Hool Whitepaper v1.1

Build up NFT team - Play To Earn - Cultivate your loyalty to the club

Abstract

The top of the most popular sports list resides football, the phenomenal team sport that acquires millions of players and billions of fans worldwide. In the eyes of its supporters, its fanatics, and its hooligans, football is not considered only as a sport but rather as a mainstream international competition. However, the lack of bidirectional interaction between football clubs and their fans and missing long-lasting contributions from fans' support to football clubs permanently hinder the development of this sport.

Furthermore, thanks to its notoriety, football inspires several games in various categories. These related games are controlled by centralized parties, which can compromise the data, the results, and the value of any rewarded assets. Thus, play-to-earn, the tremendous gaming phenomenon, is also restrained by this centralization of football games.

This paper introduces Hool, a blockchain-based game that utilizes a decentralization process to ultimately delegate the management of game results and economics to its users. The Hool system also gives fans the power to interact with their football clubs and support their favorite players sustainably. Last but not least, Hool aims to convert the value of loyalty into mutual benefit for

users and clubs in the long run, described in its motto: Build up NFT team - Play To Earn - Increase customer loyalty to your club.

1. Introduction

Football is unarguably the most popular sport worldwide. In the 2018 FIFA World Cup, there were three billion viewers on TV worldwide, and seven million fans visited the fan fests. The European football market generates total annual revenue of more than 30 billion. A whole industry is dedicated to serving football fans and making revenue for clubs. However, fans have few ways to interact with their favorite clubs. In addition, Supporters' contribution to football clubs is discrete and momentary. These facts expose this industry to instability and hinder the growth of this sport in general.

A new fans support channel was established using Fan Token as a medium of contribution toward clubs. More than 20 clubs then adopted this direction that created their own Fan Token. The total market cap of fan tokens is around 270M USD (on 2th Jun 2021). Meanwhile, the total market cap of Chilliz Coin (Chz), a startup that issued football fan tokens, is 1.6B USD (on 2th Jun 2021). However, the only token utility of CHZ Fan Token is that holders will be able to vote in a wide range of polls on Socios.com shortly. As a result, CHZ cannot incentivize football clubs and players to endorse their supporters.

Another use case of blockchain in the football industry is decentralized NFT games. NFT is an emerging trend in the blockchain community. In more detail, around 150M USD is spent on completed sales of NFT in May 2021. The decentralization opens the gate for the transparency of exchanges of items or collecting rewards in games that ultimately boost the P2E (Play to Earn) phenomenon. TopGoal NFT and Sorare are football blockchain-based games where users buy, sell, trade, and manage a virtual team with digital player cards. While TopGoal NFT operates on Binance Smart Chain, Sorare operates on the Ethereum network. The two projects are focused on the collection of Player cards. The game is just an add-on part of two platforms, where players compose five players as a team without considering the tactical or tradition of a team/club. As a consequence, the relation between users and football clubs is not significantly emphasized.

This paper proposes the Hool system, a decentralized football game that includes the following notable features:
1. **Stake to Play** concept is implemented using loyalty farming protocol, in which users do not need to consume any of their Hool tokens for the basic gameplay features. The only mandatory cost for the game is an investment in Hool tokens.
2. Enhancing the **Play to Earn (P2E)** concept where gamers can simultaneously take profits from the internal reward system and the NFT marketplace.

3. **Fairness** in the general system and gameplay is achieved using **decentralization** processes, including a multi-party random generator for football matches, decentralized data oracles for game updates, and a DAO that controls system management and development.
4. Loyalty-oriented NFT eco-system built by fans promotes the long-lasting fans' contribution and incentivizes football clubs and players to endorse their supporters.

The next section of this paper is dedicated to describing the Hool system and its relevant features. The following part introduces the Hool game, the underlying value of this system. Then, the following section presents a roadmap for the game and the procedure before finishing by the tokenomics of Hool.

