

# Money Tree

Fair, fun & decentralized blockchain gaming

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## Abstract

Money Tree is a fully on-chain BSC focussed on providing a platform for statistically fair blockchain gaming with no house edge. No external calls or processes are used at any stage, ensuring that players have full visibility of all transactions and can independently verify the integrity of the results. Active players can participate in the mini games for a chance to win prizes whilst passive investors are rewarded with automatic weekly dividends as well as automatic entry into a weekly lottery that costs nothing to play and pays in BUSD. A collection of 1 million Money Tree NFTs have been deployed on IPFS and pinned with Pinata, these NFTs can be purchased from the built-in marketplace or won in prizes. Money Tree is designed to provide investors with a safe and secure platform to participate in no loss games with minimal risk whilst still offering large rewards & prizes.

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# 1 Blockchain Gaming & NFTs

## 1.1 On-chain gaming

Blockchains provide a unique framework for developing and hosting games. There are clear benefits to hosting a game on a blockchain such as increased transparency for the players as well as providing players with the ability to validate any in-game action. However, hosting a game on blockchain also introduces several challenges.

Ethereum is a highly decentralized blockchain, however, the high demand means that in recent years, gas fees have risen to astronomical levels and can often be unpredictable. Expensive and unstable gas fees can cause a huge issue for on-chain games as players aren't expecting or willing to pay a large cost per action, players generally also aren't comfortable paying significantly more fees to perform the same action depending on the time/day.

To overcome these challenges, developers are faced with a balancing act with regards to how decentralized they want the end application to be vs the cost, convenience and feasibility in doing so. As a result of this, many developers choose to go with a semi-centralized approach, taking part of the computation off-chain or relying on external inputs to simplify the process and therefore reduce the gas fees paid by the end-user.

Money Tree has taken a fully decentralized approach, all the processes happen entirely on-chain with no external inputs or APIs. A consequence of this decision is that utilising Ethereum as the underlying blockchain becomes unfeasible in its current state, it also reduces the overall complexity of the games that can be developed. The benefit in a decentralized-first mindset is that players & investors can rest assured that no inputs have been tampered with and this allows players to operate in a trustless manner – in line with the overarching philosophy of blockchain.

## 1.2 NFT Collections

Non-Fungible Tokens (NFTs) further widen the applications and use cases of blockchain. By utilizing NFTs, both digital and physical items can be assigned ownership on the blockchain as well as any additional metadata. This capability can make many processes more efficient and remove the need for a “man in the middle,” an example of this is transferring the rights to a digital asset without the need for an intermediate party or

escrow system. It also ensures that ownership cannot be tampered with and no longer has a central point of failure.

A number of NFT collections have been created and deployed, these NFTs are often collected or traded. An issue often seen with current NFT collections is the underlying hardware, most NFT collections are stored in a centralized infrastructure, for example, on the cloud. Whilst ownership of these assets is recorded on the blockchain, the underlying digital asset (NFT) can be edited in the back end, therefore editing the supposedly immutable asset that the user purchased.

A solution to ensuring that NFT collections cannot be tampered with is utilizing the Interplanetary File System (IPFS.) IPFS is a distributed framework for storing files across a cluster of nodes. Every item added to IPFS is encoded, this ensures that if any malicious node attempts to edit the file, the encoded hash would not match and hence the wider network would reject this file. IPFS operates in a similar fashion to the blockchain and is an ideal method to store NFTs where ownership is stored on the blockchain.

Limitations of IPFS do exist, one of the primary limitations is that files on IPFS are removed after a certain amount of time if they are not being pinned by any nodes. Pinata is a pinning service that guarantees that items uploaded to IPFS remained “pinned” and accessible. Money Tree stores all one million generated NFTs on IPFS and all NFTs are pinned with Pinata to guarantee the availability of the NFTs as well as to provide absolute assurance that no NFTs can be tampered with.

## 2 How Money Tree Works

### 2.1 Transaction fee breakdown

All Money Tree transactions incur a transaction tax. The transaction tax charged is imperative to the overall structure of Money Tree and is used for several features. The overall tax charged on each transaction is 5%. The transaction tax can be split into the following categories:

- Auto-Liquidity: 2%
- Lottery 2%
- Marketing & Charity 1%

Buys, sells & P2P transfers all incur the 5% transaction tax, however, transactions incurred whilst playing minigames are excluded from the tax. Each transaction sends 5% of the tokens to a special tax wallet. Whenever a sell of the token is initiated (a sell can be thought of as swapping from \$MONEY to another token) the total amount of tokens held in the tax wallet are automatically converted in to BUSD where needed and split according to the above proportions.

