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Demonstrate the perception of Metaverse fashion market in-to Gen-Z and its impact on retail stores' design

Wala Salem
Assistant Professor, Fashion Design Program, University of East London, Egypt , Walaahmedsalem@gmail.com
Heba Eissa
Assistant Professor, Furniture & Interior Design Department, Faculty of Applied Arts, Benha University, Egypt, Heba.abdallah@fapa.bu.edu.eg

Abstract
The fashion market in Metaverse requires different designs to accommodate a new retail strategy. This study investigates the main requirements needed for a metaverse fashion market, as virtual market requires different design elements compared to the physical one. The research used an exploration case study method, students (Gen-Z) from both majors fashion and interior design departments have to collaborate for 12 weeks to demonstrate the perception of VR fashion retail platforms and the engagement of users with their own avatar's appearance. The study result has revealed that virtual environments can enhance users' spatial perception by enabling spatial design activities and providing more visual information for the user to reach a wider audience and offer customers a unique and personalized shopping experience. The study provides several theoretical and practical implications that would enhance spatial perception by enabling spatial design activities and providing more visual information for the user to reach a wider audience and offer customers a unique and personalized shopping experience.

Keywords
Metaverse, Fashion Market, Interior Virtual Store, Gen-Z

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Introduction
The use of Virtual Reality (VR) and Artificial Intelligence (AI) has increasingly become an integral part of the process of buying and selling in stores especially after the pandemic (Covid-19) 2020, in addition the usage of both VR and AI offer direct interaction with the customers, according to Frank et al. (2017) 12% of businesses will fade, 13% of new businesses will arise, and 75% of our business will change due to the emersion of AI and VR. Which has consequences on the lifestyle and the formation of society, led to a direct impact on designers and future generations especially Gen-Z, as they were born with mobile phones, subsequently they are the product of the AI era (Dupont, 2015; Wellner, 2000), therefore the large gap between generations affects their life choices and emotions, undoubtedly. It influences the entire design process to meet their needs. (Lopez, et al 2023) According to Moneta (2020), Virtual World (VW) can be considered as an extension of our Real World (RW) that includes not just physical appearance, but also cultural and social interaction, aesthetic, and philosophical arguments, while Metaverse is considered the next version of the internet, which includes all Virtual Worlds and, specifically, on a Multiuser Virtual Environment (MUVE), where users create 3D environments and objects, and move through them with their own avatars, engaging with other users in real time.

A study conducted by (Bourlakis et al. 2009) revealed that some considerations must be taken when designing a virtual fashion retail store for Gen-Z as there is an evolution shifting the retail market from traditional to electronic to virtual and highlighted new ways that affect design on the metaverse. According to Petkov (2023), Retailers and companies in the fashion industry are searching for methods to rationalize their operations as they face obstacles like the cost-of-living crisis. The democratizing influence of Metaverse on the fashion industry is well-known, especially with Gen Z customers. Retailers and designers must understand how v-commerce can meet fashion retails consumers desires (Wang et al., 2011). Retail interior design in the metaverse is an exciting and rapidly evolving field that offers endless possibilities for creativity and innovation. By

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creating immersive and engaging virtual spaces, retailers can reach a wider audience and offer customers a unique and personalized shopping experience, as VR environments provide more visual information for the user to process than the desktop environment, resulting in a low efficiency of the design process (Amatulli, et al, 2021)

Research Issue:

The retail sector currently faces challenges and heavy competition on multiple aspects such as customer service, active customer engagement, customer retention and loyalty building. To address these issues, retailers are looking at the metaverse as a solution to recreating the in-store experience of not only physical clothing stores but also furniture and automobile showrooms, etc. Hence, virtual environments are becoming more common especially for Gen-Z as they can enhance users' spatial perception by enabling spatial design activities. Conversely, the VR environment provides more visual information for the user to process subsequently Metaverse requires different fashion and interior designs to accommodate a new retail strategy.

Research Aim:

This paper aims to spot new opportunities to extend the design frontiers into the virtual world, where retail (fashion platform and interior design) in the metaverse acquire different design requirements for virtual spaces where customers can interact with products and purchase them with their own avatars' appearance, and to propose guidelines on the design of virtual retailing for the students in these fields. In addition to the role of brand identity in the digital realm to Successfully align with VR platforms requires immersive, strategically designed brand experiences.

Research Methodology:

The research methodology employed for this study assumes an exploratory approach with a strong emphasis on coupling interior design with fashion departments in developing a virtual retail store. The literature review establishes the theoretical background for understanding the concept of retail design in metaverse and its requirements for interior and fashion designers. The merging of two creative fields provides a solid platform for innovation on both fronts: artistic and commercial.

This codesign partnership between disciplines creates collaborative virtual environments where students of interior design apply their principles, such as visual appeal, spatial organization, and atmosphere, with fashion's emphasis on brand representation and product display. The coalition between students of art and students of design opens the door for venturing into narrative avenues, revamping the retail space with a new focus on blending practical design with emotional resonance allowing the embodiment of the brand's values through an experiential journey. Hand in hand, going beyond traditional shopping by creating a thorough experience that allows customers the luxury of visually interacting with the enthralling environment to facilitate brand engagement in the digital space.

