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Research Paper

From Reality to Virtuality: Digital Transformation on Luxury Brand Engagement and Purchase Intention in the Metaverse.

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ABSTRACT

Currently, luxury brands face the complexity of the concept of luxury and the constant evolution of consumers, making effective digital presence and communication essential. Interaction in digital channels strongly influences purchase decisions, requiring continuous monitoring by organizations. With the growing interest in the Metaverse, luxury brands are exploring new integration strategies in this digital universe. Based on the theory of digital transformation and the theory of consumer engagement, this study aims to analyze how Metaverse integration strategies shape the digital transformation of luxury brands and influence the engagement of luxury consumers in the digital realm. A mixed-methods approach was used, combining a qualitative approach through exploratory research and a quantitative approach through an online questionnaire (Study 1: n = 248, and Study 2: n = 198) disseminated in Prolific platform, where specific consumer habits (e.g., luxury products buying) are considered as filters to better select the targeted sample. The results revealed that Metaverse integration and digital transformation strategies positively impact purchase intention, but consumer engagement does not significantly moderate these relationships. This study highlights the importance of digital strategies adopted for the success of luxury brands in the Metaverse and suggests future research on the factors that affect the effectiveness of engagement in the Metaverse environment.

Keywords: Metaverse, Luxury Brands, Digital Transformation Strategies, Consumer Engagement, Purchase Intention

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1. INTRODUCTION

Currently, luxury brands can be characterized by their complexity, as luxury is a challenging concept to define due to its multiple aspects and the constant evolution of its consumers (Atkinson & Kang, 2022). Due to this evolution, it is now essential for organizations to have an online presence and expand their communication strategies to digital channels (Vermesan et al., 2022). With the existence of these channels, consumers find it easier to obtain information about products, services, and brands from other consumers and place higher importance on this information compared to that provided by organizations.

Given the ease and lack of control in consumer interactions, it becomes essential for organizations to regularly monitor these interactions, as they strongly influence purchasing decisions. This monitoring process produces data related to customer engagement, and organizations often prioritize posts with the highest level of interaction (Yadav & Pavlou, 2014). The constant pursuit of profit, strategic motives, and competitor influence are factors that may justify companies entering new markets. Interest in the Metaverse, generally defined as a digital universe where three-dimensional users interact socially, politically, economically, and culturally (Park et al., 2022; Rahman et al., 2023), has shown a considerable increase since 2021 (Wunderman Thompson Intelligence, 2022). According to Mystakidis (2022), these technologies expand physical boundaries and involve society, which is a differentiating factor motivating investment in this new digital universe.

In the current scenario of this emerging digital universe, consumer behavior and digital marketing strategies in the luxury segment have not been fully addressed. Therefore, the research question of this study is as follows:

RQ: How do Metaverse integration strategies shape the digital transformation of luxury brands and influence luxury consumer engagement in the digital space?

To address the above question, the following objectives are defined:

Objective 1: Analyze the impact of Metaverse implementation strategies for luxury brands.

Objective 2: Evaluate consumer engagement in virtual environments of luxury brands.

A mixed methodology was applied, with qualitative methodology involving exploratory research through secondary data, and quantitative methodology involving a questionnaire to meet the proposed objectives and answer the research question. With this research, a deeper understanding of the influence of engagement within the Metaverse in the luxury segment is expected, contributing to future studies.

2. LITERATURE REVIEW

2.1. Concept of Luxury

Understanding the concept of luxury is essential for understanding humanity and social coexistence. Kapferer and Bastien (2012) highlight its complexity and focus on defining luxury as a social effect. Desire, dreams, and the need to belong to a society or enhance self-esteem are the factors driving the purchasing decisions of these products or services, based on the levels of status and self-esteem in Maslow's Hierarchy of Needs. The purchase of luxury happens not out of necessity, but in search of pleasure, deeper feelings, and meanings for the consumer (Ko & Megehee, 2012).

Due to the growing demand for luxury products, the market has split into two groups: traditional luxury and new luxury (Batat, 2023). Traditional luxury is defined by a market tied to elite consumers who prefer more established brands over new ones. A characteristic of this market is that consumers opt for quality and exclusivity. New luxury, or emotional luxury, reaches consumers with less financial power but who are still willing to spend on products that meet emotional needs and result in happiness and well-being. Luxury today is associated with the idea of self-care, valuing oneself, seeking pleasure, and improving quality of life and personal satisfaction levels.

2.2. Brand Value

The concept of brand value, or brand equity, has various proposed definitions, with some authors focusing on a financial perspective and others on a differentiating value perspective (Aaker, 2009). Despite this ambiguity in its definition, all approaches demonstrate the need for organizations to focus on brand strategy (Côrte-Real, 2007). With brand value based on four dimensions, a strong brand creates esteem for both consumers and the organization. For consumers, interpretation, processing, and storage of received information are facilitated. From the organization's

perspective, a strong brand offers the possibility of increasing cash flow and generating entry barriers for competitors.

Perceived quality, defined as consumers' subjective evaluations of a product, is a crucial factor for achieving competitive advantage and sustainable profits (Lili et al., 2022). Enhancing perceived quality can improve brand loyalty, one of the main predictors of continuous user behavior towards a service or product.

A brand possesses value when consumers react positively to the product once they become familiar with the brand. The analysis of the brand's impact on the purchasing decision process is fundamental in assessing brand value from the customer's perspective. Thus, brand value is linked to the organization's marketing activities and stems from what resides in consumers' minds.

2.3. Digital Transformation

In the EuroMed article (2019, p.735), it was stated that Reichert and Hutchinson (2019) define digital transformation as a "profound alteration or metamorphosis in the way organizations create value for their owners and stakeholders," resulting in a significant impact on society (Cochoy & Soutjis, 2020). According to Mastropetrou et al. (2019), digital transformation aims for improvements and consequent organizational changes in the functioning of an organization through the application of technology and different tools. This influence encompasses all parts of the business, from products to the complete overhaul of business models (Hess et al., 2016), with the objective of promoting value creation among stakeholders with the help of digital techniques (Reichert & Hutchinson, 2019).

Kapferer (2017) asserts that digital transformation can enhance the relationship between brands and their consumers, allowing for more effective acquisition and retention. This relationship between brands and their consumers is stimulated through the different dimensions of digital transformation. The permanent availability that brands offer through customer support processes on various channels, as well as the improvement of digital techniques based on collected data, has enabled better quality personalized service.

Software like CRM (Customer Relationship Management) has provided a competitive advantage for brands, as they are now connected to social platforms with the goal of tracking relationships and interactions between brands and their consumers, making it easier to segment contacts (Guerola-Navarro et al., 2020). E-commerce is another sector of digital transformation that allows

for online purchases, becoming increasingly simple and efficient, with intuitive and favorable navigation, making it attractive to consumers (Omari, 2019).

Digital transformation is a great benefit for brands, as it enables them to acquire knowledge about their consumers and allows the implementation of optimized processes and decisions. Mastropetrou et al. (2019) argue that digitalization, besides helping brands improve relationships and contacts with their consumers, also increases service agility and efficiency. Juárez-Varón et al. (2023) state that through this knowledge, brands acquire information about the different customer profiles that follow and visit them, enabling them to impact each customer with lasting memories and emotions.

However, Alim et al. (2023) note that the luxury goods market has significant concerns regarding the progression of digitalization. Luxury companies have made substantial investments in the digital space that have not shown financial returns. The more progressive luxury companies are methodically seeking digital opportunities, but most companies in the same sector limit themselves to using the digital space to attract their brand through marketing strategies.

2.3.1. Digital Transformation Strategies

Matt et al. (2015) proposed a digital transformation framework that, regardless of brands and their backgrounds, presents four dimensions within the cognitive universe: (1) use of digital technologies, (2) changes in value creation, (3) structural changes, and (4) financial aspects. They further argue that, according to the proposed framework, the path to a technological future is defined by the interest and positioning of the brands.

Companies that show interest in renewal and consequent implementation of transformative digital instruments demonstrate a desire to differentiate and evolve in their processes and actions. This decision results in a change concerning value creation. The second dimension points to the analysis by brands of the shift from traditional value creation to encouraging more demanding and comprehensive digital approaches. For example, in luxury brand stores, the impact of interactive and appealing staging of different products with consumers is of utmost importance. Elements such as virtual mirrors that display different items and interact with other content contribute to personalized service that incorporates complementary purchase suggestions (Holmqvist et al., 2020).

The third dimension involves structural changes in the operations of brands. A solid operational foundation within organizations is necessary to enable the development and implementation of all

plans defined with the introduction of new digital strategies. Finally, the fourth dimension focuses on analyzing the financial aspects related to the implementation of the digital transformation process in all the points. It is crucial that the four dimensions exist in an integrated and related manner for digital transformation strategies to be successfully implemented (Fig. 1).

Figure 1. Digital Transformation Structure (Matt et al., 2015)

2.4. Metaverse and Virtual Reality

The Metaverse is generally defined as a digital universe where three-dimensional users interact socially, politically, economically, and culturally. It is described as a virtual representation of the real world, allowing people to engage in daily activities without being restricted by physical boundaries (Park & Kim, 2022). Dynamic interaction is facilitated by emerging technologies such as virtual reality, augmented reality, and mixed reality. According to Mystakidis (2022), these technologies expand physical limits and involve society. Before the advent of these new technologies, Davis et al. (2009) suggested that a Metaverse could be described by five factors: (1) the structure and layout of the digital environment; (2) the people living in the Metaverse represented by avatars; (3) the technological functions including rendering, communication, interaction, and collaborative processes; (4) the observable behaviors expressed by avatar interactions; and (5) the outcomes, primarily regarding the effectiveness of collaborative efforts.

Although interest in the Metaverse has significantly increased since 2021 (Wunderman Thompson Intelligence, 2022), it is important to remember that Second Life, a platform like virtual reality, has existed since the 2000s. According to Kaplan and Haenlein (2009), there were similar features at that time, such as the ability to create personalized avatars, conduct real estate transactions, and

exchange digital currency. Companies like Nike, Dell, and Disney established a strong presence on the platform (Eisenbeiss et al., 2012). However, there are significant differences regarding modern Metaverse-linked games like Roblox and Fortnite compared to Second Life. Rospigliosi (2022) notes the significantly increased number of users, active user involvement in creating the game environment, and technological advancements compared to the early days of Second Life.

There are two main conceptual perspectives on the Metaverse. The first relates to Web 2.0, using platforms like Roblox, Fortnite, and Second Life, which are centrally controlled and function as intermediaries of the Metaverse, with virtual assets limited within the games. The second, related to Web 3.0, includes a community-managed platform, transactions facilitated by cryptocurrencies, and asset ownership through NFTs, such as Decentraland and The Sandbox (Moy & Gadgil, 2022). Dowling (2022) argues that decentralized Metaverses, such as Decentraland, have seen land or property transactions in the form of NFTs, resulting in a significant increase in prices. The market is gradually adapting pricing mechanisms towards efficiency, but his study did not consider the different property locations, an essential factor in defining real estate prices in the real world and relevant in the digital world. Selling items in the Metaverse can be considered the sale of digital products (Lambrecht et al., 2014). These products are distinct in that they are not comparable, have minimal manufacturing and distribution costs, and reduced research and transaction costs. Additionally, NFTs can cause artificial scarcity of products and facilitate the sale and protection of property rights.

