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The Impact of NFT Digital Collection Attributes on Brand Co-Creation in the Context of Virtual Communities

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Abstract: With the continuous updating and reform of digitization and blockchain technology, digital currency and digital assets are getting more and more attention from the public, and their research is widely used in the field of technology and finance, and gradually extended to the field of management. In recent three years, NFT (Non-Fungible Token), as an emerging product based on blockchain technology, has made a name for itself in the international field of vision, and in domestic incarnation of a more localized concept of digital collectibles known to consumers, and at one time, there was a burst of fire within the public figures. However, due to its rapid development and dissemination, the theoretical level of the research lag is obvious, most of the domestic exploration of NFT digital collectibles are still in the legal level and the artistic level of the basic definition, for the practical significance of its has in the field of commercial marketing is not fully in-depth, as a strong correlation with the brand as a product of the impact of the mechanism has not yet been elucidated. Therefore, this paper proposes the effect of NFT digital collection attributes on brand co-creation in the field of branding, introducing perceived value as a mediator variable and brand attitude as a moderating variable, in order to explore its clear inner mechanism path.

Keywords: NFT digital collections, Brand co-creation, Perceived value, Brand attitude.

1. Introduction

NFT is a new technology that was officially born in 2017, but it was not until 2021 that it began to receive widespread public attention, and then a large number of digital collection marketing activities utilizing NFT technology appeared, but at the same time fell back after the explosion. From the market value and the heat of the surge is not difficult to see, behind the NFT explosion is inseparable from the curiosity, the herd, and the meta-universe + concept of labeling guidance, the domestic hot word search also appeared with a negative sentiment of the “thunderstorm”, “run away”, “alert” and other words, which shows that the domestic NFT has not yet completely got rid of the speculation bubble and the chaos of showmanship and curiosity. However, it is worth noting that the development of NFT digital collections is itself in the beginning stage, and in the process of localized development, wild growth is also one of the normal parts, and the retreat of the heat cannot negate the significance of blockchain technology, digital assets and other emerging things in the future of research.

In foreign literature, the latest research on NFT attributes in the marketing field has begun to put forward the concept of BNFT (Brand Non-Fungible Token), which indicates that the introduction of NFT into the brand field research has already had the tendency to begin to form a new research direction, reflecting the novelty of the research content.

At the same time, unlike the public chain of foreign NFT, domestic digital collections are more dominated by alliance chain platforms that provide blockchain services, for example, Whale Exploration relying on Alibaba's ant chain, Tencent's phantom nucleus of the toxin chain, etc. The state-owned capitals and related organizations have also been involved in digital collections, such as the virtual kiwi digital collection, seal digital collection, Hi yuan universe, the only art, the Chinese body of the digital collection, etc. In the trend of the link between NFT and marketing, the brand is an important Under the trend of linking NFT and marketing, branding is an important landing point, and it is more meaningful to explore how NFT influences brand co-creative behaviors in the context of its own community from a branding perspective.

In summary, although the development of NFT is only reflected in the development of a new business section of the enterprise, it will actually radiate to all aspects of the digital development of the brand in the future, and the background of the virtual community will also improve the efficiency of exploring brand co-creation behavior. Thus, the study of the impact of NFT attributes in the branding field will help brands to innovate their consumption patterns and tap into the young Generation Z market.

2. Research hypothesis

2.1. Brand Co-creation

The attributes of NFT digital collections have been categorized in many dimensions in foreign studies, but most of them are still based on the technical characteristics of irreplaceability, indivisibility, non-destructibility, identifiability as well as transparency, accessibility and tamper-proofness, and ultimately the trend of pointing to the attributes of its financial circulation as the direction, and scholars have begun to explore its impact on the field of marketing. Kleijnen et al. (2007), in their study on mobile logistics, found that consumers' perceived value is influenced by innovation features, and innovation features such as relative superiority, as a typical characteristic of NFT, have been found to positively influence perceived value. found that the scarcity, uniqueness, and ownership of NFT digital collections positively affect the perceived willingness to purchase. These reflect the “stimulus” of the commodity attributes extended by the technical attributes of NFT digital collections, and the “stimulus” of the commodity attributes

extended by the technical attributes of NFT digital collections.

