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Abstract

BRAVO, originally built for gratuity payments to artists and service professionals, has been operating in beta as a mobile payment platform for peer-to-peer (P2P) transactions that are seamless, secure and anonymous. To date, BRAVO has a community of tens of thousands of active users and has processed millions of dollars in fiat currency (government-backed currency; e.g. USD, Euro, Yen) transactions.

After a successful proof of concept, BRAVO began building an innovative hybrid blockchain platform with a seamless user-centric mobile user experience (UX) that supports on-demand public and private payments using BRAVO tokens (BVO).

BRAVO was built for a new generation of user that demands simplicity, privacy and anonymity. We strongly believe BVO will enhance the ability to pay securely, instantly and globally with significantly low fees. A previous version of BRAVO fiat currency is available today on Google Play and Apple AppStore.

This paper is an introduction to BRAVO, our team, story and market traction as well as our blockchain technology and private payments platform.

Keywords:
BVO = BRAVO token ticker;
BRAVO = BRAVO tip or pay, pay, blockchain;
fiat = government-backed currency, e.g. USD, Euro, Yen,
KYC/AML = know your customer and anti-money laundering

“A next generation, mainstream, anonymous mobile payments solution for day to day use to empower service professionals, artists, small merchants ... and everybody else!”
Introduction

In a society that is undoubtedly migrating towards a cashless system, it’s often difficult to tip the hard-working artist, waiter and other service industry professional or even settle a debt with friends. Nearly 10% of Americans no longer carry cash and 49% carry $20 or less on a daily basis.\(^1\) Worldwide, only 2% of adults have a mobile payment solution.\(^2\)

Unfortunately, this problem is not unique to the U.S. and in some parts of the world it’s even more frustrating given limited access to banks. When available, current solutions typically run on archaic software,\(^3\) pose high and constantly increasing fees,\(^4\) lack guarantee and trust,\(^5\) transparency,\(^7\) anonymity and are unsafe leading to personal data and history sharing.\(^8\) There are many well-founded market concerns about online and mobile lack of privacy and safety. In fact, a recent study revealed that 71% of Americans are most concerned about online privacy when they are accessing their financial data.\(^11\)

Recent data has shown that current non-blockchain payment methods lack privacy and protections for their users. Data exposed by researcher Hang Do Thi Duc confirmed the current systems’ weaknesses accessing public on-line data on 207,984,218 transactions of Venmo users (a Paypal company) identifying transactions by user, name, behavior and habits.\(^12\) What is worse, financial and non-financial companies seem to execute on this insecure behavior on purpose.\(^14\)

These shortcomings of the traditional banking system gave rise to Bitcoin and blockchain, which allow people to privately and securely transact with a currency that maintains value without a central authority controlling its supply and circulation.\(^15\)

Bitcoin, a first generation blockchain payment protocol, brought technology, transparency and trust to the online financial industry. It proved a brilliant concept and broke ground for other protocols and tokens with better technologies, rules, latency, stability, trust and applications beyond payments. Despite the fast evolution, the technology still lacks the qualities required to attract mass consumers; it has a fragmented clunky user experience, confusing onboarding, complex keys that often require a third-party custodian for safety, and lacks a human-centric design.

At BRAVO, we are solving the slow blockchain adoption paradigm with a proven human-centric user interface on a robust blockchain infrastructure.

BRAVO started in 2014 with a grassroots approach and was built from the ground up with iterative development incorporating user feedback in the software development lifecycle. This extensive research and development fast-tracked our product as we created a mobile fiat payment platform.

After a successful proof of concept where millions of dollars in fiat (USD) were processed using our iOS and Android apps, we are now launching our next generation platform powered by blockchain.
The Challenge

BRAVO solves various obstacles within the current payments market, user privacy, the blockchain and cryptocurrency methods of payment. The technology is robust but there are still significant challenges we aim to improve and solve.

Globally, we are moving to a cashless society, yet billions of people are unbanked and must rely on cash to earn a living and to pay for goods and services.

Cryptocurrency remains largely inaccessible to most people and businesses due to its complexity.

Mass adoption of existing blockchain payment platforms have been negatively affected by their design and lack of user-friendly interfaces. They have a complicated onboarding process and key management system, and fall short in terms of anonymity and security. Transaction fees can be expensive and the platforms slow due to high latency. This complex and at times clunky user experience forgoes the simplicity and strength of the blockchain technology.

Privacy and security of payments and personal data continues to worry consumers. Blockchain seems like a solution but implementation is hard and transactions potentially traceable.

On an ideal platform, the user can sign up and create an account with KYC/AML (know your customer and anti-money laundering) flawlessly in seconds. The system should be able to execute a transaction without entering long private / public keys; should be able to keep payments private, secure and anonymous directly from a mobile app decreasing risk for web hacking and phishing; and finally, should be able to keep the account encrypted and safe but never lose access and ownership to tokens.

*Our challenge was to create a trusted, easy-to-use and anonymous mobile payment platform for a new generation of users that value **privacy, security and anonymity** with a seamless user experience.*
The Solution

BRAVO is creating a blockchain-powered mobile payments platform that addresses the technological challenges with the current micropayments market while increasing its usability and adoption for both consumers and businesses.

After proven success with mobile fiat transactions, our team began developing our blockchain platform to run the BRAVO mobile payments app and support enhanced anonymity and security, improved cryptocurrency wallet sign up and onboarding process, and a simple PIN access code that improves usability. Since launching our MVP and beta version in U.S., our team focused on improving onboarding, KYC/AML compliance, data encryption, tokenization and security.

