

Mintbase White Paper

Digital assets minted by you

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List of Abbreviations

<u>API</u>	Application Programming Interface
<u>CQRS</u>	Command Query Response System
<u>CCPA</u>	California Consumer Privacy Act
<u>DAI</u>	DAO Stable Coin
<u>DApp</u>	Decentralized Application
<u>ETH</u>	Ether
<u>ENS</u>	Ethereum Name Service
<u>ERC-721</u>	Ethereum Improvement Proposals 721
<u>ERC-20</u>	Ethereum Improvement Proposals 20
<u>e.g.</u>	exempli gratia
<u>GDPR</u>	General Data Protection Act
<u>GUSD</u>	Gemini United States Dollar
<u>IBC</u>	Inter-Blockchain Communication
<u>ICO</u>	Initial Coin Offering
<u>MVP</u>	Minimum Viable Product
<u>NFT (ERC-721)</u>	Non-fungible Token
<u>POA</u>	Proof of Authority (Network)
<u>TBD</u>	To Be Determined
<u>USDC</u>	USD Coin
<u>UI</u>	User Interface
<u>VR</u>	Virtual Reality

1. Summary

Digital currencies allow billions of users to take part in the financial ecosystem. As such, cryptocurrencies based on blockchain networks embrace the idea of decentralization, borderless trade and free flow of digital assets. Mintbase ties in with the idea and enables anyone to mint digital assets as **non-fungible tokens** (NFT) on the Ethereum Virtual Machine from deploying and managing their own verified [smart contracts](#). We invite our clients to personalize their tokens by means of blockchain allowing anyone to create assets that are backed by them using a simple, easy to use interface on mobile or desktop. We see the fundamental power and potential of **digital ownership** and **scarcity** provided by NFTs. Being one of the first movers to help companies to mint their own tokens for their own customized global use cases such as event tickets, rewards, and physical assets, put us and investors in a key position to experiment in multiple industries. Mintbase has a working product, with smart contract code currently being audited and an interface that users are currently testing on Ethereum testnets. The prime business model will focus on the allocation of minter's NFTs to their customers and will evolve over time by integrating various allocation mechanisms including traditional bank transactions, email signup lists, VR gaming, machine learning, and influencer pull marketing.

**Throughout this paper the nouns minter (B2B) and customer (B2C) are used. The minter is Mintbase's customer (B2B) and could be a store owner, an advertising agency, or an event creator. The minter's are Mintbase's revenue stream. The noun customer is referring to the minter's customers who will receive the minter's assets (NFT). Throughout the whitepaper, gender-specific terms may be used in order to ease the text flow. Whenever a gender-specific term is used, it should be understood as referring to all genders, unless explicitly stated.*

1.1 Mission Statement

Mintbase is a global platform that allows anyone, including those with less technical backgrounds, to create their own digital assets verified on multiple blockchains. Mintbase provides minters with various creative allocation and redemption mechanisms for their customers.

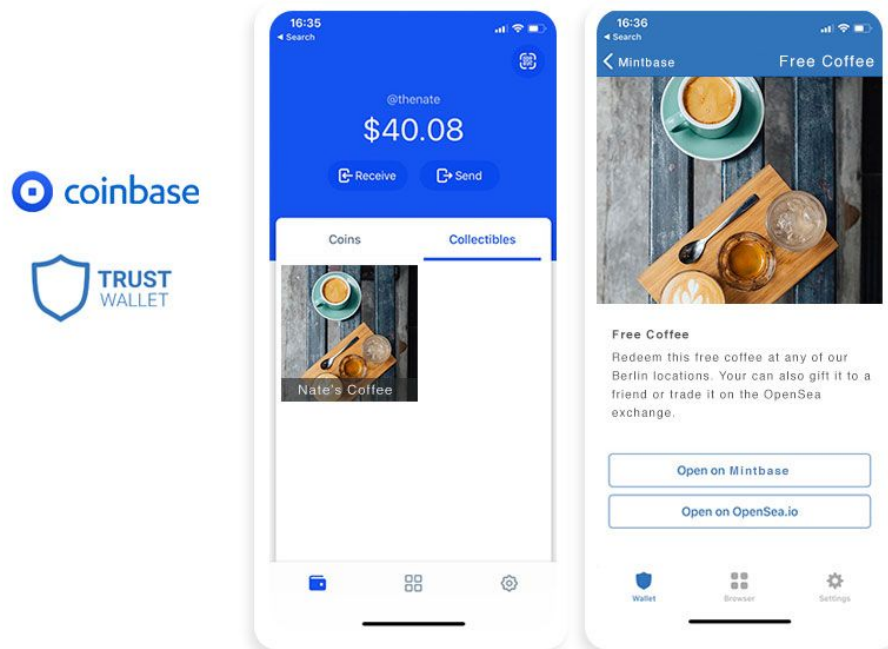
1.2 Non-Fungible Token (Digital Asset)

A [non-fungible token](#) (hereafter NFT) is a special type of cryptographic token whose individual units are essentially non-interchangeable (non-fungible) as opposed to being able to trade a dollar bill with four quarters ([fungibility](#)). Imaginatively speaking, picture a non-fungible token as being more like a title (document of ownership) to a home rather than the money you pay to own it. The most popular implementation of NFTs on a blockchain was done by [CryptoKitties](#), where each kitty is an NFT that can breed with other kitties (NFTs) and make new kitties (NFTs).

NFTs can represent something physical like a cup of coffee or something digital like airline upgrade points or intellectual property rights. NFTs provide two very important aspects: **Digital ownership and scarcity**. On the Ethereum Virtual Machine, an NFT is also referred to as an [ERC-721](#) or a collectible.

“ERC-721 defines a minimum interface a smart contract must implement to allow unique tokens to be managed, owned, and traded. It does not mandate a standard for token metadata or restrict adding supplemental functions.”

Figure 1: Mintbase NFTs



The above image of a coffee shows what an NFT would look like after being allocated from the Mintbase app to a Coinbase Wallet (right to left). These tokens are now interoperable and can be sent to any wallet or DApp that supports NFTs.

1.2.1 Digital Ownership

Each NFT represents digital ownership that can move freely throughout the Ethereum ecosystem by having a [standardized set of functions](#) such as *ownerOf*, *transferFrom*, and *balanceOf*. These functions can be called by other platforms, empowering them to interact with assets minted on Mintbase, and not need to request permission from our team or interact with our APIs to create value for their own customers. If Mintbase closed their doors tomorrow, the assets created on our platform would live as long as the Ethereum ecosystem does. This is beneficial because we can rely on other platforms and applications to help making the asset more valuable like [OpenSea](#), an NFT exchange, or cross-gaming assets that [Gods Unchanged](#) has been pioneering.

