

# Augmented Reality and the Digital Wardrobe Revolution: The Future of Fashion

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*Abstract:* AR is revolutionizing fashion retail through virtual try-ons, interactive product exploration, and more personalized shopping journeys. In parallel to AR, the uprising concept of the digital wardrobe takes fashion beyond physical ownership because consumers will curate, combine, and showcase outfits on various online platforms and metaverse environments. This paper analyzes how AR-supported digital wardrobe applications shape consumer behavior and might help achieve sustainability targets within the fashion industry. Based on a review of recent academic works and sectoral reports, sources are organized around user experience, personalization, shopping decision processes, and environmental impact. Accordingly, the synthesis of findings showed that AR experiences can increase consumer confidence and engagement, support hybrid shopping models, and reduce return rates by better pre-purchase evaluations. Virtual sampling and reduced physical try-ons may lower waste and logistics-related emissions, though outcomes depend on adoption, data practices, and infrastructure. The paper provides a conceptual framing that links AR capabilities, digital wardrobe functionalities, and consumer responses and points to future research needs, particularly user-based measurements, privacy, and ethics, and cross-cultural evidence.

*Keywords:* augmented reality; digital wardrobe; consumer behavior; sustainable fashion; personalization; metaverse; virtual reality

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## 1. Introduction

A paradigm shift in consumer shopping behaviors and expectations is caused by the end of the traditional shopping approach in favor of interactive, faster, and more customizable experiences. Digitalization has also caught up with changes in the fashion industry. With augmented reality applied in fashion, one can try on clothes virtually without going to the store or trying on the products in person. In this way, users can see how the product will look on them, change sizes and colors, and make shopping personal and enjoyable. Many opportunities in the virtual environment are shaping the shopping experience in a new way. Decreased physical store visits have made augmented reality-based virtual fitting rooms more important, especially during the COVID-19 pandemic.

This study investigates augmented reality technology use in the fashion sector, its applications in the fashion sector, and the effects of digital wardrobes on consumer behavior. This new approach, beyond the realm of fashion

understanding, gives brands the possibility to enhance customer experience and promote sustainable production and consumption habits. For instance, virtual fitting rooms decrease physical store traffic, try-on/return cycles are reduced, and unnecessary logistics mobility is avoided.

Artificial intelligence is increasingly utilized by fashion brands. Thanks to the virtual style assistants used by brands, customers can try on many products such as shoes and clothes, see them on themselves without going to the store, and place their orders accordingly. In addition, designing with artificial intelligence is also one of the preferred methods. In addition, many different designs and many things are created with many artificial intelligence tools [1]. Augmented reality, 3D design, and virtual reality are among the technological developments used in the fashion field. By using fashion design programs in a virtual environment, it is possible to examine many products such as clothes and shoes from many perspectives, and at the same time, many things such as presentations and fashion

shows can be created in a digital environment and virtual products can be offered for sale [2].

Fashion studies are actively carried out to develop fashion products such as made-to-measure clothes using digital technology. Brands are trying to automate the work stages in order to prevent a decrease in productivity [3].

Studies such as exhibiting designs in a digital environment with virtual fashion shows, allowing the customer to try on the product in a virtual environment, and creating the opportunity to examine the products in the Metaverse shopping mall attract the attention of the consumer [4].

During the COVID-19 pandemic, designers preferred digital presentations that could be done remotely to showcase their collections. The digital presentations used augmented reality and were interactive, creating a big difference for the brand against its competitors [5]. Online shopping is an electronic channel that connects brands and customers directly. It allows customers to choose and purchase products, usually through an interactive electronic environment [6].

The change in consumer behaviors, along with the effect of growth, has brought about significant developments in the fashion sector. The most important source of these developments is technological developments [7]. With the rapid developments in technology, consumers have started to shop more on the Internet to meet their needs. The frequent use of the Internet for shopping has led to an increase in online stores and online shopping [8]. With the increase in online shopping, the competition between brands has also moved to the virtual environment. In a competitive environment, the concept of brand loyalty comes to the forefront in order for brands to sustain their existence. Many brands see brand loyalty as an advantage in order to exist for a long time and to maintain profitability [9].

## 2. Literature Review

In this section, studies that address the relationship between augmented reality and fashion are examined. These studies, published over a specific period, are presented in terms of article titles, authors, and publication details; this analysis aims to clarify the position and contribution of the

current study by revealing trends and gaps in the literature.