At the same time, it is difficult to avoid the impurity of various consumption types in the start-up phase of NFT digital collections, e.g., platforms can only use the characteristics of digital collections but do not enable revolutionary digital chains, and many consumer transactions only work with non-digital items such as trading cards, branded apparel, and printed content (Wilson et al., 2021), which are the very challenges that fuel the potential for brand-damaging content misrepresentations, such as fake news (Petratos, 2021) and deep counterfeiting (Kietzmann et al., 2020). As a result, NFT digital collections, which harbor digital asset characteristics, are more prone to volatility in terms of positive and negative bi-directional influences on their value, which is one of the internal driving forces behind the reality of rapid emergence of multiple high-dollar NFT transactions. In this context, the value of NFT digital collectibles depends more on the perceived value formed by consumers' own cognition, and its limited and collectible attributes, unique and scarce form and content, the rise of explosive models, and the identity symbols brought by brand IP co-branding will all have an impact on the functional value, social value, emotional value and economic value perceived by consumers. This paper combines the S-O-R theory to explore whether the positive influence relationship of brand NFT attributes on consumers' brand co-creation behavior exists, so as to launch the hypothesis:

H1: NFT attributes positively influence virtual community brand co-creation

H1a: NFT scarcity positively influences virtual community brand co-creation

H1b: NFT social interaction positively influences virtual community brand co-creation

H1c: Uniqueness of NFT positively influences virtual community brand co-creation

2.2. Perceived Value

The traditional approach to understanding perceived value relates to consumer behavior, and the asset qualities and digital consumption characteristics inherent in NFT digital collections, when combined with brand affiliation, exacerbate the potency of perceived value in consumers' evaluation of NFT purchases. Early conceptualizations of customer perceived value were based on Zeithaml's (1988) notion of the overall evaluation of a brand given and received by the customer. Customers assess the value of a brand as part of their decision-making process, emphasizing the importance of value to both the firm and the customer. Many subsequent researchers have attempted to define perceived value in terms of multiple dimensions, although, there is disagreement on the conceptualization of perceived value, nevertheless, the four-dimensional view of customer perceived brand value (PERVAL) proposed by Sweeney and Soutar (2001) remains one of the most comprehensive and widely supported views of brand value that is applicable to a wide range of brand categories and different phases of the brand experience. These four key dimensions are related to customers' assessment of a brand's ability to deliver emotional, social, economic, and qualitative value (Sweeney and Soutar, 2001), and have evolved into a prototype for later research on the dimensionality of perceived value.

In the field of NFT digital collections, due to its digital characteristics, the brand co-creation behavior will be more social media, brand NFT digital collections virtual community and other platforms for development, foreign research has found that social media sentiment on Twitter is positively correlated with the market value of NFT digital collections, and brand co-creation can be speculated that with the enhancement of the user's perception of the value in the NFT digital collections community, it will Drive the user's value co-creation behavior will be more frequent and in-depth form and content in recent years in the business model to promote has also been more in-depth, such as a foreign coffee brand established to NFT digital collections virtual community as the core of the membership program, launched such as coffee farm tour linking reality and meta-universe development of the path of exploration. In summary, so this paper combined with the social exchange theory to explore whether there is a positive influence relationship between consumer perceived value on the brand co-creation behavior of virtual community participation, in order to launch the hypothesis:

H2: NFT attributes positively influence consumer perceived value

H2a: Scarcity of NFT positively influences consumers' perceived value.

