

The characteristics of the Korean NFT market and strategies for target expansion*

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Abstract

This paper covers the research on the specialty of the Korean NFT market in comparison to the global and American NFT market, and suggests the solution for expanding the targets. The volume of the global NFT market is presented in total and by segment including concept, exchange, storage, econ, art, collectibles, metaverse and game. Then the specialty of the Korean NFT market is analyzed. The public interest over time in NFT is described in comparison with the global trend, and popular segments and demographics of the customer base are reviewed through analyses. Finally, solutions are suggested for the Korean NFT companies to expand their targets.

1 Introduction

The Non Fungible Token(NFT) market started to get spotlight from the public as the first tweet of the twitter founder Jack Dorsey was sold to Sina Estavi the CEO of Bridge Oracle, a blockchain company. NFT is getting more and more attention as it cannot be apart from blockchain technology, cryptocurrency and the metaverse industry expected to take the lead in the future IT industry. Although the attention on the NFT is universal around the world, there exists the specialty of each country and the interests on which the market focuses differ accordingly.

This paper specifically seeks the specialty of the NFT market in South Korea in comparison to the global market and the United States where the NFT industry first started to flourish in two different dimensions: popular categories and estimated customer base demographics. Furthermore, it reviews possible strategies to expand targets in the Korean NFT market.

We first analyze the general characteristics of the NFT market and further discover the specialty of the Korean NFT market. First, the change in the volume of the global NFT market was presented using the NonFungible dataset. The volume of the NFT market is

*Code and data are available at: https://github.com/OnedayOneyeah/Korean_NFT_market

specified in different segments including concept, exchange, storage, econ, art, collectibles, metaverse and game with the Statista dataset. Then we demonstrate the specialty of the Korean NFT market. The public interest over time in NFT is described first in comparison with the global trend with Google Trend and the Kakaodatatrend dataset. In addition, we look into popular segments driven by the keywords that the public associate with NFT and demographics of the customer base with the same dataset. Finally we will be able to provide suggestions for Korean NFT companies regarding the new opportunities in the market and the new strategies to expand their targets.

Through the analysis, it became clear that the volume of the NFT market started to surge in 2021 and the collectible segment was the largest among all segments. However, it was less popular for the general public while the econ segment is the most popular besides the concept segment. It is because the actual customer size of the NFT market is still limited. Nonetheless there is a high possibility that the recognition of the market has led to actual purchase of the product considering the keywords of the econ segment are directly related to the cryptocurrency, marketplace and wallets needed for the actual NFT transaction. In addition, the Korean public interest in NFT has increased from October in 2021 accordingly, but it was slightly behind the global trend. The most pronounced feature of South Korea in terms of the interest in the NFT market is it is biased on the econ segment leaving a huge gap behind art, collectibles, metaverse and game segments directly relevant to the NFT product itself. In terms of the demographics, the Korean NFT market has a male dominant feature and the age group of the estimated main customers was focused on Generation X, followed by baby boomers and Millennials.

2 Data

This paper uses R(Team 2021) to analyze eleven datasets exported from NonFungible, Statista, Google Trend and Kakaodatatrend(Table 1). We referred to NonFungible(NonFungible 2022), a NFT data resource, to load a dataset for NFT market volume from 2017 to 2022. This dataset consists of three variables: DateTime, Number of sales and Sales USD. Also the NFT total sales data provided by Statista(Statista 2021), a business data platform, was used to present different volumes of segments in the NFT industry. It presents the total sales in seven different categories: collectible, art, metaverse, utility, defi and undefined. Another data source Google Trend(“Google Trend” 2022) is a website provided by Google which analyzes the popularity of top and rising topics in Google Search across various regions and languages. Specifically, we downloaded eight csv files; two are related to the NFT search volume for recent 5 years and 1 year worldwide, and the rest of them are for the top related topics in terms of NFT for recent 5 years and 1 year in South Korea, the United States, and worldwide. Also Kakodatatrend(“Kakaodatatrend” 2022) provided by Kakao basically has the same function as Google Trend. However, since Daum, a regional search engine of Kakao, is mainly used by Korean domestic users, the datasets from the website are more useful to illustrate the specific interests of Koreans than those from Google Trend. A dataset was used in this paper consisting of NFT search volume and the demographic statistics of the people who searched NFT via the search engine for the

last 3 years.

