



**MAZZUMA**  
Your Money, Your Freedom

## W H I T E P A P E R



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# Background

The cryptocurrency industry is a perplexing, exciting and speculative market. In the last few years, major cryptocurrencies have experienced dramatic volatility in their price valuation on various exchanges across the globe<sup>1</sup>. Bitcoin was the first decentralized digital currency which was introduced to the world in 2009. Since then, usage as well as adoption has grown rapidly amongst users globally, as investments made towards it has also grown accordingly. This is clearly evident in the market capitalization of Bitcoin which is being valued around \$100 billion at the start of 2018, compared to \$1 billion in 2013<sup>2</sup>. Other coins such as Ripple and Ethereum have further legitimized the emerging sector, as their respective market capitalizations are also in the billions (USD).

Cryptocurrencies have provided a new and innovative approach to the way we engage and think about exchange of value. By eliminating middlemen, consumers were introduced to secure, real time and low cost borderless transactions in any amount. In the 90s and early 2000s, the internet intensified a global village which connected people, businesses and organizations while enhancing trust across borders. Similarly, cryptocurrencies have managed to achieve an analogous feat through the use of a decentralized systems in transactional payments. Despite offering several benefits, there are still several limitations that has prevented the widespread adoption of cryptocurrencies. Currently, the main adopters of cryptocurrencies are most likely to be technology enthusiasts and early adopters of innovations. These users have grown into large social groups that engage in dialogue through online forums and conferences<sup>3</sup>.

One of the main challenges that the main cryptocurrencies are plagued with are their scaling issues, as high amount of transactions result in delays and slow confirmation times. The user experience factor of cryptocurrencies is another limitation that prevents the widespread adoption of the technology. Usability of these currencies can be quite cumbersome due to long private keys and wallet addresses which makes it hard for the average person to conveniently use them<sup>4</sup>.

With the popularity of cryptocurrencies such as Bitcoin, Ethereum and Ripple, there is a demand for a more convenient, simple and instant way to transfer value in the digital economy. Emerging markets are already at the forefront of reimagining the digital economy. This is clearly evident in the success and rapid expansion of the mobile money ecosystem in these emerging markets.

Today, there are over two billion people who do not have bank accounts or access to other financial services. Majority of the unbanked are in developing nations; with countries such as Central African Republic having a banking population of 3.30% and Turkmenistan 1.80%. Mobile money has significantly impacted the efforts to extend access to the unbanked and financially excluded. Today, there are close to 700 million active mobile money users across the world, with the technology being widely adopted in Kenya and several other emerging markets such as Ghana and some countries in the South East Asia region<sup>5</sup>.





Since its inception in 2006, the mobile money industry has been experiencing exponential growth and a wave of digitization. The mobile money industry continues to experience record breaking figures with billions (USD) of transactions being made daily. The ease and simplicity of mobile money has made it a leading payment platform and gateway to the digital economy across emerging markets<sup>6</sup>.

From this, it is clear that there is a need for a system which combines the efficiency and scalability of mobile money with the security of cryptocurrencies to create a more robust system and financially inclusive world. Today, Mazzuma is one of the leading payment platforms utilising mobile money and artificial intelligence to enable peer to peer payments in one of Africa biggest mobile money markets with roughly 10 million consumers, Ghana. With this in mind, Mazzuma is well poised to bridge this gap with our background in leading innovations in the mobile money space.

With the emergence of decentralized payments systems such as Bitcoin, Ethereum and other cryptocurrencies, the global payment space has seen a lot of disruption in the way payments are made and this has extended peer to peer cross-country payment to a lot of people across the world. Despite this good innovation, slow transaction confirmation times and high transaction fees makes it difficult for mass adoption of these cryptocurrencies. Even though they are widely used in the cryptocurrency space by early adopters and enthusiasts, most individuals find it difficult to use these system due to their complex nature. In line with the booming mobile money industry and smartphone adoption, it has become necessary to create a holistic payment system that embraces the simplicity and convenience of mobile money with the robustness and security of cryptocurrencies. This is where Mazzuma bridges the gap.

