ViCo: Tracking the Ownership of YouTube Clip

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1 Our Idea

1.1 Business Problem Description

YouTube is a platform that is used by millions of people on the internet. People spend countless hours on the platform learning, laughing and creating to provide entertainment and educational value. It started in 2005 and is now the second largest search engine in the world behind Google and the surprising thing is YouTube is owned by Google. The main power comes from the YouTube algorithm and its ability to provide suggestions to the audience on the types of videos they might based on their search history and current watchlists.

People have been creating careers out of starting a youtube channel and creating a sustainable resource to earn a living. YouTube monetization allows a creator to get paid based on their channel analytics. The more 'subscribers' a channel has the higher the potential revenue and it is based on certain metrics. These metrics include 'watchtime' and 'CTR or Click-Through-Rate'. All of these metrics are capture for each channel and a creator of the channel can use the Youtube Channel studio to learn about his or her own analytics and optimize for best performance.

All of the features of YouTube make it a great platform and it has influenced the world and changed it in ways never thought possible but there is still one thing to consider. Every single video uploaded to YouTube is managed by YouTube and by extension Google. A creator might make their video but to distribute it they must place it on YouTube which gives the platform access to unique data which can later be sold to advertisers for hyperfocused targeting. This also comes with a cost of a what-if scenario if one day YouTube decides to make uploading not free and requires creators to pay a fee to upload or what if they just stop paying the creators or what if they just take away access.

To bring the power back into the hands of the creators and remove the centralized authority as the sole power holder a distributed systems approach can be useful for YouTube. This would allow the creators to hold rights to their content and own their data while having complete control over the decision and choices to be made. There are platforms which are trying to make a push towards this for example LBRY platform is a service which allows the creators to share their content on a peer to peer decentralized system and allow subscription and payment services using secured blockchain technology. The platform is ad free and it might even allow to earn cryptocurrency for viewing videos.

1.2   Motivation

YouTube hosts the most content creators compared to any other online platform. YouTube content creators derive most of their income from YouTube Advertisements (which YouTube controls), or from sponsorships from other companies. However, for many creators, this income stream is not enough. Many decently popular creators (between 10,000 to 200,000 in subscribers) struggle to get sponsorships and often must generate income in other ways, like creating additional, private content for select subscribers on platforms like Patreon.

Our product, will give YouTube content creators another way to generate income. Many up-and-coming creators have at least one wildly successful and popular video. By transforming the video or clips of the video into a unique collectible digital asset, content creators can sell the ownership of that asset to their viewers, who know that they're the only ones who own that video or clip.

Additionally, content creators can create private content that is only unlockable with a 'premium' subscription. Selling clips of videos from that collection would increase the demand for that premium content.

For example, suppose Ava is a content creator on YouTube who creates comedic skits on YouTube. Ava creates an especially funny skit for only her premium subscribers, either on Patreon or YouTube. Ava sells a clip of that skit as an NFT to one of her premium subscribers, who then posts about it on Twitter, Facebook, or any other social media platform. Non-premium subscribers see the clip, want to see more, and are more incentivized to pay for access to that premium subscription.

1.3   Blockchain Architecture

To meet the need of tracking the ownership of YouTube clips, it is best to take the advantage of NFTs. Currently, the most popular NFT trading platform is the Ethereum network. The Turing-complete scripting languages of Ethereum contracts greatly facilitate the minting, trading, and spreading of the Non-fungible tokens.

While Bitcoin is designed to be the gold of cryptocurrencies, Ethereum is regarded as the oil that drives the smart contracts written in Turing-complete script languages. Compared with Bitcoin, the Ethereum blockchain expands the capabilities of blockchain by creating smart contracts, a piece of code embedded in the Ethereum account to be run by the entire blockchain network. Such smart contracts pave the way for much more complex trading mechanisms common in the real world, such as synthetic assets, derivatives, and bonds(Ethereum, n.d.). To endorse the computational power used in executing contracts, Ethereum invented the concept of gas, which is a small amount of fee used to pay for the computation steps and storages the running contract takes.

