MINERVA (OWL) addresses mainstream cryptocurrency adoption issues with Proof-of-Transaction, a set of executing properties designed to mitigate risk and generously reward merchants who accept the OWL token as payment. MINERVA doesn’t charge transaction fees, it pays them.

Welcome to Smart Money on the Ethereum blockchain.

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This is a living document. The Minerva platform is also subject to change.
ABSTRACT
MINERVA (OWL) is a platform and cryptocurrency which provides an additional revenue stream to approved merchants accepting its token as a method of payment. We seek to demonstrate less violent short-term fluctuations through Proof-of-Transaction and introduce incentivized payment solutions to accelerate the mainstream adoption of cryptocurrency and smart contracts.

MINERVA SOLVES AN IMMEDIATE PROBLEM WITH AN IMMEDIATE USE CASE:
INTEGRATING WITH A $20 MILLION ANNUAL REVENUE PLATFORM WITH OVER 10 MILLION USERS.
INTRODUCTION
TO MINERVA

Built with smart contracts on the Ethereum blockchain, Minerva aims to incentivize approved platforms to adopt its cryptocurrency as a new payment method. Incentivization is achieved by rewarding these approved platforms with newly minted OWL tokens. These tokens are generated at a variable rate as the currency is used.

Today’s digital currencies have a serious problem. They’re rarely used as currency. The problem is compounded by excessive short-term price swings which creates substantial risk for many businesses to accept cryptocurrencies.

We envision a world where smart contracts help address the issue of excessively violent price swings, changing the way businesses approach cryptocurrency. By bridging the gap between businesses and customers, we hope to assist in bringing digital currencies mainstream.

THE OWL OF MINERVA BACKSTORY

Owls were the first widely used international coin.

These thick, heavy, silver coins minted more than 2,500 years ago were arguably the most influential of all coins. Through careful control, Owls became known due to great quality and consistent weight, resulting in merchants using them for their portability and global acceptance. They were produced for over four hundred years, and remain the most widely recognized ancient coin among the general public today.

“The owl of Minerva spreads its wings only with the falling of the dusk.”


This is widely interpreted as meaning that philosophy comes to understand a historical condition just as it passes away. Hegel’s view on freedom is an interesting one, as he was writing in the wake of the French Revolution he placed great emphasis on how human freedom can be achieved.
New cryptocurrencies are introduced almost daily and their values can grow exponentially from inception. At the same time, many are abandoned after their novelty and market “honeymoon period,” thereafter quickly falling out of meaningful use. Despite these nascent cryptocurrency market features, it is clear that several statistical properties of the cryptocurrency market have been stable for years. The number of active cryptocurrencies, the market share distribution, and the turnover of cryptocurrencies remain fairly predictable.

Adopting a mathematical perspective, we see a neutral model of the cryptocurrency economy. This enables one to glean insights based on clear empirical observations, despite the varying advantages and disadvantages of one cryptocurrency over another. We have used this research to uncover the unique properties and the important factors to understanding how cryptocurrencies provide value to both end-users and long-term token holders.

- What if Ripple provided a unique advantage to companies in industries beyond banking and other financial institutions?
- What if Bitcoin was not controlled almost exclusively by speculation?
- What if Ethereum’s mining rewards went to companies that accepted it as payment and were accrued by the platforms’ customers?
**SPECIFICATIONS**

**TECHNOLOGY**

Minerva is presently an ERC20 token and smart contract system built on the Ethereum blockchain. Following this standard, Minerva tokens are easily transferable between customers and approved merchants using ERC20-compatible wallets, and can be smoothly integrated into exchanges.

**SERVICE AND APPLICATION LAYER**

Certain OWL tokens will be held and issued to approved merchants to serve as “signing bonuses” subjected to a slow-time-release algorithm and distributed on a first-come, first-served basis at a variable percentage of the bonus vault until a point where the vault becomes nearly exhausted and a signing bonus is fiscally inconsequential.

This is in addition to bonus Minerva OWL tokens issued to approved merchants via Proof-of-Transaction at a variable rate designed to ease inflation and combat violent price swings. With this model, OWL tokens can be exchanged for services on integrated platforms and released back into the market by approved merchants, thereby creating the added monetary value. Excluding the initial token distribution event, OWL tokens cannot be generated by any other method.

