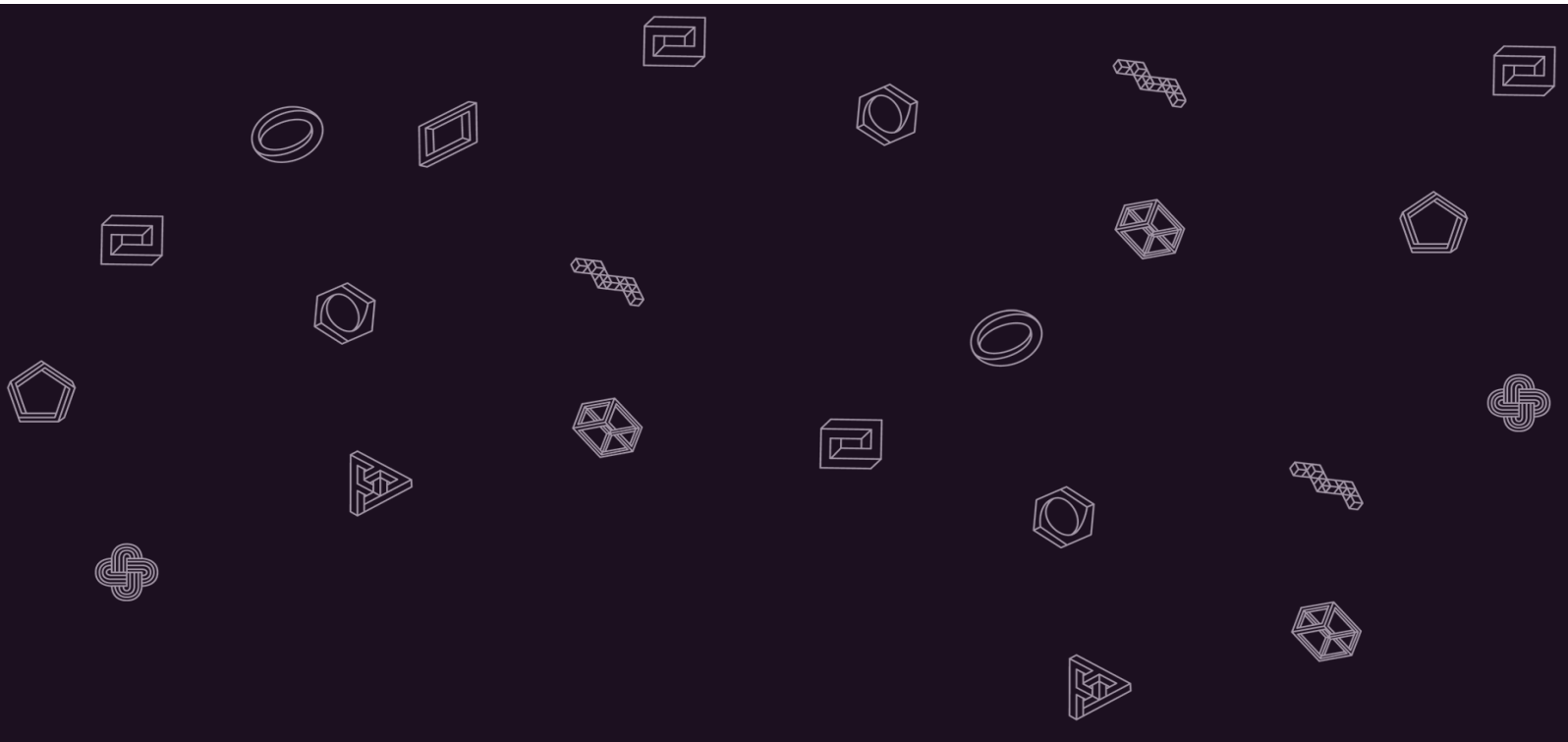
YaySwap

The first hybrid DEX platform on the Cardano Blockchain. Swap tokens in an instant, completely decentralized, and open source.