2.4.1. Metaverse Integration Strategies

The constant pursuit of profit, strategic motives, competitor influence, and other factors can justify companies entering new markets. Organizations may find themselves in situations of technological uncertainty due to long-term strategic goals, such as learning new technologies and competition-centered motivations. As more companies adopt a specific practice, this approach becomes evident to other companies, and the signaling effect becomes more distinct.

Diversification can be a motivational factor for investing in the Metaverse, as company performance, investment decisions, and employment rates are affected by economic uncertainty, such as the COVID-19 pandemic in 2020 and the invasion of Ukraine in 2022 (Ahir et al., 2022). Diversified companies are more resilient to economic changes. Therefore, there is generally a preference for greater diversification when there is uncertainty.

According to Sharma and Erramilli (2004), companies choose an entry strategy that best leverages existing resources or creates resources in the new market. This means that when a company has sufficient resources to enter a new market, opting for a high-control entry mode improves the ability to maximize profit. On the other hand, leveraging a partner's resources, a low-control entry mode is more suitable. Fashion brands can engage in the Metaverse in five different dimensions (Amed et al., The State of Fashion, 2023), the most common being digital clothing, virtual fashion shows, and trying on clothing virtually. By creating virtual and collectible pieces and organizing brand activations like the Gucci Garden, the brand lays the foundation for the future of digital design in the Metaverse (Amed et al., The State of Fashion, 2023). The company has created assets for popular games like Pokémon Go and Animal Crossing and auctioned its first NFT. More recently, Gucci announced plans to create "an interactive fashion experience based on the (Gucci) Vault" by purchasing virtual land in The Sandbox, a controlled computing environment that allows testing new features and flows safely and privately, in 2022.

Virtual Try-On (VTO) technology allows customers to try on clothes virtually, which influences their purchasing choices. VTO technology enhances the consumer experience by providing a more enjoyable and engaging shopping process. According to Baytar et al. (2016), VTO provides useful information about clothing attributes, such as size and color, to online consumers (see for example, Figs. 2 and 3).

Figure 2. Metaverse Fashion Week 2022 - Dolce & Gabbana

Figure 3. Virtual Try-on - Farfetch

2.5. Consumer Engagement in the Metaverse

Most companies use social media as a means of communication with consumers. Van Doorn et al. (2010, p.254) define customer engagement as "customers' behavioral manifestation toward a brand or firm, beyond purchase, resulting from motivational drivers." Nowadays, customers interact with brands through various channels and touchpoints, making the customer journey more complex (Godey et al., 2016). Brand engagement plays a fundamental role in empowering consumers to make conscious purchasing decisions. The goal of the brand is to engage customers through advertising to enhance the connection between the brand and the customer, ultimately increasing profitability. Social media monitoring tools evaluate the degree of customer engagement with the brand by analyzing the number of likes, comments, and shares.

To increase customer engagement, companies invest in interactive technology (Vogel et al., 2019). Within Metaverse commerce, users are allowed to be co-producers in the value creation process through entertainment and involvement in creating a product or experience, adopting a customer-centric approach. Brand awareness, perceived value, organizational associations, and brand uniqueness increase brand loyalty. To increase brand loyalty, emotional ties with the brand must continuously provide symbolic and quality advantages. They also emphasize that fashion retailers should not merely replicate procedures from virtual or physical environments but adapt them to the new context.

However, the Metaverse presents ethical and social challenges related to privacy and security. Since it requires hardware devices, as mentioned earlier, it necessitates the storage of users' confidential data. The difficulty of obtaining the necessary information to reduce security risks is a concern. Social media exemplifies how algorithms decode and collect valuable information about users for purposes such as ad personalization or even personal preferences. Elevating this algorithm to the Metaverse level, where data collection is even more intrusive—such as mapping body movements, physical responses, and brain waves—drastically increases the amount of detailed information that can be obtained about each user (Mrad et al., 2022).

2.6. Objectives and Hypotheses Formulation

Objective 1: *Analyze the Impact of Implementation Strategies in the Metaverse for Luxury Brands.*
To assess Objective 1, a qualitative approach will be considered, consisting of exploratory research using secondary data, drawing on the official websites, annual financial report, and Instagram of each brand under study.

Objective 2: *Evaluate Consumer Engagement in Virtual Environments of Luxury Brands.* Integration strategies in the Metaverse, such as participation in virtual events and the creation of digital experiences, have the potential to attract consumer attention and engagement (Amed et al., 2023; Wunderman Thompson Intelligence, 2022). Park and Kim (2022) emphasize the growing importance of the Metaverse as a virtual environment where brands can interact with consumers in a three-dimensional, social, economic, and cultural manner. Brand involvement in the Metaverse, through integration strategies, can increase the attractiveness and emotional connection of consumers with luxury brands (Amed et al., 2023, The State of Fashion, 2022). In this context, the following research hypothesis is presented:

H1: Integration strategies in the Metaverse have a positive impact on purchase intention in luxury brands.

The literature review highlights the importance of digital transformation strategies in creating value and differentiating luxury brands (Matt et al., 2015). Additionally, the use of digital technologies can contribute to service personalization and enhancement of the consumer experience (Holmqvist et al., 2020). Therefore, the following research hypothesis is proposed:

H2: Digital transformation strategies have a positive impact on purchase intention in luxury brands.

Consumer engagement can strengthen the relationship between digital transformation strategies and purchase intention, amplifying the positive effects of these strategies on perceived value and customer satisfaction. Thus, this engagement can increase the effectiveness of integration strategies in the Metaverse, making the consumer experience more immersive and engaging, which can positively influence purchase intention in luxury brands. In this context, the following research hypotheses are formulated:

H3a: Consumer engagement positively moderates the relationship between digital transformation strategies and purchase intention in luxury brands.

H3b: Consumer engagement in the Metaverse positively moderates the relationship between integration strategies in the Metaverse and purchase intention in luxury brands.

Based on the literature review and the presented hypotheses, the following conceptual model is proposed (Fig. 4):

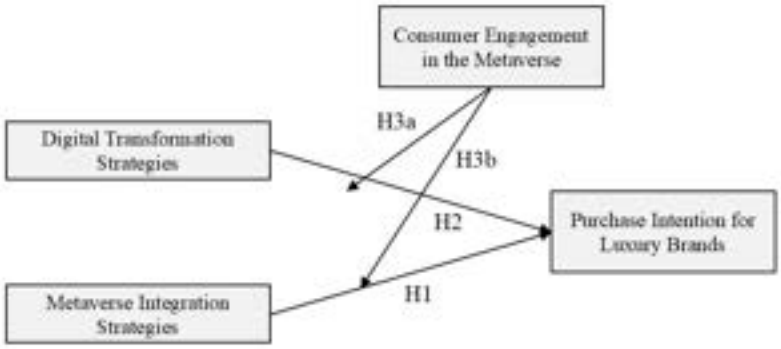


Figure 4. Conceptual Model

3. METHODOLOGY

A mixed-methods research approach was applied combining a qualitative methodology (exploratory research for three selected brands: Gucci, Louis Vuitton, Burberry), and a quantitative methodology through the application of an online questionnaire. This approach aimed to further deepen the acquired knowledge and obtain more consistent conclusions.

3.1. Qualitative Methodology

The choice for a qualitative methodology, specifically an exploratory study of three luxury brands, was motivated by the need to address Objective 1 (*Analyze the Impact of Implementation Strategies in the Metaverse for Luxury Brands*). The focus was placed on the brands Gucci, Louis

Vuitton, and Burberry due to their recognition in the luxury market, as evidenced in Table 1, and the availability of relevant data for this study.

Table 1. Number of Followers on Instagram for Luxury Brands

Brand	Instagram followers
Gucci	52,4M
Louis Vuitton	55,5M
Burberry	20,1M
Balenciaga	14,5M
Hermès	14M

According to Martelli et al. (2020), exploratory research represents a qualitative methodological approach that focuses on obtaining data to provide an initial understanding of the topic through techniques such as literature review, case study, and interviews. Through this methodology, it was possible to verify the implemented strategies in the Metaverse by each of the studied brands and the impact of these implementations.

3.1.1. Gucci

Since its founding in 1921 by Guccio Gucci in Florence, Gucci has been recognized as a symbol of Italian craftsmanship excellence and visionary creativity in the luxury fashion world. Initially focused on travel items, it expanded over the decades, introducing innovations such as the brand's distinctive Diamond pattern and the legendary bamboo bag (Gucci, n.d.). According to the brand's official website, over the years, Gucci has established itself as a global leader, expanding its international presence and launching iconic products such as the Horsebit loafer and the Jackie bag. Under the leadership of renowned designers like Tom Ford, Frida Giannini, and Alessandro Michele, the brand has continued to evolve, staying at the forefront of fashion and design. Today, Gucci is recognized for its values of quality and innovation, holding a privileged position in the luxury market.

Gucci in the Metaverse

Gucci's presence in the Metaverse represents a significant entry into the digital world, aligned with emerging trends and contemporary market demand (Vogue Business, 2023).

The launch of Gucci Cosmos Land, a virtual experience set in a digital London within the Metaverse platform, The Sandbox, marks this entry. This blockchain-based platform allows users to create, own, and monetize their own voxel worlds and games. Gucci Cosmos Land is a digital interpretation of the physical Gucci Cosmos, currently on display in London, showcasing the

brand's heritage and evolution through immersive installations and displays (Vogue Business, 2023).

The experience offers users the opportunity to explore different themed worlds that reflect Gucci's history, values, and vision, while completing missions and collecting rewards. Users can also dress their avatars in digital Gucci clothing, including exclusive designs from the debut collection of Sabato De Sarno, the brand's current creative director (Medium, 2023). This initiative exemplifies Gucci's marketing strategy, which leverages the power and popularity of the Metaverse, attracting younger, tech-savvy consumers seeking new forms of entertainment, socialization, and online self-expression. By creating a unique and immersive brand experience that combines the physical and digital, reality and imagination, Gucci reinforces its identity and relevance in the fashion industry while generating buzz and awareness both online and offline. The capitalization of Gucci's digital assets, both directly and indirectly, through the sale of digital Gucci clothing in exchange for SAND, the virtual currency of The Sandbox, contributes to the brand's growth and increases demand for its physical products. Preliminary results indicate that Gucci Cosmos Land has been a success, attracting millions of visitors and generating substantial revenue since its launch (Forbes, 2022). In conclusion, Gucci's entry into the Metaverse not only demonstrates its capacity for innovation and adaptation to the ever-changing preferences and behaviors of consumers but also positions the brand as a pioneer and leader in this emerging space. Gucci Cosmos Land is a glimpse into the future of fashion, where the Metaverse will play a crucial role in shaping the industry and culture (Medium, 2023).

Analysis of Gucci's 2023 Annual Report (Kering, 2023)

Sales and Revenue: According to the official 2023 annual report from Kering, the parent company of Gucci, Gucci's total revenue for the year 2023 decreased to €9.9 billion, representing a reported decline of 6% compared to the previous year and a comparable decline of 2% (Table 3). This reduction can be attributed to various factors, including changes in market conditions and the strategy to strengthen the exclusive distribution of the Group's Houses. Despite the drop in total revenue, the increase in direct retail sales and the growth in wholesale sales in the fourth quarter, as indicated in the report, may suggest a solid foundation for future performance.