This fundamental revenue-generating aspect of Minerva allows approved merchants to increase their revenue immediately upon implementation, and grants more flexibility to these merchants to reward their customers with discounts.
CRYPTOGRAPHIC AUDIT

The Minerva team commits to subjecting its platform to comprehensive security audits. We will implement multiple strategies to provide maximum transparency in our funds management. The goal is to prove the following:

1. All profits are properly recorded.
2. The company is in possession of all declared funds.

For each platform that accepts the Minerva OWL as a payment method, we will create a view-only API key which will allow anyone to verify the balance and trade history of its account. To prevent abuse, monitoring and resource tracking will limit users from the exploitation of reward rate loops.

DISTRIBUTION & SUPPLY MODEL

Minerva uses two advanced methods to increase and decrease the OWL token supply.

The first method mints new OWL tokens and inserts them into the Minerva economy when an approved merchant accepts the token as the payment method. The rate at which OWL tokens are currently entering the economy is called the “reward rate.” The reward rate is directly proportional to the price of OWL: as the price rises, the reward rate rises. The reward rate will rise until it increases the total supply enough to prevent violent short-term price swings. When the reward rate is greater than zero (0), a portion of the rewards are taxed to sustain Minerva, and another portion is sent to a smart contract to be stored for incentivizing future MVP and voting participants. The inherently inflationary reward rate used to reward approved merchants is hard capped at 10%. This hard cap means supply will not dramatically change during episodes of significant growth, enabling the market price to naturally stabilize when artificial steadying is inadequate.

The second method sterilizes OWL tokens when their price is decreasing. Instead of a negative reward rate, we enact a system which incentivizes users to temporarily take their OWL tokens out of circulation. Users will freeze their OWL tokens with our MVP contract in exchange for a potential bonus after their funds stay frozen for a certain amount of time. In any instance of price decrease, the MVP contract may be used, but the more drastic the price decrease at the time of MVP contract funding, the higher the bonus given to participants. In the event of a prolonged decline in which the MVP vault funds are exhausted, the OWL token will have to naturally regain stability as we cannot issue bonus tokens unless they exist.
EQUATION DETAILS

The equations in the next section explain the circulation of assets in the economy; we use these to adjust the reward rate in order to mitigate price volatility. Price, which is determined through a Schelling points-based voting system to be explained in granularity later in this document, will be our known variable. Using price, we can adjust the reward rate to increase the supply or, in the case where the reward rate would be negative, take actions to sterilize assets. Rewards increase exponentially as the price increases according to a largely linear model, thereby guaranteeing that the rewards will increase the supply enough to catch up to rising expected demand.

DISTRIBUTION & SUPPLY MATH MODEL

Minerva cryptocurrency circulation equation:

\[ M_t Y_t = P_t Y_t \]

Product demand equation:

\[ \frac{dY_t}{Y_t} = \beta + \gamma \left( \frac{dM_t}{M_t} - \frac{dP_t}{P_t} \right) \]

Speculative transactions velocity:

\[ V_t = 1 + k \left( \frac{M_t - B_t - P_t Y_t}{M_t} \right) \]

Minerva reward rate targeting:

\[ r = \max \left\{ 0, z \left( \frac{dM_t}{M_t} - \frac{dP_t}{P_t} \right) \right\} \]

Minerva supply:

\[ \frac{dM_t}{M_t} = Y_t [r(1 - \mu)] + W_t \]

Returns paid for those MVP tokens \( j \) being redeemed at time \( t \):

\[ W_t = \sum_j B_t R_i \]

MVP token rate targeting:

\[ R = \max \left\{ 0, -\delta \left( \frac{dM_t}{M_t} - \frac{dP_t}{P_t} \right) \right\} \]

Model variables:
- Minerva cryptocurrency supply, \( M \)
- Speculative transactions, \( V \)
- Product output / demand, \( Y \)
- Minerva price index, \( P \)
- Reward rate, \( r \)
- MVP token return rate, \( R \)
- Sum of all MVP token values \( B_t \) outstanding at time \( t \)
- Return rate for MVP token \( B_t \) established when bought, \( R_i \)

