



Annex Finance

Lending and Decentralized swap system

V1.3
July 9th, 2021

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Introduction

Abstract and mission:

This technical whitepaper explains the decisions behind Annex Finance, it covers the contract features and protocols which bring a complete decentralized-finance based lending system onto the Binance Smart Chain (BSC).

Annex Finance allows users to utilize their cryptocurrencies by supplying aToken (ANN) to the network to earn passive income, supplying both collateral and liquidity respectively. By utilizing ANN tokens, this enables the community to (1) Create a secure lending platform where lenders receive a compounded interest rate paid per block while borrower pays interest on the cryptocurrency borrowed (2) Supplying liquidity contributing to the continuation and sustainability of the ecosystem (3) Governance of select protocol features supporting flexibility and community ownership. (4) Enable purchase and bid of NFT collectibles. (5) Auction currency with ANN.

Unlike traditional finance systems, Annex Finance is enabled by an integrated DEX so that the community can swap tokens through a community-centric Defi platform. The community enhances the platform by detaining its governance through votes.



Problems:

The blockchain in decentralized finance has created massive diversity in the crypto financial space. This can be extremely daunting for new users. For the model to be massively adopted the Defi space needs to be new-user friendly and secure across the network. In traditional financial lending systems, a borrower needs to provide credit or traceable income to a lender before consideration on lending funds. Annex Finance aims to solve this friction in the traditional lending system by utilizing digital assets and cryptocurrencies to be pledged and used as collateral while earning interest.



Solution and Model:

Defi is essentially a borderless financial system, tackling inefficiencies in the global finance system. In order to secure the network Annex Finance has adapted the Defi model, supporting liquidity provided by users. Wherein the more users, the more liquidity providers, the more stable and secure the native token will be.

When a user adds liquidity to a pool they become a liquidity provider (LP), the token can then be utilized for either lending/borrowing within the blockchain or compound itself to earn higher interests. Due to the nature of this borderless system this is an enhancement of finance globally, allowing anyone to borrow funding unlike the traditional system where currently many countries and peoples are prevented from participation. Additionally, Annex Finance users would not have to worry about centralized institutions manipulation of user funds.

Annex finance is not the first decentralized financial platform that is attempting to bridge the traditional lending platform with blockchains. Annex Finance benefits from lessons learned through these earlier projects providing a greatly improved platform. Annex Finance will be the first to provide a DEX swap allowing users to create LP and liquidity itself to mint high apy returns and increase ANN price/volume while allowing users to borrow and supply assets through smart contracts.

V1 of the project will focus on Binance Smart Chain network ensuring low fee and high security, V2 of the project will bridge into other networks such as Ethereum and Cosmos allowing cross chain lending through aTokens.



Annex Finance

Key Features:

To enforce the project's commitment to the benefit of the community. Annex Finance will be launched following a fair model.

- ▶ BEP20 tokens swap & Liquidity Mining
- ▶ Borrowing cryptocurrencies and stablecoins with collateralized lending through the Binance smart chain network
- ▶ Supply cryptocurrencies and stablecoins and earn variable APY for providing liquidity to the protocol
- ▶ Mint stablecoins from supplied collateral
- ▶ Initial liquidity provider will get extremely high APY with ANN, see bonus structure below
- ▶ Annex Finance will feature a time lock system to control funds value. This feature will allow user to select a lock up time, the longer the assets are locked, the higher ANN apy will be paid out, see time lock structure below
- ▶ Securing native LP allows users to earn high APY for providing liquidity to the protocol.
- ▶ ANN will act as a governance token following a fair launch distribution to the community as well as supporting other future development.
- ▶ There will be a total limited supply of 100,000,000 tokens released over the course of the platform's growth, the project token will be launched following a fair model with an initial distribution supply of 40,000,000 tokens.



- ▲ All liquidity will be controlled via smart contracts, only stakeholders will have access to their own funds, security audit will also be implemented as soon as possible to ensure investors ease of mind that all funds are safe.

