

Digital Fashion: Its Growth, Evolution and Future

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We are finally in an era where services and commodities are easily accessible thanks to technology. For instance, think about the fashion industry. Who would have thought that we would ever see fashion going digital? Not me. Here's why — fashion is a form of art, and the designers are the artists. As with most art pieces, you have to be physically present to fully capture its essence and beauty.

Times have changed and technology has proven to withstand the test of time. Today, the Internet has enhanced globalization, and data has become the new gold. So, why not merge technology and fashion to make it everlasting? This is what digital fashion is all about.

Digital adoption among businesses occurred during the infancy of the Coronavirus (COVID-19) pandemic. [Statistics](#) now indicate that fashion brands with digital channels gained at least 20% of revenue in 2021. Additionally, [reports](#) indicate that 45% of fashion executives viewed COVID-19 as their biggest challenge while 30% viewed going digital as the biggest opportunity in 2021.

This paper analyzes why Digital Fashion was 2021's most innovative trend and how it sought to change the world for the better. This article will articulate the history and evolution of digital fashion before elaborating on its operations. Thereafter, there is an examination of the suitability of digital fashion in the realm of global sustainable development.

History and Evolution of Digital Fashion

Digital Fashion is the interaction of Information Communication Technology (ICT) and the fashion industry. It is also referred to as **e-Fashion**. Credit is often given to the existence of social media, which emerged in 1997 with the creation of the first website known as [Six Degrees](#).

Shortly after, there was a social media boom in the early 2000s, with MySpace and LinkedIn leading the way. By 2006, Facebook and Twitter were available which enabled fashion brands to access a larger consumer market — the beginning of the evolution.

In its infancy, digital fashion was available in the gaming industry where gamers could spend money on virtual clothing for game characters, such as in the [Zwift cycling](#) app. There are now more ways to explore the fusion of technology and fashion.

As of 2016, there existed significant growth in the digitalization of fashion magazines and the increased use of mobile phones. [Researchers](#) even noted the major digital transformation that the fashion industry began to undergo; specifically in its facets, layers and processes.

The face of fashion took a turn when a Scandinavian retailer; [Carlings](#), launched the world's first digital-only clothing collection in 2018. Their customers would send in their photos and then their team of designers would edit the digital outfit onto the image. In retrospect, this may be viewed as the template for digital fashion in the upcoming years.



[image source: [Wikimedia Commons](#)]

Now, you may be wondering why digital fashion has only recently begun gaining popularity — The COVID-19 pandemic takes all the credit. The enforcement of mandatory national lockdowns and international travel bans greatly affected the fashion industry, which heavily relied on physical interactions with its consumers and collaborators. As an illustration, [McKinsey](#) notes there was a 70-80% decline in the purchase intent for offline fashion within Europe and North America; even in countries that were not fully in lockdown. Similarly, in [Kenya](#), there was a ban on the importation of second-hand clothing in a bid to stop the spread of Coronavirus. Keep in mind that the Kenyan second-hand clothing market is valued at [10 billion Kenya Shillings](#), thus, one can only imagine the effect the ban had on various fashion retailers. These are but a few examples of how the global fashion industry suffered in the face of a pandemic. Fortunately, this fueled the realization that a change in circumstances requires: revolution and adaptation.

“COVID-19 gave us time to re-think, re-invent and re-develop the fashion industry.”

-[Mahlet Teklemariam](#)

(Founder of Hub of Africa Fashion Week in Addis Ababa)

Fashion brands have now begun using three-dimensional (3D) technology, digital fabrics and social media strategies to successfully formulate wholly digital fashion brands. In 2019, Carlings created the [first augmented reality graphic t-shirt](#) which can seamlessly change in design when paired with a custom Instagram or Facebook filter. According to the brand, this means you can change your shirt design without having to buy a new one. This unlocks a whole new level of **Digital Couture** in the fashion industry. Note that most social media users prefer to replicate popular fashion trends on their pages, which is a great advantage for fashion enthusiasts or influencers who would like to display a new look each day. Yet, this example is not the only manifestation of digital fashion's splendor.



[image source: [Carlings](#)]

How Digital Fashion Works

It is important to note that digital fashion is now booming because it aims to make products and services readily available to consumers despite their geographical locations.