Definition of Terms:

Generation Z (18-25) - Gen Z

This generation includes people who were born between 1997 and 2012 according to the Pew Research Centre, as several demographic researchers have identified Generation Z as the group of young people that are now getting close to 25 years old where the oldest members have completed college and have their own family and kids Gen Z followed the millennials, who were born between 1981 and 1996. Gen Z faces a future that is maybe more uncertain than that of many previous generations as a result of the COVID-19 epidemic. (Lopez, et al 2023)

1. Literature Review

1.1. Metaverse

Metaverse is a 3D simulated environment that combines various virtual worlds in real-time. Many believe the metaverse concept is a futuristic resumption of the internet, where individuals can socialize, meet, work and gaming in a way that mirrors real-life experiences (Park, et al, 2023) and (decentworld.com), which means beyond the universe, refers to a future version of the internet consisting of lasting, collective 3D virtual environments connected to form a virtual universe (Moneta,2020). According to Bourlakin, et al (2009), metaverses originated as games known as massively multiplayer online role play games (MMORPGs), but quickly transformed into alternative realities that expanded our physical and digital environments. Due to the rapid increase in individuals engaging in virtual worlds, a fresh social and commercial realm has developed that integrates physical, digital, and various virtual spaces.

It is predicted that by 2025 (Belleghem, 2022), the in-game buying market would be worth $74.4 billion. In-game transactions have been a regular occurrence where a robust economy built on NFTs and a cryptocurrency wallet is anticipated to develop as the Metaverse gains popularity to facilitate simple transactions in virtual worlds, this digital payment system works without relying on traditional banks to verify transactions, operating as

a network where individuals globally can make payments. Prominent instances of these digital currencies, like Bitcoin and Litecoin, allow users to purchase virtual items from virtual stores in the Metaverse. Referring to the article by (Ball, M.,2020) and (F. Mustaffa et al.2022) who outlined the key characteristics of the Metaverse is Always active as it does not pause when you leave, nor end but it continues indefinitely. Additionally, it Exists in real-time and has a timeline that synchronizes with real-world timing. Players have individual agencies where they can do different activities at the same time, i.e. one could just be standing still in the corner while others are interacting. Furthermore, it is Self-contained and fully functioning universe which allows users to create, own, sell, and invest. It has A mix of different platforms that can work together on Metaverse. And finally, it is a User-generated content, it is more than just virtual spaces for users to hang out. Users can create content that other users can also enjoy.

1.2. Retail design in Metaverse

In the metaverse, retail interior design involves creating simulated spaces where consumers may engage with items and make payments using virtual currency. Virtual shopping combines the finest aspects of physical stores with the convenience of internet shopping. By enabling customers in direct contact with in-store specialists via live chats and video conversations to get product guidance and inspiration, it gives them the confidence to browse and purchase online. By enabling

Fig. 1 shows virtual shop framework, by the authors.

in-store teams to share images, videos, and product demos live from the store floor, virtual shopping enables retailers to authentically and interactively share their expertise with millions of online shoppers beyond the confines of physical stores. This increases brand engagement and loyalty while lowering return rate (klarna.com). According to Tavman (2024), The interior design environment of the virtual stores is a simulation of the physical store, although it is created inside the virtual reality using the computer where all the design elements (display units, movement corridors, displayed products...etc.) are virtual objects, as it is an integrated environment that carries all design elements procedure and provides interaction on several levels: visual, auditory, tactile, Taste and other different senses. Therefore, we can say that the computer-generated virtual environment is indistinguishable to the real world. (More. et al 2019). Figure 1. The potential to provide customers with a highly individualized shopping experience is considered as one of the most significant advantages of Metaverse retail design as retailers customize each customer's purchasing experience by using data and analytics to understand their preferences and browsing history. Like that they can employ virtual mirrors to let them virtually try on clothing so they can see how it looks before buying it.

Designers may employ the metaverse for involving customers in fresh and creative ways, as well as providing an enjoyable purchasing experience. For instance, they can hold virtual events that let customers engage with the business and one another in real time, such as fashion shows and product releases.

Store Layout:

Several researchers have identified three main types of shop designs utilized in traditional retail settings. They elaborated on the three shopping layouts found in conventional stores—grid, freeform, and racetrack – as well as – the three configurations for online shops—tree, pipeline, and guide path (Roland, G. et al.,2021); (Akther, T., & Xu, F, 2020).

The design of retail environments within the metaverse plays a vital role in facilitating a cohesive customer experience. This process encompasses the development of virtual storefronts, product displays, and interactive features that captivate customers and motivate them to navigate the space. Utilizing lighting, textures, and color schemes can contribute to the establishment of a virtual store environment, allowing customers to experience a sensation akin to being in a physical retail location. Tree or Hub layout: The grid style is a well-established concept in traditional retailing. In online shopping, a tree structure allows customers to navigate through a hierarchical system that progresses from categories to subcategories and ultimately to the final product. A button prominently displayed on the homepage encourages clients to explore the various product categories via a central hub. This tree structure is increasingly viewed as a replacement for the grid format in the realm of virtual retail (Patel. B,2022) Figure 2. While the Pipeline layout: This arrangement is

considered freeform within the context of mainstream retailing. The primary objective of this design is to provide customers with the freedom to move about. By employing different maps, such as search engines, consumers can view their preferred brands simultaneously across any of the store's search results pages. The homepage and search button of this layout enable easy navigation and facilitate the process of saving. In the realm of virtual retailing, the pipeline layout can serve as an alternative to the freeform layout commonly found in traditional retail settings, (Figure 3). Furthermore, the Guide path layout: This is also considered a racetrack in conventional retail environments. The structure enables customers to navigate along a designated path through two online corridors on each webpage. As a result, clients can access their desired website. The layout serves as a virtual shopping alternative (Figure 4).

