about the item for sale. Next, a natural language processing algorithm process the information provided by the seller. Third, the object is listed for sale in the SwagStation0x marketplace. Merchandise may be listed in the marketplace at a fixed cost until the merchandise is sold or removed by the seller.

C. Reputation

The SwagStation0x marketplace will include a system for users to provide positive or negative reviews for listed merchandise. Additionally, users can also search and filter marketplace items, rank peers, and build a reputation with their contributions to the marketplace. Figure 5 is a process by which user reputation evolves in the SwagStation0x market.

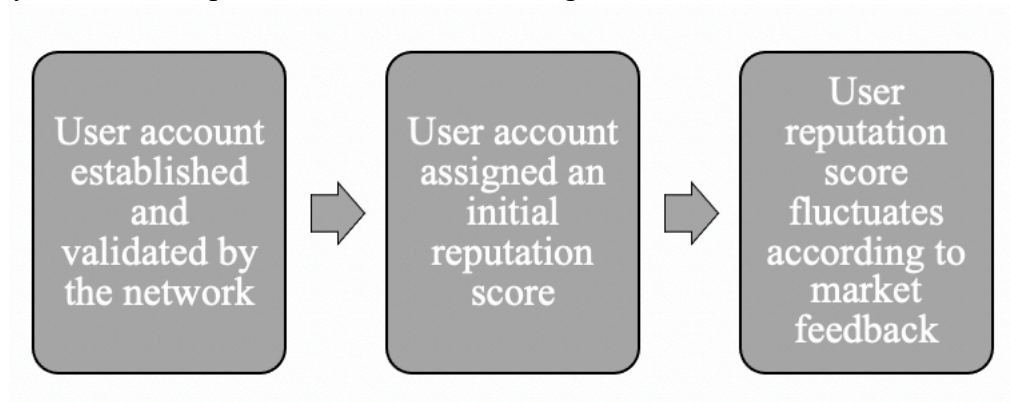


Figure 5

In addition to user feedback, reputation may also change according to a user's participation in the market. For example, a user who sells an item may receive a reputation score increase according to the sale size. Similarly, buyers may also receive a reputation score increase upon successfully purchasing an item proportional to the acquisition size. As the marketplace evolves, reputation points may also be redeemable for promotional items, advanced marketplace features, or tokenized payouts.

III. Transactions

A. Network

More generally, blockchains are decentralized databases, maintained by distributed computer networks. At core, their purpose allows for value transfer between parties.^{viii} A financial transaction communicates to a network an authorized money movement has occurred. The essential elements are a network of parties, an asset moved among those parties, and a process defining the procedures and obligations associated with the movement. In other words, transactions are data structures encoding value transfer between participants in a system.

Bitcoin is currently the largest blockchain network. Similar to Bitcoin, Ethereum trading volumes have seen significant growth in the past two years. But there are two important distinctions between the Ethereum and Bitcoin cryptocurrency: the rate and the volume of token release. Unlike Bitcoin, Ethereum releases a set rate of 15 million coins (ETH) each year and there is no cap to the total number outstanding ETH. Also, the greater Ethereum development platform provides a more scalable and liquid market.

SwagStation0x is hosted on District0x, a cooperative of decentralized marketplaces and communities operating on the Ethereum network.^{ix} If a node stakes District Network Token (DNT) to SwagStation0x or any district, the district receives governance tokens in exchange. For example, if a user stakes 1,000.00 DNT to SwagStation, SwagStation gets 1,000.00 District Voting Token (DVT). These governance tokens can be used for voting within the SwagStation0x District. Users can also unstake DNT tokens if they choose to at any point up until the district's creation and registration in a registry. In other words, the DVT obtained apply to the district in which they are staked.

