nBase
A Strategy Game with a Profitable Virtual Economy

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1. Introduction

nBase is a mobile real-time strategy game with a virtual economy that allows players to trade with each other and make profit. It is currently available on Google Play and uses an ERC-20 token as its trading currency. The gameplay is based on matches between players and similar to the game StarCraft.

The goal of this game was to create a virtual economy where players can make profit through investing in items, negotiating with other traders, and winning games. To achieve this and have value in the economy, players need to be invested in the actual gameplay. That is why I have opted to base the gameplay on the strategy games from the 1990s which is seen by many as the “Golden Age of RTS”.

The game was developed solely by me, using the Unity game engine. The graphics were also done by me. Therefore, it is inevitable that the game may contain bugs and I appreciate any feedback related to it.

2. Game Items

Games with Successful Virtual Economies

There have been many examples of games that have a large portion of the community who do not only play the game – they also trade items with other players with the goal of reaching profit and even making real money. Some of the best examples include the top games on Steam developed by Valve such as Counterstrike: Global Offensive (CS: GO), Team Fortress 2 (TF2), and Dota 2. The economy of Team Fortress 2 for example, was estimated in 2011 to be worth 50 million USD. Here, most players spend most of their time playing the game itself, which is a class-based shooter. However, there is also an extensive virtual economy that is mostly separate from the gameplay. In it, players can purchase keys that unlock crates. Unlocking a crate will give the player a random item, usually worth much less than the key. However, they have a chance of receiving an unusual – an item with a special effect. These can be anywhere from $20 or less, to more than $10,000 depending on the effect. The average is around 100-200 USD. Counterstrike has a similar system where players can unlock patterns for their weapons, and the most valuable items are knives (which are similar in value to unusuals in TF2). In CS: GO, items can have different level of wear, ranging from Factory New (brand new) to Battle Scarred (heavily scratched and used).

The goal of nBase is to introduce a similar system in a mobile game and use a crypto token as its main currency.

How nBase Implements Item Qualities

Players can play matches against friends or against AI. After completing a match, the player is awarded a certain amount of gold. The gold can be used to buy new units in the store. Upon winning a multiplayer match they have a (currently) 33% chance of receiving a random item with a random effect. The effects can be for example fireworks, flames, etc. and they only add visual appeal to the item. These items cannot be purchased, like unusuals in TF2 or knives in CS: GO. The effects do not give the player unfair advantages which is important to balance the game. Due to their limited supply, and random nature it is expected these will be the most valuable items available to trade.

It is important to note that all items are stored in a MySQL database, not on the blockchain. The player’s use an ERC-20 token as a currency for trading these items, and that is stored on the Ethereum blockchain.

3. The nBase Market

nBase CryptoGold (NCG)

The game features an ERC-20 token as its main trading currency called nBase CryptoGold (It will be referred to as just “CryptoGold” or “NCG” in this whitepaper). It is on the Ethereum blockchain and has an initial supply of 100,000.

The main menu includes a built-in crypto wallet where users can conveniently see their NCG and ETH balances. This is also where they can send NCG to other users. It is important to note that players do not need to have an initial stockpile of ETH to trade, this will be covered in the UX section.

The Central Bank of nBase

Without any initial CryptoGold, players may find it difficult to start trading. Therefore, I have implemented a bank in nBase where traders can take interest-free loans. The loans are currently set to a maximum of 10 NCG, and last for 10 days. These values may change as more information is available to me through testing. The way it works on the smart contract is that there is a function called *lend* that only the owner can call which transfers tokens from the owner’s initial supply to the borrower. The smart contract registers the loan in an object that contains the due date, borrower address, lender address (the owner), and the amount borrowed. If the player does not pay the loan back on time, the server can call the smart contract’s function *getLoanPayback* which deletes the loan and gives the funds back to the contract’s owner. The owner may only take a loan back after it has expired and is not allowed to do so earlier. There remains the question of what to do if a player does not have enough funds to pay back their loan at the time it is due. I am currently considering a system that blacklists such accounts for trading, which will effectively freeze these assets and prevent users from spamming accounts for loans that they do not intend to pay back.

Overcoming the UX Problem

Many Ethereum apps today suffer from a UX problem: their users must have an initial stockpile of ETH, they must have an Ethereum wallet, and they need to spend ETH to use the service. nBase does not require new users to have any ETH and they do not need to pay gas for transactions. This section will explain how this is achieved.