A by-product of this system is that gas fees are slightly higher on sells than buys, as buys will not trigger the conversion of tokens to BUSD nor will it split the tax wallet into the relevant wallets. This provides a slight disincentive to sellers although the effect is relatively marginal.

## 2.2 Auto-liquidity

Given the fair launch of Money Tree and the relatively low initial liquidity (due to the lack of external investors,) auto liquidity is an essential element in ensuring a stable price floor. Auto liquidity is often structured to trigger once the tax wallet receives a certain balance, this tends to occur 1-5 times per day, this process can cause negative price pressure as the contract looks to swap a large number of tokens.

The automatic liquidity built in the Money Tree will run on every sell, this ensures a stable price for the token by adding liquidity, but it is done more frequently and on a smaller scale to mitigate any negative price impact. Each time auto liquidity is triggered in the smart contract, the LP owner is, by default, sent to the burn address. This ensures the dev wallet does not build up a large amount of liquidity provider tokens over time and provides further security to the end investor that the token will continue to remain highly liquid.

## 2.3 Weekly Lottery

Every transaction sends 2% of the amount transferred in BNB to the smart contract. The amount of BNB sent throughout the week is tallied up and at the end of the week, converted to BUSD and is automatically paid out to a holder of \$MONEY. The lottery size effectively amounts to 2% of the previous week's volume (in terms of BNB)

The more \$MONEY owned, the higher the likelihood is of winning the weekly lottery. This provides an incentive for users to hold \$MONEY and provides a fair playing field where even the smallest wallets have a chance to win. Official wallets such as the

dev wallet and tax wallet are excluded from winning the lottery by default, \$MONEY held on an exchange is also excluded from participating in the lottery.

The lottery pays out in BUSD, the benefits of this are twofold, firstly the lottery does not impact the price of \$MONEY as the winner does not receive any tokens, secondly, it becomes easier for the end-user to understand the true value of the weekly lottery when compared to the highly fluctuating price of a token.

## 2.4 Marketing Wallet

The marketing wallet is used to fund demand generation for \$MONEY. The 1% transaction tax sent to the marketing wallet is sent in BUSD, once again, ensuring that the price of the token is not negatively impacted whenever marketing initiatives are required.

The marketing wallet is expected to be a relatively short to medium-term need. After \$MONEY has received large-scale adoption, the marketing wallet will no longer be used for demand generation but instead will be used to donate any surplus to a charity. In future iterations, choosing the charities will become a community driven activity.

# 3 NFTs

## 3.1 Generation

All one million Money Tree NFTs are created and deployed on launch. As previously mentioned, all Money Tree tokens can be found on IPFS and are pinned by Pinata. Whilst the 1 million NFTs may sound like an exceptionally large amount, there is many reasons for this.

Firstly, there exists over 2500 unique assets available to choose from, the total unique number of NFTs that can be derived from these assets exceeds 4.5 trillion. Secondly, whilst there is 1 million NFTs available from launch, this number is expected to decrease over time due to the burning mechanism in the NFT upgrade game.

The 1 million NFTs are categorized into different rarities: Common, Uncommon, Rare, Epic & Legendary. The rarity of the NFT is determined by the underlying assets used to create the NFT. All NFTs can be burned and upgraded to a higher rarity

(excluding Legendary NFTs) this process can be done to burn 2 lower rarity NFTs for 1 NFT of a higher rarity. This process places a strong deflationary pressure on the NFTs, it allows for a system in which avid collectors can upgrade their way to a legendary NFT whilst those simply interested in owning an NFT they like can purchase a common NFT for significantly less time and effort.

## 3.2 NFT skills

Each of the NFTs come with an overall attack, health & magic score. These scores are derived from the accumulative sum of the assets and the appropriate attack, health & magic score on each underlying asset.

The overall NFT skills will be highly correlated with the overall rarity of the NFT, however, given they have been programmatically generated, there is always an element of randomness which could create exceptions to the rules. Future planned mini games will utilize the NFT's overall skills in-game.

## 3.3 NFT security

NFTs are secured in the Interplanetary File System (IPFS), including their skills. All NFTs are pinned for a minimum of a 12-month contract by Pinata. These NFTs are uploaded within 1 directory, and all assigned a unique content identifier (CID). The CID is encrypted into the solidity to prevent any NFT outside the folder from being minted onto the blockchain.

Many NFT collections will mint 10,000 to 20,000 on launch. However, given the 1 million NFTs and unorthodox upgrade mechanism, it would be unfeasible to mint all of these on launch due to extreme gas fees. Therefore all 1 million NFTs have been deployed on IPFS in advance of the coin being deployed. Users can mint NFTs which are stored in the directory. When a user does this, the NFT and its associated URI are minted to the blockchain.