Annex Tokens(ANN) Tokenomics:

ANN (Annex Finance Governance Token)

Annex Finance will be governed by the aToken (ANN), ANN will be mintable up to a maximum of supply of 50,000,000 tokens throughout the growth of the platform, minting 10,000,000 ANN Tokens every year for 5 years. Annex Finance will provide 40,000,000 tokens in LP Pools to mint ANN with LP tokens. 10,000,000 tokens for prior Liquidity price speculation auction (see section below for more detail), 30,000,000 tokens after product release, LP reward with initial lock. The release of the token will be based on a fair model through Annex Auction and DEX swap with additional initial distribution supply to project development. Early investors who utilize the system lock up in this early stage will be rewarded with aTokens heavily thru the bonus system. The token can also be used to vote within the governance system by Annex Finance token holders.

Annex NFT marketplace will use ANN/BNB as NFT currency to purchase and bid NFT collectibles.

ANN will be auction currency to create an auction pool and pay auction fees.



Automatic LP Provider

Automatic LP is the large incentive of ANN. There is a function that acts as a two-fold beneficial implementation for holders.

First, the contract sucks up tokens from sellers and buyers alike, and adds them to the LP creating a solid price floor.

Second, the penalty acts as an arbitrage resistant mechanism that secures the volume of ANN as a reward for the holders. In theory, the added LP creates a stability from the supplied LP by adding the tax to the overall liquidity of the token, thus increasing the tokens overall LP and supporting the price floor of the token. This is different from the burn function of other reflection tokens which is only beneficial in the short term from the granted reduction of supply.

As the ANN token LP increases, the price stability mirrors this function with the benefit of a solid price floor and cushion for holders. The goal here is to prevent the larger dips when whales decide to sell their tokens later in the trading, which keeps the price from fluctuating as much as if there was no automatic LP function.

All of this is an effort to alleviate some of the troubles we have seen with the current DeFi reflection tokens. We are confident that this model and protocol will prevail over the outdated reflection tokens for these reasons.

Lending Reserve Automatic LP

Annex Finance Lending Reserves are an accounting entry in each aToken contract that represents a portion of historical interest set aside as cash which can be withdrawn or transferred through the protocol's governance. A small portion of borrower interest accrues into the protocol, determined by the reserve factor.

Reserve factor will be 10% for stablecoins and 20% for non stablecoins.

Annex will use this reserve to make automatic LPs with ANN-BNB, ANN-USDT, ANN-USDC and etc to Annex Swap and the LP will be locked.

Prior Liquidity Price Speculation Auction

Auction LP contract will release deposited 10M ANN with ANN price fixed at \$2 prior to product launch. User will be able to deposit BNB to BNB-ANN auction LP, or BTCB to BTCB-ANN LP and will receive prior BNB-ANN or BTCB-ANN LP that can receive liquidity after auction complete. After the auction is complete, the large majority of invested users will receive rewards based on the invested amount. Users can only bid higher than the previous price. Bidders will be eligible if they will be in the range of high price equals to total auction ANN amount like diagram.

