BTMX Technical Report

The BITMarkets team

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Abstract

We present you the technical report of BTMX, an ERC20 token that resides on the Polygon blockchain that will enable the users of the BITMarkets platform to perform cryptocurrency exchanges with low fees, to participate in initial coin offerings and exchange offerings and to vote on the ecological and social impact investments of the company.

Keywords: bitmarkets, blockchain, ico, polygon, solidity

1 Introduction

Digital tokens provide individuals and organizations with a robust, decentralized method of exchanging value while using a familiar accounting unit. Blockchains are cryptographically secured global ledgers of transactions that can be audited by the public. Smart contracts are computational logic that can be tied to a digital token in order to augment its basic functionality with various mechanisms such as automated market marking, transaction fees, locking mechanisms, without the ability of a central authority to block their execution. This can add an economic layer to digital or physical activities that were not even conceivable 12 years ago.

An ERC20 token uses the peer-to-peer network of an existing blockchain that is compatible with the so-called Ethereum Virtual Machine (EVM) to operate with no central authority or banks. Managing transactions and the issuing of tokens is carried out by the network of the blockchain's nodes, or servers, following the instructions outlined by the token's accompanying smart contract. We believe that the Polygon blockchain is the most suitable home for our token because it builds on the already proven technology of Ethereum while improving on the transaction costs and speed.

Tokens can be bought through online trading platforms with traditional currencies or other cryptocurrencies, through smart contracts running on the blockchain in exchange for the native cryptocurrency of the blockchain or another token, or in personal transactions where the sender and recipient agree on an exchange rate in person. The token trading process itself is identical to the typical trading process.

In our exchange platform, trading pairs that involve BTMX will have lower exchange fees than those that don't. Moreover, users that hold more than 20% of their portfolio value in BTMX will be eligible for airdrops, NFT lotteries and other perks that will be announced in the future. Finally, holders of BTMX will be able to participate in platform exclusive ICOs and IEOs, which will be a great way for investors to invest in vetted, high impact projects that they may find interesting.

2 Token

Digital tokens are stored in "addresses" on the blockchain network and their owners can send them to other users in the network by issuing transactions signed by their private key. A private key is essentially a random number between 1 and 2^{256}, converted to 64 hexadecimal digit representation, while the public key is a set of coordinates (x, y) calculated from the private key on the secp256k1 curve $y^2 = x^3 + 7$ over the finite field $\mathbb{Z}_{2^{256}-2^{32}-977}$. The magic of a blockchain "account opening" is that the private key can be generated offline and it will produce a perfectly valid destination address for a cryptocurrency transaction. This is contrary to opening a bank account where the procedure takes days, requires extensive KYC checks and the eventual account is controlled by a bank which can effectively close it or freeze at any given time. In the example of Ethereum, and consequently Polygon, "wallet" address is the last 20 bytes of the Keccak256 hash of the public key. If someone knows a private key, they can trivially calculate their corresponding public key and their wallet address, but someone who knows only the address or the public key cannot reproduce the private key from it. Without the private key, a user cannot sign transactions.

2.1 ERC20

For out token, we will use the ERC20 token standard, which is a standard for fungible tokens where each unit is equal in value and type to any other unit of the same token. In this standard, the smart contract that governs the token needs to implement a set of specific publicly accessible functions that allow external programs to interact with the token. The first set of functions has to do with the characteristics of the token, such as its name, its symbol, the number of decimals that it has and the total supply of tokens in existence:

```
function name() public view returns (string);
function symbol() public view returns (string);
function decimals() public view returns (uint8);
function totalSupply() public view returns (uint256);
```

Listing 1: ERC20 Solidity qualitative function signatures.

The rest of the functions in the ERC20 standard have to do with getting the balance of an address, the issuing of a transfer from one address to the other, the so-called “approval”, which is an operation that allows one address to delegate the spending of some amount of its balance to another address, and the getter of the total allowance that this second address is approved to spend:

```
function balanceOf(address) public view returns (uint256);
function transfer(address to, uint256) public returns (bool);
function transferFrom(
    address from,
    address to,
    uint256 amount
) public returns (bool);

function approve(address to, uint256) public returns (bool)
function allowance(
    address owner,
    address spender
) public view returns (uint256);
```

Listing 2: ERC20 Solidity operational function signatures.