Whilst this system is slightly unorthodox it ensures that NFTs are as secure as if they had been minted on launch. A by-product of this system will be the appearance of 0 NFTs available at launch and a maximum supply of 1 million NFTs, however, the maximum supply will almost certainly never be reached due to the burning mechanism in the upgrade NFT game.

## 3.4 NFT Acquisition

NFTs can be acquired through Loot boxes, mini game prizes, and the Money Tree marketplace. The marketplace provides users with a platform to view and explore the NFTs available as well as buy individual NFTs. All common NFTs can be purchased with \$MONEY tokens. For rarities up to and including epic, users can only purchase with BNB. A large portion of these NFTs will not be available to purchase from the marketplace, as these NFTs are exclusively reserved as prizes from games or upgrading NFTs.

## 3.5 NFT Contract

Money Tree NFTs use a separate contract so we can comply with both ERC20 and ERC721 standards, whilst the ERC1155 protocol looks to satisfy both protocol's requirements, the adoption and compatibility of ERC1155 is still very lackluster when compared to ERC20.

The ERC20 smart contract is the exclusive owner of the ERC721 contract which provides the ERC20 contract with full NFT capability whilst remaining compliant with both standards. The ERC20 uses a UUPS upgradeable proxy which allows the Money Tree team to implement code changes based on feedback from the community. Both the ERC20 and ERC721 contracts are deployed on BSC and the source code is made visible on launch for maximum transparency

# 4 Money Tree dApps

## 4.1 Numberdome

Numberdome is a chance-based game in which users have a 1 in 125 chance to win (5<sup>3</sup>) Given each ticket has a flat cost of 10,000 \$MONEY, and the odds of winning the game, the size of the average winnings for Numberdome would accumulate to 1.25 million \$MONEY. The statistically average nature of Numberdome helps ensure the Numberdome winner will not be able to cause a negative price impact upon winning if they were to liquidate their prize.

If multiple users choose the same winning numbers the prize will automatically be split evenly between them. As the number of Numberdome players increases, the

number of concurrent winners is expected to increase given the statistically fair nature of the game. When this situation arises, the mini game can easily be adjusted to increase the number selection from 3 to 4 and hence changing the odds of winning to 1 in 625.

All winners of Numberdome will be rewarded with an NFT prize, this process is recorded and visible to the user directly on the blockchain, winners can claim their owed NFT prizes from the claim rewards section. Any tokens won are automatically be paid out for Numberdome, it is only the NFT that needs to be manually claimed.

The total supply of \$MONEY is not affected by Numberdome as the prize is precisely equal to the exact cost of the number of tickets purchased since the last winner. Numberdome is a no-loss game, if nobody matches the winning numbers the pot will roll onto the next day, this process will continue until a winner receives the entirety of the prize.

## 4.2 Gridlock

Gridlock is designed to be a Statistically fair game where users can place as many tokens as they please on as many different positions as they wish to for the chance to win more tokens. All tokens placed will be automatically burned, however, if a user matches the daily winning number, the user will be minted 12x the tokens placed on the winning number.

Tokens placed between numbers, columns and rows will all be placed with the mathematically appropriate number for each spot, e.g if a user places 3 million tokens on row 1 it would be the equivalent of placing 1 million tokens on positions 1, 2, and 3. Translating these off-grid positions into an array of length 12 reduces the complexity of solidity and reduces gas cost for the end-user.

Given the lack of a “house-edge” in our game, if the user played 1 million games their overall balance would fluctuate but, on average, would stay the same. Similar games to gridlock often add an extra position to the board to skew the odds in the houses favour whereas all Money Tree games are no loss with no house edge. Given the fair nature of Gridlock, no loot prizes are rewarded to users as this could be manipulated.

## 4.3 Versus mode

Versus mode revolves around live events and lets users stake tokens against one another based on their predicted outcome of a binary event. The total pot from both sides is calculated once the event is completed and the winning side can claim a proportionate number of tokens to what they staked from the loser's pot.

In essence, Versus mode provides a platform for players to stake tokens on their side where the returns are determined by the opposition, instead of a centralized organization providing the odds. This provides a more transparent system where all the inputs and outputs are determined in a peer-to-peer fashion, given this, Versus mode will not award a loot box to the winning side. Versus mode does not affect supply.

## 4.4 Loot Box

Loot boxes can be purchased with \$MONEY or BNB. When purchased with tokens 90% of the total cost is redistributed as dividends to \$MONEY token holders and 10% is permanently burned. Holders also benefit from the deflationary pressure caused by the burned tokens.

