

“Huge mess of theft and fraud:’ artists sound alarm as NFT crime proliferates”⁵



Art Guardian

Team Blue

CS410 Spring 2022 Prototype Presentation



Table Of Contents

- | | | | |
|-----|--------------------------|-----|-------------------|
| 3. | Biography | 13. | Development Tools |
| 4. | Glossary | 14. | Requirements |
| 5. | A Growing Problem | 15. | User Stories |
| 6. | Problem Characteristics | 17. | Development Plan |
| 7. | Problem Statement | 18. | Risk Matrices |
| 8. | Solution Statement | 21. | Conclusion |
| 9. | Solution Characteristics | 22. | References |
| 10. | RWP vs. Prototype | 23. | Q&A |
| 11. | Solution Process Flow | | |
| 12. | MFCD | | |

Biography



Carlo Diaz
Frontend



Paolo Ihde
Frontend



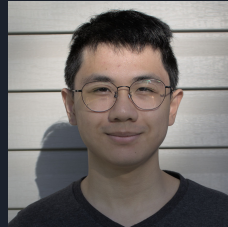
Brandon Kidd
Database Specialist



Michael Thompson
Backend



Autumn Roberts
Team Leader/Front End



Tobin Zheng
Webmaster



Spencer Hite
Database Specialist



Glossary

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



A Growing Problem

- NFT Market rose from \$100 million in 2020 to \$41 billion by the end of 2021⁶
- Deviantart reported 90,000 possible thefts of digital art in December, 2021, an increase of 300% since November, 2021.⁵
- Vn-Parco reported that roughly 50% of NFT sales were over \$200 in 2022.⁶

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



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.