A smart contract that adheres to the ERC20 standard also emits two events, namely a successful transfer and a successful approval:

```
event Transfer(
    address indexed from,
    address indexed to,
    uint256 value
);

event Approval(
    address indexed owner,
    address indexed spender,
    uint256 value
);
```

Listing 3: ERC20 Solidity events.

2.2 Extensions

Other than the basic functionality of an ERC20-compliant smart contract, we have authored some extensions that adhere to our own business model and will help us enforce our code of conduct regarding the use of our products and services.

2.2.1 Fees

At the time of the deployment of the main token smart contract on the blockchain, an extension that handles the fees from every token transfer is also deployed. This extension calculates the transfer fees that will be distributed to two company-controlled wallets, based on prespecified percentages on the total amount of a transfer that are made available on deployment. These fees are removed from the transfer amount.

The two wallets that will receive the fees are an *ESG fund* and a *company rewards* wallet. The fees will be 0.1% each and they will apply to all transfers above 1000 tokens.

We have also added the functionality to exclude some addresses from fee collection, because their ability to transact freely is instrumental to our smart contract functionality. The three wallets that are excluded from fee collection automatically are the company liquidity wallet, the company rewards wallet and the ESG fund. We also set a separate wallet as an admin of the feeless list on deployment, and we set a limit of 4 addresses that can transact freely with our token. The feeless functionality can be accessed publically by the following methods:

```
function addFeeless(address) public virtual;
function removeFeeless(address) public virtual;
function isFeeless(address) public virtual returns (bool);
```

Listing 4: Solidity feeless functions.

The corresponding events that are emitted on successful completion of the state-mutating functions are:

```
event FeelessAdded(address indexed);
event FeelessRemoved(address indexed);
```

Listing 5: Solidity feeless events.

2.2.2 Blacklisting

The other token-related smart contract that will be deployed is one with blacklisting functionality, meaning that if an address is on this list, it will not be able to transact with our token. The wallet that will be the admin of the blacklist is a company-controlled one. The methods that are exposed by this contract are the following:

```
function addBlacklisted(address) public virtual;
function removeBlacklisted(address) public virtual;
function isBlacklistAdmin(address) public virtual
    returns (bool);
function isBlacklisted(address) public virtual
    returns (bool);
```

Listing 6: Solidity blacklist functions.

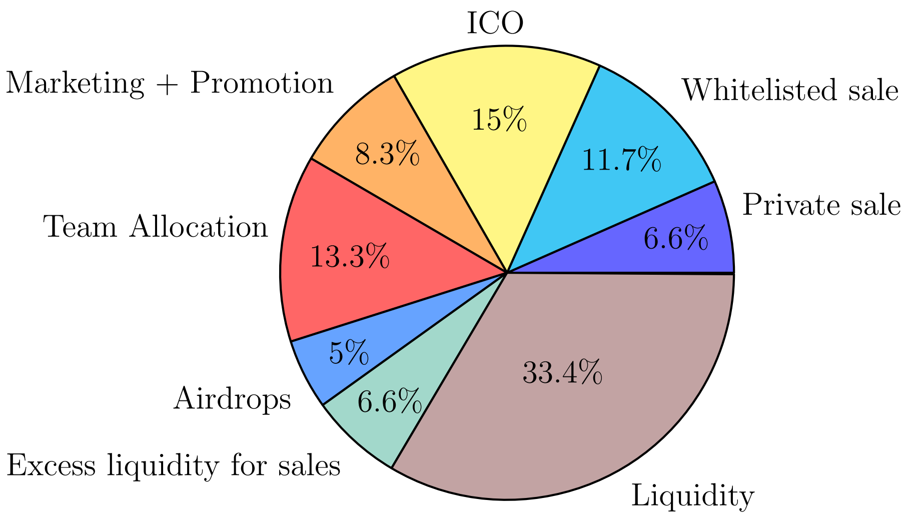
The events that are emitted from the mutating functions are:

```
event BlacklistedAdded(address indexed);
event BlacklistedRemoved(address indexed);
```

Listing 7: Solidity blacklist events.