Whitepaper



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Abstract

YaySwap is poised to become the go-to decentralized finance (DeFi) solution for smart-swaps in Cardano. Our unique technology will allow traders to effortlessly execute smart contract-based trades at a fraction of the cost of similar services provided by other decentralized exchanges while safely trading digital assets,

Introduction

Over the last few weeks only, the number of native tokens on the Cardano Blockchain has increased exponentially. Once smart contracts are available on Cardano, new projects with use cases will be deployed every day. We believe that this is not a passing fad but rather something that is here to stay; especially that there is lots of use to the Cardano blockchain for businesses that need fast transactions in their business model. Therefore we will see businesses migrate their smart contracts token from other cryptocurrencies like Ethereum to offer native tokens on the Cardano blockchain. We believe this growth will create a demand for a swapping platform as users move between use cases or rebalance their tokenized portfolios. Other blockchain-based exchanges have their own set of drawbacks, all of which can be mitigated by the implementation decisions illustrated in this document. By defining a series of protocols that unlock asset liquidity and free the Cardano ecosystem from the constraints that its cryptocurrency counterparts face, we hope to provide an alternative to blockchain order books or AMM.

Why Cardano?

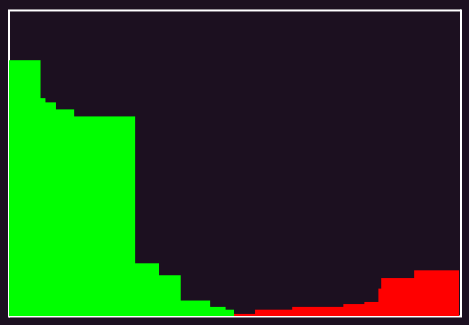
The Cardano blockchain has many advantages compared to other blockchains. It is fast, transaction fees are low, and fees can be paid with the same token sent. Although Cardano does not yet have the same degree of acceptance as Ethereum, we trust in the Cardano Blockchain's potential to attract new ventures and developers, and we anticipate a similar level of adoption in the near future.

YaySwap DEX

YaySwap is the first hybrid DEX platform on the Cardano Blockchain that integrates both an Automated Market Maker and an order book.

How does an Order Book work?

Traders place buy and sell orders for an asset, which are then organized by price in the order book. This ensures that anyone can sell any commodity as long as it has a supply and demand. The traditional trading model is used for order book exchanges.



Order Book

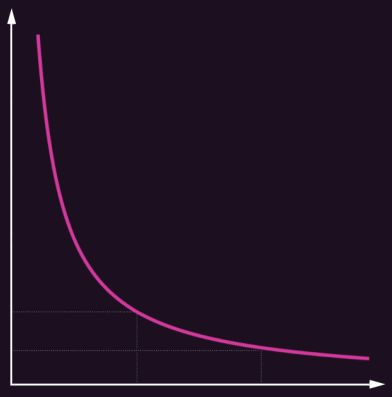
Automated Market Maker (AMM)

When an individual or an entity wants to swap two assets, an AMM is like a robot that is always able to quote a price. An AMM uses a mathematical formula to provide traders with an immediate quote based on the current liquidity of a trading pair. How? Crypto owners invest their digital assets to provide liquidity in a liquidity pool. In exchange for providing liquidity, they will earn tokens from the fees the DEX receives. To put it another way, instead of getting a price from an order book, the price is calculated using an algorithm.

Constant Function Market Makers

CFMMs are the first Automated Market Makers (AMMs) to be expressly designed for use in real-world capital markets. They are based on a function that defines a pre-defined collection of prices depending on the available amounts of two or more assets and were developed by the crypto community to build decentralized markets for digital assets. Traders trade against a pool of securities rather than a single counterparty, as opposed to conventional order

book-based markets. Any exchange must adjust the reserves in such a way that the product of those reserves remains unchanged, which is referred to as a "constant operation" (i.e., equal to a constant).



CPMM

Constant Function Market Makers have three participants:
Trader: Exchange one asset for another asset.
Liquidity providers (LPs): Accept trades against their portfolio in exchange for a fee.
Arbitrageurs: Maintain the price of assets within that portfolio in accordance with the market price in exchange for a profit.

Decentralized Exchange

The order book-based DEX contracts that have appeared on Ethereum use an off-chain matching and on-chain settlement approach due to Ethereum's transaction speed and transaction fees. However, because of issues such as poor user experience and limited liquidity, DEX that uses order book have low transaction volume and cannot compete with centralized exchanges (CEX). AMM such as Uniswap, have recently emerged, bringing with them innovations in the decentralized finance (DeFi) sector and fresh concepts for building contract-based DEX platforms. These DeFi projects also provide a way to monetize these unused digital assets and improve liquidity via the capital pool. Their function is pretty primal, they process users' transaction requests with simple logic through the constant function market maker (CFMM) because they have been designed to be light and fast. Adding features to an Ethereum-based DEX could raise transaction costs, which are already high; one workaround would be to use an off-chain mechanism. On the Cardano blockchain, these issues are not a concern; therefore, a more complete and complex DEX can be built on the Cardano blockchain.