Based on the in-depth literature review performed with a qualitative research method, AR/VR technologies were found to have altered customer experience, marketing strategies, and brand interactions in the fashion industry significantly. However, the study does not incorporate any applied data or user experience-based measurements and is solely based on case studies and theoretical frameworks [10].

In this study, a comprehensive literature analysis was conducted within the conceptual framework, and digital fashion examples were examined through case studies. The research revealed that 3D clothing is used not only in the field of design but also in consumer identity creation processes in the metaverse environment. In addition, it has been determined that digital wardrobes play a critical role in terms of secure sharing and registration. The study represents one of the rare academic studies in Turkey that addresses the relationship between digital fashion and NFT. However, due to the fact that metaverse applications are still at an experimental level, the results obtained cannot be generalized and the lack of practical user data is among the important limitations [11].

3D clothing systems were examined and compared. The findings show that 3D technologies are effective in increasing user satisfaction and reducing return rates. In addition, augmented reality-supported applications make online shopping processes easier. However, the limitations of the study include the absence of empirical data, participant insights, and formal statistical analyses [12]. In this study, literature review and case analysis methods were used together and supported with international examples. AR/VR technologies strengthen brand image and customer loyalty. The effects on the market are emphasized. In addition, strategic marketing suggestions are presented. However, the study draws attention to the limited number of original applications for the local market and the lack of case studies focused on Turkey [13].

The paper is a compilation paper that focuses on the application use of the AR technology in the creation of a personal product design. The potential application use of the AR technology in fashion and the personal customized product designs has been shown in many ways by carrying out analysis on seven different samples selected by using the random sampling technique. However, the paper is

grounded in practical experiences. The paper is limited in terms of empirical research in a way it does not involve qualitative information, opinions, or findings [14].

This research has proven that virtual reality technology now has more accessible and interactive presentation styles free from the constraints of space, time, and expense associated with fashion shows. The effectiveness of the digital fashion show in building a strong relationship, especially among the youth, is highlighted. This research work has provided an interdisciplinary approach towards the literature as it merges fashion and technology. But the research has a theoretical approach as it contains neither experiment nor analysis done by the users; lacks quantifiable support [15].

The main purpose of this research is to examine in detail the effects of Augmented Reality-supported digital wardrobe applications on the fashion industry and consumer behavior, to identify the deficiencies in the current literature, and to provide original contributions in this direction. In addition, it will be discussed how Augmented Reality applications provide value in terms of sustainability and environmental impacts. In this context, the study aims to present future projections at the intersection of fashion and technology fields, to examine digital trends that transform consumer behavior, and to develop innovative suggestions with a sustainability perspective. There are a limited number of studies in the current literature on the effects of the digital wardrobe concept on consumer behavior. Therefore, this study aims to provide an original, practical, and sustainability-oriented contribution to the current literature and to fill the gap in the current literature.

### 3. Methodology

This research aims to understand the use of Augmented Reality technology in the fashion industry, the effects of digital wardrobe applications, and the reflections of these innovations on consumer behavior. A descriptive analysis based on a literature review was carried out. Due to the nature of the subject, the technological impacts on the industry were addressed holistically in terms of user experiences, sectoral transformations, and sustainability.

Within the scope of the research, more than 30 academic articles, journal articles, sectoral reports, and conference proceedings on fashion, augmented

reality, and digital user experiences published in the last 25 years were analyzed.

#### 3.1. Research Design

An explanatory research study was conducted to understand the reflections of digitalization and AR technology in the fashion industry. An interdisciplinary approach was adopted because it is a multidimensional study topic in terms of both technology and consumer behavior. The literature review was based on academic articles and industry reports published particularly in the last 25 years. The highlighted parts of the article are listed:

- A multi-faceted perspective that includes fashion, technology, consumer psychology, consumer habits, digitalization, and sustainability has been preferred.

- An original research topic was chosen by focusing on topics such as "digital wardrobe applications with AR", which have been previously addressed in a limited way in the literature.

#### 3.2. Data Collection and Analysis

The main data sources of the research are academic literature, industry reports, digital marketing analyses, and technology trends, which are defined as secondary data. The resources obtained during the analysis process were classified into themes (technological application, sustainability, user experience). Common trends, contradictory results, and missing topics in the literature were identified. In line with this analysis, the gaps that the study would contribute to were clarified. It was determined that there were a limited number of studies in the literature, especially in the context of consumer behavior and digital wardrobe experience.