H2b: NFT social interactivity positively affects consumers' perceived value

H2c: Uniqueness of NFT positively affects consumers' perceived value

H3: Consumer perceived value positively affects virtual community brand co-creation behavior

H4: Perceived value mediates the effect of NFT attributes on virtual community brand co-creation behavior

2.3. Brand Attitude

Brand attitude has been one of the important variables in scholars' research in the field of branding for many years, and it is closely linked to various brand-related variables. Brand attitude refers to the overall evaluation of a brand by a customer after communicating different levels of integrated brand-related experiences such as purchasing or usage, and attitudes can produce beneficial behavioral outcomes. For example, brand attitudes drive brand loyalty and purchase frequency of brand applications (McLean et al., 2020). Product image and brand image positively influence brand attitude, brand attachment, and willingness to download emoji (Liu et al., 2019). Similarly, the design complexity of luxury fashion images on Facebook pages can enhance brand attitudes, leading to increased brand familiarity, purchase intention, and sharing intention (Lee et al., 2018). Consistency in social media influencers' product posts can enhance users' attitudes, purchase intentions, and recommendation intentions (Belanche et al., 2021b). Similarly, influencers' social media posts affect recipients' attitudes, making users more likely to form intentions to follow accounts, as well as imitate and advocate for influencers (Belanche et al., 2021a).

Because of its close connection with the brand, brand attitude brings about more participatory appeals from consumers, and when customers have a positive attitude towards the brand, they tend to evaluate the brand positively and favorably, as well as having a connection with non-product attributes and symbolic attributes, and is therefore seen as an important factor influencing a variety of consumer behaviors in the brand domain. Values such as emotions and relationships in perceived value are also augmented by brand attitudes that also generate more interactive behaviors based

on the brand itself, and in addition, brand attitudes have been found to increase willingness to purchase YouTuber-generated product content (Miranda et al., 2021), so it can be hypothesized that in the context of virtual communities, perceived value can attract customers by fostering brand attitudes Implementing brand value co-creation behaviors in online environments, this paper introduces hypotheses based on the theory of rational behavior to explore what role brand attitudes play in the influence of NFT digital collection attributes on brand co-creation behaviors:

H5: Brand attitude plays a moderating role in the influence of NFT digital collection attributes on brand co-creation behavior in virtual communities.

3. Research Methodology

3.1. Experimental Design

The purpose of this study is to investigate the influence of NFT digital collection attributes on consumer brand co-creation behavior. After first describing the research scenario through text to bring subjects into the research scenario, the independent variable, i.e., NFT digital collection attributes, will be directly controlled and manipulated by designing the experimental materials. After viewing the experimental stimulus material, the subjects will fill out the questionnaire. Considering that the questionnaire content is the same, only the scenarios are different, and there will be a cumulative effect if a single-group repeated-measures design is used, this study adopts a one-way between-groups design with three one-factor between-groups experimental designs (NFT digital collection scarcity: high vs. low; NFT digital collection social interactivity: high vs. low; and NFT digital collection uniqueness: high vs. low) in order to test the main effect of NFT digital collection characteristics on the main effect of brand co-creation.

3.2. Scale Design

The brand co-creation scale in this paper was measured using the Likert scale focusing on measuring customer citizenship behavior by Yi, Gong (2013), Chou, Lin, Huang (2016), and others. The brand attitude scale in this paper was measured using the Likert scale of WANG Y C (2004), Zhou (2013), and Bu, Qingjuan et al. (2017) et al. The brand attitude scale in this paper was measured using Lafferty (2007), Kim and Han (2005), Mitchell and Olsen (1999), and others' Likert scale.

Basic demographic information was also selected as control variables for the study, including gender, age (years), occupation, education, monthly disposable income.

4. Empirical Analysis

This study uses a combination of online and offline distribution of questionnaires, and pay attention to the screening of all aspects of the target population, the attack put 450 questionnaires, and finally recovered 418 valid questionnaires, according to the use of various data analysis software for descriptive analysis, reliability and validity analysis, correlation analysis, and regression analysis of the data processing and hypothesis validation.

4.1. Reliability and Validity

Table 4.1. Sample Reliability Tests

variables	item count	Cronbach's alpha
Scarcity	3	.894
Social interaction	4	.910
Uniqueness	3	.872
Brand co-creation	4	.920
Perceived value	4	.909
Brand attitude	4	.910

The Clonbach coefficients of the research variables in this study are all greater than 0.8, with the coefficients of social mutuality, brand co-creation, perceived value, and brand attitudes all being 0.9 and above, indicating that the questionnaire has high reliability and is reliable.

