

**“Huge mess of theft and fraud:’ artists sound alarm as NFT crime proliferates”<sup>5</sup>**



# Art Guardian

Team Blue

CS410 Spring 2022 Prototype Presentation



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# Biography



Carlo Diaz  
Frontend



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Frontend



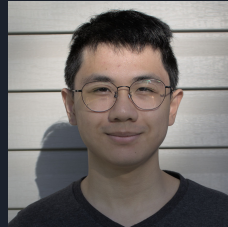
Brandon Kidd  
Database Specialist



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Backend



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# Glossary

- NFT stands for Non Fungible Token.
  - Non-fungible means unique, indivisible, and irreplaceable.<sup>1</sup>
  - NFTs are a certificate of ownership stored on a blockchain that links to a file.<sup>2</sup>
- **Blockchain:** an immutable ledger that anyone can validate.<sup>3</sup>
- **Minting:** the process in which the files become part of the blockchain.<sup>4</sup>
- **NFT Marketplace:** an online platform in which NFTs are minted, sold, and collected.<sup>7</sup>
- **DMCA (Digital Millennium Copyright Act) Takedown:** The owner of the copyrighted content requests the removal of the infringing content from the internet or platform.<sup>8</sup>
- **Art Platform:** A website in which users can post their digital art.

# Problem Characteristics

- Artists are having their art minted as NFTs without permission.
- Artists must search on NFT Marketplaces manually for stolen art.
- Filing a DMCA takedown is a tedious manual process that artists must go through when they find their art is stolen.
- It can be hard to keep track of the success of a DMCA takedown as well as all the information associated with it



RJ Palmer  
@arvalis

Cool new scam artists should be aware of. Any rando can now turn your tweet and by extension, your artwork into an NFT by tagging this account @tokenizedtweets

Block this guy



RJ Palmer @arvalis · Feb 27

I always really appreciated that Pokemon could bring us together regardless of where we are in our lives.



73

1.1K

7.4K



Zach Cain @lamzachcain · 1h

@tokenizedtweets 0x6261aa23E013B9A6825EB913398d0415517C32fF



5:16 AM · Mar 9, 2021



[Read the full conversation on Twitter](#)



48.8K



Reply



Copy link to Tweet

[Read 615 replies](#)

[twitter.com/arvalis](https://twitter.com/arvalis)



# Problem Statement

Digital artists lack an automated system that will detect art that has been minted on NFT Marketplaces without artists' permission and prevent future sale of their art by having it taken down from those marketplaces.



# Solution Statement

Art Guardian will provide an automated system for artists that will detect that their art has been minted as an NFT and file a DMCA takedown request to get it removed from the marketplace.