Other platforms will be able to verify the ownership of the minted asset by calling the standard function *ownerOf*. This is far more verifiable than simply creating a QR code with a binding confirmation number as

airlines do today for boarding passes. There is a case in which a girl was excited that she bought a ticket for a flight and posted her confirmation number on Twitter. Someone unknown saw her post and was able to [cancel her flight](#). With NFTs, the true ownership of the token is verified on the blockchain by over [6,400 nodes](#) (as of June 14th, 2019) on the Ethereum blockchain. Such thing could not have happened if the airline ticket would have been backed by a NFT.

1.2.2 Digital Scarcity

NFTs represent digital scarcity, which is the prime source of value of all real-world assets such as gold or shares of Apple stock. Scarcity is the basis for [zero-sum game](#) and [game theory](#). NFTs provide verifiable proof that X amount of assets exists in the entirety of the world without needing to trust a company's private algorithms. This fact will play a major factor on Mintbase's delivery mechanisms. The scarcity data will be easily viewable in the Mintbase platform, but can also be viewed on other platforms like OpenSea or an app built by the minters or even the minter's customers, again never needing permission from Mintbase to do so.

1.3 Problem

Cryptocurrencies and digital assets are beginning to radically challenge our financial ecosystem. We are seeing this growing development with the adoption of blockchain technologies from traditional institutions such as [JP Morgan's JPM Coin](#), [Facebook's new cryptocurrency](#), [Coinbases Custodial Services](#), and [Fidelity beginning trading of cryptocurrency](#). Innovative financial instruments and systems are creating new paradigms for transactions and producing alternative conduits of capital. In 2017, the market capitalization of digital currencies accelerated and grew by 3171% to 700 billion USD (source: coinmarketcap.com).

A recently conducted study by the University of Cambridge shows the following: Firstly, user adoption of various cryptocurrencies has taken off, expressed in high market capitalization and a steep rise in active wallets.

Secondly, the industry is both globalized and localized which allows borderless exchange operations to flourish. Moreover, the industry is becoming more fluid and blurred due to the rise of different cryptocurrencies which is supported by the growing ecosystem. Overall,

the rise of cryptocurrencies is creating huge and evenly distributed investment opportunities for different stakeholders all over the world.

Politically, the cryptocurrency ecosystem faces challenges. Governments and hostile regulatory institutions forced the closure of accounts and aggravated the growth of businesses built on the distributed ledger technology. One might assume that this is due to lack of tech-savviness or security concerns. Whatever the reasons may be, the blockchain community is a global and borderless one starting their operations wherever the regulatory circumstances are the most favorable. Some countries such as Singapore or Liechtenstein in Europe have passed [blockchain laws](#). Slowly, governments all over the world see the technologies' potential and there is an upward trend in adoption usage. The cryptocurrency development is expected to continue to grow, as adoption becomes increasingly mainstream.

Besides the political aspect, the industry is facing two major issues: One may be security issues as described below. Another challenge is the adaption of new applications by less tech-oriented users. Naturally, where there is a lack of knowledge, there is fear. As technology is highly complicated and (especially for non-technical users) difficult to understand, there have not been many applications that bridge the gap between technology and real-life usage. Blockchain is highly abstract and the “break-through” application has- until the development of Mintbase- not been developed yet. Mintbase aims to deploy real-life use cases and brings the technology closer to the people.

Mintbase's vision is to be a global platform which allows minters to create their own digital asset (physical or digital) and choose creative mechanisms to allocate these assets to their customers. It will allow anyone to engage in the global flow of digital assets by making it easy to use targeting users with a less technical background.

The solutions Mintbase can offer to their customers are described hereafter.

1.4 Cases

Mintbase is a platform that invites different companies from different industries to participate in the free trade of digital assets.

Nonetheless, and for the sake of focus, we will go over two use cases in popular industries, **rewards** and **ticketing**, that Mintbase can help in solving fundamental points of friction. In those two industries, we see enormous potential, but will enter with caution given blockchains current user adoption barriers and scalability limitations.

1.4.1 Reward systems

Problem

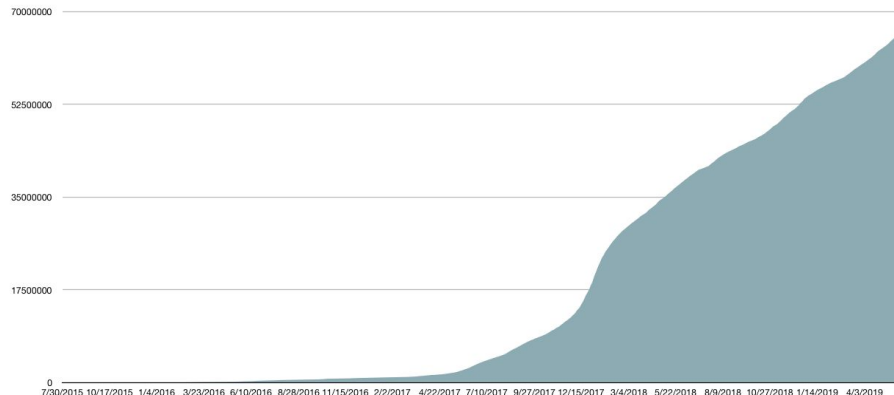
Digital assets, take for example the reward points of the [Starbucks Reward Program](#), are not able to move freely in our current financial system or internet. As it is now for a Starbucks user, he is required to download the Starbucks app when wanting to participate in loyalty reward programs. As a consequence, users who do not sign up and download the Starbucks reward app also do not participate in the program missing out on opportunities. On the other hand, Starbucks is also missing out on customer loyalty bindings. In general, companies' reward programs are flawed as consumers interact with many different brands a day. One cannot expect customers to have different mobile applications for every different brand that they shop with (e.g. Walmart, Walgreens, McDonalds REI). On top of this, small stores (e.g. small coffee shops) do not have the resources to create their own mobile application and rewards program as does a multinational organization like Starbucks.

Solution

Mintbase allows any kind of organization to create their own reward programs without investing huge resources by enabling them to create their own non-fungible tokens (NFT). These digital assets can move freely in the cryptocurrency ecosystem using only peer-to-peer verification. Thus Mintbase is solving the interoperability issue of the financial ecosystem and making it easier for companies to reward their customers. The only prerequisite is that a user has either a [Coinbase Wallet](#), [Trust Wallet](#), or any kind of wallet connected to an Ethereum node (even self-built).