Table 4.2. Sample aggregation validity

variables	item			Estimate	S.E.	P	CR	AVE
Scarcity	SC1	<---	F1	.888			0.9001	0.7502
	SC2	<---	F1	.855	.035	***		
	SC3	<---	F1	.855	.035	***		
Social interaction	SI4	<---	F2	.842			0.9125	0.7230
	SI3	<---	F2	.808	.050	***		
	SI2	<---	F2	.859	.049	***		
	SI1	<---	F2	.890	.056	***		
Uniqueness	U3	<---	F3	.805			0.8799	0.7097
	U2	<---	F3	.850	.057	***		
	U1	<---	F3	.871	.073	***		
Brand co-creation	BA4	<---	F4	.832			0.9155	0.7310
	BA3	<---	F4	.804	.049	***		
	BA2	<---	F4	.851	.047	***		
	BA1	<---	F4	.928	.059	***		
Perceived value	PV4	<---	F5	.817			0.9132	0.7247
	PV3	<---	F5	.855	.054	***		
	PV2	<---	F5	.832	.052	***		
	PV1	<---	F5	.899	.064	***		
Brand attitude	BCC4	<---	F6	.857			0.9238	0.7522
	BCC3	<---	F6	.856	.045	***		
	BCC2	<---	F6	.851	.044	***		
	BCC1	<---	F6	.904	.053	***		

In terms of convergent validity, this paper used Amos 26.0 for model drawing and statistical analysis to summarize the

factor loadings and significance of the standardized items for each question, as well as the combined reliability CR and mean variance extraction AVE for each variable as shown in Table 3.2. The AVE value for each variable is greater than 0.5 and the CR is greater than 0.8, indicating that the data for each of the scales reflect a relatively high level of convergent validity.

4.2. Correlation Analysis

Table 4.3. Sample correlation analysis

	gender	age	occupation	education	income	Scarcity	Social interaction	Uniqueness	Brand co-creation	Perceived value	Brand attitude
gender	1										
age	.011	1									
occupation	.029	.087	1								
education	-.039	.061	-.123*	1							
income	-.005	-.031	-.004	.033	1						
Scarcity	-.034	-.029	-.059	-.065	-.004	1					
Social interaction	.016	-.057	.037	-.146**	-.087	.412**	1				
Uniqueness	.020	.008	-.008	-.076	-.078	.393**	.486**	1			
Brand co-creation	-.032	-.048	.053	-.047	-.083	.362**	.488**	.491**	1		
Perceived value	.088	-.017	.049	-.081	-.054	.361**	.433**	.439**	.541**	1	
Brand attitude	.080	-.101*	-.009	-.060	-.089	.347**	.418**	.398**	.471**	.396**	1

This section examines the correlation between the variables by calculating Pearson correlation coefficients using SPSS26.0. Based on the results of the correlation analysis above, it can be seen that the correlation coefficients of the variables are significant at the level of 0.01 and they are all greater than 0, so there is a positive relationship between the variables. In addition, the correlation coefficients are less than 0.75, so it can be considered that there is no serious multicollinearity between the variables.

4.3. Main Effects Regression Analysis

Table 4.4. main effects regression analysis

variables	Brand co-creation				
	Model 1	Model 2	Model 3	Model 4	Model 5
gender	-0.101	-0.064	-0.115	-0.126	-0.112
	(0.143)	(0.134)	(0.126)	(0.125)	(0.118)
age	-0.077	-0.067	-0.039	-0.085	-0.056
	(0.072)	(0.067)	(0.063)	(0.063)	(0.059)
occupation	0.051	0.074*	0.040	0.060	0.058
	(0.047)	(0.044)	(0.041)	(0.041)	(0.039)
education	-0.061	-0.015	0.053	0.002	0.061
	(0.085)	(0.079)	(0.075)	(0.074)	(0.070)
income	-0.097*	-0.096*	-0.049	-0.054	-0.042
	(0.057)	(0.053)	(0.050)	(0.050)	(0.047)
Scarcity		0.356***			0.126***
		(0.045)			(0.045)
Social interaction			0.520***		0.305***
			(0.047)		(0.052)
Uniqueness				0.495***	0.307***
				(0.043)	(0.048)
Constant	5.291***	3.403***	2.378***	2.752***	1.339***
	(0.424)	(0.461)	(0.454)	(0.432)	(0.448)
Observations	418	418	418	418	418
R-squared	0.015	0.146	0.244	0.252	0.343