2. The Hool universe

The Hool Univer encompasses all the elements that allow Hool to operate, including Hool Club NFT, the Hool token, the Fuel token, the marketplace, the Hool Vault… in this section, we will introduce the definition of each element in the Hool Universe.
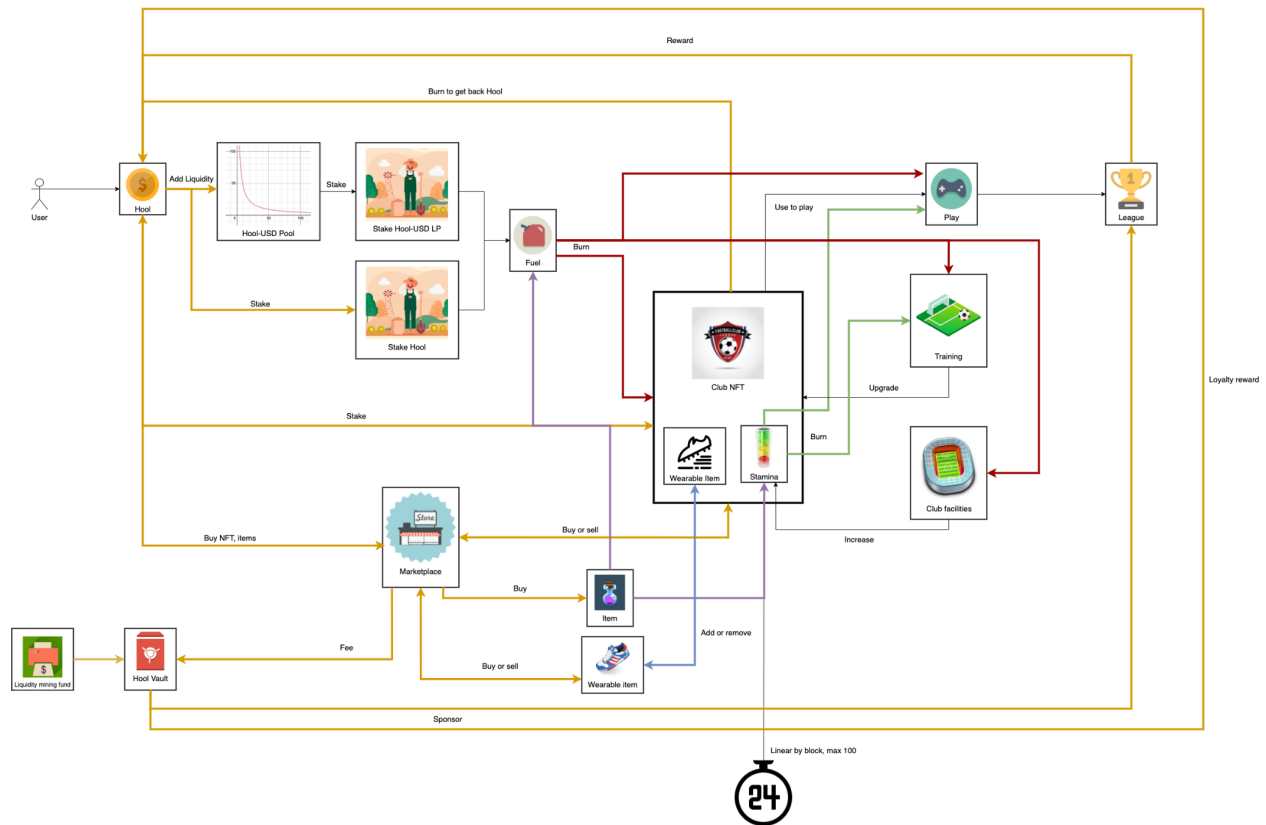
2.1 Tokens

2.1.1 Hool tokens

Hool token is the core cryptocurrency that bootstraps the general system and game economy. Hool tokens are standard ERC20 (BEP20) tokens that perform the role of currency, thus, are transferable between users. Outside of the Hool system, Hool tokens may be available in any DEX or CEX after its listing. Hool tokens will be subjected to a fair ICO in the beginning phase and continuously distributed to users in the form of game rewards.

