White Paper

A guide to build a Web3 Marketplace for Physical Collectibles
Using NFT and ERC20 token currencies

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Introduction

Today is a world connected strongly to the virtual world. It is hard to imagine a simple pixel animation has been sold for $6.6M, making history of the most expensive digital art sale ever made. However, when we bring back our thoughts. What would be the value of the physical world? Should the physical world have even more true value?

Today, we bring to the world **Cryptocradle** - a marketplace of Physical collectibles, which connects the blockchain, crypto, as well as the physical art textures, brushes, vibrant colors together to lead the future of the physical goods market. Here, you can explore the most niche collectibles, trading them with detailed and the most inclusive collectible data details, and view the historic footsteps of the beautiful artwork, and preserve the value of your treasure in the safest places and view all your precious things within a few clicks.

As a collector, a creator, or a trader, you will have the ability to establish a network of collectibles while creating the opportunity to earn rewards for trading your collectibles. This document describes the adventure ahead for new collection lovers.

1. Technology basics

Blockchain

Blockchain is an immutable decentralized database. These two features are secured by its network. a physical asset can be represented in a digital form because the data on the blockchain is hard to be changed or replicated. the blockchain would store the record of transactions as data on the block. each block in the chain would have a timestamp then be added to the main chain. Thus the data being added to the blockchain has a nature of irreversible timeline.

Web3

Nowadays, the internet is stateless. In contrast, web3 is a network where the state can be stored and transferred. by having web3. every participant of the network could hold the value of its creation, which would form a native economic value for each one. And since every participant can deliver the state to the other, they are able to transfer the value to the other participants.

As for the web3 framework, there are several layers that are highly correlated to our application.
In the state layer, there are bitcoin blockchain and Ethereum blockchain, and so on.
In the protocol layer, there are trading, lending and derivatives supported.
In the user control layer, there are hosted wallets(Coinbase, Binance) and user-controlled wallets(Coinbase, Metamask, etc.).

Smart contract

Smart contracts are simply programs stored on a blockchain. Just like a traditional contract, it also has rules and conditions. The difference is that when predetermined conditions are met, the forehead agreed items would be automatically executed. Therefore, each party can receive the result right after the conditions are triggered. One special characteristic is that the trigger of the action does not need any third party, but only if the conditions are met without any time loss.

NFT

It refers to the non-fungible token, which means the unit of data stored on the decentralized system is unique and cannot be modified. Unlike normal digitized items which are easily changed and distributed online, NFT strengthens the specialty of each item, and by using the digital ledger, the ownership of the item is protected.

Physical NFT

A physical NFT is a physical item in the real world that is connected to the digital form of itself. The digital form would store its attributes and have a tracing of the product history, especially the transaction and ownership history. The application of physical NFT can be used in many industries like artwork, pharmaceutical, and grocery. It would increase the liquidity of the real item and also combines functions like logistics and supply chain management to the product.

2. What is CryptoCradle NFT Marketplace

Using Web3, crypto, NFTs, and open source, CryptoCradle is a physical collectible marketplace to empower a decentralized tribe of collectors and investors across the realms of collectibles. As a niche market, it has been exploring the following areas.

- Trade physical collectibles NFTs
- Collectibles valuation
- Logistics and storage management
- ERP system for product management

Why collectibles?

The main reason why we select collectibles is that there are problems with the collectibles investment market. There are multiple risks in investing in collectibles: prevalence of counterfeits, high costs and fees which come with the complexity of paying, and finally, information asymmetry between buyers and sellers. We are hoping to solve this with the technology of blockchain.

From a different perspective, collectibles communities share some common ideology with the normal NFT market. The value of the collectibles is not based on the actual intrinsic value but based on the willingness to pay for the items.

3. Customer segmentation

Customers of Cryptocradle consist of both sellers and buyers in the marketplace. One user can sell, buy, or can be in both roles to trade collectibles.

Customer attributions

Cryptocradle is looking to attract two types of customers.

- Traditional collectibles investor
  The first type of customer is art collectors and connoisseurs. These people work in or participate in art auctions.