## References

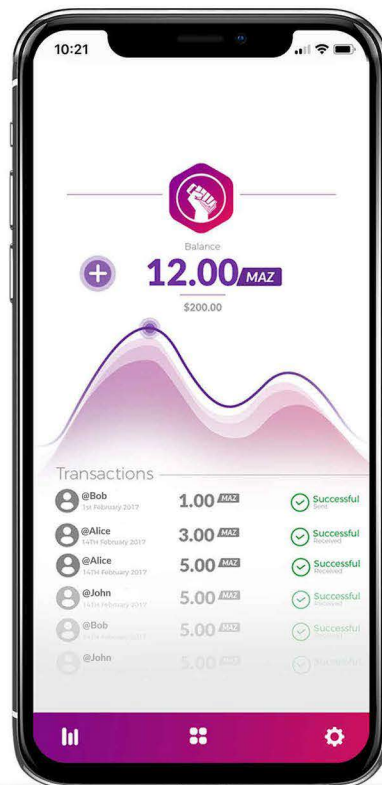
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- <sup>2</sup>Extreme movements in Bitcoin prices: A study based on extreme value theory-[https://www.longin.fr/Recherche\\_Publications/Resume\\_pdf/Gangwal\\_Longin\\_Extreme\\_movements\\_Bitcoin\\_prices.pdf](https://www.longin.fr/Recherche_Publications/Resume_pdf/Gangwal_Longin_Extreme_movements_Bitcoin_prices.pdf)
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- <sup>5</sup>The world's 2 billion unbanked, in 6 charts - <http://uk.businessinsider.com/the-worlds-unbanked-population-in-6-charts-2017-8?IR=T/#the-vast-majority-94-of-adults-in-oecd-high-income-countries-said-they-had-a-bank-account-in-2014-while-only-54-of-those-in-developing-countries-did-the-middle-east-had-the-lowest-proportion-of-account-holders-with-only-14-on-average-1>
- <sup>6</sup>2017 State of the Industry Report on Mobile Money <https://www.gsma.com/mobilefordevelopment/sotir/>

# Introduction, review and philosophy

Mazzuma is a mobile money payment system that utilizes distributed secure infrastructure and cryptocurrency to enable seamless payments. The Mazzuma token which will be referred to as MAZ will be the key payment medium in the Mazzuma ecosystem. Transactions made on the Mazzuma platform are instantaneous and free of transaction fees. This philosophy is the driving force behind the Mazzuma ecosystem, which is to develop a strong and robust payment ecosystem which is available to the masses and provides the freedom for users to use their funds in a convenient and stress-free manner.