The peer-to-peer network developed as a way to solve the double spending problem, where the same digital coin is spent more than once. The means by which users transact on the network is through a system of Public-Private Key Cryptography. The code for DNT smart contracts is available on the District0x GitHub, in the network token repository.^x

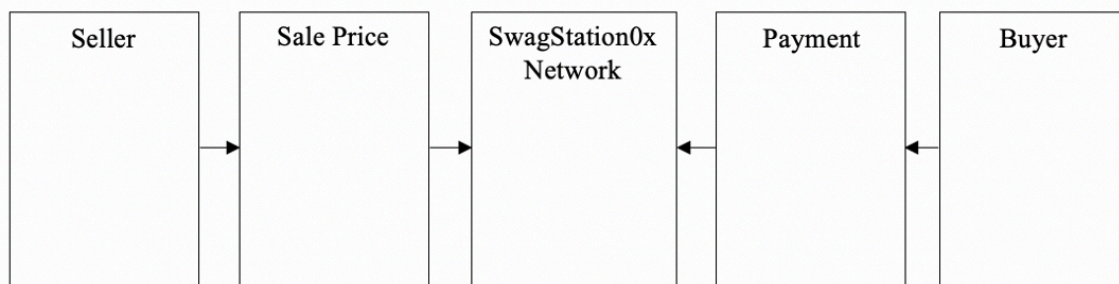


Figure 6

While costly financial institutions have policed such transactions in the past, the Ethereum blockchain supports a network of traders to perform this function itself. Thus, users on SwagStation0x can trade items, which can be purchased directly with ETH or other blockchain network tokens, like DNT.

B. Fees

One challenge for parties transacting on the Ethereum network is that transaction fees impose costs for executing smart contracts. As such, SwagStation0x is developing a payment protocol to minimize transaction fees imposed by the network. For example, the goal is to have payment options, integrating a wallet where gas fees are not an issue.

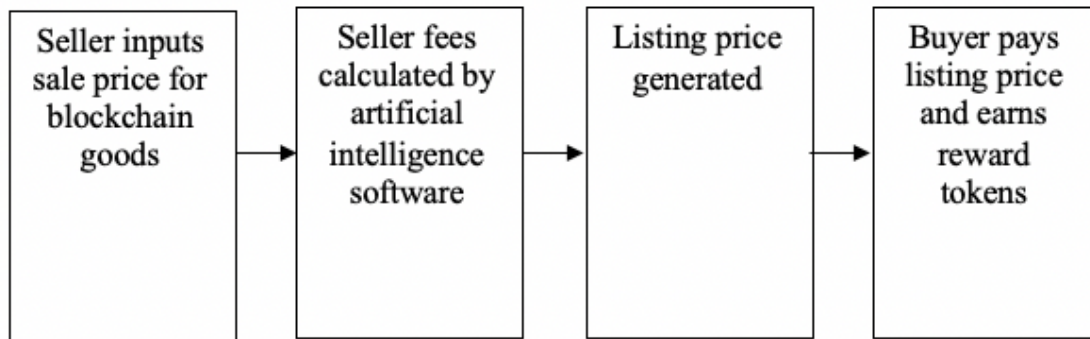


Figure 7

The idea behind network fees is they provide incentive to miners to validate the network.^{xi} One way to reduce fees is by acting as a layer-2 network for Ethereum, validating tokens with cold storage reserves. This would minimize user interaction with the layer-1 network for Ethereum. In doing so, SwagStation0x would reduce costs by minimizing Ethereum gas fees for the entire District0x network.

C. Shipping

Secure payment and shipping protocol. One of the toughest challenges for SwagStation0x will be developing a private and secure shipping and payment protocol. The shipping protocol may evolve in several ways.