This methodological approach is therefore theoretically supported and is also used to show how augmented reality technology affects fashion more systematically.

### 4. Conceptual Framework

This section analyzes how augmented reality technology has shaped consumer behavior and digital wardrobe applications. The conceptual framework explains the basic theories, key

concepts, relationships between them that guide this research.

### 4.1. Augmented Reality (AR)

Computer-aided virtualization of real-world image objects is performed. It is a hybrid visual experience. This lets users experience real-world and virtual content simultaneously in real time. As a fashion application, it enables product trials / virtual cabins / 3D clothing simulations to change the customer experience. AR lets the consumer try the product out without actually wearing it.

### 4.2. Digital Wardrobe

A digital platform where people can virtually try on clothes, save them and create combinations. This is an innovative concept for personal style management, shopping decision making and sustainable consumption.

### 4.3. Consumer Behavior

Consumption behavior is how people buy, use and evaluate products. Such factors as usability / ease of access / perceived benefits / quality of experience drive AR-based shopping adoption.

### 4.4. Sustainable Fashion

It is a fashion concept based on sustainable, ethical production processes aiming to reduce consumption of fast fashion. AR applications help fashion become more sustainable as users consume fewer physical goods. Reducing physical try-ons and return rates may also reduce the carbon footprint of fashion. For this reason, the study focuses on how environmental awareness can be integrated with technological solutions.

### 4.5. Fashion and Technology Integration

Developments such as wearable technologies, personalized recommendation systems with artificial intelligence, and smart fabrics constitute the intersection of fashion and technology. Within the scope of this research, developments such as digital fashion design and the inclusion of virtual products in collections are also included in the conceptual framework.



**Image 1.** A woman choosing a dress with Augmented Reality [29].

### 4.6. Conceptual Model

Below, a summary conceptual model is proposed that shows the key concepts guiding this study and the relationships between them:

Table 1. Conceptual Model

Concept	Related Concepts	Expected Impact
Augmented Reality	Digital Wardrobe, Consumer Experience	Increasing consumer engagement, influencing shopping decisions
Digital Wardrobe	AR Technology, Personalization	Simplifying style management
Consumer Behavior	AR Usability, Digital Literacy, Virtual Identity	Adaptation to technology, change in shopping habits
Fashion and Technology	Wearable Technologies, AR Infrastructure	Innovative designs impact brand perception
Sustainable Fashion	Physical Trial Reduction with AR	Reducing carbon footprint

This conceptual framework forms the theoretical basis of the research and determines the direction of the analyses to be made in the following sections. It also shows that not only technological but also economic, environmental, and socio-cultural

dimensions of digitalization in the fashion industry should be taken into consideration.

## 5. Findings

In this section, the findings obtained from the literature review, user experiences, and application examples in the sector are analyzed and the effects of digital wardrobe and augmented reality on the fashion sector are discussed in line with these findings.

### 5.1. The Beginning of a New Era in Fashion

The fashion world has moved beyond traditional patterns with the influence of digitalization and has come to the threshold of a new era.

Digital wardrobes are also a technological innovation. They also bring with them issues of sustainability, individual expression, and changes in consumption habits. Popularity of digital clothing is also driving fashion brands to produce digital collections [16]. This digital clothing may be used for identity sharing via social media, video conferences, or metaverse platforms.

In terms of sustainability, digital wardrobes may reduce the environmental impact of fashion. Typical clothing production is quite high in terms of water consumption, carbon emissions, and waste production. However, digital clothing does not involve such physical production processes either [17]. In this sense digital wardrobes support an environmentally friendly fashion approach.

As for the technological infrastructure, the most pertinent technologies are augmented reality and artificial intelligence. Augmented reality helps in the real-time experience of digital clothes in virtual reality. Artificial intelligence-assisted recommendations help in suggesting designs as per the preferences of the user [18]. This helps in the original user experience.

Simultaneously, "DressX," "The Fabricant," and "Replicant," new generation platforms that offer only digital fashion products, are also popularizing the concept of digital wardrobes.