# Solution Characteristics

## Fully Implemented

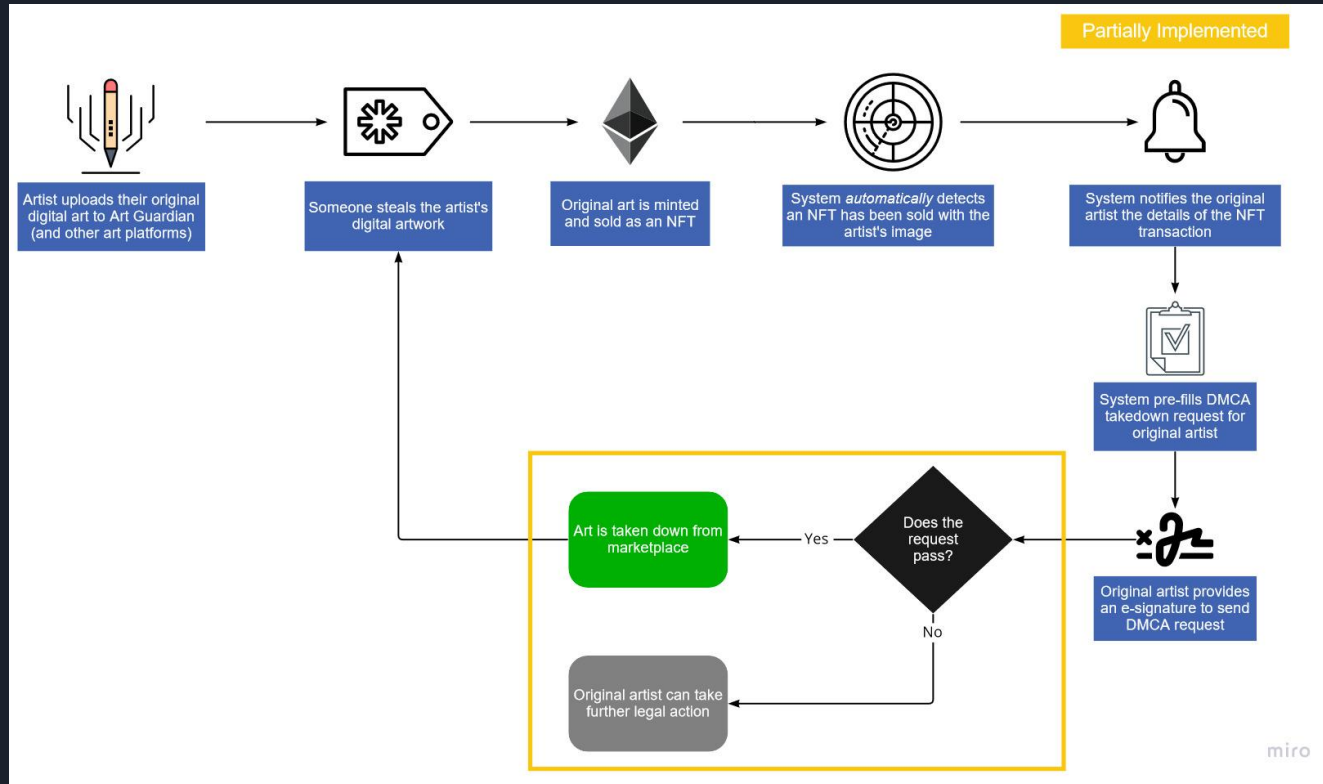
## Partially Implementing

## Eliminated

- Progressive Web App where artists upload their art into the database.
- Alerts users when stolen art is found on a marketplace.
- Automatically prepares and sends DMCA takedown requests once validated by the user.
- Keeps track of DMCA takedown requests:
  - Catalog DMCA takedowns.
  - Monitor the takedown status.



