Limited or limitless? Exploring the potential of NFTs on value creation in luxury fashion

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Abstract

Accelerated by the global pandemic, the speed of technology adoption has significantly increased, resulting in new business opportunities, channels, touchpoints and digital toolkits. One such burgeoning technology which is generated increasing attention is Nonfungible tokens (NFTs). Adopting an exploratory approach, this study aims to develop a deeper understanding of the value of NFTs from a luxury business and consumer perspective. Taking a qualitative approach, interviews were conducted with luxury experts and consumers, totalling 11 informants. Our findings revealed new technology acceptance and value dimensions in addition to the existing dimensions from literature, within a luxury context, from which two models ensue, NFT value creation and NFT digital strategies. The research makes a valuable contribution to the paucity of existing scholarly studies on blockchain and NFTs and their value creation within a luxury context. It serves to provide preliminary insight into perceptions towards and potential value creation of NFTs for both luxury industry and consumers to inform future luxury digital strategies.

Keywords: blockchain; NFTs; value creation; technology acceptance; luxury; fashion.

Introduction

Globally, retailing is rapidly changing, due to changes in technology and consumer behavior (Grewal et al., 2021). The velocity of change demands retailers to innovate and experiment or risk stagnation (Ibid). The global pandemic enforced closure of physical retailing, resulting in the unprecedented pivot to online. In 2020, global online retailing grew by 14.4% to USD$1,819 billion as consumers shifted to purchasing online (GlobalData, 2020). Within the luxury market specifically, the move from physical to digital channels saw the share of online purchases increase by 27% in 2021, to an estimated USD $70 billion, some 2.5 times higher growth than pre-pandemic (WGSN, 2022). Time spent in online environments by consumers has significantly increased, to both shop and socialise (Ibid), and in turn, there has been a proliferation in retailers experimenting with creating new digital places, spaces, experiences and products for customers, fuelled by novel technologies (McDowell, 2020; WGSN, 2022). These include social-commerce, Live-streaming, Artificial Intelligence (AI) voice assisted devices, shoppable TV, in-home personalized smart mirrors, virtual fashion, gamification and immersive e-commerce (Grewal et al., 2021; Humphrey, 2021). For example, leading luxury labels, like Gucci are attracting young shoppers by appearing in online games, in the metaverse and releasing in-game exclusive goods to encourage digital engagement (Bain, 2021). Accordingly, fashion companies are expected to accelerate their technology investments from c.1.6% of sales in 2021 to 3.5% by 2030, as it is increasingly seen as a strategic priority (BoF and McKinsey 2022).

One such burgeoning technology which is generating increasing attention is *NFTs* (Kay, 2021; Humphrey, 2021), especially driven by Generation Z and millennials, aged 18-44. These digital savvy shoppers are also the same consumer segment driving luxury growth, estimated to comprise 55% of all luxury consumers by 2025 (WGSN, 2022), and the nexus of this study.

NFTs are unique digital assets that can be traded on specific web platforms (Kay, 2021). They are authenticated using blockchain technology, whereby each transaction is recorded using a digital ledger which cannot be modified. In this way, proprietorship is evidenced throughout the NFTs lifetime (Chitrakorn, 2021; Jelen, 2021). Whilst burgeoning within digital environments since 2013, NFTs adoption and value has recently rapidly accelerated, growing 750% from sales of USD $41mn in 2018 to USD $24.9bn in 2021 (BoF and McKinsey, 2022). Its rapid ascent was recognized when Collins Dictionary included NFT as the word of the year in 2021, after it shot up 11,000% (Tan, 2021). NFT attention increased when auctioneer, Christie's sold a digital asset created by artist Beeple for USD $69.9mn, whilst within the fashion sector, design studio RTFKT collaborated with artist Fewocious, selling 621 pairs of digital NFT shoes for USD $3.1mn (Nanda, 2021). Luxury players, have also been experimenting with digital assets and environments, exemplified in Gucci for The Sims and Zepeto, producing USD $12 digital sneakers to buy and wear in virtual worlds (Bain, 2021). Similarities exist between the luxury sector and NFTs: they are exclusive, with limited accessibility, the value of both are regulated by market demand (Romagnoli, 2021), and the consumer segment of strategic importance are Gen Z and millennials (D'Arpizio et al., 2020; Humphrey, 2021; WGSN, 2022). The increasing attention afforded to NFTs by industry as well as consumers' craving for novelty, raises the questions: what is the potential of NFTs for the luxury market? Is it merely temporary hype, triggered and accelerated by COVID-19 and therefore limited, or does it offer luxury retailers new opportunities for customer engagement and revenue streams, therefore limitless? If so, what value can they generate? The aim of this paper is therefore to conduct an exploratory study on the potential of NFTs value creation from an industry and consumer perspective, an unexplored domain of scholarly research thus far. The aim is achieved through the following objectives: first, to identify the opportunities and challenges of NFT adoption through interviews with NFTs, blockchain and luxury experts. Second, to assess luxury consumer perceptions and perceived values towards them.