The smart contracts also provide Ethereum with the ability to create new types of digital currencies also known as tokens. Instead of creating a cryptosystem entirely from scratch, the developers can now simply register a new type of token onto the Ethereum blockchain, by following the ERC-20 standard. Ethereum is evolving by setting up new standards and adding new interfaces for the smart contracts through the Ethereum Request for Comments(ERC). Just like BIP for Bitcoin, anyone in the Ethereum community can submit new ideas through Ethereum Improvement Proposal. After careful review and possibly revisions of the original proposal, the community may accept the proposal and set it as a new ERC standard.

Over the years, several ERC standards have witnessed the development of non-fungible tokens on the Ethereum blockchain. They are ERC-721(Non-Fungible Token Standard), ERC-998 and ERC-1155(Proposals, n.d.). Each of these standards introduce new features and functionalities of NFTs. ERC-721 introduced the interface of non-fungible tokens creation/transfer in the Ethereum network, mitigating the flaws of the ERC-20(only sufficient

for tracking tokens that are fungible). Each NFT is identified by a unique uint256 ID in the blockchain, and can be created during contract creation. The way to represent the ownership of an asset using an NFT is to record some metadata of the asset in the contract metadata. For example, associate NFTs with URIs for digital assets. Later, ERC-998 allows bundles of ERC-721 tokens to be transferred in one single transaction. This improvement greatly facilitates the trading of collections of NFT assets, such as a pack of gears in the game or several YouTube clips from one author. Finally, ERC-1155 extends the content of a single contract to include multiple kinds of tokens, now that a collection of both NFTs and fungible tokens can be traded in one single contract.

2 Design

We implement the contract with Solidity and the front-end with Java script. As far as front-end concerns, we have two pages called "Gallery" and "Market" (Figure 1). In the Market (Figure 2), people can upload a picture of their video and some other information such a tag and a link to their video. All such information then will be showed in the "Gallery" (Figure 3) where customers can search and buy their video of interest. The contract keeps track of each item, makes sure they are listed and sold properly.
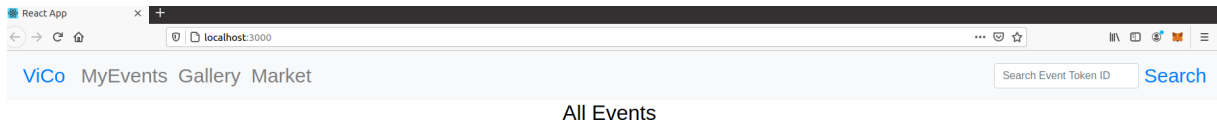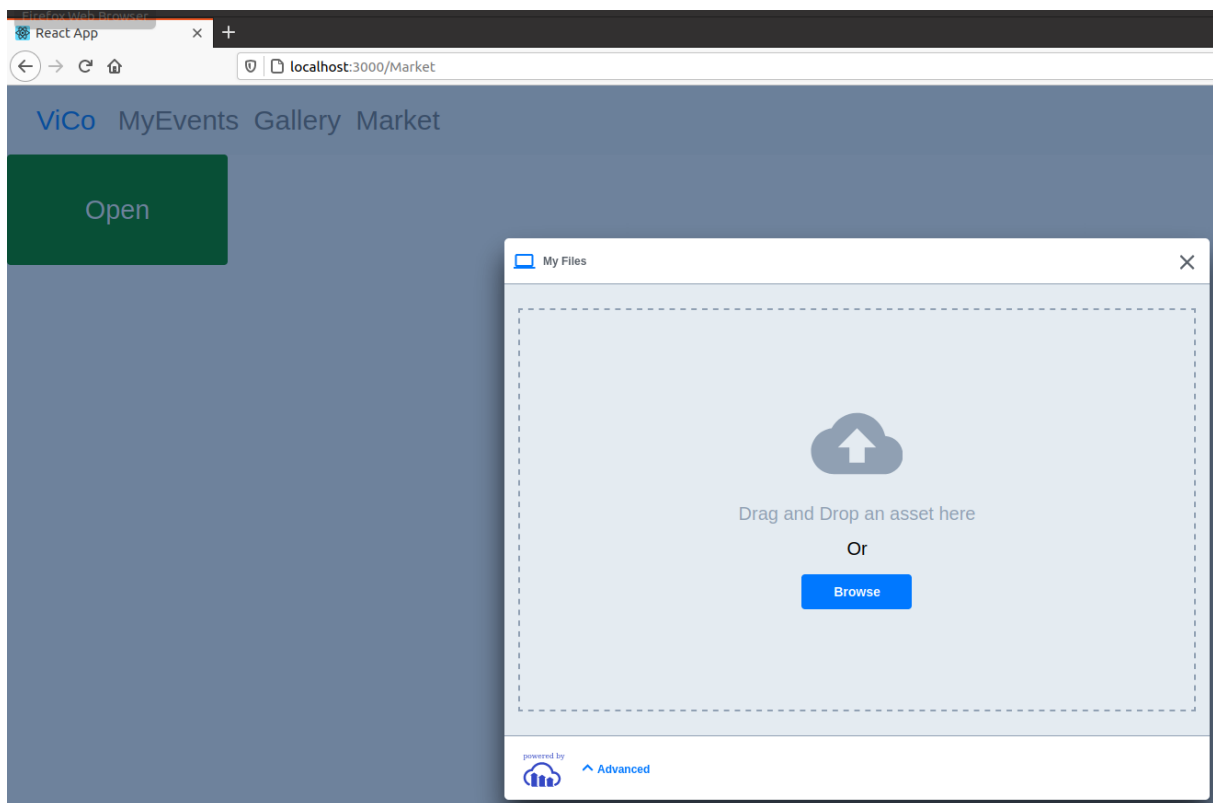