With the BRAVO app, there is no need for long public or private keys or third-party custodians of keys or funds. Users have a simple but secure password recovery protocol to ensure full control and access to their tokens and funds. BRAVO runs on a proprietary blockchain platform created by our engineering team to optimize security, integrity and functionality. We created an Incognito Payments protocol as a solution for enhanced privacy.

Users have full control of privacy, funds and payments which are executed in seconds without intermediary bank or third party blockchain platforms and no hidden fees. BRAVO is also designed to integrate with, and power other applications.19

The BRAVO blockchain is the culmination of years of research, user feedback, design and engineering. Blockchain technology will allow BRAVO to scale at a faster rate and accommodate a much larger user base. It not only enhances user anonymity and transaction transparency, but it also broadens the applicability and reach by expanding the BRAVO ecosystem globally with a single platform that is seamless and consistent.
Anonymous fiat or crypto payments seamlessly in seconds powered by a scalable hybrid blockchain.

Find users nearby with geolocation or search directly by username or private code.

Hybrid blockchain allows alternating from traditional blockchain to anonymous blockchain on-demand with Incognito payments protocol for additional security.

BVO token solution capable of any type of payment including tipping, micro-payments and macro-payments.

Funds and payments are recorded (deposited) on user’s BRAVO account immediately (low latency) after transaction. Transactions recorded on the BRAVO blockchain cannot be altered or tampered.

Simple account authentication and recovery protocol to ensure full control and access to tokens and funds 100% of the time.

Funds can be attached to a private message via our in-app messenger.

BRAVO (and BVO token) materializes a well-balanced combination of blockchain technology, user experience, and a successful business model that is ready for large-scale adoption. With the ability to process payments globally, BRAVO is well positioned to establish a cryptocurrency platform with a real use-case that truly serves the mass market.
Brief History Of BRAVO

At the end of a hiking trip in Southern Utah, the founders of BRAVO found themselves out of cash to tip and thank their hiking guide. At that moment, they came up with a simple idea to pay or get paid anonymously, respecting the privacy of both parties.

The company was founded in 2014 by TechCrunch Disrupt Battlefield Alumni, Maria Luna, MBA and Dr. Hector Rodriguez. Hector is a physician with a background in research and technology (ANN) while Maria holds a Master of Business Administration (MBA) from the University of Texas in Austin. Together, they have launched several startup businesses in technology, marketing and the medical field.

BRAVO’s minimum viable product (MVP) was built and launched at TechCrunch Disrupt San Francisco in September 2015 where it won the Audience Choice Award. Since then, BRAVO has continued to grow well beyond the test market of Arizona and has organically reached over 1,000 cities in the United States.

The BRAVO beta version was recently featured on ABC’s Shark Tank in November 2017 where BRAVO landed a deal on the show.

BRAVO’s successful beta test and deployment is due to our community integration into the feedback process and encouragement of members and users to assist in creating the optimal payment solution for everyone. The next milestone for BRAVO was to integrate these payments onto the blockchain to create a truly secure payment solution, the BVO token and ecosystem.

The BRAVO blockchain and BVO token project started in early 2017 driven by our team of engineers and will be ready for consumer use in Q2-2019.

To get a glimpse at BRAVO, and while we launch our cryptocurrency version, check out our current BRAVO fiat app and create a BRAVO account (currently available as beta in restricted markets):

1. Go to [https://trybravo.com/](https://trybravo.com/) or download the app from the Google Play for Apple App Store.
2. Create an account in seconds with your email address or social accounts.
3. Select your 4-digit pin.
Current and Potential Verticals

Conceptually, BRAVO was created as a simple tool for seamless anonymous tipping or payments to service professionals and artists without exchanging private information. However, the idea's simplicity led to other rapidly-growing verticals and is now positioned to be the platform that powers day-to-day cryptocurrency micro- and macro-payments.

BRAVO brings utility to cryptocurrency to be used as a tender for any kind of purchase. Current and other growing potential verticals include:

The Gratuity (tipping) Industry
The magnitude of the gratuity market in the U.S. is significant with reported revenues over $42.2 billion/yr. according to the U.S. Department of Labor. Millions of workers in the U.S. alone such as valet attendants, hairdressers, bartenders, baristas, bellhops and tour guides derive most of their income from gratuities, a situation also common in numerous other countries and occupations. Overall, we estimate this industry surpasses $1 trillion/yr. worldwide and these figures do not include artists.\(^{24}\)

The Entertainment Industry
BRAVO has a strong presence in the current music industry with many supporting artist around and outside U.S. and continues to expand its presence with tools tailored for the entertainment industry. BRAVO has recognized the opportunity to become a payment leader in facilitating transactions for buskers tipping, video streaming tipping, small event tickets, private concert merchandise sales, and other payment transactions related to the entertainment industry; all on your mobile device. The size of this industry is harder to measure, mostly because of the independent nature of the business. To provide a glimpse of the magnitude of this market, let’s explore the industry of watching people play video games which is quantifiable and continues on the rise. In 2017 around 666 million people around the globe tuned in to gaming video content made by fans and publishers, and that number is expected to grow to over 740 million by 2019.\(^ {25}\) According to Statista, there were nearly 22.6 million occurrences of tipping on Twitch in the first quarter of 2017. It is also noticeable that estimates of Statista, show that this monetization method has become more popular in the past years. For example, the increment of tipping instances recorded on the Streamlabs platform went from 43.6 million to 101 million between 2015 and 2017.\(^ {26}\)
Micro-Merchants Industry
In a recent report from the World Bank Group and the World Economic Forum, the value of micro-transactions processed globally is estimated at $34 trillion, of which $19 trillion are cash or check-based transactions. In U.S., the micro-merchant potential market size is estimated to be about 25 million users. Over 55% of those small businesses do not accept cards for several reasons, including cost and lack of trust creating a lost opportunity cost of $100m/yr. BRAVO’s micro-merchants include gardeners, dog walkers, babysitters, yoga teachers, makeup artists, street vendors and farmer’s market vendors amongst other users who trust the transparency, low cost, simplicity, and anonymity of the BRAVO payment solution.