# Solution Process Flow





# RWP vs Prototype

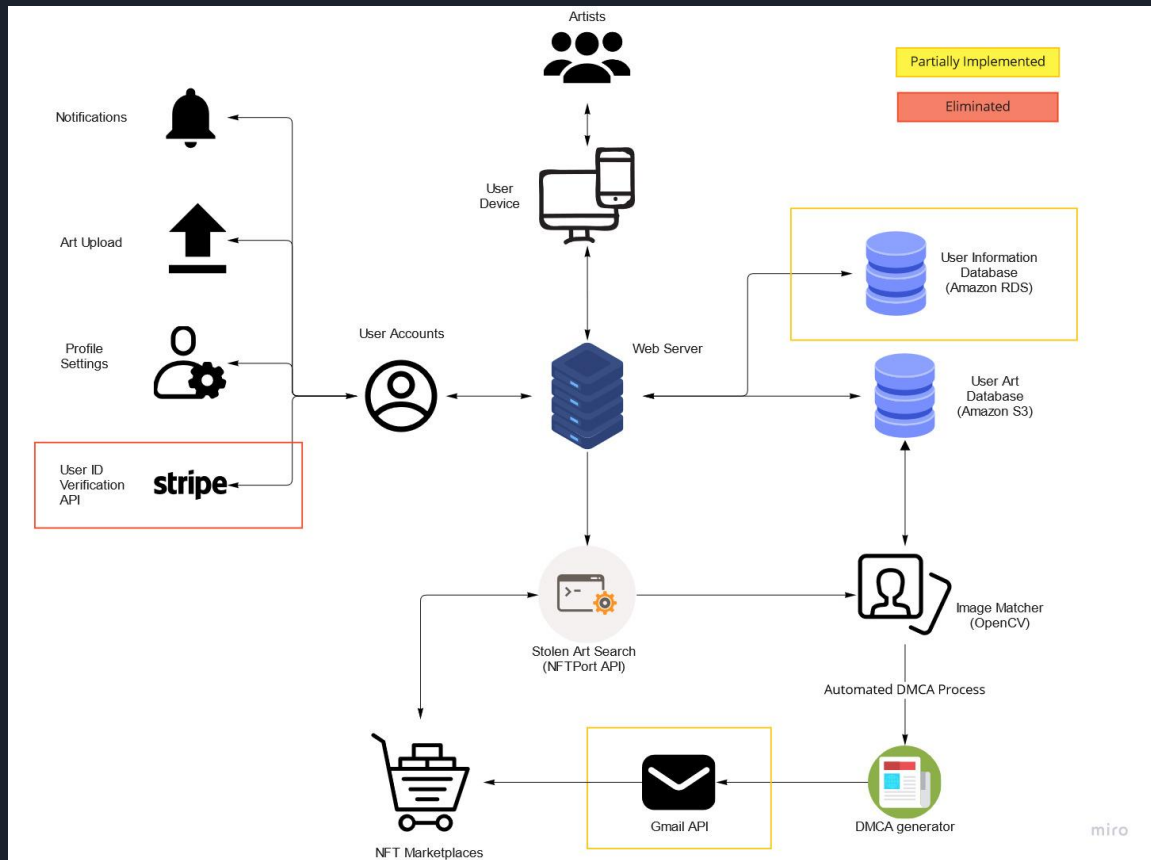
Fully Implemented

Partially Implementing

Eliminated

Art Guardian	RWP	Prototype
Account Creation	Fully Implemented	Fully Implemented
User Verification	Fully Implemented	Eliminated: Mock data
Art Upload	Fully Implemented	Fully Implemented
Image Library	Fully Implemented	Fully Implemented
Whitelisting	Fully Implemented	Fully Implemented
Marketplace Monitoring	Fully Implemented	Fully Implemented
Image Matching	Fully Implemented	Fully Implemented
Stolen Art Alert	Fully Implemented	Fully Implemented
DMCA Generation	Fully Implemented	Fully Implemented
DMCA Filing	Fully Implemented	Partially Implemented: Send to testing email
DMCA Cataloging	Fully Implemented	Fully Implemented
DMCA Tracking	Fully Implemented	Eliminated: Simulated Data

# Major Functional Component Diagram



miro



# Development Tools

Platform			
Component		Mobile	Desktop
	Language	JavaScript	HTML, CSS, Javascript
	Frameworks	React, Ionic	React, Ionic
	IDE	Visual Studio Code	Visual Studio Code
	Database	Amazon RDS And AWS	Amazon RDS And AWS
	Version Control	Git	Git
	Issue Tracking	GitHub	GitHub
	API Documentation	jsdoc	jsdoc



# Requirements

## Hardware

- Desktop:
  - An Intel Pentium 4 processor or later that's SSE3 capable.
- Mobile:
  - Any smartphone released after 2010.
- Stable Internet connection to browse the web:
  - At least 10 Mbps download speed per person.
  - At least 1 Mbps upload speed per person.

## Software

- Chromium based Web Browsers:
  - Google Chrome
  - Opera
  - Microsoft Edge
  - Etc.
- Windows 7, Windows 8, Windows 8.1, Windows 10 or later.
- OS X El Capitan 10.11 or later
- 64-bit Ubuntu 18.04+, Debian 10+, openSUSE 15.2+, or Fedora Linux 32+
- Android Marshmallow 6.0 or later



# User Stories

Fully Implemented

Partially Implementing

Eliminated

Artist:

As an artist, I need to be able to sign in to my account to access the app.