Hool tokens can be used for farming Fuel tokens, staked to mint Club NFT, and consumed as bidding/asking fee in the NFT marketplace and some advanced game features. The consummation of Hool tokens generates a buying force that maintains and grows their value.

In addition, Hool vault also uses Hool tokens as a reward for users who participate in leagues or daily matches. This enhancement of the **play-to-earn** concept benefits every gamer by generating stable income regardless of the supply/demands status of the external market.

Another critical use case of Hool tokens is the right to vote in DAO's proposals. Hool tokens bootstrap the decentralization features of the Hool system, which protect users from centralized parties. Voters of DAO's proposals can also be rewarded by raising their loyalty metric, which indirectly increases their long-term results. Thus, the Hool tokens are also the incentives that encourage DAO management participation of the Hool community.

2.1.2 Fuel tokens

Fuel tokens behave like an internal money-like game asset dedicated to each user; thus, they are not transferable and correspond to a specific club model. Fuel tokens are consumed for participating in every activity corresponding to the club NFT, such as match playing, training, and recovery. Fuel tokens do not have any value outside of the system as their owners can not buy or sell.

Users can stake Hool tokens or LP tokens of a liquidity pool to farm Fuel tokens. This process represents the core concept of "**Stake to play**" in its earnest form. In this way, the system fuses two types of actors: users and investors, which encourages users to invest and investors to play. Thus, this concept enhances the link between Hool currency and the Hool game, the underlying use case of the system. The farming of Fuel is implemented based on the loyalty farming protocol, which encourages and rewards Hool holders for their long-term contributions and their

frequent participation. One can find the details of the formula in .

2.1.3 Loyalty farming protocol

Loyalty farming protocol is a novel concept that encourages long-term and continuous contributions toward an expanding system in liquidity mining and staking bonuses. Users' loyalty is evaluated by different loyalty metrics: long-term commitment, ecosystem contribution, and activity frequency. The long-term commitment metric emphasizes the long-lasting contribution of users toward the liquidity protocol and the system. In the case of Hool, this metric is applied to calculate the number of rewarded Fuel tokens for each user depending on their loyalty to a club model. Ecosystem contribution metric motivates users to contribute to the ecosystem of Hool; for example, users who hold not only Hool tokens but also partners' tokens such as Football fan tokens also gain a bonus. Finally, the activity frequency metric appreciates the participation of users in the game; the more they play, the more rewards they get.

2.2 NFT

2.2.1 Club NFT

Hool clubs are NFTs principal entities in the game, each user can process multiple Club NFTs, but they can use only one Club NFT to play at a time. Each club NFT possesses five attributes that determine their overall value, style, and experience within the Hool universe - collateral value, model, traits, stamina, and wearables.

To mint a Hool Club NFT, we need to stake a specific Hool token as collateral in the collateral value. This mechanism prevents mass creation and controls the total number of Club NFT while preserving the decentralization feature where any user can create any Club NFT. The staked amount may be variated for each club which helps to maintain the fairness of the system.

Collateral value

Collateral value is the amount of collateral Hool token staked to mint the Hool Club NFT. Each Hool ERC721 NFT stores the amount of staked Hool token. Transferring a Hool Club to a new owner also transfers its staked collateral. If the Hool Club owner desires to get back the collateral, they can burn the Hool Club NFT and receive their collateral back.

NFT Model

Each Club has traditional traits and will initialize the Hool Club NFT's traits in minting. The corresponding real-life football club inspires the conventional characteristics of each Club. Moreover, each Club has its default tactic. In addition, if a Club plays in its default tactic, the system will add a bonus when stimulating the match as the Club is familiar with the tactic. The traditional traits are determined when the club model is created and rarely change.

"Form is temporary, but class is permanent." Apart from the traditional traits that describe the "class," the Club Model also includes performance traits representing the "form" of the Club. The performance traits frequently change based on the real-life result of the corresponding counterparty that eventually connects the NFT and the Club. A (decentralized) data oracle can be used to update the models' performance traits according to the vote of DAO.