RWP vs Prototype

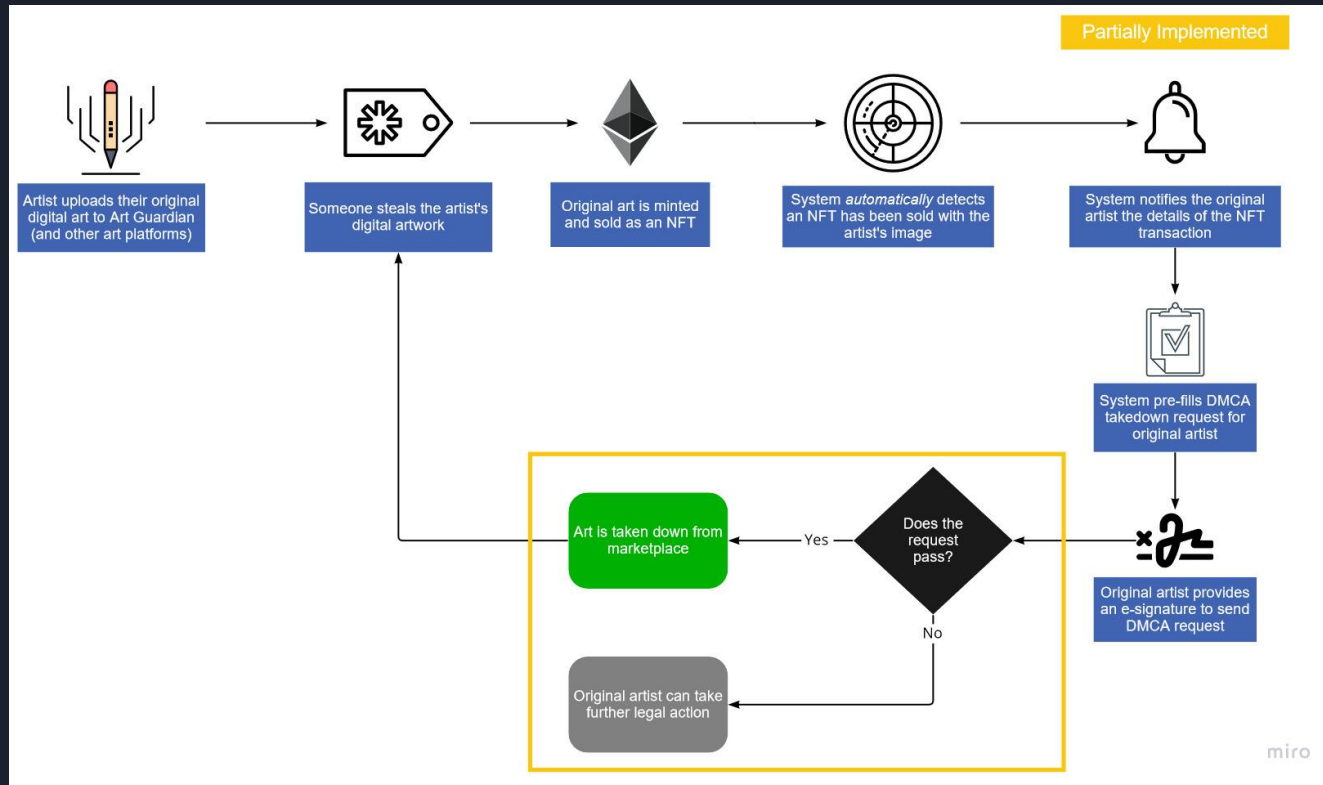
Fully Implemented

Partially Implementing

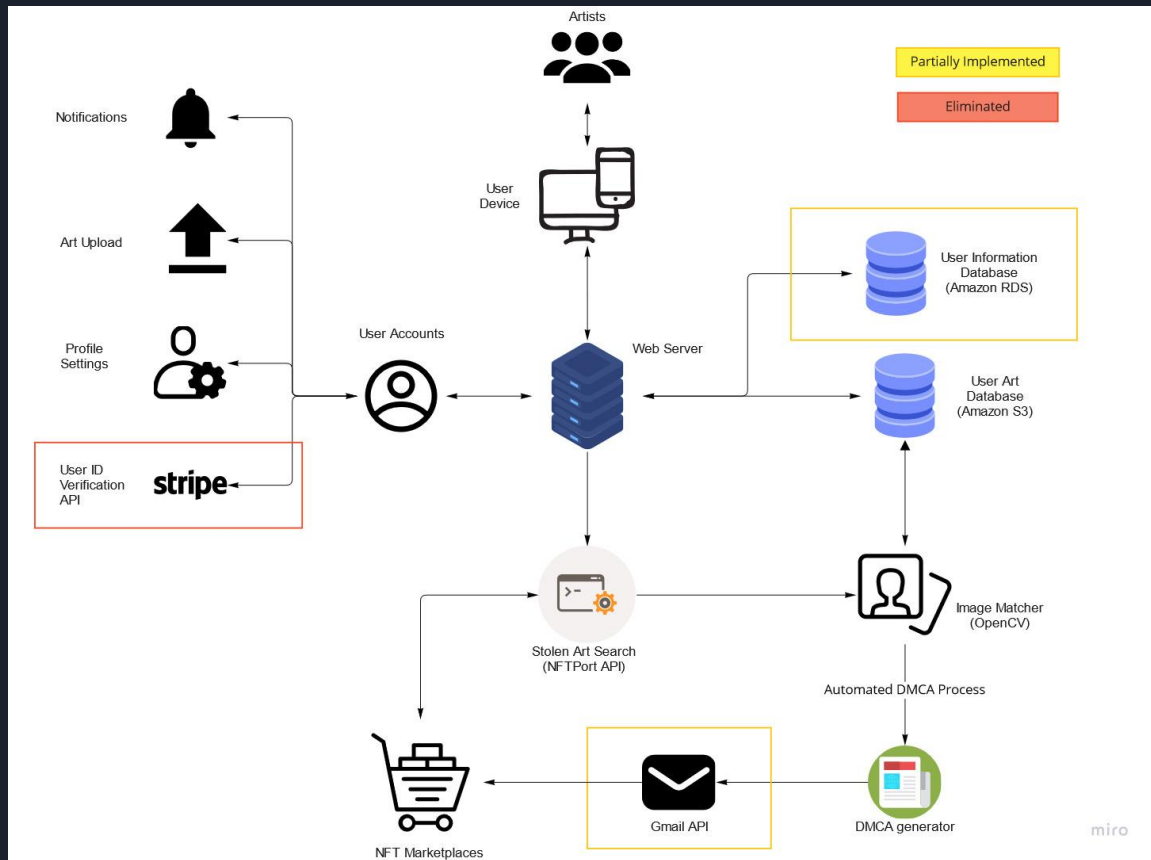
Eliminated

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

Solution Process Flow



Major Functional Component Diagram



miro



Development Tools

Platform			
Component		Mobile	Desktop
	Language	JavaScript	HTML, CSS, Javascript
	Framework	React Native	React
	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 back-end tester I need to be able to trigger the 2-Factor-Authentication for testing.