In the models where the scarcity variable was introduced (model 2 and model 5), the coefficients were 0.356 and 0.126, with a standard error of 0.045, both significant at the 0.01 level of significance (*** denotes p<0.01), indicating that scarcity had a significant positive effect on the explanatory variables. In the models where the social interactivity variable was introduced (the third and fifth models), the coefficients were 0.520 and 0.305, with standard errors of (0.047) and 0.052, respectively, both significant at the 0.01 level of significance, indicating that social interactivity had a significant positive effect on the explanatory variables. In the models where the uniqueness variable was introduced (fourth and fifth models), the coefficients were 0.495 and 0.307 with standard errors of (0.043) and (0.048), respectively, which were significant at the 0.01 level of significance, indicating that uniqueness had a significant positive effect on the

explanatory variables.

The R^2 of each model is 0.015, 0.146, 0.244, 0.252 and 0.343 respectively. it can be seen that with the gradual introduction of brand co-creation related independent variables, the goodness of fit of the model gradually improves, and the final model has a relatively better fitting effect, which proves that the hypothesis H1 (H1a, H1b, H1c) is valid.

4.4. Intermediary Effects Regression Analysis

Table 4.5. intermediary effects regression analysis

variables	Brand co-creation	Perceived value	Brand co-creation
	Model 6	Model 7	Model 8
gender	-0.064	0.273**	-0.198*
	(0.134)	(0.129)	(0.119)
age	-0.067	-0.016	-0.059
	(0.067)	(0.064)	(0.059)
occupation	0.074*	0.058	0.046
	(0.044)	(0.042)	(0.039)
education	-0.015	-0.072	0.020
	(0.079)	(0.076)	(0.070)
income	-0.096*	-0.057	-0.068
	(0.053)	(0.051)	(0.047)
Scarcity	0.356***	0.344***	0.187***
	(0.045)	(0.043)	(0.043)
Perceived value			0.491***
			(0.045)
Social interaction	0.520***	0.440***	0.332***
	(0.047)	(0.046)	(0.047)
Perceived value			0.428***
			(0.045)
Uniqueness	0.495***	0.422***	0.317***
	(0.043)	(0.043)	(0.044)
Perceived value			0.422***
			(0.045)
Constant	3.403***	2.848***	2.006***
	(0.461)	(0.443)	(0.427)
Observations	418	418	418
R-squared	0.146	0.150	0.336

Stepwise regression was used to test for mediating effects. First, scarcity has a significant effect on perceived value in Model 7 (coefficient of 0.356***). Then, in Model 8, when both scarcity and perceived value are introduced, the coefficient of the direct effect of scarcity on brand co-creation becomes 0.187***, and the coefficient of perceived value is significant (0.491***) and the goodness of fit of Model 3 (R^2= 0.336) is higher than that of Model 6 (R^2= 0.146), which indicates that perceived value plays a partial mediating role between scarcity and brand co-creation. played a partial mediating role. Social interactivity has a significant effect on perceived value in Model 9 (coefficient of 0.520***). Then, in Model 11, when both social interactivity and perceived value are introduced, the coefficient of the direct effect of social interactivity on brand co-creation becomes 0.332***, and the coefficient of perceived value is significant (0.428***), and the goodness-of-fit of Model 11 (R^2= 0.381) is higher than that of Model 9 (R^2= 0.244), which indicates that perceived value plays a partial mediating role between social interactivity and brand co-creation. and brand co-creation, suggesting that perceived value plays a partial mediating role between social interactivity and brand co-creation. Stepwise regression was used to test the mediating effect. First, uniqueness has a significant effect on perceived value in Model 13 (coefficient 0.422***). Then, in Model 14, when uniqueness and perceived value are introduced at the same time, the direct effect coefficient of uniqueness on brand co-creation becomes 0.317***, and the coefficient of perceived value is significant (0.422***), and the goodness-of-fit of Model 14 (R^2= 0.383) is higher than that of Model 6 (R^2= 0.252), which indicates that perceived value plays a partial mediating role in the relationship between uniqueness and brand co-creation. between uniqueness and brand co-creation, suggesting that perceived value plays a partial mediating role. This verifies that hypothesis H2, H3, H4 holds

