

## About the document

This is a technical overview of the upcoming C.A.T. game with a more detailed overview of internal game mechanics. Please remember that all the numbers, equations and game mechanics described here will go through a rebalancing process and are subject to change. However, we thrive on feedback, so please let us know what you think in the Discord server. Without further ado, are the main elements of the game:

## Catto NFTs

Each Catto NFT has various attributes, that will be stored as metadata on IPFS. Proof of ownership is then going to be stored on the Ethereum blockchain. These attributes are easily divided into two groups:

1. Visible attributes - recognizable attributes (background, fur color, lower left item, facial expression), those also determine the NFT's rarity
2. Hidden attributes - that are crucial for the NFT's performance in the game. These include the Catto's level and the amount of experience points it has

Gaining experience - a Catto will receive experience on completion of any mission, if the mission was completed unsuccessfully, the experience yield is going to be cut by 50%.

| Level    | Experience needed | \$SINDRI needed | Level    | Experience needed | \$SINDRI needed |
|----------|-------------------|-----------------|----------|-------------------|-----------------|
| Level 2  | 1000              | 10              | Level 12 | 2712              | 20              |
| Level 3  | 1100              | 10              | Level 13 | 2983              | 20              |
| Level 4  | 1265              | 10              | Level 14 | 3281              | 20              |
| Level 5  | 1392              | 10              | Level 15 | 3609              | 20              |
| Level 6  | 1531              | 15              | Level 16 | 3970              | 25              |
| Level 7  | 1684              | 15              | Level 17 | 4367              | 25              |
| Level 8  | 1852              | 15              | Level 18 | 4804              | 25              |
| Level 9  | 2037              | 15              | Level 19 | 5284              | 25              |
| Level 10 | 2241              | 15              | Level 20 | 5813              | 25              |
| Level 11 | 2465              | 20              |          |                   |                 |

Levelling up - once a Catto gathers enough experience, it can level up. Levelling up is going to reduce the XP of the Catto in its metadata to 0 and set a new XP cap based on the Catto's new level. A Catto can only have as much experience as is required for it to level up (etc. on level 5 the Catto cannot have more than 1392 experience). In addition, it is going to require burning a certain amount of \$SINDRI from the players' wallet. Levelling up is going to be progressively harder, with each level up requiring more resources than the previous one. A table of requirements to level up is included below.

The Catto's experience level determines how efficient it is in completing missions and therefore earning \$SINDRI. The higher level a Catto is, the easier it is for it to successfully complete missions, making the levelling system important in the game's P2E functionality.

Note: The amount of necessary \$SINDRI varies from level to level, and the amount of experience required to reach the next level is always 10% more than the previous one.

## Missions

Missions are the main vehicle that allows players to earn resources. They are dynamically generated from a pre-determined set of parameters, these include:

- Mission length (6,12,24,48) hours. The algorithm is offset so that 12 and 24 hour missions are the most common.
- Mission minimum level (1,10, 20)
- Mission optimal level (randomly determined from an range of possible levels for the mission)
- Mission name + description (short piece of lore) - this does not influence the mission's yield of resources.

New missions will be available every 24 hours. These will be generated randomly through an off-chain algorithm. A player will be able to refresh missions instantly in exchange for \$SINDRI. When a player has more Cattos and sends one on a mission, a new set of missions will be generated instantly - the aim of this is to not punish players for owning more Cattos and always give them fresh options to choose from.

| Level 1-5 | Level 6-10 | Level 11-15 | Level 16-20 |
|-----------|------------|-------------|-------------|
| 70 %      | 75 %       | 80 %        | 85 %        |

Technically, a mission in the back-end is going to be a smart contract written in Solidity. It is going to take in randomly drawn inputs (as described above) to determine its length, level requirements and reward pool. For the duration of the mission, the NFT will be essentially staked in the contract.

At the end of the staking period, there will be several semi-random rolls to determine if the mission was successfully completed or not, how much experience does the Catto receive and how much \$SINDRI is going to be awarded for completion. After that, the NFT is going to be released from the contract with a new amount of XP stored in its metadata.

Successful mission completion - at the end of each mission, there is a base chance to complete a mission successfully. This base chance increases as Catto NFT keeps levelling up to symbolize the Catto becoming a better agent. You can see the base chances depending on levels below:

These values directly transform into a number from 0-100, which is then going to be offset by further modifiers - most commonly those that are caused by Optimal level, which is going to add or subtract from the base chance. That creates a total number referred to as the Mission score.

In addition to the Mission score, there is a random number picked from 0-100, which is then compared to the Mission score. If the mission score ends up being higher, the Catto has successfully completed the mission. If the mission score ends up being lower than the random number, the mission was unsuccessful.

In future updates, there will be further options to offset the Mission score, such as equipment that Cattos will be able to take with them. There might be special events with hard missions that will lower the mission score and in turn have higher rewards. All of these are in the pipeline.