Global Boundless Payments and Unbanked Population
According to the International Monetary Fund, more than two billion people worldwide are without bank accounts, including about 7% of the U.S. population. BRAVO represents a seamless local and global cross platform payment alternative to traditional banks. Our team has already designed a solution for end users to effectively utilize their funds with and without institutional banking support.

BRAVO has the potential to assist the unbanked and underbanked by allowing them to create their own financial alternatives efficiently with an immutable trusted platform. These unbanked individuals constitute a large market ready to adopt disruptive financial solutions outside of the traditional banking system. The BRAVO app provides a secure, scalable tool to serve and meet the needs of these individuals.

These are only a few of the current and potential verticals that BRAVO addresses. Whether it be helping transfer gratuity to a waiter, musician or facilitating your payment during the next sports game, BRAVO plans to aggressively pursue the position as market leader for micro- and macro- payments, globally.
BRAVO’s Competitive Advantage

BRAVO’s technology is a market pioneer for mobile anonymous, private and secure payments executed seamlessly by finding the person you want to pay nearby or via search of username or alias without exchanging personal information, just a payment.

BRAVO’s foundation and strengths are based on our ability to translate the blockchain integration into a simple user experience and our fundamental understanding of privacy and security. We rely on our community of active users, our team and innovative technology.

Unique Proposition

• First in market: First ICO with a fiat currency payments beta product already in the market with a community of tens of thousands active users.
• First hybrid blockchain mobile payments application with global reach.

Traction

• Established FinTech Company since 2014 with financial product in the market and significant traction.
• Successful beta for anonymous payments to pay or be paid amongst “strangers” without sharing personal information.
• Tens of thousands of active daily users (in test market).
• Millions of dollars in transactions processed (in test market).

Technology, User Experience and Security

• Seamless sign up, short PIN to login, no need for private/public key to pay or get paid.
• Simple and secure password recovery (prevents loss of access and funds).
• Hybrid blockchain platform facilitates anonymous, fast and inexpensive payment.
• Incognito protocol for enhanced anonymity.
• High user security with encryption and tokenization.
• Plug and Play interface to integrate with other apps.
• BRAVO is currently PCI DSS compliant (for fiat payments in US) by Security Standards Council.

BRAVO’s technology is a market pioneer for mobile private and secure payments executed seamlessly without exchanging personal information.
BRAVO BLOCKCHAIN TECHNOLOGY

Building a Better Payment System

One of the main goals of BRAVO is to make tipping and paying for goods and services easy for customers and vendors while offering unparalleled security and privacy. BRAVO already has success in local markets with their currently available BRAVO App. To expand their reach globally while still providing a cost-effective solution to payments and sending funds, BRAVO will be augmenting and evolving their existing P2P platform to include blockchain technologies to create a next generation peer-to-peer payment platform that will provide faster transfer times, lower costs and strong anonymity with incognito transactions.

To accomplish this, BRAVO will release BVO Coin with a blockchain network to support the token. Anyone can join and participate in the BRAVO Blockchain and will be able to send funds from one party to another using BVO Coin regardless of location. Transactions will complete quickly and will cost a fraction of a cent. Using a blockchain token has proven to be difficult for most people, requiring access to lengthy keys through a non-user-friendly interface. BRAVO has addressed this difficulty by integrating the BVO Coin into the BRAVO app and providing hosted wallets that allow users to easily interact with the BVO Coin. Hosted wallets allow BRAVO to make the user experience seamless and intuitive while allowing users to take control of their BVO Coins through a personal wallet. Typically, sending funds to another party via blockchain is a perilous process requiring users to know the destination wallet address, a jumble of incomprehensible numbers and letters. By integrating BRAVO Blockchain in the BRAVO app, it will be easy to find friends and vendors without the intricacies of complex keys and addresses, yet still maintain the safety of blockchain technology. Finally, current blockchain technologies make recovering a lost password near impossible with a potential risk of losing cryptocurrency and assets. BRAVO has made the process seamless with a secure and simple access code.
BRAVO Blockchain Consortium

BRAVO exists because of its users: everyday people that include your friends, neighbors, and people you pass on the street; and everyday vendors that include your taxi driver, your favorite band and your local grocer. With the incorporation of blockchain, it is only natural for BRAVO to invite its users to participate in the operation of its network to ensure smooth and secure operations while avoiding the concentration of power in the hands of a few. Collectively, users who materially participate in the operations of the BRAVO Blockchain will be known as the BRAVO Blockchain Consortium (BBC). Members of the Consortium are select merchants who provide computing resources through existing or new computing infrastructure to keep the BRAVO Blockchain running. For example, a restaurant that joins as a member can use the computers running their point-of-sale system (POS) to lend some of their computing power to the BRAVO Blockchain.

The BRAVO Blockchain network is a decentralized system that will require members of the Consortium to validate and process transactions. This differs from Proof-of-Work (PoW) blockchains like Bitcoin and Ethereum where each transaction is validated by every node on the network which results in high transaction costs and latency (i.e. slow transactions). BRAVO Blockchain uses a modified BFT consensus algorithm where members of the Consortium review transactions, allowing BRAVO to avoid the problems associated with PoW. In addition, BRAVO cannot be compromised by what is known as 51% attack since each validator is vetted and approved by BRAVO. Each member of the Consortium is, in essence, a partner of BRAVO with a vested interest in keeping the network from being compromised while benefiting by taking a portion of the transaction fees for services rendered.