Profit Margins: Gucci's recurring operating profit in 2023 was €3.3 billion, resulting in a recurring operating margin of 33.1%, representing a 13% decrease compared to 2022 (Table 2 and 3). This

indicates a reduction in the company's profitability, which can be justified by the decline in sales and revenue or significant investments in strategies, such as the Metaverse.

Table 2. Recurring Operating Income for Gucci (in millions €) 2022/23 (Kering, 2023)

Recurring operating income *(in € millions)*	2023	2022	Change
Gucci	3,264	3,732	-13%
Yves Saint Laurent	969	1,019	-5%
Bottega Veneta	312	366	-15%
Other Houses	212	558	-62%
Kering Eyewear and Corporate	(7)	(88)	+92%
Eliminations	*(4)*	*2*	-
KERING	**4,746**	**5,589**	**-15%**

Table 3. Operating Income for Gucci (in millions €) 2022/23 (Kering 2023)

Operating performance

Revenue *(in € millions)*	2023	2022	Reported change	Comparable change (1)
Gucci	9,873	10,487	-6%	-2%
Yves Saint Laurent	3,179	3,300	-4%	-1%
Bottega Veneta	1,645	1,740	-5%	-2%
Other Houses	3,514	3,874	-9%	-8%
Kering Eyewear and Corporate	1,568	1,139	+38%	+11%
Eliminations	*(213)*	*(189)*	-	-
KERING	**19,568**	**20,351**	**-4%**	**-2%**

(1) Change on a comparable scope and exchange rate basis

Development and Maintenance Costs: Although the report does not provide specific details on the costs associated with the development and maintenance of Metaverse initiatives, it is reasonable to assume that significant investments were made in this area, given the emphasis on revitalizing Gucci and launching new ventures.

Consumer Engagement: Despite the lack of direct data on consumer engagement in the Metaverse, the reopening of the historic store on Monte Napoleone in Milan showed an increase in wholesale sales by 3% in the fourth quarter and sequential improvements in direct sales in North America and Asia-Pacific, as noted in Kering's annual report. These improvements suggest continued interest in Gucci's products. To better understand consumer engagement with the brand, the relative engagement rate of Gucci on Instagram was calculated between April 1 and April 27, 2024, based solely on the likes of all posts published by the brand during this period. To obtain the average relative engagement, the total likes obtained on the 31 posts during this period were divided by the total number of posts, resulting in an average engagement rate of 2.7%.

Customer Acquisition and Retention: The drop in retail sales in 2023 by -2% indicates possible challenges in acquiring and retaining customers.

Brand Perception and Reputation: Despite the challenges faced in 2023, Gucci remains an iconic and highly recognized brand. The brand's revitalization strategy and efforts to enhance the exclusivity of the Group's Houses may contribute to further strengthening the brand's perception and reputation in the long term.

Comparison with Previous Periods and Competitors: Gucci faced challenges in 2023, reflected in the decline in sales and profit margins. However, in a challenging market context, Gucci maintained a solid position and implemented strategies to drive future growth. Comparatively, Gucci's direct competitors may have faced similar challenges.

It is possible to conclude that the brand is undergoing significant transformation by expanding its presence into the Metaverse while facing challenges in the traditional market due to declining sales and pressure on profit margins. Gucci's entry into the Metaverse with the launch of Gucci Cosmos Land demonstrates its capacity for innovation and adaptation to emerging trends, attracting younger, tech-savvy consumers. This strategic move may help the brand maintain its leading position in the luxury fashion industry, ensuring its future relevance. Despite the financial challenges faced in 2023, as evidenced by the decline in sales and profit margins, Gucci remains an iconic and highly recognized brand. Its brand revitalization strategy and investments in the Metaverse reflect a commitment to long-term innovation and growth.

In summary, Gucci's entry into the Metaverse not only reinforces its identity and relevance in the fashion industry but also suggests a promising potential for the future, where the intersection between the physical and digital worlds will play an increasingly crucial role.

3.1.2. Louis Vuitton

Louis Vuitton, a renowned brand in the luxury world, traces its roots back to luggage making, founded by Louis Vuitton, who began his journey as an apprentice at 16 in Paris in 1837. The brand quickly stood out for its craftsmanship excellence in creating custom-made trunks and travel bags designed to protect travelers' valuable belongings (Louis Vuitton, n.d.).

According to the brand's official website, over time, Louis Vuitton expanded its operations, establishing its own workshop in Asnières in 1859, a location that remains the heart of the brand's production to this day. Under the leadership of Georges Vuitton, the brand revolutionized suitcase locks in 1886 with an innovative locking system, transforming their suitcases into true safes.

Always in pursuit of excellence and innovation, Louis Vuitton invited designers to create exclusive pieces to commemorate the 100th anniversary of the Monogram canvas in 1996. This collaboration highlighted the brand's innovative and collaborative spirit, reaching fashion admirers worldwide (Louis Vuitton, n.d.).

Louis Vuitton in the Metaverse

Louis Vuitton is actively exploring the potential of the Metaverse and NFTs (non-fungible tokens). Recently, it announced the launch of a new collection of physical-digital "Treasure Trunks", offering owners exclusive access to future products and experiences, as well as belonging to a select community of other holders. This project is part of the "Via" initiative, which aims to create an exclusive pathway to products and experiences inaccessible to others. Louis Vuitton's approach to NFTs is more cautious, with less frequent releases than some competing brands like Gucci (McDowell, 2023).

According to Vogue (2023), the brand recognizes the importance of creating immersive and engaging experiences for its customers in the Metaverse, exploring innovative ways to use blockchain technology to ensure the authenticity and traceability of its products, as demonstrated in the LV Diamonds collection, which uses the Aura blockchain. Louis Vuitton is building its presence in the Metaverse carefully and strategically, aiming to offer lasting value to the holders of its digital assets.

The same article (Vogue, 2023) mentions that Louis Vuitton's approach to the Metaverse highlights its commitment to maintaining the exclusivity and prestige associated with the brand. Simultaneously, the company is open to adopting new technologies and digital platforms to meet the constantly evolving expectations of its customers. The brand is proactively positioning itself

to lead the next phase of digital luxury evolution, creating unique opportunities for interaction and engagement in the Metaverse.

Furthermore, Louis Vuitton is adopting a cautious but innovative approach to its Metaverse venture. While other brands may have engaged in more prolific and varied projects in Web3, Louis Vuitton's strategy aligns more with a "Web2.5" model, prioritizing exclusivity, interactivity, and after-sales support. For example, the brand is implementing a system where "Treasure Trunk" owners can access exclusive products and special events within the Metaverse, ensuring a truly unique and personalized shopping experience. This approach reflects Louis Vuitton's philosophy of maintaining its exclusivity and prestige in the luxury market while leveraging the opportunities offered by the Metaverse to expand its digital presence and captivate a new generation of consumers. With Pharrell Williams, an NFT enthusiast, recently appointed as the creative director of men's fashion, Louis Vuitton is positioned to continue its Metaverse journey, combining tradition and innovation to create unparalleled luxury experiences (Vogue, 2023). This carefully planned strategy aims to ensure that Louis Vuitton remains at the forefront of the digital revolution while preserving its heritage of craftsmanship excellence and exclusivity. The future of luxury is unfolding in the Metaverse, and Louis Vuitton is determined to lead the way, offering customers an extraordinary and unforgettable digital experience.

Analysis of Louis Vuitton's 2023 Annual Report (LVMH, 2024)

Sales and Revenue: According to the annual report from LVMH, the parent group of Louis Vuitton, the brand had an exceptional performance in 2023, with revenue in the Fashion and Leather Goods group reaching €42.2 billion, representing an organic growth of 14% compared to 2022 (Table 4 and 5). This significant increase demonstrates the strong demand for the brand's products.

Table 4. LVMH Revenue (in millions €) 2023

Revenue for 2023 (in millions of euros)

Full-Year 2023	Wines & Spirits	Fashion & Leather Goods	Perfumes & Cosmetics	Watches & Jewelry	Selective Retailing	Other activities & eliminations	Total
First quarter	1 694	10 728	2 115	2 589	3 961	(52)	21 035
Second quarter	1 486	10 434	1 913	2 839	4 394	140	21 206
First half	**3 181**	**21 162**	**4 028**	**5 427**	**8 355**	**87**	**42 240**
Third quarter	1 509	9 750	1 993	2 524	4 076	113	19 964
First nine months	**4 689**	**30 912**	**6 021**	**7 951**	**12 431**	**201**	**62 205**
Fourth quarter	1 912	11 257	2 250	2 951	5 454	124	23 948
Total 2023	**6 602**	**42 169**	**8 271**	**10 902**	**17 885**	**324**	**86 153**

Table 5. LVMH Revenue 2023 (organic change vs. same period in 2022)

Revenue for 2023 (organic change versus same period in 2022)

Full-Year 2023	Wines & Spirits	Fashion & Leather Goods	Perfumes & Cosmetics	Watches & Jewelry	Selective Retailing	Other activities & eliminations	Total
First quarter	+3%	+18%	+10%	+11%	+28%	–	+17%
Second quarter	-8%	+21%	+16%	+14%	+25%	–	+17%
First half	**-3%**	**+20%**	**+13%**	**+13%**	**+26%**	**–**	**+17%**
Third quarter	-14%	+9%	+9%	+3%	+26%	–	+9%
First nine months	**-7%**	**+16%**	**+12%**	**+9%**	**+26%**	**–**	**+14%**
Fourth quarter	+4%	+9%	+10%	+3%	+21%	–	+10%
Total 2023	**-4%**	**+14%**	**+11%**	**+7%**	**+25%**	**–**	**+13%**

Profit Margins: Despite the increase in revenue, Louis Vuitton's recurring operating profit grew at a lower rate, with an increase of 7%, as noted in the LVMH annual report. However, this still indicates a healthy profit margin for the brand, suggesting efficiency in cost and operational management.

Development and Maintenance Costs: Although the report does not provide specific details on the development and maintenance costs of Louis Vuitton, it is reasonable to assume that the brand has invested in innovation, design, and expansion of its operations to sustain significant revenue growth.

Consumer Engagement: According to the LVMH group's annual report, Louis Vuitton's exceptional performance in 2023 reflects strong consumer engagement with the brand.

To better understand consumer engagement with the brand, the relative engagement rate of Louis Vuitton on Instagram was calculated between April 1 and April 27, 2024. On average, this rate was 0.5%, with Louis Vuitton publishing a total of 64 posts during this period.

Customer Acquisition and Retention: The annual report does not provide direct information on this topic. Based on the brand's annual revenue growth (Table 5), it is reasonable to assume that Louis Vuitton continued to acquire and retain customers in 2023, gaining market share.

Brand Perception and Reputation: Louis Vuitton is widely recognized as one of the most prestigious luxury brands globally, known for its exceptional quality, innovative design, and historical heritage. The brand's positive performance in 2023 further strengthens its reputation as a leader in the fashion and luxury goods sector.