To motivate users' loyalty to a specific Club model, the system enforces the unchangeability of the Club Model attribute in the NFT. Moreover, it can use only the Fuel token related to the model for any activities.
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Traits

Hool clubs NFTs possess multiple traits that influence their performance in matches, including **attacking, vision, technical, speed, defending, physical, aerial, and mental.** These traits are determined based on the traditional and performance characteristics of the NFTs' model. Features also consider the wearables, NFTs' experiences, NFTs' stamina, and the loyalty metrics of their owners. The tactic choice of users also affects the traits evaluation. More detailed information about each type of trait is presented in the gameplay section of this paper.

Wearables

Some wearables can increase specific attributes of a Club NFT. Some wearables ameliorate the Club NFTs' traits, such as shoes for speed boosting, gloves for defense enhancement. Some other

wearables can lower the state penalty of Club NFTs like a bus can decrease the effect of low stamina.

Wearables are also stored in the form of NFTs. Wearables can be obtained through the internal game store by consuming Fuel Token and Hool Token. Excellent non-binding wearables can eventually be traded through the NFT marketplace.

Stamina

Stamina is a specific attribute in club NFT that limits the number of practical activities that one club NFT can perform in a particular period. Stamina has a maximum of 100 and can grow by a constant number in each block until it reaches 100. Whenever a user uses the NFT to play a football match or an activity, a portion of stamina will be spent. Stamina can be recovered after time or by using specific items or facilities. While recovering stamina by items creates a channel to exchange from Hool token to stamina instantly, recovering stamina by facilities encourages an early investment in the game for long-term benefit.

Stamina limits the growth rate of NFTs that keeps the game fairer in the long run. If the Fuel token increases permanently without a reachable cap, thus, favors the early backer of the Hool system, the stamina system benefits the regular gamers who frequently play Hool.

2.2.2 Loyalty oriented NFT framework

The loyalty-oriented NFT framework is a framework for building a specific class of NFT that represents a loyal relationship between users and real-world models. In the case of Hool, these models are club models. Through this NFT system, users can contribute to their favorite football clubs, and these clubs can acknowledge their supporters by accepting or promoting this contribution. The bilateral interaction between these clubs and supporters can furthermore enhance the intrinsic value of NFT.

Thanks to this framework, users are encouraged to participate in promoting and utility activities to develop their NFTs further, leading to acknowledgment from club models. Clubs have economic and sentimental incentives to accept these NFTs and approve the contribution of their supporters. The novel framework creates an interaction channel where supporters can pay tribute to their favorite models and seek the club's acknowledgment.

2.2.3 NFT evolution

The NFT evolution mechanism is introduced based on [the loyalty-oriented NFT framework](). NFTs store an experience index that grows after each activity. When the experience metric surpasses some thresholds, NFTs can eventually evolve and gain more power. The result of actions affects the growth rate of NFTs, which makes NFTs from the same model become different. Excellent gamers can create and train their NFTs to an elite state to win various tournaments.

The growth rate of NFTs can also be affected by their owners' loyalty. Users' loyalty can be measured by many indicators, including users' activities, users' pooling time, or users' portfolios of fan tokens. This mechanism encourages fans to play with their favorite clubs and stay loyal.

2.2.4. Marketplace

Users can sell their Club NFT or non-binding wearables items through the marketplace. They can eventually buy NFT/wearable items from other players; they can also purchase items to boost Fuel or stamina. Each transaction in the market will pour an amount of Hool token as a fee to the Hool Vault.

The underlying value that distinguishes a club NFT is its experience metric gained from game activities. A club NFT's price depends on the collateral value, experience metric, and supply/demands of the market. In the Hool ecosystem, the marketplace is the core supporting entity that allows implementing the concept "**play-to-earn**."