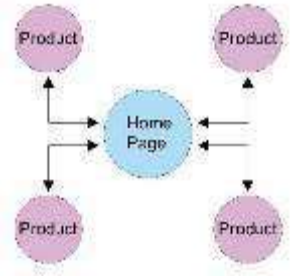

Fig. 2 shows the tree store layout, By the authors

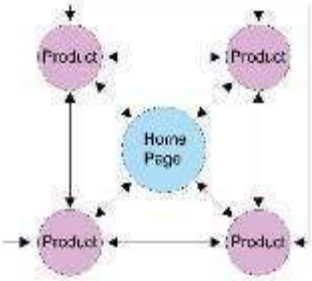

Fig. 3 shows the pipeline store layout, By the authors.

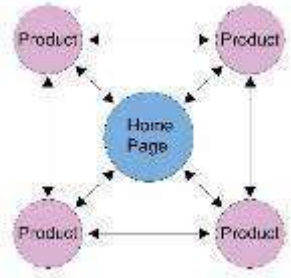

Fig. 4 shows the guideline store layout, By the authors

Visual Display

As an interior designer, transferring traditional design concepts into virtual places required for creating visual displays in the metaverse. Since users view 3D space on a monitor screen and can freely move the viewpoint (zoom, pan, orbit) using mouse and keyboard user interfaces, designers can create retail environments that generate specific, affective responses in customers, improving their purchase intention (Ballantine, 2005). Through a virtual reality experiment, Yeom et al. (2021) verified the impact of green wall design on the user's cognitive state. Hong et al. (2019) investigated how occupant satisfaction is impacted by a building's window-to-wall ratio. Since it is hard to conduct experiments with real buildings, the two articles used virtual reality technology to validate the answers the building user received (Kimi, H. & HoonHyung, K, 2022).

Innovation and originality are vital in the metaverse. Exploring with various technology and design components to produce visually appealing and engaging virtual environments that capture consumers. Product displays, for instance, can be more interesting and dynamic than those found in actual stores where fashion brands can establish a virtual runway where buyers can watch models showing their current collection, or can employ music effects, animations, and other sensory components to showcase their products.

The vertical areas are divided into four horizontal levels (Figure 5) according to C, Ebster 2011, The first area is the stretch level at a height of 180 cm or more, and it is an area that does not receive much attention when displaying products. The second area is at eye level (from 120 to 150 cm) and what is in the shoppers' field of vision receives the greatest amount of attention. Products displayed at eye level are the best sellers. A person's peripheral vision extends 30 degrees from the eye's centre point in all directions, so the farther shoppers move away from the displays, the wider the eye level area. (Ebster, C, 2011, P.26) When selling products targeting children, the eye level (sight) becomes slightly lower to match the child's eye level. Moving to the third level, which is the touch level where its height ranges between 90 to 120 cm, it is located approximately at the shopper's waist level. Products placed in this area receive more attention than products at stretch level, but less attention than products displayed at eye level. However, it is still a desirable area for placing high-profit items. Finally, we reach the stoop level, which is located at a height of less than 90 cm and is the least preferred area for display for adults, as The shopper does not prefer to bend down to examine the product, and this does not happen in virtual stores, but it must be taken into account to achieve the realism of interior design in the virtual environment and the ergonomic performance of humans. (Chandon, 2009, P.5)

Fig. 5 shows the visual display levels on metaverse, By the authors

Virtual storefronts: Just like physical stores, virtual storefronts in the metaverse can be designed to showcase the brand and products. Retailers can create 3D models of their storefronts that customers can explore, complete with signage, windows, and entrance doors. They can also customize the storefront to match the season, holidays, or any upcoming sales (Figure 6).

Fig. 6 A Louis Vuitton inspired Pop-up concept. by AI, Amar A. 2024 https://www.linkedin.com/posts/amar-a-2560352_lv-ai-activity-7254457046698192897-

Simulation:

Designers traditionally approached the built environment with a comprehensive perspective. They acknowledged that, in addition to factors such as cost, aesthetics, and structural integrity, it is essential to consider elements like social interaction. For example, certain design strategies for public spaces facilitate positive human engagement, while others may hinder it. However, such considerations have not been a primary focus for the developers of contemporary virtual worlds, which are predominantly designed for gaming purposes. As the metaverse evolves into a more immersive experience and increasingly incorporates everyday activities, it will be vital to understand that we are constructing a space for "human society" rather than merely a product or service. Interior designers, in particular, are already accustomed to this holistic approach. The metaverse presents a remarkable opportunity for exploration. Unlike the physical realm, which is bound by various constraints, the virtual environment offers a liberating experience. The costs associated with materials will no longer pose a challenge, nor will there be concerns regarding the structural integrity required to support buildings. In this virtual landscape, both the aesthetics and functionality of constructed spaces will undergo significant transformation. It is, in essence, an entirely new realm to discover. Through the process of designing retail spaces in the metaverse, it is crucial to consider the specific limitations and opportunities presented by the chosen platform. Certain virtual reality platforms may facilitate intricate 3D designs, while others might impose restrictions on the types of objects that can be utilized. Additionally, considerations regarding accessibility and user-friendliness of the space are vital, as well as understanding how customers will interact within it. (Dwivedi, Y. et al, 2022).