Despite challenges that AMM exchanges face, such as impermanent loss and low capital interest rates, the steady increase in the overall locked valuation in the capital pool and the daily transaction volume of assets have proved the viability of AMM and users' acceptance. Nonetheless, traders cannot perform limit orders in current automated market makers as they do in centralized markets due to the lack of an order book. Although the daily trading volume of projects like Uniswap in the AMM model has surpassed 1 billion US dollars, reality shows that limit orders are used to resolve the majority of ordinary users' trading volume on centralized markets. Limit orders have become an integral aspect of users' trading practices. Without an order book, the CFMM model will experience more slippage when handling big orders, reducing consumers' excitement for trading. Integrating an order book with an automated market maker substantially increases liquidity. On the other hand, since native tokens on the Cardano Blockchain were just recently introduced, some tokens would struggle with liquidity and demand if they were listed on an order book.

How does YaySwap work?

YaySwap is a decentralized hybrid exchange that integrates both an AMM and an order book. By using a tried-and-true concept known as a constant-product market maker as an AMM and an order book, it gives users a familiar way of trading limit orders while increasing liquidity of the digital assets.

YaySwap uses the Constant Product Market Maker (CPMM) model. In a transaction scenario involving two tokens, CPMM is more concise and versatile than other models.
Users can earn digital assets as liquidity suppliers by injecting liquidity into YaySwap's trading pair capital pool with their idle native tokens.
When a capital pool of two assets is created by each rational liquidity provider, an appropriate amount of the two assets has to be injected into the pool following the current market price. For example, if the exchange rate between YETH and YBTC is 0.04 YBTC per ETH, the capital pool injections would be based on that ratio, such as 10 ETH versus 0.4 YBTC. Each fund pool in YaySwap has a corresponding equity token. Liquidity providers who add liquidity into the pool receive corresponding equity tokens as proof of equity to be able to withdraw funds. The capital pool would retain the product of the two token numbers, x and y, in the pool as a constant to answer any exchange transaction request:

$$xy = const$$

If the number of tokens in the pool before and after an exchange operation is $x1$, $y1$ and $x2$, $y2$ respectively, CPMM ensures:

$$x1y1 = x2y2$$

The absolute value of the constant will keep changing depending on the injection and outflow of liquidity.
Traders that use YaySwap can initiate market order transactions and limit order transactions. For a market order, the pair contract applies the optimal price by comparing the order book price to the AMM price and tries to fulfill the transaction request at the optimal price. The market order that cannot be traded is further processed in time through the CPMM model, and the qualified limit order is processed in time upon the price fluctuation of CPMM. Unfilled orders are temporarily saved to the on-chain order book and are processed when the conditions are met.

Structure

YaySwap contains a series of capital pools that are referred to with the transaction pair contract.
Every Pair contract is formed like this:
Equity tokens : record the liquidity provider's privileges;
On-chain order book: stores limit orders that cannot be fulfilled in time;
Constant product market maker : provides liquidity for the Pair contract.

When a liquidity provider injects native tokens into the Pair contract's capital pool, the Pair contract will mint new equity tokens for the liquidity provider depending on the pool's actual size, the existing injections, and the total number of equity tokens issued. When the liquidity provider requests funds, the Pair contract will return the funds to the liquidity provider depending on the pool, in the proportion of the equity tokens in the sum and then burn those equity tokens.
The Factory contract creates on-demand each Pair contract. YaySwap also provides a Router contract, which receives all transactions, as a communication bridge between users and the Pair contract. The Router contract orders the Factory contract to create a new Pair contract for the trading pair every time a user injects funds for a new trading pair. YaySwap allows the user to specify the exchange path of the transaction. The user sends the exchange path to the Router contract, and the Router will complete the exchange following the direction provided by the user according to the Pair contract address stored in the Factory contract. Market orders and limit orders are both supported by each Pair contract. When a market order is requested, the Pair contract compares the optimal price in the order book with the AMM price and tries to fulfill the transaction request at the optimal price. Since each transaction will cause the price of CPMM to fluctuate, whenever the price fluctuates to the price of the pending limit order, the

Pair contract will try to process the limit order in the order book. Limit orders that cannot be executed immediately are temporarily stored in the order book of the Pair contract.