The paper is organized as follows: the next section presents an overview of the literature on NFTs, technology acceptance and value creation as it applies to luxury retailing. The subsequent section focuses on the research design, which is followed by the presentation and discussion of results. The final section details the theoretical and managerial implications and concludes with avenues for future research.

Literature review

Blockchain and NFTs

Whilst increasing practitioner attention has been afforded to blockchain and NFTs (e.g. Ahram et al., 2017; BoF and McKinsey, 2022; Risius and Spohrer, 2017; Zheng and Dai, 2018) scholarly studies remain nascent, limited to blockchain definitions (e.g. Marr, 2018) applications and usage, (e.g. Crosby et al., 2016; Karame and Androulaki, 2016; Underwood, 2016; Caldarelli et al., 2017; Nofer et al., 2017; Cole et al., 2019; Xu et al., 2021), benefits (e.g. Xu et al., 2021) and barriers (Caldarelli et al., 2017; Hughes et al., 2019; Nawari and Ravindran, 2019). Yet such studies tend to be restricted to financial and supply chain management (Tapscott and Tapscott, 2017; Wang et al., 2019) with few focused on fashion or retailing sectors (Chakrabarti and Chaudhuri, 2017; Rai, 2019). Indeed, within retail, blockchain is considered an underdeveloped technology (Gatteschi et al., 2020). If academic attention to blockchain is still burgeoning, NFTs specifically, as a product of blockchain is scarce (Chohan, 2021). Within practitioner studies, emphasis is given to financial (e.g. Ante, 2021; Musan, 2020), legal (e.g. Robert et al., 2021), security (e.g. Regner et al., 2019) and digital collectibles (e.g. Muddasar and Bagui, 2021) perspectives, yet the fashion context remains conspicuous by its absence. NFTs contextualization is therefore reliant on the practitioner perspective, which is reviewed next with a focus on the potential benefits and barriers derived.

NFTs characteristics incorporate blockchain principles. They are authenticated and minted through blockchain technology that contains a digital ledger where each transaction is recorded and cannot be modified. Therefore, all NFT transactions show evidence of the proprietorship, the authenticity and the price (Gallagher, 2021). The significant difference with cryptocurrencies being that crypto's are fungible, whilst NFTs are nonfungible, meaning that for every NFT traded, there can only be one of each and they cannot be interchanged (Jelen, 2021). Therefore, NFTs have the potential to create value in five key ways: 1) *Monetary* - considered valuable assets by investors / collectors (Odion-Esene, 2021). 2) *Authenticity* - given the decentralized blockchain technology used by NFTs, authenticity is a core facet of NFTs (Chaudhury, 2021). Moreover, NFTs can act as a digital twin of the physical product, enabling buyers to check its provenance and authenticate it through the blockchain (Ong, 2021). 3) *Proprietorship* - NFTs contain unique data, stored on the blockchain that cannot be altered, to prove ownership and uniqueness (Jelen, 2021). 4) *Scarcity* - NFTs generate digital scarcity because they are stored on the blockchain, with a unique identifying code signifying ownership (Nanda, 2021); and 5) *Access* - NFTs can be used to gain access to exclusive products, services or experiences, with digital tokens also being used for memberships and subscriptions (Gottsegen, 2021).