Fig. 7 shows Nike simulation store on metaverse, Source Nike Virtual Store

Light

Lighting is essential in the design of virtual stores, significantly affecting the ambiance, product visibility, and overall customer experience. The lighting within a retail environment establishes the atmosphere, necessitating alignment with the nature of the business. The lighting design encompasses general illumination options, including track lights, ceiling fixtures, and chandeliers, as well as accent lighting such as spotlights. It is advisable to strategically combine these various light sources throughout the store to ensure comprehensive illumination. For businesses aiming to foster a tranquil environment, such as spa boutiques and

upscale dining establishments, ambient and soft lighting is most effective. In contrast, opulent lighting can enhance the dining experience, adding a touch of sophistication. (https://qvalon.com/blog/virtual-merchandising-basics/). The space provides your customers with a respite from visual merchandising displays. It is essentially a vacant area devoid of furniture, fixtures, or any items. Such white spaces help to avoid the perception of a cluttered environment, offering a soothing effect for the eyes of your customers.

Fig. 8 shows Lacoste light design in store on metaverse, https://emperiavr.com/project/lacoste/

Light Color: Lighting significantly affects both the hue of the product and the overall interior design. It is essential to consider the light's temperature when making selections.

Light Temperature: it refers to the hue of the illumination, which should be considered in relation to the color of the product and the overall interior design, as well as the impact of the lighting on these elements. In modelling software, the color of the light source is defined by its color temperature measured on the Kelvin scale. A neutral white light is characterized by a temperature of 6500 Kelvin; temperatures lower than this indicates warm lighting, while those higher correspond to cold lighting. (Medhat Abd El Aziz Mostafa, A., et al, 2022)

Embodiment: The concept of embodiment is significantly influenced by lighting, which serves to accentuate the featured product and delineate its contours. The use of diffuse lighting effectively eliminates shadows, resulting in a flat appearance for both the product and its design. To achieve a more harmonious illumination, it is advisable to integrate direct lighting with diffuse lighting. Nevertheless, in instances where the product and design necessitate a more theatrical ambiance, relying solely on direct lighting sources may be adequate.

Fig. 9, shows Lululemon light design store on metaverse, Source https://emperiavr.com/project/lululemon/

Color:

Color serves as a fundamental component in both fashion and interior design, with several color schemes that can harmoniously coexist (Murugesan,2020). The strategic use of color provides an effective means of visual presentation without incurring significant costs. As one of the most influential elements, color exerts both physical and psychological effects on individuals. Its affordability is notable, as much of the color derives from the products themselves, thus requiring no additional financial investment. The interplay of colors among ceilings, walls, flooring, and overall design can significantly influence the ambiance of retail space. For instance, vibrant hues may draw customers into a store, while warmer tones in displays can foster a serene environment. The primary effects of color on consumer behavior include Establishing the mood, Highlighting features, Accentuating products, and seasonal trends.

Dr. Satyendra Singh, a Professor of Marketing and International Business as well as the Executive Director of the Academy of Business and Markets (ABEM), has asserted that color influences between 62 and 90 percent of purchasing decisions. He stated, “The appropriate application of colors can profoundly impact mood and emotions,” which can be either positive or negative. Given the fluctuating nature of human emotions and the role that colors play in shaping attitudes, it is crucial to recognize the significance of color in marketing strategies. (Singh, 2006).

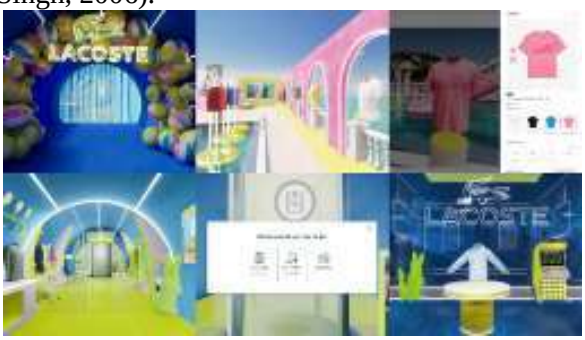

Fig. 10 shows Lacoste color design in store on metaverse, Source Lacoste Virtual Store.

Branding and storytelling :
The branding and visual appeal of a fashion retail store within the metaverse play a vital role in establishing a memorable and immersive experience for consumers, akin to traditional physical retail environments. This encompasses various elements, including the store's overall layout, color schemes, textures, and lighting choices. It is essential for a fashion retail establishment to be crafted in a manner that embodies the brand's identity and core values, fostering an ambiance that evokes excitement and inspiration among customers.

2. Examples of Virtual stores

The prevalence of virtual reality retail stores is increasing within the fashion industry. These establishments offer an immersive shopping experience, enabling customers to explore collections within a virtual environment. Consumers have the capability to visualize how garments appear on them without the necessity of physically trying them on. This technological advancement introduces a more convenient and captivating approach to the shopping process.