Model parameters:
- Output growth rate per period \( t \), \( \beta \)
- Elasticity of output growth to an increase in real Minerva supply, \( \gamma \)
- Elasticity of speculative transactions to Minerva excess supply, \( k \)
- Sensitivity of reward rate to real money supply, \( z \)
- Sensitivity of MVP token return rate to real Minerva supply, \( \delta \)
- Term to MVP expiration, \( T \)
- Minerva deposit insurance, \( \mu \)
MINERVA VOLATILITY PROTOCOL

The Minerva economy uses OWL tokens, an MVP contract, and Voting tokens.

Minerva is the underlying infrastructure on which its economy is based. Rewards for approved merchants are directly introduced to the economy as OWL tokens, and these OWL tokens are used for all normal transactions.

The MVP contract becomes accessible during episodes of price decrease. Its purpose is to incentivize users to temporarily take OWL tokens out of circulation in order to effectively decrease OWL supply and bring the OWL/USD price back up. When users freeze their OWL tokens, they will potentially receive a bonus in OWL tokens when their original OWL tokens are released. This varies on how low OWL/USD was at the time of MVP smart contract funding, and the amount of time their tokens were frozen.

MVP bonuses are never guaranteed without the reserves necessary to satisfy them. A tax is collected from rewards (reverse transaction fees) provided to approved merchants during times when the reward rate is positive in order to deposit into the “MVP Vault” which funds both voting and MVP participation incentives. If the vault is able to distribute enough bonuses to MVP contract participants to exhaust up to all of its current funds, no more bonuses can be given.

Voting tokens are exchanged for users “voting” on (reporting) the current OWL/USD conversion rate to a smart contract. These are necessary because votes are still required during prolonged periods of price decrease, and we therefore cannot guarantee immediate rewards since the MVP vault which holds rewards for voting can at times become exhausted.

THE VOTING SYSTEM

Voting is based on a Schelling point method inspired by Vitalik Buterin’s SchellingCoin, yet modified to be more resilient against manipulation (explained further below), in order to determine the approximate OWL/USD conversion rate. In addition to the normal transfer of OWL tokens, users will be able to use a function which allows for the transferring of tokens and voting within a single transaction. Because of this “piggybacking,” voting will require minimal gas (Ethereum transaction fee) costs. In exchange for voting, voters are provided a specific number of voting tokens correlated to their stake deposited for the vote.

Minerva employs four key methods to deter voter manipulation:

1. A deposit is required to vote; the deposit corresponds to the influence the participant’s vote has on OWL’s “contract price” and the deposit decides the reward received for voting. This deposit will be lost if the vote is found to be illegitimate.

2. A “votechain” is employed in this process. The votechain permits further judgment of the validity of past votes as new votes are input. When a participant votes on the current price, they are also asked to input the price from selected past moments. These votes are then compared against the previously cast votes and votes found to be illegitimate will lose their deposit. “Illegitimate votes” are defined as not falling between the 25th and 75th percentile—and not being reasonably close to either end—given a sufficient sample size.
The biggest reasons cryptocurrencies aren’t more widely used are: the amount of money saved by using it is often less than the costs of using it, and the price of cryptocurrencies often change dramatically over short periods of time, making it difficult for both buyers and sellers to feel comfortable using them.

Minerva’s OWL token is preferable to fiat currency for users because of the incentives approved merchants will be provided based on the rewards system. Approved merchants, or approved sellers, receive rewards when OWL is used. We think these merchants will want to take full advantage of this extra revenue by offering their customers discounts, freebies and exclusive content for paying with OWL.

Why would people spend OWL instead of fiat currency or other cryptocurrencies?

The reward rate doesn’t have to hit zero. If the OWL token’s market price is rising for any reason, the reward rate will not be zero. Since supply rising decreases the price of the OWL token, we can increase supply as the price increases in order to decrease the price and prevent short-term violent rises and decreases in price. We will be able to use various methods to decrease the amount of OWL tokens in circulation, one notable method being the MVP (Minerva Volatility Protocol) system described in the “Distribution & Supply Model” section of this document.