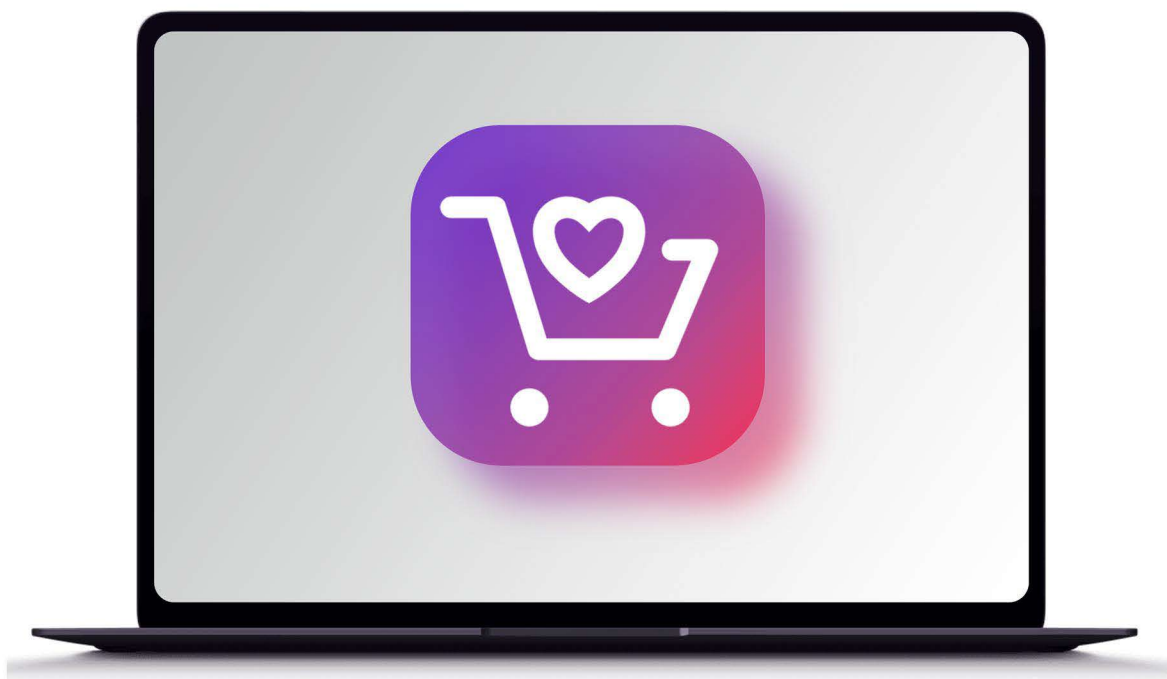
## Mode of Use

The Mazzuma Mobile App will be the primary medium of exchange of the Mazzuma token. The app will display account details, amount of MAZ in the wallet, transaction history, Mazzuma price graph, account QR code amongst other features. Users will be able to send Mazzuma tokens to other users and authorize transactions on the Mazzuma platform seamlessly and instantly.



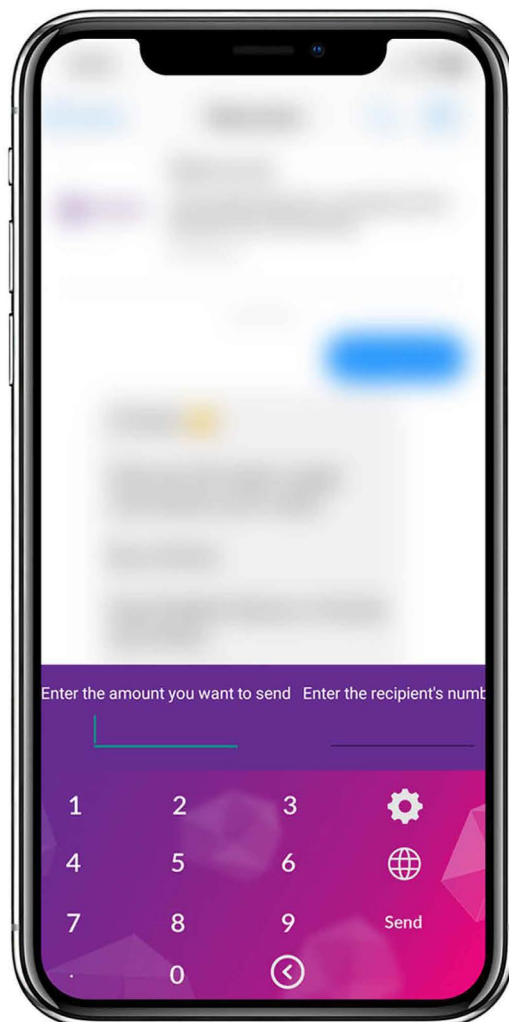
## E-commerce

Plugins for E-commerce platforms such as Woocommerce and Prestashop will be made available for online shops to integrate and accept Mazzuma tokens for payments. Once a user visits any online shop that accepts Mazzuma, the user will just have to choose the “Pay with Mazzuma” option, then the user will be redirected to a secure payment page where the Mazzuma account will be entered to initiate the transaction. A push notification alert will be sent to the user’s Mazzuma app, prompting the user to authorise the transaction by entering a 4-digit PIN. From here, a user can either choose to confirm, decline or flag a transaction as a spam. Once the transaction is authorized, the tokens will be transferred to the online shop and the transaction will be completed successfully.