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

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

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

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

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

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

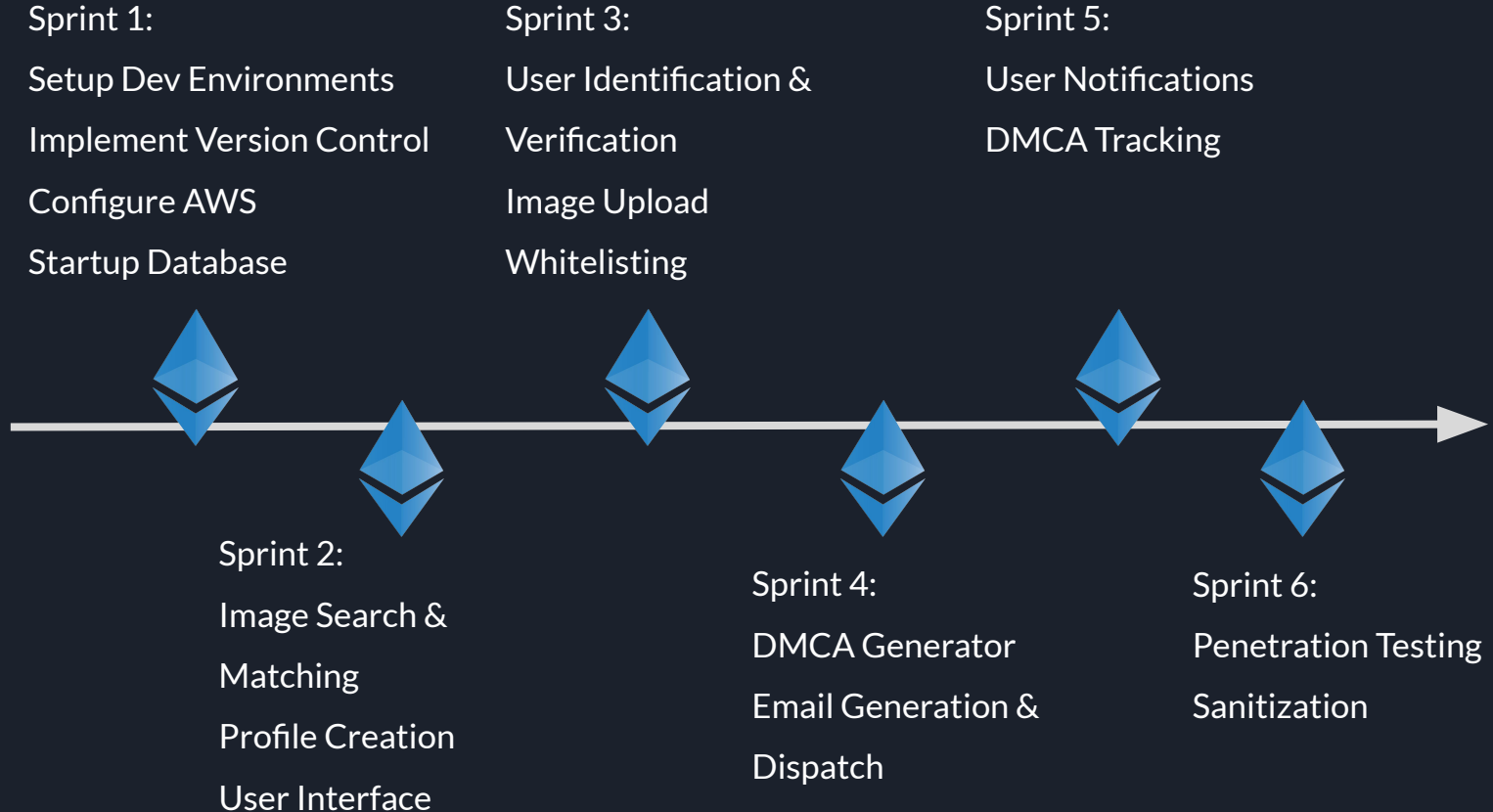
As a back-end tester I need a testing mode for our app to access tests easier.

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

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

As a back-end 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				
		Very Low	Low	Medium	High	Very High
Probability	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.



References

1. Collins, B. (2021, December 23). Fungible vs Non-Fungible Tokens: What's The Difference? Bryan Collins. <https://www.bryancollins.com/fungible-vs-non-fungible-tokens/>
2. BBC. (2021, March 12). What are NFTs and why are some worth millions? BBC News, <https://www.bbc.com/news/technology-56371912>
3. Telmo Subira Rodriguez. (2018, December 2). Blockchain for Dummies. Medium; The Startup. <https://medium.com/swlh/blockchain-for-dummies-d3daf2170068>
4. Coincorner. (2022, February 11). What Is Nft Minting? Coin-Corner. <https://coin-corner.com/what-is-nft-minting/>
5. Beckett, L. (2022, January 29). 'Huge mess of theft and fraud:' artists sound alarm as NFT crime proliferates. The Guardian. Retrieved January 31, 2022, from <https://www.theguardian.com/global/2022/jan/29/huge-mess-of-theft-artists-sound-alarm-theft-nfts-proliferates>
6. Dailey, N. (2022, January 6). *NFTs ballooned to a \$41 billion market in 2021 and are catching up to the total size of the global fine art market*. Markets Insider. Retrieved February 23, 2022, from <https://markets.businessinsider.com/news/currencies/nft-market-41-billion-nearing-fine-art-market-size-2022-1>
7. Abrol, A. (2022, January 14). *What is an NFT marketplace and How Do You Create Your Own?* Blockchain Council. Retrieved February 23, 2022, from <https://www.blockchain-council.org/nft/nft-marketplace/>
8. Mr. DMCA Helper. (2022, February 23). What is a DMCA Takedown? Dmca.com. https://www.dmca.com/FAQ/What-is-a-DMCA-Takedown?ref=why_is_sol5a32
9. Palmer, R. (2022). @arvalis. Retrieved 1 March 2022, from <https://twitter.com/arvalis/status/1369230566843813891?s=20>
10. Jon, M. (n.d.). *Agile Method* [Diagram]. <https://mobile-jon.com/2021/04/05/Applying-the-Agile-Methodology-to-the-Modern-Workplace/>



Thank You for Participating!
Any Questions?