If the economy is ever-expanding we can keep reward rates forever, but if the reward rate does hit zero it is a good thing. It would likely imply that OWL tokens are very widely used, and at that point, if the OWL stays stable for a long time, we could abolish reward rates altogether. It is important to remember that bonus OWL tokens will never be issued to approved merchants unless the bonuses can be accounted for.
INTEGRATION

PLATFORM INCENTIVES

Minerva provides a generous reward system for businesses that accept it as payment. Upon receiving Minerva OWL tokens, each business is issued a bonus that resembles a credit card’s “cash back” incentive. When Minerva OWL tokens are received from their customers, they are automatically liquidated.

1. **Instant liquidity via API from Minerva-relevant trading exchanges**
2. **The elimination of chargebacks and exchange fees**
3. **Additional protection from violent short-term price fluctuation**
4. **Reverse transaction fees. We pay them, not the other way around**

RISK MITIGATION

The founder of Ethereum, Vitalik Buterin, has said, “There would then be multiple separate classes of cryptoassets: stable assets for trading, speculative assets for investment, and Bitcoin itself may well serve as a unique Schelling point for a universal fallback asset, similar to the current and historical functioning of gold.” While Bitcoin itself is not the unique Schelling point, our aim is for OWL to become a comparatively stable cryptocurrency which allows businesses to benefit by simply accepting it as a method of payment.

The reward system is designed so OWL tokens enter the economy at variable rates, making efforts to ensure that demand does not cause short-term violent price swings. As is evident below with our first and immediate use case, we will be integrating with a large company at launch, and future businesses requesting integration will require vetting through a rigorous security-focused protocol.

Speculation, exchange scams, drug markets and the common negative publicity of cryptocurrencies will all have little-to-no impact on our partnered platforms. Minerva tokens have utility beyond speculative value as they represent an applicable purpose of value between platforms and customers, as well as agents, contractors, vendors, content creators and more.

USER BENEFITS

When customers pay using Minerva’s OWL token, approved merchants have more flexibility to offer them discounts. This is because, rather than paying transaction fees, Approved merchants can be paid bonus OWL tokens at the time of each approved transaction. Users are able to purchase OWL tokens from any exchange or market where they are traded, transfer them to one of many ERC20-compatible wallets and spend them on Minerva-integrated platforms.
IMMEDIATE USE CASE

The first business to integrate into the Minerva economy is a live-streaming service with $20MM in revenue and over 10 million users. We will show a clean and concise before-and-after revenue impact of integrating with Minerva. At this time, Minerva has been advised to temporarily withhold the name of our first partnered business. We aim to integrate across a wide spectrum of large niche and mainstream businesses spanning several industries by recruiting platforms into the Minerva Smart Money Alliance (MSMA).

Minerva will allow content creators to receive payments and exchange funds indiscriminately while enabling the business to provide more value to both customers and content creators alike.

MINERVA SMART MONEY ALLIANCE (MSMA)

The Minerva Smart Money Alliance (MSMA) is a proposed consortium of organizations that either accept the OWL token as payment or are strategically partnered with Minerva Technologies S.a.r.l., a Luxembourg-based blockchain software company and parent entity to the Minerva platform. We plan to work with various groups and individuals to optimize value exchange and the secure storage and transmission of sensitive data.
BASIC INFORMATION

Early adopter participation takes place through a crowdsale dashboard accessible via Minerva.com. 60,000,000 of roughly 100,000,000 total initial OWL tokens will be distributed in two crowdsales. A private presale followed by a primary crowdsale. 40,000,000 Minerva will be excluded from the crowdsales which is described below in the “OWL RESERVE” section. After the initial 100,000,000 OWL tokens are created, new token creation, apart from bonuses associated with platform utility, will be halted permanently. Within 1 year (365 days) of the crowdsales an announcement will be made regarding any potential 1:1 token exchanges relating to any proposed private blockchain migrations. Such an announcement would be made via mailing list and confirmed on the minerva.com website and across all official social media channels. All OWL token transfers may be restricted for unspecified amount of time no shorter than 1 week (7 days) and no longer than 1 year (365 days) after the completion of the crowdsale.