4.5. Moderating Effects Regression Analysis

Table 4.6. moderating effects regression analysis

variables	Brand co-creation		
	Model 15	Model 16	Model 17
gender	-0.142	-0.210*	-0.198*
	(0.122)	(0.116)	(0.116)
age	-0.015	-0.010	-0.040
	(0.061)	(0.058)	(0.058)
occupation	0.075*	0.042	0.074*
	(0.040)	(0.038)	(0.038)
education	0.003	0.069	0.016
	(0.072)	(0.069)	(0.068)
income	-0.052	-0.046	-0.015
	(0.049)	(0.046)	(0.046)
Brand attitude	0.413***	0.346***	0.352***
	(0.046)	(0.045)	(0.045)
Scarcity	0.235***		
	(0.044)		
Scarcity*Brand attitude	0.109***		
	(0.031)		
Social interaction		0.401***	
		(0.047)	
Social interaction*Brand attitude		0.151***	
		(0.031)	
Uniqueness			0.374***
			(0.044)
Uniqueness*Brand attitude			0.127***
			(0.030)
Constant	4.746***	4.678***	4.726***
	(0.363)	(0.343)	(0.344)
Observations	418	418	418
R-squared	0.298	0.368	0.369

In each model, the main effect of brand attitude on brand co-creation is significant (the coefficient in Model 15 is 0.413***, the coefficient in Model 16 is 0.346***, and the coefficient in Model 17 is 0.352***, with a standard error of (0.046), which is significant at the 0.01 level of significance), and the interaction term between brand attitude and the dimensions of the independent variables is significant, further indicating that brand attitude has a significant effect. on the relationship between uniqueness and brand co-creation. significant, further indicating that brand attitude plays a moderating role between the independent variables and brand

co-creation. Through the stepwise regression analysis of the three models, we can see that in Model 15, scarcity itself has a significant effect on brand co-creation, and its interaction term with brand attitude is also significant, indicating that brand attitude regulates the relationship between scarcity and brand co-creation. Similarly, in Model 16, social interactivity and its interaction with brand attitude have significant effects on brand co-creation; in Model 17, uniqueness and its interaction with brand attitude have significant effects on brand co-creation.This verifies that hypothesis H5 holds

5. Summary

5.1. Conclusions

The three dimensions of NFT digital collection attributes (scarcity, social interaction, and uniqueness) have a positive influence on brand co-creation behaviors, and in particular have a significant impact on proactive customer citizenship behaviors. Through holding and paying attention to the brand's NFT digital collections, the brand audience realizes the identity transformation from product consumers to brand virtual community members, and realizes more frequent and in-depth discussions and interactions with other members of the community, as well as between the users and the brand, thus positively influencing the degree of investment in brand co-creation behaviors.

Consumer perceived value plays a partial mediating role between NFT digital collection attributes and brand co-creation behavior. The acquisition of perceived value in the brand virtual community plays a positive role in influencing the acquisition of perceived value, and the properties of NFT digital collections enable consumers to perceive social value, emotional value, economic value and other aspects.

Community members were able to interact with other members to gain a wealth of useful information, generate pleasure, and enhance self-branding. The findings also demonstrate that the attributes and perceived value of NFT digital collections can positively influence value co-creation behavior. This suggests that the functional, emotional, or social value created by customers through NFT digital collections within a brand community is an important perspective for studying customers' brand co-creation behavior.