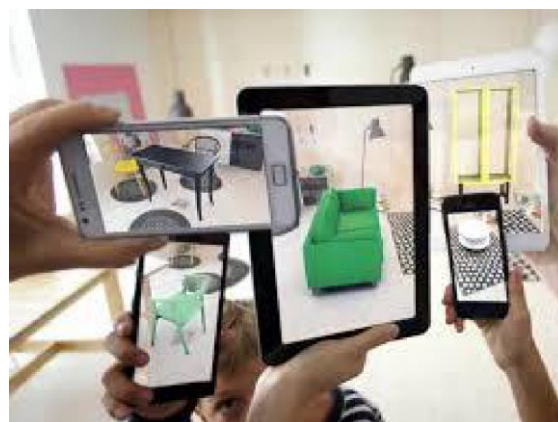
In conclusion, the digital wardrobe is a technological evolution in fashion, but also a cultural revolution. In an era where the physical meets the digital, fashion is becoming more sustainable, accessible and individual.

### 5.2. AR Applications for Fashion Brands

Besides the technology sector, today digitalization concerns all creative industries including fashion. It's a physical application of digital content so-called augmented reality technology. AR features integrated into the application develop the user's experience, making it an interactive relation between customer and brand [19]. Fashion brands use this technology to rethink shopping and brand image.

Limited physical store experience, especially post-pandemic, forced brands to create digital solutions. Now comes AR technology: customers can virtually try on products, see how clothes fit and make conscious purchases [20]. Most familiar is Gucci's "Try On" app, which lets users virtually try on shoes on their phones. Similarly fast fashion brands like Zara have combined AR-enriched in-store and mobile app experiences [21].

Turkish fashion sector representatives understand that customer loyalty and personal shopping can be improved. So a customer might try on an outfit virtually at home without going to a store. In response, augmented reality applications have become an innovation in technology for fashion brands and also part of their marketing plans, customer experience plans, and sustainability plans. As shopping is adopted more widely in the fashion industry, hybrid shopping models where physical and virtual experiences mix are expected to become standard.



**Image 2.** An example of an AR application used by a fashion brand [30].

### 5.3. Fashion Shopping with Augmented Reality: The New Generation Experience

Nowadays, digital transformation is transforming consumer behavior, and the transition of the fashion industry to augmented reality technology is one such change. AR changes the user experience by digitizing the fashion shopping process and is very popular with young consumers [22]. Users can try on clothes digitally without going to a store with AR technology. Users can experience these applications to simulate the appearance of products on the body while realistically reflecting details like fabric movement and fit [23].

Top fashion labels adapted quickly to this technology. Zara allows customers to try goods from virtual try-ons via their mobile application, while Gucci and Nike increased customer engagement by integrating virtual try-on technologies within their applications [24]. However, a major aspect where AR technology has a positive impact on sustainability is by avoiding physical trials. This reduces returns and contributes to a reduced carbon footprint [25].

Technology like augmented reality allows practical shopping and is now interactive and aware. This is the future shopping experience that users get. Fashion is using technology to offer consumers an interactional and personal shopping experience. One problem is that the consumer cannot try the item physically. This problem is solved to some extent using technology in the form of augmented reality, especially in online shopping.

AR-supported mobile applications and smart mirrors let you wear clothes virtually on your own. This technology allows the customer to see how the clothes fit their body type, color harmony, and style. This reduces returns and increases customer satisfaction. For example, Zara, H & M, Gucci and Nike have integrated AR technology in their apps so users can try on clothes virtually. This technology also works in-store; store visitors learn more about the products and compare them in different combinations. Augmented reality makes fashion shopping fun, efficient and customer-centric - and gives brands a competitive edge.



**Image 3.** An example of AR-based in-store information and guidance [31].

### 5.4. The Combination of Virtual and Physical Fashion Experience: Hybrid Shopping

Digitalization is transforming consumer shopping habits. Especially after a pandemic, we see physical stores being replaced by digital experiences [26]. But today hybrid shopping models combining the two worlds are rebuilding the user experience. For example, in fashion a more personalized shopping approach is developing which combines virtual and physical experiences. This hybrid shopping model lets consumers shop online and in person. Shoppers may buy products in virtual environments. Once they experience it, they can have a tactile experience in physical stores or do the opposite. It thus gives the consumer shopping freedom independent of time and space [27].