Yet, despite the potential value they create, NFTs raise a number of issues: 1) Minting assets on the blockchain is energy consuming, raising severe environmental sustainability concerns (Nanda, 2021). 2) Being digital assets, NFTs may be subject to cyber attacks (Peters, 2021). 3) NFTs are separate to the asset itself, meaning that the investor owns nothing more than a one-of-a-kind hash stored on the blockchain, whilst the copyright still belongs to the creator (Jordan, 2021). Lastly, 4) NFTs have generated significant hype, but translating that into a sustainable revenue stream has yet to be realized (BOF and McKinsey, 2022; McIntosh, 2021).

Whilst the aforementioned contributes to our understanding of NFTs value creating possibilities, it falls short theoretically. Given its rapid growth, but the dearth of scholarly perspectives in the field, the Value Creation and Technology Acceptance theoretical constructs are applied to advance understanding of NFT usage and value creation conceptually, from a firm and customer perspective.

Value creation

Firm value creation

Bowman and Ambrosini (2007) assert that firms exist to create value, identifying five activities involved in *value creation* for the firm: creation of products/services, generating customer revenues, reducing supplier costs, firm maintenance and future value creation. The focus being on the relationship between buyer and seller where the exchange plays a central role (Moran and Ghoshal, 1996). However, given the focus on virtual goods within this study, arguably traditional notions of *use value* (i.e. UV - the ability of a good to fulfil a need) and *exchange value* (i.e. EV - the monetary amount exchanged between the firm and its customers when use values are traded) need to be reframed for e-businesses. For this reason, we also consider theoretical constructs offered by Amit and Zott (2001) to explore the sources of value creation for digital NFTs. Specifically, dimensions of efficiency (i.e. related to reducing potential transaction costs), complementarities (i.e. firms expect to increase value by enabling revenue increases through bundling of complementary products or services e.g. NFTs offering a digital twin of a physical garment), and novelty (i.e. the value creation potential of new innovative product (NFT) as well as innovative approaches to doing business. E.g. NFTs are traded on novel online marketplaces like Opensea and Rarible that allow creators and buyers to transact) (Tong, 2021). As the notion of value has different meaning for different stakeholders (Bowman and Ambrosini, 2003), we shift from the firm to the customer perspective next.

Customer perceived value (CPV)

The concept of *Customer perceived value* (CPV) explores the concept of value from the customer rather than the company's perspective (Zeithmal, 1988; Parasuraman, 1997), which is critical for firms to identify to remain competitive. Over the past four decades, many scholars have offered definitions, with Zeithmal (1988) suggesting that the value of a good is based upon what is given and what is received, with lower and higher level attributes associated with quality, superiority, price and sacrifice. Dodds et al (1985) defined value as an abstract concept, comprising interrelated facets of quality, benefits and price. Teas and Agarwal (2000) put forward that value is implicated on intrinsic and extrinsic cues. Despite increasing credence given to the CPV construct, its usage has been predominantly in offline rather than online contexts (Overby and Lee, 2006) and preoccupied with financial value (Choo et al., 2012; Salehzadeh and Khazaei Pool, 2017). Sweeney and Soutar (2001) deviated from the dominant position by putting forward emotional and social value dimensions as well as price and quality, inferring that consumers assess products not only in terms of value for money or superior quality but also on the pleasure derived from the product and its perception by others (i.e. its ability to enhance the self-concept). This extended value construct resonates with luxury fashion, as it is known that the feelings and emotions associated with purchasing a luxury product, enhances the consumer-brand relationship and in turn loyalty (Bowlby, 1979), and may be used to assess luxury CPVs not only of physical but virtual goods.

As it is widely recognized today that the interaction between the firm and its customers is vital in the co-creation of value process (Prahalad and Ramaswamy, 2004), delimiting value to firm or customer perspectives is arguably insufficient (Wernerfelt, 1984; Barney, 1991; Hoyer et al, 2011). For this reason, we seek both points of view in the assessment of the potential of NFTs to generate value.

