THE NFT ART DIGITAL LIBRARY

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Abstract: NFT art is a controversial new form of digital art. It consists on digital artworks cryptographically registered with a token on a blockchain. Even if blockchains are openly available, nowadays the easiest way to access NFT art on the web is through the digital art marketplaces. The NFT Art Digital Library provides a way to access NFT art for all those users who are not highly skilled in computer programming and offers an alternative to access NFT art with fruition purposes.

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SUMMARY

INTRODUCTION

What is NFT art: definition and problems

NFTs "are a cryptography tool that uses blockchain technology to verify and secure a record of the existence and ownership of digital and real world assets. Some of the most famous and high-priced NFTs have been associated with artwork, particularly digital artwork" (Murray 2022, 2).

NFT art is a controversial new form of digital art. It consists of digital artworks cryptographically registered with a token on a blockchain. Even if blockchains are openly available, nowadays the easiest way to access NFT art on the web is through the digital art marketplaces.

The relationship between art and business after the industrialisation has becoming problematic mostly because of problems related to authorship and authenticity. The recognition of NFT art as 'real art' is even more chained to those problems, since both of them are not verifiable in a digital environment. Moreover the NFT art popularity is strictly related to the rising of digital currencies and most of NFT art are produced directly on the galleries platforms. This direct dependence of NFT art to the market shifts the focus from the art itself and it can bring to perceive NFT art as commodity.

As stated by Strauss in his analysis about the relationship between art and business "Art is produced as business' Other that always resists full assimilation, no matter how far artists seem to have crossed over to the business sphere." (Strauss 2017, 28). A digital library is a solution both to underline the alterity of NFT art from the market and to provide an alternative, decentralized way to access it.

The NFT Art Digital Library: Users and Goals

The NFT Art Digital Library addresses the needs of two kind of users: it provides a way to access NFT art for all those users who are not highly skilled in computer programming; it offers an alternative to all those users who do not have a buying purpose, but are interested in the fruition of NFT art or want to enlarge their knowledge about its world.

The creation of a digital library for NFT art will bring two indirect and opposite advantages: on one hand it will avoid the marketplace centralization currently in act by the digital galleries, on the other it will provide NFT art interoperability, being a first step in the interexchange of NFT art between the same galleries.

Furthermore, NFT will preserve not only the history of transaction, that is already openly accessible, but also the history of the artwork itself. The digital library will provide storage and preservation of the NFT art itself and a cataloguing of NFT art by means of International standards that can be the starting point for fraud tracking, underlying the uniquity of a piece of art.

ARCHITECTURE AND DESIGN

General architecture

The NFT art Digital Library will provide two main services to the user: search and discovery.

In the NFT Art Digital Library the digital object will be hosted by IPFS[1], that will assign an immutable content identifier (CID). NFT art will be exposed by a IIIF[2] server. Through Mirador[3] the user will be able both to visualize the NFT art and to explore the related metadata.

Since Omeka s[4] will be used as content management system (CMS), that requires MySQL[5] as DBMS, the metadata will be stored in a relational database. The meta image retrieval will be managed through the Omeka s' Metadata Browse module[6]. In the relational database will be stored also the features extracted from the images that will allow to suggest further items to the user selected by means of a content-based image retrieval (CBIR) system.