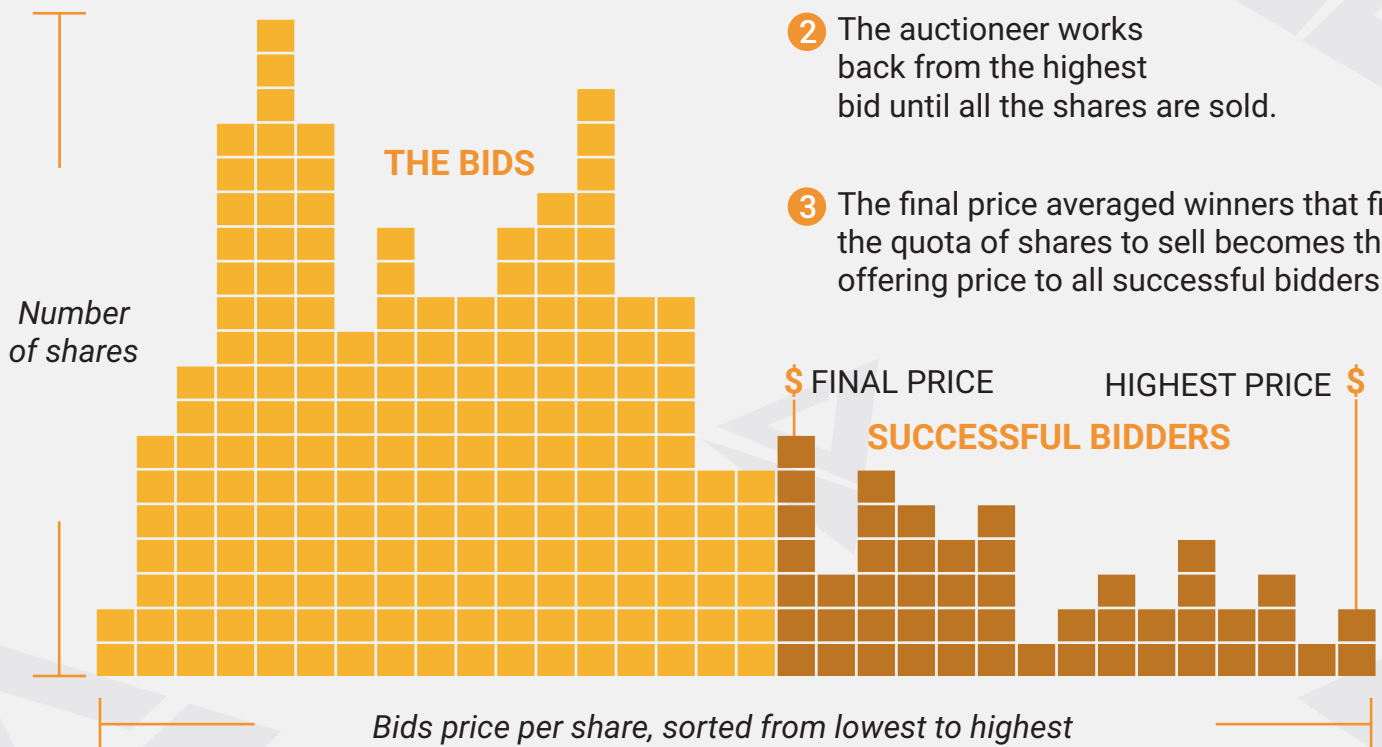
Annex starts by gathering all the bids and sorting them according to price.

Annex works back from the highest bid until all the ANN are liquidated.

The final price is the average price that fills the quota of ANN to make LP become the offering price to all successful bidders.

Adding it up

- 1 The auctioneer starts by gathering all the bids and sorting them according to price.

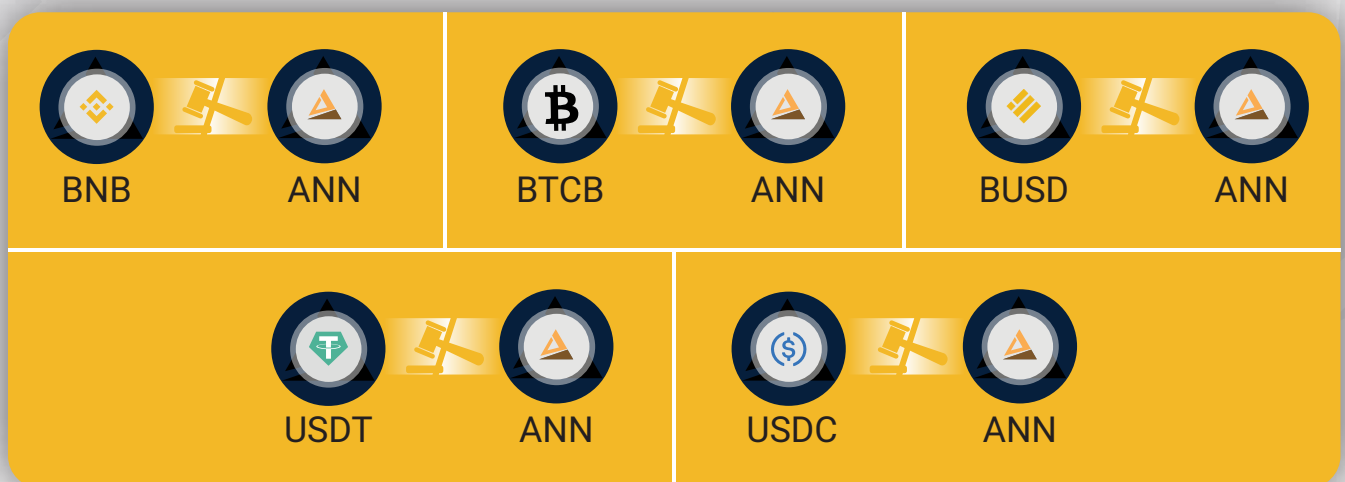


Setting the price

- 2 The auctioneer works back from the highest bid until all the shares are sold.
- 3 The final price averaged winners that fills the quota of shares to sell becomes the offering price to all successful bidders.