- Crypto-savvy investor
  The second type of customer is the population that is already familiar with and actively trading crypto-related assets. In recent years, this pool of customers is growing. According to surveys, roughly 14% of the U.S population, which is 21.2 million adults, own cryptocurrencies such as Bitcoin or Ethereum. Around 4 million adults had purchased or sold an NFT in the past

Customer adoption types

- Early adopter
  After the core team, early adopters are the first to back this project. In return, we will reward the early adopters with an airdrop coin - a small number of governance tokens. They can only start using these airdrop coins after they make the first purchase or first listing on the platform.

- Majority
  After launching for an amount of time and the platform has a certain crowd, new users coming will be treated as normal without the benefit of airdrop coin.

- Shared-based membership
  At a later stage of Cryptocradle, the organization would transform into a Decentralized Autonomous Organization. Any member wants to join would need to submit a proposal for membership so the group can assess whether you have the necessary expertise and capital to make informed judgments about potential grantees. Users can't just buy some token to access the decision-making process.

4. Value Proposition

Collectible Quality Assurance

- Authentification

Artists and collectors can have ways now to authenticate their products using the app. Chip, hologram stickers, or 2FA QR codes can work as a method to transfer a digital asset offline.

When the buyers receive the product from the marketplace, they can verify the item by scanning the code or using NFC for traceable information about the product.

- Digital Visibility

Customers can have access to the ledger, real-time activities, and verified collected data of the collectible, about where the product was created, who was the owner, and when the product was being modified.

- Collectible Valuation

Because the data is crystal clear, it is so much easier for the marketplace to have a collectible valuation compared to the traditional valuation. The traditional artwork evaluation involved in-person evaluation of the product based on the evaluator's experience. However, for the physical NFT, the marketplace can provide a valuation based on the history price, product transaction trend, popularity, and reputation metrics. The buyers won't have difficulty deciding if the price is worth the real quality if they have a better idea about the product's background.

Accelerated Trading Profit

Once the transaction is moved onto the web3 marketplace, auctions or transactions can be done much quicker and easier. This may result in a growth of buyers who regard trading as a good way for making a profit. Just like the stock market, when the market is with more liquidity supported by more professional traders, the market will be more vibrant and the price of the deals would be more reasonable.

Besides, the supply for auctions has been less than demand during the COVID-19 crisis. The traditional trading market may face obstacles when people can not congregate. Previously, people did not conduct transactions online because it has less credibility. However, enhanced online auctioning activity has helped to expand the customer base for auction houses. Interestingly, the auction houses have reported that about 40% of their online buyers are new customers. So, importantly, the enhanced online auctioning activity has helped to expand the customer base for auction houses.(Credit Suisse, 2020). Based on the blockchain, the physical NFT market would solve the problem of both transparency and convenience.

Convenient Logistics Management

Having a supply chain support to the physical marketplace with a digitized record of all the information related would help the buyers and sellers better manage their collectible space.

The buyers can consign the marketplace for shipping and delivery. Compared to the traditional way of delivery, the process is more transparent with the related cost management for different products and the delivery timestamp. Having storage centers in different areas, the marketplace provides storage service as well, the collectors can have the overall storage overview on the NFT collection system. What's more, they can also choose to have a consignment at a venue, for checking the status of the product.

Vibrant Collector Community

Collectors used to meet in small social groups or by acquaintances in some clubs. The social circle is rather limited. In our marketplace, the buyers and sellers would have enough chances for sharing information and having virtual events. They will feel more connected than ever before. Having sharing sessions and discussion boards on different topics like animation, artwork, wines, and so on, they would find more people of the same interest across the globe. The geographical limitation is no more restricted, culture can be more fastly delivered to the other side of the globe. It is especially helpful for very niche market growth.

5. Economics

Cost structure

In order to set up this marketplace, the following are the costs involved:

Fixed cost:

- Technology set-up
  A few examples for this category of cost are development cost, server, hosting, data storage, etc.
- Business registration
- Compensation for the core team

Variable cost:

- Associated cost with the good: minting, preserving, and storage, tax, shipping, etc.
- Technology maintenance

Organization and revenue distribution

There are two approaches to setting up the organization: a traditional business and a DAO. Each would have its own pros and cons. The traditional business will ensure a stable establishment at the conception stage. On the other hand, operating as DAO is an effective way to bootstrap the business and attract wider attention from the traditional collectibles investors.

Cryptocradle will aim to start as a traditional limited liability business and then gradually transition into a DAO. Within this DAO, the traditional business will serve as the governance body.