Anyone can still buy and sell BVO Coin without having become a part of the Consortium. The difference is that each buy and sell transaction is verified by a trusted BRAVO partner instead of by everyone on network.
Incognito Payments™

BRAVO Blockchain will support two different ways of transferring funds: public transfers and incognito transfers. Public transfers are coin transactions that are logged and viewable on the blockchain. Like Bitcoin and Ethereum, it is possible to trace funds going from one wallet to another. For transactions that do not need anonymity and untraceability, public transfers using the BRAVO blockchain provide a fast, low-cost method of sending coins.

However, BRAVO understands that people value their privacy and wish to send funds anonymously when needed. To support this, BRAVO Blockchain will offer anonymous transfers of BVO Coin on-demand through what is known as "Incognito Transfers". This is achieved with the use of BRAVO Private Coin (BVO-P) through an algorithm that utilizes anonymizing technology, making it impossible to determine where funds came from and where they are sent to.

BVO-P will be integrated into the BRAVO mobile app and support an incognito mode for payments and transfers while still maintaining the intuitive, easy-to-use interface of a public transaction. When a user wishes to send payment anonymously, BRAVO’s incognito transfers work by performing the following steps automatically:

1. Convert sender’s BVO to BVO-P
2. Send BVO-P anonymously to receiver
3. BVO-P automatically converted to BVO and placed in receiver’s wallet

Incognito transfers require more computation resources and have higher transaction fees. Since incognito transfers are performed on-demand, users have the choice of instantly switching between the fast, low-cost public transfers and the anonymous incognito transfers.

Figure 2: Incognito payments BVO <--> BVO-P Conversion
Hybrid Blockchain

BRAVO is creating an innovative hybrid blockchain technology that consists of a public and private blockchain. The public blockchain is based on the Federated Byzantine Agreement (FBA) consensus algorithm while BRAVO’s private, Incognito blockchain is based on an anonymizing Proof-of-Stake algorithm. The BRAVO blockchain integrates these two technologies together, which allows them to interoperate seamlessly, and gives the end-users control over transaction speed, privacy and cost.

![BRAVO Hybrid blockchain protocol](image-url)
Federated Byzantine Agreement

Understanding the Federated Byzantine Agreement (FBA) consensus algorithm requires understanding its predecessor, the traditional Byzantine agreement. The Byzantine agreement ensures consensus even if you have some misbehaving members in your network. This has two advantages. First, consensus can be fast and efficient. Second, trust is entirely decoupled from resource ownership. This means that a small vendor has as much power as a wealthy, large organization which helps keep them both honest. On the downside, all parties must agree on the exact list of participants. Generally, membership in Byzantine agreement systems is set by a central authority or closed negotiation.

In practice, traditional non-federated Byzantine agreements require every node to be involved with every transaction to reach quorum. This is akin to letting every city mayor in the state know you’re about to plant a tree in your yard and getting most of them to agree to it. This is unnecessary and a waste of everyone’s time and resources. In BRAVO’s FBA system, each node can decide whom to trust and be part of their decision-making group, which we are referring to as a quorum slice. Following the earlier example, you only have to let your neighbors know (your quorum slice) that you want to plant a tree in your yard and get them to agree to it. Furthermore, the system-wide agreement is reached when overlapping quorum slices communicate the transactions. To continue with the tree planting example, after you and your neighbors agree to plant the tree in your yard, you bring it up to your local city council, who in turn legitimizes the action for the rest of the city.
**FBAS Definition**

Formally speaking, we can define a federated Byzantine agreement system (FBAS) as a pair \( \langle V, Q \rangle \) compromising a set of nodes \( V \) and a quorum \( Q : V \rightarrow 2^V \setminus \{ \emptyset \} \) specifying one or more quorum slices for each node, where a node belongs to all of its own quorum slices. Specifically,

\[
\forall v \in V \\
\forall v \in Q(v) \\
v \in q
\]

**Quorum Definition**

A set of nodes \( U \subseteq V \) in FBAS\( \langle V, Q \rangle \) is a quorum iff \( U \neq \emptyset \) and \( U \) contains a slice for each member (i.e. \( \forall v \in U, \exists q \in Q(v) \text{ such that } q \subseteq U \)).

**Incognito Blockchain and Coin™**

BRAVO’s Incognito Coin (BVO-P) is powered by the Incognito Blockchain which is based on a Proof-of-Stake algorithm. Proof-of-Stake has a number of differences and advantages over Proof-of-Work which you can see in the following table:

<table>
<thead>
<tr>
<th>Proof-of-Work</th>
<th>Proof-of-Stake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anyone can mine</td>
<td>Anyone can stake*</td>
</tr>
<tr>
<td>Computationally Expensive, Wasteful</td>
<td>Computationally inexpensive</td>
</tr>
<tr>
<td>Race to the next block</td>
<td>Earnings based on amount staked</td>
</tr>
<tr>
<td>Concentration of wealth</td>
<td>Relatively more decentralized</td>
</tr>
<tr>
<td>Vulnerable to 51% attack</td>
<td>Vulnerable to Sybil attack*</td>
</tr>
<tr>
<td>Slow and high fees</td>
<td>Fast and low fees</td>
</tr>
</tbody>
</table>
Since BVO-P is going to be used as a way to transfer funds and not used as an asset, Proof-of-Stake was chosen to support the needs of its users.

In terms of vulnerability, BRAVO’s main concern is to reduce the risk of a Sybil attack. In a Sybil attack, a malicious attacker creates multiple fake identities and get those identities accepted as peers. After they are accepted as peers, they then begin to corrupt the network and its transactions.