Optimal level - optimal level is a mechanic that is meant to add depth and diversity into gameplay. At a moment of dynamic mission generation, a mission is assigned an optimal level for a Catto. In combination with the Catto NFT's level it has impact on potential rewards and it can potentially increase or decrease chances of successful mission completion. We are using Python 3 for simulating our game's economy, so for the nerdier of you, here's a snippet of code that shows how optimal level is worked with:

|  |   |
|--|---|
| <code>OL_limD=lvl-8</code>               | <code>#optimal level lower limit = Catto's level -8</code>              |
| <code>if (OL_limD&lt;1):</code>          | <code>#if the lower limit is less than 1, make it 1</code>              |
| <code>    OL_limD=1</code>               |   |
| <code>OL_lomU=lvl+8</code>               | <code>#Optimal level upper limit = Catto's level +8</code>              |
| <code>OL=randint(OL_limD,OL_lomU)</code> | <code>#Optimal level is a random number within the defined range</code> |

| Level           | \$SINDRI modifier | Difficulty modifier |
|-----------------|-------------------|---------------------|
| OL - 5 and more | 0,625             | 0,3                 |
| OL - 4          | 0,7               | 0,24                |
| OL - 3          | 0,775             | 0,18                |
| OL - 2          | 0,85              | 0,12                |
| OL - 1          | 0,925             | 0,06                |
| Optimal level   | 1                 | 1                   |
| OL + 1          | 1,075             | -0,06               |
| OL + 2          | 1,15              | -0,12               |
| OL + 3          | 1,225             | -0,18               |
| OL + 4          | 1,3               | -0,24               |
| OL + 5 and more | 1,375             | -0,3                |

Below is a table of how Optimal level can influence the mission difficulty and its \$SINDRI rewards. Experience is not impacted by Optimal level, but rather by completely random chance as that would make random chance too influential on results of the game.

## Mission rewards:

There are two possible rewards for completing a mission:

1. \$SINDRI - the amount of \$SINDRI is directly based on the Catto's level and offset by random chance. The chart for base \$SINDRI yield is below, the equation for the random modification at the end of the mission is below as well.

**\*\*TO BE ADDED\*\***

2. Experience points - experience yield is always influenced by the length of the mission and a modifier that is randomly determined before the start of the mission. The amount of experience received is not influenced by the Catto's level itself and is available to the player before they choose which mission to pick. The base experience yield is 20 experience points per hour spent on a Catto mission.

$$\text{Total experience yield} = (\text{BY} + \text{RM}) * \text{ML}$$

BY - Base Yield

RM - Random Modifier (up to 3 xp points added or subtracted from the base xp count)

ML - Mission Length in hours

## \$SINDRI tokenomics

\$SINDRI is going to be a backbone not only for the C.A.T. P2E game, but for the whole community and Sindri Labs brand. At the moment of writing this material, a test script is being developed in Python 3 that is going to simulate the economy of the game and is going to allow us to balance the tokenomics so that they can be sustainable long-term.

Below you will find key characteristics, that are going to define \$SINDRI:

### **\*\*TO BE EXPANDED\*\***

In the beginning, \$SINDRI will not have any USD value assigned to it. It is simple, 1\$SINDRI = 1\$SINDRI. Once we have properly tested out the economy through real gameplay with real users, we will create a liquidity pair, most likely with the MATIC token. The concrete exchange where this is going to take place is being negotiated. That is going to give SINDRI an initial monetary value and it is going to really make the play2earn game model come alive. The value that will be assigned to \$SINDRI are going to be announced after the mint when we test out the economy as a whole.

## Game UI

The game's user interface is going to be rather simple. There will be a welcome screen that is going to prompt players to connect their Metamask wallet. When players connect their wallet, they will be taken to a game screen, that is going to show the following:

- player's Catto NFTs + their status (level, experience, are they on a mission? How long before they come back?)
- three possible missions that players can choose from
- player's \$SINDRI balance + button to withdraw \$SINDRI to player's wallet
- player's Ethereum wallet address

We will be releasing sneak peek concept art as our designer works on the game, layouts and possible ways to put everything together.

## Project Timeline

Below is a first version of our development timeline - roadmap 2.0. It is an early concept that includes some of the future plans and visions we have for the project. The final version broken down into tasks for each month is going to be released as soon as the sale of our NFTs finishes.

### Q2/22 - **Lay down the base**

- successfully sell out the collection
- build the community
- have frequent collabs with other projects
- expand the team

### Q3/22 - **Game prototyping/testing**

- prototyping of the p2e game
- testing on the polygon testnet
- testing \$SINDRI and its economy on polygon testnet
- deployment of game on Polygon mainnet
- release of \$SINDRI on Polygon mainnet

### Q4/22 - **The project economy comes alive**

- creation of \$SINDRI - MATIC liquidity pool
- C.A.T. merch store comes online
- development of further p2e game mechanics

## Final word

This is a summary of essential gameplay mechanics that we are looking to implement in early prototypes of the game. As future generations of Cattsos are released, we will be releasing updates to the game itself. These will add depth, further use cases for \$SINDRI and a lot more.

We already have some unique ideas that we want to expand on, but for now we want to focus on the best possible execution of concepts described in this document. You can bet that we are going to tease every possible update as we are just as eager as you to see what the future holds for C.A.T.!