## Mazzuma Keyboard

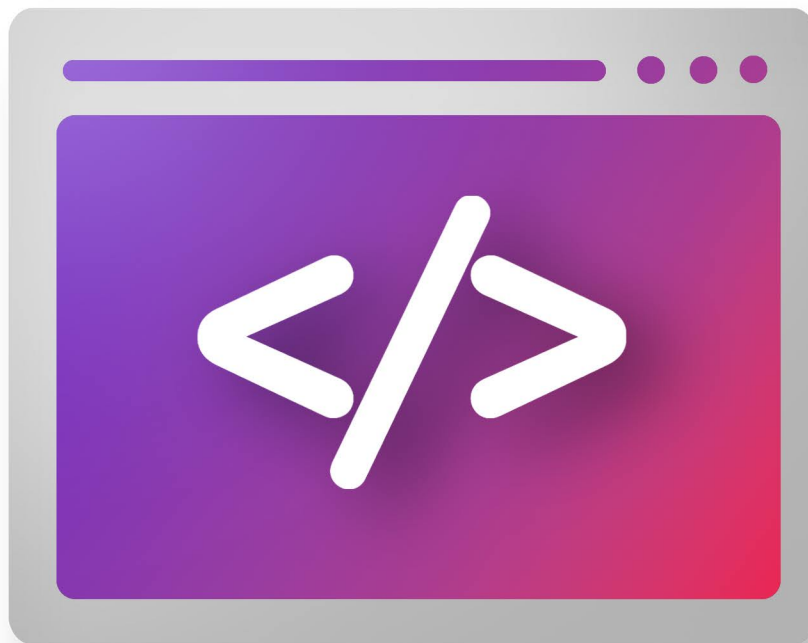
The Mazzuma app comes with a companion keyboard that allows users to make transactions conveniently without leaving their favorite messaging app. Transactions can be initiated from the keyboard and will be completed once authorized by the user. The companion keyboard makes it easy to access Mazzuma anywhere in your mobile phone with ease and simplicity





## REST API `</>`

An Application Programming Interface will be made available to developers to enable them to accept Mazzuma tokens as payments into the applications. This will support iOS, Android and Web applications. Once a transaction is initiated from the Mazzuma API, it will require authorization from the user. The transaction will be completed when duly authorized by the user. Developers can refer to the Mazzuma Github page for a full documentation and API usage guide.





## Identification of wallets and accounts

Tokens in the Mazzuma ecosystem are stored in wallets. Each wallet is uniquely linked to a single user account. Meaning, one account can only have a single wallet. Unlike long complex wallet addresses used in most cryptocurrencies, accounts in Mazzuma are identified using a human readable alphanumeric name which is between 2 to 32 characters in length. Examples of compliant account names are @Alice, @bob101, @j1mmy etc. Account names are immutable once set. Even when an account has been deactivated, that account name cannot be reused by any other user. This format of wallet addressing system makes wallet and account identification easily accessible to users who are new to digital assets since these conventions have already been widely adopted in other mainstream platforms such as social media. Incorporating this accessibility feature increases the user experience for both adept digital asset users and newcomers alike.

## Security of Tokens

Since all tokens are linked to accounts in the Mazzuma ecosystem, they cannot be transferred without authorization from the account holders. To authorize a transaction, a user must enter a 4-digit PIN in the Mazzuma app before the tokens will be sent to the respective recipient. Transactions initiated on e-commerce stores, web applications, Mazzuma-enabled APIs and bots will have to be authorized through the Mazzuma app before tokens will be sent and the transaction will be completed.

## Account Security

A user on Mazzuma is required to set a password upon signing up to the application. After the password has been set, a 4-digit PIN will also be set by the user. This PIN will be used for authorization of transactions on the Mazzuma platform. In case a user forgets the password to an account, a reset link will be sent to the user's email. If the user has also forgotten the email that was used, the user will be required to enter a uniquely generated passphrase which was given to the user upon creation of the account. This passphrase represents the private key of the user in the Mazzuma platform. If this private key is lost, the funds in the account will not be accessible by anyone.

# Formal Specifications

User accounts in the Mazzuma system are formally denoted by  $\lambda$  which belongs to all accounts  $A_{32}$  where the subscript 32 represents the total number of characters allowed in an account name. Hence:  $\lambda \in A_{32}$

A transaction on the Mazzuma platform that is initiated to transfer tokens will take the form:  
 $T = \alpha(\lambda_x, \lambda_y, \rho, \gamma)$

Where:

- $\alpha$  is the transactional function.
- $\lambda_x$  is the sender's account.
- $\lambda_y$  is the recipient's account.
- $\rho$  is the amount of tokens to be transferred.
- $\gamma$  is the API key of the sender.