BRAVO will combat this by making the Incognito blockchain private and by only allowing vetted organizations to stake. The sole purpose of the BVO-P is to facilitate the private transmissions of BVO which would not require it to be public. BVO-P will not be on a public exchange, cannot be bought and cannot be speculated on. Its existence is entirely utilitarian. However, BRAVO will not wield absolute power over BVO-P since the select members who join the blockchain will aid in running the network while keeping everyone honest.

**Zerocoin Protocol**

BRAVO Incognito blockchain will anonymize transactions on the BVO-P PoS blockchain by utilizing the zerocoin protocol. The zerocoin protocol basically pools all BVO-P into predetermined denominations and sends sets of these denominations when a transfer is initiated.

For an analogy, let’s use water as a currency. Water is heavy, hard to transport and takes up space so instead of storing and transporting water on your own, you exchange your water for water tokens which have different tokens that represent cups, pints, quarts and gallons. You give 10.5 gallons of water to the water exchanger; the exchanger pours the water in a large pool and gives you newly minted tokens (2 gallon tokens and 2 quart tokens). If you want to send 2 gallons of water to a friend, you give the exchanger 2-gallon tokens and the address of the friend. The exchanger then delivers 2 gallons of water to your friend from the common pool.

**Minting & Converting**

When converting or sending BVO privately, BVO will be converted to BVO-P using the following algorithm to automatically determine the denominations used:

1. **If you have the exact amount, then start with largest possible denomination and go down until you reach the total**

2. **Otherwise: Minimize Spends**
   (a) find the next denomination higher than the spend amount (if possible) and use that if available, (b) if not available start with the larger denominations and go down until you reach an amount just over what is needed

3. **Or: Minimize Change**
   If not exact, try to find the amount above what is needed that minimizes how many coins you receive in change
Auto-Converting BVO-P

The privacy of BVO-P becomes more effective when more of each denomination is converted from many different sources. To that end, a percentage of BVO will be automatically converted to BVO-P for every wallet. This will guarantee that there will be a sizable pool of BVO-P for operations to go smoothly and to anonymize transactions.

With each incoming new block, it does the following:

1. **Check how much mintable coins are available.**
2. **Check how much BVO-P is available.**
3. **Check if the percentage is below the target percentage.**

If the percentage is below the target percentage, it:

1. **Calculates how many BVO needs to be converted to BVO-P.**
2. **Uses the next smaller denomination.**
3. **Rinse and repeats until enough BVO-P are minted.**

ICO and Redemption

Bravo will initially release an ERC-20 token for those who wish to pre-purchase BVO Coin. Those who purchase the ERC-20 tokens will benefit from reduced prices and will be able redeem their ERC-20 tokens for BVO Coin to use in the Bravo App. ERC-20 tokens that are redeemed will be taken out of circulation.
BRAVO BLOCKCHAIN COMPONENTS

Blockchain Overview

The BRAVO Blockchain will empower Consumers and Providers to send and receive cryptocurrency payments with full anonymization capacity. BRAVO will create a Blockchain API that will include User Wallets, BVO Token Reserve, Operational Wallet & Exchange, Wallet SDK, Public Transparent Blockchain, Public Anonymous Blockchain, and Validators. BRAVO will also assign Trusted Liquidity Partners who will provide “over the counter” exchanges to BRAVO users worldwide while operating to collect a small fee of each transaction exchange. Liquidity partners will be able to operate as tellers to offer cash liquidity in localized regions in exchange for the BVO Token. A proprietary API will be built for Liquidity Partners, so their operations can be managed. The API will also support third-party applications.

BVO ICO Token

The ERC protocol standard function is a technical specification on the Ethereum blockchain optimized for token transference, token balance inquiries for specific addresses and total supply of tokens. The BVO Token for the BRAVO ICO (called “BVO-ERC” token) will be based on the ERC20 protocol for its utility optimizations specific to the BRAVO ICO. The BVO-ERC protocol will reduce risk and complexity while providing uniformity and an enhanced level of liquidity for tokens.

While the protocol attributes of the BVO-ERC token are robust and ideal during BRAVO’s ICO, the high-volume demand of BRAVO’s micro-transaction economy will require a utility token protocol with decentralized control, low latency, flexible trust and asymptotic security. This next phase utility token protocol will simply be called “BVO” and will move money quickly, reliably and for a fraction of a penny. Contrary to BVO-ERC protocol, the BVO token blockchain protocol will be ideal for BRAVO’s daily load of payments and transactions and the BVO blockchain network will resolve each transaction in a few seconds (on average). BRAVO will allow BVO-ERC Token holders to exchange their purchased security tokens for BVO blockchain protocol tokens. Tokens will be deposited with minimal latency into the user’s wallet right after the purchase. Any BVO-ERC Tokens exchanged for BVO Tokens will be “burned“.
**ICO Token Smart Contracts**

BVO Token smart contracts will be tested on Testnet environments to simulate the Ethereum network and EVM to confirm contracts are functioning as expected (while bypassing the cost of gas). BRAVO will offer BVO Token purchasers a custom built portal that is private and secure and will work asynchronously with the Ethereum DApp Metamask which will allow the purchase of the BVO-ERC token. Post-ICO, all BVO Token purchases will receive the new standard of BRAVO’s BVO blockchain protocol token (not BVO-ERC).

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**BRAVO Blockchain API**

The BRAVO Blockchain API will support blockchain-specific operations including creating a BRAVO wallet for cryptocurrency, transfer of funds between wallets, retrieving the balance of wallets, and an execution method to support smart contracts. Beyond this, BRAVO will eventually offer an API and SDK to retailers and 3rd party apps to provide payment using the BRAVO token so other 3rd party companies with multi-asset wallets can add support for the BVO Token.