Table 1: The list for datasets

Data file	Notes	Source
chart.csv	Number of sales and Sales USD of NFT from 2017 to 2022	NonFungible
Manually copied	Different volumes of segments in the NFT industry	Statista
NFT_worldwide_5y_interest.csv	Search volume for the last 5 years	Google Trend
NFT_worldwide_1y_interest.csv	Search volume for the last 1 year	Google Trend
related_topics_5y_top.csv	Top related topics for the last 5 years worldwide	Google Trend
related_topics_1y_top.csv	Top related topics for the last 1 year worldwide	Google Trend
SK_5y.csv	Top related topics for the last 5 years in South Korea	Google Trend
SK_1y.csv	Top related topics for the last 1 year in South Korea	Google Trend
US_5y.csv	Top related topics for the last 5 years in the United States	Google Trend
US_1y.csv	Top related topics for the last 1 year in the United States	Google Trend
SK_customer_statistics_2y.xls	Search volume/demographic statistics for the last 3 years in South Korea	Kakaodatatrend

To induce insights from top related topics datasets, Google Trend datasets were cleaned and manipulated. First, we analyzed the related topics in the datasets, and categorized them into ten sectors: concept, exchange, storage, econ, art, collectibles, metaverse and game. This division is basically referred to the segment division of NFT market from NonFungible Yearly NFT Market Report(2021)(“Yearly NFT Market Report 2021” 2022), therefore art, collectibles, metaverse and game are included as individual sectors. The concept sector is always above 100 since the ‘Non-fungible token’ keyword itself is counted as a related keyword, which is a limitation of Google Trend dataset. However, it also includes the keywords expected to be used to understand the concept of the NFT industry such as “fungibility” or “security token.” The exchange and storage include keywords related to exchange mar-

ketplaces and wallet respectively. Finally, all the keywords related to cryptocurrency and investment are categorized as the econ sector.

Then we generated a new variable ‘Score,’ the sum of the relative search volume of each keyword by sector defined above. Values of the search volume under 1 was all calculated as 0.5. The six datasets of top related topics in terms of NFT for recent 5 years and 1 year in South Korea, the United States, and worldwide are all manipulated and then merged as one dataset(Table 2).

Table 2: The public interest score of NFT by sector driven by top related topics

Segment	Worldwide		South Korea		United States	
	5Y	1Y	5Y	1Y	5Y	1Y
concept	101.5	100.5	100	100.5	101.0	100.5
exchange	13.0	13.0	5	6.0	11.5	13.0
storage	2.0	2.0	0	0.0	2.0	2.0
econ	18.0	15.5	17	17.5	16.0	14.0
art	8.0	7.5	3	1.0	9.0	8.0
collectibles	4.0	4.5	0	1.0	6.5	7.0
metaverse	1.0	1.5	4	4.0	1.0	1.0
game	1.0	1.0	0	1.5	0.0	0.0

In terms of NFT search volume for the last 3 years using Daum, we input five maximum paraphrased keywords of NFT(Figure 1). It turned out ‘nft’ is the most representative keyword over the others, therefore we exclude them for further analysis herein. Afterwards we manipulated the dataset and the data of NFT search volume for the last 5 years by Google Trend to compare the interest over time(Table 3). The datetime variables were altered into “%y-%m” character format to unify the x axis in the range of April 2020 to April 2022, and the maximum value of each month was selected respectively as the value for the new tables.

Finally, We excluded the datasets of the NFT rising related topics of Google Trend because this paper focuses on the NFT keywords which can show the general interest of the public in a given period. For the same reason, NFT search volume by country data is not used in this paper to focus on the comparison between South Korea and the United States.