We are seeing an increasing amount of active wallet addresses on the Ethereum Blockchain, and more companies like [Samsung that integrate a native ETH wallet](#). For less technical-savvy users, this will lower the barrier to entry even further. Thus, more users are becoming increasingly familiar with digital wallets.

Table 1: Unique Ethereum address growth since 2015



Source: [Data from Etherscan](#)

To make things as user-friendly as possible, we will have an easy onboarding process which will constantly be tweaked as Mintbase and our users evolve. The onboarding is a crucial process, if not one of the most important points in user adoption and A/B testing will be implemented throughout Mintbase's growth.

With Mintbase, only one app is needed to create a reward program and the customer can decide which reward assets (e.g. a cup of coffee) they want to receive. Also, a customer could easily swap his NFTs on exchanges or re-gift assets to a friend.

1.4.2 Ticketing

Problem

The worldwide revenue in the event tickets segment counts up to USD \$73,424 million in 2019 (source: [statista](#), 2019). Between 2019 and 2023, an annual growth rate of 9,4% is forecasted. The biggest players such as Ticketmaster and [Eventbrite may take](#) between 2% + \$0.79 per ticket sold or 3.5% + \$1.59 per ticket and 10% as a ticketing fee, making tickets fairly expensive.

Fraud plays a major role and is a frustrating friction point for ticketing providers and event creators. As such, tickets can be duplicated or sold at higher prices on secondary markets. On average, [12% of people attempting to buy event tickets get scammed](#), as of now verifying the authenticity and the state of the ticket is done only by consumers trust in third party platforms.

Proving ownership of tickets is also difficult as we have seen when a girl [posted her flight confirmation](#) number to Twitter had her boarding pass canceled from a random follower. In order to minimize the risks of something like this happening, many providers have to personalize their tickets requiring an exhaustive registration process requiring users to gather first, and last name, address, credit card, and security numbers. All of this data is highly personal and could easily be leaked. Personal information from sites like [Equifax gets leaked](#) on a daily basis. This also puts the event creators at risk as they are requiring their customers to trust a third party with their customers' data.

Lastly, if a person wishes to transfer the ownership of a ticket by selling, trading, gifting or wishes to cancel the ticket, this process can be cumbersome as the primary mechanism today is a lengthy customer service call or to use third parties that take exorbitant fees for handling the fraud, transfer of ownership, and allocation of funds, all of which comes pre-baked into NFTs.

Solution

Mintbase can help ticketing companies to greatly reduce the fees as we are removing credit card fees that can be as much as [3.5% + \\$0.20](#) per ticket. As of today, the average transaction cost on the Ethereum network stands around \$0.02. As a disclaimer, this can fluctuate greatly, from network clog to as high as \$4.00 as it did in July for a few weeks. If the [POA](#) or [Loom](#) layer two solutions proves viable, this transaction fee could be reduced to fractions of a penny.

Most of the other issues mentioned can be solved with NFTs verifiability of ownership and ease in transfer of ownership functions and some basic smart contract logic. It is also possible to prohibit the sale of a secondary market by allowing the minter to disable the transfer function after the initial sale. This can be handled and personalized on the Mintbase interface.

Regarding the high ticket price, Mintbase could bring the ticket cost and price down as well as providing incentive mechanisms for different

stakeholders. As such, a function could be created where ticket sales commissions are spread fairly amongst stakeholders involved in an event. For example, a promoter would want to create a concert event in London. Firstly, the promoter would need to pay the landlord rent. The landlord would take a high price as he could possibly demand. Secondly, the promoter would need to pay the artist to perform at his event. The artist, not surprisingly, would take a fee as high as he could possibly demand. The solution to lower ticket prices and in turn, selling more tickets would be the following: The promoter (minter) would give incentives by giving commission for every ticket sold to the landlord and the artist. The landlord and the artist would have an incentive to lower their demands as they would earn more, in proportion, the more tickets get sold. As it is all stored on a blockchain, there is no third party that can manipulate ticket sale numbers. In economic terms, this would be a win-win situation for all parties.

2. Revenue

Monetizing the allocation methods from minter to customer post-MVP will be the prime revenue source for Mintbase. These mechanisms will evolve as Mintbase grows using connected data sources such as bank transactions from a users' debit or credit card using the [Plaid](#) API. Some other options will include Email sign up forms, VR gaming, machine learning, and social media influencer pull marketing. The goal is to have users finding assets automatically popping up in their wallets of choice as rewards for doing everyday purchases. The minters will be prompted to pay their own transaction costs every time they create a new smart contract, mint, burn, and transfer a token directly with the Ethereum Virtual Machine (via MetaMask or Coinbase Wallet).

The intention is the adoption in the blockchain space and as more people interact with blockchains, there will be more incentives for minters to be onboarded to Mintbase. Keeping a generous free tier (blockchain-related minting costs will still apply) that allows minters to create, hold, and allocate, without Mintbase taking fees will help us to acquire less tech-savvy clients. This will also help other blockchain platforms to trust Mintbase and incentivize them to suggest Mintbase as the primary minting platform which in turn directs more users to our platform. Once a user is comfortable with Mintbase, we will charge to manage multiple smart contracts and allocations in two ways:

1. NFT Paywall Card

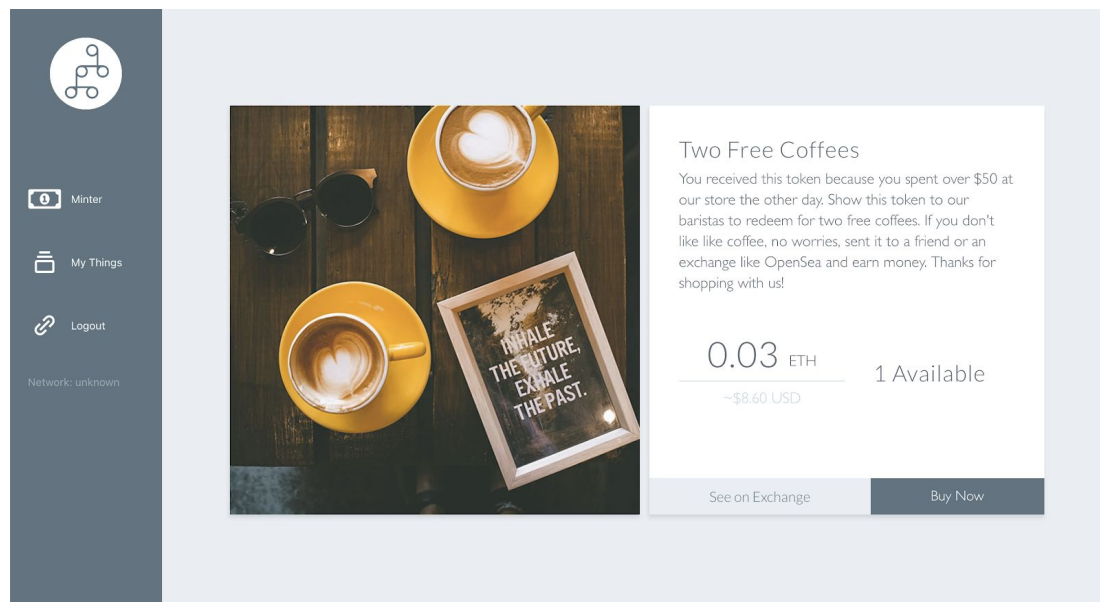
Using a NFT as a paywall card minted on Mintbase will help to show off the capability of NFTs. Minters will see that they too could implement the same method for their own sites using open source libraries built by Mintbase. This can be another stream for revenue.

- Generous Free Tier for user acquisition
- Unknown amount: Handling multiple contracts
- Unknown amount: Handling private contracts ([Github's model](#))

2. Selling Items on Mintbase: See Escrow System

Mintbase takes a yet to be determined fee per item sold from their minters. The purchase process will be a two-step process of clicking the “buy” button, which will interact with the customer’s wallet such as MetaMask, and again one more click to confirm the combined gas and cost of the item. A certain amount will feed to Mintbase’s smart contract and the remaining value will automatically appear in the wallet of the minters. (for further information, please see below: [“Escrow System”](#)).

Figure 4: Single item for sale with a public link



3. Platform Overview

Mintbase enables any company in any industry to create NFTs minted on the Ethereum Virtual Machine and the [POA Network](#), but will not be restricted to the Ethereum ecosystem in the future (for further information, please see below: [“Blockchains”](#)).

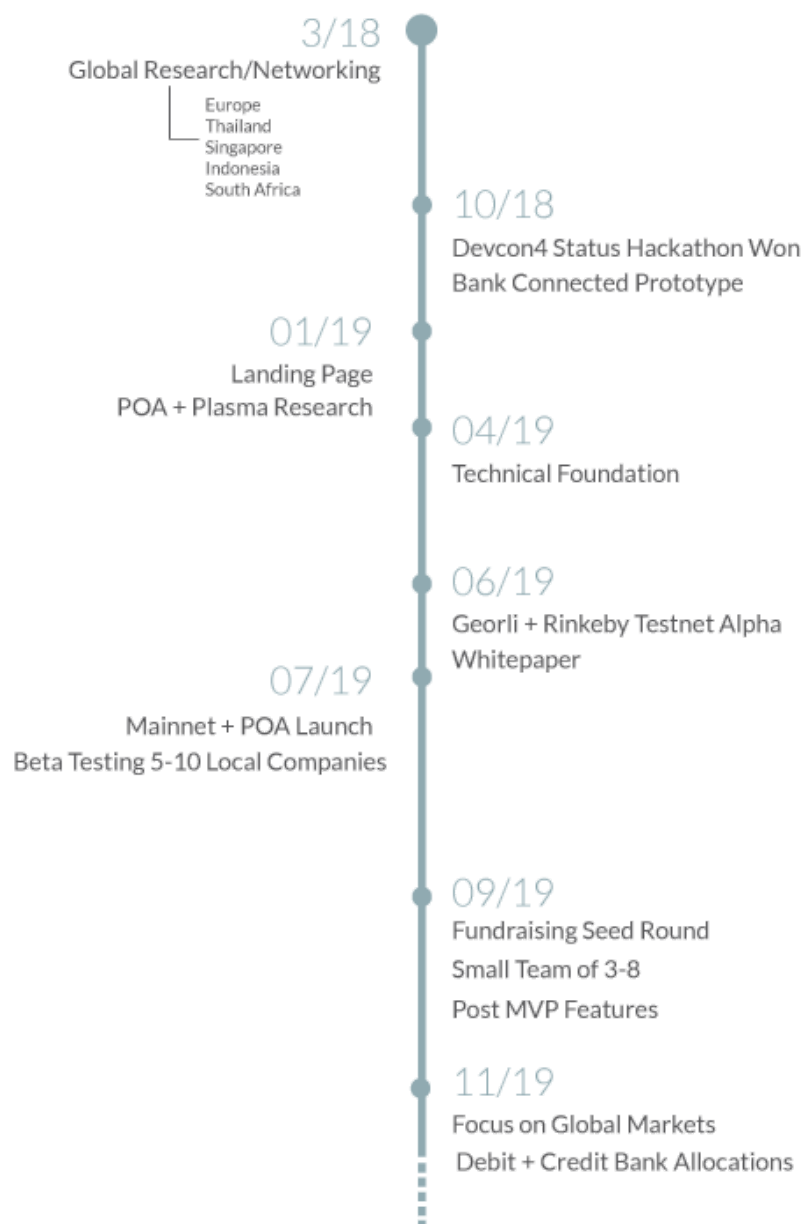
3.1 Current State of Mintbase

Mintbase has currently launched an MVP to the [Rinkeby](#) and [Görli](#) testnets and will be allowing Mainnet users in July 2019 once we launch with our first ticketing offering for an upcoming Berlin blockchain week event. We are fully aware that we can not be a one-size-fits-all digital asset solution, but at this current phase of blockchains' maturity, we are simply opening up our platform for all industries and individuals to see diverse use cases. We are conducting A/B user tests and are assessing in which markets most customers make use of our platform. Once we see practical use-cases, we will focus on these niches, and supply APIs, tools, and native apps to help that ecosystem thrive.

We have a partnership with [OpenSea](#), the main NFT exchange and an agreement to be its go-to tool for minting once Mintbase launches to Mainnet in July. The integration is now live on the Rinkeby testnet. Once a user creates a smart contract and mints a token, that token is available for purchase immediately on its exchange. Minters can also create their own storefront easily as the contract created on Mintbase is now available on the OpenSea platform.