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**Anonymized/Incognito Blockchain Payments**

BRAVO blockchain technology will offer the capacity for anonymized payments through BRAVO’s private blockchain. Consumers will be able to pay Providers anonymously utilizing BRAVO’s private blockchain network. This network will be hosted on BRAVO’s private blockchain and approved partners can become validators. BRAVO’s anonymous blockchain payments feature zero-traceability.

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**Mobile Operator Wallets**

BRAVO mobile operators (app users) can be provisioned a BRAVO wallet to send, receive and store BVO Tokens. This wallet will support anonymous and non-anonymous payments. Private keys for each wallet are stored in a secure and private key vault with BRAVO. BRAVO will be able to deposit BVO tokens into user wallets and pull from excess cold storage if additional operational funds are ever necessary.
**BRAVO ICO WEBSITE TECHNOLOGY**

**BVO Token Website/ICO Token Purchasing Gateway**

BRAVO will be leveraging a wide arsenal of security tools and communication methods to safeguard the purchase of the ERC20-based BRAVO BVO Token during the BRAVO ICO.

<table>
<thead>
<tr>
<th>Security Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phishing Security</strong></td>
<td>After passing KYC/AML processes, approved BRAVO ICO supporters will be privately contacted. Contact will include private instructions and a secure link to purchase ERC20-based BVO Tokens. BRAVO’s proprietary token purchasing portal will bypass the risk of phishing attacks.</td>
</tr>
<tr>
<td><strong>DDOS Security</strong></td>
<td>BRAVO will maximize website uptime &amp; mitigation performance and maintain 24/7 visibility on the network with monitoring to prevent any Distributed Denial of Service (DDOS) attack and eliminate website downtime. BRAVO will overprovision bandwidth on our web servers to accommodate any sudden or unexpected surges in traffic.</td>
</tr>
<tr>
<td><strong>On-Demand Support</strong></td>
<td>In any event, BRAVO will have a global development team of veteran software engineers ready to respond immediately to any sight of website irregularities or unexpected downtimes. This development team is familiar with common and uncommon hacker tactics and will be prepared to respond if necessary.</td>
</tr>
<tr>
<td><strong>Community Security</strong></td>
<td>BRAVO’s team of internet and social media community managers will continuously change passwords for all digital accounts and make sure no password is used for more than one account/site. BRAVO will use complex and randomized passwords across all platforms along with two-factor authentication. Passwords are only shared internally on a need-to-know basis.</td>
</tr>
</tbody>
</table>
BRAVO ECOSYSTEM

The BRAVO ecosystem consists of an interaction between BVO and fiat on the same application while transacting through our native blockchain. BVO can be used to tip or pay anyone with cryptocurrency. In due course, BRAVO will offer a full suite of tools for different industries and will also allow for altcoins with fees paid in BVO (and incentivize this by making fees for other alts slightly higher).

Micro-merchant Tools and Artists

BRAVO’s blockchain stack will provide micro-merchant tools for artists, buskers, tour guides and many others to easily accept cryptocurrency and will provide the ability to issue tickets for events.

This functionality aims to introduce the power of paying in cryptocurrency to the commercial market by giving the control back to those who require it on a daily basis, while saving time, money and honoring the privacy of both parties.

Buying, Selling and Converting BVO

After the token sale is completed, BVO can be purchased with fiat, BTC, ETH and alt-coins through a number of industry-recognized partner crypto-exchanges. BVO tokens will also be available for purchase directly through the BRAVO app.

Users will be able to send BVO internally through the app to pay (or tip) for services (or goods) using their crypto holdings. Users will also be able to send their BVO tokens externally through and between exchanges.

Please note that the process of applying for various high volume exchanges is not simply paying a fee and listing the token. There is a process of auditing before joining the exchanges. BRAVO aims to complete these processes in a correct and timely manner to ensure the token is available for purchase globally.

Liquidity is King

Going forward, the cryptocurrency market will mature and BRAVO (BVO) will establish itself globally for commercial use. What drives the BVO token and ultimately the liquidity, is BRAVO’s and BVO real use-case.

BRAVO has tens of thousands of active users on its fiat platform who will have early access and migration to the BRAVO blockchain ecosystem. This will provide for immediate growth and adoption.
BRAVO’s platform and ecosystem will provide liquidity to the BVO token by allowing users to make real payments. These tokens can be used to tip, pay or get paid anywhere around the world. As our fiat base continues to see strong growth, this liquidity puts BRAVO in a strong position to integrate cryptocurrency payments and the BVO token, which will ultimately expand our reach while reducing fees for the end user.

Liquidity in the BRAVO ecosystem will be further enhanced by listing the BVO token on external exchanges.

The BRAVO platform will also allow users to exchange BVO tokens internally between users and eventually for other cryptocurrencies or fiat as many users will still require fiat for everyday transactions that BRAVO might not support.

BRAVO will mitigate risk to ensure continued value-driven liquidity on both sides of the spectrum and a consistently-available supply of the BVO to allow an ever-existing ecosystem of payments.

Token Generation Event (BRAVO Coin - BVO)

What is a BRAVO token (BVO)?
BVOs provide the ability to tip or pay and be paid with cryptocurrency in a simple and anonymous way. BRAVO tokens are designated and registered with the token market abbreviation: ‘BVO’. BVOs are divisible digital tokens with up to 8 decimal places.