Table 3: The public interest in NFT market for the last 3 years :Worldwide, South Korea

Datetime	Variable	Value
20-04	Worldwide	0
20-05	Worldwide	0
20-06	Worldwide	0
20-07	Worldwide	0
20-08	Worldwide	0

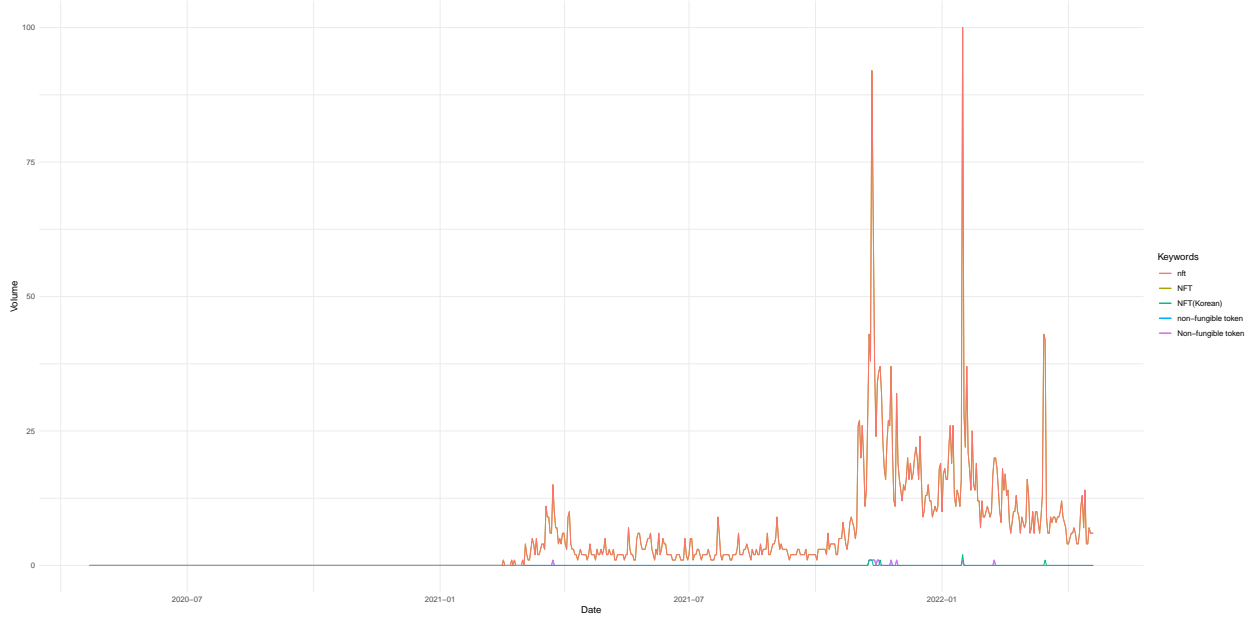


Figure 1: Search Volume of five NFT queries over time

3 Results

3.1 The characteristics of the global NFT market

Two line graphs show the volume of the NFT market started to surge in 2021 using two different axes ‘The number of sales’ and ‘Sales USD’(Figure 2). It cannot be attributed to a single cause, but it is obvious that NBA Top Shots NFT and Jack Dorsey’s first tweet NFT got viral in the same year among the public, which strongly fueled the public interest in the NFT market(Silber 2021). Moreover, the news that a couple of celebrities such as Eminem collect NFTs and also make NFT for their artworks got attention from the public. On top of it, there were a number of exhibitions showing diverse possibilities that NFT products could have. It would be more reasonable to conclude that all of these factors affected the rise of the NFT market. Indeed, the correlation between the public interest in NFT with Sales USD is statistically significant in that the p-value between the two variables is 0.0000000000000176, which is lower than 0.05.