PRE-SALE

We will be holding a token presale which will likely be held privately for accredited parties.

PRIMARY FINAL CROWDSALE

After the token presale, the primary and final crowdsale will take place.

RESERVE OWL

At the end of the crowdsales the founding team will receive a 20% allocation of OWL tokens, subject to a twelve-month (12-month) holding period. These tokens will serve as a long-term performance incentive for management and the founding team. An additional 7% will be allocated to strategic advisors, 5% for long-term operational costs, 5% partnership signing bonuses (new approved merchants), 2% for a bug bounty and 1% for a promotional bounty.
CALLING ALL HACKERS!

MINERVA BUG BOUNTY

INTRODUCING MINERVA’S AGGRESSIVE BUG BOUNTY PROGRAM

In line with our security-forward approach, we are issuing an open letter to all hackers. We do not care if you are a ruthless blackhat behind seven (7) proxies, an ethical whitehat who follows the rules, or anything in between. We do not care if you are the evil hacker who drained $30M from an ICO contract running Parity or a stand-up guy who teaches the elderly how to use anti-virus software and ad-blockers. If there are critical security vulnerabilities present in Minerva, and you find them, you will be significantly rewarded with Minerva. The tech world, and the world itself, would not look the way it does today without hackers.

SOCIAL ENGINEERING AND PHISHING

This counts. We are not quite sure why this is not included in many bug bounties. Human error is a massive security issue. As a hypothetical target, if you are able to socially engineer our web host and/or data center and gain access to critically sensitive information we would, in this case, be switching web hosts and/or data centers and paying you for your efforts. However, if such actions violated the TOS (terms of service) of a hypothetical target, due to the potential negative legal consequences of this Minerva and its parent entity would both discourage these actions and waive all legal liability involving such an incident.
Bounties will be awarded from the roughly 2,000,000 (2% equivalent) reserved token vault set aside for this bug bounty program. This vault will be used to issue bounties to qualifying hackers and will be subjected to a slow-time-release algorithm and distributed on a first-come, first-served basis at a rate of 1% of the reserved pot for critical vulnerabilities, and at a rate of 0.1% for not-so-critical vulnerabilities until a point where the pot becomes nearly exhausted and a 0.1% to 1% bounty is fiscally inconsequential. At such a point, the Minerva parent entity would compensate you for your efforts.

### Critical Security Vulnerabilities - Smart Contracts

- **Vault contract error**: exploit in the MVP/voting vault which may result in significant loss of funds
- **Voting contract error**: direct exploit in voting vault that results in significant loss of funds
- **Voting Token ERC20 error**: any error critical to the operation of the token
- **MVP ERC20 error**: any error critical to the operation of the token
- **Minerva OWL ERC20 error**: any error critical to the operation of the token

### Critical Security Vulnerabilities - Minerva.com

- Anything resulting in significant financial loss in excess of $100K (100 thousand)

### Not-So-Critical Security Vulnerabilities

- Creative DDOS attack vectors
- Creative spamming attacks
- **Solidity**: accidental function failure affecting the sender
  - (not checking a send to make sure it completed, etc.)
- Solidity: race conditions depending on severity

### Not Vulnerabilities

- Targeted attacks on Minerva team members
  - Self-XSS
  - Logout CSRF
- XSS/CSRF/Clickjacking without significant privilege escalation
- Rate-limiting issues
- Lack of password length restrictions
- Vulnerabilities unrelated to Minerva exploitation on 3rd party platforms
- Vulnerabilities which involve privileged access to a victim’s device(s)
- User existence/ enumeration vulnerabilities
- Reports from automated tools or scans unaccompanied by an explanation of a legitimate vector
- Email mutations (+, ., etc.) to create multiple accounts for a single email

### IN-SCOPE

Minerva smart contracts / Minerva.com / Crowdsale.Minerva.com / Private Blockchain / Minerva Software