Technology adoption and acceptance

Blockchain NFTs technology adoption

The reputable Technology acceptance framework (TAM) offered by Davis (1985) is used in our study to explore NFTs adoption and acceptance. It remains a useful conceptual lens in which to assess customer’s perceived ease of use, usefulness and attitude towards innovative technologies; typically used in insolation or increasingly combined with other theories of adoption (Lai, 2017; Parasuraman, 1997; Venkatesh and Davis, 2000; Venkatesh et al., 2003; 2012; Rogers, 2003). Importantly, it has been used by scholars in a range of recent technology studies (Altarteer and Charissis, 2019; Jang et al., 2021; Kim, 2017; Rauschnabel and Ro, 2016; Sohn and Kwon, 2020; Vahdat et al., 2020), including blockchain (Lee and Kim, 2019; Lou and Li, 2017; Rossi et al., 2019; Shrestha et al., 2021) but to the author's knowledge, it has yet to be used within the context of NFTs.

The dimensions emerging from TAM and its recent blockchain application related to perceived used, perceived ease of use, trust, security and willingness to manage cryptocurrency are most applicable in our exploration of customer value perceptions, acceptance and adoption of NFTs.

Intersecting theoretical perspectives from both the firm and customer towards value creation with technology readiness theories within the novel context of blockchain NFTs, a nascent field of research, serves to contribute new knowledge and offer much needed managerial recommendations on NFT technologies as a source of value creation for luxury fashion. The research questions arising are therefore as follows:

- What is the potential of NFTs for luxury fashion retailers?
- How can luxury retailers create value through NFTs?
- What influences luxury consumers' value perception of NFTs?
- Which dimensions influence luxury retailers' and consumers' acceptance of NFTs?

- What will be the future adoption of NFTs within luxury fashion from a retailer and consumer perspective?

Methods

Given the paucity of extant scholarly studies on NFTs, our research took an exploratory, qualitative approach, using interviews and a focus group, to investigate the potential of NFTs for luxury fashion, and their value creation, from a luxury retailer and consumer perspective. Qualitative research enables exploration of issues previously ignored by the positivist research paradigm and a readiness to address novelty (Parker, 2014). It encourages engagement with the field, with context and with subject specificities (Guercini, 2014). Given the dynamism of retailing, the ability to generate thick, holistic, contextual understanding using a qualitative approach is arguably more appealing and relevant, especially when developing new knowledge on an emerging phenomenon, like NFTs (Denzin and Lincoln, 1994).

The unit of analysis is luxury retailing with a focus on personal goods. As no widely accepted definition exists for what constitutes a luxury brand, the authors draw on common dimensions and product categories posited by scholars Ko et al (2019) and market consultancy Bain & Co (D'Arpizio et al, 2021) as being high quality, offering authentic value via desired benefits, having a prestigious image within the market, worthy of commanding a premium price and capable of resonating with the consumer, with personal luxury goods comprising apparel, shoes, accessories, jewelry, watches and beauty. The luxury market is recognized as being disrupted by digitalization (D'Arpizio et al, 2020), as early adopters of NFTs (WGSN, 2022) and with a strategic focus on Gen Z and millennial consumers (D'Arpizio et al., 2021). Moreover, London, UK is widely acknowledged as a luxury fashion destination (Hickey and Selwyn, 2019) as well as a hub for digital innovation (Deloitte, 2013).

The research is based on a review of existing technology adoption, acceptance, value creation and, customer perceived value literature (e.g. Ajibade, 2018; Bowman and Ambrosini, 2000; Davies, 1985, 1989; Parasuraman, 1997; Rogers, 2003; Sweeney and Soutar, 2001; Zeithaml, 1988), interviews with blockchain NFT experts, luxury executives as well as luxury consumers. An interview protocol was constructed, informed by the key themes deduced from the literature review concerning the opportunities and challenges of adopting NFTs and their potential creation of value. Purposive sampling was used, with participants selected based on their prior knowledge of NFTs and the luxury fashion market. The sample were selected during the NFT Summit, in June 2021. Six interviews in total were undertaken, with senior managers operating in technology, Fintech, fashion and education. Each interview was facilitated by the researchers via video call and lasted around 40 minutes, over a two-week period (Jamshed, 2014). To ensure consistency of understanding, a definition of NFTs was given to each participant at the outset. Interviews were recorded, from which full transcripts were developed.