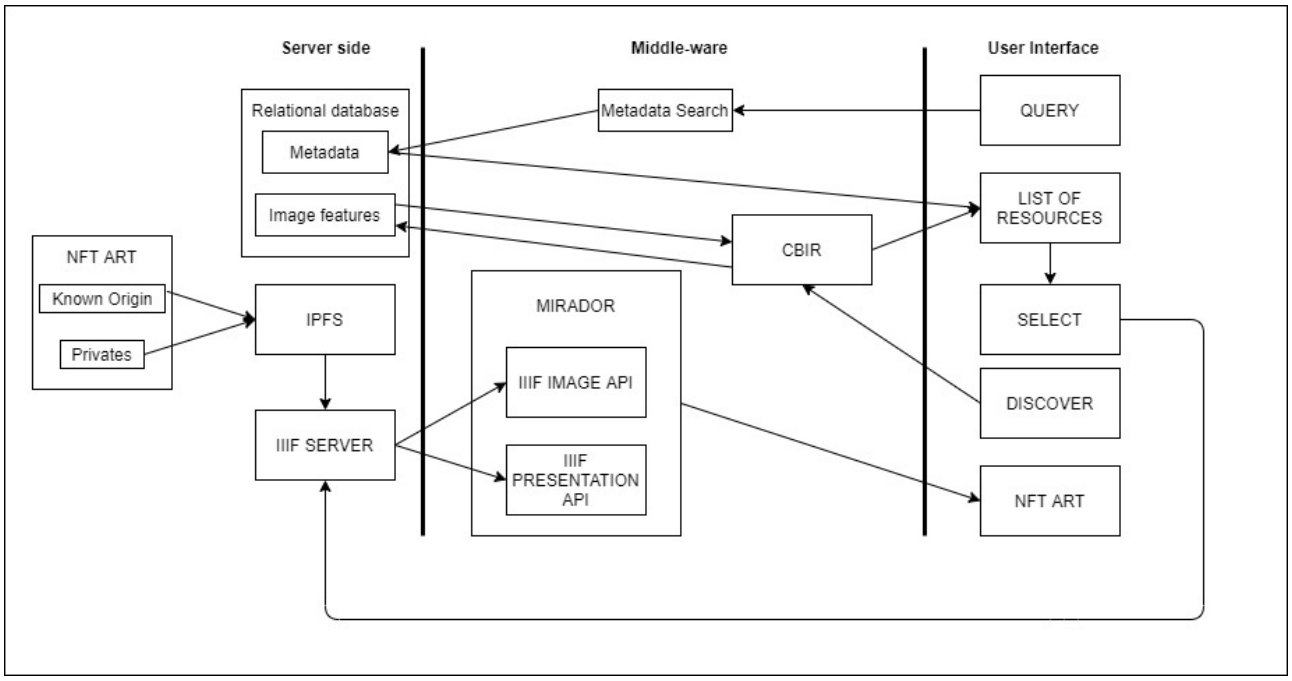

FIGURE 1 THE ARCHITECTURE OF THE NFT ART DIGITAL LIBRARY

The collection

The collection of the NFT art Digital Library will be extracted from the collection of NFT art on KnownOrigin[7]. Privates will have the possibility to load their own NFT art too.

The collection can be explored according to: artist, medium and collections.

[1] https://ipfs.tech/.
[2] https://iiif.io/.
[3] https://projectmirador.org/.
[4] https://omeka.org/s/.
[5] https://www.mysql.com/.
[6] https://omeka.org/s/docs/user-manual/modules/metadatabrowse/.
[7] https://knownorigin.io/.

Metadata

The table below shows the main metadata standards selected for the items held by The NFT Art Digital Library.

Descriptive metadata	Schema.org CIDOC-CRM DublinCore
Name authority	Getty Union List of Artist Names
Administrative metadata	METS
Preservation	PREMIS OWL

KnownOrigin provides the NFT art metadata in a json file stored in IPFS exposed by Pinata[8], a NFT media management service[9]. Once the NFT art from KnownOrigin enters the digital libraries collections, those metadata will be mapped according to the International Standards. NFT art coming from privates will be recorded according to the same metadata.

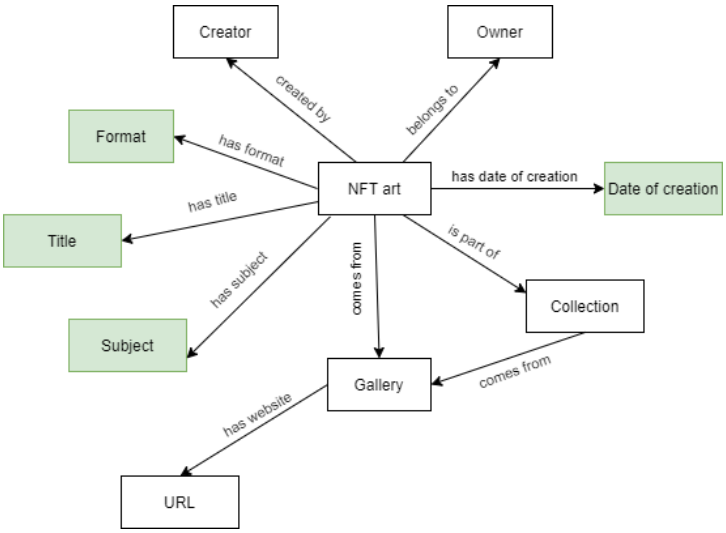

FIGURE 2 THE STARTING E/R MODEL FOR THE REPRESENTATION OF THE NFT ART IN THE DIGITAL LIBRARY.

In particular, the descriptive metadata are the one that will be shown to the user, and their organization can be formalized in an Entity/Relationship model (Figure 2).