Brand attitude plays a moderating role between the attributes of NFT digital collections and brand co-creation behavior, in contact with NFT digital collections as an emerging thing, the brand's additions have a great degree of influence on the consumer's initial attitude toward the consumer's psychological tendency for the brand indirectly supports the recognition of the brand NFT digital collections and provides an objective virtual community platform to undertake the first impression of the After cognition, consumers have more information channels and discussion paths to further understand the NFT digital collections under the brand, so the brand attitude reflects its own significance in its influence on brand co-creation.

5.2. Contribution

This study enriches the research related to the concept of NFT digital collections in the business domain, especially in the brand domain, by finding that NFT digital collection attributes in the context of virtual communities are antecedents of brand co-creation behavior. By unifying NFT digital collection attributes, perceived value, brand attitude and brand co-creation in the same conceptual model, it is possible to gain a more detailed understanding of the intrinsic mechanism of consumers' spontaneous co-creation behaviors through participating in the information sharing and interaction in brand virtual communities. In the past, many scholars in the academic community have confirmed that the attributes of NFT digital collections have a positive impact on customers' purchasing decision-making behavior, such as leading to better brand trust, higher willingness to re-purchase, and even stronger brand loyalty, but there is no research on the virtual digital asset class of products that is completely synchronized with the commodities and rises to the level of the co-creative value.

5.3. Research Outlook

This study conducted a literature review on the past research and current situation of brand NFT digital collections, and improved the theoretical research, experimental design and experimental process, and finally obtained a more reliable conclusion, the results of the study have a certain significance and innovativeness in the brand level, but there are some limitations in this study that can be used as a reference for subsequent research.

First, this study summarizes and establishes the three characteristics of NFT digital collections of scarcity, social interaction and uniqueness and conducts subsequent research, however, in practice, branded NFT digital collections are based on Web3.0 and accompanied by the continuous updating of blockchain and other technological changes, and its business model is more comprehensive and innovative, the researchable characteristics of branded digital collections are still to be further explored, and the future researcher can study the branded digital collections of branded digital collections of branded digital collections of branded digital collections of branded digital collections of other characteristics. Future researchers can start to study the marketing effect of branded digital collections.

Secondly, the experiment in this study is stimulated by showing static pictures to the subjects, however, the NFT digital collection itself is richer in diversity based on the digital scene, and there is no lack of 3D and dynamic IP images, so it has certain limitations. Future research can build a real brand NFT digital collection marketing scene through technical means, and verify the experimental results through the real data feedback from the data burial point.

Third, this paper only selected Nike, a consumer goods brand, as the research object, however, the current NFT digital collections and related digital products have a clear trend of cross-domain development, so the international sports brands, although representative, still fail to take into account the impact of brand type, product familiarity and product type, etc., which can be supplemented by future research.

References

[1] R. Alkhudary, X. Brusset, P. Fenies. Blockchain in general management and economics: A systematic literature review. European Business Review. 2020, Vol. 32 (No. 4), p.765-783.

[2] Y. Wang, F. Horky, L.J. Baals, B.M. Lucey, S.A. Vigne Bubbles all the way down? Detecting and date-stamping bubble behaviours in NFT and DeFi markets. Journal of Chinese Economics and Business Studies. 2022, Vol. 20 (No. 4), p.415-436.

[3] M. Dowling. Is non-fungible token pricing driven by cryptocurrencies? Finance Research Letters. 2022, Vol. 44 ,p.97-102.

[4] R. Chohan, J. Paschen. What marketers need to know about non-fungible tokens (NFTs). Business Horizons. 2021, Vol. 66 (No. 9), p.30-40.

[5] Wilson K B, Karg A, Ghaderi H. Prospecting non-fungible tokens in the digital economy: Stakeholders and ecosystem, risk and opportunity. Business Horizons, Elsevier. 2022, Vol. 65 (No. 5), p.657–670.

[6] M. Ali, S. Bagui. Introduction to NFTs: The future of digital collectibles. International Journal of Advanced Computer Science and Applications. 2021, Vol. 12 (No. 10), p.50-56.

[7] C.D. González, D.F. Mena, A.M. Muñoz, O. Rojas, G. Sosa-Gómez. Electronic voting system using an enterprise blockchain. Applied Sciences. 2022, Vol. 12 (No. 2), p.10-17.