Comparison with Previous Periods and Competitors: According to the official LVMH group report, Louis Vuitton recorded impressive organic growth in 2023, surpassing its performance in the previous year. Compared to its competitors, the brand continues to stand out as a leader in the luxury fashion market, maintaining its position as one of the most desired and recognized brands globally.

It can be concluded that both the history of Louis Vuitton and its venture into the Metaverse, along with the analysis of the 2023 annual report, reflect the brand's continuous pursuit of balance between tradition and innovation. Over the years, Louis Vuitton has established itself as one of the world's most iconic luxury brands, maintaining its exclusivity and prestige while embracing new technologies and trends, such as the Metaverse and NFTs (Vogue, 2023). Its carefully planned strategy aims to offer an unparalleled luxury experience, both in the physical and digital worlds.

The brand is positioned to lead the digital revolution in the luxury sector, maintaining its reputation for craftsmanship excellence and exclusivity.

3.1.3. Burberry

Burberry is a world-renowned brand with a rich British heritage, established in 1856 by Thomas Burberry, whose values remain fundamental to the company today. Known for its passion for nature and exploration, Burberry combines tradition and innovation in its creations (Burberry, n.d.).

According to the brand's official website, a significant moment in Burberry's history is the creation of the trench coat, a global fashion icon that emerged from the need for protection for soldiers during World War I. This coat, designed to provide greater freedom of movement, reflects Burberry's commitment to functional and elegant design. The Burberry Check pattern, introduced in the 1920s as a lining for the brand's coats, has become a globally recognized symbol representing Burberry's unique identity. Additionally, Burberry is known for its innovation in fabric development, having created gabardine, the world's first breathable and waterproof fabric, in 1879. This revolutionary fabric remains the foundation of Burberry's clothing to this day (Burberry, n.d.).

Burberry's position in the luxury market is reinforced by its commitment to craftsmanship quality and timeless design. The iconic Equestrian Knight Design, winner of a public contest in 1901, symbolizes the brand's values of protection, innovation, and progress. In the luxury market, Burberry is recognized not only for its history and tradition but also for its ability to continuously adapt and evolve, remaining at the forefront of fashion and style. By combining British elegance with a contemporary approach, Burberry remains a prestigious and globally relevant brand.

Burberry in the Metaverse

According to a Vogue article (2022), Burberry adopted bold strategies by entering the Metaverse early and has since consolidated its position as an innovator in customer service and a leader in the luxury fashion sector through its NFT launches and immersive retail experiences.

NFT Collections: Burberry launched its first in-game NFT collection within Mythical Games' Blankos Block Party. Set in a vibrant and dynamic environment, this innovative game allows players to compete in fun and interactive minigames with friends, collect, combine, and truly own exclusive digital toys called Blankos (Metaverse, n.d.).

In August 2021, Burberry's first Blanko was a shark character named Sharky B, accompanied by the release of some limited-edition accessories. The prints aimed to celebrate Burberry's TB

Summer Monogram collection, inspired by the spirit of summer and adventure. To maintain exclusivity, only 750 of these were released, with an initial sale price of $299.99 per Blanko or 30,000 Blanko Bucks in-game currency. The accessories, including jetpacks, armbands, and pool shoes, were more affordable, priced between $25 and $100. The collection sold out in less than 30 seconds, the fastest of all the releases by the Blankos team so far, including an NFT launch with music artist Deadmau5.

In June 2022, building on the success of the first NFT collection, Burberry launched a second collection in Blankos Block Party. Adorning Burberry's latest TB Summer Monogram and inspired by the brand's Animal Kingdom theme, the second Burberry Blanko NFT was a unicorn character named Minny B. Similar to the previous release, Minny B was accompanied by accessories such as boomboxes, TB sliders, chains, and a 'Shellphone,' which players could add to their virtual portfolio. Minny B had an initial price of $349.99 or 35,000 Blanko Bucks, while the accessories could be purchased for $50-$100. Rachel Waller, VP of channel innovation at Burberry, said in a press release, "The Metaverse offers unlimited opportunities to express our imagination and connect with our customers in richer ways, and we are excited to continue experimenting in this space" (Metaverse, n.d.).

The same article (Metaverse, n.d.) explains that to facilitate social interactions between multiple characters, Burberry also designed its own miniverse "The Oasis" on the gaming platform. A futuristic resort-style cabin inspired by recent TB Monogram summer showcases in global hotspots like Saint-Tropez, Korea, Singapore, and Ibiza, featuring sailing boats and Burberry-branded sun loungers.

Burberry's Social Retail Store: Since 2020, Burberry has been creating synergies between the virtual and physical worlds. In Shenzhen, China, Burberry launched a "social retail" store. This store combines a boutique, a café, and a virtual amusement park, the latter designed by Tencent - a video game company that also owns WeChat. "This marks a shift in how we engage with our customers," said CEO Marco Gobbetti in a statement. The store perfectly blends social media interactions in a tangible retail environment. Comprising 10 rooms, customers can explore and unlock special interactive experiences accessible via WeChat. Through the mini-program, users can dive into exclusive Burberry content and personalized in-store experiences. Visitors also receive a digital deer avatar that matures as they engage more with the store's offerings. Shoppers

can scan QR codes on Burberry products for deeper insights and take guided tours of the store (Metaverse, n.d.).

Virtual Replica of the Ginza Store: Burberry has tried several web3 experiences for customers during COVID, especially in the Asian market. In March 2021, the luxury brand announced a partnership with Elle Digital Japan for the launch of an "interactive virtual replica of its flagship store in Ginza" in Tokyo. The company claims this experience challenges the "boundaries of creativity, exploring the relationship between physical and digital experiences to create exciting new concepts for its community and enhance personalized luxury commerce." In the online store, customers could walk through the store and purchase items from the brand's SS21 collection by selecting digital icons. They also collaborated with actress Elaiza Ikeda to create five style tip videos accessible at touchpoints throughout the virtual store.

Partnership with Minecraft: According to the brand's official website, Burberry partnered with Minecraft as the British luxury house expands its presence in the Metaverse and delves deeper into the gaming world. Burberry's in-game adventure in Minecraft, Burberry: Freedom to Go Beyond, encompasses a series of immersive experiences, as well as a physical capsule collection available online and in seven global stores: New York, Shenzhen, London, Tokyo, Seoul, Taiwan, and Bangkok. The game, consisting of four rounds, takes place in a fantasy representation of London. By exploring the space, players will encounter classic brand elements adapted for the gaming experience, such as an Equestrian Knight character, a Thomas Burberry Monogram maze, and underwater reefs, plaid balloons, and animal kingdom characters from Burberry.

Analysis of Burberry's 2022/23 Fiscal Annual Report

Sales and Revenue: According to Burberry's official annual report, total revenue increased by 5% at constant exchange rates (CER) and 10% on a reported basis, totaling £3,094 million (Table 6 and 7). Comparable store sales growth increased by 7% during the period, driven mainly by positive performance in key product categories such as leather goods and outerwear.

Table 6. Burberry Income Statement 2022/23

Summary income statement

Period ended £ million	52 weeks ended 1 April 2023	53 weeks ended 2 April 2022	YoY % change 52 vs 53-week Reported FX	YoY % change 52 vs 52-week CER
Revenue	3,094	2,826	10	5
Cost of sales*	(912)	(831)	10	8
Gross profit*	2,182	1,995	9	4
Gross margin*	70.5%	70.6%	(10bps)	(80bps)
Net operating expenses*	(1,548)	(1,472)	5	2
Net opex as a % of sales*	50.0%	52.1%	(210bps)	(140bps)
Adjusted operating profit*	634	523	21	8
Adjusted operating profit margin*	20.5%	18.5%	200bps	60bps
Adjusting operating items	23	20		
Operating profit	657	543		
Operating profit margin	21.2%	19.2%		
Net finance charge**	(23)	(32)	(30)	
Profit before taxation	634	511	24	
Taxation	(142)	(114)		
Non-controlling interest	(2)	(1)		
Attributable profit	490	396	24	
Adjusted profit before taxation*	613	492	25	11
Adjusted diluted EPS (pence)*	122.5	94.0	30	16
Diluted EPS (pence)	126.3	97.7	29	
Weighted average number of diluted ordinary shares (millions)	388.0	404.8	(4)	

* Excludes adjusting items. All items below adjusting operating items are on a reported basis unless otherwise stated.

** Includes adjusting finance charge of £2 million (FY 2021/22: £1 million).

Table 7. Burberry Revenue Analysis by Channel 2022/23

Revenue analysis

Revenue by channel

Period ended £ million	52 weeks ended 1 April 2023	53 weeks ended 2 April 2022	YoY % change 52 vs 53-week Reported FX	YoY % change 52 vs 52-week CER
Retail	2,501	2,273	10	6
Comparable store sales growth	7%	18%		
Wholesale	543	512	6	1
Licensing	50	41	23	22
Revenue	3,094	2,826	10	5

Profit Margins: The gross margin remained robust at 70.5%, remaining virtually stable compared to the previous period, as noted in the report. The adjusted operating margin increased to 20.5% at constant exchange rates (CER), reflecting efficient cost management and significant revenue growth.

Development and Maintenance Costs: As noted in the report, development costs included investments in innovation, digital operations, and new talent to strengthen the digital presence and product offering. Maintenance costs were optimized through operational efficiency programs and strict expense management.

Consumer Engagement: Burberry demonstrated strong consumer engagement through brand campaigns, activations, and strategic partnerships that highlighted its heritage and iconic products. To better understand consumer engagement with the brand, the relative engagement rate of Burberry on Instagram was calculated between April 1 and April 27, 2024. On average, this rate was 0.2%, with Burberry publishing a total of 53 posts during this period.

Customer Acquisition and Retention: As explained in the brand's annual report, the strategy of expanding digital channels aimed to attract and retain customers. Loyalty programs and after-sales services, such as repairs and product upgrades, were enhanced to strengthen customer relationships.

Brand Perception and Reputation: The appointment of a new Chief Creative Officer and the launch of a new creative expression of the brand contributed to updating and revitalizing its identity.

Comparison with Previous Periods and Competitors: Burberry continued to demonstrate solid growth in revenue, margins, and profits, indicating effective execution of its business strategy. The company faced challenges, such as volatility in Asian markets due to COVID-19 restrictions, but maintained strong performance in other regions, as noted in the brand's report. Compared to competitors in the luxury sector, Burberry stood out for its innovation capability, consumer engagement, and social and environmental responsibility.

In summary, Burberry continues to be a dominant force in the world of luxury fashion, combining its rich British heritage with an innovative and adaptable approach to contemporary challenges. By expanding its presence in the Metaverse through NFT launches and immersive retail experiences, Burberry has demonstrated its ability to stay at the forefront of the industry while maintaining its reputation for craftsmanship excellence and timeless design.

The 2022/23 fiscal annual report reflects not only solid growth in revenue and profit margins but also a continuous commitment to customer satisfaction, innovation, and social and environmental responsibility. Through effective customer acquisition and retention strategies, Burberry has strengthened its position as a leading brand in the global luxury market, standing out for its ability to adapt and differentiate itself from competitors.

Looking ahead, Burberry is well-positioned to continue its success trajectory by staying true to its core values and exploring new opportunities for growth and expansion. With a unique combination

of tradition and innovation, Burberry continues to inspire and delight consumers worldwide, reaffirming its place as one of the most iconic and respected brands in the fashion industry.