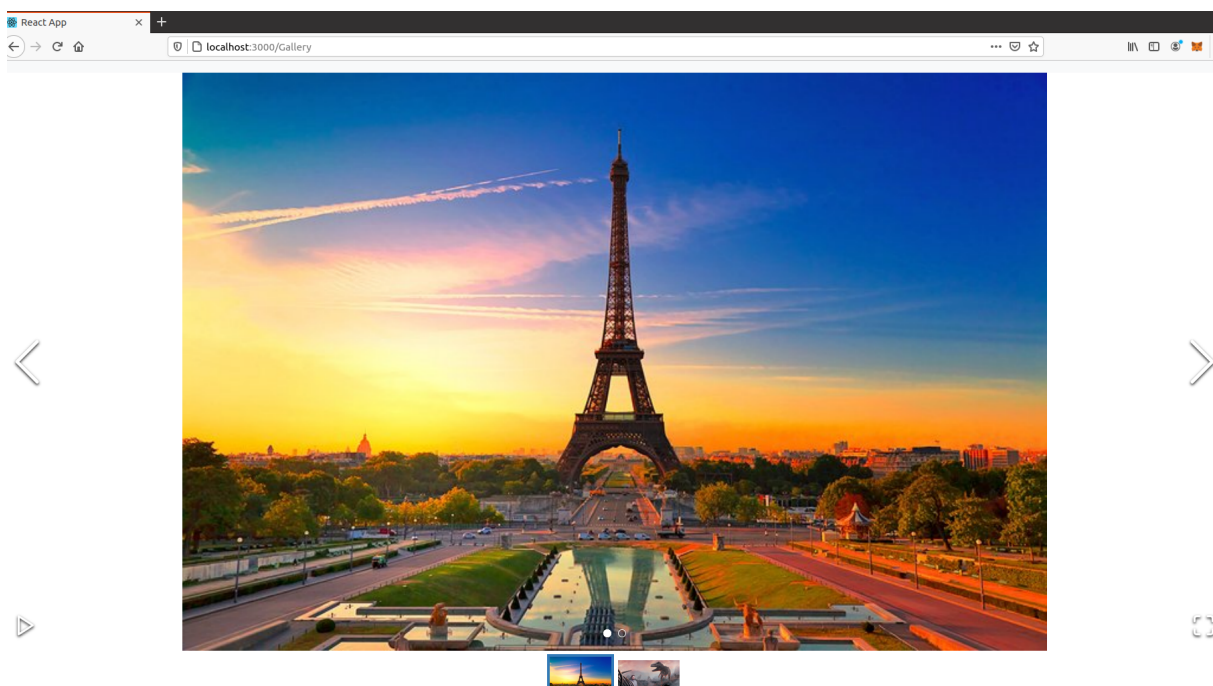Figure 1: Front-page of the ViCo.

Figure 2: Page Market.

Figure 3: Page Gallery.