Initial Auction Offering support in Annex Auction:

Batch Auction



Development/Community Treasury

Development & Community allocation 10m ANN will be locked in community treasury and only 3m ANN will be released when governance will start to create the first proposal and 7m ANN will be released 1m every month after start governance and community operation.

Bonus System:

First 15 days to add liquidity: 60% bonus ANN
15-30th days to add liquidity: 30% bonus ANN
30-45th days to add liquidity: 15% bonus ANN

Time Lock Structure:

1 month ANN LP lock up: 10% APY
3 months ANN LP lock up: 70% APY
6 months ANN LP lock up: 150% APY + unsold token from auction pool

Token Contract:

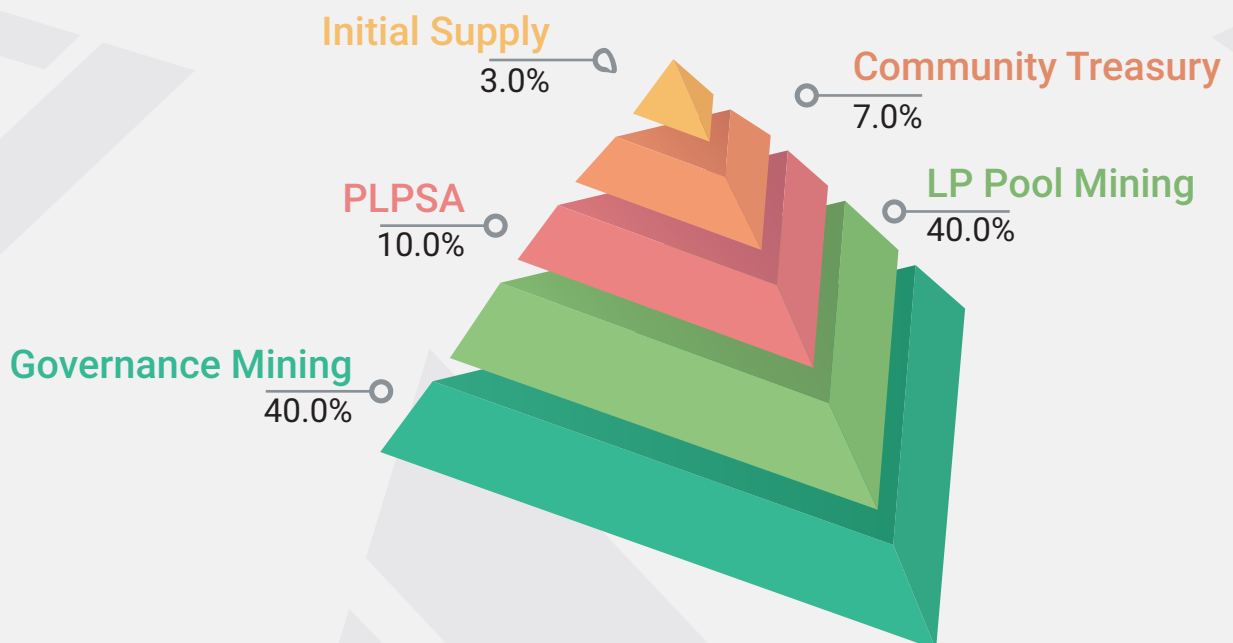
Chain: Binance Smart Chain
Name: Annex
Symbol: ANN
Chain ID: 56
Decimal: 18
Total Supply: 100,000,000
Token type: BEP20

Distribution Overview:

- ▲ Prior Liquidity Price Speculation Auction (PLPSA): 10,000,000 ANN
- ▲ LP Pool Mining: 40,000,000 ANN
- ▲ Governance Mining: 40,000,000 ANN
- ▲ Governance supply: 3,000,000 ANN
- ▲ Community Treasury: 7,000,000 ANN
- ▲ Total supply: 100,000,000 ANN
- ▲ Initial Marketcap: \$20m
- Total Marketcap: \$200m

Initial price: 1 ANN = \$2 USD

ANN Distribution



Annex Auction

Annex Auction is a suite of open-source smart contracts created to ease the process of launching a new project on the AnnexSwap exchange. Annex Auction aims to drive new capital and trade to the exchange by increasing the attractiveness of AnnexSwap as a place for token creators and communities to launch new project tokens.