In order to join as the DAO, the member needs to own the governance token and then submit a proposal so that the governance body can verify their expertise.

Inside DAO, the governance team will have a Treasury. The Treasury will be in charge of maintaining the system pool and repurchasing governance tokens from users if needed.

The governance body and DAO members get the voting right, but they will only receive a commission based on a fixed rate. In order to gain more economic return, the only way is to

help to increase the volume of collectibles/number transactions on the collectibles. The creator and/or owner of the collectibles will still receive the return based on their collectibles.

Governance token and other currencies

Cryptocradle will need to set up its own native governance token. The use case for governance token are:

- **Voting rights**
  The number of governance tokens that each user owns would represent direct voting power and ownership. Members can exit at any time with their proportionate share of the treasury. Note that in order to utilize the voting rights, users on the marketplace need to do one extra step of submitting a proposal and the governance of Cryptocradle will verify whether they have the expertise to make informed decisions.

- **One of the circulated currencies in the platform**

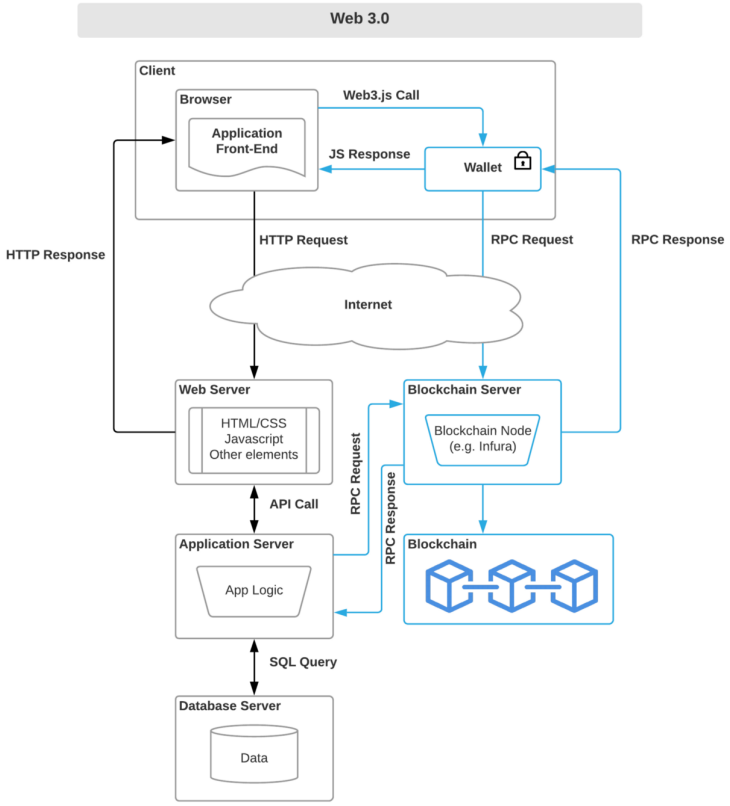
  Customers in the platform can choose to trade in this native token or in other currencies.
  For utility coins that are being used for transaction and fee payment in Cryptocradle, preference would be popular currency such as ETH, and stable coins such as USDC and DAI but may support a wider range of currencies. A mechanism and/or partner to convert cryptocurrencies to non-crypto currencies such as USD or Euro will need to be included because there are costs to cover for physical collectibles.

- **Paying the royalties to the art creator when a new collectible is minted**
  This would only be for the very creator of the art. Since the creator's reputation can increase over time - if their collectibles are in high demand and they are traded many times, the creator can also claim some benefit of that.

The governance tokens pool will be expanding over time. The Treasury and core team will need to hold a percentage of governance tokens from the beginning. For reference, in Axie Infinity, this amount is 8% of the whole pool and in StarAtlas, this amount is 7.5%. Thus we would recommend a similar amount of 8% for the whole pool in all coming years.
Besides governance tokens, the Treasury should consider diversifying their system pool by holding other currencies such as ETH, USDC, or DAI as well, so that they can mitigate the risk.

6. Technical Tools

- Web3 structure



Basically, web3 is a tool to help connect your SPA web app to the blockchain. The above diagram shows the process of this connection. With web3, the app could be easily built on blockchain and used by public people.