**Token supply**: The total number of BVOs to be issued is 1 billion

The BRAVO token solution
Use the BVO token to tip, pay or be paid in a simple, seamless and anonymous manner. The BRAVO token solution provides the ability to create a payment focused on micro-merchants, micro-payments and tipping. In a world that is inevitably migrating towards a cashless society, the BVO token, complimented with our seamless user experience and scalable technology, is built for the day to day consumer and is ready for true global mass adoption of digital currencies.
### Whitelisting & Tokenomics: BRAVO (BVO) - ICO

<table>
<thead>
<tr>
<th>Token Name</th>
<th>BVO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Token Type</td>
<td>ERC-20</td>
</tr>
<tr>
<td>Total Token Amount</td>
<td>1,000,000,000</td>
</tr>
<tr>
<td>% of Tokens on Sale</td>
<td>50%</td>
</tr>
<tr>
<td>Token Sale Period</td>
<td>TBA</td>
</tr>
<tr>
<td>Token Price</td>
<td>$0.10</td>
</tr>
<tr>
<td>Hard Cap</td>
<td>$34,700,000</td>
</tr>
<tr>
<td>Accepted Currencies</td>
<td>ETH, BTC &amp; USD</td>
</tr>
<tr>
<td>Accepted Nationalities</td>
<td>Any except the People’s Republic of China, Singapore, USA &amp; Canada.</td>
</tr>
</tbody>
</table>
Angel Investor Sale

Up to 65% discount: If you are interested please contact us at investors@trybravo.com

<table>
<thead>
<tr>
<th>Date</th>
<th>Token</th>
<th>Discount</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>BVO</td>
<td>45%</td>
<td>$0.055</td>
</tr>
<tr>
<td>Phase 2</td>
<td>BVO</td>
<td>35%</td>
<td>$0.065</td>
</tr>
</tbody>
</table>

Target Raise: $5M - $10M

## Private Main-Sale Break

<table>
<thead>
<tr>
<th>Date</th>
<th>Token</th>
<th>Discount</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 3</td>
<td>BVO</td>
<td>5%</td>
<td>$0.095</td>
</tr>
<tr>
<td>Phase 4</td>
<td>BVO</td>
<td>0%</td>
<td>$0.10</td>
</tr>
</tbody>
</table>

Target Raise: $10M - $20M

## Distribution of BVO Tokens - Start Listing on Exchanges ##
Token Allocation

- Angel Round: 9%
- ICO Pre-Sale: 17%
- ICO Main Sale: 24%
- Bounty Blocks: 2%
- Advisors: 5%
- Team, Partnerships & Early Investors: 20%
- Promotion: 8%
- MAIN RESERVE: 15%
- Empty: 9%
- ICO Main Sale: 3%
- Legal Expenses: 3%
- Misc: 20%
- Reserve: 9%
- Software Development: 45%
- Marketing: 20%
- Reserve: 20%
- Operational Expenses: 9%
- Legal Expenses: 3%
- Misc: 3%
Summary

Our society is undoubtedly migrating towards a cashless system, but the traditional banking systems are continuously falling short while lack of security and privacy plague current alternatives. Blockchain and cryptocurrency are on the rise, however, despite the fast evolution, blockchain platforms still lack the qualities required to attract mass consumer adoption. Fragmented, “clunky” user experience and complex onboarding remain large obstacles to worldwide adoption.

At BRAVO, we are working to solve this paradigm with a proven, human-centric solution. Our user-friendly interface is built on top of a robust blockchain infrastructure, allowing users to access this technology easily and more efficiently. We are building our blockchain platform from the ground up to better support our use case and allow for a scalable, trusted and decentralized global platform with transactions occurring in milliseconds. Most of all, we are creating secure, anonymous, and incognito payments to meet growing privacy concerns.

What sets BRAVO apart is that we already have an existing product with a large community of active users. Our platform has already been tested and refined for simplicity and ease. In addition, we’ve added anonymity of payment with an innovative hybrid blockchain technology that consists of a public and private blockchain. The public blockchain is based on the FBA consensus algorithm while BRAVO’s incognito blockchain is based on an anonymizing Proof-of-Stake algorithm. The BRAVO blockchain integrates these two technologies together, which allows them to interoperate seamlessly, and gives control to the end-users on transaction speed, privacy and cost.

BRAVO (and BVO token) materializes a well-balanced combination of blockchain technology and user experience with strong emphasis on financial empowerment and privacy built on an already-existing business model that is ready for large-scale adoption.

Contributors

Maria Luna, MBA, Dr. Hector Rodriguez, Elmer Morales, Paul Nguyen, Steven Cornejo. Many thanks to Michael Lees, Dr. Jose A. Rivera, and Kellie Coppola for their invaluable input.

*We consider this a live document. Updates will be performed on an on-going basis.
Team

Maria Luna, MBA
Co-founder and CEO
Energetic serial entrepreneur with over 22 years of experience in marketing and managing consumer and healthcare brands at Nabisco and other top companies. Maria excels at lean operations and is a firm believer that blockchain and cryptocurrency will disrupt many industries as we know them. Maria brings laser focus vision, business intelligence and strong implementation skills with charismatic leadership.

Dr. Hector Rodriguez
Co-founder and COO
A doctor, researcher, software and blockchain enthusiast who started his first technological experience in ANN for prediction of cancer recurrence. Innovative entrepreneur and cryptocurrency advocate, first time bought ETH in late 2014. Hector brings strong “physician problem solving”, business skills, creativity and technology expertise to build BRAVO as a disruptive force in financial technology.

Elmer Morales
CTO
Serial entrepreneur and self-taught hacker with 17+ years of experience building innovative software and leading high-performance engineering teams at companies like Microsoft, Accenture and American Express. Elmer leads BRAVO’s blockchain initiatives.