3 Distribution

For BTMX, the total minted supply will be 300 000 000 tokens, which will be divided into three equal parts. The first 100 000 000 tokens will be sold in public and private sales for fundraising. The second 100 000 000 will be allocated to the wallets of the BITMarkets team and to wallets for special activities such as conferences, marketing campaigns, airdrops etc. and our partners. The rest of the tokens will be held by a company wallet that will be used as a liquidity vault which will periodically "burn" some portion of its tokens in order to diminish the token supply to the eventual point of 200 000 000 final supply. This last wallet's private key will not be owned by one single entity, but rather it will be split in at least 9 Shamir shares, which will be distributed to members of the developer team and external partners and it will only be possible to recreate it if at least 5 of them coordinate with each other. This wallet will be the minting wallet, therefore it will also hold the sales funds and it will provide allowance of 100 000 000 tokens to the smart contracts that will govern the crowdsales.



4 Crowdsales

One third of the initial supply of BTMX will be sold in public and private sales. The smart contracts that govern these sales will have a combined allowance of 100 000 000 tokens from the company wallet to distribute to the buyers. The smart contracts expect to trade MATIC, Polygon's native cryptocurrency, with BTMX. The company's Ethereum wallet will receive the MATIC that the buyer sends to the crowdsale smart contracts and the contract will send them in return the amount of BTMX that corresponds to the rate that is derived from the contract's code. The BTMX comes from the company-controlled liquidity wallet, provided that it does not exceed the contract's allowance. The most important publicly-exposed methods of public and private crowdsale contracts are the following:

```
function buyTokens(address buyer) public payable;
function getContribution(address buyer) public view returns (
    uint256);
function remainingTokens() public view returns (uint256);
function token() public view returns (IERC20);
function tokenWallet() public view returns (address);
function wallet() public view returns (address payable);
function weiRaised() public view returns (uint256);
```

Listing 8: Solidity common crowdsale function signatures

Every sale will happen in a limited time window that will be specified on deployment. In order for external programs to track their timing, the smart contracts provide the following functions:

```
function isOpen() public view returns (bool);
function hasClosed() public view returns (bool);
 (uint256);
function paused() public returns (bool);
function openingTime() public view returns
function closingTime() public view returns (uint256);
```

Listing 9: Solidity crowdsale timing function signatures

The smart contracts have algorithmic safeguards in order to ensure fair access to the sales for as many buyers as possible. The first and most obvious safeguard is that the hard cap of the sale will be 100 000 000 tokens. Two publicly accessible methods that give feedback regarding these safeguards are:

```
function cap() public view returns (uint256);
function capReached() public view returns (bool);
```

Listing 10: Solidity public crowdsale cap function signatures.

The second safeguard is that an individual address will have both a tariff to participate and an individual cap to contribute:

```
function getInvestorCap() public view returns (uint256);
function getInvestorTariff() public view returns (uint256);
function investorCap() public returns (uint256);
function investorTariff() public returns (uint256);
```

Listing 11: Solidity public crowdsale tariff/cap function signatures.

The tariff will be at least 100 MATIC and the cap will be at most 20000 MATIC. The timing of the sale is also written in code so no buyer can exchange MATIC for BTMX with the conditions that we discussed at a time prior to the specified opening and after the closing time.

The contract will emit the following event on successful purchase:

```
event TokensPurchased(
  address indexed purchaser,
  address indexed beneficiary,
  uint256 value,
  uint256 amount
);
```

Listing 12: BTMX ICO events.

Users who are not in possession of a decentralized Ethereum, Polygon wallet will be able to participate in the crowdsales by exchanging their traditional currency to BTMX on the BITMarkets platform. They will need to pass a basic KYC check in order to exchange "fiat" for MATIC and then we will deposit their MATIC into the company wallet, which will then trigger a server-side transfer of the corresponding to the predefined individual exchange rate BTMX tokens to the client's platform-managed Polygon wallet.

4.1 Whitelisted sales

There will be both a private and a public whitelisted crowdsales that will happen before the ICO. In the case of the private crowdsale, the whitelist will be prespecified. In the case of the public whitelisted crowdsale, the company will provide a way for prospective buyers to make it into the whitelist by completing a number of tasks that will promote the company. The publicly accessible functions that are relevant to the whitelist are the following:

```
function addWhitelisted(address) public virtual;
function removeWhitelisted(address) public virtual;
function isWhitelistAdmin(address) public view returns (bool)
function isWhitelisted(address) public view returns (bool);
```

Listing 13: Solidity whitelisted crowdsale function signatures.