With that, digital fashion has seen tremendous growth from 2019 with the use of ICT to:

- a) Design and produce fashion products;
- b) Facilitate marketing and sales; and
- c) Enhance global communication and collaboration with relevant stakeholders and consumers.

The above are the three main layers of how ICT merges with the fashion industry to create an overall digital fashion product, service or experience. This section examines how digital fashion works within the three aforementioned layers.

a) Digital Design and Production of Fashion Products

The fast fashion industry is well-known for its harmful effects on the environment through unsustainable practices. It is responsible for releasing [up to 10%](#) of global carbon emissions and consuming [93 billion cubic meters](#) of water during production processes. In this digital fashion

era, ICT is used to design and produce fashion products through the use of 3D software to create **digital fabric**, which is deemed to be more sustainable — through means that are discussed hereafter.

To begin with, digital fabric can now be found in two forms; that is, the intangible fabric of fashion items selected by a customer online. The other form of digital fabric is the tangible result of **digital textile printing**; which is more common.

Digital textile printing is not a novel concept. Rather, it emerged among ancient Egyptians, who used painted blocks to imprint design onto the material. They also hand printed the material. Then, roller printers were used during the mid-eighteenth century to facilitate mass printing. However, this soon lost its popularity as it hindered the design quality. Digital textile printing took over during the late 1980s by enhancing aesthetics and designer creativity.

Technological evolution has now improved the digital textile printing process by printing on textiles and garments using specialized or modified Inkjet Technology.

Moreover, 2D and 3D software are increasingly being used by fashion brands to facilitate the design and production process because of its sustainability benefits by:

- a) Using laser cut technology that reduces unnecessary physical waste from fittings and offcuts.
- b) Making it easier to correct errors on virtual garments using the software.

The popular 3D programs used for digital fashion are CLO3D, Optitex and Marvelous Designer. User experience shows that these programs result in a completely digital fashion product in [60% less time](#) in comparison to traditional methods.

“In the last 15 years, the potential digital inkjet printing speed has skipped from 10m per hour to an astounding 90 linear meters per minute.”

-Federation of European Screen Printers Association ([FESPA](#))

Inevitably, 3D software and Computer Generated Imagery (CGI) has led to virtual fashion shows for luxury brands like the 2019 Louis Vuitton and Final Fantasy launch of their digital garments.

Digital fabric and digital textile printing are now viewed as eco-friendly alternatives that reduce pollution from fast fashion since it only uses data. For instance, [research shows](#) that the carbon footprint of a white cotton shirt is 10.75kg while its digital counterpart emits 0.312kg.

b) Digital Marketing and Sales

The fashion industry is dynamic and retailers need a way to reach their target consumers. In this respect, social media has been a great asset to communicate and launch promotional campaigns. Digital practices in fashion are gaining more attention, starting from communication, online reputation and e-Commerce.

Retailers today use social media to study consumer behavior and trends to stay ahead of the competition. They also use social media channels, like Instagram, to promote their products and services in a language that attracts their target audience to maximize sales. Similarly, they use these platforms, like Facebook and Twitter, to stream their catwalk events bringing the runway to the comfort of our homes.

One of the flagship online events that recently occurred was the [Milano Digital Fashion Week](#), which involved a multi-channel experience from video chats to holograms and virtual spaces in collaboration with Microsoft cloud and artificial intelligence solutions. In the bargain, [Anifa Mvuemba](#), a New York-based designer from Congo, showcased her first live 3D virtual show on Instagram live which went viral and led to her collection selling out. Indeed nobody has been left behind with the rise of digital fashion.

Thereafter, this enhances sales since the consumer can easily purchase the products using the same platforms because they are user friendly. In particular, Prada – among others - makes a monthly limited edition “Time Capsule” with 3D pieces that are only available for sale within 24 hours.

c) Global Communication and Collaboration in the Fashion Industry

Consequently, fashion is now merging with the gaming culture, which was where digital fashion first manifested itself. Gaming clothing, which is referred to as “skins”, is set to be valued at 50 billion US Dollars [by the end of 2022](#). Social media enhances globalization, which facilitates collaboration between the fashion and gaming industries. Namely, a game called “Animal Crossing” offers character outfit selections from brands including Marc Jacobs, while Nike makes exclusive Air Jordan skins for Fortnite characters. For Nike, this resulted in 1.4 billion Sterling pounds in revenue.