3.2 Roadmap

Figure 2: Mintbase Roadmap



3.3 Blockchains

3.3.1 Ethereum Ecosystem

Since each company or individual will be creating its own smart contract per campaign, the network restrictions are extremely flexible. We have tested minting assets on a layer two technology called the [POA Network](#) with similar success as on the Ethereum Mainnet, but with much faster transaction times ([5 Second block times](#)). The main disadvantage we see with the POA network is that there is currently no token bridge for NFTs to be transferred to the Mainnet, which means the assets can't be transferred to exchanges like OpenSea until they support this network. This increased speed and significantly lower cost per transaction (fractions of a penny) will enable us to test our system as a ticking platform implementing a simple redeemer app for local concerts in the Berlin area as a start.

We have looked into using the Plasma Chain [Loom Network](#) as well, but the bridge for a minted NFT would take up to seven days for the asset to transfer to the Ethereum Mainnet.

3.3.2 Internet of Blockchains

The [Cosmos Network](#) looks promising with its build of the [Inter-Blockchain Communication \(IBC\) Protocol](#). Potentially, a customer could create a lower grade security blockchain with faster transaction times using the [Tendermint](#) consensus algorithm, potentially enabling customers to swap NFTs back to the Ethereum Mainnet to trade on higher volume exchanges. The [Parity](#) team is also implementing their own version of Cosmos, just swap out the term Tendermint for [Grandpa](#) and IBC for [Polkadot](#).

4. Global Target

At the core, blockchains are global asset transit systems. Without the need to interact with third parties like banks or payment rails like PayPal or Stripe or clearing firms like Apex Clearing, we see the opportunity for significant reach by directly communicating with the settlement layer. After MVP, localizing content will be front of mind as we build. Post-funding will allow us to hire translators making sure we can communicate with as many customers as we can. As Blockchain applications are purely decentralized, we will be looking to set up offices and partnerships worldwide once we have proven our concept in local markets.

4.1 Wallet Mappings

Eventually assets created on Mintbase would have wallet mappings connecting users to events and purchases, for example, one can imagine attending two blockchain conferences, say Devcon3 and Devcon4, and the ticket suddenly becomes a badge, or proof of attendance. If a Devcon5 conference promoter wanted to incentivize loyalist or simply reward its long following community, the promoter could have an automatic reduction baked into a smart contract requesting proof of ownership of said badges. Once one has proof of purchase or attendance, similar rules could apply to many other promotions and industries.

These assets created on Mintbase will have a few programmable aspects including the ability to give permission to users to spawn assets, and divy up proceeds upon a customer purchase to stakeholders. There is more information on this topic throughout the text.

5. Privacy

5.1 User Information

Mintbase complies with [GDPR](#) and [CCPA](#) and thus the “right to be forgotten” approach. A user will simply sign an [Ethereum Signature](#) before entering into Mintbase binding a hash address to our app. This helps to reduce security breaches of losing a users’ personal information and in an age where major companies are losing millions of users’ private information almost daily, we think there will be a major shift from consumers wanting to use tools that limit these leakages by never acquiring personal information in the first place. We rely on authentication through connected wallets such as MetaMask, Coinbase Wallet, and Trust Wallet. We leave it up to the users to decide what the most secure app is for them when interacting with Mintbase.

Mintbase’s customer such as a store owner or other corporate liaisons will need to connect to an Ethereum node, using a platform like [MetaMask](#), [Status.im](#), or [Coinbase Wallet browser](#). We are also doing more research on implementing the [Universal Login](#) flow.

5.2 Privacy on a Blockchain: Starks

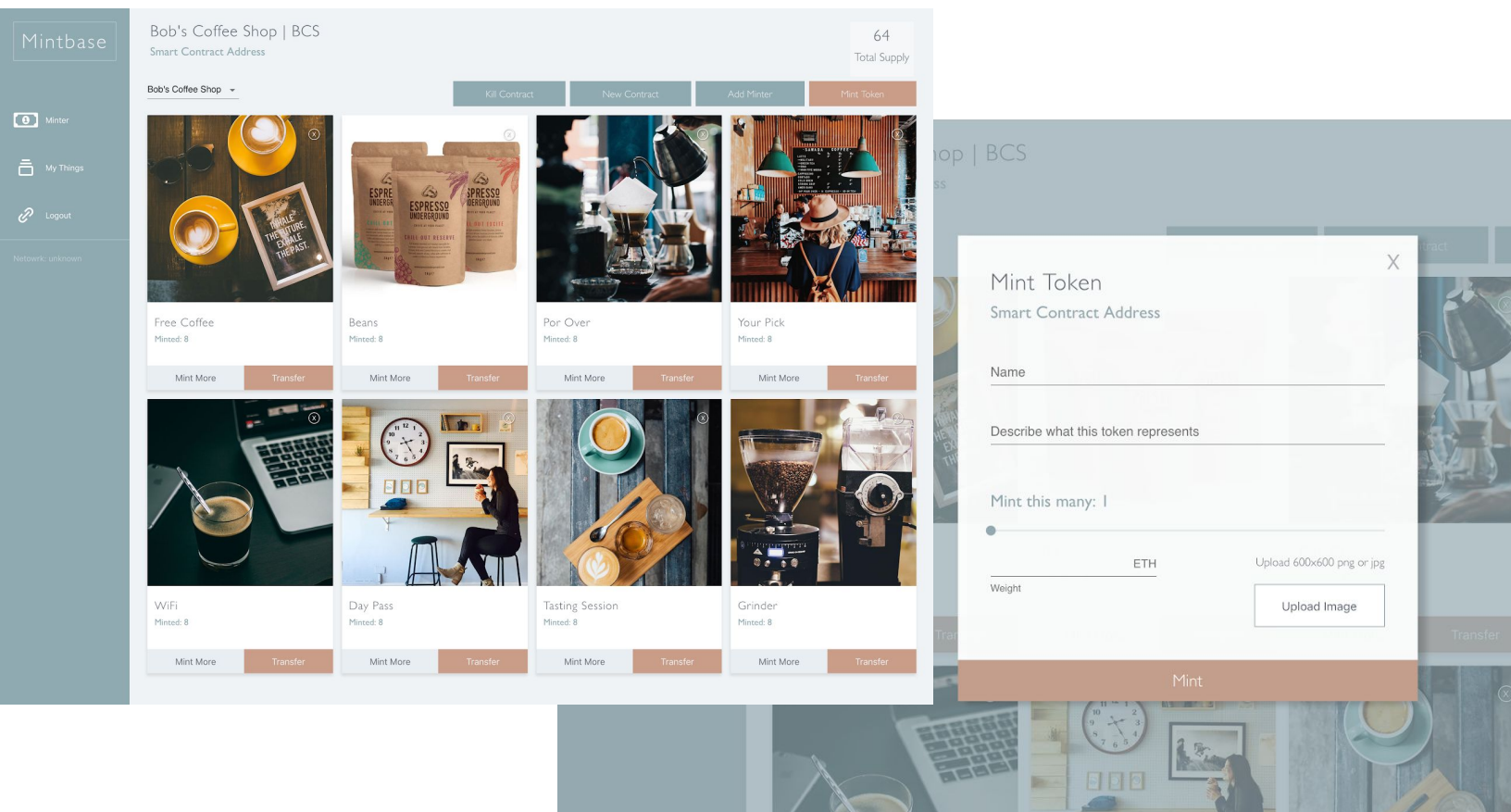
We have more research to do on the topic, but we will follow closely with the research on [Starks](#). The article talks about a boost in Transactions Per Second from 12TPS to 500TPS along with zero-knowledge proofs allowing customers to show ownership of digital tokens without revealing their transaction histories. An example of this use may be a governmental regulators that could start implementing a system of verified prescriptions using NFTs. This is an entire research study paper on itself, but for brevity, starks could solve the issue of showing that a user has a valid prescription. These prescriptions could be freely open and accessible to data scientists and trusted US regulators, but the actual ownership of individual prescriptions could remain anonymous. That said, if deemed necessary, the issuer could be a known entity to help fight over prescribing citizens helping to solve problems such as the current US [Opioid Crisis](#).