This transaction function will only be valid if wallet value function:

$$\beta(\lambda_x) > 0 \wedge \beta(\lambda_x) \geq \rho$$

The API key function which is needed is to validate a transaction function is:

$$\gamma = \omega(\text{Pr}_x, \text{Pu}_x)$$

where:

- $\omega$  is the API Key generation function.
- $\text{Pr}_x$  is the private key of the account.
- $\text{Pu}_x$  is the public key of the account

The total supply of tokens in the ecosystem can be calculated through

$$\Omega \equiv \sum_{i=x}^n \Phi(\lambda_i) = \Phi(\lambda_i) + \Phi(\lambda_{i+1}) + \Phi(\lambda_{i+2}) + \dots + \Phi(\lambda_{i+n})$$

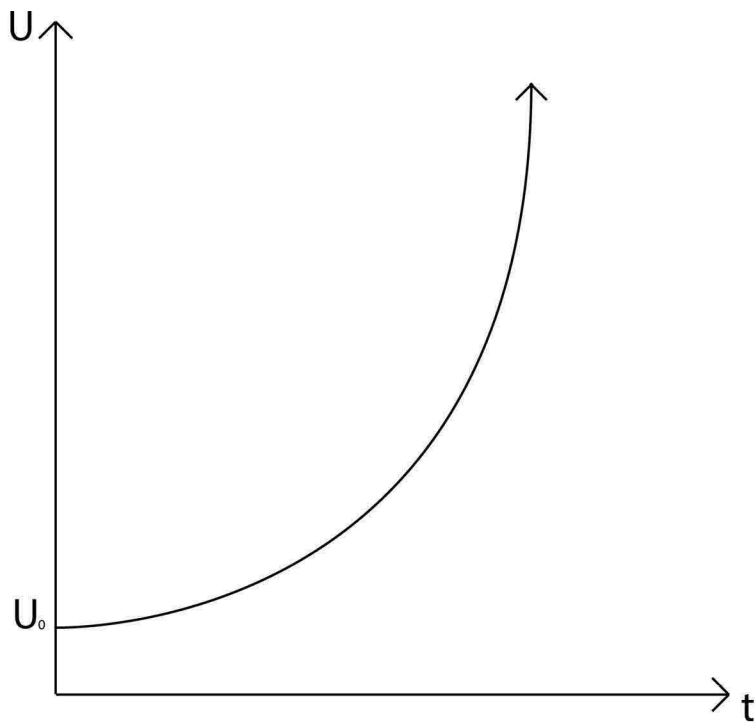
where:

- $\Phi$  is the function for the amount of token in a wallet.
- $\Omega$  is the total supply of tokens.

The dynamic model of users in the Mazzuma ecosystem can be expressed by:

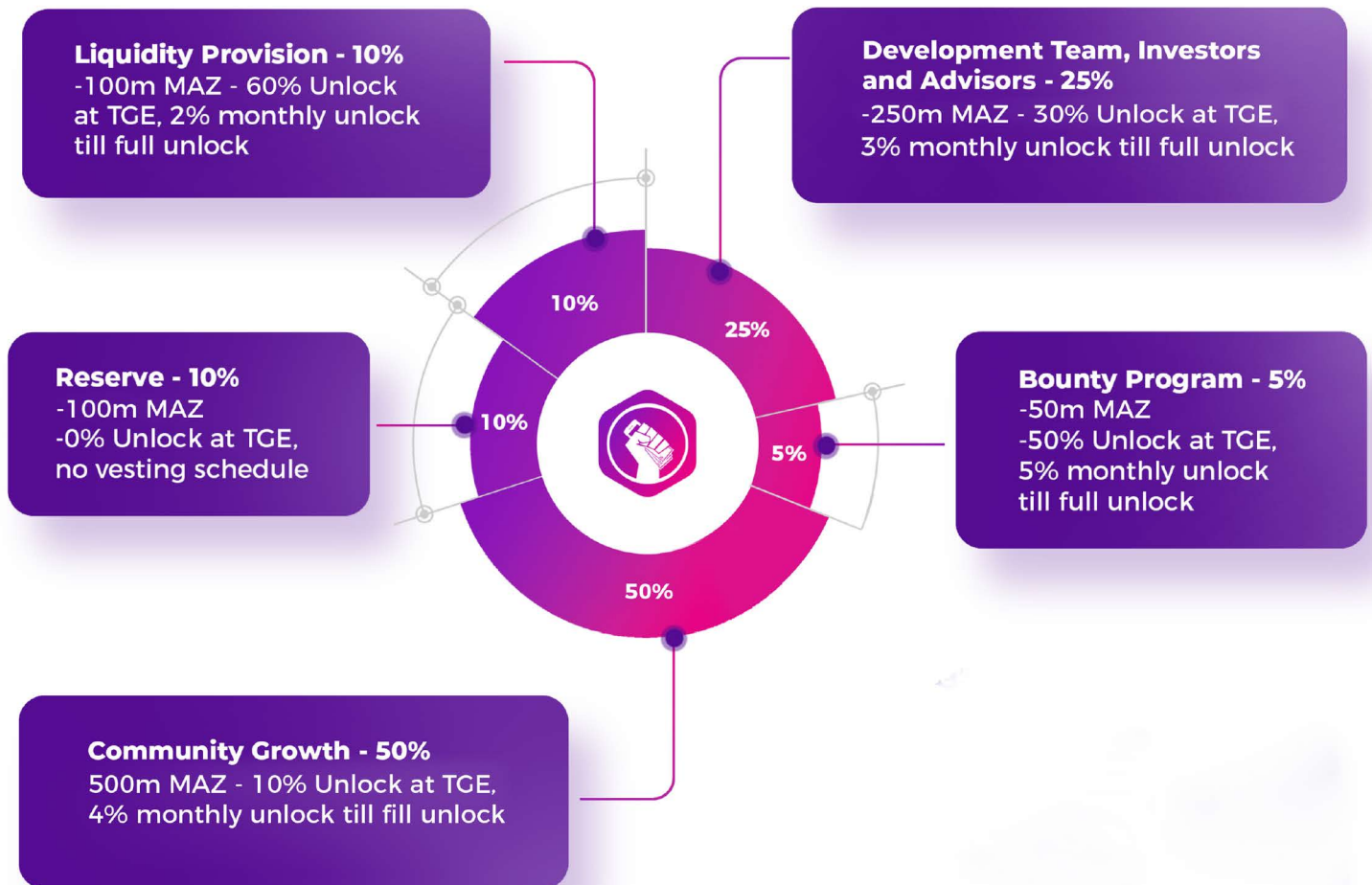
$$\begin{aligned}\frac{dU}{dt} &= ku \\ \frac{dU}{u} &= k \cdot dt \\ \int \frac{1}{u} dU &= \int k dt \\ \ln|U| &= kt + c \\ |U| &= e^{kt+c} \\ |U| &= e^{kt} \cdot e^c \\ \text{since } c &= e^c \text{ and } u > 0 \\ U(t) &= ce^{kt} \\ \text{if } U(0) &= C \text{ then} \\ U(t) &= U_0 e^{kt}\end{aligned}$$

By using the above exponential function, the graph can be drawn as:



# Token Allocation

**Total Supply - 1 Billion MAZ**





## Future enhancements

With more adoption of the platform, Mazzuma seeks to expand its utility to major e-commerce outlets and avenues globally. Also, with our experience and expertise in dealing with mobile money systems in Sub Saharan Africa, Mazzuma seeks to bridge the gap between the huge economic benefits of cryptocurrencies and the existing financial ecosystem. This strategy is set to position Mazzuma to be a global leader in payments in both developed and emerging markets. Regarding technical improvements, Mazzuma will continue to research and incorporate Artificial Intelligence into payments, continuously improve the system by making it more fault tolerant, and support payment-enabled IoT devices. These will enable Mazzuma to stay at the edge of the global payment industry and continually evolve payments for ages to come. Mazzuma! Your Money, Your Freedom

# THE FUTURE OF ONLINE *Payments* IS HERE!



**MAZZUMA**  
Your Money, Your Freedom