### BOUNTY AWARD PROCESS

Bounties will be awarded from the roughly 2,000,000 (2% equivalent) reserved token vault set aside for this bug bounty program. This vault will be used to issue bounties to qualifying hackers and will be subjected to a slow-time-release algorithm and distributed on a first-come, first-served basis at a rate of 1% of the reserved pot for critical vulnerabilities, and at a rate of 0.1% for not-so-critical vulnerabilities until a point where the pot becomes nearly exhausted and a 0.1% to 1% bounty is fiscally inconsequential. At such a point, the Minerva parent entity would compensate you for your efforts.
**ROADMAP**

**FUNDING BREAKDOWN**

- **$1,000,000**
  - Advanced Internal Security Audit
  - Bug Bounty Program (Tier 1)
  - Advanced Simulations and Modifications
  - MVP (Minerva Volatility Protocol) Beta

- **$10,000,000**
  - Minerva Smart Money Alliance (Tier-2)
  - Team Expansion (Tier-2)
  - Advanced Platform Automation
  - Advanced Revenue Reporting Interface
  - Resource Tracking
  - Continuous Audit Implementation
  - Cross Platform Minerva, Ethereum & General Purpose ERC20 Wallet

- **$20,000,000**
  - Minerva Smart Money Alliance (Final Tier)
  - Team Expansion (Tier-5)
  - Private Blockchain Research

- **$5,000,000**
  - Minerva Smart Money Alliance (Tier-1)
  - Team Expansion (Tier-1)
  - Bug Bounty Program (Tier-2)
  - Cross Platform Minerva Wallet
  - Voting Dashboard
  - MVP Dashboard and Management
  - Platform Integration Automation
  - New Platform Developer Documentation
  - Improved Revenue Reporting Interface

- **$15,000,000**
  - Minerva Smart Money Alliance (Tier-3)
  - Team Expansion (Tier-4)
  - Private Blockchain Research
  - Debit Card Partnership(s) Research
  - Market Research Stability Advancements

- **$35,000,000**
  - Team Expansion (Final Tier)
  - Private Blockchain Test Network
  - Bug Bounty Program (Final Tier)

**FUNDED INTERNALLY**

- Base Platform Development
- Internal Market Simulations
- Integration Testing / Compliance
- Content Translation
- Exchange Listings
- Legal Counsel
- Initial Security Auditing
CONCLUSION

Minerva is a platform and its token is designed to be used as a currency; employing methods to influence the supply of the OWL token, we aim to combat extreme short-term price swings that plague other cryptocurrencies.

We employ a smart money cycle powered by real economic activity and business incentives. A positive feedback loop occurs that expands the Minerva market: The more incentives we provide for businesses to accept the Minerva OWL, the more purchases will occur. The more purchases that occur, the less impact speculation will have on Minerva’s market price. The less impact speculation has, the more stable the market price will be. The more stable the market price, the more purchases occur.

If the value of the OWL token increases, more incentives are provided to businesses to accept it as payment, therefore increasing the supply and stabilizing the market price. If the value of the Minerva OWL decreases, more incentives are provided to freeze Minerva OWLs in the MVP contract, effectively decreasing the supply and stabilizing the market price.

In our quest to stabilize the Minerva OWL we have spent considerable time ensuring that our volatility model is both viable as well as the most optimal decentralized cryptocurrency stabilization solution to date (outside of fiat tethering, a system reliant on cash reserves that presents non-trivial risks of frozen assets via the direct and indirect affiliations to traditional bank accounts). Additionally, fiat tethering prohibits cryptocurrencies from appreciating or depreciating in value in a volatility-tolerable manner and is limited in its flexibility and application in comparison to Minerva.

As an endeavor in “smart money” and “reverse merchant processing,” we assert no claims regarding any initial high volatility in market behavior or outcomes for an unspecified period of time as Minerva becomes institutionalized through community participation, platform integration, and the utilization of MVP (Minerva Volatility Protocol).

Market simulations aside, we use real-world field testing to produce critical data with our immediate large-scale use case. We expect to encounter challenges, and we expect to overcome them. We will continue to work with accredited economists, mathematicians and programmers with the goal of producing the most optimal Minerva-compatible stabilization model achievable. Though concerted time and effort will be needed, it is a realistic expectation that Minerva and its OWL token will become one of the most enterprise-friendly platforms and cryptocurrencies available.