Listings & Traders safety

New assets and low market cap assets will not be listed on our dropdown menu, traders who wish to trade these assets need a custom link in order to swap them. YaySwap will only list verified projects with a big enough market cap in order to make it easy and safe to use the platform. To create a market, YaySwap requires no permission, and does not charge any fee for listing any native token built on the Cardano Blockchain.

Fees & Rewards

There is a 0.25% swap fee on YaySwap. Half of the fees that the platform receives in swapping are split by liquidity providers proportional to their contribution to liquidity reserves. The other half is split between the people stacking YAY LP proportional to their contribution.

YAY LP tokens are exchanged for YAY tokens when YAY tokens are provided to the liquidity pool.

Example #1 :
If YaySwap receives 100 ADA in swap fees
50 ADA are split between the ADA liquidity providers.
50 ADA are split between the people stacking YAY LP.

Example #2:
If YaySwap receives 100 YAY in swap fees
50 YAY are split between the YAY liquidity providers
50 YAY are split again to the people that used their YAY LP tokens that they received as liquidity providers.

Babel & Native tokens fees

A concept called Babel fees on the Cardano blockchain allows token users to pay transaction fees in the token used instead of in ADA. It facilitates the use of native tokens on the Cardano blockchain as users are not required to hold ADA to be able to create transactions, unlike

Ethereum where it is required to hold ETH to be able to send tokens. The fees paid in native token go to stake pool operators (SPO). If the token is unpopular, the transaction can take more time as fewer SPOs are willing to accept to be paid in that token, if any. YaySwap will incentivize SPOs to accept more tokens by making swapping an easy process, thus incentivizing SPOs to process native token transactions. Native tokens fees will be offered only to the tokens listed on our dropdown menu, other assets will have to pay cardano fees in any of the accepted tokens, while having ada as the main option.

Wrapped Tokens

What is a wrapped token?

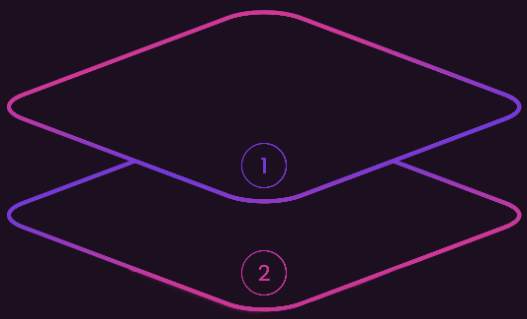
A wrapped token is an asset hosted on another blockchain with an equivalent value as another underlying asset. It can be on a different blockchain or not even on a blockchain.

Layer 1

On-chain smart contract where wrapped tokens are issued and

Layer 2

is where the different cryptocurrencies exchanged for wrapped tokens will be held and locked. The number of locked tokens and the quantity issued will always be the same. It will be possible to audit the quantity at any time, by looking at the tokens issued in the contract and the tokens available in each wallet. To make it easier, we will give our users access to this link at any time from our website.



Transaction fees

Fees on transactions that are made with wrapped tokens will be paid using the same wrapped tokens.

Which cryptocurrency will be available as a wrapped token?

We will offer wrapped bitcoin (YBTC) and Ethereum (YETH) tokens and then let the community vote on which cryptocurrency to include later.

Security audit

We place a high value on safety. We invite all developers to study our platform. Anyone who may find a flaw in our smart contract, platform, or application and report it will be rewarded.