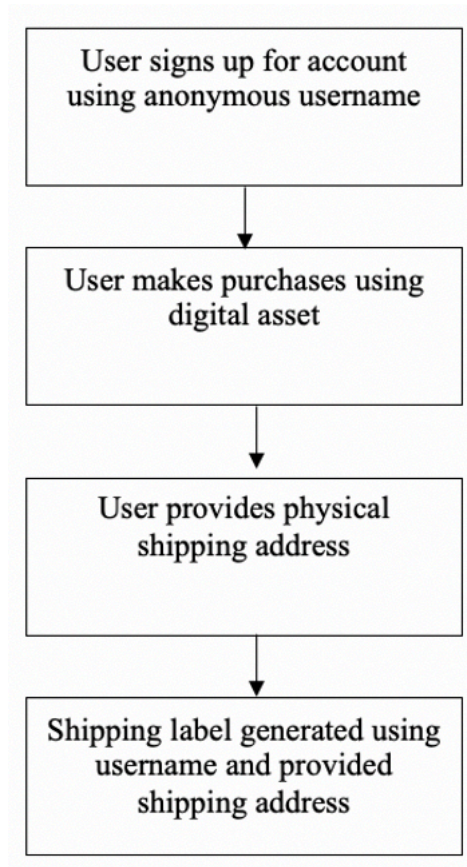


Figure 8

For example, all shipments could be made between buyer and seller, where SwagStation0x is an intermediary only for the digital transaction. Payment and method for shipment may be provided to the buyer as options before initiating the purchase by transferring funds to a public Ethereum address.

SwagStation0x will leverage automated label generating software to facilitate the transaction between buyer and seller. Once the user decides to make a purchase, they will have the option to receive shipment anonymously. In which case, a pseudonym will be generated for shipment purposes. Then, a label will be generated for shipment based on the information offered by the user in their anonymous profile information. The label will then be provided to the seller, who will ship the merchandise to the buyer. Upon receipt, the buyer will confirm satisfactory acceptance to the network and may review the seller accordingly.

IV. Security

A. Cryptography

Security is the most important feature for blockchains. In fact, if transactions are not secure, then users will not engage because the risk for loss will be too high. If information is not secure, then it can be accessed and thus taken. For example, the United States Department of Justice warns against cryptocurrency stealing as one of the main security concerns for blockchain technologies.^{xii} Ethereum complies with the federal standards published by the U.S. Department of Commerce for key pair management.^{xiii}

As such, SwagStation0x will safely build on the existing security protocol using cryptography within the Ethereum Network. Ethereum uses Public-Private Key Cryptography (PPKC), a method for authentication, relying on two codes, a private key and a public key. The methodology developed to meet the need for a secure key distribution method allowing authentication, similar to the way in which serial numbers identify paper currency. The public key is used to receive funds and the private key is used to sign transactions and spend funds. In essence, the public key is an address, and the private key is a secret password.

B. Information

Information security will be one of the most important elements for successfully scaling SwagStation0x. Indeed, if SwagStation0x experiences a security breach, or if SwagStation0x's private key is lost or destroyed, SwagStation0x may lose some or all of its cryptocurrency holdings.^{xiv} As such, information storage silo management will be critical to SwagStation0x's success.^{xv} The network will emphasize fluid information flow as a means for improving information transparency, access, and coordination within the SwagStation0x network.

The ability of distributed ledger technology (DLT) to maintain reliable and resistant records provides new ways to share information across entities such as independent auditors.^{xvi} Thus, data will be stored from all transactions on the network in a private and secure database.

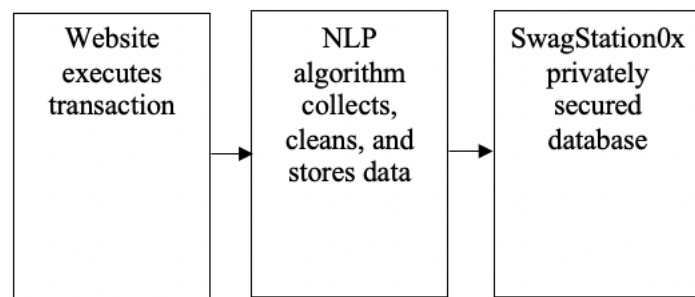


Figure 9

Moreover, SwagStation0x software is strategically developed to securely scale. To further reduce risk in information security, Swagstation0x will utilize a novel siloed storage apparatus (SSA).