To be specific, collectible is one of the largest sectors over time and especially it took the first place in 2021 when the volume of the market and the public interest started to burst in earnest, leaving a huge gap over other segments. The volume of the segment has been relatively bigger than other sectors over time by and large besides 2019. On the other hand, the relative scale of the metaverse segment has shrunk gradually although it was the biggest sector initially in 2018. Also it is noticeable that the volume of the art and DeFi segment has increased in a large amount. The art segment showed a remarkable expansion in 2020 and also recorded the third largest volume among all sectors in 2021. Similarly the DeFi

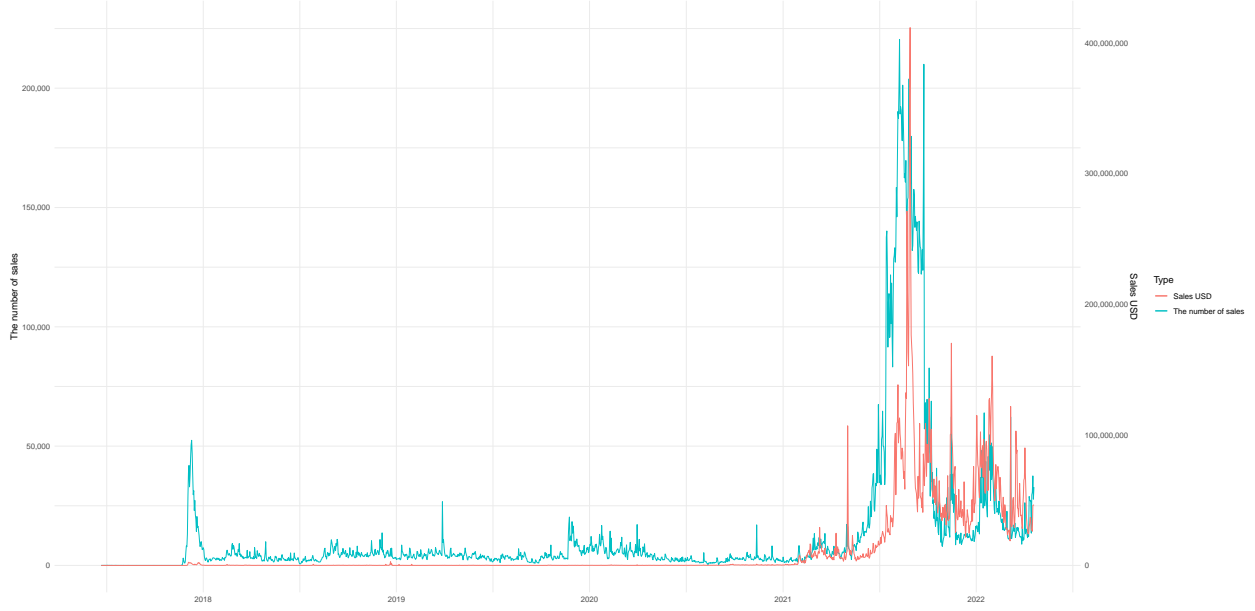


Figure 2: Volume of the NFT market(USD)

segment grew from under a million USD to about twenty millions USD in 2021(Table 4).

Table 4: The rank of NFT market volumes by sectors over time (in million USD)

	2018	2019	2020	2021
2	Metaverse (16.35)	Game (11.59)	Art (17.11)	Collectible (7130.05)
3	Collectible (13.86)	Metaverse (5.38)	Collectible (16.45)	Game (2153.82)
4	Game (5.19)	Utility (4.11)	Metaverse (15.97)	Art (2107.57)
5	Utility (1.29)	Collectible (2.71)	Game (15.26)	Undefined (1864.22)
6	Art (0.05)	Art (0.45)	Utility (2.41)	Metaverse (630.99)
7	Undefined (0.03)	DeFi (0)	DeFi (0)	Utility (75.5)
8	DeFi (0)	Undefined (0)	Undefined (0)	DeFi (19.75)

Inconsistent with the sales volume of each segment, collectible is a less popular segment for the general public and so is art(Table 5) worldwide. In contrast, the econ segment is the most popular segment besides the concept segment. There is almost no difference of this tendency both in the long term(for the last five years) and the short term(for the last one year).

