

Text Mining NFT Whitepapers

Research Paper

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Abstract:

In order to understand the popularity of NFTs within the gaming industry and world, we should consider the prices of them and how many times the topic of them comes up in our data. The data we focused on were NFT whitepapers which were found on rarity.tools. Topic Modeling was used on the dataset to find popular topics within our data so that we could start text mining and find patterns. After conducting analysis on our dataset, we were able to come to identify that NFTs are useful in the game universe.

Keywords: Topic Modeling, Latent Semantic Analysis, Blockchain

1. Introduction

Non-fungible tokens are unique pieces of art that can not be replaced. They are part of the Ethereum Blockchain which is a type of crypto-currency. Other types of currency such as bitcoin and dogecoin have a blockchain, however, the Ethereum blockchain is able to store more information which makes each NFTs unique. The various NFTs that are sold have value and symbolize social status, credibility, exclusivity, and a way for individuals to express themselves. They can be used as a user's profile picture on social media, in-game avatar, or skin, and can represent real-life art or real estate. NFTs can vary in price depending on their popularity and rarity. Creators have also made some of their art exclusives which mean only a certain amount of NFTs are created so there is some competition when it comes to buying them. NFTs are basically digital certificates that are stored on a secure distributed database called a blockchain. These digital certificates prove that you own a non-fungible asset, giving NFTs real-life value.

Potential impacts of NFTs are the concerns of how they can help consumers in the future when deciding which NFT to buy. Since the focus is on video game NFTs, each user will have more knowledge on which NFT is worth investing in. Games have numerous, different topics and developments. Some NFTs give players rewards that can be earned during gameplay, allow users to play various game modes, and how users can purchase assets within that game's marketplace. Some games are free to play but in order to level up or experience premium modes, players have to purchase new characters, be invited into the metaverse, or they would need to purchase the unique NFT. This leads also benefits the creator since they can add attributes, health, spells, and special actions the player can use in the game, but only if the player purchases it. For example, Citizens of Bulliever Island is an open gaming universe with a community full of players and creators. The virtual world resembles real life because it has a pay-and-play

economy. Citizens are able to play and earn rewards but in order to be a player of this environment, citizens have to buy the Bull NFTs. It builds exposure for the creator as well because their NFT is not only being used in a game, but people will see it as an opportunity to explore their virtual world.

Text Mining is a process where a large amount of texts becomes structured and more meaningful. It helps us clean a document with a lot of data by removing unnecessary words, symbols, and identifying patterns within the text. Our project is focusing on the Whitepapers of NFTs. Whitepapers are a detailed document of what the NFTs vision, goals, extra perks, opportunities, type of community, and more are about. They can be multiple pages long so in order to find the main idea and important keywords, we use text mining. It will assist us in decision-making when we try to figure out the common themes of certain NFTs. A concept of text mining that we used in our project is Topic Modeling. Topic Modeling detects different topics in documents. It can be used for finding various trends on social media, but in this situation, we will be using topic modeling to identify whether gaming is a popular type of NFT people invest in.

2. Background and Prior Research

After analyzing various articles, there were a few pieces that resonated with the ideas of NFTs promoting video games. Well-known designer brands, such as Burberry and Louis Vuitton, have recently introduced new NFTs that are directly linked to current and newly launched video games. According to Vogue Business, Burberry was one of the few designers that launched its first NFT with the world-known game of Blankos Block Party. This newly launched NFT has been crafted to allow access to unique characters and in-game accessories modeled on the vinyl toy industry. Once Burberry released its collection, other brands became captivated by the

audience of consumers that operate within these developments. Only a few days after Burberry released their first NFT, the luxury brand known as Louis Vuitton announced its first NFT launching with its own video game, *Louis The Game*. In Whitney Bauck's article, *Immaterial Gains: The NFT Boom Comes for Fashion*, he sheds light to NFTs, along with video games, have driven the marketing industry for top designers around the world. NFTs are not just curated to a small area, but rather to everyone who has access to the internet or digital world. These companies that craft personal NFTs solely rely on the expertise of gaming developers to manage production and accessibility for the consumer. The revenue for global video games has been estimated to be about \$180 billion in the year 2021 based on in-game assets. By creating these NFTs, not only does it interact with the next generations, but this allows designers to remove any environmental concerns of Ethereum-based blockchain, legal and storage issues of the iteration of fashion NFTs. Simply, there may be issues with storing long-term NFTs as they discontinue any market value.

Although NFTs have popularized the gaming industry, it expands on numerous industries and brands. These non-fungible tokens have taken over mainstream media about arts and entertainment. Within these personalized NFTs, it shares a lot of social media influences as celebrities or well-known companies have vocalized their support. According to Nintendo Life, popular video games have jumped on the NFT wagon, and they have crafted in-game activities to obtain these unique tokens. NFTs allow the user access to specific in-game cosmetics, i.e. Ghost Recon distributes NFTs to players by simply claiming the token or fulfilling in-game requirements. Overall, NFTs are primarily focused on blockchain technology and cryptocurrencies.

3. Methodology and Dataset

To answer our research question, we had to collect around 20 NFTs that had Whitepapers. We used the website rarity.tools to find our data. At first, collecting the data was difficult since many of the NFTs did not have a Whitepaper created or listed on their website. It was important that we found the whitepapers since we would be using the information in the text to answer our questions. We gathered our NFTs by copying them into an Excel spreadsheet and having one column for the NFT name and the other for text within their whitepaper. The CSV file was then imported into Google Colaboratory where we input the data into an array, used the `ravel()` method to flatten it out, tokenized the data which means splitting the large lines of text into smaller words or lines, and then imported regular expression to remove stop words, extra white spaces, and make all the text lowercase. Finally, we vectorized the text to find the frequency of the different words. Because this textual data is curated by the NFT creators and there may not be fact-checking involved prior to this information being put into whitepapers, some or all of the text may be a bucket of lies. The analysis revealed that NFTs that can be bought and used in video games are typically popular and have a high floor. That data was able to be analyzed through LSA topic modeling. We saw that community, players, blockchain, land, and voxie were shown to be important parts of the topic of 'game'. This means that in particular, it was NFTs that discussed these concepts within the concept of a game that is popular and has a high floor.

5. Discussion

A possible finding we noticed while looking for whitepapers, was that most NFTs that listed whitepapers were involved in the game industry. I believe that is because NFT avatars and the games have various levels and builds that a player can be involved in so there is a need for a more in-depth description of how that community works. Over half the NFTs we collected

involved a game universe or plans for game development in the future. A few of the NFTs we found that were a part of the game industry were Citizens of Bulliever Island, Game of Blocks, The Lost Glitches, and Uninterested Unicorns. They had in-depth whitepapers which listed a summary of the universe, game designs & modes, and different builds.

6. Conclusion

Applying topic modeling in our research has helped us understand how impactful the game universe is to the NFTs. It gave us possible findings and popular topics that were found within the whitepaper. We were able to come to the conclusion that NFTs that can be used in games are popular and have a higher price ceiling. In the future, we hope to work with a larger dataset that has more NFTs and possibly more details such as price or how many are sold in a day.

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