2.1. Tommy Hilfiger

An American fashion brand, which go through virtual shopping on Metaverse fashion week 2023 with Emperia partnership. The main goal for the tech department was to provide real-time value to customers, providing tailored product recommendations based on their needs. They used for the virtual store detailed features with a monolithic structure with the 'TH' monogram, DressX digital fashion, gamification, AR, and a community-driven competition. The target is to enhance the shopping journey experience and provide adapted messages to customers when they show interest in a product (Figure 11)

Fig. 11 shows Tommy Hilfiger store on metaverse, Source https://emperiavr.com/project/tommy-hilfiger/?tourShow

- **Layout:** the designer used pipeline layout to obtain the freeform in mainstream retailing, where this layout aims to enhance user experience by optimizing product visibility and ease of navigation (Figure 12).
- **Visual display:** on eye level from 120 cm to 180 cm.

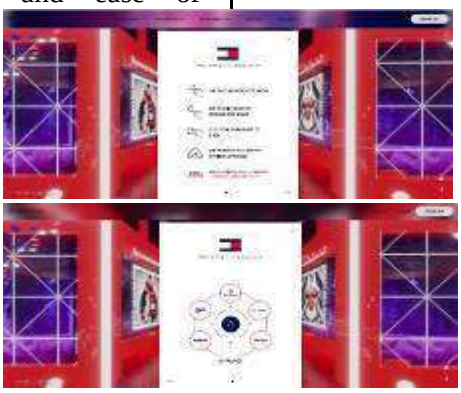

Figure 12, shows Tommy Hilfiger layout store on metaverse, Source https://emperiavr.com/project/tommy-hilfiger/?tourShow

Color palette:

Name: Cetacean Blue Hex: #08154a RGB: (8, 21, 74)	Name: Crimson Hex: #d51635 RGB: (213, 22, 53)

Light: Relying on the simulation of artificial lighting in white. (Figure 13).

Fig. 13 shows Tommy Hilfiger light design on metaverse, Source https://emperiavr.com/project/tommy-hilfiger/?tourShow

3.2 Gisela

A Spanish fashion brand started a virtual showroom in Autumn/Winter 2022 collection, "Nomads of the Future" is the project name, which was a collaboration with The Next Cartel, showcased the innovative use of Virtual Reality (VR) in enhancing the digital journey of virtual online shopping which is crucial for brands to explore their collection's themes and reinforce their brand identity. The design of the virtual store is located in a desert allowing seamless browsing and purchasing experiences on both desktop and mobile platforms. This experience sheds light on the importance of integrating VR in the real world, where customers engaged in metaverse with their avatars extends beyond physical space. (Figure 14).

Fig. 14 shows Gisela store on metaverse, Source https://thenextcartel.com/work/gisela-nomads-of-the-future-vr-2022/

Layout: the designer used tree or hub layout. (Figure 15).

Visual display: on eye level from 120 cm to 180 cm. (Figure 15).

Fig. 15 shows Gisela store layout & visual display on metaverse, Source https://thenextcartel.com/work/gisela-nomads-of-the-future-vr-2022/

Color palette:

Name: Burlywood Hex: #E0B692 RGB: (224, 182, 146)	Name: Pearl Hex: #E9E0C8 RGB: (233, 224, 200)	Name: Columbia Blue Hex: #C5DBEA RGB: (197, 219, 234)

Light: Relying on simulating natural lighting (sky and sun).

3.3 Hugo Boss:

A German fashion brand which launched a virtual showroom at Metaverse in Spring/Summer 2023 Fashion Week, where they blend gamification with a digital shopping experience in the showroom to serve as a digital extension of the BOSS Miami Fashion Show, unveiling five shoppable outfits linked to product pages on hugoboss.com. The brand's concept on metaverse was timeless tailoring and effortless separates to celebrate in the showroom and to be connected to BOSS online store (Figure 16), through guiding the users to discover the space and each look in a new and engaging way collecting products along the journey to complete the quest and obtain a digital item which can then be worn on the multi-game avatar platform Ready Player Me which allow users to input their measurements to generate an avatar that accurately displays how the clothing would appear on them., the main design theme shown in the brutalist architectural elements which blends gamification and digital shopping experiences using

Artificial Intelligence to transform the show's innovative concept into a Metaverse showroom. (Figure 17)

Fig. 16 shows Boss store on metaverse, Source https://group.hugoboss.com/en/newsroom/news/news-detail/boss-enters-metaverse-fashion-week-with-an-immersive-ai-inspired-showroom-experience

Fig. 17 shows Boss store interface on metaverse, Source https://group.hugoboss.com/en/newsroom/news/news-detail/boss-enters-metaverse-fashion-week-with-an-immersive-ai-inspired-showroom-experience

The used avatar is not only standard dimensions, but it is shaped by the customer according to his/her body shape and morphology, to result in a highly accurate virtual representation to enhance the possibilities for virtual fittings, allowing users to layer different items, experiment with styles, and explore different ways of wearing the selected model to address the issue of not being able to try on items before purchasing. (Figure 18).

Fig. 18 shows avatar trying items before purchasing, Source https://group.hugoboss.com/en/newsroom/news/news-detail/boss-enters-metaverse-fashion-week-with-an-immersive-ai-inspired-showroom-experience

Layout: the designer used a guide pathway layout (Figure 19).

Fig. 19 shows store's layout, Source https://group.hugoboss.com/en/newsroom/news/news-detail/boss-enters-metaverse-fashion-week-with-an-immersive-ai-inspired-showroom-experience

Visual display: the designer used several types of displays starting with the stretch level to the touch level.