2.3 DAO

2.3.1 Hool Vault

Hool vault is the smart contract that stores fees collected from the marketplace and Hool tokens from the Liquidity mining fund. Hool Vault then distributes the Hool tokens as bonuses for users who participate in the Hool ecosystem. Hool Vault is the second entity that allows implementing the concept "**play-to-earn**." Hool Vault rewards activity participants based on their results and based on activity types. Results can be win/lose/draw for a match or ranks in a league. Activity types can be classified by their scope, duration, and impact: monthly global leagues, weekly

regional leagues, and daily matches between random users. The Hool Vault does not fix a reward amount for activities but shares the total epoch reward amount to every user based on their participation. As a result, users are motivated to play the game frequently and make the game vibrant.

2.3.2. Hool DAO

Hool DAO's ultimate goal is to delegate complete control of the Hool system, including all game mechanics and funding, to its users. We will accomplish this goal in three phases.

1. In the first phase, the Hool team will be the entity that proposes different proposals relevant to any protocol changes, game mechanism, parameters. Hool DAO will be able to accept/reject or choose the best options through voting. In this phase, the system expects that the community is still on its early dates and is not mature enough to carry system maintenance tasks.
2. The second phase inherits the ability of the first phase. In addition, Hool DAO will propose parameter updates and validate/revoke data oracle. In this phase, the system expects that the community is mature and can maintain the system. However, the Hool foundation and core team still control the rhythm of system development.
3. The final phase inherits the two first phases and allows Hool DAO to propose any protocol or game mechanism and even funding. In this phase, the contribution of community devs outside the core team becomes more important. The DAO gains full control of the Hool system, and the core team can not manage the system in a centralized manner.

3. Game play

3.1 Club NFT Traits

Hool clubs possess multiple traits that influence their performance in matches.

Attacking

The trait attacking defines how good a club is when they are in attack. There are two principal types of attacks: pass and cross in a match.

Vision

Vision shows us the ability of a club when its players pass the ball or shoot on target. An ideal vision improves the ability to shoot on target and improves the chance the pass is successful.

Technical

A club has a better technical trait meaning they can keep the ball in between their players longer than the adversary. The vision that determines the chance the pass is a success, hence it also determines the probability of possession.

Speed

On the other hand, speed is the crucial trait when a club often uses the cross to attack as their winger player will be faster than the defender; hence, they can cross the ball.

Defending

The ability to defend a club allows determining the probability of blocking an attack from the adversary. The trait defending has impacts on both types of attacks (pass and cross). And a block of attack also opens a chance to counterattack.

Physical

A club with an excellent physical trait can easily block and defend against a pass; together with the trait defending, it defines the probability to block a pass.

Aerial

Aerial is the ability to win a header when attacking or defending.

Mental

The mentioned above traits are tactically related; only mental is the trait that is not associated with the tactic but impacts how we determine who is controlling the game. In other words, it affects possession.

As we explained before, when minting NFT, a fundamental value for each trait of NFT is initialized based on the club model. From these essential traits, the trait of one club NFT could be improved over time by training or winning/losing a match or a league.

Moreover, the traits that will be used to simulate a match are also considered bonuses from the tactic and wearables. The impact of wearable items available at launch is illustrated in the following table:

Wearable item	Defending	Physical	Speed	Vision	Attacking	Technical	Aerial	Mental
Glass	0	0	0	1.2	0	0	0	0
Bus	1.2	0	0	0	0	0	0	0
Shoe	0	0	0	1.2	0	0	0	0
Headband	0	0	0	0	0	0	1.2	

3.2 Activity

There are three main activities for club NFT: match, training, and recovery. Each activity for club NFT requires several Fuel tokens. Moreover, when playing a match or training, it consumes stamina. Stamina is actually not a must, but it can affect the result of a match or performance of training. If the amount of stamina in the club NFT is not enough, their performance will be affected. When performing the activity, the required stamina or the rest of the stamina (if it is not enough) will be deduced. To recover stamina, users can also perform the recovery using stadium facilities which will burn an amount of Fuel; they can also buy items in the marketplace to recover stamina.

Unlike stamina, the amount of Fuel for each activity is a must; otherwise, the activity is hardly performed.