In fashion, hybrid shopping is a necessity due to digitalization, but it is a need for the new generation of consumers. This model changes shopping from a purchasing process to a social, technological experience. The future fashion industry depends on combining physical reality with digital imagination. And hybrid shopping allows personalized marketing via customer data. Loyalty programs, recommendations based on shopping history, in-store navigation systems, live stock information, and special discounts - all part of the hybrid experience. This model is even more relevant in the post-pandemic period. Consumers prefer digital solutions without contact but they also want to physically touch the products. This forced the fashion industry to optimize its physical and digital assets.

Consequently, the hybrid shopping model allows consumers to shop independently of time and place

while simultaneously offering brands many multifaceted benefits such as increased customer loyalty, data collection and operational efficiency.

### 5.5. Sustainable Fashion and AR Technology

Sustainable fashion seeks to limit the negative effects of fashion on the environmental, social and economic levels. Fast fashion production and consumption habits create serious environmental problems. Fast-fashion collections of big brands like global fast fashion retailers, for example, use up tons of water and energy, and waste problems are also on the rise.

AR technology also supports sustainability strategies of brands. For example, virtual fitting rooms and digital collections allow customers to try out products without physically trying them on. This practice decreases product returns and carbon emissions from logistics and productions. Meanwhile, digital fashion shows are organized during fashion weeks to decrease the environmental impact of large events and travel. Some fashion weeks experimented with virtual or hybrid formats. Such developments conserve environmental resources while enhancing consumer experience [28].

Brands extend the concept of zero waste design, where the collections are made from material recycling and reuse. By this, AR/digital technology becomes a sustainability tool. These technologies assist in spreading the concept of more responsible/environment-friendly practices right from the point of production. For example, using AR technology, the buyer can virtually try the product before purchasing, thereby eliminating the concept of waste in the production sector. By the virtual fitting room, the concept of returning the product to the shop, untried, gets reduced, eliminating the unnecessary shipping process. By direct carbon footprint, this reduces carbon emissions. Additionally, using AR technology, some brands produce virtual garments only, with no production, thereby protecting the environment.

However, the AR tech trend also has positive impacts on designers. In this way, designers can conceptualize product prototypes through AR tech and test them prior to the actual product development process. It limits the wastage of materials and enables enhanced development processes. In this way, the entire systematic approach has positive effects on the environment

and the fashion industry. However, the reduction of AR tech-related effects provides an innovative and technological touch to the entire process.

### 5.6. The Intersection of Fashion and Technology: Wearable Smart Technologies

Those electronic devices that can be worn on a user's body are considered wearable technologies. These technologies are both functional and fashionably integrated. Wearable smart technologies are currently redefining fashion on both user experience concepts and product designs.

The wearable technologies are product ideas developed at the boundary of fashion and technology. At present, most products possess dual characteristics such as aesthetic and functional features, found in smart watches, glasses, fitness wear, or electronic textile products. The above-mentioned products are related to health and communication with surroundings, and they function as interfaces of health data with the digital world [29]. The fashion industry sets up new designs of products by integrating these developments with aesthetic forms. The wearable technologies have impacted individual expressions. Technology today goes beyond mere function and becomes a style statement. A new type of consumer profile emerges through this integration of fashion and technology, with emphasis on personalization and functionality.

Numerous technologies can be classified as 'wearable.' The definition of 'wearable technology' is evolving, encompassing smart fibers, tattoos, biosensing devices, implants, networked jewelry, and LED-embedded garments. Wearable technology is often categorized as e-textiles and clothing, linked biosensing devices, and wearable computers. Functions vary from highly practical, such as monitoring heart rate or counting steps, to entirely fantasy, as shown by clothing that adjusts its transparency in response to biological signals of interest or attraction. Currently in the experimental phase, forthcoming sweat-analyzing biofuel apparel and equipment will harness microorganisms to enhance health, pursue well-being, and foster an improved environment [32].

### 5.7. Future Fashion with Augmented Reality

AR lets digital objects interact with the real world. This technology is applied to many different fashion applications including virtual clothing trials

/ virtual runway shows / in-store interactions and personal shopping experiences. AR makes shopping less physical and more personalized, accessible and innovative. Such fashion is becoming the future, especially with e-commerce.

Augmented Reality is considered the pioneer of an experience-oriented fashion revolution. By removing the boundaries of physical shopping, AR lets users try on virtual clothes on themselves in real time. Post-pandemic, brands have accelerated the demand for AR-based virtual fitting rooms and have invested in this area.