This discrepancy shows that the actual customer size of the NFT market is still limited but there is a high possibility that the recognition of the market has led to actual purchase of the product. The scores of collectibles, art, and games, the segments are relatively low. It means the actual NFT products are still not popular enough to the general public. Moreover, the

NFT market is macrotransaction centric so far, based on cryptocurrencies such as Ethereum or Bitcoin, which raises the barrier for the younger generations who have low disposable income. Hence, even though the total sales of the NFT market dramatically has increased, it does not directly mean that the customer size is also in proportion to it. On the other hand, this table shows as the NFT market got the public attention, the interest in actual purchase of the products started to increase accordingly. To be specific, the score of econ is the highest besides concept segment. As the keywords related with the actual purchase such as the marketplace, cryptocurrencies, and wallets used for the actual transactions are included in the econ segment, it can be concluded that a decent amount of people are looking for the actual purchase.

Table 5: The public interest score of NFT by sector driven by top related topics: Worldwide

Segment	Worldwide	
	5Y	1Y
concept	101.5	100.5
exchange	13.0	13.0
storage	2.0	2.0
econ	18.0	15.5
art	8.0	7.5
collectibles	4.0	4.5
metaverse	1.0	1.5
game	1.0	1.0

3.2 Analysis on the Korean NFT market

The Korean public interest in NFT started to increase in earnest from October in 2021, and it scored the highest in January, 2021(Figure 3). By and large, the interest of South Korea is in accordance with the interest of the world.

The most prominent characteristic of South Korea in terms of the interest in the NFT market is it is biased on the econ segment in both long term and short term(Table 6). Contrasted to it, the interest score in art, collectibles, metaverse, and game segments are lower than one fifth of that in econ segment. This tendency was much clearer for the last one year while the score of art is one third of the long term score. Additionally the public interest in the game segment was higher in the short term as video games such as mir4 and Axie infinity and classic card game Cyber Dragon got viral for combining NFT to their business.