Furthermore, a consumer focus group was undertaken, to assess luxury consumers perceptions and perceived values towards NFTs. Focus groups as a form of interview are widely used in social science and business research to elicit rich descriptions on a particular topic from multiple participants (Carson et al., 2001; Coule, 2013). Procedurally, a protocol, was used to guide the interactions and elicit responses on the core themes derived from the literature (Smithson, 2000). In this sense, focus groups are discussions occurring in a specific, controlled setting, for a particular purpose (Ibid), generating information on how people feel, act or think regarding a specific topic (Freitas et al., 1998). Due to the nascency of NFT consumption (it is inferred only 1% of luxury consumers use cryptocurrencies to purchase NFTs) (Chitrakorn, 2021), snowball sampling was used to access luxury Gen Z or millennial consumers who were familiar with or had previously purchased NFTs (Etikan and Bala, 2017). This meant making an initial contact with 'seeds' through which other participants were recruited. LinkedIn was used to make contact and recruit initial participants, resulting in the selection of five luxury consumers. The online focus group was conducted over Zoom (Stewart and Shamdasani, 2017) and lasted around 100 minutes. Photo-elicitation technique, was used, by showing NFT examples (e.g. Beeple's artwork, NFT sneakers from RTFKT studio and The Fabricant's NFT couture dress) to generate more depth of discussion (Mishra, 2016). The interaction was audio recorded from which a verbatim transcript was developed.

Qualitative sample size is scarcely discussed in scholarly literature (Boddy, 2016), however, it is acknowledged that studies based on a small number of participants are likely to yield rigorous descriptions of people's experiences, which are deemed important for documenting uniqueness as well as patterns across the data corpus, when exploring an emerging field (Patton, 1999). For this reason, the sample size used in this exploratory study is deemed acceptable.

Data across the corpus was analyzed thematically, categorized and key quotes added, in order to gain interpretive understanding (Silverman, 2014). Given the study's naturalistic paradigm, Guba and Lincoln's (1994) criteria for assessing qualitative research trustworthiness and authenticity were broadly used in the research procedures. Research protocols were informed from emerging themes in the literature and used to guide the onward data collection and analysis, rich descriptions were derived from the interviews and probing was used to verify and extend understanding. Triangulation of data were used to increase credibility, member checking was deployed to determine the accuracy of findings by taking the themes back to participants, and finally, during the research process, records concerning the protocol, codebook and database were kept to ensure procedure transparency and transferability (Seale, 1999; Cope, 2014). In keeping with an inductive approach, the research aimed to identify new themes and offer theoretical conceptions in relation to an under-researched topic, rather than the making generalized assumptions (Eisenhardt, 1989).

Results and discussion

What is the potential of NFTs for luxury fashion retailers?

Benefits, barriers to acceptance, users and *use cases* were considered when exploring the potential of NFTs for luxury fashion. Concurrent with the literature, *benefits* cited related to authenticity and ownership (Caldarelli, 2017). This was deemed especially important for secondary markets, wherein blockchain NFTs were seen to counteract counterfeiting, a negative aspect prevalent within the luxury market, and defend originality and unicity. Moreover, NFTs were seen as preventing digital product replication, benefiting from immutability offered by blockchain technology. The ability to gain access to exclusive products, experiences and data were seen as valuable to the luxury market, akin with scarcity, already synonymous with luxury goods (Gallagher, 2021; Nanda, 2021).

Conversely, the main *barriers* of NFTs were related to energy usage, low levels of company and customer understanding, cryptocurrency volatility and technological instability issues. The problems associated with typically utilizing Ethereum's blockchain that contributes to energy consumption and environmental unsustainability resonates with extant literature (e.g. Calma, 2021). Low levels of understanding relates to the newness of NFTs as an emerging entity and thus current users were seen to be limited to innovative creators, start-ups, experimental luxury brands, investors and speculators. As one respondent said:

> "Some of the big luxury houses are playing with NFTs. Gucci with its $12 digital sneaker, LVMH and Prada with the formation of AURA blockchain consortium are examples of such experimentation"

This concurs with practitioner perspectives that suggest only 1% of luxury customers use cryptocurrencies (Chitrakorn, 2021). In the context of Rogers (2003) level of innovativeness, this falls short of the 2.5% classification of innovators within a sector. Those venturesome, technology enthusiasts, who are usually first to use a new technology.