3.2.1 Match

In this activity, users can play against other users thanks to the introduction of match simulation. A user can use the Club NFT to play against another user online (if they accept the challenge). The club's traits will be used in the game; the user can also choose the tactics they want the club to play in this match. Each tactic has a different impact on the club's traits.

Tactics

The following table resumes the impact of tactics on club traits when we use to play.

Tactics	Defending	Physical	Speed	Vision	Attacking	Technical	Aerial	Mental
Long ball	1.0	1.0	1.1	1.1	0.9	0.8	1.2	1.0
Tiki taka	0.9	0.8	0.8	1.2	1.1	1.2	0.8	1.0
Counter attack	1.1	1.1	1.2	1.0	1.0	1.1	0.9	1.0
Park the bus	1.2	0.9	1.0	0.8	0.8	1.0	1.1	1.0
Gegenpress	0.8	1.2	1.1	0.9	1.2	0.9	1.0	1.0

Note: Different tactics consume different stamina
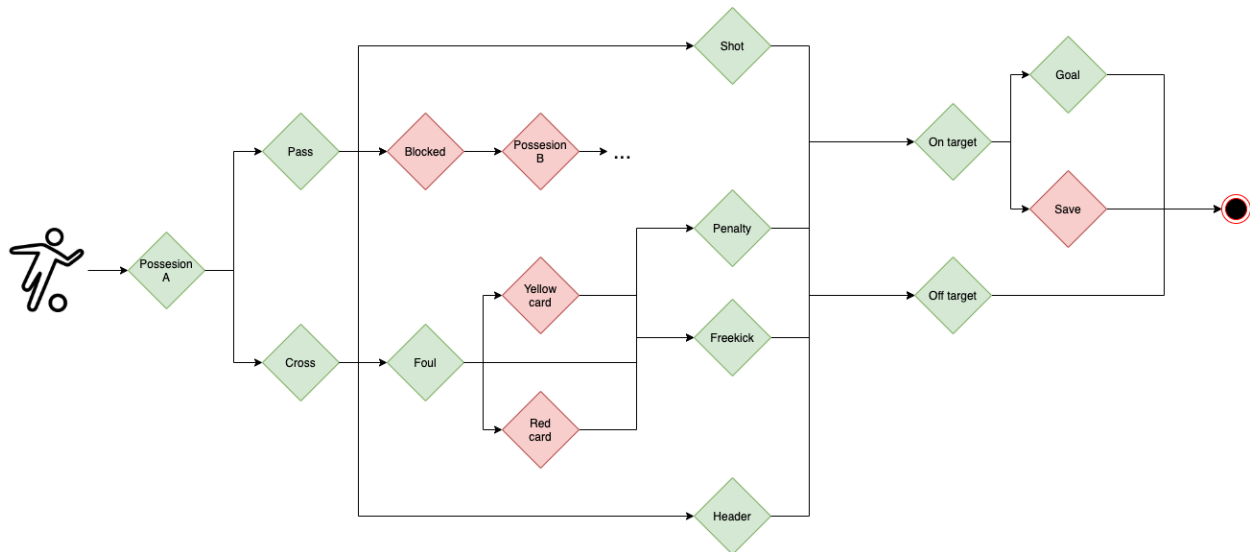
Match simulation

Match simulation in the Hool system is implemented using decentralized random number generators (RNG). In a match between two teams, a multi-party RNG can be employed to preserve the game's fairness. If the match is a training activity versus the system, the result is generated using the Chainlink verifiable random function.

The generated random number and the traits parameters of teams are used to interpret match results. For example, in a match between team A (40% chance to win) and team B (50% chance to win), a random number is generated to take a value from 1 to 100. If the number is less or equal to 40, team A wins; if the number is from 41 to 50, a draw happens. If the number is greater than 50, it is a winning match for team B. The random number is also utilized to interpret the score of the match. The interpretation of match scores is fully processing on-chain using a smart contract. This result and score affect users' reward amounts and club NFT's growth rate. An example of match result interpretation is presented in the following table.