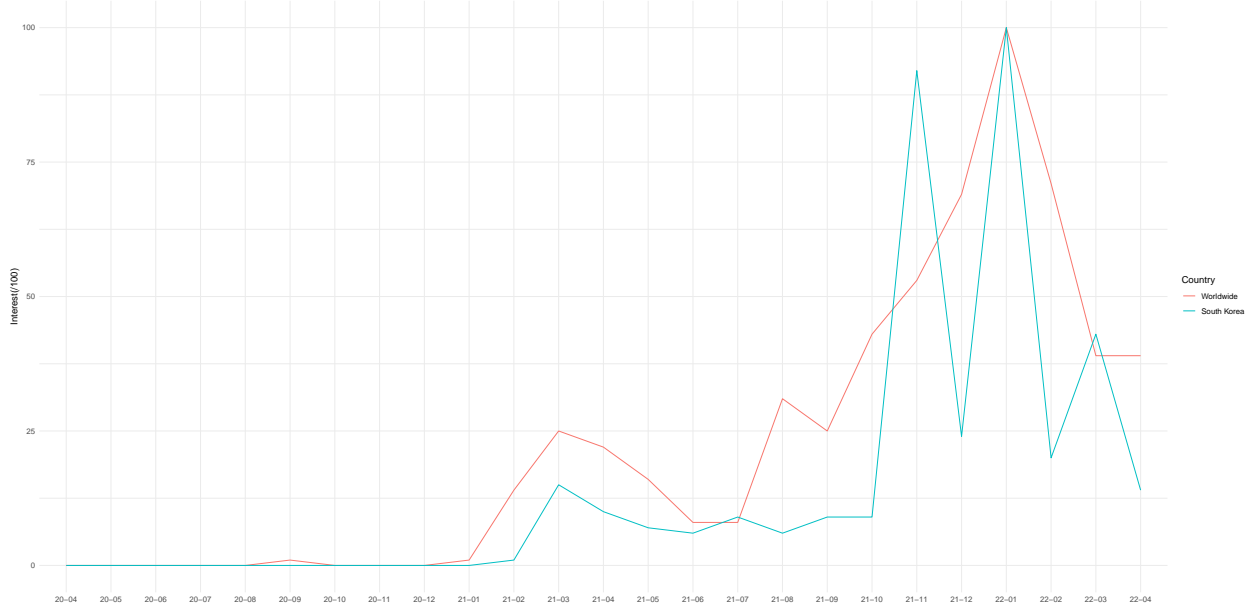


Figure 3: Public interest in NFT

Table 6: The public interest score of NFT by sector driven by top related topics: South Korea and the United States

Sector	South Korea		United States	
	5Y	1Y	5Y	1Y
concept	100	100.5	101.0	100.5
exchange	5	6.0	11.5	13.0
storage	0	0.0	2.0	2.0
econ	17	17.5	16.0	14.0
art	3	1.0	9.0	8.0
collectibles	0	1.0	6.5	7.0
metaverse	4	4.0	1.0	1.0
game	0	1.5	0.0	0.0

In comparison to the Worldwide and the United States, the public interest in art and collectibles is significantly lower in the past five years (Table 7). Similarly the interest of South Korea in the exchange and storage segment are also less than half of the interest of the worldwide and the United States. Contrary to these segments, the score of the metaverse segment is much higher in South Korea in comparison to the worldwide and the States. With regards to the game segment, there was no significant difference between two countries, which took the lowest place overall. There was no significant difference for the last one year as well (Table 8).

Table 7: Horizontal comparison of the public interest score of NFT: Longterm(5Y)

Sector	5Y		
	Worldwide	South Korea	United States
concept	101.5	100	101.0
exchange	13.0	5	11.5
storage	2.0	0	2.0
econ	18.0	17	16.0
art	8.0	3	9.0
collectibles	4.0	0	6.5
metaverse	1.0	4	1.0
game	1.0	0	0.0

Table 8: Horizontal comparison of the public interest score of NFT: Shortterm(1Y)

Sector	1Y		
	Worldwide	South Korea	United States
concept	100.5	100.5	100.5
exchange	13.0	6.0	13.0
storage	2.0	0.0	2.0
econ	15.5	17.5	14.0
art	7.5	1.0	8.0
collectibles	4.5	1.0	7.0
metaverse	1.5	4.0	1.0
game	1.0	1.5	0.0

The strong bias on the econ segment of the public interest in the South Korea NFT market can be defined as a specialty of the Korean NFT market in that it is distinguished from worldwide and the United States. Because this shows the different interest of the Korean general public in the NFT market. One possible explanation for this characteristic is linked with the social context that Koreans jumped into investment during covid era. According to the survey conducted by Hankook Ilbo, a daily Korean newspaper, 43% of the stock investors started the investment after the outbreak of covid pandemic(Shim 2021). As the funding liquidity increased during the period, a lot of Koreans regardless of their gender and age aggressively invested in the stock market. This common experience raised their interest in investment overall. For this reason, NFT has been magnified as an investment means rather than has been taken for possession itself.

It is impossible to portray the demographic of the NFT Korean customer base due to the absence of relevant datasets. However, we can estimate it through the Kakaodatatrend dataset based on an assumption that the people who look up nft are more likely to be

customers of the NFT market. Table 9 describes male dominant features in the Korean NFT market. This characteristic is consistent with the counterpart of the American NFT market discovered from Morning Consult Poll(*National Tracking Poll* 2021) with 15% of male respondents saying they collect NFTs, compared to 4% of female respondents. In addition, the main customer base of the Korean NFT market is expected to be in the forties to fifties(Table 10). The Interest in the Korean NFT market is the highest in Generation X, followed by baby boomers, and Millennials. This tendency is inconsistent with the American NFT market in that NFT appeals primarily to Millennials with 34% of users are between the ages of 25-34, followed by Generation Z(28%) and 35-45(27%). The finding that the age group of the Korean NFT market estimated customer base is relatively older than the counterpart of the American NFT market shows the Korean NFT market is limited to the macrotransaction so far mainly focused on the customer who have high disposable income.