Benefit of Auction

The key benefit of Annex Auction is that it provides Initial Liquidity Providers for new listing tokens with low prices and keeps the auction token price higher than the listing price.

Annex supports several types of auctions based on auctioneer requirements to incentivize more new tokens listings.

ANN will be an auction payment currency, for example, 1,000 ANN required to create a new auction therefore it will incentivize ANN tokens usage and circulating supply.



Types of Auction

Dutch Auction
Fixed swap Auction
Sealed Bid Auction
Batch Auction (Recommend for ILO)
English Auction

Annex will recommend mostly Batch Auction to increase initial liquidity of new listing tokens throughout Annex Auction.

Advantage of Batch Auction

The biggest advantage is certainly that buyers don't have to wait for a certain time to submit orders, but that they can submit orders at any time. This makes the system much more convenient for users.

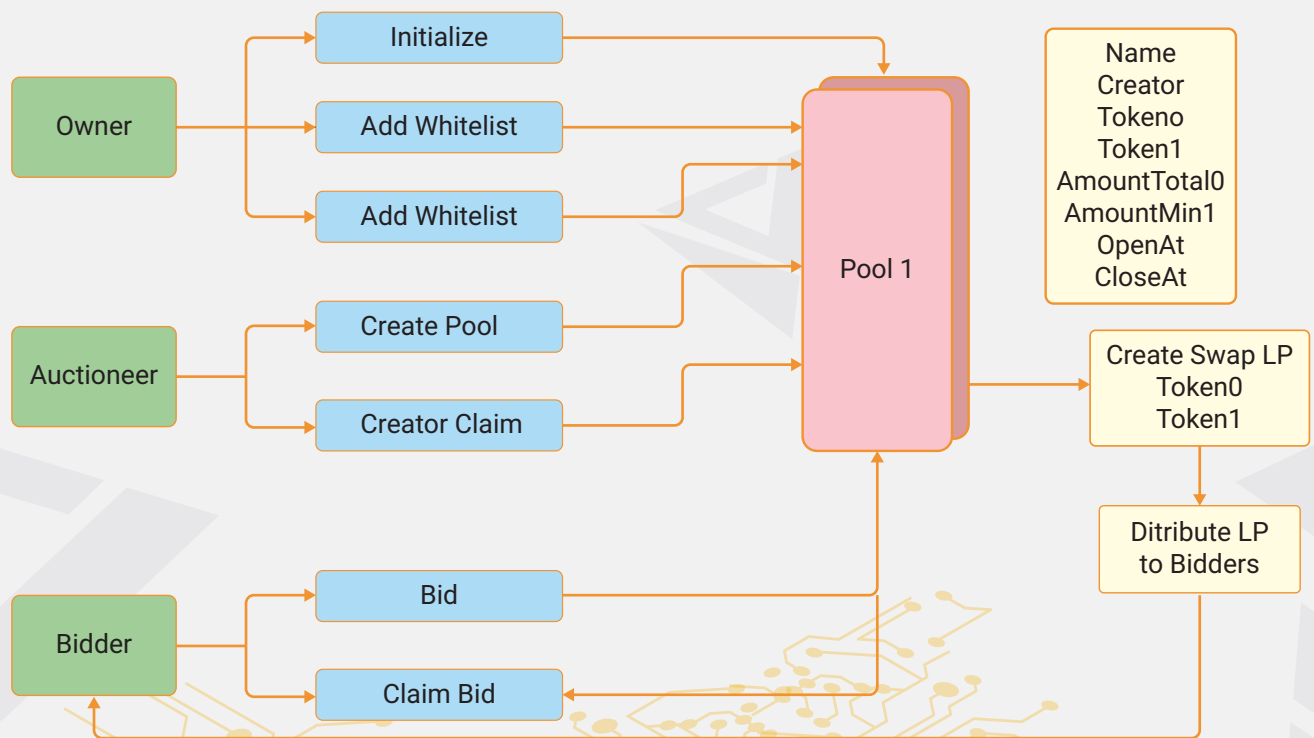
Dutch auctions have a very high activity right before the auction is closing. If pieces of the infrastructure are not working reliably during this time period, then prices can fall further than expected, causing a loss for the auctioneer. Also, high gas prices during this short time period can be a hindering factor for buyers to quickly join the auction.