As an artist, I need to be able to sign up for an account to join and protect my art.

As an artist, I need to be able to reset my password in case I forget my password.

As an artist, I would like a tutorial on how to use the app so I can properly protect my art.

As an artist, I need to be able to upload my art to keep my art safe.

As an artist, I would like to see a collection of the art that I have uploaded in order to know what is or is not protected.

As an artist, I would like to know which pieces of my art have been found on the NFT marketplaces so I can take further action.

As an artist, I would like to see information to help me protect my art so I can prevent theft.

As an artist, I would like to be able to issue takedowns of stolen art found on the marketplace so I can prevent an illegal sale.

As an artist, I would like Art Guardian to automatically generate DMCA takedowns for stolen art so I do not have to do that myself.

As an artist, I would like to be updated on the status of the DMCA Takedown so I can know when it is taken down or if I have to take further action.

As an artist, I need my information to be secure and private so I can remain anonymous.

As an artist, I would like to see information about the NFT using my art so I can see who stole it and what marketplace it is on.

As a NFT Artist I need to be able to whitelist my minted NFT so my own NFT doesn't trigger a theft alert.



# Tester User Stories

Fully Implemented

Partially Implementing

Eliminated

Tester

As a tester I need to be able to trigger the 2-Factor-Authentication for testing.

As a tester I need to be able to trigger a push notification for testing.

As a tester I need to be able to access the image database for reading and uploading images.

As a tester I need to be able to make a fake NFT to test our DMCA Generation system.

As a tester I need to be able to make a fake NFT to test our flagging system.

As a tester I need to be able to invoke the image matcher to receive test matching values.

As a tester I need to be able to make a fake NFT to test our Whitelisting system.

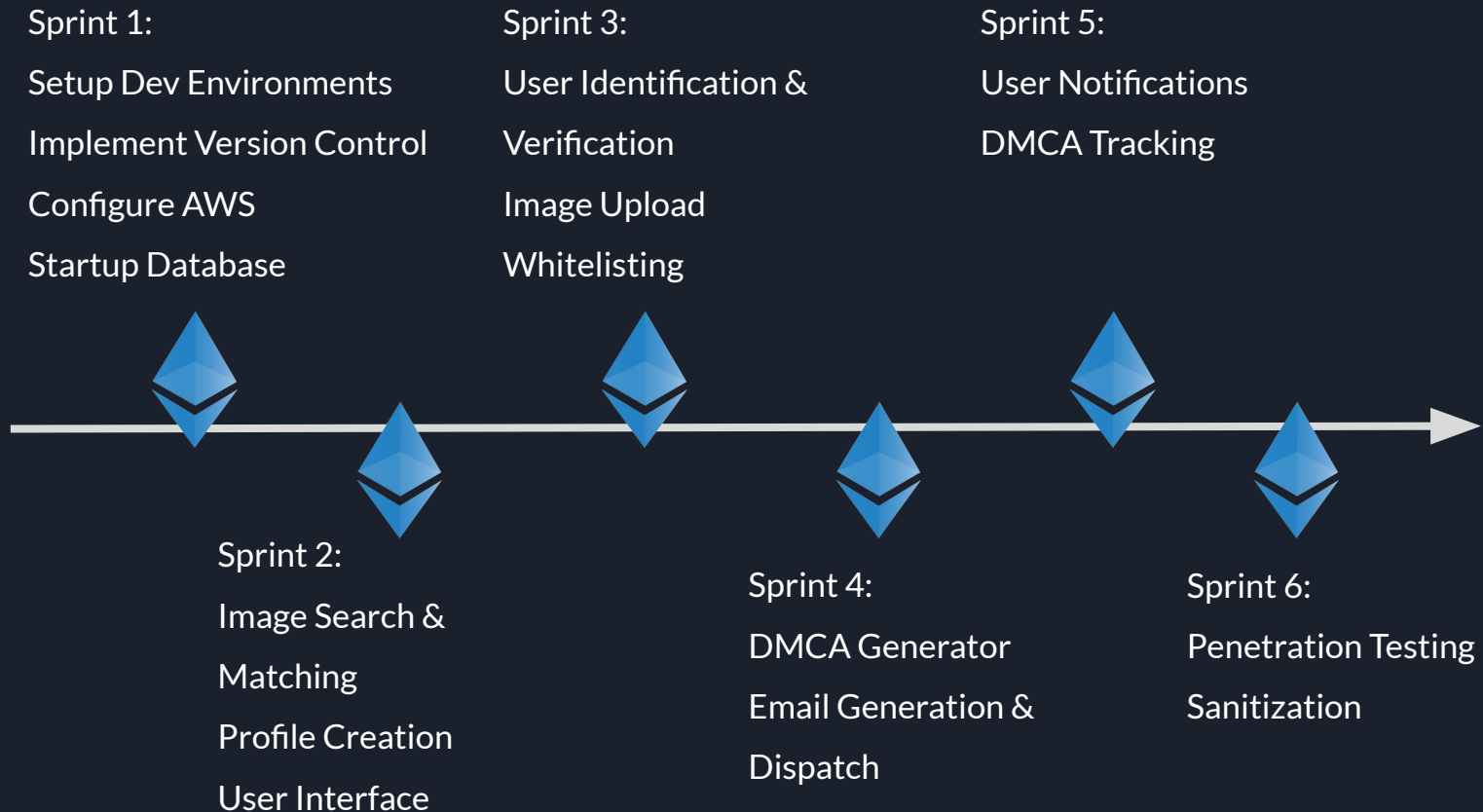
As a tester I need a testing mode for our app to access tests easier.