LaunchPad

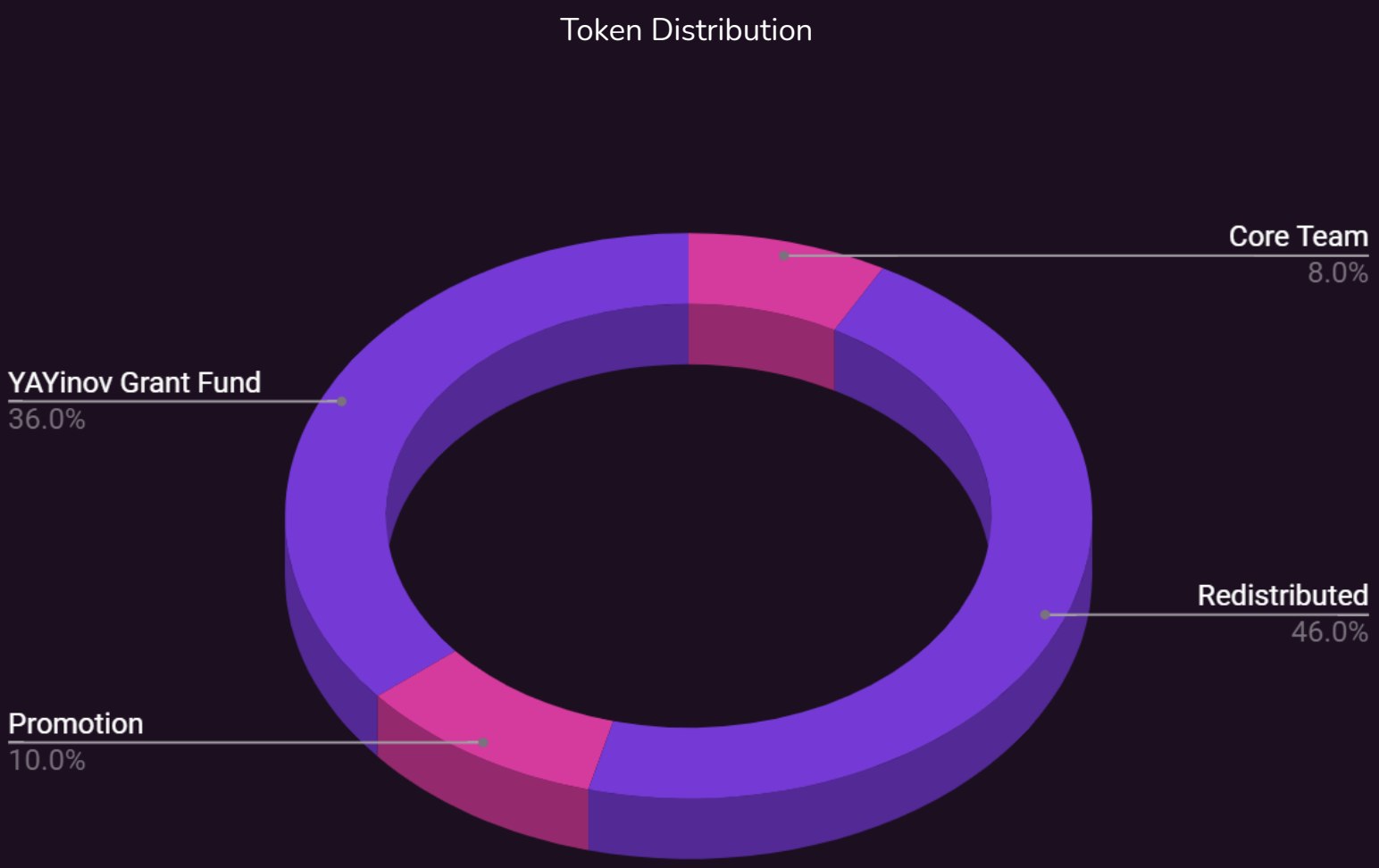
YayLaunch will be the first platform to assist businesses in migrating their tokens from other blockchains. With the aim of assisting Cardano's mainstream adoption while increasing the appeal of the YAY token. It will also allow users to easily create and manage NFT, and native tokens on the Cardano blockchain. Although users will be able to pay fees in YAY, the LaunchPad will remain a separate branch of our project and a distinct product; further details will be announced prior to the launch.