The findings revealed six *use cases* of NFTs for luxury brands: 1) to implement a digital identity in the metaverse; 2), to generate hype; 3), metadata utility; 4) generate new collaborations; 5) attract new consumers and 6) explore new revenue streams. Each of these are explored in subsequent sections.

How can luxury retailers create value through NFTs?

Three key aspects of value creation for luxury players emerged from the expert interviews related to *marketing and promotion*, *collaboration* and *financial* gain. First, NFTs were considered to create value by experimenting with a novel technology as a way of generating hype around a product, service or experience. Second, as a way of securing first mover advantage by collaborating with technology-based enterprises and experts to release regulated NFTs. And finally, in-game purchases or investing in NFT collectibles was seen as a new revenue stream for luxury brands. However, in contrast with extant literature (Bowman and Ambrosini, 2007) which emphasizes financial value creation for firms, within the context of NFTs, this was seen to be lacking, with greater emphasis given to marketing and promotion. This means, given the nascency of NFTs, greater credence seems to be given to customer *use value* by luxury firms (i.e. fulfilling a customer need for product novelty, experience etc.) as opposed to *exchange value* (i.e. monetary gain generated from NFTs).

Related to the three dimensions of value creation specific to e-businesses identified in the literature (Amit and Zott, 2001), all resonated with the NFT and luxury experts. Most related *transaction efficiency* with the benefits of purchasing NFTs using cryptocurrencies, providing an "easier and cheaper way to buy" (R3), whilst acknowledging the risk of their volatility, making it "difficult to determine a general value" (R2). Most recognized the high transaction cost of NFTs due to their current market nascency and the lack of economies of scale. In terms of *complementarities*, most related this with NFTs enabling access to exclusive products or experiences and to digital twins i.e. having a physical item paired with a digital asset. In doing so, luxury consumers, “receive complementary outputs that add value to their customer experience” (R1).

Finally, *novelty* was deemed the most important value creation dimension for luxury businesses. As one respondent inferred, “the hype around the digital assets is generated from their mystery” (R5).

What influences luxury consumers’ value perception of NFTs?

All four customer perceived value dimensions discussed in the literature (Zeithmal, 1988; Sweeney and Soutar, 2001) resonated from the consumer focus group related to NFTs. The most tangible being *price and quality*, whereby most participants talked about NFTs as collectibles, referring to Pokemon cards as a point of comparison to assert that the NFT holds little value in themselves, but are worth, “what people are willing to pay for them" (P3). Price was also related to brand associations, memories, past experiences, exclusivity and heritage, if positive in the consumers’ mind and scarcity is high, are likely to influence willingness to pay a higher price. Interestingly, the power of the *virtual community* was seen as important. The NFT community is seen as small and bound by strong relationships, generating loyal following on digital platforms, which also affects the price of an asset.

The *emotional value* generated from NFTs was seen as intangible and not easily identifiable by most participants. This was due to the nascency of NFTs and their preference for purchasing physical over digital fashion. As one participant asserted, “there isn’t anything right now that gives the same emotional feeling as buying something physical” (P2). A few associated the emotional value generated from buying

NFTs with the personal satisfaction felt from seeing the price sore in value, related strongly with personal choice and taste. Thus a relationship between price and emotional value creation was shown.

The *Social value* generated from purchasing NFTs resonated with Sweeney and Soutar's (2001:211) definition as "the utility derived from the products ability to enhance the self-concept", with most participants purchasing them to wear in their social media profiles. Some related this to creating a *digital reputation* or a novel digital persona as having the potential of creating social value. Most, however found it difficult to extrapolate possible social value generated from living in virtual worlds from their current physical existence as it felt too far removed.

Which dimensions influence luxury retailers and consumers acceptance of NFTs?
Drawing on Davis (1989) and Venkatesh and Davis (2000) determinants of technology acceptance concerning NFTs, in addition to usefulness and ease of use, safety and security, trust, seamless experience, uniqueness, durability and authenticity also emerged as important across experts and luxury consumers.