As a tester I need to be able to access the image database for reading and writing user information.

As a tester I need to be able to verify my identity using the Stripe-API.

As a tester I need to be able to access the email API to send test emails.

# Development Plan: Agile Sprints





# Technical Risk Matrix

## Prototype

		Impact				
Probability		Very Low	Low	Medium	High	Very High
	Very High					
	High					
	Medium		T-2	T-1		
	Low					
	Very Low				T-4	T-3

### Technical Risks

- T-1: Matching API yields a false match.
- T-2: Market does not comply with DMCA.
- T-3: ID API does not correctly verify identity.
- T-4: Automatic DMCA has wrong information

### Technical Risk Mitigations:

- T-1: User verifies art is theirs before sending DMCA.
- T-2: Flag art that reappears in the market place and notify user.
- T-3: Multiple ways to submit ID information.
- T-4: Final verification check.

# Customer Risk Matrix

## Prototype

		Impact				
		Very Low	Low	Medium	High	Very High
Probability	Very High					
	High					
	Medium		C-2		C-1	
	Low					
	Very Low			C-3		

### Customer Risks

- C-1: Users abuse the system by uploading/issuing DMCA for art they do not own.
- C-2: User doesn't know how to use the app.
- C-3: User forgets to issue the DMCA.

### Customer Risk Mitigation

- C-1: Sign up using art accounts.
- C-2: Integrated User Tutorial.
- C-3: Timer that reminds user to cancel or send the DMCA

# Security Risk Matrix

## Prototype

		Impact				
Probability		Very Low	Low	Medium	High	Very High
	Very High					
	High					
	Medium					
	Low			S-1		S-2
	Very Low					

### Security Risks

- S-1: Unauthorized access to a user account.
- S-2: Database Integrity.

### Security Risk Mitigation:

- S-1: Two Factor Authentication for Login.
- S-2: Use Secure Databases and Encrypt user data (AWS)



# Conclusion

- Art Guardian works to implement existing technologies to monitor stolen art in NFT markets.
- It will generate, send, and monitor DMCA takedown requests into one simple application.
- This is a new and evolving situation, and the digital art world needs a solution.



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Thank You for Participating!  
Any Questions?