6. Minting Tool

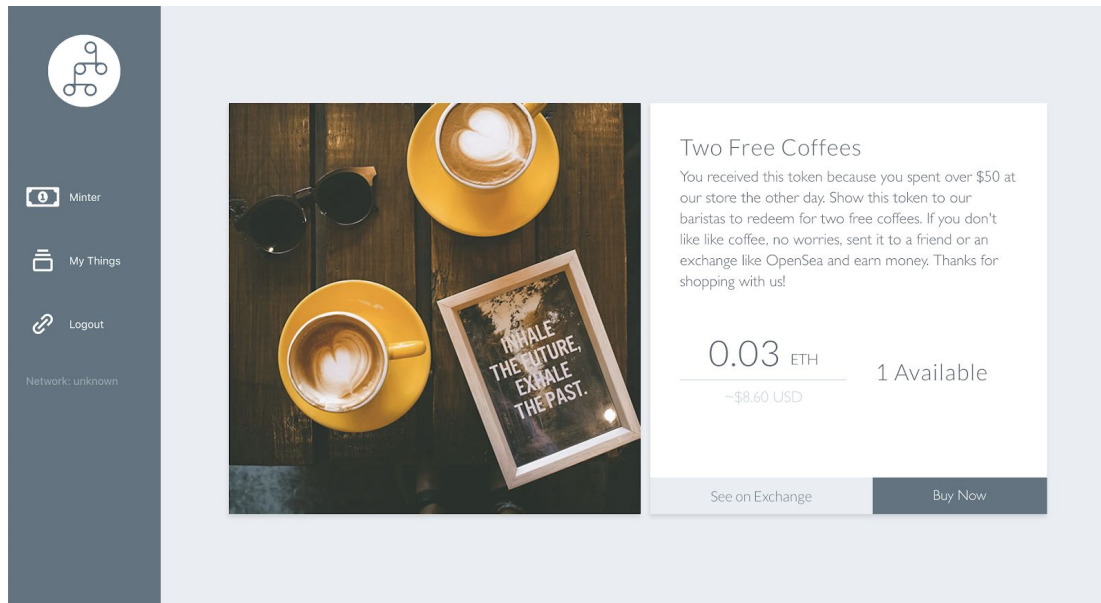
The Minting tool is an interface a company can use to create, mint, and deploy tokens managing several smart contracts as individual campaigns. On contract creation, the contract is immediately registered with the OpenSea NFT exchange and any token minted will be viewable for both the minter and the customer. The customer will be able to trade or sell their NFTs. Tokens can also be batched and all transferred to one address or to multiple addresses on one calculated gas spend request.

For simplicity, we will hide some more complicated rules, so a company owner will not get overwhelmed with options.

Figure 3: Mintbase's Minting tool



6.1 Escrow System



An escrow system is a financial arrangement where a third party holds and regulates the payment of the funds required for the two parties involved in a given transaction. When a minter enters the price when minting a token, they will have the option to set it as “*For Sale*”. If the item is up for sale, a minter can send out a link to their customers via social media or email and the group of tokens from their smart contract, for example 30 VIP tickets, could be sold immediately from a user by two clicks if the customer is connected to an Ethereum node (MetaMask, Trust, Coinbase Wallet).

A minter’s customer would click a “*Buy*” button and if the value sent to the customer’s created token stored in the smart contract matches the correct value, the asset will automatically change ownership to the buyer. A fee yet to be determined (TBD) will transfer to Mintbase and the rest of the value will be sent directly to the minter’s (original owners) address.

As a result, users will no longer need to pop in a lengthy form as you would find in normal ticketing systems such as Eventbrite. In such a system, the following data needs to be entered: First name, surname, address, card number, security number, expiration date, postal address.

With Mintbase, using the browser to purchase items only takes two clicks: One click will show the requested value and the second click will be to confirm the cost sending the value to the minter's smart contract. The only prerequisite is that the user has MetaMask or an integrated wallet like the Coinbase Wallet. Coinbase Wallet uses facial recognition to confirm the transaction which is working on our platform today.

Furthermore, companies creating the tokens will have their own smart contract, however, when a buyer purchases an asset, it will interact with our upgradeable main Mintbase smart contract developed using the [ZeppelinOS](#) kit.

The increased use of regulated stable coins such as [Dai](#), [GUSD](#), and [USDC](#) is making liquidity easier and more reliable, moreover, accepting stable top focus post MVP.

6.2 Virality

Pez Dispenser

Once an asset is minted with a price and set as *“For Sale”* or *“Give Away”* as a single (e.g. one free coffee) or a batch (e.g. thirty free coffees), a link will be generated which a minter can send out to social media, email lists, or blogs. We are calling this feature our Token Pez Dispenser. Like a Pez Dispenser we all know, this mechanism will show the total amount available, showing scarcity and pushing on a few FOMO buttons. The minter's customers can purchase these items as described in the Escrow System. Users will not need to be connected to an Ethereum node to view the item, but if they wish to buy or receive the item, they would need to connect.