Safety and security was perceived as one of the main factors for accepting NFTs, as posited, "NFTs have to be a lot more regulated, secure, verifiable, so the file won't disappear from the storage system" (R1). Safety was discussed in the context of trust, and the necessity for NFTs to be released in a safe environment, with the ability to "offer refunds and assistance during the transaction" (R2). Moreover, offering a *seamless experience* was deemed important, with some participants considering the path to purchase of NFTs easy, whilst others perceived the requirement to have a digital wallet containing cryptocurrencies as less so. *Uniqueness* refers to the ability of having a one-of-a-kind digital asset, which participants likened to luxury, sharing commonalities of limited edition, rarity, scarcity, durability and provenance. “NFTs last forever as a digital asset which kind of links with the concept of provenance and ownership of luxury too” (P4). Thus a natural fit was seen between NFTs and the luxury sector. Crucially, the value derived from NFT *authentication* was deemed important, befitting with consumers’ increasing desire towards product traceability and authenticity (BoF and McKinsey, 2022).

Contributing to the *ease of use* dimension, luxury consumers suggested that more *intuitive interfaces* are necessary, for example mobile pay, credit cards and other common payment methods to overcome some of the current usage barriers. Overall, both industry experts and luxury consumers considered NFTs as an emerging technology with little influence on their current value creation. Some suggestions for further adoption were offered, which are discussed next.

What will be the future adoption of NFTs within luxury fashion from a retailer and consumer perspective?

NFTs, whilst positively perceived, were seen as a fledging yet fast evolving technology. Some barriers to adoption were offered to support future acceptance, related to *interoperability, collaborations, relationship with the Metaverse, education and environmental and social purpose*. A few participants suggested collaborating with gaming companies to overcome issues of *interoperability*, that is, the inability for NFTs to be used across platforms. “You can’t buy a dress from DressX and use it for Fortnite for example” (R1). As gamification is well entrenched, with gamers purchasing skins to play in virtual worlds, it is seen as a fitting starting place to experiment with NFTs (Goosens and Feldman, 2021). Pioneering luxury brands are already doing this, for example, Gucci and Zepeto, Burberry and Tencent and Balenciaga and Fortnight (BoF McKinsey, 2022). This relates to the requisite to *collaborate*, with gaming or technology companies to buy-in capabilities to provide the know-how to pursue NFT digital fashion innovation. Many participants proposed that consumer's *relationship with the Metaverse* needs to be strengthened to improve adoption. That is, luxury brands and consumers developing digital lives that replicate their real lives. To accelerate this process, many pointed to the need to *educate* consumers, make them more informed about NFTs, digital fashion and the NFT purchase experience journey towards Metaverse retailing. "The main issue is that people don't know enough about NFTs and they don't understand how it works outside of avid investors" (R3). Lastly, utilizing NFTs to promote *social purpose*, for example, supporting independent digital artists and designers, building community through charitable causes and augmenting sustainable efforts towards traceability and authenticity, were perceived as supporting future adoption. Whilst simultaneously, overcoming consumer concerns regarding the climate cost (i.e. CO_2 emissions generated) of minting NFTs on the blockchain.

Collectively, the findings point to an evolving scenario, in which NFT adoption is at a low level across luxury firms and consumers (Davis, 1989), with limited luxury innovators and early adopters currently (Rogers, 2003). Value creation opportunities are burgeoning but predominantly limited to *marketing and promotion* for luxury firms because of the novelty associated with NFTs. Conversely, for consumers, value creation emphasis was towards *price and social value* dimensions with scarcity, novelty, rarity contributing to the notion of value for money and self-identify through the creation of 'selfie' digital identity. Luxury firms are encouraged to leverage these in developing their digital strategies.

Conclusion, implications and future directions

This is one of the first known scholarly studies to investigate the value creation potential of NFTs from a luxury firm and customer perspective. It therefore makes several theoretical and managerial contributions.