Dutch auctions calculate their price based on the blocktime. This pricing is hard to predict for all participants, as the mining is a stochastic process. Additionally, the unpredictability for the mining time of the next block

Dutch auctions are causing a gas price bidding war to close the auction. In contrast, in a batch auction, different buyers will bid against other bidders in the mem-pool. Especially, once EIP-1559 is implemented and the mining of a transaction is guaranteed for the next block, then bidders have to compete on bidding limit-prices instead of the gas-prices to get included into the auction.

Advantage of Batch Auction

- Owner: Auction Contract Creator
- Auctioneer: Auction Pool Creator who list their new token to add in Annex Swap or Pancakeswap
- Bidder: Buyers who can buy auction token in auction period



After the auctioneer finalizes the auction pool, the auction pool will create AnnexSwap LP with invested token0 and token1 and it will distribute the created LP to successful bidders based on invested amount so that they can claim LP.

Unsuccessful bidders can claim invested token1 for refund after the auction is finalized.

Annex Lending

aTokens

The protocol-created pegged assets when collateral is supplied are called aTokens. aTokens represent the unit of the collateral supplied and can be used as a redemption tool. aTokens are created and implemented by Governance processes and voted by Annex Token holders.

Contract ABI	Description
<code>mint(uint256 amountUnderlying)</code>	Transfers an underlying asset into the market, updates msg.sender's aToken balance.
<code>redeem(uint256 amount)</code> <code>redeemUnderlying(uint256 amountUnderlying)</code>	Transfers an underlying asset out of the market, updates msg.sender's aToken balance.
<code>borrow(uint amount)</code>	Checks msg.sender collateral value, and if sufficient, transfers the underlying asset out of the market to msg.sender, and updates msg.sender's borrow balance.
<code>repayBorrow(uint amount)</code> <code>repayBorrowBehalf(address account, uint amount)</code>	Transfers the underlying asset into the market, updates the borrower's borrow balance.
<code>liquidate(address borrower, address collateralAsset, uint closeAmount)</code>	Transfers the underlying asset into the market, updates the borrower's borrow balance, then transfers aToken collateral from the borrower to msg.sender

Supplying Assets

Annex Finance users may supply various supported cryptocurrencies or digital assets onto the platform, which can be used as collateral for loans, supply liquidity and earn an APY. Supplying assets such as cryptocurrencies or digital assets to Annex Finance gives the users the ability to participate as a lender while maintaining the security of collateral in the protocol. Users will earn a variable-based interest rate depending on the yield curve utilization of that specific market. All user assets are pooled into smart contracts so that users can withdraw their supply at any time, given that the protocol balance is positive. Users who supply their cryptocurrency or digital asset to Annex Finance will receive a aToken, such as aBTC and aBNB, which is the only token that can be used to redeem the underlying collateral supplied. This will enable users to use these tokens to hedge against other assets or move them into cold storage wallets that support Binance Smart Chain.

Borrowing Assets

Users who want to borrow any of the platform supported cryptocurrencies from Annex Finance will be required to pledge aTokens or collateral that are locked on the protocol. The locked up assets will enable users to borrow up to 60% of the collateral value.

Once a user supplies their collateral asset, the user will be able to borrow a collateral ratio range of the asset depending on the assets. For example, if a user supplied \$1000 worth of BNB, the user will be able to borrow up to 60% of the value of your asset from the lending platform. However, if a user's collateral value drops below their collateral ratio percentage of their asset, a liquidation event will occur. Users need to be aware of their asset ratio value to avoid liquidation in the case that their locked up collateral asset took a dip while borrowing.

Users of Annex Finance platform will have a compound interest rate that will be applied per block on the borrowed asset while holding no monthly payment obligations. In order to return the asset, the borrower must pay off their original balance plus the total compounded interest back to the platform.