3.1.4. Results

After analyzing the three brands' entry into the Metaverse, several conclusions can be drawn concerning Objective 1 (*Analyzing the Impact of Implementation Strategies in the Metaverse for Luxury Brands*). There is a strategic movement toward digital innovation and expansion into new virtual spaces among the three studied brands. Although the annual reports and other sources analyzed do not provide specific data on the direct impact of Metaverse strategies, some results can be inferred based on the available indicators. In the case of Louis Vuitton, the brand has adopted a cautious yet innovative approach to its venture into the Metaverse. Although there are no concrete data on the financial impact of these initiatives, the strong financial performance of LVMH and the brand's commitment to exclusivity and prestige suggest that Metaverse strategies are aligned with the company's long-term objectives.

Similarly, Burberry has shown a strong commitment to the Metaverse, launching NFT collections, immersive retail experiences, and collaborations in digital games. While annual reports highlight revenue growth and improved profit margins, there is no direct analysis of the impact of Metaverse strategies. However, the success of sales and consumer engagement can be positive indicators of the impact of these initiatives.

As for Gucci, although there are no specific data on its Metaverse strategies, the brand has actively explored the potential of new digital spaces. With NFT launches, virtual experiences, and partnerships with gaming platforms, Gucci aims to strengthen its relationship with consumers and expand its presence in an ever-evolving digital environment.

To sum up, while specific data on the impact of Metaverse implementation strategies for the luxury brands studied are not available, it is evident that they are adopting a proactive approach to exploring and capitalizing on the opportunities offered by this new digital universe. The commitment to innovation and adaptation to emerging trends suggests that the three brands are well-positioned to lead the digital revolution in the luxury sector and provide unique and memorable experiences to their customers.

3.2. Quantitative Methodology

The choice of a quantitative methodology through an online questionnaire, was motivated by the need to address Objective 2 (*Evaluate Consumer Engagement in Virtual Environments of Luxury*

Brands). This approach was chosen because it provides quantitative data that can be subjected to more objective analysis regarding consumer engagement in the Metaverse with luxury brands.

3.2.1. Sample and Procedures

Two studies were conducted using the online platform Google Forms. Responses were collected on April 20th, 2024, and May 5th, 2024 (Study 1). However, due to a specific condition imposed in the questionnaire section that respondents must answer, related to purchases in the Metaverse, there was a lack of responses. Therefore, a Study 2 was carried out, similar to Study 1, but without the purchase condition. Both questionnaires were disseminated through Prolific, an online platform that gathers large-scale human data. Both questionnaires were written in English to target an international sample.

The sample includes individuals of various age groups and genders to provide a broad view of consumer engagement in the Metaverse with luxury brands. Some filters were applied on the Prolific platform to define the desired segmentation. Thus, it was possible to obtain a lifestyle-centered segmentation, aiming to get responses from individuals who consume luxury products and services and use the Metaverse.

In Study 1, a total of 305 responses were obtained, in which 248 were considered valid, as 57 participants did not complete the questionnaire. In Study 2, 240 total responses were obtained, in which 198 were considered valid, with 42 participants not completing the questionnaire (Table 8).

Table 8. Demographic Analysis, Study 1 and Study 2

Variables	Study 1 (n = 248)	Study 2 (n =198)
Sex	-	-
Female	79%	47%
Male	54.8%	53%
Other	0.7%	0
Age	-	-
18-27 years old	35.1%	36.5%
28-43 years old	34.1%	35.3%
44-59 years old	10.8%	9.1%
60 years old or older	1.3%	1.2%
Profession		
Arts & Design	6.6%	5.8%
Education	7.2%	5.8%

Finance and Accounting	6.6%	10%
Health and Medicine	5.9%	9.1%
Information Technology (IT)	24.3%	22%
Marketing and Advertising	8.9%	2.9%
Other	22%	26.6%
Salary	-	-
Less than $20,000 / €18,500	22.6%	22.8%
$20,000 - $40,000 / €18,500 - €37,000	22.3%	23.7%
$40,000 - $60,000 / €37,000 - €55,600	13.8%	12.9%
$60,000 - $80,000 / €55,600 - €74,000	9.8%	10%
$80,000 - $100,000 / €74,000 - €92,700	8.2%	6.2%
$100,000 - $150,000 / €92,700 - €139,000	2.6%	4.6%
More than $150,000 /€139,000	2%	2.1%

The questionnaire included an introduction to the theme and its purpose, followed by a request for informed consent. It was divided into 7 sections, with Section 1 containing control questions aimed at qualifying respondents. Section 2 assessed knowledge of the Metaverse concept, also with the objective of qualifying respondents. Next, questions assessing the variables were presented. Section 3 evaluated Digital Transformation Strategies, where specific filters were applied on the Prolific platform to define the desired segmentation. These filters included participants who had interacted with virtual reality, augmented reality, or mixed reality, who had luxury consumption and purchasing habits, and who owned at least two fashion items valued over £200. The questions in Section 3 were adapted from Ko et al., (2005) and Mathwick et al., (2004). Section 4 evaluated Metaverse Integration Strategies, with questions based on sources adapted from Ko et al., (2005). Section 5 evaluated Consumer Engagement in the Metaverse, with questions adapted from Voss et al., (2003), Voss and Kevin (2005), and Algesheimer et al., (2005). Section 6 evaluated Purchase Intention for Luxury Brands, with questions adapted from Voss et al., (2003) and Voss and Kevin (2005). Section 7 was used for demographic data, where respondents were asked about Gender, Age, Professional Area, Annual Salary, Nationality, and Current Residence.

In Study 1, a pre-test was conducted with four participants. Afterwards, some adjustments were made regarding the age scale. To control for valid responses, four control questions were included:

identifying luxury brands from provided lists (1), frequency of luxury brand purchases in the last 12 months (2), an approximate total value spent on luxury products in the last 12 months (3), and finally, defining the Metaverse (4).

3.2.2. Variables and Measurement Scales

For all studied variables, a 5-point Likert scale was applied (from 1 = strongly disagree to 5 = strongly agree), and all variables were adapted to the Metaverse context. The variable Digital Transformation Strategies (1) was evaluated by 7 items, Metaverse Integration Strategies (2) was evaluated by 4 items, Consumer Engagement in the Metaverse (3) was evaluated by 6 items, and Purchase Intention for Luxury Brands (4) was evaluated by 5 items.

3.2.3. Results

Study 1

After obtaining the questionnaire responses, a descriptive analysis was conducted using SPSS Statistics software (Version 29) (Table 9). It is noteworthy that the variable Digital Transformation Strategies (I_ESTR_D_all) has a significantly lower number of responses compared to the other variables. This is justified by the presence of a control question in the questionnaire, where only individuals who had purchased in the Metaverse had this section available. For this variable, the values range from 1 to 4.5, with an average of 2.7 and a standard deviation of 0.87. These results indicate that while Digital Transformation Strategies are recognized, they are not considered highly effective.

For the variable Metaverse Integration Strategies (I_ESTR_m_all), responses were obtained across the entire response scale, indicating that integration strategies vary widely in their implementation. An average of 2.76 and a standard deviation of 0.91 suggest that integration efforts in the Metaverse are not perceived as universally strong or influential.

The variable Consumer Engagement in the Metaverse (D_ENG_M_all) also had responses across the entire response scale and has an average similar to the other variables (2.6), indicating a moderate level of engagement in the Metaverse. It has a relatively high standard deviation of 1.04, reflecting significant variation in the perception of engagement among consumers.

Considering Purchase Intention for Luxury Brands (D_INT_LUX_all), it has the lowest average (2.4) compared to the other variables, indicating a tendency for lower purchase intention influenced by Metaverse strategies. The standard deviation of 1 suggests some variability in

responses, which may indicate that different consumers perceive the impact of strategies differently (Table 9).

Table 9. Descriptive Analysis, Study 1

Descriptive Statistics

	N	*Min.*	*Max.*	*M*	*SD*
I_ESTR_D_all	37	1.00	4.50	2.72	.870
I_ESTR_m_all	248	1.00	5.00	2.76	.914
D_ENG_M_all	248	1.00	5.00	2.75	1.04
D_INT_LUX_all	248	1.00	5.00	2.43	1.01
N (valid)	37				

By interconnecting the results of this analysis with the research hypotheses, it is understood that the moderate averages of the variables Digital Transformation Strategies and Metaverse Integration Strategies, along with the Consumer Engagement in the Metaverse variable, indicate that the strategies used by luxury brands may not be reaching their potential in influencing consumers' purchase intention. This suggests that hypotheses H1 and H2 are not confirmed, as they indicate a positive impact of the strategies on purchase intention, which was not confirmed by the results. To infer the validity or invalidity of hypotheses H1 and H2, Pearson's linear correlation coefficient was determined (Table 10).

Table 10. Pearson Linear Correlation, Study 1

Correlations

		I_ESTR_D_all	I_ESTR_m_all	D_ENG_M_all	D_INT_LUX_all
I_ESTR_D_all	Pearson Correlation	1	.542**	.431**	.450**
	Sig.		<.001	.008	.005
	N	37	37	37	37
I_ESTR_m_all	Pearson Correlation	.542**	1	.554**	.522**
	Sig.	<.001		<.001	<.001
	N	37	248	248	248
D_ENG_M_all	Pearson Correlation	.431**	.554**	1	.626**
	Sig.	.008	<.001		<.001
	N	37	248	248	248
D_INT_LUX_all	Pearson Correlation	.450**	.522**	.626**	1
	Sig.	.005	<.001	<.001	
	N	37	248	248	248

It was found that all the correlations analyzed, although not strong (correlation coefficients between 0.4 and 0.7), are statistically significant for usual significance levels (p-value<0.01). Moreover, it was found that there are significant correlations of 0.543 between the variables Digital Transformation Strategies (I_ESTR_D_all) and Metaverse Integration Strategies (I_ESTR_m_all), indicating a significant positive correlation. The correlation between the Digital Transformation Strategies (I_ESTR_D_all) and Consumer Engagement in the Metaverse (D_ENG_M_all) is 0.431, also significant. The correlation between Digital Transformation Strategies (I_ESTR_D_all) and Purchase Intention for Luxury Brands (D_INT_LUX_all) is 0.450, indicating a significant positive correlation. The correlation between Metaverse Integration Strategies (I_ESTR_m_all) and Consumer Engagement in the Metaverse (D_ENG_M_all) is 0.554, indicating a strong positive correlation. The correlation between Metaverse Integration Strategies (I_ESTR_m_all) and Purchase Intention for Luxury Brands (D_INT_LUX_all) is 0.522, also significant. The correlation between Consumer Engagement in the Metaverse (D_ENG_M_all) and Purchase Intention for Luxury Brands (D_INT_LUX_all) is 0.626, the highest among the variables, indicating a strong positive correlation.

These significant positive correlations suggest that, although the averages of the variables indicate moderate levels of perception and effectiveness, there is a significant interdependence between Digital Transformation Strategies, Metaverse Integration Strategies, Consumer Engagement, and Purchase Intention for Luxury Brands.