The SSA is a protocol for protecting information by compartmentalizing information. As such, if a malicious attacker breaches the SwagStation0x network, they ability to move throughout the network will be limited to the silo in which the attacker gains access. Each silo will be recorded in an offline backup, in cold storage. The term cold storage refers to the storage of private keys in any fashion that is disconnected from the internet. Cold storage is the industry standard and used by Coinbase, which will become the first publicly traded cryptocurrency exchange in April 2021, and examples include offline computers, USB drives, or paper records.^{xvii}

C. Privacy

Additionally, privacy is impossible without security. The late cryptographer, Hal Finney, warned there is much protentional for fraud in digital currency.^{xviii} Across distributed ledgers, no transactions are private. Instead, all transactions are public.

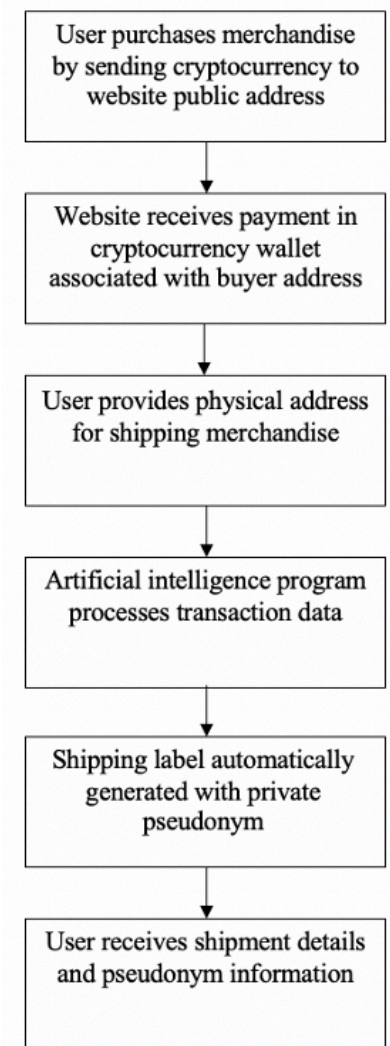


Figure 10

SwagStation0x will have an ethical obligation to safeguard user's privacy to the best of the organization's abilities.^{xix} Maintaining the balance between privacy and security is a difficult challenge. The central challenge will be storing users public Ethereum addresses and shipping information securely. An Ethereum address is an alphanumeric reference to where crypto assets can be sent or stored. Still, as SwagStation0x progresses new methods will continue evolving to preserve privacy on distributed ledgers.^{xx} For example, Zcash evolved software specifically to create a more private cryptocurrency.^{xxi}

V. Software

A. MIT License

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The MIT License grants a license to use the technology, while limiting liability for the copyright holder.^{xxii} In general, the software for SwagStation0x will be made available for open development under the MIT License. The text of the License will appear in a separate file on the SwagStation0x GitHub, as well as in the text of core scripts. At the election of SwagStation0x, certain computer code may be kept proprietary for security and privacy purposes.

B. Development

SwagStation0x maintains open software on a GitHub page, allowing developers to evolve the code base. Critically, protocol for file naming conventions must be created and adopted to support scalable software structures.