Color palette:

Name: White Hex: #FFFFFF RGB: (255, 255, 255)	Name: Dirt Hex: #9F754D RGB: (159, 117, 77)	Name: Black Hex: #000000 RGB: (0, 0, 0)

Light: Relying on simulating natural lighting; sky and sun (Figure 20).

Fig. 20 shows store's light design on metaverse, Source https://group.hugoboss.com/en/newsroom/news/news-detail/boss-enters-metaverse-fashion-week-with-an-immersive-ai-inspired-showroom-experience

3. Analytical Study in VR platform fashion retail brand

3.1. Description / Experiment structure

In the fall semester of 2023 at MSA University, as a part of the study, a task was assigned to students from both Fashion design and Interior design departments. Each was required to provide a fully fleshed out concept and develop a luxury womenswear brand, with Gen-Z demographic as front and center of their target demographic. As the tasks are being executed, the students' own fashion retail brands start to demonstrate a shake up in the current market framework as they approach the Metaverse. For the purposes of furthering participants' vision of their own brands, they had to start at virtual market research. All contributors in this study were required to come up with touchpoints of their own virtual brands that can be horizontally implemented in the Metaverse marketplace. The accumulative actions of all participants lead to the creation of many virtual storefronts on digital platforms, thus narrowing the space between the virtual fashion market and their brand concepts.

The investigation stage, in this study, lasted 12 weeks as a design course with the explicit goal of assessing the results of 18 students, (9) of which from the interior design department and (9) from the fashion design department. Groups were created specifically to have one student from each department to allow the construction of identities for the virtual fashion brands intended for the current market of fashion. Afterwards, the following portion goes into the specifics for each brand, such as names, concise statements written by the participants. It is important to take notice that the brands were strategically targeting the Virtual Reality (VR) platform and specifically the Metaverse. The instruments employed for data collection in this study include; students' concepts and project execution. Outcome analysis heavily relied on qualitative description from participants of their own progress and project concepts. This marks the trial-and-error phase. This phase of experimentation highlights the identity of the brand within the any digital space, specifically in the Metaverse. This emphasis on the strategic alignment of each individual brand as an emerging trend in the VR platform is shown in (Figure 21).

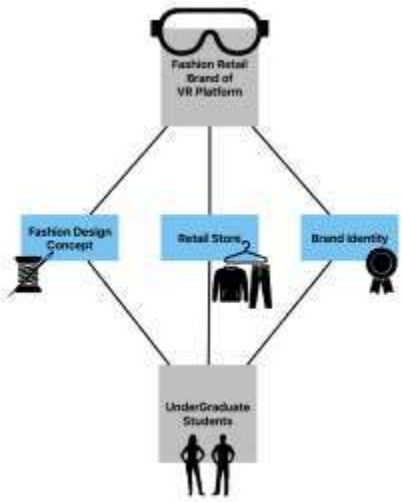

Fig. 21 Experiment tree model, By Authors

3.2. Instruments Overview / Study Tools

The students' conceptualization and execution of the projects heavily drove the analysis of the outcomes for this study through the means of qualitative description. Our main goal with this approach is to evolve the information into more insight into fashion design dynamics, specifically within the virtual space. Furthermore, understanding the requirements needed for designing a virtual store and using it to fulfill the current needs of consumers with the emerging landscape of the Metaverse.

Aspects to be Observed:

- User Interaction: The way users choose to operate in virtual environments.
- Visual Design: Artistic choices for the virtual store that compel users to remain on it.
- Social Interaction: Intercommunication among users inside the virtual landscape.

Data analysis:

Qualitative Analysis: Gathered data goes through content analysis in this study to examine content of both visual and textual nature inside the fashion design retail environments within the VR space.

3.3. Experiment analysis

- Virtual fashion brand

This endeavor propelled students to create high-end womenswear brands, specifically hand-crafted for the Gen-Z customer base, with a strong emphasis on maneuverability within the Metaverse dynamic space. For starters, market research of the virtual space earned a lot of insight of how to position brands within this cutting-edge realm of virtual space. The experiment went farther beyond conventional frameworks of markets, pushing participants to craft digital storefronts. In keeping up with the ever-changing landscape of the fashion

industry, the creative idea of the participants was to integrate the concept of seasonal fashion with brands. To add substance to the altered Metaverse Students work diligently to maintain the beauty of each season. It captures the roots of winter, spring, summer, and autumn in a virtual space. It emphasizes the cyclical nature of fashion trends through this critical approach. As the need for compelling stories is the core expectation of the Gen-Z demographic, the need to capture their expectations within the virtual space of the Metaverse has finally been met.

The participants' vision for their digital brands is clearly expressed in the project framework. Participants will be provided with a hand-crafted graphical user interface. Attractive experiences and digital touchpoints within the Metaverse landscape breathe new life into the luxury womenswear brand's concept. Hand-sewn to perfection. Every detail is for the Gen-Z digital storefront target audience—the fourth priority is innovation. Showing a meeting of technological acumen and not only in-depth understanding, the detailed execution here demonstrates students' abilities and skills only, but it also emphasizes achieving the overarching goal of all of these endeavors with a digital fashion brand.