The moderating hypotheses H3a and H3b, which involve engagement as a positive moderator, require a more detailed study due to the variety of engagement among consumers. Due to the reduced number of responses regarding the Digital Transformation Strategies variable, it was necessary to implement a second study to proceed with the investigation. In Study 2, the restriction on responses for this variable was removed, allowing all respondents to answer this variable while keeping the rest of the questionnaire unchanged.

Study 2

For the second study, more in-depth analyses were conducted, including SPSS analysis and SMART PLS analysis. Within the descriptive analysis of Study 2 (Table 11), it is evident that the variable Digital Transformation Strategies (I_ESTR_D_all) shows a range of responses with values between 1.00 and 4.36, and a moderately low average of 2.6281 (standard deviation of

0.74185). This indicates that although digital transformation strategies are present, they may not be perceived as extremely effective or are still in the early stages of implementation.

Table 11. Descriptive Analysis, Study 2

Descriptive Statistics

	N	*Min.*	*Max.*	*M*	*SD*
I_ESTR_D_all	198	1.00	4.36	2.6281	.74185
I_ESTR_M_all	198	1.00	5.00	3.1263	.97355
I_ENG_M_all	198	1.00	4.67	2.7652	.82678
D_INT_LUX_all	198	1.00	5.00	2.6939	1.12969
N (valid)	198				

The variable Metaverse Integration Strategies (I_ESTR_m_all) shows a range of responses between 1.00 and 5.00, with the highest average of all variables, 3.1263 (standard deviation of 0.97355), indicating a more favorable perception of Metaverse integration strategies compared to digital transformation strategies.

The variable Consumer Engagement in the Metaverse (D_ENG_M_all) shows a range of responses between 1.00 and 4.67, with an average of 2.7652 (standard deviation of 0.82678), suggesting a moderate level of engagement, although the standard deviation of 0.8 indicates a variation in the perception of engagement.

The last variable, Purchase Intention for Luxury Brands (D_INT_LUX_all), shows a range of responses between 1.00 and 5.00, with an average of 2.6939 (standard deviation of 1.12969), indicating a moderate purchase intention. This variable has the highest standard deviation, demonstrating a wide variation in purchase intention among respondents.

With the reliability and validity analysis (Table 12), it was found that all constructs show good reliability with Alpha and Reliability values above 0.7, indicating good internal consistency of the items for each construct. Except for the Digital Transformation Strategies variable, all other constructs have AVE above 0.5, suggesting good convergent validity. The lower AVE in the Digital Transformation Strategies construct (0.4) may indicate that some items within it are not strongly related.

Table 12. Reliability and Validity Analysis, Study 2

CONSTRUCT REABILITY AND VALIDITY - OVERVIEW

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CONSUMER ENGAGEMENT IN THE METAVERSE	0.791	0.881	0.851	0.519
METAVERSE INTEGRATION STRATEGIES	0.789	0.811	0.863	0.614
DIGITAL TRANSFORMATION STRATEGIES	0.834	0.916	0.873	0.429
PURCHASE INTENTION FOR LUXURY BRANDS	0.907	0.925	0.930	0.727

In the model fit analysis (Table 13), values below 0.1 for SRMR and low values for d_ULS indicate a good model fit. The SRMR (Standardized Root Mean Square Residual) is an absolute fit measure that evaluates the average discrepancies between observed and predicted correlations. Values below 0.1 suggest that the discrepancies between the observed data and the model are small, reflecting a good fit. Additionally, low values for d_ULS (Unweighted Least Squares Discrepancy) also indicate a good model fit, as they reflect smaller discrepancies between observations and model predictions.

Table 13. Fit Analysis

MODEL FIT

	Saturated model	Estimated model
SRMR	0.092	0.092
D_ULS	2.942	2.940
D_G	0.953	0.953
CHI-SQUARE	1145.478	1144.592
NFI	0.718	0.718

The high Chi-square value and NFI below 0.9, as shown in Table 14, suggest that although the model has a reasonable fit, there is room for improvement in its structure. The high Chi-square value points to a greater discrepancy between the observed covariance matrix and the expected covariance matrix by the model. It is important to note that the chi-square test is sensitive to sample size, and high values can be expected in large samples, even if the model has a good fit. The NFI

(Normed Fit Index) compares the proposed model with a null model (a model without relationships between variables) and ranges from 0 to 1, where values closer to 1 indicate a better fit.

As shown in Table 14, the analysis of path coefficients indicates that the impact of Metaverse Integration Strategies on Purchase Intention has a significant path coefficient (coef = 0.304) and is statistically significant (p-value = 0.000 < 0.05), thus supporting research hypothesis H1, which posits that Metaverse Integration Strategies have a positive impact on Purchase Intention.

Table 14. Path Coefficients Analysis

FINAL RESULTS PATH COEFFICIENTS 1ª OPÇAO

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
CONSUMER ENGAGEMENT IN THE METAVERSE -> PURCHASE INTENTION FOR LUXURY BRANDS	0.290	0.288	0.083	3.516	0.000
METAVERSE INTEGRATION STRATEGIES -> PURCHASE INTENTION FOR LUXURY BRANDS	0.304	0.305	0.076	3.984	0.000
DIGITAL TRANSFORMATION STRATEGIES -> PURCHASE INTENTION FOR LUXURY BRANDS	0.206	0.216	0.072	2.863	0.004
CONSUMER ENGAGEMENT IN THE METAVERSE X DIGITAL TRANSFORMATION STRATEGIES -> PURCHASE INTENTION FOR LUXURY BRANDS	0.065	0.057	0.072	0.904	0.366
CONSUMER ENGAGEMENT IN THE METAVERSE X METAVERSE INTEGRATION STRATEGIES -> PURCHASE INTENTION FOR LUXURY BRANDS	0.003	0.005	0.065	0.051	0.959

Digital Transformation Strategies also detrate a positive effect (coef = 0.206) and are statistically significant (p-value = 0.000 < 0.05) on Purchase Intention for Luxury Brands. This allows us to validate research hypothesis H2.

The impact of Engagement in the Metaverse on Purchase Intention shows a significant path coefficient (coef = 0.290) and is statistically significant (p-value = 0.000 < 0.05), supporting

hypothesis H3b, which suggests that greater engagement in the Metaverse leads to a higher purchase intention.

The moderation coefficient is low and not significant (coef = 0.065, p-value = 0.366 > 0.05) in moderating the impact of Digital Transformation Strategies, suggesting that consumer engagement in the Metaverse does not significantly moderate the impact of digital transformation strategies on purchase intention, thereby questioning hypothesis H3a.

In the Outer Loading Matrix analysis (Table 15), it can be observed that Consumer Engagement in the Metaverse (D_ENG_M) presents high factor loadings on some items, suggesting that these items capture the construct well. The Outer Loading Matrix translates the factor loadings of each indicator in relation to their corresponding latent variables, showing the degree of correlation between the observable indicators and the latent variable to which they are associated. High factor loadings indicate that the item is a good representative of the latent variable, while low loadings may suggest that the item is not a good indicator of the latent variable.

Table 15. Outer Loading Matrix Analysis

OUTER LOADING MATRIX

	D_ENG_M_	D_INT_LUX_	I_ESTR_D_	I_ESTR_M_	D_ENG_M_x I_ESTR_D_	D_ENG_M_x I_ESTR_M_
D_ENG_M_1	0.875					
D_ENG_M_2	0.858					
D_ENG_M_3	0.354					
D_ENG_M_4	0.310					
D_ENG_M_5	0.889					
D_ENG_M_6	0.858					
D_INT_LUX_1		0.876				
D_INT_LUX_2		0.870				
D_INT_LUX_3		0.791				
D_INT_LUX_4		0.859				
D_INT_LUX_5		0.864				
I_ESTR_D_1			0.831			
I_ESTR_D_2			0.826			
I_ESTR_D_3			0.855			
I_ESTR_D_4			0.875			
I_ESTR_D_5			0.677			
I_ESTR_D_6			0.582			
I_ESTR_D_7_A			0.257			
I_ESTR_D_7_B			0.270			
I_ESTR_D_7_C			0.633			
I_ESTR_D_7_D			0.714			
I_ESTR_D_7_E			0.038			
I_ESTR_M_1				0.706		
I_ESTR_M_2				0.862		
I_ESTR_M_3				0.725		
I_ESTR_M_4				0.830		
D_ENG_M_X I_ESTR_D_					1.000	
D_ENG_M_X I_ESTR_M_						1.000

The lower loadings on other items within the same construct suggest that these specific items do not adequately measure the construct or may be irrelevant to the proposed construct. Purchase Intention for Luxury Brands (D_INT_LUX) shows high numbers, indicating robust measurement of the constructs. Digital Transformation Strategies (I_ESTR_D) presents moderate items (I_ESTR_D_1 (0.831), I_ESTR_D_2 (0.826), I_ESTR_D_3 (0.855), and I_ESTR_D_4 (0.875)), indicating adequate measurement of the construct, but also presents items with low loadings (I_ESTR_D_5 (0.677), I_ESTR_D_6 (0.582), I_ESTR_D_7a (0.257), I_ESTR_D_7b (0.270), I_ESTR_D_7c (0.633), I_ESTR_D_7d (0.714), and I_ESTR_D_7e (0.038)), indicating that these items may not be aligned with the construct.

In the Discriminant Validity analysis (Table 16), the discriminant validity of the constructs is revealed, ensuring that each one is unique and captures distinct phenomena from the other constructs in the model. Discriminant validity was tested to ensure that each construct is unique by evaluating if the square roots of the AVEs (Average Variance Extracted) for each construct are greater than the correlations of that same construct with other constructs in the model. Discriminant validity is a fundamental criterion in evaluating structural equation models, used to ensure that the constructs measure different concepts and do not overlap. For this analysis, the Fornell-Larcker criterion is used, comparing the square roots of the AVEs with the correlations between the constructs. The square roots of the AVEs must be greater than the correlations between the constructs to confirm discriminant validity. The square roots of the AVEs for each construct are as follows:

Purchase Intention for Luxury Brands (D_INT_LUX): 0.853

Consumer Engagement in the Metaverse (D_ENG_M): 0.720

Digital Transformation Strategies (I_ESTR_D): 0.655

Metaverse Integration Strategies (I_ESTR_M): 0.784

Table 16. Discriminant Validity Analysis

DISCRIMINANT VALIDITY						
	D_ENG_M_	**D_INT_LUX_**	**I_ESTR_D_**	**I_ESTR_M_**	**D_ENG_M_ x I_ESTR_D_**	**D_ENG_M_ x I_ESTR_M_**
D_ENG_M_						
D_INT_LUX_	0.692					
I_ESTR_D_	0.846	0.610				
I_ESTR_M_	0.780	0.709	0.698			
D_ENG_M_ X I_ESTR_D_	0.073	0.113	0.178	0.035		
D_ENG_M_ X I_ESTR_M_	0.133	0.056	0.052	0.221	0.615	

The correlation between Purchase Intention for Luxury Brands (D_INT_LUX) and Consumer Engagement in the Metaverse (D_ENG_M) (0.692) indicates a moderately high correlation but still suggests that the constructs are distinct, as it presents a lower square root of the AVEs for both constructs.

