Group 04

Hrishikesh Date | Kaushiki Ambi

Soham Palnitkar | Pranjali Bhat

NFT TRANSACTION ANALYSIS

Part 1: Introduction and Research Questions

Non Fungible Tokens (NFTs) are digital assets that represent objects like art, collectible, and in-game items. They are traded online, often with cryptocurrency, and are unique cryptographic tokens that exist on a blockchain and cannot be replicated. NFTs are sold to and from collectors, investors, traders and creators on NFT market places. When the NFT market experienced record sales they started to gain popularity. With time the complexity of the trades increased and the need to understand the NFT transaction sales is essential. The aim of this dashboard is to analyze NFT transaction trends to identify demand for different types of NFTs. In turn it would help creators and owners to understand market trends for creating, buying or selling NFTs under their price range.Investors can observe the price variations of NFTs throughout their lifecycle.

Part 2: Summary of Results

- Which NFT should I buy?

While buying an NFT the factors to be considered are volume and owner-asset ratio. Volume traded will tell the popularity of the NFT collection. If the volume traded is higher, it means more buyers are interested in investing in the collection. Owner-asset ratio can tell the number of owners that have bought the assets in the NFT collection.

- What are the popular NFTs?

The popularity of NFT can be found out by considering the volume traded of the NFT collection. If the volume traded of an NFT collection is moving up than the previous day, then the collectors and traders are liking the digital asset.

- Which NFTs come in my price range?

The floor price of an NFT can be taken into consideration while buying an NFT. It tells the starting price of any NFT in a collection. By looking at the floor price one can decide which NFT is affordable depending on the budget.

Part 3: Data Sources

There are three types of datasets that we have used for this project. Each dataset was used to answer different questions. The datasets used are as follows:

1. 'Top NFT Collections'
2. 'Sales-Bids-Tokens'
3. Dataset collected from an API source.

Top NFT Collections dataset

This dataset is a compilation of the top 600 NFT's by Sales Volume on the "Solana" blockchain.The information was pulled on January 16, 2022, and represents all time information for the top NFT collections. The dataset consists of the following information:

1. Index: The index of the file.
2. Name: The name of the NFT collection.
3. Volume: The volume of sales from the NFT collection in Solana (SOL).
4. Volume_USD: The volume of sales from the NFT collection in United States Dollar (USD).
5. Market_Cap: The market capitalization—total value of the collection's items in circulation—in Solana (SOL).
6. MarketCapUSD: The market capitalization—total value of the collection's items in circulation—in United States Dollar (USD).
7. Sales: The number of sales from the NFT collection.
8. Floor_Price: The lowest price of any NFT in the collection in Solana (SOL).
9. FloorPriceUSD: The lowest price of any NFT in the collection in United States Dollar (USD).
10. Average_Price: The average price of an NFT in the collection in Solana (SOL).
11. AveragePriceUSD: The average price of an NFT in the collection in United States Dollar (USD).
12. Owners: The number of owners of NFT's in the collection.
13. Assets: The number of items in the collection.
14. OwnerAssetRatio: The ownership percentage of all items in the collection.
15. Category: The category of the NFT collection.
16. Website: The associated website of the NFT collection.
17. Logo: The associated image of the NFT collection.

Sales-Bids-Tokens dataset

This dataset has 3 different files named 'sales.csv', 'bids.csv', 'tokens.csv'.

1. Sales

   This dataset contains 17529 rows and 9 columns. This dataset represents the sales of each NFT token along with their TokenID and the time and date at which the NFT sale took place. The price of the NFT token in Ethereum and USD is also present.

2. Bids

This dataset contains 51640 rows and 8 columns. This dataset represents the multiple bids of buyers for each NFT token along with their TokenID and the time and date at which the NFT bid was placed. The price of the NFT token in Ethereum and USD is also given.

3. Tokens

   This dataset contains 22232 rows and 14 columns. It contains the name of the Token,TokenID, image and the description of the token.

API source dataset

This is a comparitively larger dataset which has around 6,000,000 rows and 24 columns. It contains the following columns.

1. Unique_id_collection: Unique ID for a given NFT
2. Price Crypto
3. Crypto, Price_USD: Conversion in USD is done with a daily resolution
4. Seller_address, Seller_username, Buyer_address, Buyer_username: Addresses for sellers and buyers and (when available) their username used on the N marketplace
5. Image_url_1, Image_url_2, Image_url_3, image_url_4: Url to the digital object associate with the NFT. Given that urls may change over time
6. Datetime_updated, Datetime_updated seconds: It identifies the time of the transaction with either a day or second resolution
7. Smart contract: Smart contract of the given NFT
8. ID_token: ID of the NFT asset within a given smart contract Transaction_hash hash of the transaction involving a NFT sale
9. Collection: It corresponds to the collection in which the NFT belongs to
10. Collection_cleaned: It removes common misspellings in the field Collection. It also uses words in Cleaning_collections.csvto smooth the names.
11. Market It is where data is downloaded from (so the API).
12. Name: Title of the NFT listing
13. Description: Description of the NFT listings
14. Permanent link: A link that allows to verify the NFT authenticity (valid only for the OpenSea Market)
15. Category: Category in which the NFT belongs to. Examples are: Art, Games, and Collectible