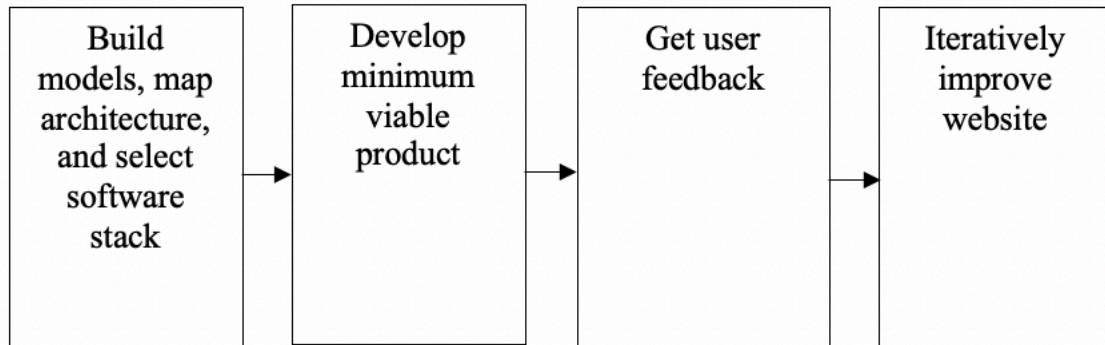


Figure 11

Additionally, development should scale using labeled folders for specific code and development projects to enable future developers with the ability to utilize and build on top of prior software infrastructure and architecture. The SwagStation0x network deploys heterogeneous programming languages according to a wide variety. However, the network focus is on five specific languages, Python, Node.js, C ++, JavaScript, and Solidity. A checklist of tasks may also be maintained by the network on GitHub, to structure development and align incentives.

C. Website

The SwagStation0x website will enable users to interact directly with the marketplace. One option for developing the landing page is using Skynet for hosting and development resources. Skynet is a decentralized hosting platform that allows users to upload files and web-apps.



Figure 12



Figure 13

Figure 12 is a demo display for a website where users can select options for exploring an online blockchain store. Figure 13 is a sample listing, where users can select a Buy Now feature to proceed to purchase blockchain items from an online store. Figure 13 also includes up vote and down vote features, to allow users to rank the listing.

Skynet's database system creates dynamic websites, permitting users to iteratively update various webpages. Hosting SwagStation0x on Skynet will enable users to have a secure way to transact with remote data storage. Skynet systems are viable and validated but may also impose costs on the network as it scales, which may also increase transaction fees. As SwagStation0x grows, additional development options may be explored, for example developing the website in JavaScript and HTML to be hosted on SwagStation0x's private servers.

Conclusion

A. Review

In sum this White Paper laid the infrastructural foundation for the SwagStation0x digital store. First, the Paper explored the market for blockchain technologies, with an emphasis on incentivizing users to transact using SwagStation0x. Next, a protocol was developed for a website with a focus on promoting user access and accountability through a reputation mechanism. Third, the transaction process was evolved and tailored toward minimizing blockchain fees and privacy. Then, security was processed with a focus on cryptography, data management, and information storage. Finally, software strategies for development and design were provided to crystalize a blue print for full stack web deployment.

B. Evolution

In sum, SwagStation0x is a decentralized marketplace for users to buy and sell blockchain merchandise. As the marketplace evolves new software systems and architectures must follow. The purpose for this White Paper is to lay the groundwork for a scalable software infrastructure to support network goals. As SwagStation0x's technology advances toward deployment, new infrastructures may be invented according to a similar design process, promoting diligent documentation for development. In other instances, there may be exceptions to this general rule, in which software documentation is developed and added to the network via GitHub directly and may be included in the text of software code itself.

C. Innovation

Great innovations are often born of focused solutions to small problems. For example, in the Bitcoin White Paper Satoshi Nakamoto presents a problem, "Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments."^{xxiii} Nakamoto's focused solution, a blockchain, has spawned a completely new economy on the internet today.^{xxiv}

As such, SwagStation0x seeks to innovate by solving a small problem, users on various blockchain networks struggle to find markets which accept cryptocurrency as payment. In turn, this problem reduces liquidity for blockchain markets as a whole, decreasing the value captured in blockchain networks. The solution to the problem is an online store where users can buy and sell products using cryptocurrency. As such, users of the SwagStation0x platform will be able to trade digital assets, digital art, technology hardware, and other blockchain products.

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