The correlation between Digital Transformation Strategies (I_ESTR_D) and Consumer Engagement in the Metaverse (D_ENG_M) (0.846) indicates a strong correlation, greater than the square root of the AVE of Digital Transformation Strategies, indicating a potential lack of discriminant validity between these two constructs, as they do not demonstrate being sufficiently distinct.

The correlation between Metaverse Integration Strategies (I_ESTR_M) and Consumer Engagement in the Metaverse (D_ENG_M) (0.780) also indicates a relatively high correlation, greater than the square root of the AVE of Metaverse Integration Strategies, suggesting a potential lack of discriminant validity between the two constructs as they do not appear sufficiently distinct.

The correlation between Metaverse Integration Strategies (I_ESTR_M) and Consumer Engagement in the Metaverse (D_ENG_M) presents a higher correlation than the square root of the AVE of Consumer Engagement in the Metaverse but lower than that of Metaverse Integration Strategies, suggesting that although the correlation is high between the two constructs, discriminant validity can still be considered maintained for Metaverse Integration Strategies.

The correlations of the interactions between Consumer Engagement in the Metaverse (D_ENG_M) with Digital Transformation Strategies (I_ESTR_D) and the correlations of the interactions between Consumer Engagement in the Metaverse (D_ENG_M) with Metaverse Integration Strategies (I_ESTR_M) both present low values, indicating that the interactions between these

constructs present low direct correlation, suggesting that the interaction terms capture different dynamics from the main constructs, pointing out that the interactions add a unique dimension to the analysis.

In the Cross Loading analysis (Table 17), the aim is to compare the loadings of each item not only on the construct to which it belongs but also with the other constructs in the model. The objective is to verify if each item presents the strongest loading on the construct to which it belongs compared to the others, reinforcing the discriminant validity of the model.

For Consumer Engagement, from D_ENG_M_1 to D_ENG_M_6, the majority show high loadings on their own construct and lower loadings when compared to the other constructs, suggesting robust measurement and good discriminant validity. For Purchase Intention for Luxury Brands, from D_INT_LUX_1 to D_INT_LUX_5, the highest values are found in their construct, which demonstrates its discriminant validity, allowing for clear and distinct measurement of purchase intention for luxury brands.

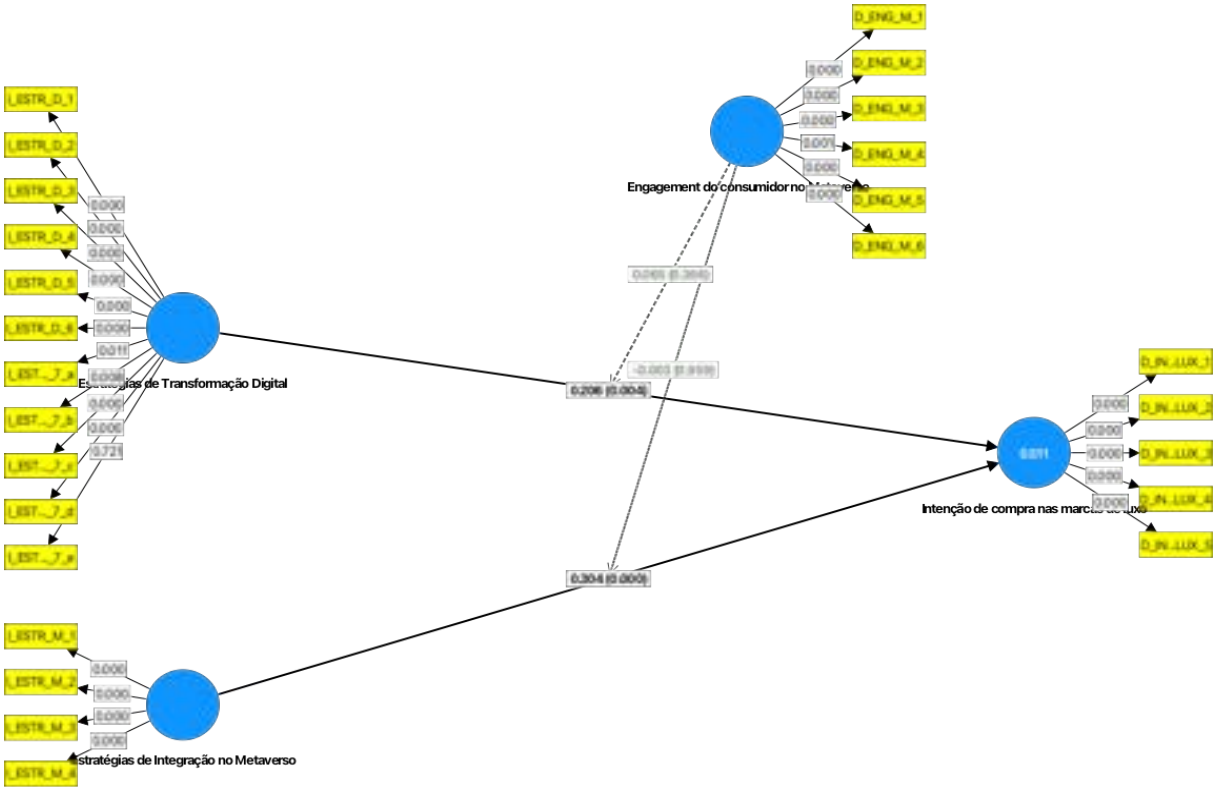
Table 17. Cross Loadings Analysis

COSS LOADINGS						
	D_ENG_M_	D_INT_LUX_	I_ESTR_D_	I_ESTR_M_	D_ENG_M_x I_ESTR_D_	D_ENG_M_x I_ESTR_M_
D_ENG_M_1	0.875	0.600	0.678	0.596	0.029	-0.096
D_ENG_M_2	0.858	0.549	0.662	0.629	-0.063	-0.152
D_ENG_M_3	0.354	0.137	0.189	0.224	-0.019	-0.035
D_ENG_M_4	0.310	0.229	0.279	0.224	-0.086	-0.102
D_ENG_M_5	0.809	0.439	0.583	0.394	0.034	-0.078
D_ENG_M_6	0.858	0.579	0.611	0.539	0.041	-0.054
D_INT_LUX_1	0.512	0.876	0.520	0.497	0.093	-0.021
D_INT_LUX_2	0.504	0.870	0.526	0.474	0.157	-0.018
D_INT_LUX_3	0.388	0.791	0.379	0.465	0.023	-0.088
D_INT_LUX_4	0.528	0.859	0.506	0.519	0.103	-0.068
D_INT_LUX_5	0.721	0.864	0.663	0.642	0.081	-0.032
I_ESTR_D_1	0.643	0.585	0.831	0.589	0.206	0.011
I_ESTR_D_2	0.665	0.495	0.826	0.476	0.191	-0.018
I_ESTR_D_3	0.578	0.586	0.855	0.527	0.190	0.008
I_ESTR_D_4	0.663	0.533	0.875	0.510	0.173	-0.062
I_ESTR_D_5	0.520	0.333	0.677	0.321	0.239	0.075
I_ESTR_D_6	0.401	0.291	0.582	0.247	0.033	0.024
I_ESTR_D_7_A	0.190	0.075	0.257	0.195	-0.015	0.001
I_ESTR_D_7_B	0.194	0.056	0.270	0.149	0.013	0.023
I_ESTR_D_7_C	0.485	0.421	0.633	0.447	0.006	0.007
I_ESTR_D_7_D	0.521	0.442	0.714	0.499	0.069	0.006
I_ESTR_D_7_E	0.021	0.019	0.038	-0.017	-0.024	0.102
I_ESTR_M_1	0.476	0.426	0.500	0.706	-0.031	-0.084
I_ESTR_M_2	0.554	0.491	0.517	0.862	0.013	-0.181
I_ESTR_M_3	0.405	0.404	0.417	0.725	0.044	-0.215
I_ESTR_M_4	0.567	0.589	0.497	0.830	-0.009	-0.135
D_ENG_M_X I_ESTR_D_	-0.000	0.109	0.188	0.004	1.000	0.615
D_ENG_M_X I_ESTR_M_	-0.113	-0.051	0.003	-0.193	0.615	1.000

In Digital Transformation Strategies, from I_ESTR_D_1 to I_ESTR_D_4, there are consistent and high loadings on their own construct, but from I_ESTR_D_7_A to I_ESTR_D_7_E, there are inconsistent and generally low loadings, indicating potential issues in the ability to measure the construct. Lastly, for Metaverse Integration Strategies, from I_ESTR_M_1 to I_ESTR_M_4, strong values are presented on their own construct, also demonstrating consistency in the loadings of the different items, which further reinforces the discriminant validity for the construct.

A bootstrap analysis (Figure 5) was also conducted to test the stability of the model coefficients, providing an approximation of the significance test of the path coefficients, which helps determine the robustness of the observed effects in the model.

Figure 5. Bootstrapping Analysis



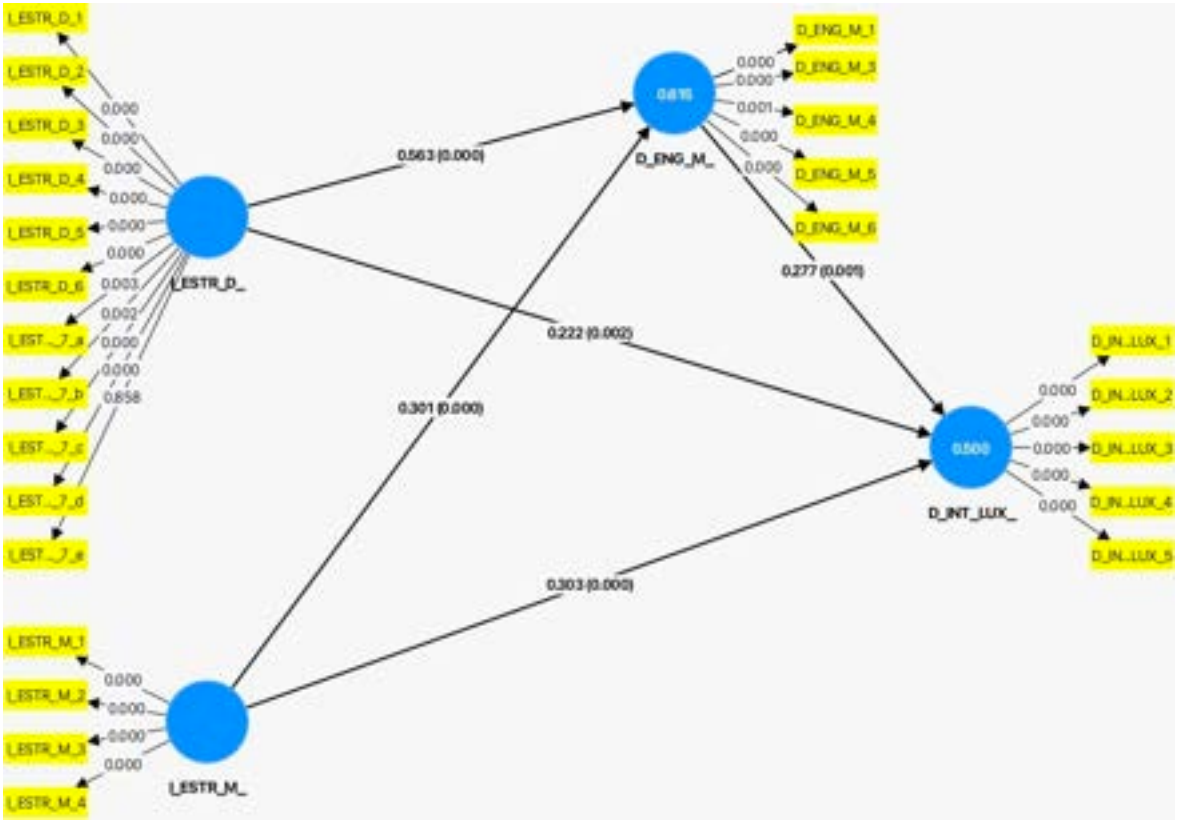
The relationship between Metaverse Integration Strategies and Purchase Intention for Luxury Brands shows a statistically significant result, with a path coefficient of 0.304 (p-value = 0.0 < 0.05), suggesting that the impact of Metaverse integration strategies on purchase intention is robust