The contracts will emit the following events on successful whitelisting and dewhitelisting:

```
event WhitelistedAdded(address indexed account);
event WhitelistedRemoved(address indexed account);
```

Listing 14: Solidity crowdsale whitelist events.

4.2 ICO

In the public crowdsale, the rate of MATIC over BTMX will decrease overtime, meaning that the initial rate of exchange will be higher than the final one, and this decrease will happen in a linear manner overtime. This means that an early buyer will have to deposit less MATIC for a bigger amount of BTMX compared to a late one. The initial rate will be 100 BTMX for 1 MATIC and it will linearly reduce to 10 BTMX for 1 MATIC. The publicly accessible methods of the public crowdsale contracts regarding the trading rate are:

```
function initialRate() public view returns (uint256);
function finalRate() public view returns (uint256);
function getCurrentRate() public view returns (uint256);
```

Listing 15: Solidity public crowdsale rate function signatures.

This is in contrast to the private whitelisted crowdsales where we will use a prespecified, invariant trading rate.

5 Vesting

In order to ensure fair use of BTMX by the team and to reduce the volatility of its exchange price in the short run, there is a locking and vesting functionality built into the crowdsales and the team allocation contracts.

The vesting will occur linearly and will start from a point in time that is called the "cliff". As time goes by, more and more tokens are unlocked from the purpose-generated locking wallets and are claimable by their original owners. The functions that expose this functionality to the public are the following:

```
function vestingWallet(address beneficiary) public view
    returns (address);
function vestedAmount(address beneficiary) public view
    returns (uint256);
function withdrawTokens() public;
```

Listing 16: Solidity vesting function signatures.

In the crowdsale contracts, the vesting functionality intercepts the transfer of BTXM to the beneficiary, generates a vesting wallet with the cliff and vesting duration that corresponds to each sale and transfers the purchased BTMX token to that wallet. The mapping of the beneficiary and their vesting wallet is stored on the blockchain and it is visible to everyone.

In the case of the team allocation, there will exist a special smart contract that will be deployed along with the BTMX token contract, which will have a "whitelist" of the team members' Ethereum wallets, an allowance that equals the team allocation amount from the company minting wallet and a list that corresponds to each team member's percentage. The members will be able to call a special "participate" function which will automatically send their tokens to a vesting wallet with a cliff of 6 months and a duration of 3 years.

6 Utility

Holders of BTMX will enjoy exclusive perks on our platform and on the blockchain. We will periodically release exclusive airdrops, NFT lotteries when we start introducing collections in our platform, reduced exchange fees for trading pairs that include BTMX and many more.

The most interesting use case will come in Q1 of 2023 where we will introduce an ICO platform where promising projects with little-to-no marketing budget will be able to list their upcoming offerings on it and exchange a predefined amount of their tokens with BTMX. BTMX investors will be able to participate in these sales inside our platform and our contract logic will handle the transfer of their newly purchased tokens to their wallets. Our platform will provide this service to the chosen projects in exchange for 10% of their accumulated funds. We will also put 2 out of every 5 slots in the list of upcoming ICOs into hourly auctions in order to cover the cost of marketing for all the projects and to monetize the benefit of high placement advertising.

We will also create utility from the transaction costs of BTMX. Specifically, 0.5% of the transferred amount from one address to another will go to a specially designated wallet that will serve as the social investment arm of our operation. Our goal is for the BTMX holders to be able to participate in Governance votes that will determine the purpose of the accumulated "social investment" units every 6 months. The BITMarkets team will put together a list of all the potential investment targets and the community of investors will hold a vote on the blockchain that determines the top 5 projects that will receive the funds and a corresponding smart contract will execute the transactions.

7 Conclusion

This was the technical analysis of BTMX, an ERC20 token that will reside on the Polygon blockchain. It's a token whose utility will have ramification in both the digital and the physical world. Our BITMarkets platform will be more that an exchange platform and BTMX will be the native currency to its ecosystem. Projects with great potential will benefit from the vibrant investor community that we will host and developer teams that focus on the technical aspect of their innovation will be able to offload the burden of marketing, ICO design and investor search to us. It is our hope that this will make BITMarkets the go-to place for bright innovators and socially-conscious investors alike.