A very interesting thing is that more and more individual developers begin to choose blockchain rather than traditional app platforms like Apple Store and Android Store, to deploy and publicize their apps. Blockchain is totally decentralized and it could not charge any channel fees, unlike Apple or Android, which charges more than 30% channel fees of total income.

By adding a web3.js into the SPA WEB App, the app could interact with the Ethereum wallet. The wallet is a third-party application that could be installed as an extension of a browser or phone app, it could connect to the public blockchain and handle transactions. The back-end of the WEB app is usually an application server; it could interact with the blockchain server by RPC calls. You could build a local blockchain using tools like Ganache, or connect to the public blockchain like Zeppelin. By adding these third-party tools, it could be easy for the web app to become a real application connected to the public blockchain and used by people.

Web3 structure requires web3.js, connection to the wallet, RPC endpoint, and blockchain server. Specifically, for NFT transactions, it needs a layer 2 solution, chainlink, certificate management, and smart contract.

- Infura -- Node as a service

Node as a service is needed to provide an API key to connect the activities on the app to the blockchain. These APIs can include access to Ethereum testnets and Mainnet. With such a service, the app would not need to have its own infrastructure built and it could use the protocols provided by the APIs directly.

Infura is used as a back-end API service when building dapps. It provides the dapps the ability to connect to the public blockchain. It provides great convenience because the back-service no longer needs to be built from 0, greatly reducing the workload of app development.

- Chainlink

An oracle is a bi-directional bridge between the blockchain and the real world. Chainlink is used to monetize data with Chainlink oracle real-time data. It securely connects smart contracts with off-chain data and services. Chainlink nodes cryptographically sign every piece of data transferred between systems, providing on-chain proof that our data came straight from the source. Chainlink network protects against failures in both liveness (availability) and safety (report integrity).

- Layer 2 solution--Immutable X

The most spending part of creating an NFT in the first layer is the gas fee. It stores all the transaction and product-related data onto the blockchain directly. Thus would be really time-consuming and computing-consuming. By having a lay 2 solution, Immutable X, it can eliminate gas fees, and store the less important data on the Side Chains or State channels. Such a mechanism would allow instant trades and scalability for the marketplaces.

- PKI Root Certificate provider

Strong Public key infrastructure (PKI) can provide root certificates and give root authority by using Verisign.

A digital certificate certifies the ownership of a public key by the named subject of the certificate. This allows others (relying parties) to rely upon signatures or on assertions made about the private key that corresponds to the certified public key. It provides a way to authorize the NFT.

- Servers configured for TLS

It provides Intermediate certificate authorities with leaf certificates and server certificates.

Just like SSL, TLS provides a way to authenticate and encrypt the RPC communication between dapps and back-end service.

- Remix-- smart contract

Remix IDE is a tool for developing smart contracts. It is an interactive website for testing, deploying, and administering the smart contracts we designed for Ethereum.

Normally smart contracts are difficult to develop. Remix provides a tool for professionals to do this task. After development, test, and development, smart contracts would be

pre-configured on blockchain. When the pre-set conditions are met, the smart protocol will automatically trigger.

- ERC-20 -- Governance token

Ethereum's cryptocurrency system is based on the use of tokens. People can buy, sell and trade the tokens on the blockchain. Among the many types of tokens, ERC-20 is one of the most popular and widely used ones.

It is a technical standard for small contracts and many digital currencies have been using it as the standard, like Maker, Basic Attention Token and OmiseGo, and so on. As we build the governance token system, we would use ERC-20 as our standard as well.

Conclusion

Cryptocradle aspires to bridge the gap between the potentials of blockchain technology and the real world's physical assets. It would play a major role in establishing collectibles as a prosperous investment channel. Running as a decentralized organization, Cryptocradle might attract meaningful engagements and enough traffic to generate new economic benefits for art creators, traders, investors, developers, and core teams.

In the next stages of Cryptocradle, there are more possibilities to realize:

- Build a department for community outreach.
  This department will first act as an academy to provide knowledge to members who are active in the platform. Then they will focus on educating the basics to the public.
- Expand the functionality of Treasury into collectibles investment: a small DAO inside a DAO.
  Collectibles can be very pricey and a large part of the population can't afford to invest in one whole collectibles piece. They can form a small group, gather the fund together and vote to purchase which collectibles. This functionality of Treasury would act as microfinance and expand the user base of the marketplace.

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