If two users want to transfer tokens or exchange tokens for something else, there is a risk that they will not receive their payment. In the ERC-20 standard, there is a function called *transferFrom* that allows one address to transfer funds on behalf of another, but only if they are authorized to do so, i.e. one address can allow another one spend it’s tokens on its behalf. This is useful to prevent scamming, as players can delegate the transfer to a server or admin, thus ensuring that both parties make the transfer. However, this presents

a UX problem as new players must approve the admin to transfer their tokens for them, which requires them to have some ETH for the initial approval transaction. nBase solves by including a function in the contract (*initializeApproval*) that the admin may call once per address, where the admin sets the user's approved amount to 1 million tokens. This means that the server is allowed to trade a user's tokens by default. However, this presents an ownership problem because the point of blockchain token is that it belongs entirely to the user and no one can take it from them. This is solved by the fact that the server initializes a player's allowance, but the player can revoke it. If a player has ETH and does not want to allow the admin to transfer it for them, they can simply set their approval to zero and the server is unable to change it again. This means that traders can choose whether to allow the server to perform their transactions (and thus not need to spend ETH on gas) or do it themselves and have their tokens "untouchable".

The Trading Market

To enable players to trade items, I have built a trading market into the game. It is based on the Steam Community Market but uses NCG. In the market, traders can list items from their inventory for NCG. They can also view the value of their inventory in NCG or almost any world currency. The player's inventory is valued using prices from the market, so the amount that items are being bought and sold for is tracked.

When a user lists an item on the market, it adds an entry to the database containing the address of the seller, the ID of the item, the date, and the amount requested. When a player buys an item that is listed, the server checks if they have enough CryptoGold and if it has permission to transfer their CryptoGold. If it does then it transfers the CryptoGold to the seller on the blockchain and transfers the item to the buyer's inventory in the database.

The buying and selling of items that do not have set prices in the store will lead to the possibility of investing in items that are expected to have a higher value in the future. This presents a way for users to make profit in the economy.

The Crypto Wallet

The crypto wallet can be found in the menu, and any player can create one. It prompts the user for a password and warns them that the password cannot be recovered (because it is not stored anywhere). The password is used to decrypt the private key which is encrypted using AES-256 on the user's device. It is also possible to import an account by entering its private key and a password to encrypt it. After creating/importing a wallet, the client sends their address to the server which then associates it with their account.

The wallet contains the user's ETH balance, NCG balance, a section to transfer NCG to another address, a section to copy their address or private key, and a warning that they should have their password and private key backed up somewhere safe.

Real Time Trading

Each player has a friends list which allows players to communicate using built-in instant messaging and trade in real time. Players can initiate a trade which will prompt the receiver to either accept or decline. Both traders must unlock their crypto wallets first. In the trading window both traders can offer items, offer CryptoGold, and discuss the trade using its own chat. To safely trade the items, the server requires that both traders have approved their CryptoGold to the server and it transfers the tokens and items on their behalf. This ensures that both parties receive the deal without fear of scamming.

4. The Gameplay

Today, the mobile app stores are saturated with strategy games that follow a pattern. The player builds a base, raises an army, and may go to battle against another player. However, these games are often built on a business model that involves making the players wait hours or days to build and upgrade things. They have an option to pay, which builds/upgrades these things instantly or reduces the time necessary. Most games following this pattern are nearly identical in gameplay, and they are often copies of the top grossing games with a different theme. nBase is instead built on the system that strategy games in the 1990s had, where players would build buildings and units during battles instead of outside them, such as in for example StarCraft. This creates more dynamic gameplay and fast paced action which I believe is missing from the mobile gaming world.

To have a virtual economy where items have high value, players need to be invested into the gameplay first. Many crypto games today have only focused on blockchain technology, decentralization, or gambling. With nBase, the goal is to have an exciting real-time strategy game that has a profitable virtual economy on the side.

The game's units differ from each other in ways other than simple stats, such as "+3 damage and -12 HP". Units have special abilities and a specific playstyle associated with them such as scouts for reconnaissance, snipers for long range attacks, stealth units for secret operations, and so on.

5. Initial Coin Offering

The ICO’s funds will be used for advertising and improving the security. The softcap has been set at 10,000 USD and the hardcap is at 100,000 USD.