

Lab 1 – Art Guardian Product Description

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1. Introduction

In the early Summer of 2015, the first smart-contract-based blockchain went online and helped push the phenomenon of blockchain to what it's known as today (2022, April 25). Since Ethereum's mainnet launched, this new blockchain has been at the forefront of many developing technologies, however, the topic of non-fungible tokens (NFTs) is likely the most popular in recent years. The first NFT sold on the Ethereum blockchain was made in August of 2015 and was named "Terra Nullius." The means by which this NFT was created on the Ethereum blockchain was of staking one's 'claim' on the Ethereum blockchain (2021, December 30). As the popularity of NFTs exponentially rose in 2021, so did the ever-growing market of cyber-theft... in this case, stolen NFT artwork.

A digital art platform, Deviantart, reported that from November 2021 to year's end, there was an increase of stolen NFT artwork of the likes of 300%. The problem has become rampant and is only getting worse as more and more artwork is being stolen from online art libraries like Twitter, Tumblr, and Instagram (2022, January 29). The solution to an artist's stolen artwork is often strenuous and cumbersome. It requires them to submit a DMCA take-down request themselves, which is essentially submitting a legal claim to the U.S. government to remove said NFT(s) from the marketplace... all the while keeping track of all necessary materials they will need as these processes are followed through.

Art Guardian is a solution that would allow all artists to have complete control over their stolen artwork's caseloads all while taken care of by our progressive web applications that oversee all possible areas of the theft and its resolution.

2. Art Guardian Product Description

Art Guardian is a progressive web application that monitors an artist's original artwork that is uploaded by them and kept in a database. Once uploaded, Art Guardian will monitor the popular NFT marketplaces and keep track of any artwork that is matched with an artist's original artwork. Once the stolen NFT is identified and the artist is made aware of the theft, the artist may then choose whether or not to pursue charges and if so, Art Guardian will generate a DMCA, receive the artist's e-signature, and submit and file the form. Art Guardian will monitor all artwork caseloads. If the DMCA request is approved, then the artwork will be removed from the marketplace and if the request is denied then further action may be taken at the artist's request. The artist also reserves the right to whitelist certain artwork they have created if they wish for it to be used in whatever means necessary.

Art Guardian takes the problem of stolen artwork and turns the burdensome task of repeated DMCA takedowns into a streamlined, manageable process to ensure that you and your art are not taken advantage of.

2.1 Key Product Features and Capabilities

Art Guardian will upload the provided art pieces, from the artist, into the app's database and will begin monitoring the major NFT marketplaces for theft of the advised artwork. When the artist uploads their artwork, they will be required to identify whether or not they will whitelist an NFT associated with the art, if they do they will provide a Token ID to help prevent false theft alerts for NFTs the artist minted themselves. If an incident of theft is found, Art Guardian will send a notification to the artist's account on the desktop and send a push notification if the artist has the app downloaded on mobile. When the artist taps on the notification they will be asked if the art is theirs, and if they would like to file a DMCA. If the

answer to both questions is yes, a DMCA is generated and the artist e-signs, taking liability by agreeing the DMCA is accurate, and that the art is theirs. If they choose not to file a DMCA they will be asked if they wish to whitelist the NFT, in which case they will not be bothered about that token again. If the artist does not continue with the notification or discontinues the process, the database will erase the flagged NFT and the artist will no longer be notified of the theft.

Every artist will have a profile on Art Guardian. This profile will contain the artist's legal information as well as their artwork. This legal information will be used solely for the filling of a DMCA request and verifying the artist's identity. These specialized profiles will also have the ability to be linked to art platforms; which will add further verification of identity. All information will be encrypted and all artists will have their anonymity.

2.2 Major Components (Hardware and Software)

From the start, Art Guardian is compatible with any PC or mobile device that has a connection to the internet. Artists will authenticate their identities using an ID verification API, such as Stripe (as seen in figure 1). Artists have access to their profile or notification settings as well as the art upload feature. Art Guardian will have two databases: one to store the artist's information and the second to store the artist's artwork. The artist's information will be secured with Amazon's RDS while Amazon S3 is planned to store the artwork.

Art Guardian will make use of the NFTPort database to compare artists' artwork that is stored in our S3 database. This system will be used to image-match different images. Once a similar image has been discovered, Art Guardian will incorporate OpenCV which will be set up to distinguish stolen art. If OpenCV determines that the artwork is a correct match, a DMCA will be created and sent to the original artist for verification and an e-signature to send a takedown

request. Art Guardian’s web application will use JavaScript and CSS while the mobile application will make use of IOS’s Swift and React.