In a similar way, AR affects design processes as well. The design of products can begin with digital models, followed by the creation of a prototype, and conclude with a virtual presentation of products for customers. This way, the manufacturing of products will become economical and ecologically friendly, as well as an interactive experience for customers. This transformation of the fashion sector through AR technology reshapes the processes of marketing and consumption.

Consequently, the technology in the realm of augmented reality is presently one of the most influential digital resources for the future of the fashion industry. This technology has completely modified the experience associated with shopping as well as design, marketing, and customer relations.

The attraction of shopping, which is a favorite pastime activity for most people, is undergoing a revolution with the seamless integration of technology and fashion. While the world is faced with the challenges posed by a rapidly changing society, the need for innovative solutions is imperative [33].

In order for them to keep their competitive advantage as well as keep up with the ever-evolving demands of smart technology consumers, businesses and merchants around the world are incorporating AR technology. This is a trend that is poised to become even more mainstream and embedded in every aspect of the purchasing experience as the technology underlying AR becomes better and is released for broader usage. Augmented Reality will soon experience greater mainstream acceptability in terms of usage by consumers, resulting in the development of new norms in the retail and e-commerce sectors. This in itself will become the stimulator for other

innovations and ultimately design the future of global commerce [34].

The apparel sector is progressively depending on digital representations. Virtual models are attired and paraded up the catwalk at virtual fashion shows. Retail environments display apparel in 3D, while personal, personalized avatars don these garments. 2D-CAD systems utilized for the construction and grading of apparel are well-established within the industry (e.g., Assyst, Gerber, Lectra, etc.) and, alongside standalone systems such as CLO 3D and V-Stitcher, facilitate the realistic visualization of products in three-dimensional space. The availability of real-time capability and interaction, or a standardized export of virtual models for use in AR-capable development environments (e.g., Unity3D or Unreal), is either nonexistent or severely restricted due to the diversity of data formats employed. The gaming business is progressively utilizing these CAD techniques to customize game avatars. The emphasis here is not on the accuracy of the fit but rather on the efficacy of producing genuine fabric movement during gameplay [35].

## 6. Conclusion

The technology of reality is altering the consumption experience in the fashion retail sector. This paper will discuss the rise in the concept of the digital wardrobe that has resulted from the integration of reality technology in the fashion industry. The multidimensional impacts, including the aspects of user experience, sustainability, shopping behaviors, virtual fashion identity, and ethics, have been assessed. The result has shown that the applications of AR in the digital wardrobe are altering the consumption of fashion, providing flexibility in the fashion try-on practices, and improving the expression of the virtual fashion identity. The technology not only provides a better user experience, but the shopping process has become more efficient and sustainable. The digitally impacted behaviors of Generation Z in the fashion industry, together with the concept of NFT, are the driving forces in the future trends in digital fashion. This technology has become essential in building a competitive advantage in the fashion industry.

At the theoretical level, the work is a contribution to the digital fashion literature. The areas that intersect include fashion, technology, sociology, and ethics, in which the applications of AR also have a purpose in terms of serving as tools for

change in society. The research is a practical contribution in that it offers strategy that is useful for the retail sector, digital designers, as well as tech developers. Notably, the results that could be used in the development of a fitting room in the digital clothing industry/marketing an NFT collection/creation of a digital fashion experience were achieved. At this juncture, augmented reality transcends its status as a tech tool.

There are also limitations in the study. In general, the source of the data is secondary and an outcome of previous literature reviews. The pace of a constantly changing technology means it has an ever-changing environment and can quickly influence the relevance of the research. The device dependence and infrastructure demand of Augmented Reality technology contribute to some limitations in the application level. Despite the limitations, it is also important to take into consideration the limitations in relation to technical issues, for instance, those that influence user experience and privacy.

Some proposals for future research are. User behaviors and experiences must first be researched. Age, gender, and digital literacy must be analyzed through statistics for their influence upon the perception of digital fashion. Similarly, interdisciplinary research must be conducted to examine the influence of NFT fashion upon the psychology of investment. Regarding the ethical discussions presented, a legal and political framework for copyright, biases in artificial intelligence, as well as digital designer labor must be established. Additionally, a combination retail approach using AR technology and the analysis of the mix of the digital and physical fashion experience must be examined.

This research contributes to the body of work on the applications of Augmented Reality in the fashion industry. Further analysis such as analysis of the different age groups, the role of culture and the psychology of the user would be recommended in future research. Also, more research should be done on AR being used in other technologies such as the metaverse.

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