The conceptual model (Figure 3) has been produced from the E/R model, implementing the metadata choices according to the Linked Open Data and FAIR principles (Wilkinson, Dumontier, Aalbersberg 2016).

[8] The KnownOrigin metadata organization is available at the following link: https://docs.knownorigin.io/developers/metadata/.
[9] https://www.pinata.cloud/

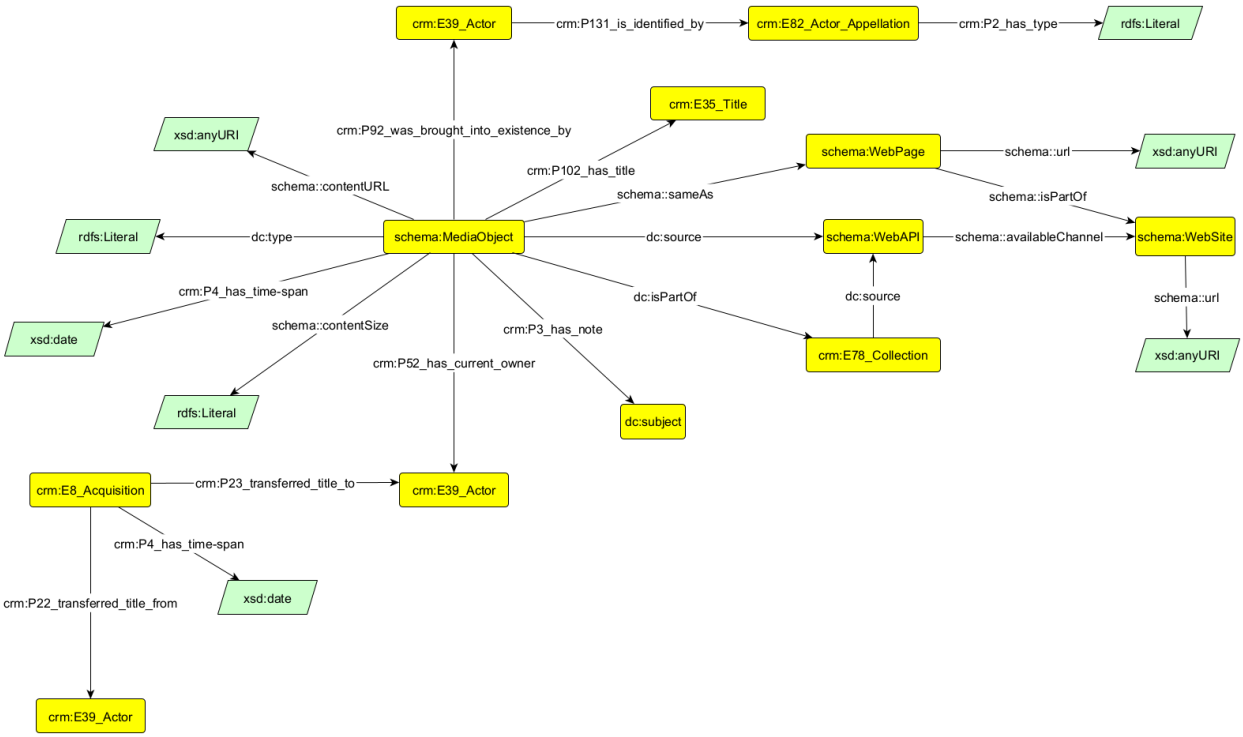

FIGURE 3 THE CONCEPTUAL MODEL OF AN ITEM IN THE NFT ART DIGITAL LIBRARY MADE WITH GRAFFOO

SERVICES

The user will have access to the items through the categories in which they have been divided: by author, by medium or by collection.