Random number	Team A wins	Draw	Team B wins
[1,10]	1-0		
[11-20]	2-1		
[21-30]	2-0		
[31-40]	others		
[41-45]		0-0	
[46-48]		1-1	
[49-50]		others	
[51-65]			0-1
[66-70]			1-2
[71-85]			0-2
[86-100]			others

Example for a match interpretation.

In the game's UI, a series of events are also generated based on this random number. The detailed interpretation must stay coherent with the on-chain one. The complex event series does not affect the Hool system reward mechanism but ameliorates users' experience in the gameplay.

In a more sophisticated and interactive version of match simulation, the system can define a series of checkpoints in which the match will be paused. In a checkpoint, users can adjust their tactic and formation based on the score of previous periods. The game is resumed after two teams have adapted their setting or after a threshold. If no change is submitted, the current tactic will remain.

3.2.2 Training

To improve the club's traits, users can train their Club NFTs. There are different types of training to boost the club's traits. The following table resumes the basic effect of each training type:

Training	Defending	Physical	Speed	Vision	Attacking	Technical	Aerial	Mental
Cross	0	0	+1	+1	0	0	+2	0
Pass	0	0	0	+2	+1	+1	0	0
Run	0	0	+2	0	0	0	0	0
Defend	+2	+1	0	0	0	0	0	0
Attack	0	0	0	0	+2	0	0	0
Gym	0	+2	0	0	0	0	0	0
Technique	0	0	0	0	0	+2	0	0

3.2.3 Recovery

Recovery is the activity that allows to increase the stamina of a club using Fuel.

3.3 League / rewards

Users in Hool can join a league and play against other players to win rewards which the Hool Vault sponsors.
Besides, we also reward users using the activity frequency metric in the loyalty farming protocol. More specifically, in the first phase, the activity scoring is equal for each activity (buy/sell NFT, training, match, recovery).

4. Roadmap

4.1 Phase 0 (Q3 2021)

- Release MVP in Testnet
  - Fuel farming using loyalty farming protocol
  - Stake Hool to mint NFT
  - Training NFT

4.2 Phase 1 (Q4 2021)

- Mainnet release
- Match simulation
- Update building and facilities for training and recovery

4.3 Phase 2 (Q1+2 2022)

- Buy/sell NFT, items, wearable items on the **marketplace**
  - Marketplace allows users to jump into the game rapidly by buying Club NFT directly in the marketplace. Current users can also make money by selling their NFT in the marketplace.
  - Users can also eventually buy items in the marketplace to boost their Fuel or Stamina.
- Vote for game parameters via DAO
  - In this phase, users can vote game parameters for match simulation or league via Hool DAO.
- Build **tactic** in a match
- Mission/event system

4.4 Phase 3 (Q4 2022)

- Mint NFT players

A new type of NFT will be introduced called NFT players, similar to Club NFT (**intrinsic value, model, traits, stamina, and wearables**). However, these NFTs will be based on the model of real players. The traits for an NFT player are identified for a club NFT. From this phase, each NFT club will consist of a squad of default NFT players. These default NFT Players have an intrinsic value equal to zero and therefore cannot be bought/sold on the marketplace or burned to get back Hool tokens. Users can mint a specific NFT Player and replace the default NFT Player in their squad.

- Buy/sell NFT players

Users can also buy/sell their NFT players in the marketplace, new items, and wearables items for NFT players.

4.5 Phase 4 (2023)

- Simulation v2
  - Users can combine NFT players into their squads.
  - A novel match simulation that takes into account NFT players' traits is introduced to replace the old one.
- NFT evolution

4.6 Phase 5 (2024+)

- Community development and Real-life contribution
  - Incentives for football clubs and players approve, promote, and further utilize the system to benefit and image.
  - The Hool team can organize dual events between the game and the real world for further interaction.
  - The ultimate vision of this system is a bilateral interactive channel between Hool's users and their favorite club and football players.

5. Hool tokenomics

[Hool tokenomics](#)