- Student's design proposals

Building on the futuristic theme, students employed a systematic workflow for initiating, designing, and submitting their proposals for this study. Starting off with an all-encompassing brief of the project, Meticulous information was distributed among students that entail the set goals, the target audience (Gen-Z), and the peculiar challenge of positioning brands inside the Metaverse ever-changing framework. Afterwards, the next order of business was to tackle the virtual market research portion. This can only be done through an understanding of the target demographic, thus exploring the expectations, preferences, and behaviors of Gen-Z inside the Metaverse. This in-depth research acts as the foundational beam the concepts for the luxury womenswear brans can be build on. Harnessing the wisdom gleaned from the market research efforts, all participants can commence the conceptualization phase of their brands, sketching out individual identities, exclusive selling points, and aesthetics for their brands meticulously chosen for accommodating the virtual space. At the same time, participants roll out extensive plans that entail identifying information of the brand; such as names, visual components, audience feedback, and Metaverse-unique proposals.

To allow for a smooth joining of the Metaverse virtual market with the brand concepts, participants embark on a journey to design the overarching touchpoints for the virtual environment. This design journey to create the sought-after immersive experiences for the brand included many aspects; such as digital storefronts, intuitive graphical interfaces, purposeful layouts for the stores, vital use of light and color theory, and an emphasis on dynamically showcasing brand essence.

Practice makes perfect, thus an iterative approach to the process was employed, and it started with producing a first draft of the proposals, allowing students to enter the productive feedback loop from both professors and colleagues, thus expediting polishing and distilling their products before the final submission of the proposals. Professors have an extremely vital part in this experiment, as all their evaluation, feedback, and constructive criticism granted the students guidance on where improvements were needed and ensuring the quality of the products aligned well with the set goals of this experiment. This iterative process winds up with turning in the final proposals, within the limits of the predetermined deadline, including all virtual touchpoints created. Afterwards, the professors thoroughly investigated the final proposals, appraising them on a multitude of aspects; such as ingenuity, creativity, Metaverse suitability, vital positioning, and long-term feasibility. Subsequently, the implementation phase starts. Students start off with executing the virtual touchpoints outlined in their proposals, providing them with the chance to introduce and display, inside the Metaverse virtual framework, their luxury womenswear brands.

Table 1 shows the students' proposals

Brand Name	Dalla	Alora	Neferure	Lotus	Fimz
Brand Identity					
Design Brief	DALLA focuses on and points out society problems, as well as preserving traditions that were long lost by western influences. Its' designs are mainly influenced and inspired by nature. Not to mention, its name (دلّ) illustrates the brand's purpose of leading people to a path into bettering their surroundings and make a statement of their point of view. Dalla uses sustainable raw materials that take into consideration the sudden climate changes that take a toll on the human body. Refusing to use polymer-based raw material, the	Alora, a premium Greek beauty brand, celebrates the radiant female form. Drawing inspiration from ancient Greece, Alora's products empower women to feel confident and radiant in their skin. The brand's aesthetic draws from Greece's rich cultural heritage, focusing on botanical ingredients and idealized depictions of the female figure. Alora's mission is to inspire self-acceptance and body positivity through nourishing skincare and flattering color cosmetics, crafted with high-performance botanicals and ethically sourced ingredients	Egypt treated women with more regard than most other ancient cultures. There were female doctors, scribes, business owners, and even rulers. There were some queens who left their imprint on history. Nowadays women look up at the ancient Egyptian queens and want to make an impact on the future. So, this brand will make this by connecting the queens/goddesses of Egypt to the modern Egyptian women, which they are already connected by looks, style, personality, etc. This will happen by combining tradition and modernity and show femininity and highlighting the different personality and styles.	Lotus is a kind of plant, lotus comes from the Greek word called lotus, which means beauty. Lotus was seen as a symbol of beauty and love for the ancient Egyptians. Acts like the sun. It adapts to its environment as it exists in dirt, water, and air. The Brand's values align with the values of the lotus plant and the ancient Egyptians' perception of it. Lotus is to provide clothing which inspires women to adapt to whichever environment they are put in.	FEMZ is a brand that makes all body types and sizes specifically plus sizes women's clothing. Plus-size women represent a diverse and vibrant community, challenging traditional beauty standards and fostering a movement toward body positivity and inclusivity. Plus-size women continue to inspire and empower others, fostering a culture of acceptance and breaking down societal norms. Fimz provides ready-to-wear clothes that are comfortable, and stylish.

Brand Name	Dalla	Alora	Neferure	Lotus	Fimz
	brand uses natural raw materials, whether in fabric for clothing and fabric bags, or leather for handbags and accessories (edible animals only). Since nowadays the market is mainly focused on trend driven products, our brand is trying to focus on those who need more modest, casual clothing that is hard to find.				
Target Audience	Customers that are not looking for extravagance and attention-grabbing products are going to feel home in Dalla's stores.	Alora caters to a discerning clientele who values fashion and sophistication. The target audience for Alora is primarily women in the age range 20 to 30. These individuals are fashion-conscious and seek luxury clothing that reflects their refined taste. They appreciate classic elegance with a modern twist and are willing to invest in high-quality, enduring pieces.	Women between the age 18 - 30 who love to try new things.	Women who want luxury wear with the best quality and price, also modest wear in luxury form which inspires the women to adapt with the environment they are in. The target of the brand is to rival the international brands in making luxury local brand with the best quality and the best product. From 20 - 40 years old.	Targeting women from age 20 to 30.