Market Dynamics

Each time a transaction occurs, the Interest Rate Index for the asset is updated to compound the interest since the prior index, using the interest for the period, denominated by $r * t$, calculated using a per-block interest rate:

$$Index_{a,n} = Index_{a,(n-1)} * (1 + r * t)$$

The market's total borrowing outstanding is updated to include interest accrued since the last index:

$$totalBorrowBalance_{a,n} = totalBorrowBalance_{a,(n-1)} * (1 + r * t)$$

And a portion of the accrued interest is retained (set aside) as reserves, determined by a **reserveFactor**, ranging from 0 to 1:

$$reserve_a = reserve_{a,(n-1)} + totalBorrowBalance_{a,(n-1)} * (r * t * reserveFactor)$$

Annex Swap & AMM

Liquidity mining model will be implemented to provide exclusive yield farming for aTokens. In the essence of DEX (decentralized exchange), DEX needs liquidity from its user, community, and participants. Therefore by utilizing DEX, the liquidity provided by users will have the opportunities to enhance their capital. Users who provide aTokens in liquidity will also receive high APY for lending.

NFT Marketplace

Annex NFT marketplace will offer a wide range of non-fungible tokens, including art, censorship-resistant domain names, virtual worlds, trading cards, sports, and collectibles. It includes ERC721 and ERC1155 assets. Users can buy, sell, and discover exclusive digital assets like Binance NFT, ENS names, Fungible, and more.

NFT Currency ANN

ANN is the main NFT currency in the Annex NFT marketplace for creators and buyers to purchase items. Creators can set fixed prices with ANN units and buyers can make offers or place bids with ANN.

How to use

Creators can create their own items on the blockchain using the Annex NFT item minting tool. Users can use it to make a collection and NFTs for free, without the need for a single line of code. If users are developing their own smart contract for a game, digital collectible, or some other project with unique digital items on the blockchain, users can easily get added to the Annex NFT marketplace.

System Architecture:

The platform's DEX will utilize a codebase fork from sushiswap for token farming. When users use the platform, they are using an underlying asset to first bond with aTokens. These assets held as collateral will have dollar values that are tied to the native tokens. Due to the nature of crypto currency. The collateral values are pulled from market rates in real time through the use of Chainlink protocol for market pricing update to assure fair market value.



Token access:

Users will be able to open an account with Annex Finance using Metamask, Trust wallet, and Wallet Connect wallets. Our goal is to grow the platform as quickly as possible so that we can apply for crypto exchange listings such as Binance.com as soon as the platform meets all the exchange's requirements.



Liquidations:

It is entirely up to the user to monitor their collateral assets, the collateral could be liquidated if it falls below the threshold rate required for the borrowing. These liquidations are subject to liquidation fee and satisfy the outstanding debt. The remaining collateral, if any, will then be returned to the user if available.



Token Reserve:

Depending on the collateral asset with aToken. Stable collateral will have a reserve factor of 10% while non-stable collateral will have a reserve factor of 20%. These reserve factors will be captured from the spreads of the lending platform and can be used for project development, protections, etc. These Reserve Factor funds are controlled by the Governance process and can be used in a variety of ways such as rewards mechanisms.

Interest rates:

The platform will utilize interest rates that are designated per market from both supply and borrowing side of the protocol. The interest rate provided for the markets will be determined by a yield curve that varies based on assets liquidity.



Liquidity Incentive Structure:

The protocol does not guarantee liquidity; instead, it relies on the interest rate model to incentivize it. In periods of extreme demand for an asset, the liquidity of the protocol (the tokens available to withdraw or borrow) will decline; when this occurs, interest rates rise, incentivizing supply, and disincentivizing borrowing.



Price Feeds

A Price Oracle maintains the current exchange rate of each supported asset; the Annex Finance delegates the ability to set the value of assets to a committee which pools prices from Band Protocol. These exchange rates are used to determine borrowing capacity and collateral requirements, and for all functions which require calculating the value equivalent of an account.

Governance:

All aToken can be used to participate in the Annex Finance Governance and Proposals system. The users can participate in the poll section and cast their votes on different proposals. The proposal threshold will be 1million ANN and Quorum votes at 2million ANN.