Table 9: Estimated gender demographic of customers in Korean NFT market

Gender	Interest
female	30
male	70

Table 10: Estimated age demographic of customers in Korean NFT market

Agegroup	Interest
10-19	0
20-29	1
30-39	8
40-49	37
50-59	37
60+	17

4 Discussions

This paper analyzes the general characteristics of the NFT market and further discovers the specialty of the Korean NFT market. First of all, the change in the volume of the global NFT market was presented with two different variables: ‘The number of sales’ and ‘Sales USD.’ The volume of the NFT market was specified in different segments including concept, exchange, storage, econ, art, collectibles, metaverse and game. Then we demonstrated the specialty of the Korean NFT market. The public interest over time in NFT was described first in comparison with the global trend, and popular segments and demographics of the customer base were reviewed through analyses.

It is found that the volume of the NFT market started to surge in 2021, with collectible taking the first place for the largest segment in the same year. Contrarily collectible is a less popular segment for the general public while the econ segment is the most popular besides the concept segment. It can be interpreted that the actual customer size of the NFT market is still limited but there is a high possibility that the recognition of the market has led to actual purchase of the product. The Korean public interest in NFT has increased from October in 2021 accordingly, but slightly later than the global trend. The most pronounced feature of South Korea in terms of the interest in the NFT market is it is biased on the econ segment leaving a huge gap behind art, collectibles, metaverse and game segments directly relevant to the NFT product itself. Additionally, the Korean NFT market has a male dominant feature and the age group of the estimated main customers was focused on Generation X, followed by baby boomers and Millennials.

The biggest limitation of the Korean NFT market is the limited customer base. To facilitate the business expansion, it is critical to broaden the customer base to Millennials and Generation Z who showed high demand in physical collections as it is seen that the Kream, a sneakers limited resell platform in South Korea has gotten attention from Generation Z recently. The game changer for the target expansion is the technology which makes the microtransaction possible with the cryptocurrencies used for NFT transactions. Current NFT transactions are mostly large sizes, raising a barrier to the younger generation whose disposable income is relatively low. The new technology is expected to alleviate the pain point therefore increase the number of actual transactions of Millennials and Generation Z.

Another problem of the Korean NFT market is there are not enough NFT products appealing to female customers. As it is shown in Table 9, the gender disparity of interest in NFT is pronounced. However, it does not mean there is no demand for the NFT products. Brian O'Hagon, who leads growth at Sorare a football game NFT company, recognized the same problem in the American market and theorized it is attributed to the fact that the vast majority of collectibles on today's NFT market are male-centric. Based on this assumption, he began to create NFTs featuring female athletes. In accordance with it, Dapper Labs, a company consisting of creators of NFA Top Shot is also working with the WNBA to introduce women players into the Top Shot collection. Of course gender representation is obviously important in terms of appealing to female customers, but the interest of female targets should be refined more elaborately. For instance, their hobbies, and values they are willing to pay can be combined with the NFT products.

The biggest limitation of this paper is that it is based on a huge assumption that the people who look up NFT are more likely to be customers of the market. A further study is required with the actual customer base data to validate the demographic of the estimated customer base induced from this paper. Also, we used Daum, the search engine used by Kakaodatatrend instead of Naver, the most popular local search engine in South Korea since it was not possible to collect the demographic data of the people who looked up NFT. Another limitation which should be considered in further study is that there is no academic standard for the segments of the NFT related topic keywords. This paper is referring to the NFT categories defined by NonFungible, keywords cannot be directly linked to the NFT industry categories since they are the queries driven by customer perspective. Hence, the

standard for the keywords segments should be refined in the next step. Finally, we excluded a keyword “school of open learning” of the top related topics in the United States for the last one year because it was hard to be interpreted in the NFT context and the score was also below one, not significant enough to influence the final outcome.

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