Brand Name	Dalla	Alora	Neferure	Lotus	Fimz
Proposed Designs					
Layout	The designer used a guide pathway layout.	The designer used a pipeline pathway layout.	The designer used a guide pathway layout.	The designer used a tree/ hub layout.	The designer used a tree/ hub layout.
Visual Display	The designer used both the touch level and the eye level; from 90 cm to 150 cm.	The designer used eye level; 120 - 150 cm.	The designer used the touch level, the eye level, and the stretch level; from 90 cm to 180 cm.	The designer used eye level; 120 - 150 cm.	The designer used eye level; 120 - 150 cm.
Light	Relying on the simulation of artificial lighting.	Relying on the simulation of artificial lighting.	Relying on the simulation of artificial lighting.	Relying on the simulation of artificial lighting.	Relying on the simulation of artificial lighting.

4- Study Findings:

The research reveals new opportunities for fashion and interior design join forces to create a virtual retail store. It showcases the dynamic convergence of the two sectors. and provides a new platform for market-driven innovation and expression of design aesthetics by combining interior design concepts such as visual aesthetics, atmosphere, and spatial planning. Participants from both disciplines can collaborate to create immersive virtual environments. It combines design functionality and intangible features. This hands-on interaction allows art and design students to explore the many perspectives of a retail space. Reflect the brand's journey through one customer. It provides a visually stimulating and engaging environment to connect.

- Integration of virtual reality (VR) and artificial intelligence (AI) devices has become important in fashion and interior design. It provides a virtual reality experience that helps professionals and students simulate virtual platforms and analyze virtual reality-specific design concepts.
- Interactive and immersive shopping experiences are highly appealing to Gen-Z students. They love hybrid virtual retail environments with 3D avatars and digitally customizable options.
- A collaborative fashion and interior design initiative claims that its virtual reality platform has greatly increased user engagement. and allows for creative avatar customization. Using this, students develop a luxury women's clothing brand that appeals to Gen-Z's desire for a personal and engaging shopping experience within the Metaverse.
- In virtual reality situations. Students learn that virtual market research is an important first step in determining and meeting their company's unique needs.
- Students demonstrate how a brand concept can be transformed into a virtual shopping experience in the Metaverse, successfully creating a digital store and touchpoints for their brand in the digital marketplace space.
- This experiment highlights the importance of brand identity in a virtual environment. and shows that students studying interior design and fashion can work together across disciplines to successfully meet the demands of the Metaverse's rapidly changing digital fashion landscape.

5- Results and Discussions:

This research recognizes the presence of Metaverse while highlighting how students can be taught to use modern technology in design to keep up with progress. Analyzing the information mentioned above, the results show that daily digital advancements are creating new opportunities. to fashion designers and interior designers. Key issues include the emergence of the digital economy and the increasing importance of digital assets. These changes have transformed traditional business models. internal positioning Fashion designer in virtual space as content creator This is the opposite of consultant. Retail spaces are shifting to hybrid formats that blend digital and physical experiences as a result of the growth of the Metaverse (Petkov, 2023). Meeting Gen-Z's purchasing needs now relies on features like digital displays. virtual reality testing room and AI-powered customization tools. Metaverse creates virtual fashion collections. This reduces the need for production and inventory. This change aligns with Gen-Z's focus on sustainability, which will push various brands to explore digital fashion as a greener alternative. (Frank et al, 2017). Metaverse events and virtual showrooms are an exciting new way for marketers to reach Gen-Z consumers. They can promote their products without needing to have a physical storefront.

A qualitative Gen-Z study clearly demonstrates the importance of brand recognition in the virtual space. A carefully planned and immersive brand experience is necessary to successfully align with the VR platform. Brands can engage with Gen-Z in new ways through the Metaverse events and virtual showrooms. without having to rely on traditional retail stores. These platforms help companies tell a story. Focus on their products and create memorable experiences that foster brand loyalty (Tavman, 2024).

All retail and shopping in general are shifting towards next-generation models that blur the lines between the digital and physical worlds. As a result of the Metaverse revolution, virtual reality displays VR fitting room technology, AI-based customization, and tailoring. Advances in technology have opened up new opportunities for fashion designers and interior designers, various changes, such as the growth of the digital economy and the increasing importance of digital property rights. It is considered a trend. Businesses are changing almost every aspect of their operations. And it appears that in-house fashion designers working in virtual environments are transforming from simple consultants (Gadalla, et al, 2013).

The Metaverse facilitates the virtual display of

fashion collections. While reducing the need for physical sourcing and manufacturing, Gen-Z has made sustainability a top priority. And changes in fashion make this appropriate. Because at present many companies, digital fashion is encouraged to be used as an environmentally responsible medium (Sridharan, et al, 2024).

The importance of a well-known brand identity across social media platforms and the metaverse has been highlighted by qualitative research on Gen-Z behaviors and shopping habits. Brands must develop a comprehensive plan that includes creative and meaningful experiences. To respond to the needs of current VR enthusiasts.

6- Research Recommendations and Future Implications:

The research reveals initial patterns related to design in the metaverse and fashion aspects that contribute to the planning and implementation of interior design in retail stores. The research recommendation is to conduct further studies of existing virtual stores to uncover the patterns that virtual stores display and integrate them into the stages of interior design and fashion education. Future analysis in Egypt and the world can reveal the factors and aspects that contribute to the creation of a well-designed virtual store that ultimately stems from the behavior of users. Using this knowledge in designing future virtual stores will directly support their users and thus contribute to creating new opportunities to extend the design frontiers into the virtual world.

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