- ▲ The ability to list a new aToken market
- ▲ The ability to update the interest rate model per market
- ▲ The ability to update the oracle address
- ▲ The ability to withdraw the reserve of a aToken
- ▲ The ability to add LP farms with ANN reward
- ▲ The ability to add staking pool with ANN reward

Annex Finance build:

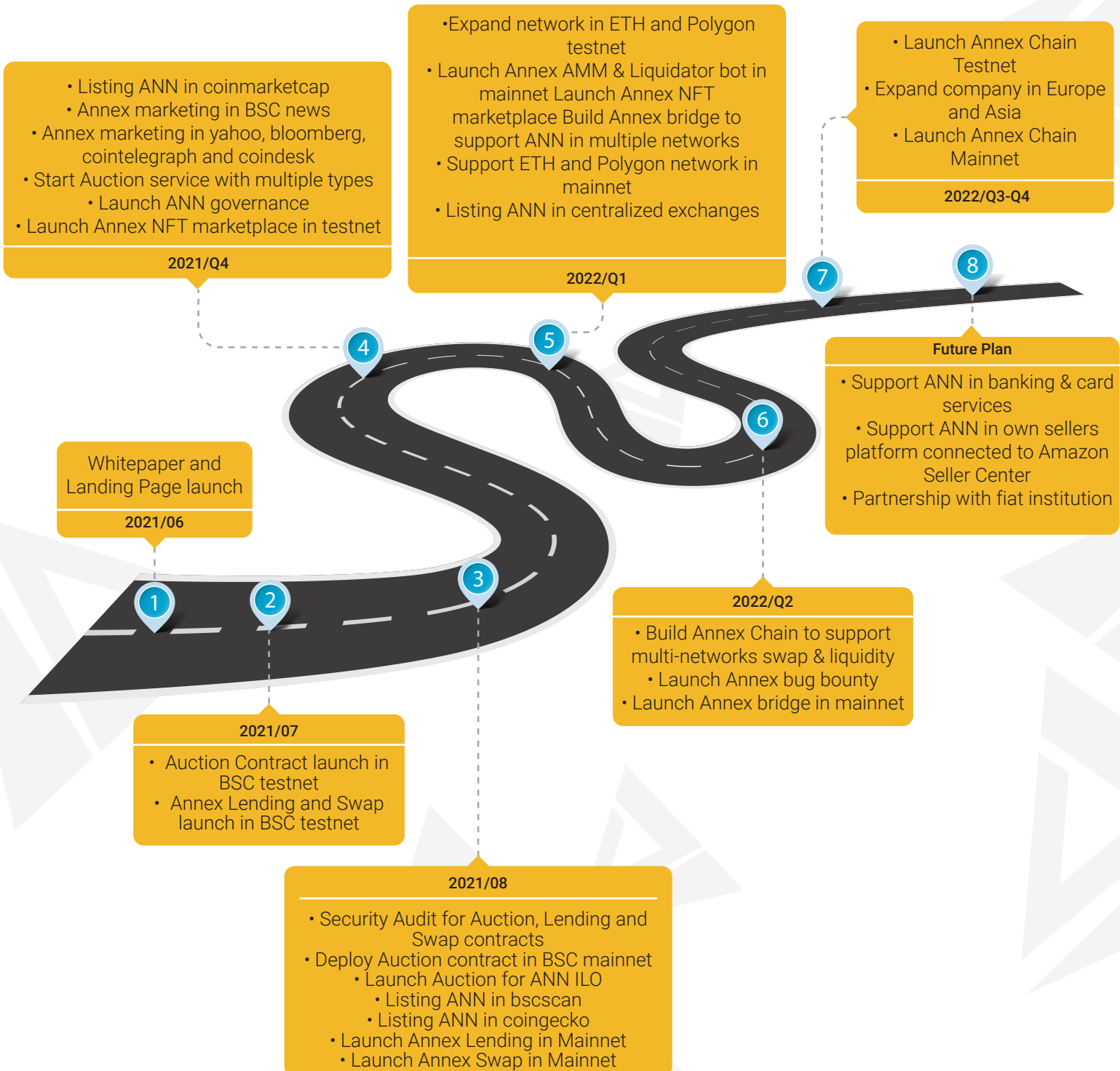
Annex Finance V1 will utilize Binance Smart Chain due to three main advantages:

- ▲ Fast transaction block time
- ▲ Secure transfer
- ▲ Lower fees compared to others

Binance Smart Chain has a record of trustworthy entities where users can report malicious projects, freezing project's assets so that the user's funds will always be safe. V2 of the development will utilize networks such as Ethereum and Cosmos.



Roadmap



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