The Influencer Example

Mintbase sees an opportunity in virality of being able to delegate ownership of digital assets to others to distribute even though that person might not be an employee of a company. If a company would want to spread the word about a new product or ticket to an event, the company could easily mint thirty tickets, transfer the ownership of these tickets to three influencers (10 each), empowering them to create their own creative campaign to give them away. Each could, for example, host a competition to post something unique to a comment thread accompanied by an Ethereum address winning a ticket to a big end of the year party.

6.3 Technical Infrastructure

The system as it stands today has very low technical debt from being set up with a proper foundation from the start. Mintbase's prime focus is easy on-boarding of new developers, hardware scalability using the Google Cloud ecosystem, and immediate bug feedback cycles using linters, TypeScript, and unit tests all of which has a key focus on immutability.

Mintbase is a DApp and DAO first and foremost. The platform could run on its own with or without the interface. This is why we will not charge fees for minting at the beginning. It is the allocation mechanism our customers can make use of that will largely rely on traditional infrastructures like our cloud functions and storage.

We are using a serverless compute platform, currently Google Cloud Functions (Similar to AWS Lambda), and [CQRS \[Event Sourcing\]](#) data model using the [Google Cloud Pubsub](#) technology. This allows us to onboard data scientists who could then use any language they want to interact with our data, including Python, Rust, Haskell, and latch on to specific events the system generates to create their data models.

Mintbase's code has been developed in a continuous delivery system using [CircleCi](#) integrated into [Github](#) to make sure that our master branch is always in sync with production. Before every merge, several checks need to pass including linting, unit tests, formatting, and types, limiting the number of critical bugs from being pushed to productions. We are also using the latest technology, which will be a big incentive for talented programmers to join Mintbase.

Tech Overview

Currently, all of the [Mintbase Organization](#) repositories are private, but as we start to build open APIs and small connected applications, we will push to make as much of our technology as open source as possible to help the Ethereum community not needing to “reinvent the wheel”, without giving away our core value proposition. The following is a list of some of the core technologies that we are using:

Web/Native

- [ReactJS](#)
- [React Native](#)
- [Redux](#)
- [TypeScript](#)
- [CircleCi](#)
- [Github](#)
- [Jest](#)
- [Ethers.js](#)

API Connections

- [Plaid](#)
- [SaltEdge](#)
- [OpenSea](#)

Decentralized/ Distributed

- [Truffle Suite](#)
- [Ethereum](#)
- [MetaMask](#)
- [IPFS](#)
- [ENS](#)
- [OpenZeppelin](#)
- [Solidity](#)

Traditional Cloud

- [Google Storage](#)
- [Firestore](#)
- [Cloud Functions](#)
- [Analytics](#)
- [NodeJS](#)
- [PubSub](#)

Please note: Technologies may change and this is not an exhaustive list, but currently the core of our development environment.

6.3.1 Metadata and File Storage

We see value in using a distributed storage system like [IPFS](#) and will offer this option as a secondary solution to our own cloud storage, but it will remain secondary until a few issues are sorted out. With IPFS, it could take several minutes to actually load to the global gateway which could confuse minters and customers by not being able to see their assets immediately on Mintbase. Another IPFS problem is that there is no telling whether that data will remain there if it does not get utilized or pinged enough, just how a singer’s song gets removed from the platform Napster if no one listens to it. We have also experienced heavy latency and inconsistencies directly using [Infura’s](#) gateway. We also found that using an Infura gateway URL embedded into a token is in of

itself a centralized solution as we have to rely on Infura keeping up this IPFS node.

In an already fragile ecosystem, we made the decision to remain in a heavily tested cloud infrastructure to hold the NFT metadata for our initial phase but might push to run our own IPFS peer down the road. We will also keep a close eye on other decentralized/distributed systems like [Filecoin](#), and will make the obvious switch to help us to remain as decentralized as possible when that ecosystem matures.

6.4 Token Features

6.4.1 Spawning Tokens

We also see a potential for customers to be able to spawn more assets once they receive some themselves. For example, a high fashion shop gives away a ticket to a party with a ten spawnable ticket allowance to a designated influencer who matches the company's vision. In this scenario, the influencer would then be able to mint ten more tickets and transfer them to their followers. The influencers may market the event on their channels and start creating their own competition for their followers to receive these tickets. Thus, the trickle-down effect can increase quickly. As such, we see a huge marketing potential to help brands reach out to the right target groups.

6.4.2 Self Destructing Tokens

A token can be self redeeming and burn on set conditions, for example, a transit system gives away a month pass. Once it is allocated or instantiated, the ticket can be enabled and can self burn after a month has passed. The ticket can easily be verified by transit guards either by the transit system creating its own ERC-721 verification application or by scanning the QR of the NFT that will open up a link to view the assets metadata and token state (enabled or disabled). Tokens will be automatically removed from the users' wallet after they have destructed themselves.

6.4.3 Embedded Value Tokens

Actual ERC-20 tokens with real value such as [Gemini's GUSD](#) are backed by the US dollar from a regulated New York exchange. ERC-20 tokens could be added to a smart contract and be released if the message sender shows ownership over a loaded digital asset. On the

other side, if the customer does not wish to redeem the digital assets, the owner may later retrieve the value. It is estimated that over [\\$100 billion](#) of rewards goes unclaimed every year in the US alone.

7. Rollout

Our rollout will focus on slow incremental phases, first focusing on the cryptocurrency-savvy groups like blockchain conferences, bitcoin cafés, and exchanges. We are also in talks with the Berlin music scene looking to find customers who test the ticketing concept on a few small events around town.

Mintbase has no current plan to do an ICO, however, we are looking to begin fundraising in the fall of 2019 once we have some users on-boarded into the system and have a focus set on a particular industry.

7.1 User Feedback

User feedback about buyers and sellers is an important component to maintain a community of reliable traders. Both parties have the opportunity to leave feedback and respond to it after the transaction is complete. Traders additionally may view feedback before deciding whether or not to accept incoming trades.

7.2 Community Engagement

The blockchain community is small and for Mintbase, keeping a good reputation and giving back to the community with open source code, are key components. Attending and speaking at conferences will be important for our growth.

The [Telegram Channel](#) will serve as a direct line of communication between users and staff to help us to maintain customer relations and improve on the system.

Additionally, Mintbase will engage with the minting community through its public [Twitter](#), [Slack](#), [Instagram](#), [Discord](#), [Linkedin](#) and integrated forums.

8. Transparency

Mintbase will hold monthly announcements that will detail continuous developments of the platform, earnings, and issues brought within the last announcement. These issues will include security enhancements, feature requests, design considerations, potential new partnerships and more.