Delegated asset management

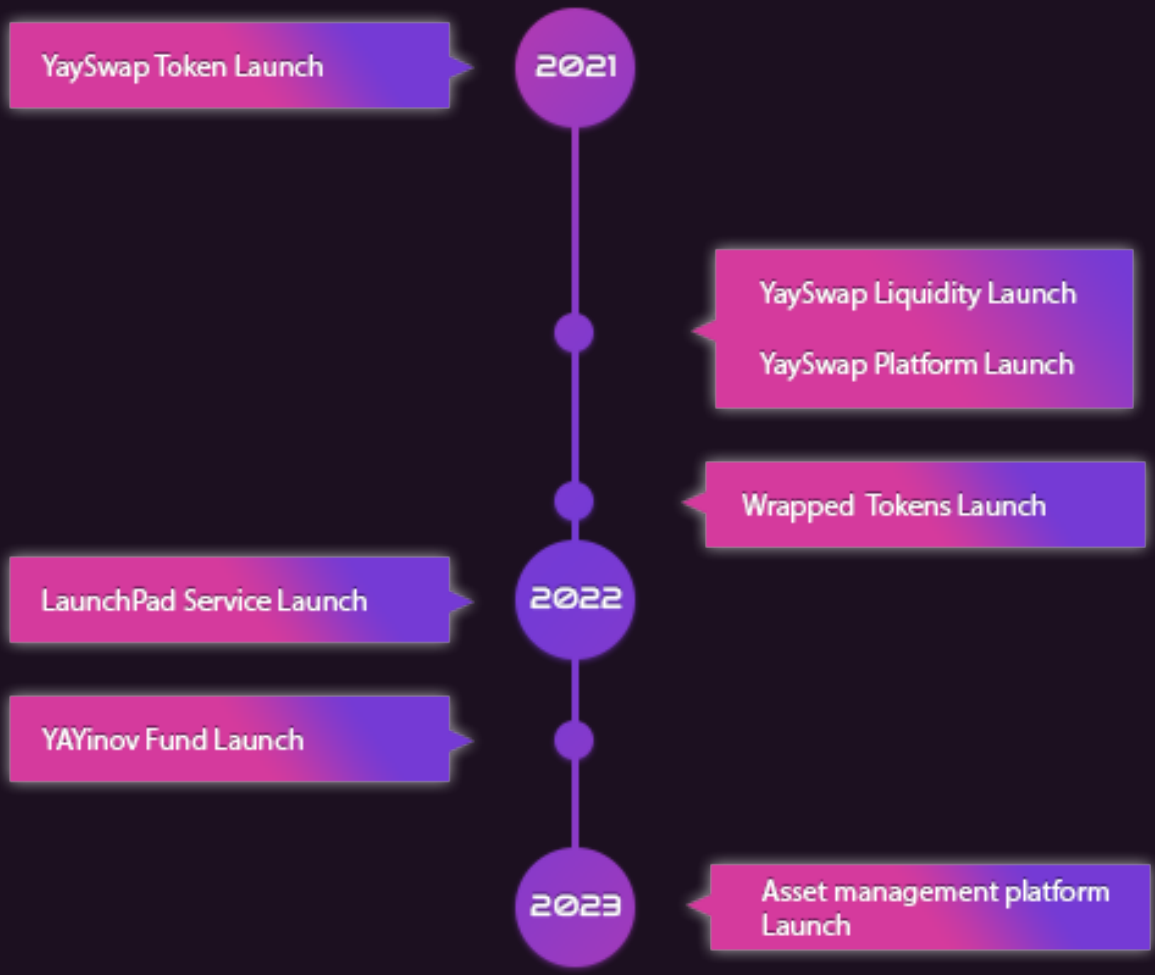
For a typical crypto investor, keeping track of the resources available in the DeFi market, let alone analyzing and scrutinizing the mechanisms of each protocol, takes time. DeFi offers a variety of services to assist customers in managing their crypto funds, including lending, liquidity protocols, and derivatives. Crypto is essentially out of reach for the general public due to the high technical barrier to entry. In contrast to the ease with which one can buy an investment portfolio in the fiat world, crypto is largely out of reach for the general public due to the high technical barrier to entry. We want to replicate the user interface in conventional FinTech without sacrificing the decentralized ownership of assets with YaySwap Delegated Asset Management. Further details will be announced before the launch of the delegated asset management platform.

YAY Tokens

YAY is a native token built on the Cardano blockchain, with a total supply of 100,000,000 YAY, 56,000,000 YAY will be redistributed the following year after the token launch to early users, 8,000,000 YAY will go to the core team and 36,000,000 YAY to the YAYinov Grant Fund which will promote and kickstart new project built on the Cardano Blockchain.



Timeline


YaySwap Token Launch
2021
YaySwap Liquidity Launch
YaySwap Platform Launch
Wrapped Tokens Launch
LaunchPad Service Launch
2022
YAYinov Fund Launch
2023
Asset management platform Launch

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