[8] H. Hamledari, M. Fischer. Construction payment automation using blockchain-enabled smart contracts and robotic reality capture technologies. Automation in Construction. 2021, p.132.

[9] Z. Umar, M. Gubareva, T. Teplova, D.K. Tran. Covid-19 impact on NFTs and major asset classes interrelations: Insights from the wavelet coherence analysis. Finance Research Letters. 2022, p.47.

[10] Hofstetter R, de Bellis E, Brandes L, et al. Crypto-marketing: How non-fu ngible tokens (NFTs) challenge traditional marketing. Marketing Letters, Springer. 2022, Vol. 33 (No. 4), p.705–711.

[11] L. Ante. The non-fungible token (NFT) market and its relationship with Bitcoin and Ethereum. FinTech. 2022, Vol. 1 (No. 3), p.216-224.

[12] A.P. Doan, R.J. Johnson, M.W. Rasmussen, C.L. Snyder, J.B. Sterling, D.G. Yeargin NFTs: Key US legal considerations for an emerging asset class. Journal of Taxation of Investments. 2021, Vol. 38 (No. 4), p.2-8.

[13] Popescu A-D. Non-Fungible Tokens (NFT) – Innovation beyond the craze. Marketing research. 2021, p.66.

[14] Wang D, Ren Q, Li X, et al. Defining Consumers' Interest and Future of Nft Fashion://Nanjing, China: 2022.

[15] Kleijnen M, de Ruyter K, Wetzels M. An assessment of value creation in mobile service delivery and the moderating role of time consciousness. Journal of Retailing. 2007, Vol. 83 (No. 1), p.33–46.

[16] Kiliçaslan F, EkıZler H. Factors Effecting Purchase Intention in Blockchain and NFT (Non-Fungible Token) Technologies. Journal of Research in Bu siness. 2022, Vol. 20 (No. 4), p.33-46.

[17] Zeithaml, V.A. Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. Journal of Marketing. 1988, Vol. 52 (No. 3), p.2–22.

[18] Sweeney, J.C.; Soutar, G.N. Consumer perceived value: The development of a multiple item scale. J. Retail. 2001, Vol. 77, p.203–220.

[19] France, C., D. Grace, B. Merrilees, and D. Miller. Customer brand co-creation behavior: Conceptualization and empirical validation. Marketing Intelligence & Planning. 2018, Vol. 36 (No. 3), p.334–348.

[20] Cassandra France, Debra Grace, Joseph Lo Iacono & Joan Carlini. Exploring the interplay between customer perceived brand value and customer brand co creation behaviour dimensions. Journal of Brand Management. 2020, Vol. 27, p.466–480.

[21] Ah-Min Kwon, Young Namkung. The Impact of the Perceived Values of Social Network Services (SNSs) on Brand Attitude and Value-Co-Creation Behavior in the Coffee Industry. Sustainability. 2022, Vol. 14 (No. 9), p.25-54.

[22] ASLAM W, LUNA I D. The Relationship Between Brand Facebook Page Characteristics, Perceived Value, and Customer Engagement Behavior: An Application of Stim-ulus-Organism-Response (S-O-R). Revista Brasileirade Gestão de Negócios. 2021, Vol. 23 (No. 1), p.43-62.

[23] Çağlayan Aksoy P, Özkan Üner Z. NFTs and copyright: challenges and opportunities. Journal Of Intellectual Property Law and Practice, Oxford University Press. 2021, Vol. 16 (No. 10), p.1115–1126.

[24] Florian Horky, Lili Dubbick, Franziska Rhein, Jarko Fidrmuc. Don't miss out on NFTs?! A sentiment-based analysis of the early NFT market. International Review of Economics & Finance. 2023, Vol. 88, p.799-814.

[25] Langaro, D. Rita, P.; De Fátima Salgueiro, M. Do social networking sites contribute for building brands? Evaluating the impact of users' participation on brand awareness and brand attitude. J. Mark. Commun. 2018, Vol. 24, p.146–168.