Data Sources

This data was scraped from coinmarketcap marketplace and downloaded from kaggle. https://www.kaggle.com/datasets/nenamalikah/nft-collections-by-sales-volume

This is the link form which the API data was collected.

https://osf.io/wsnzr/files/osfstorage?view_only=319a53cf1bf542bbbe538aba37916537

KPIs (Key Performance Indicators)

1. **Floor Price**

The "floor price" is the lowest price at which an NFT is made available for purchase. This is essentially the base minimum market price for the project's tokens. A project with higher floor expenses will be worth more money. When investing in a new NFT project, especially if it's your first, an excellent goal is to find one that strikes a balance between exceptional value and an accessible base price. Even if projects with higher floor costs are worth more money, it is more difficult to get into them since they are more expensive. Furthermore, a project with a particularly low floor price has a lower chance of generating a positive return on investment.

2. **Volume**

charts showing the development of the non-fungible token (NFT) market, with data on trade volumes and transaction counts. Non-fungible token trading volumes, which are digital art and collectibles housed on blockchains, have decreased 97% since their record high in January of this year. The NFT market's trading volume is a crucial metric for gauging consumer demand.
Higher sales volumes indicate lower liquidity risk, whereas lower trade volumes typically indicate a bad market. Numerous initiatives are emerging as a result of the rapid rise of NFTs.

3. **Estimated Market Cap**

If there are more token owners, they will be willing to spend more to buy each other's NFT collections, which is indicated by a high predicted market cap. By dividing the price by the supply over the previous seven days, this can be calculated. Even if projects with higher floor costs are worth more money, it is more difficult to get into them since they are more expensive. Furthermore, a project with a particularly low floor price has a lower chance of generating a positive return on investment.

4. **Owner Asset Ratio**

Cryptographic assets known as non-fungible tokens (NFTs) are distinguishable from one another on a blockchain by unique identifying codes and metadata. Like cryptocurrencies, they cannot be purchased or swapped for equal amounts. Despite being readily available for free online, a non-fungible token (NFT) is a digital representation of ownership of a work of digital art or media.s

Part 4: Results and Methods

In this project, we used four parameters such as Volume, Owner-Asset ratio, Floor price and Market cap to answer the research questions. We have used different types of datasets for this project to summarize our results. The data preprocessing of the datasets was done using Python programming language in Jupyter notebook.

Results obtained using Identified Key Parameters:

1) **Volume**

   This is one of the most important parameters that we used in this project. Volume can be defined as the cumulative sum of crypto being bought and sold on the market. If the volume of a particular NFT collection is increasing day by day then it means that collectors and traders are finding the NFT collection worth investing in.

   The dataset holds the data of the transactions that took place for multiple NFT collections. With the help of this data we calculated the total amount spent in transactions for a NFT collection. This calculated amount is the total volume of the collection. Similarly, the volume of all other NFT collections was calculated. After that the top 10 NFT collections were found out. These top 10 NFT collections are the most famous because a lot of money was invested in these by traders. The result was represented by a bar graph to show the top 10 NFT collections by volume.

2) **Owner-Asset ratio**

   Owner-Asset ratio can be defined as the number of owners that own the assets (in this case NFTs) in a collection. In the dataset 'Top NFT Collections' there were 2 columns, owners and assets for each NFT collection. Using these 2 columns the Owner-Asset ratio for each NFT collection was calculated. The top 100 collections were shown using a bar chart in python.

3) **Market Cap**

   Market cap can be defined as the total amount of money involved in a NFT marketplace. There are various marketplaces from which traders can buy or sell the NFTs. In order to find out the best marketplace to buy a NFT, we found out all the marketplaces and the respective NFTs that are sold on these markets. Our results show that the famous marketplace to buy or trade NFTs is OpenSea, followed by Atomic and Cryptokitties. This result was obtained by considering the total amount involved in USD and also the number of NFTs in a respective marketplace.

Access to our full implementation

1) Extract the data from different sources.
2) Import data on any python environment.
3) Extract the data frames from the data imported.
4) Import and extract data frames to tableau workbench.
5) Visualize the data.

Part 5: Limitations and Future Work

As the NFT market is volatile in nature, the data collected in this project needs to be updated and maintained in order to get consistent results.

The collection of NFT transaction data also has its limitations as the owner or the market place where the NFTs are sold has full control over the data and the data is private.

Collecting data from the APIs has a long process of application for the keys and may need crypto currency payments in order to retrieve the data from APIs.

Moving forward with the results we achieved from this project. It is concluded that live sales data of NFTs might help in order to keep the results relevant. The question of what type of NFT might be sold in future can be addressed using regression models.

Interpreting the results achieved from this project one can understand the terminologies of the NFT market. The Sale patterns over past years. This project Is helpful to readers who are potential buyers and sellers of NFTs. the results can be refined by creating models and providing more data relevant to the objectives of the project.