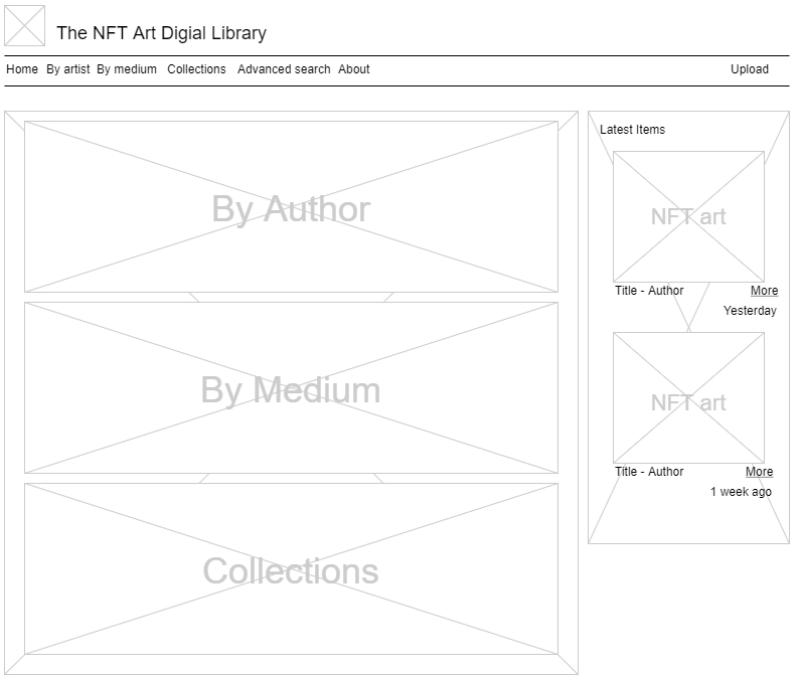

FIGURE 4 THE WIREFRAME OF THE HOMEPAGE

Information retrieval

An NFT art can be searched through the image meta search, i.e. retrieval based on the research against metadata. The user can search for keywords that will be matched against the tags, title, author and description metadata of the NFT art.

The advanced search allows to search through queries inside the metadata.

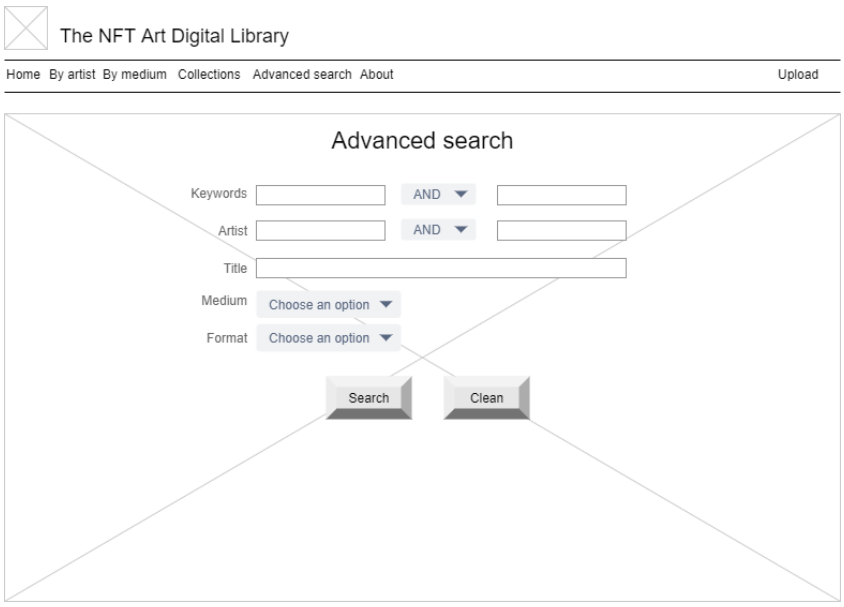

FIGURE 5 THE WIREFRAME OF THE ADVANCED SEARCH WEBPAGE

Once an item is opened, all the information related will be shown. Furthermore will be provided access to the visualization through Mirador and the possibility to download the metadata.

Discovery

The other service is the discovery: once an NFT art is selected, suggestions of additional works of art are provided to the user.

Suggestions to related NFT art will be provided according to:

- Related works of the same artist
- CBIR: a selection sorted by similarity of the NFT art in the database that shares more features with the selected one.