Furthermore, there has been increased collaboration between international fashion retailers to facilitate the sharing of ideas for growth. In 2021, a webinar by [Fashionomics Africa](#) involved discussions on Digital Fashion in Africa, which resulted in an exchange of views between fashion entrepreneurs, digital enthusiasts and the general public.

Now that you know what digital fashion is all about, we need to figure out whether it is in line with the global vision for sustainability.

Is Digital Fashion Good or Bad For Us?

The fashion industry is worth [759.5 billion US Dollars](#), which is predicted to rise to 1.002 trillion US Dollars by 2025. This may seem alarming since the industry is well-known for contributing to 10% of greenhouse gas emissions, water pollution and unethical practices such as employing child labor. It may be a wonder whether this is the right way forward. So far, here is what digital fashion promises to offer.

1. Replaces Fast Fashion

Overconsumption of fast fashion has led to a negative impact on the environment and it loses around 500 billion US Dollars annually due to a [lack of recyclability](#) resulting in polluted landfills.

Currently, the new dawn of digital innovation appears to meet the speed of change in consumer taste and current trends more intensely than fast fashion. With that, brands are keen on campaigning for eco-friendly business plans that ensure transparency and product traceability using QR Code technology like the Denim Reimagined Project by [the R Collective](#).

Using technology in the fashion production process has also been effective in eliminating excess fabric waste and preventing water pollution from chemical dyes by using laser-cut technology for accuracy. Using software makes it faster to rectify errors. To add to that, digital fashion actively contributes to reducing carbon emissions such as [Dress-X](#) which produces one item with 95% less total carbon footprint than the average production for a physical garment.

2. Reduction in Production Costs

[Nuel Bans](#), the founder of Style Lounge Weekend, notes that this is a positive benefit in the fashion industry. For instance, [Puma](#) reduced their water usage by 17.4% during the production of their new collection, resulting in a 30% reduction in marketing costs too. Brands will now be able to divert the saved up costs to expand and contribute to the global economy.

3. Creation of Jobs

Contrary to the popular belief, the introduction of technological processes does not entirely replace human interactions. In digital fashion, there may be an influx of jobs in the industry, which can be deduced from the recent participation of West African designers in digital fashion shows and marketing as illustrated by [Vogue Business](#). The article articulates the different roles that fashion experts can participate in or seek recruitment of such as designers, 3D creatives, show producers and retailers.

4. Increase in Inclusivity and Self-Expression

Fashion has always been and will be a form of self-expression. The fusion of fashion and technology only elevates this ability to greater heights by allowing fashion brands to promote their products to anyone regardless of their size, age or gender. Using 3D software to digitally fit clothes onto the image of any consumer gives a whole new meaning to “one size fits all.”

In consideration, digital clothing will enhance self-expression through social media, since most consumers are subject to lockdowns and quarantine measures.



[image source: [Deezen](#)]

Focus on Sustainability and Overlook the “Digital versus Personal Debate”

Like most matters, digital fashion is a double-edged sword. Participants and stakeholders in the digital fashion industry note that it is an expensive venture to participate in. As a result, some of the products may be well above the budget of ordinary people who are more concerned with appearance and affordability rather than uniqueness and sustainability. While this is a challenge that brand owners can curb through awareness creation, it is not entirely impossible that soon we might have fully digitalized wardrobes and achieve net-zero emissions by 2050.

As Henri Joli, Haute Couture expert states in [a recent interview](#), it is important for one not to systematically reject innovation. Instead, one must know how to measure his or her needs.

To conclude, it is noteworthy that digital fashion does indeed involve a large amount of personal data. There must be increased discussions on the safety of consumers' personal data and the standards of handling the same to safeguard their right to privacy. Fashion designers and stakeholders should also adhere to the 2018 Fashion Industry Charter for Climate Action and the goals of the Paris climate change agreement, with a vision of how the industry can achieve net-zero emissions by 2050.

“We truly believe this is something that is going to shape the future of fashion, and it’s something that is totally zero-waste.”

-Gala Marija Vrabnic, Creative Director at Tribute.