Empirically, our research corroborates and extends extant literature on the technology acceptance and adoption dimensions associated with blockchain technology NFTs perceived use, ease of use (PU and PEOU) (Davis, 1985, 1989; Venkatesh and Davis, 2000), authenticity, proprietorship, trust and security (Chaudhury, 2021; Lee and Kim, 2019; Nanda, 2021; Shrestha et al., 2021). Seamless experience, uniqueness and intuitive interfaces emerging as new dimensions influencing *NFT acceptance and adoption.* From a luxury consumer and company perspective, NFTs were seen to create value across five and six dimensions respectively, with emphasis afforded to marketing and promotion for retailers and price and social value for consumers. In doing so, it advances extant studies (Amrit and Zott, 2001; Bowman and Ambrosini, 2007; Sweeney and Soutar, 2001; Zeithmal, 1998). These dimensions conceptually converge in the NFT value creation for luxury model, as depicted in Figure 1.

<<Insert figure 1 about here>>

Given the dearth of scholarly studies in the field, our study contributes new knowledge on value creation and technology acceptance specific to the luxury sector and NFT technologies. The proposed model serves as a useful starting point for subsequent researchers and practitioner usage when investigating new dimensions affecting NFTs and other crypto-related technologies' value creation processes. We recognize that as a burgeoning market, NFTs and digital goods within retail Metaverses are evolving at speed, requiring significant scholarly attention to progress knowledge to keep abreast with industry advancements. Subsequent empirical studies are therefore encouraged to augment our model in the theoretical development of the field (BoF and McKinsey, 2022; Humphrey, 2021).

Our study found that NFT adoption is limited, mainly perceived as collectibles for a few early adopter luxury collectors and consumers and constrained to a few innovative luxury company's, with greatest NFT value currently generated through marketing and promotion and experimentation. Therefore, from a practical perspective, several recommendations ensue from our findings for the luxury sector.

First concerns overcoming the barriers to improve NFT adoption. Our study revealed several hurdles including consumer awareness, knowledge and understanding, interoperability, environmental emissions generated from Ethereum blockchains and prerequisites for strategic collaborations and Metaverse immersion. Some of these may be overcome through *education and regulation*, educating consumers about the functions, applications, ease of use, initiatives and investment in pursuit of alternatives to Ethereum blockchains to make crypto fashion more sustainable, whilst moving towards a more regulated crypto environment. Partner selection is deemed critical to success, initially leveraging synergies with gaming platforms, and utilizing the expertise of digital SMEs to partner, build and acquire relevant capabilities. In conjunction with this, luxury firms are encouraged to expand their relationship with the Metaverse. This is conceived as evolving from limited use case and value creation to widespread immersion; from NFT value creation for luxury firms centred on marketing and promotion to multiple and varied value creation opportunities; from exclusive customer value creation to more inclusive and diverse customer value creating opportunities and from low to high adoption. This evolution in NFT digital strategy, depicted as phases from one – emergent, to three – widespread, is conceived in Figure 2, and offers a useful tool to inform luxury firm's specific digital strategy development.

<<Insert Figure 2 about here>>

Whilst the paper makes a valued contribution to an emerging field, it is not without limitations. The research is limited by scale, geography, sector and age. The findings are restricted to Gen Z and millennial consumers, the luxury sector and predominantly London, UK. The narrow geographical focus, small sample size and its qualitative approach should therefore be considered when drawing conclusions. Given the novelty of NFTs, the research is purposely exploratory in nature, offering a scholarly starting point for a myriad of scholarly advancements in the field. Similar studies could be undertaken across different market sectors and different geographies, that have shown to be actively engaging with NFTs and where consumer appetite for digital fashion is high and retailer innovativeness towards digital fashion and the Metaverse are progressive. Equally, as NFTs become more diffused amongst consumers, there is scope to broaden research beyond the technology ready Gen Z and millennials of this study, to other consumer groups, whilst also expanding the sample size through more rigorous qualitative and quantitative enquiry. The nascency of the field offers both conceptual and methodological avenues for future research, including an investigation of the various NFT use cases, the six identified in our study provide a useful starting point, the many value creating dimensions found in our study could be examined in detail, from either a firm or customer perspective or both. Methodologically, utilizing a case study approach would elicit rich learnings to support future NFT and digital strategy developments. Moreover, our research recognizes that fashion practices precede scholar studies in the field and it is rapidly evolving. Therefore there is merit in taking a more longitudinal approach, to track change in NFT acceptance and adoption over-time and their contribution to future digital strategy directions.

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