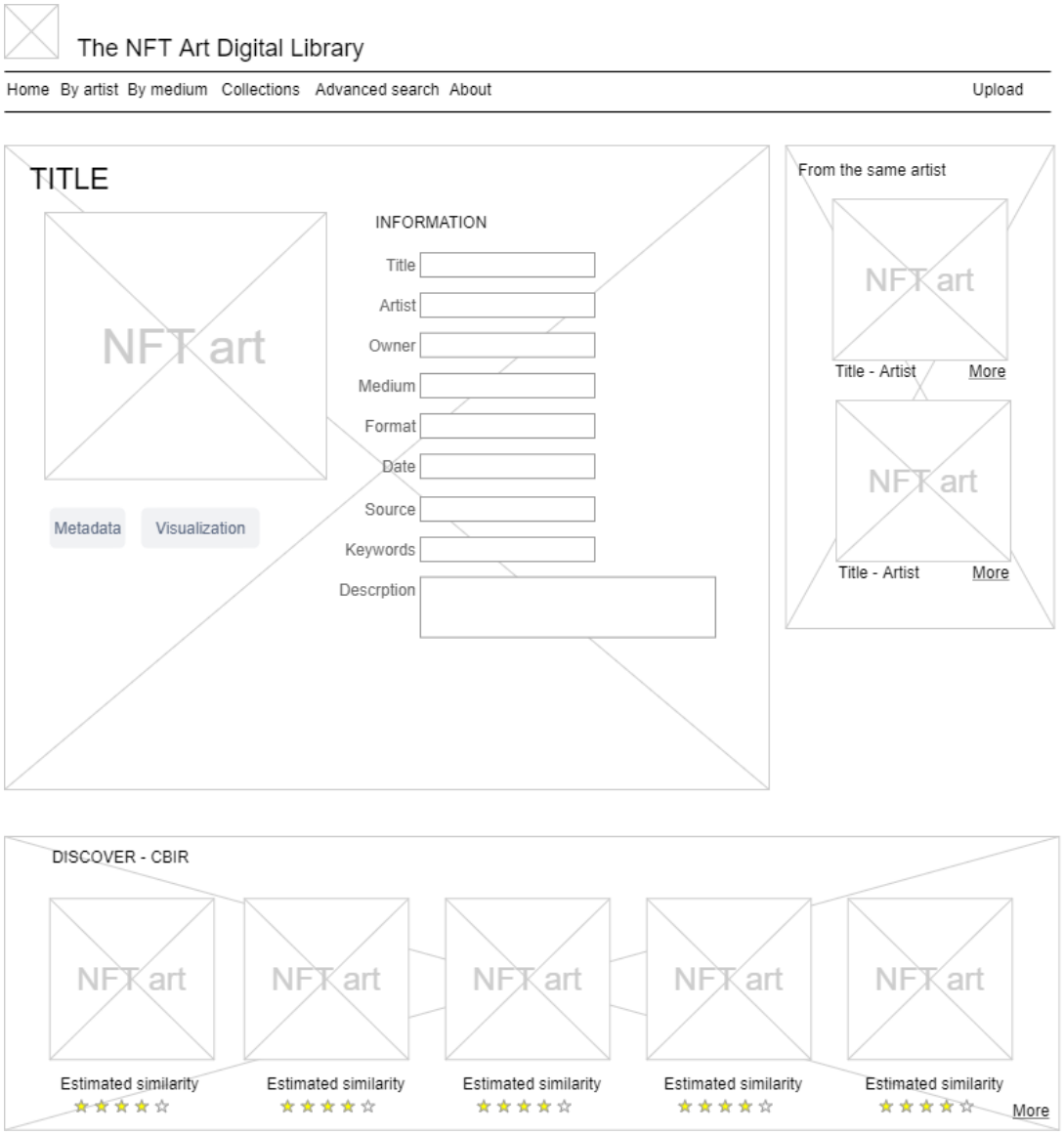

FIGURE 6 THE WIREFRAME OF THE LEAF PAGE WITH THE SELECTED ITEM AND THE TWO DISCOVERY SECTIONS

In this way the user will be free to explore new NFT art.

MANAGEMENT

Omeka s will be used as content management system (CMS). Omeka s is OAI-PMH compatible and provides a module called "OAI-PMH Repository"[10] to implement it, that allows also to expose metadata in RDF/XML format.

Flexibility and Community-based

NFT art is at the centre of a discussion related to copyright and authorship, two of the core elements to provide a trustable service to the user and a good preservation for the item in a digital library.

To overcome the difficulties in defining those three elements for each item in the library, The NFT Art Digital Library is based on the principles of flexibility and community. The use of administrative metadata will allow to update the history of the life of the item in the digital library. This will give to the library the flexibility to change data about the ownership, authorship and copyright in a transparent way, allowing to update the data and keep track of the different phases of the life of the digital artwork (e.g. it is possible that in the future the copyright status will change completely).

Copyright

Since no copyright is actually provided on the NFT art, this platform will recognize only the intellectual property rights to the artist on the digital artwork. However, continues update will be needed in order to keep track of changes in law.

Authorship

Since artists of crypto art largely use pseudo-names (and it is neither possible to identify if two pseudo-names belongs to the same person) The NFT Art Digital Library will provide Name Authorities for the artists only when available. In case of ambiguities, when possible the artist itself will be contacted in order to know the preferred form to be identified with.

Since it is not possible to identify fraud in NFT art, this platform will count on community reports.

[10] https://omeka.org/s/modules/OaiPmhRepository/.

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