The dividends are distributed proportionately to the number of tokens held by an account. Each Monday a snapshot is taken where user's balances are recorded, the users will then be able to claim a percentage of the total dividends owed to them. If a user wishes, they can let their dividends accumulate and retroactively claim them to justify claiming them. This can be a useful mechanism for smaller holders of \$MONEY where the gas cost to claim one week's dividends may not justify the value of the dividends.

If the Loot box is purchased with BNB, 50% of the cost is held on the contract itself and will be added to the next lottery winner as BUSD, the other 50% will be sent to the dev wallet. This means that the lottery prize gets even bigger.

Regardless of whether a Loot box is purchased with BNB or \$MONEY, a 0.01 BNB charge will be levied to cover the cost of the Chainlink VRF call. This functionality is important as, without it, a situation could arise where many VRFs are being called for and LINK is being consumed without the marketing wallet being able to cover these costs. Whenever a Chainlink VRF call is made on-demand by the user, they will pay an appropriate amount of BNB. As the price of BNB and Link fluctuates, this charge will be adjusted to reflect this.

Given the VRF call is made on-demand for the lootbox, the user must pay for 2 transactions. The first makes the VRF call, and after 10 blockchain confirmations the user must run a second transaction to mint their NFTs, this will be based on the number returned by the VRF.

Common NFTs are not winnable in any loot boxes as these can only be purchased with tokens in the Marketplace. Similarly, to Lootboxes, 90% of the \$MONEY cost is distributed as dividends, the other 10% is burned. A percentage of higher rarities of NFT is also available for purchase from the Marketplace, but the majority will need to be won in games, loot boxes or upgraded. The higher rarities are only available to purchase with BNB. Similarly, to Loot Boxes, 50% is swapped into BUSD for the lottery and 50% is sent to the dev wallet.

## 4.5 The Lottery

The Lottery automatically enters all holders of the token into a "pool" each pool can hold 100 holders. Whenever a user in the pool performs a transaction, whether this is a buy/sell/ minigame or buying an NFT, the overall balance for the user's pool is adjusted.

The more tokens held by an individual, the better the chances of winning the lottery. This creates buying pressure as people try to accumulate more tokens so they can win the lottery, winners of the lottery are also able to claim an NFT prize.

When the lottery is called once a week the smart contract will call VRF - once the number has been returned the smart contract will calculate which pool has the winning holder, it then finds the winning holder within that pool - this process is significantly more efficient than looping through the token balances of all users. This ensures the lottery system will scale with an exponentially large number of users as the maximum number it will loop through is 100 (the size of a pool)

## 4.6 NFT Upgrade

This game allows users to burn 2 NFTs of the same rarity to produce 1 NFT of the rarity above. It is not possible to upgrade Legendary NFTs. Due to the on-demand nature of the VRF calls in the NFT upgrade there will be two charges to the user, similarly to the Loot box. The first charge will be 0.01 BNB The second charge will be significantly cheaper. Gas costs remain consistent across NFT upgrade calls.

## 4.7 Claim Rewards

Claim rewards acts as a hub for users to get a comprehensive overview of any rewards owed to them. From this dApp, users can claim their dividends, token rewards from games that don't award tokens automatically and any owed NFT prizes. Unopened Loot boxes can also be claimed in this dApp, if for instances, a user disconnects or leaves the page during a loot box purchase.

## 4.8 The Front End

Whilst Money Tree has been developed to work fully on-chain and independently of a centralised front-end, the user experience is significantly reduced in the absence of an easy to use front-end. Hence, the website includes a front-end web application for each of the above dApps,

The front end allows users to connect to Metamask and send web3 transactions through the front end. The end users experience is significantly more pleasant and less prone to errors using the front end; however, it is worth noting that \$MONEY can operate independently of any front end due to its fully on-chain design.

# 5 Future Development

## 5.1 Full Automation

Money tree aims to be a fully automated process that requires no manual intervention at any stage. Further integration with Chainlink is planned during Q4-21 to add Keeper capabilities.

Keeper will allow any functions currently being manually run, for example, the lottery, to be run on a periodic basis and in an automated fashion. Triggers can be set up to ensure that Keeper maintains all aspects of the smart contracts "upkeep." This will further enhance the decentralized design of Money Tree and will provide investors with more confidence and security.

## 5.2 Future games

Money Tree has been designed to have full mini game and NFT functionality on launch - this was to ensure users can benefit from a complete platform on day 1 without being reliant on promises and plans in a roadmap. Due to the rapidly changing nature of the industry, Money Tree will be constantly looking to expand the existing collection of games. Plans to utilize the NFTs attack, health and magic stats are in development and should be available by Q1-22 at the latest.