and reliable. The relationship between Consumer Engagement in the Metaverse and Purchase Intention for Luxury Brands, also significant, presents a path coefficient of 0.290 (p-value = 0.0 < 0.05), indicating that consumer engagement in the Metaverse has a strong and positive influence on purchase intention. The relationship between Digital Transformation Strategies and Purchase Intention for Luxury Brands is significant, with a path coefficient of 0.206 (p-value = 0.004 < 0.05), supporting the idea that digital transformation strategies positively affect purchase intention. Regarding the moderation of Consumer Engagement in the Metaverse in the relationship between Digital Transformation Strategies and Purchase Intention, the result is not significant, with a moderation coefficient of 0.065 (p-value = 0.366 > 0.05), indicating that consumer engagement in the Metaverse does not significantly moderate the relationship between digital transformation strategies and purchase intention.

The moderation of Consumer Engagement in the Metaverse in the relationship between Metaverse Integration Strategies and Purchase Intention also shows a non-significant result, with a moderation coefficient of -0.003 (p-value = 0.959 > 0.05), suggesting that consumer engagement in the Metaverse does not significantly moderate the relationship between Metaverse integration strategies and purchase intention.

The analyses conducted in SMART PLS support the effectiveness of Metaverse Integration Strategies and Consumer Engagement as positive influencers on purchase intention for luxury brands. While the initial moderation model was not supported, further analysis revealed that Consumer Engagement functions better as a mediating variable. To better represent these relationships, the conceptual model was adjusted to a mediation model, as shown in Figure 6.

Figure 6. Adjusted Bootstrapping Analysis



In the mediation model (Figure 6), significant improvements in the relationships between the constructs are observed. The relationship between Digital Transformation Strategies (I_ESTR_D) and Consumer Engagement in the Metaverse (D_ENG_M) shows a path coefficient of 0.56 (p=0.0), which is significantly positive and strong, indicating that Digital Transformation Strategies have a substantial impact on Consumer Engagement in the Metaverse as a mediating variable.

The relationship between Metaverse Integration Strategies (I_ESTR_M) and Consumer Engagement in the Metaverse (D_ENG_M) shows a path coefficient of 0.30 (p=0.0), also significant, suggesting that Metaverse integration strategies contribute positively to consumer engagement as a mediator, although to a lesser extent compared to digital transformation strategies. The mediating role of Consumer Engagement in the Metaverse (D_ENG_M) is further supported by its relationship with Purchase Intention for Luxury Brands (D_INT_LUX), showing a path coefficient of 0.28 (p=0.0), confirming that Consumer Engagement in the Metaverse mediates the relationship with Purchase Intention for Luxury Brands.

The relationship between Digital Transformation Strategies (I_ESTR_D) and Purchase Intention for Luxury Brands (D_INT_LUX) shows a path coefficient of 0.22 (p=0.002), indicating a significant direct path and demonstrating that besides the mediated effect through engagement, digital transformation strategies also have a direct impact on purchase intention.

Finally, the relationship between Metaverse Integration Strategies (I_ESTR_M) and Purchase Intention for Luxury Brands (D_INT_LUX) shows a path coefficient of 0.303 (p=0.0), which is significant and suggests that Metaverse Integration Strategies positively affect purchase intention both directly and through the mediation of consumer engagement.

4. DISCUSSION

By connecting the results of the descriptive analysis with the formulated hypotheses, it is observed that the averages of the variables Digital Transformation Strategies and Metaverse Integration Strategies indicate a moderate perception of their effectiveness. The higher average of the Metaverse Integration Strategies variable may suggest a more effective alignment with consumer expectations or a more complete implementation, which may support H1, indicating a positive impact of Metaverse integration strategies on purchase intention, as proposed by Amed et al. (2032) and Wunderman Thompson Intelligence (2022).

Moderate engagement and variability in purchase intention suggest that measuring engagement (H3a and H3b) may be more complex and influenced by various factors. This means that the relationship between consumer engagement in the Metaverse and their purchase intention is not linear and may depend on multiple elements. Therefore, more detailed analyses are needed to fully understand these interactions and validate hypotheses H3a and H3b.

Analyses were conducted in SMART PLS to gain a more detailed insight into the relationship between the study variables. Convergent validity is primarily compromised in constructs where multiple items show low loadings. This suggests that these constructs may be heterogeneous in terms of the aspects the items measure, or the items may be irrelevant to the construct.

For H1 and H2, the bootstrapping results strengthen the evidence that both Metaverse integration strategies and digital transformation strategies positively influence purchase intention, confirming these hypotheses. This result aligns with Matt et al. (2015) and Holmqvist et al. (2020), who emphasize the importance of digital transformation in creating value and improving consumer experience.

For H3a and H3b, the lack of statistical significance in the moderation coefficients indicates that the hypotheses regarding the moderating role of consumer engagement in the Metaverse are not supported by the data, necessitating a reassessment or a different approach to be effective.

The bootstrapping analysis confirmed the robustness of the main effects of digital strategies and Metaverse integration strategies on purchase intention, while the proposed moderating effects were not supported. This result suggests that luxury brands should focus on strengthening and optimizing their digital strategies and integration strategies to directly influence purchase intention, as most luxury companies still limit their use of digital space to marketing strategies.

The bootstrapping analysis for the adjusted conceptual model suggests that both digital transformation strategies and Metaverse integration strategies are fundamental in driving engagement in the Metaverse and, in turn, purchase intention for luxury brands. This model highlights that digital transformation strategies are particularly effective, impacting both engagement and directly purchase intention, suggesting that these strategies not only enhance the immersive experience in the Metaverse but also directly contribute to increased sales, as supported by Mastropetrou et al. (2019).

Metaverse integration strategies are also fundamental, but their direct impact on purchase intention is comparable to their effect on engagement, reinforcing the idea that successful integration is essential to converting interest into purchase actions, aligning with Amed et al. (2023).

Consumer engagement serves as an important intermediary between digital strategies, the Metaverse, and purchase intention, demonstrating the importance of marketing strategies that not only attract but also actively engage consumers in the Metaverse environment.

Theoretical and practical implications

Digital transformation has proven to be a crucial factor for luxury brands in improving consumer relationships. This research indicate that digital transformation strategies are present but may not be perceived as extremely effective or are still in the early stages of implementation. This aligns with the assertions of Kapferer (2017) on the importance of digital transformation in customer retention and acquisition. Brands should continue to invest in digital technologies to enhance segmentation and personalized service (Guerola-Navarro et al., 2020).

Metaverse integration showed a significantly positive impact on purchase intention, highlighting the relevance of these strategies for luxury brands, as discussed by Amed et al. (2023). Practices such as creating digital clothing and virtual fashion shows are effective. The research confirms

that Metaverse integration strategies are perceived more favorably compared to digital transformation strategies. Brands like Gucci, with the purchase of virtual land in Sandbox, exemplify this approach well.

Consumer engagement in the Metaverse also has a significantly positive influence on purchase intention, supporting the idea that greater engagement in the Metaverse leads to higher purchase intention. Social media monitoring tools and interactive technologies should be used to increase engagement, in line with the recommendations of Papagiannidis et al. (2017) on adapting virtual environment procedures to improve brand loyalty.

5. CONCLUSION

The research validates the importance of digital transformation and Metaverse integration strategies as positive influencers on purchase intention. Digital transformation, as defined by Reichert and Hutchinson (2019), and Metaverse integration are essential for maintaining the competitiveness of luxury brands. The results show that these strategies have a significant positive correlation with purchase intention, contributing to the existing literature on digital marketing and consumer behavior.

The analysis of convergent and discriminant validity suggests the need to develop new constructs or adjust existing ones for better representation of digital transformation and Metaverse integration strategies. Convergent validity was compromised in some constructs due to low loadings on multiple items, indicating that the constructs may be heterogeneous or that some items may be irrelevant to the construct, aligning with Kapferer's (1998) assertion on the importance of consumer mindshare for evaluating brand value.

Although consumer engagement in the Metaverse did not significantly moderate the relationship between digital strategies and purchase intention, the research suggests that other moderating variables should be explored. The literature suggests that personalization and interaction through digital technologies are fundamental to increasing consumer loyalty.

Although Objective 1 was investigated using a qualitative methodology, the absence of concrete data on the impact of Metaverse implementation strategies for the luxury brands studied limits the robustness of the conclusions. Future studies should consider using in-depth interviews and focus groups to obtain more detailed and specific information about the strategies adopted by luxury brands in the Metaverse.

Our results may not be fully generalizable to other sectors than luxury. The specific context of the Metaverse and the peculiarities of the luxury market may influence the applicability of the findings to other sectors. Future studies should consider applying the same methodologies to different markets and sectors to validate and expand the conclusions of this study.

The study was conducted during a specific period, and consumer perceptions and behaviors can change rapidly, especially in a dynamic digital environment like the Metaverse. Future research should track changes over time to identify these dynamics and emerging trends.

Finally, we would like to mention the limitations in terms of some possible sampling biases and some lack of internal consistency in some constructs. In fact, although the study used a random sample applied on the Prolific platform, with the application of some filters (to define the intended segmentation), some problems could not be foreseen/avoided. For example, the demographic and behavioral diversity of the respondents was not sufficient/desired (there is not an equitable representation in some sample subgroups, namely in terms of age and income level). This may lead to some bias in the reported results. In addition, in terms of construct validation, the value of some metrics was below the desired norms, indicating some vulnerability in terms of internal robustness/consistency (e.g. digital transformation strategies). Ensuring a better balance between sample subgroups in future studies could make the study's findings more robust, with consideration given to expanding the sample and validating the findings in different contexts.

Additionally, our results suggest several promising avenues for investigation, particularly the examination of alternative moderating variables. Specifically, cultural context, technology self-efficacy, or product category emerged from our demographic and case study analyses as potentially significant factors that could moderate the relationship between digital strategies and purchase intention in luxury markets. Testing these moderating effects across different contexts would contribute to a more comprehensive understanding of consumer behavior in the luxury Metaverse environment.

Finally, for future research, we believe that will be beneficial to include a social media analysis (discussions and trends) related to Metaverse experiences. Moreover, tools that track sentiment and engagement from consumers on social media, could be relevant to provide valuable insights.

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