Paul Nguyen
Blockchain Architect
Over 20+ years in software engineering leadership and CTO positions at companies like AT&T and Accenture. Led several mission critical systems including PCI-compliant payment systems, electronic financial trading systems and blockchain-based platforms. Deep expertise in Ethereum, Hyperledger and A.I.

Robert Lunny, CPA, MBA
Chief Financial Officer
Born and raised in Canada, Bob had always had an entrepreneurial spirit. After his MBA from the W.P. Carey School of Business at Arizona State University, Bob started a career in technology as CFO. He has successfully guided multiple companies to profitability and through rounds of venture capital, debt financing and private equity investments. He brings to BRAVO strong emphasis in organic growth and lean startup methodologies.
Team

Tanmay Shahane
Lead Blockchain Engineer
12+ years of experience in developing and leading cutting edge technologies and platform, worked on various domain including Health care, Finance, Non-Profits and micro economies. Blockchain like Ethereum, Hyperledger, Crypto platform engineering expertise.

Adam Swanton
Director of Client Strategy
Dynamic Business Development Strategist with over 16 years of experience in Sales and building functional teams for the Bio-Pharma and Technology sectors. Adam has a Bachelor of Science from the University of Iowa.

Vitaliy Marusenko, MSL
Community Manager
10+ years of Multimedia Experience in Education, Startups and Private Sector. Managed large teams in app, web and marketing development. Vitaliy is a crypto currency investor and hodler. He will help grow and support the BRAVO crypto community.

Steven Cornejo
Product Manager
Over 12 years of experience in business marketing, project management and product development with a passion to help entrepreneurs bring their visions to life. Steven has managed software development projects with tech companies worldwide and continues to manage the design, development and delivery of all BRAVO products including blockchain, mobile and web. Lifelong musician with a Bachelor’s Degree in Business Marketing, plays guitar for the band OddHeart and is the Creative Director of his own digital media production studio that helps artists and musicians grow their brands.

Travis Colbert
Visual Content Director
As an entrepreneur, he sustains connections with other major companies that work closely with Bravo. Bravo is shared with the world through his artistic visuals. His work has been displayed worldwide on major television networks such as MTV, Trace TV, amongst other.
Advisors

**Dean Cannell**  
*Blockchain & ICO Advisor*  
Dean is the Founder of CoinFabric.com, a full-service management consultancy for Blockchain & Blockchain-enabled companies - specialising in fundraising through ICOs. Dean has spent the last 13+ years helping traditional technology startups to go from idea to funding or acquisition. Dean’s experience includes business strategy, internal governance, technology & product positioning to enable growth.

**Lance Connolly**  
*ICO Advisor*  
Lance is an early adopter of cryptocurrency and blockchain enthusiast. Due to the combination of his previous experience in both marketing strategy and web development, he has quickly progressed in this space as an ICO advisor on several projects. Lance has experience in delivering a full stack A-Z services that assists in a successful campaign for tokenized fundraising.

**Michael Lees**  
*Marketing Advisor*  
Experienced CMO/CEO with a proven track record of bringing software solutions to market and developing profitable business for startups and public companies. Michael is a specialist on all aspects of marketing strategy and execution, inside sales leadership, European and US software sales, business development/strategic alliances, VC fundraising, financial analysis and planning as well as company formation.

**George Grellas**  
*Legal Advisor*  
For over 25 years, George has practiced business, corporate, commercial, and intellectual property law in Silicon Valley and has served as a business and corporate lawyer for a broad range of startup and business clients, from sole proprietorships to leading companies in the high tech field. He has concentrated on helping entrepreneurs, founders, executives, and the companies they own and operate, in all types of industries.

**Mital Makadia**  
*Legal Advisor*  
Mital is a corporate and securities partner at Grellas Shah. She works with companies in a range of areas, including corporate formation, private securities offerings, and merger and acquisition transactions.
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**Advisors**

**Miikka Saloseutu**

**ICO Advisor**

Miikka is a strategic marketing advisor he is also an ICO Bench ranked advisor. He is a founder of icotokennews.com and cryptocoinducjde.com websites. He is an experienced marketing professional with a demonstrated history of working in the internet industry with many challenging projects relating to Search Engine Optimization (SEO), venture capital investments, angel investments, E-commerce Optimization, Sales, Initial Coin Offerings, Crypto Currencies and Pay Per Click (PPC) marketing. He has his own internet marketing company Triplex Trading OU, which specialized in highly targeted SEO based affiliate marketing in the financial space and has grown exponentially in a last few years.

**Early Boykins III**

**ICO Advisor**

Early is an ICO investor, advisor, mentor in the blockchain space. He has 6 years of cryptocurrency experience; participating in the first ICO – Omni (formerly Mastercoin) in 2013. He is a Director at Andra Capital – a “tokenized” technology growth fund focused on late-stage investments, specifically in the Silicon Valley private technology sector. His role is guiding the ICO process for the tokenization of the fund and oversight of future investment in the blockchain space. Early advises other institutional funds, ICO projects, & security token exchanges.

**Manpreet Singh**

**ICO Advisor**

All aspects of merchant services and global payment processing. Focus is on strategy, innovation, executive leadership, operational efficiency, partner relationship building, and general management. Extensive corporate finance and accounting experience in payments, including compliance, reporting, management, and training. Strong experience in thought-leading payments innovations, financial technology, startups, and high-growth companies. Specializing in global e-commerce, multi-currency payment processing, managed-risk payment processing, SEC reporting, start-ups, international trading, and commodities.
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Any potential offerings by BRAVO will be done in offshore transactions with no directed selling efforts in the U.S. and subject to additional restrictions to ensure that BRAVO refuses to record any potential future sale of a coin not made in accordance with Regulation S and all applicable laws of the United States.
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