9. Security

First and foremost, Mintbase is a DApp (decentralized application). We will not be storing the minters' or their customers' personal information as we use an Ethereum node to authenticate the user (MetaMask, Coinbase Wallet, Trust). Our traditional databases will hold the asset metadata and will always be open and viewable to the public, so exchanges can access the information. The only private data that might somehow be exposed to risk is an Ethereum address bound to multiple contracts users create.

85% of our smart contract code was written by the [OpenZeppelin](#) team, a highly trusted group in the blockchain community with battle-tested contract codebase, handling over \$4.5 billion worth of digital assets.

10. Legal Considerations

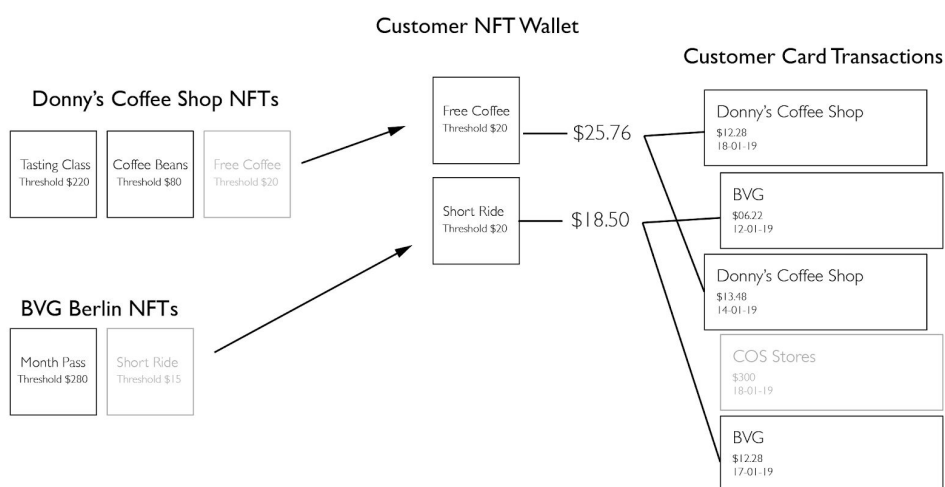
As discussed herein, decentralized markets are an area of interest for many regulators around the globe, including those within the United States. Though we feel that decentralization holds great promise, we must, and intend to, operate our business in accordance with the laws of relevant jurisdictions. As such, Mintbase may not immediately be available in certain jurisdictions.

11. Post MVP

Bank Connected NFT Allocations

The future allocation mechanism will evolve once identity becomes easier and the control of spam gets solved with user email sign up forms, but as a first implementation, we feel tying in a bank account is the very best first step.

Figure 5: Bank Connections



Mintbase currently has a sandbox account with five live bank accounts connected with [Plaid](#) that we are using for testing and our prototype. Plaid has partnerships with over [1,700 financial institutions](#) in the US and Canada and works with several fortune 500 companies including

Venmo, Coinbase, and Robinhood. They provide the interface called [Plaid Link](#) to connect users bank account [transactions](#) that we will embed in our mobile and desktop application. Plaid handles all sensitive user login credentials and error flows so that we mitigate risk by never storing such data.

On average, it takes a user 11.5 seconds for them to look up their online bank and enter their details. After a successful connection, we will hash the success token that allows us to access customers daily transactions including possible real-time webhooks for immediate feedback on a purchase.

Mintbase can tie in multiple checking and savings accounts from multiple banks, so we will be able to allocate earned assets to the same user, regardless whether they use their Chase debit card one day and then a different Bank of America Credit card the other day. These transactions will never interfere with a customers' current rewards program like frequent flier miles.

We are also looking at utilizing the [Spectre API built by SaltEdge](#) for European customers, which offers the same consumer purchasing data and login integration for a wide array of European Banks with strict GDPR Compliance.

Thanks for reading!

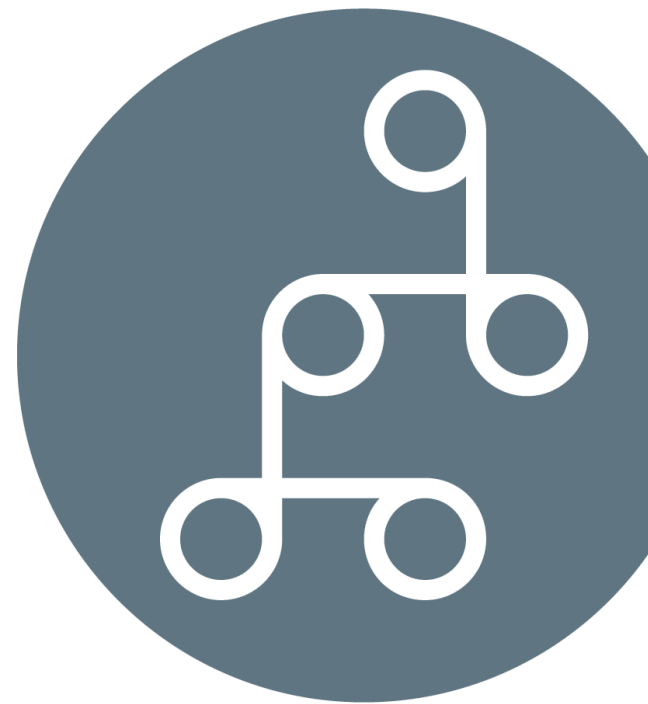
Nate Geier | CEO

Since putting everything in storage in Portland, Oregon in March of 2018, Nate has been meeting any blockchain communities he could find around the world including Lisbon, Paris, Budapest, Croatia, Bali, Sumatra, Singapore, Bangkok, Chiang Mai, Prague, Budapest, Cape Town, and now Berlin. Nate also won first prize for Marketplace at the Devcon4 Status Hackathon.

Nate worked with a clearing firm at a broker-dealer, fractionalizing publicly traded stock based on users everyday purchases with their debit or credit card. Nate also helped push Nike to rebuild its million-dollar a day application, NikeiD to React and Redux when React was still in beta.

Carolyn Wend | Director of Business Relations

Having lived and worked in Indonesia, Great Britain, Spain, and Germany, Carolyn has worked in communication and business development roles in several startups and political environments. As a research assistant at the German Parliament, she is responsible for consulting with lobbyists and publishing research papers on [Blockchain](#) and [technology](#)- related topics. She truly believes that decentralization will make the world a better place and wants to bridge the gap between technology and people.



Mintbase White Paper

Thanks for reading, we are pretty excited for what's next!

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