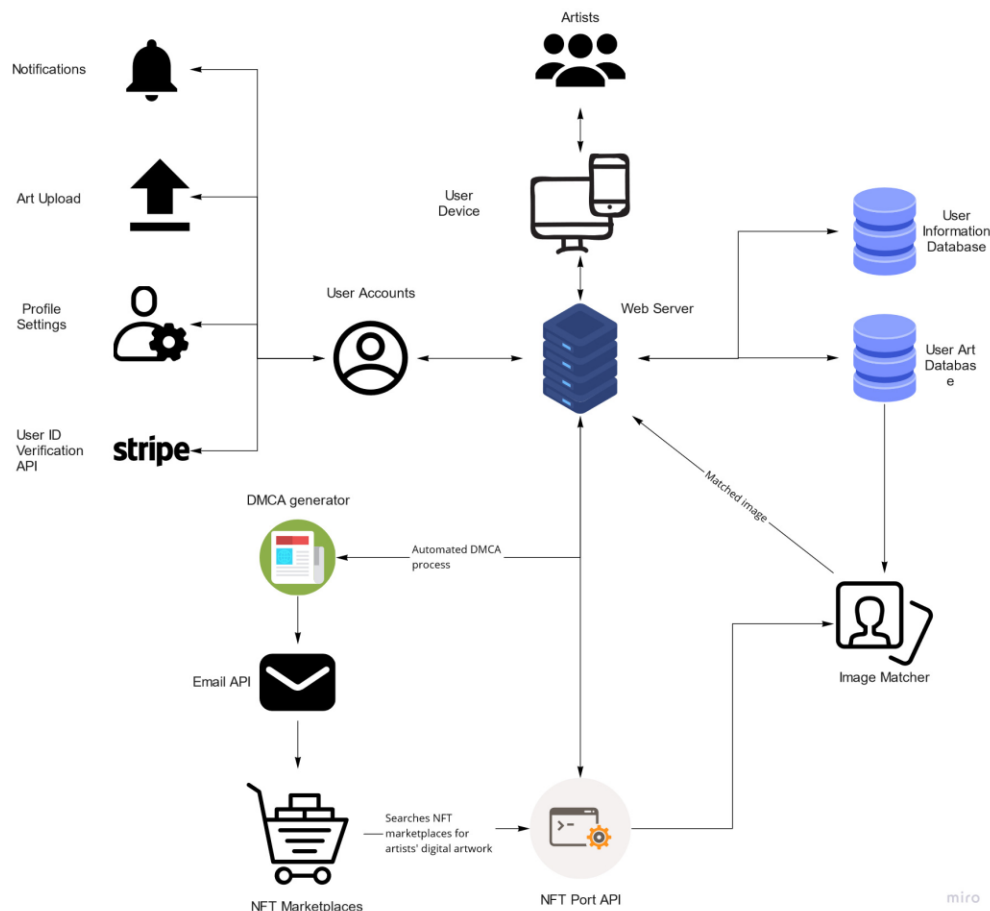


Figure 1 - Art Guardian Major Functional Component Diagram

Once the DMCA claim has been submitted, the system will await a response. If the DMCA is approved, the NFT marketplace will take down the listing and if not, then the artist can decide as an individual if they wish to pursue the matter further.

3. Identification of Case Studies

Art Guardian was created to resolve theft directly affecting commissioned artists. It will prevent their artwork from being minted as NFTs on the Ethereum blockchain and later sold for

profits. This system helps the artists being harmed by malevolent criminals who want to make money from others' work. To certify that said artwork is stolen, image matching, with the help of the artist's confirmation, will be used. A DMCA generator will fill out the takedown requests using the legal action provided. In the future, Art Guardian will participate with any digital artist who could use it to resolve their stolen art and minted as NFTs for auction.

For our testing, we will be having students majoring in art studies at Old Dominion University. Each student will fill the artist's role and be able to upload a piece of their art and Art Guardian will be able to run many mock tests for our prototyping.

4. Product Prototype Description

4.1 Prototype Architecture (Hardware/Software)

4.2 Prototype Features and Capabilities

4.3 Prototype Development Challenges

5. Glossary

Smart-Contract-Based Blockchain: A smart, digital ledger that keeps all information and can execute simple programs that can run and be stored on the blockchain.

Non-Fungible Tokens (NFTs): A non-interchangeable unit of data stored on a blockchain.

Digital Millennium Copyright Act: A law that criminalizes the reproduction of material, in this case, digital artwork.

6. References

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